



# 2040 COMPREHENSIVE PLAN

CITY OF FARMINGTON, MINNESOTA

DECEMBER 2019





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# 1. PLAN PURPOSE & VISION

## Purpose

The city of Farmington continues to value long-range, strategic planning in order to ensure the existing community can successfully evolve to meet the anticipated needs of the future. Farmington's 2040 Comprehensive Plan serves as the primary guide for projecting and managing the community's growth, changes, public improvements, and redevelopment in the community over the next 20 years. The 2040 Comprehensive Plan's most essential purpose is to establish the community's long-term vision, guiding principles, goals, policies, and maps to shape and manage future changes in the community.

Successful community comprehensive planning, development, and infrastructure investment requires community input and involvement; monitoring and analysis of current conditions, trends, and future needs; forward-thinking goal and policy setting; the dedication of staffing and funding; and the ability to make sound decisions when faced with competing interests. The update of Farmington's 2040 Comprehensive Plan provides the opportunity to review and calibrate the community's long-term direction out to the year 2040.

## Comprehensive Plan Elements

A comprehensive plan is a tool used to guide the physical and socio-economic growth of a community. It is intended to be broad in scope and establishes general goals and policies. It is a guide for landowners, residents, elected and appointed officials, business owners and developers as they make decisions about land uses and investments. The 2040 Plan is developed based on input from community members and careful studies of the land and public infrastructure. This information is synthesized into a broad consensus on future land use, development patterns, and public infrastructure systems that support planned development and growth.



Farmington's 2040 Comprehensive Plan is comprised of several interrelated elements:

- » Land Use
- » Housing
- » Transportation
- » Water Resources
- » Parks & Recreation
- » Sustainability
- » Economic Development

## Why is the 2040 Plan Important?

As the guide for future community development, the 2040 Comprehensive Plan will influence many decisions. It is intended to be a dynamic document that is regularly reviewed and updated. The 2040 Comprehensive Plan:

- » Establishes a Community Vision and Guiding Principles developed through a community input process;
- » Establishes goals and policies for each of the plan elements;
- » Guides the location, type, and pace of future growth, new development, and redevelopment in an orderly and efficient manner;
- » Defines different types of land uses and protects property owners' investments by ensuring consistency and compatibility of land uses and development;
- » Determines approaches for protecting natural resources and providing parks, trails, and open spaces;
- » Guides the expenditures of scarce resources for capital investments in roads, utilities and public spaces;
- » Promotes the maintenance and enhancement of existing neighborhoods and business districts;
- » Provides a nexus for zoning, subdivision, and other land use and development related regulations;
- » Help coordinate public and private sector decision-making and investments;
- » Lends a greater degree of predictability to future community changes;
- » Supports a sense of community and neighborhood identity;
- » Promotes the city and demonstrates a shared vision to those wishing to invest in the community, start a business, or establish residency.

## City's Authority and Requirement to Plan

The power to create and employ a comprehensive plan comes from Minnesota State Law. Minnesota Statutes, Sections 462.351 to 462.364 contain the planning powers granted to Minnesota cities and townships. Specifically, M.S. Section 462.353, Subd. 1 authorizes communities to “carry on comprehensive municipal planning activities for guiding the future development and improvement of the municipality and may prepare, adopt and amend a comprehensive municipal plan and implement such plan by ordinance or other office measure.”

As a city within the Twin Cities metropolitan area, the city of Farmington is also required to complete and keep updated a Comprehensive Plan under the Metropolitan Land Planning Act of 1976 and all subsequent amendments to that act (Minnesota Statute Chapter 473). The Metropolitan Land Planning Act (MLPA) addresses the interdependence of local units of government within the Twin Cities Metropolitan Area and requires the adoption of coordinated plans and programs. In preparing the city's comprehensive plan, it is required to work with other governmental agencies, adjacent communities, school districts and counties in order to ensure coordinated regional planning.



## 2040 Regional Plans

The MLPA also requires the Metropolitan Council to prepare a comprehensive regional development plan for the metropolitan area. The Metropolitan Council's Thrive MSP 2040, adopted in 2014, fulfills this requirement. These regional plans provide local units of government with direction on how to plan for development, transportation, water resources management and parks. Subsequent to adoption of the 2040 regional development plan, the following metropolitan/regional system plans were updated and adopted:

- » 2040 Transportation Policy Plan
- » 2040 Regional Parks Policy Plan
- » 2040 Water Resources Policy Plan
- » 2040 Housing Policy Plan

Local governments within the seven county metropolitan area are required to amend local comprehensive plans so that they are consistent with the goals and policies established in Thrive MSP 2040.

## THRIVE MSP 2040 POLICIES FOR EMERGING SUBURBAN EDGE

Farmington has been designated as an Emerging Suburban Edge community. The following are examples of the policies that Emerging Suburban Edge communities are expected to incorporate into their plans:

- » Plan for new growth and redevelopment to occur at a density of at least 3-5 units per acre.
- » Target opportunities for denser development in areas with better access to regional sewer and transportation infrastructures, connections to local commercial activity centers, transit facilities, and recreational amenities.
- » Identify and protect an adequate supply of land to support growth for future development beyond 2040, with regard to agricultural viability and natural and historic resources preservation.
- » Incorporate best management practices for stormwater management and natural resources conservation and restoration.
- » Plan for local infrastructure needs including those needed to support future growth.
- » Encourage site planning that incorporates natural areas as part of site development and redevelopment.
- » Plan for affordable housing that meets the needs of multi-generational households.
- » Develop local policies, plans, and practices that improve pedestrian and bicycle circulation, including access to regional transit services, regional trails with improved pedestrian connections, and regional bicycle corridors.

The city of Farmington has initiated this update of its Comprehensive Plan in accordance with Minnesota Statutes 473.864, Subd. 2, which requires that all cities in the Twin Cities metro area update their comprehensive plan every ten years. To assist local governments in this effort, the Metropolitan Council issued a “System Statement” to each community that describes the specific areas that must be addressed as part of the local comprehensive plan in September 2015. In addition to identifying the specific planning and infrastructure areas to include, the System Statement identifies population, household, and employment forecasts for the years 2020, 2030, and 2040 as shown in Table 1.1 below:

**Table 1.1 Projections**

	2010 CENSUS	2020	2030	2040
<b>POPULATION</b>	21,086	24,300	28,300	32,500
<b>HOUSEHOLDS</b>	7,066	8,500	10,100	11,800
<b>EMPLOYMENT</b>	4,438	5,600	6,200	6,800

Source: Metropolitan Council, 2015

In 2014, the Metropolitan Council designated Farmington as an “Emerging Suburban Edge” community in Thrive MSP 2040, the new regional development plan for the Twin Cities metro area. An Emerging Suburban Edge community is defined as “[a community] that is in the early stages of transitioning into urbanized levels of development.” Typical of an Emerging Suburban Edge community, Farmington is located between a Suburban Edge community (Lakeville, to the west and north) and Agricultural communities (Empire Township to the east, Castle Rock and Eureka Townships to the south), as seen in Figure 1.1.

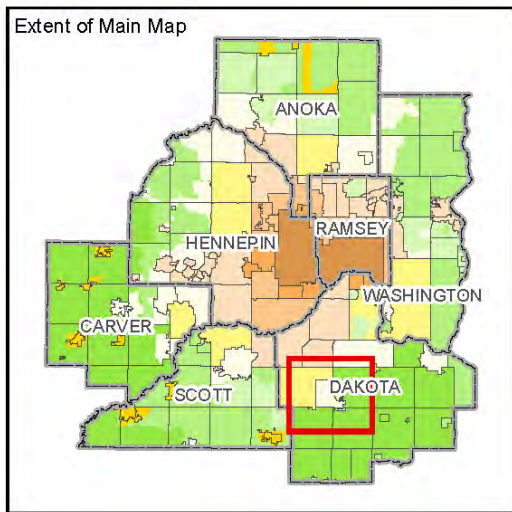
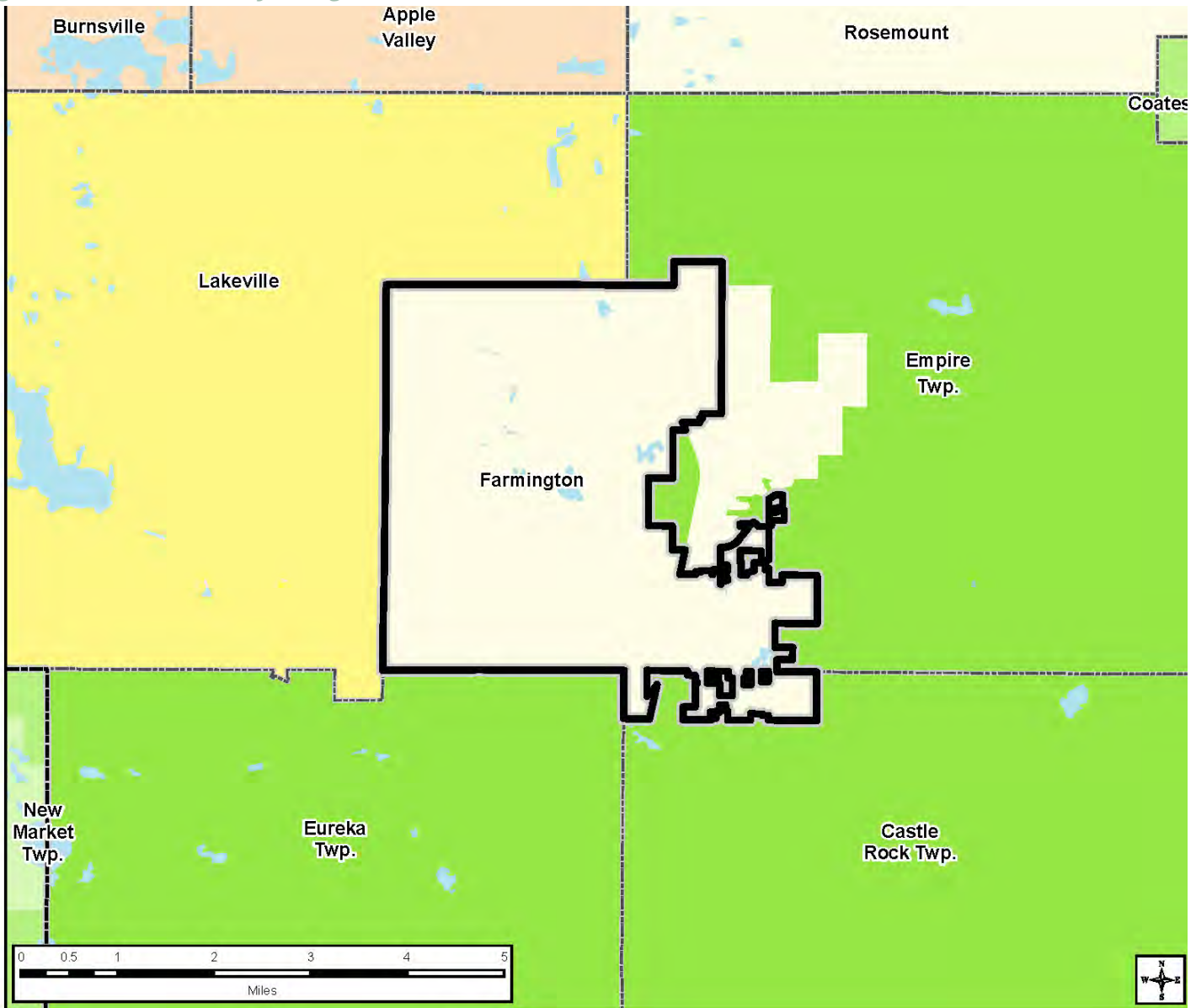
## 2040 Comprehensive Planning Process

Farmington’s 2040 Comprehensive Plan update process extended for more than a year during 2017-2018 and involved the city’s elected and appointed officials, as well as the general community. The planning process was organized into the following tasks:

- » Community Context and Background
- » Evaluation of Existing Conditions
- » Updates to Individual Elements/Chapters of the Plan
- » Prepare Complete Plan Document
- » Plan Review and Approvals



**Figure 1.1 Community Designation from Thrive MSP 2040**



**Community Designation**

- Urban Center - Core City
  - Urban Center
  - Urban
  - Suburban
  - Suburban Edge
  - Emerging Suburban Edge
  - Rural Center
  - Diversified Rural
  - Rural Residential
  - Agricultural
  - Outside Council planning authority
- County Boundaries
  - City and Township Boundaries
  - Lakes and Major Rivers



Planners speaking with community members at the Farmington 2018 Community EXPO

## Community Engagement

A Comprehensive Plan that effectively engages community members and takes their input into consideration is more likely to reflect the needs and wants of the community and actually be used/implemented. The city engaged with community members in the following ways regarding the update of the 2040 Comprehensive Plan:

- » Developed a project website where information could be downloaded and project event notifications were posted;
- » Put up advertising posters in City Hall and the Farmington Library to inform the community about the Comprehensive Plan;
- » Conducted a community survey to identify the city's key issues and opportunities, which was available at pop-up events, City Hall, the Farmington Library, as well as on the city's website;
- » Hosted pop-up events at community events in Farmington, including Music in the Park and Movies in the Park;
- » Hosted a Public Open House;
- » Hosted an information table at the Farmington Community EXPO.

A summary of community responses to the 2040 Comprehensive Plan survey is shown in Figure 1.2

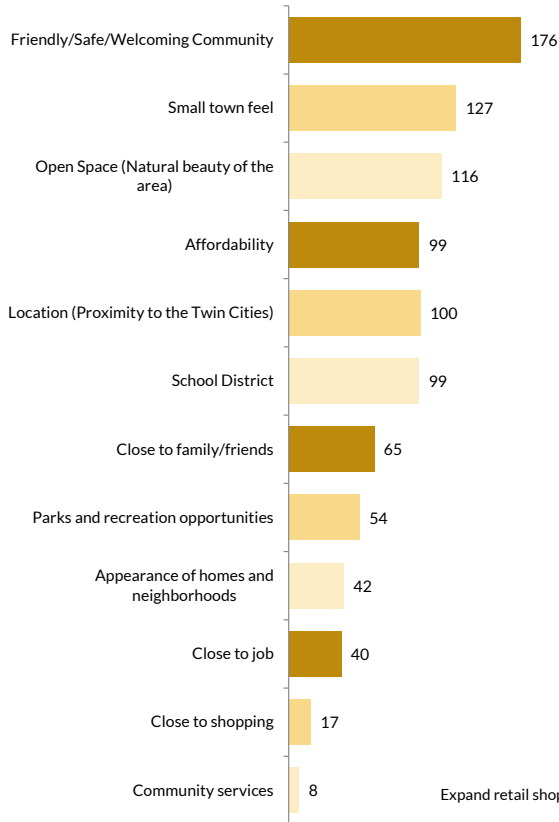
|| The city of Farmington is relying too much on the residential taxpayers to pay for what they need. The city needs a lot more retail, restaurants, and services here so the tax dollars stay here, not in Lakeville or Rosemount, etc..

|| Farmington cannot ignore the tremendous residential growth of our community and the strain this will put on existing infrastructure and amenities. My biggest fear as a resident is that Farmington will take on too much residential growth without making necessary adjustments / investments in infrastructure, amenities, and schools.

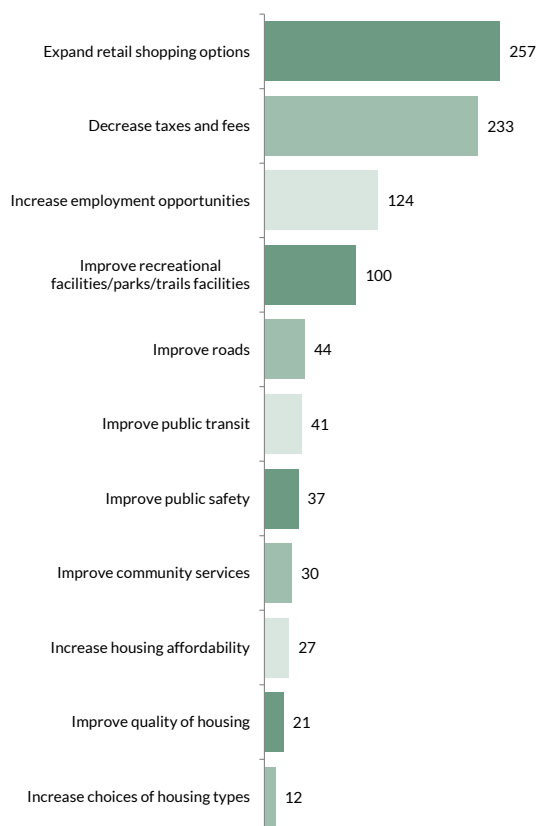
|| One of the things I love about Farmington is the trail systems. I would like to see them continue to be developed so that we could safely bike or walk everywhere we needed to go in our community.

## Figure 1.2 Community Survey Responses

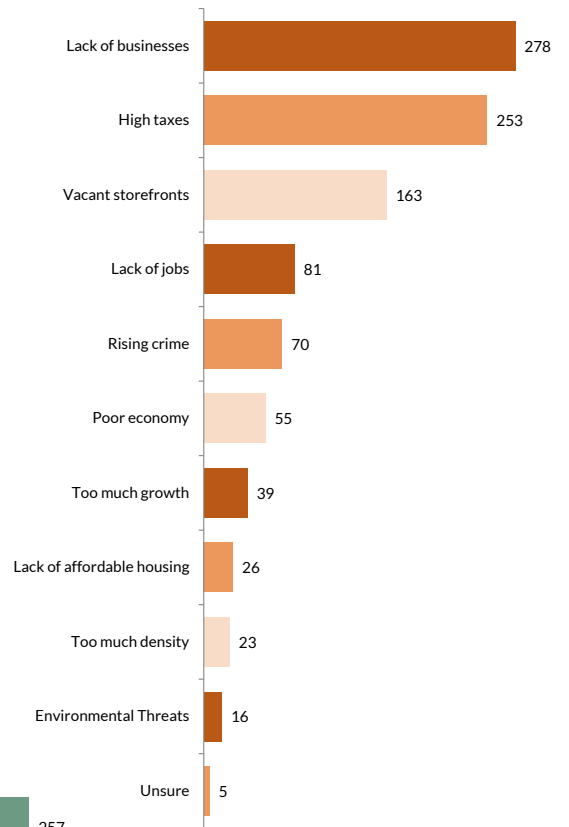
Please select the TOP THREE attributes/qualities/strengths that you believe make Farmington a great place to live today.



Please select the TOP THREE CHANGES you think would have the greatest impact on improving the quality of life in Farmington in the future.



What do you think are the serious issues facing Farmington today?



## 2040 Community Vision

*Farmington will continue to grow as a community in ways that are high quality, balanced, and enhance our hometown feel. Farmington will be a desirable community for its friendly, safe, and well-maintained neighborhoods for residents of all ages. Farmington's hometown feel is also based on the community's natural open space character which entails strategic preservation of the community's natural and rural character. The community's continued growth will bring opportunities for adding and strategically locating schools, recreational facilities, retail businesses, job opportunities, and other community assets convenient to neighborhoods. Balancing the community's residential growth with business growth will improve residents' access to desired retail, employment opportunities, and the residential/business tax ratio.*

### GUIDING PRINCIPLES

#### Balance the Mix of Land Uses for Economic Vitality and Growth

- » Protect and expand area for jobs in Farmington
- » Designate future areas for retail, restaurants, and services
- » Strengthen the downtown commercial district
- » Preserve and enhance the community's hometown character

#### Protect and Conserve Natural Resources

- » Natural resources serve as amenities throughout the community
- » Enable a green network of multiuse trails and natural open space
- » Preservation of these areas ensures stability for the future and also enhances the land uses around them for development

#### Promote an Interconnected Community

- » Bring the city together through a local and regional system of pedestrian walkways, bike trails, public transit opportunities, and functional streets for vehicles
- » Link neighborhoods and destinations to one another, as well as to parks, open space, bike trails, transit, and other desirable amenities
- » Enable connections across physical barriers, such as the railroad, river, and creek corridors

#### Provide a Variety of Well Maintained Housing Choices

- » Accommodate a variety of housing choices and styles for residents of all income levels and stages of life
- » Promote the upkeep and enhancement of existing housing stock
- » Create neighborhoods that are connected and provide a sense of community

## Ensure Quality and Controlled Growth

- » Invest in infrastructure that enables the planned growth and prosperity of the community
- » Promote development within the areas of existing systems of sewer, water, roads, and other infrastructure before expanding
- » Work with neighboring communities and regional entities to efficiently provide services and plan for the best areas of growth



Community members attending a Music in the Park event in the summer of 2017

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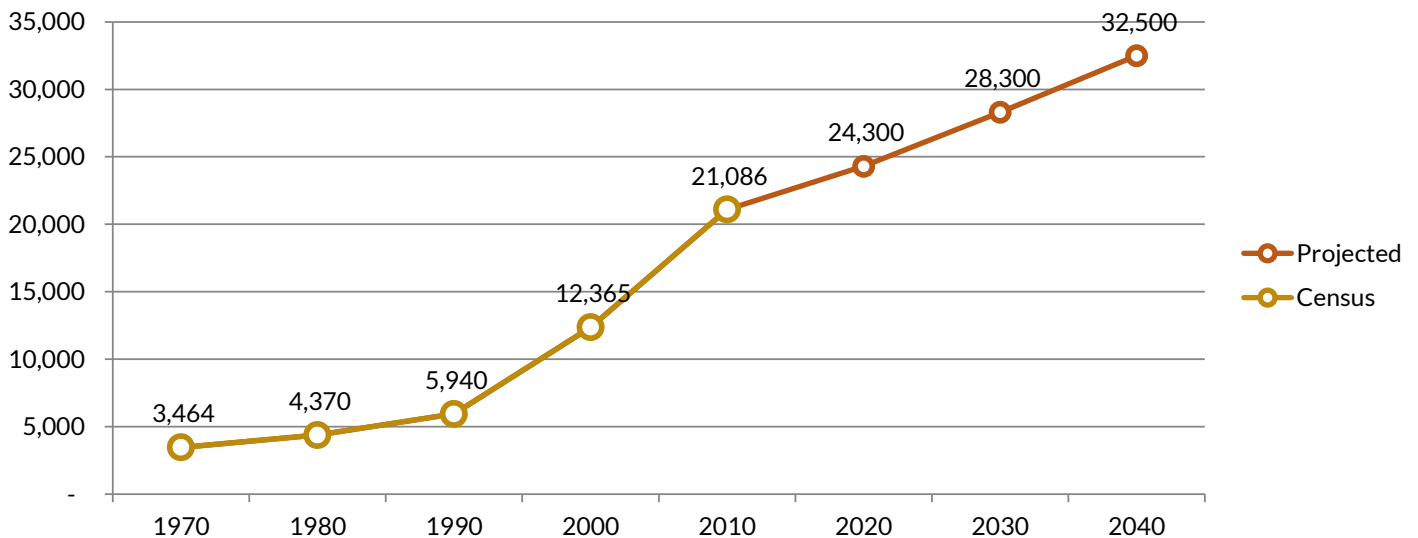


# 2 . COMMUNITY BACKGROUND

## Farmington Growth History

The development of Farmington occurred originally because of the railroad system. The original town site, today's downtown area, was established at the intersection of two small rail lines - the Minnesota Central and the Hastings & Dakota - that ultimately became part of the Chicago, Milwaukee and St. Paul Railroad. The town's business district grew up adjacent to the Milwaukee Road Depot. Until the 1990s, Farmington's commerce and industry was focused upon agricultural production. In addition to the significant active farmland in the city today, remaining evidence of the city's agricultural economy includes the Feely grain elevators and the Kemps plant, both located downtown.

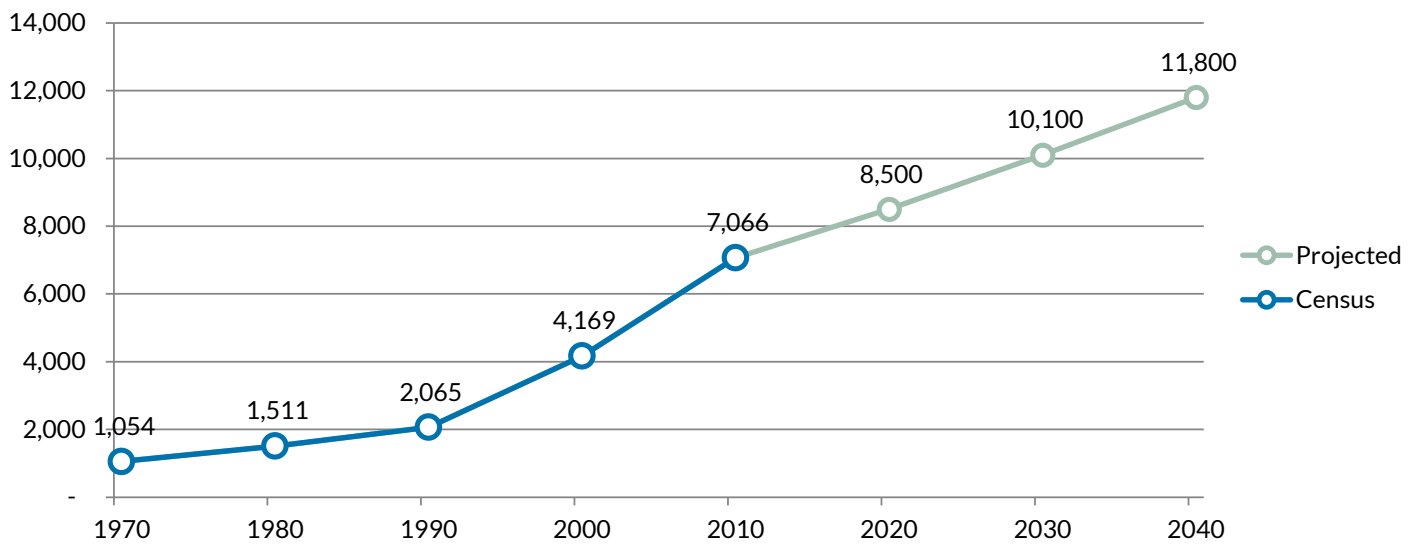
**Figure 2.1** *Historic Growth & Projections of Farmington's Population*



Source: US Census & Metropolitan Council

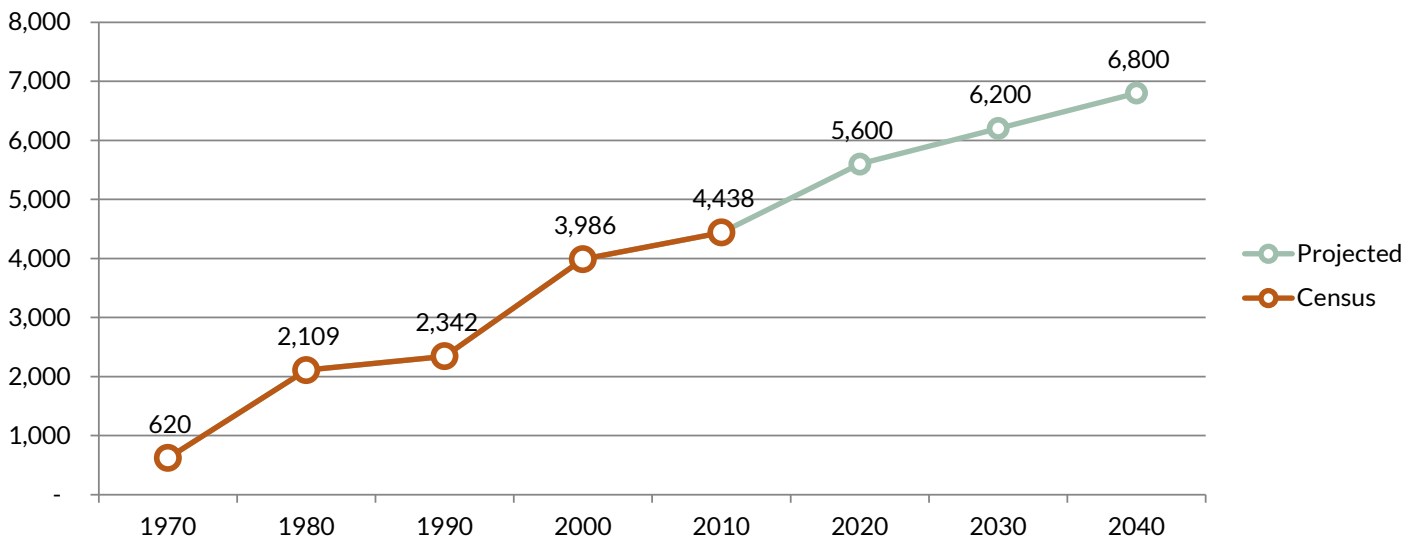
The population of Farmington totaled 3,464 with 1,054 households in 1970. These totals included the area of Lakeville Township that was annexed into Farmington in 1971. When this ten square mile area became part of the city, the existing 97 housing units were added to Farmington. This major annexation immediately created a large gap of undeveloped land between the original town of Farmington south of the Vermillion River and this new residential area to the north. In the early 1980s, the City approved the construction of the initial phase of a new residential area immediately east of Pilot Knob Road, Dakota County Estates. By allowing this new residential development to occur, a disconnect between the residents of the established downtown area of Farmington and the residents in the northern

**Figure 2.2** *Historic Growth & Projections of Farmington's Households*



Source: US Census & Metropolitan Council

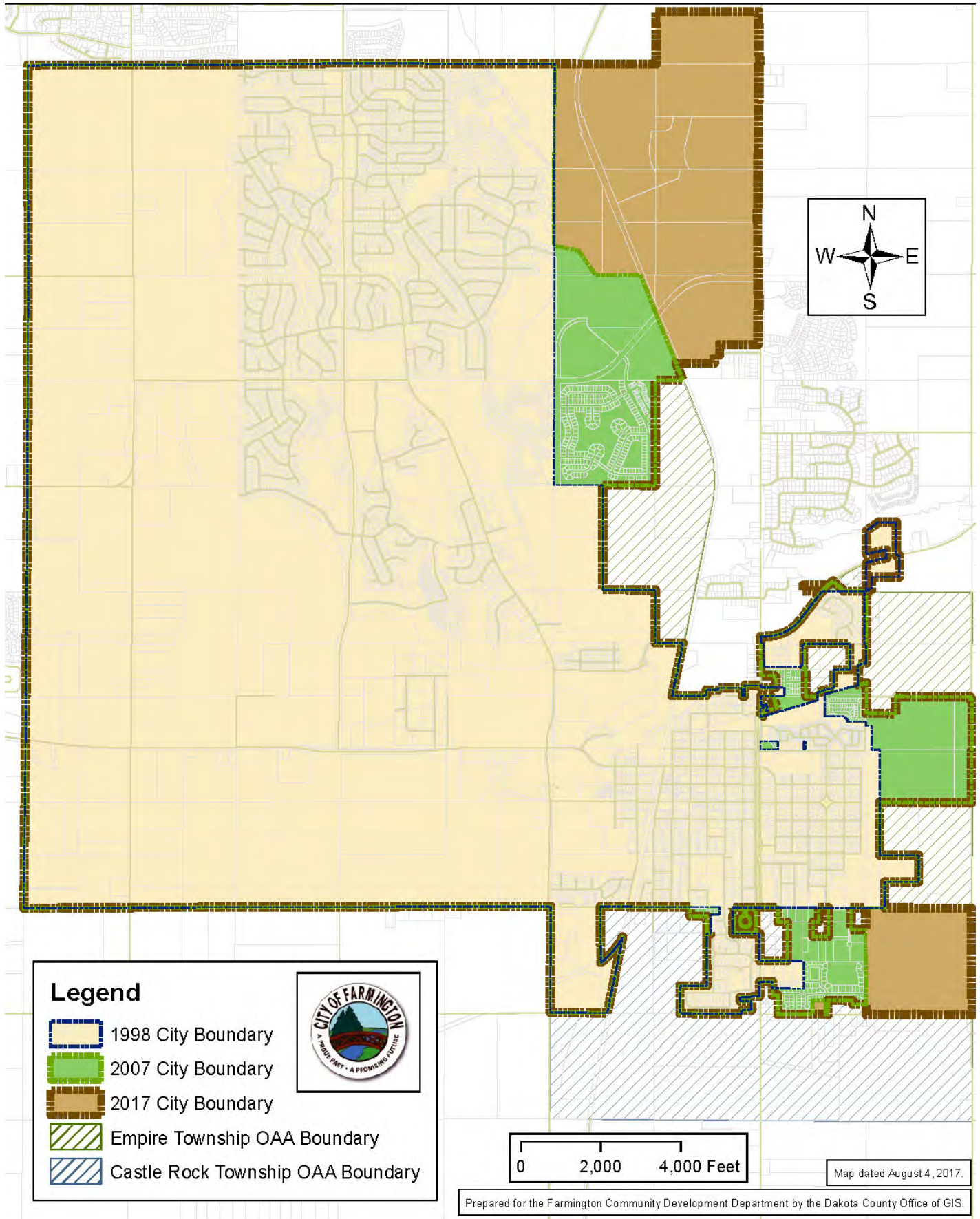
**Figure 2.3** *Historic Growth & Projections of Farmington's Employment*



Source: US Census & Metropolitan Council



**Figure 2.4 History of Annexation in Farmington**



portion of the city was created. In large part, the housing stock in the downtown area was built prior to 1950, whereas, much of the housing in the northern portion of the city was constructed since the 1980s.

During the mid to late 1990s, Farmington’s physical characteristics continued to change at a dramatic rate. With Farmington’s location on the edge of the Twin Cities metro area, it experienced an unprecedented growth rate of 300-350 new dwelling units per year during the mid 1990s. New housing developments were primarily constructed in the city’s northern portion closer to Lakeville than the original town of Farmington. These new developments consisted of typical suburban subdivisions of single-family homes laid out on curvilinear streets. This growth intensified the disconnection and development contrast between the northern and southern portions of the city. As a result, Farmington as a whole is often perceived to have two separate areas within the community, one north and one south.

During the 2000s, a considerable amount of development occurred in the central portion of the city to better connect the northern portion with the downtown area. In large part this connection of the community was accomplished with the development of the Charleswood, Middle Creek, and Vermillion Grove residential areas.

Since 1990 the city has been growing at a rapid rate. The city’s population, the number of households, and residential densities have all risen a great deal in the last 30 years. The largest periods of growth were between 1990 and 2010, as seen in Figure 2.2. The city’s population and number of households more than doubled in the ten years between 1990 and 2000. During the 2000 - 2010 decade, the city experienced its largest population growth of 8,721 new residents after adding 6,425 people in the 1990 - 2000 decade.

The city of Farmington is projecting that the community will continue to expand, forecasting an estimated growth rate between 150 to 175 households constructed per year between 2016 and 2040.

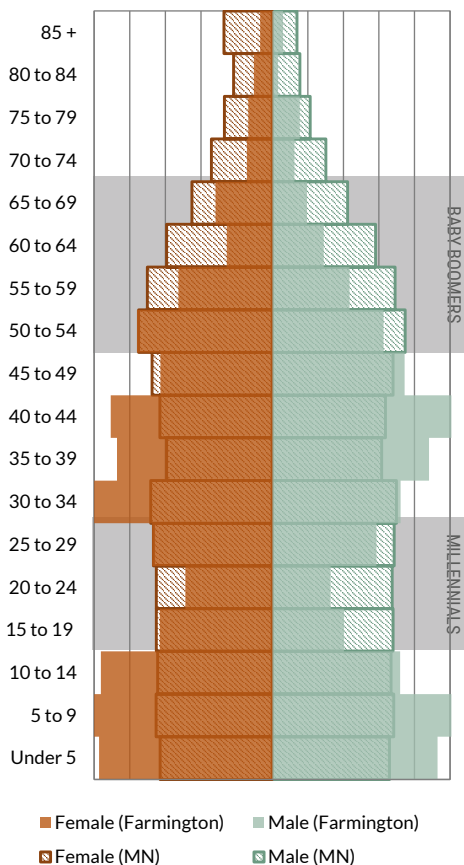
## Demographics

The analysis of population and demographics provides an understanding of the characteristics of the community, as well as provides a foundation for planning future needs. The demographic information was collected by using information from the 2030 Comprehensive Plan, the 2010 Census, the 2015 American Community Survey, and Metropolitan Council forecasts.

### POPULATION

Farmington’s population has risen steadily over the last 40 years to reach its current population of just over 22,000. Demographic figures from 2000 and 2015 were compared to gain an understanding of how Farmington’s population is changing and what future needs could arise.

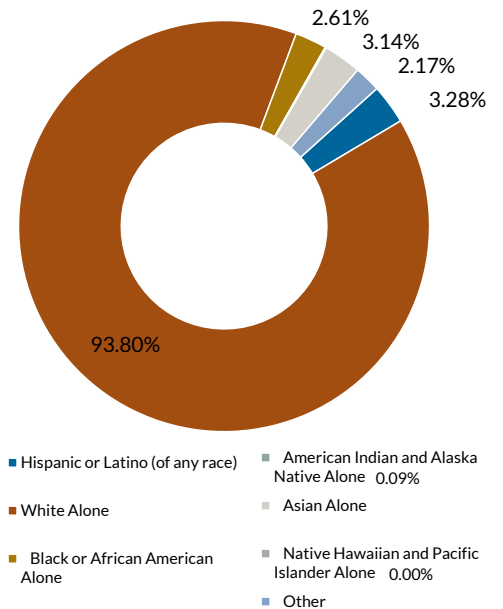
**Figure 2.5 Age Pyramid 2015**



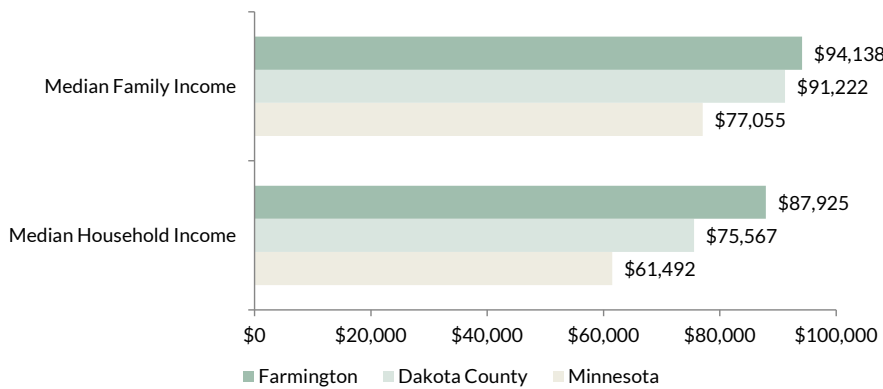
Highlights from this analysis are as follows:

- » Farmington’s population is much younger than Minnesota as a whole, with the largest age groups in 2015 being 14 years and under, as well as ages 30-44, as seen in Figure 2.5.
- » Farmington may need to shift focus of employment opportunities, amenities, and housing types in order to attract Millennials (born between 1980 and 2000), especially as they begin to age
- » The city continues to become more diverse over time, however, it is still predominately white, with 93.80% identifying as White, Non-Hispanic in 2015, as seen in Figure 2.6.
- » Median income levels were \$87,925 for households and \$94,138 for families in 2015. As shown in Figure 2.7, Farmington’s median income levels are higher than both Dakota County and the State of Minnesota.

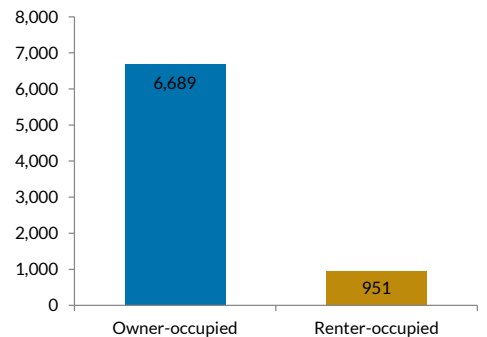
**Figure 2.6 Ethnicity & Race in Farmington 2015**



**Figure 2.7 Median Income in Farmington 2015**



**Figure 2.8 Housing Tenure 2015**



## HOUSEHOLDS

As Farmington’s population continues to grow, so does the number of households. Metropolitan Council projections estimate the city will add more than 4,000 households by 2040. Additional characteristics of Farmington’s households include:

- » Approximately 50% of all households have children in Farmington.
- » The average household size has been decreasing over time; 2.95 in 2000 compared to 2.88 in 2015. Even with this decrease, Farmington has a much higher average household size compared to the Twin Cities Metropolitan Region, which is 2.55.
- » While there was an increase in the percentage of attached single family units like rowhouses and townhomes from 5.4% in 2000 to 19.4% in 2015, single-family detached homes remain the predominant housing type at 72.5%.
- » Housing units are occupied by renters approximately 12.4% of the time and owners 87.6%. The percent owner occupied is relatively consistent with 2000, as seen in Figure 2.8.

## HISTORY OF FARMINGTON'S MUSA EXPANSION

The city was connected to the Metropolitan Council Environmental Services (MCES) trunk sanitary sewer in 1977 when the regional Empire Wastewater Treatment Facility replaced Farmington's municipal Wasterwater Treatment Facility. The city of Farmington has been very committed to ensuring that the Metropolitan Urban Services Area (MUSA) is strategically and carefully expanded carefully to properties in order to manage and guide growth that meets the Metropolitan Council's density requirements.

### 1980s

In 1982, the city received its initial MUSA approval from the Metropolitan Council. The MUSA map was adopted by the Farmington City Council on October 18, 1982 as a component of the city's 1982 Comprehensive Plan. The Dakota County Estates residential development occurred in the northern portion of the city during the 1980s, connected to the regional sanitary sewer system. The MUSA was expanded by 92 acres in 1989 for the east side of Dakota County Estates (28 acres) and Farmington Industrial Park (64 acres).

### 1990s

MUSA expansions included the Riverside Estates residential development in 1993 and 714 acres in 1998 encompassing areas south of 195th Street, east Dakota County Estates, and the east side of TH 3 and south of CSAH 66.

### 2000 to 2010

Farmington's 2020 Comprehensive Plan was approved by the Metro Council in 2000. In the 2020 Plan, the city opted to represent the proposed MUSA areas as "undesignated MUSA reserve" rather than designating a specific locations for each MUSA staging area. The city designated the acreages, types and densities of land uses and local/regional service levels for each five-year stage between 2000 and 2020, with the exact location of each stage unspecified to avoid land speculation.

Shortly after the approval of the Farmington 2020 Comprehensive Plan, a number of land owners approached the city requesting MUSA designation for their properties, totalling 682 acres. Ultimately, the Metro Council approved 610 acres for MUSA expansion between 2000 and 2005 to be utilized by the City as needed. To assist with the numerous requests for MUSA in early 2000, the City Council formed the 2000 MUSA Review Committee to make recommendations to the Planning Commission and Council for the expansion of MUSA. This committee established MUSA Expansion Criteria to guide its MUSA recommendations.

During the 2000s, the city's MUSA was expanded by 3,086 acres beginning with 620 acres in 2000, followed by:

- » 2004: 477 acres
- » 2005: 149 acres
- » 2006: 885 acres
- » 2007: 520 acres
- » 2010: 445 acres

The proposed Fairhill neighborhood development (965 acres) was a significant annexation and Comprehensive Plan Amendment when it was approved by the City Council and Empire Township in 2007. The 2007 and 2010 MUSA expansions were for the Fairhill development.

### **2011 to 2018**

In 2011, the MUSA Review Committee was reconvened to review the existing MUSA map and to hear requests from property owners regarding the expansion of MUSA. The committee recommended that 25 acres of land at the northeast intersection of CSAH 50 and Flagstaff Avenue be granted MUSA expansion. MUSA was granted for 24 acres of land at the northwest intersection of CSAH 50 and Flagstaff Ave in 2017.

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# 3 ■ LAND USE

## Introduction

State law requires all municipalities to include a land use plan as part of their Comprehensive Plan to designate the existing and proposed uses of all land and water in the city. Land use planning begins with forecasts of growth in population, households and employment. Once those figures are established for the region and the municipality, local planners must identify where growth will occur in terms of land uses and intensities. Based on these assessments, they create plans for future development and redevelopment.

The city's Land Use Plan is a general guide to physical growth and development. It establishes goals and policies for the appropriate location and phasing of various types of development as well as for protecting the natural environment. The Land Use Plan is used by the city in determining public investments, making decisions concerning private development proposals, and setting priorities for future planning efforts.

The Land Use Plan is also a general guide for the legal regulation of land development, which is controlled by the city's Zoning Ordinance and Zoning Map under the powers granted to it by the State of Minnesota. The Land Use Plan provides maps that generally guide the location of future land use categories within the city. Since the plan is a general guide for the use and development of land in the city, the boundaries of the uses as shown in the various maps are approximate and subject to interpretation and adjustment as necessary to conform to actual field conditions.

# Overview of Plan Requirements

The development and redevelopment anticipated in the Land Use Plan drives the need for local and regional infrastructure, including sanitary sewer, water supply, surface water management, roads, and parks. For infrastructure planning to occur effectively at the regional level, the Metropolitan Council requires that the local land use plan must contain complete and accurate information in the following areas:

- » Inventory of existing use of land and water within the municipality in terms of standard land use categories.
- » Plan future land use and staging of development to accommodate forecasted growth including location, intensity and extent of development.
- » Housing plan that establishes standards, plans and programs for providing adequate housing opportunities to meet existing and projected local and regional housing needs (Chapter 4 of this plan).
- » Strategies for protecting special resources including heritage preservation, tree preservation, premature subdivisions, protected areas, and solar access.

To plan for regional infrastructure, the Metropolitan Council needs accurate information about how each municipality allocates land for residential, commercial, industrial, public, parks and open space, institutional and mixed uses.

## Goals and Policies

- LU G1. EFFICIENT, WELL-PLANNED LAND USE EXPANSION AND DEVELOPMENT THAT MEETS THE NEEDS OF THE CITY'S PROJECTED POPULATION, HOUSEHOLD AND EMPLOYMENT GROWTH.**
  - LU P1.1 Support residential development within the city's existing MUSA (Metropolitan Urban Service Area) over expansion of the MUSA.
  - LU P1.2 Prioritize development of areas with existing lots and utilities.
  - LU P1.3 Make strategic investments in infrastructure that will facilitate well-planned growth.
  - LU P1.4 Promote development of a greater mix and higher density of uses adjacent to key corridors, nodes and amenity areas.
  - LU P1.5 Phase growth and development that maintains efficient use and expansion of local and regional infrastructure.



**LU G2. BALANCE OF RESIDENTIAL, COMMERCIAL, EMPLOYMENT, AND PUBLIC LAND USES THAT PROMOTES THE CITY'S LONG-TERM ECONOMIC STABILITY.**

- LU P2.1 Promote a mix and pattern of land uses that enable the community to become a place to live, work, shop, and play.
- LU P2.2 Ensure adequate developable areas that allow opportunities for growth of employment, retail, and services.
- LU P2.3 Diversify the city's tax base by allowing for a wide variety of non-residential uses throughout the community.

**LU G3. FARMINGTON'S EXISTING HOMETOWN CHARACTER IS MAINTAINED AND STRENGTHENED THROUGH ITS FUTURE GROWTH.**

- LU P3.1 Create land use patterns that create connections between residential neighborhoods and the city's parks, downtown, and other amenities.
- LU P3.2 Expand park and open space land uses to create a system of parks and open spaces throughout the community.
- LU P3.3 Locate educational land uses in a manner that capitalizes on the importance of schools in increasing the community's livability.
- LU P3.4 Ensure that the community's significant natural resources are preserved, protected and enhanced as part of the community's growth, creating connected open space corridors where feasible.

**LU G4. THE DIVERSITY OF HOUSING OPTIONS AVAILABLE IS EXPANDED AS PART OF THE COMMUNITY'S GROWTH AND REDEVELOPMENT.**

- LU P4.1 Increase the mix of residential land uses throughout the community to meet the needs of residents in all stages of life and all income levels.
- LU P4.2 Support increasing the variety of residential land uses within and adjacent to neighborhoods to provide residents options for moving to meet their lifecycle housing needs.
- LU P4.3 Promote adding more residential uses in and adjacent to downtown through redevelopment.

LU P4.4 Support the development of mixed use commercial/residential areas near downtown and commercial centers/nodes.

**LU G5. A MIX OF CONVENIENT AND ATTRACTIVE COMMERCIAL AREAS ARE DISTRIBUTED AROUND THE CITY.**

LU P5.1 Support the development of complementary commercial centers within the community including downtown, Spruce Street area, major roadway corridors, and key roadway intersections.

LU P5.2 Allow for commercial uses to locate at key roadway intersections throughout the community to meet the retail and service needs of surrounding neighborhoods.

LU P5.3 Promote development of retail, restaurant and service uses as anchors of mixed use areas to create desirable and viable commercial destinations.

**LU G6. EMPLOYMENT CENTERS ARE EXPANDED IN THE COMMUNITY TO INCREASE JOB OPPORTUNITIES AS WELL AS INCREASE AND DIVERSIFY THE TAX BASE.**

LU P6.1 Ensure that adequate developable land is available with access to urban services for commercial and industrial growth.

LU P6.2 Leverage the Mixed-Use Commercial/Industrial land use designation to allow greater flexibility for development of offices, business parks, and light industry.

LU P6.3 Increase the city's commercial/industrial identity and growth potential by clearly identifying employment centers.

LU P6.4 Encourage reinvestment and redevelopment within the downtown to strengthen its role as an employment center.

**LU G7. DOWNTOWN IS REINVIGORATED AS THE COMMUNITY'S COMMERCIAL, CULTURAL, AND RECREATIONAL CENTER AS WELL AS A GREAT PLACE TO LIVE.**

LU P7.1 Promote commercial and mixed use development on vacant and underutilized downtown core sites.

LU P7.2 Expand the community's housing options through downtown redevelopment.

- LU P7.3 Promote preservation and reuse of vacant historic buildings and other commercial buildings in downtown core.
- LU P7.4 Retain and expand civic uses in downtown.
- LU P7.5 Improve and expand outdoor public spaces in downtown.
- LU P7.6 Increase street and trail connections to downtown from other parts of the city.
- LU P7.7 Support implementation of the redevelopment initiatives established in the Downtown Redevelopment Plan.

**LU G8. ENVIRONMENTAL RESOURCES ARE PROTECTED FOR THE BENEFIT OF THE OVERALL HEALTH OF THE COMMUNITY'S NATURAL AND HUMAN ENVIRONMENT.**

- LU P8.1 Protect surface water resources during subdivision and development planning processes to preserve their environmental, visual, recreational and economic benefits for the community.
- LU P8.2 Preserve, protect and enhance woodland areas and retain substantial existing tree cover, as much as practicable, during subdivision and development of land as a means for improving air quality, protection against wind and water erosion, shade, energy conservation, wildlife habitat, scenic beauty, and protecting the integrity of the natural environment.
- LU P8.3 Encourage private and public developments to retain or restore natural areas planted with native species to enhance the health and diversity of wildlife populations, promoting connectivity of habitat when possible.
- LU P8.4 Ensure that any excavation or mining of aggregate resources are compatible with existing and planned development of the surrounding area and do not negatively impact the natural environment or city infrastructure.

- LU G9. FARMINGTON'S SIGNIFICANT, SCARCE, AND NON-RENEWABLE HERITAGE RESOURCES ARE PRESERVED, PROTECTED AND USED IN APPROPRIATE WAYS TO REFLECT THE COMMUNITY'S SHARED VALUES (PUBLIC AND PRIVATE SECTORS) FOR ITS UNIQUE HERITAGE.**
- LU P9.1 All historic properties identified by a heritage resource survey are evaluated by the HPC and staff to determine eligibility for designation as a Farmington Heritage Landmark or the National Register of Historic Places.
- LU P9.2 A property must be demonstrably significant in history, architecture or archaeology and it must also be adaptable to modern needs and uses to be considered for heritage resource designation.
- LU P9.3 No significant heritage preservation resource is destroyed, damaged, or defaced as a result of any action permitted, licensed, funded, or assisted by the city of Farmington.
- LU P9.4 Every reasonable effort is made to preserve and protect heritage resources of historical, architectural, archaeological, and cultural significance, including those properties which have been found eligible for designation but have not been designated.
- LU P9.5 Heritage preservation is entirely compatible with economic development and growth, therefore, heritage preservation pays and everybody profits by recycling historically significant resources and adapting them to new, economically viable uses.
- LU P9.6 Heritage preservation information shall be made available to all city departments, other public agencies, developers, property owners, and the citizens of Farmington.

# Existing Land Use Conditions

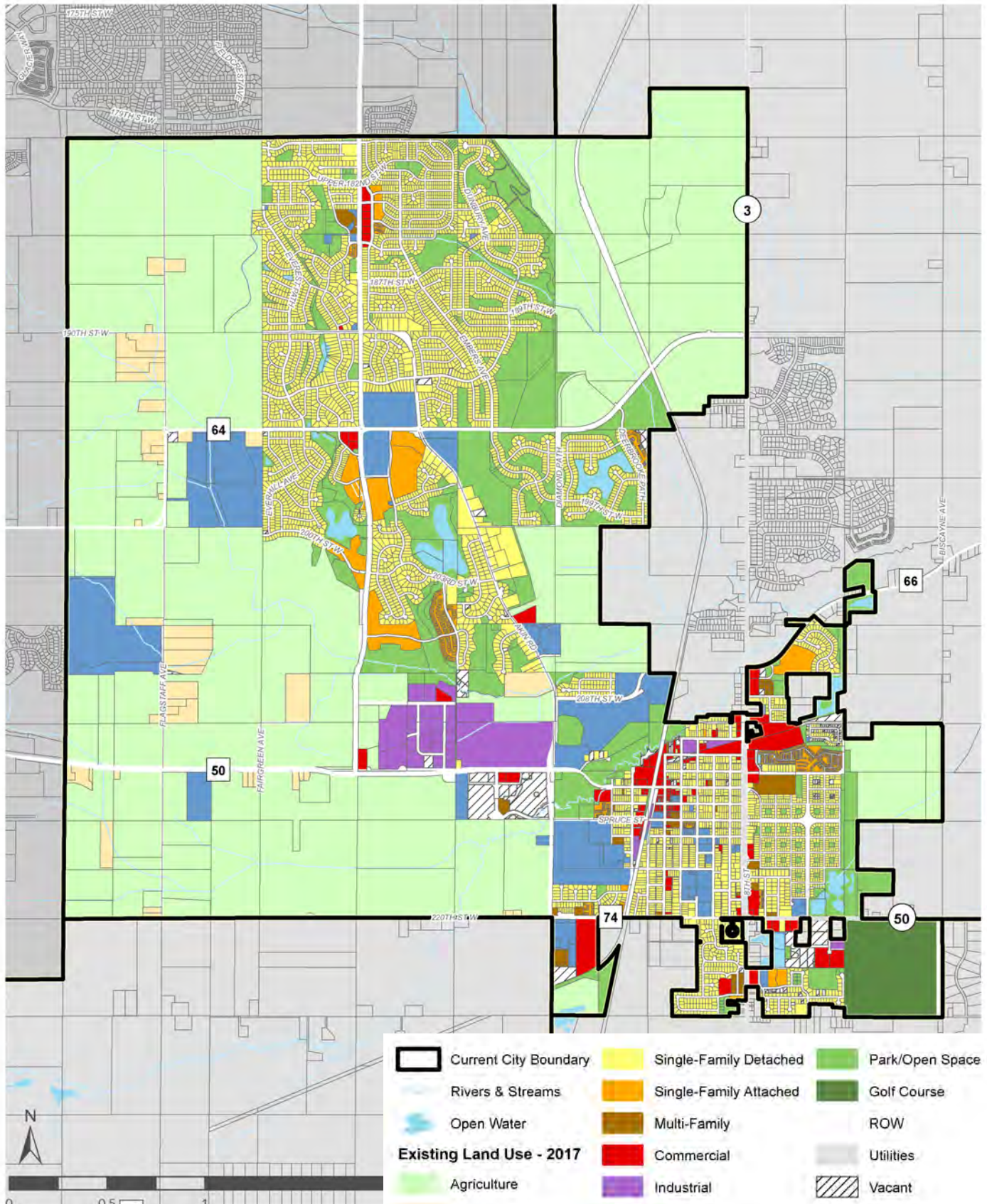
Figure 3.1 identifies the existing land uses within Farmington’s current municipal boundaries and Table 3.1 identifies the acreage of each of the land use categories. The city of Farmington currently encompasses approximately 9,496.6 acres of land. Agricultural land makes up 46.0% of Farmington. Single-family detached residential uses comprise 16.8% of the existing land area, establishing that the city is largely developed with single-family homes, while single-family attached and multi-family residential uses comprise 1.9% and 0.5% of the land area, respectively. Park and open space uses include 10.5% of the land area, which includes, parks, floodplains, wetlands, steep slopes, and open space. The existing commercial and industrial land uses only occupy 3.4% of the total land in the city, which correlates to the urgency to increase these types of land uses to increase the tax base in the community.

**Table 3.1 Existing Land Use Gross Acres 2017**

LAND USES	EXISTING (2017)	PERCENTAGE
Agriculture	4,368.52	46.00%
Rural Residential	191.62	2.02%
Single-Family Detached	1,592.55	16.77%
Single-Family Attached	184.04	1.94%
Multi-Family	42.82	0.45%
Commercial	150.46	1.58%
Industrial	175.50	1.85%
Institutional	559.46	5.89%
Park/Open Space	993.92	10.47%
Golf Course	148.01	1.56%
ROW	974.62	10.26%
Vacant	115.05	1.21%
<b>TOTAL</b>	<b>9,496.58</b>	<b>100.00%</b>

Source: City of Farmington, HKGi

**Figure 3.1 Existing Land Use 2017**



## AGRICULTURE PRESERVE

Minnesota’s Agricultural Preserve Program is administered by Dakota County and is designed to value and assess taxes for qualifying agricultural property located in the metropolitan area. The owner signs an eight-year perpetual covenant/agreement to leave the property in agricultural use, using acceptable practices as approved by the County Agricultural Service. Special assessments cannot be levied on Agricultural Preserve property. A property owner may file an “Expiration Notice” at any time; however, it takes eight years from the filing of the notice to remove a property from the program. A waiver of the eight-year requirement may be granted only by action of the Governor due to some emergency.

**Table 3.2 Agricultural Preserve Program Acres, 2017**

AG PRESERVE EXPIRATION DATE	PROPERTY OWNER	ACREAGE	PROPERTY IDENTIFICATION NUMBER (PID)	MAP ID
1/7/2019	Nordling	39.88	140220001014	6
5/12/2019	Christensen	40.00	140270090030	17
5/12/2019	Pleasant View Farms	74.92	140220012020	7
5/25/2020	Donnelly	158.54	140150001010	1
5/25/2020	Donnelly	155.69	140140025011	2
5/25/2020	Donnelly	78.45	140150075012	3
5/25/2020	Donnelly	158.20	140230025020	8
5/25/2020	Donnelly	80.00	140220085010	9
5/25/2020	Donnelly	10.00	146575000032	10
5/25/2020	Donnelly	19.93	140350050014	21
5/3/2026	Devney	75.22	140140050013	4
5/3/2026	Devney	50.12	140140050030	5
<b>SUBTOTAL</b>		<b>940.95</b>		
No Expiration	Devenshire Farms	13.47	140350010020	20
No Expiration	Devney	33.93	140350030013	18
No Expiration	Devney	66.35	140350010011	19
No Expiration	Devney	79.68	140350055011	22
No Expiration	Devney	153.11	140350075014	23
No Expiration	Donnelly	6.66	140270007020	11
No Expiration	Donnelly	33.30	140270007011	12
No Expiration	Donnelly	74.93	140270001011	13
No Expiration	Donnelly	20.75	140260025012	14
No Expiration	Donnelly	135.19	140260025013	15
No Expiration	Donnelly	5.00	140260025020	16
<b>SUBTOTAL</b>		<b>622.37</b>		
<b>TOTAL AG PRESERVE ACREAGE</b>		<b>1,563.32</b>		

Source: City of Farmington, HKGi





According to the Dakota County Assessing Services, the city of Farmington currently has a total of 23 properties that are in the Agricultural Preserve Program (Table 3.2 and Figure 3.2). The Agricultural Preserve Program properties take up 1,563.3 out of 4,368.5 acres of current agricultural land, which is 35.8% of the city's existing agricultural land.

However, as the table shows, 940.95 acres will be released from the Agricultural Preserve Program by 2020. Those properties are located mainly on the western city limit line north of 200th Street W (CR 64) around Flagstaff Avenue. Properties within the program will not be allowed to develop until they are through their eight year expiration process. Until such a time that they are out of the program, these properties will be limited to a density of 1 units per 40 acres.

### **PREMATURE SUBDIVISIONS**

The city of Farmington will attempt to prohibit and restrict any subdivision of land that is deemed premature for development as stated in Section 11-2-4 of the City Code.

Premature subdivisions will be labeled as such when they fall outside the MUSA Urban Service line or lack adequate drainage. In the event that a subdivision falls into the category of being deemed premature it will be denied approval by City Council.

### **LAND USES NEAR AIRPORTS**

Although parts of Farmington are within the "influence" area of the Airlake Airport (LVN) in Lakeville, according to Appendix L of the Metropolitan Council's 2040 Transportation Policy Plan, the city is completely outside of the "Noise Policy Area" of the airport, which has an impact on land use. More information about aviation is addressed in Chapter 5. Transportation.

# Future Land Use

## FARMINGTON'S LAND USE CATEGORIES

Regional planning is made more efficient when local municipalities use the Metropolitan Council's standardized land use categories and definitions. Doing so facilitates review of the comprehensive plan and simplifies the compilation of regional land use maps and geographic information system data sets. Nonetheless, municipalities may choose to use their own land use categories and definitions if they prefer to do so. Farmington has chosen to use its own land use categories, but does utilize the Metropolitan Council's Land Use Classification categories as a general guide for the densities and uses.

### Agriculture

Intended to preserve land where agricultural uses are currently occurring, rural residential not connected to urban services, as well as to create an urban reserve for such time when there is a need for additional urban development and urban services may be extended.

### Low Density Residential

Land guided for development of single-family detached dwellings, including manufactured homes, connected to urban services with a density range of 1.0 to 3.5 units per net acre.

### Low/Medium Density Residential

Land guided for a variety of low to medium density housing types, including single-family detached dwellings, duplexes, and twin homes that are connected to urban services with a density range of 3.5 to 6.0 dwelling units per net acre. It is also incorporates existing older residential development in the city.

### Medium Density Residential

Land guided for medium density multi-family housing types, including townhouses and row houses, in areas with access to jobs, services, public facilities, transit and urban services with a density range of 6.0 to 12.0 dwelling units per net acre.

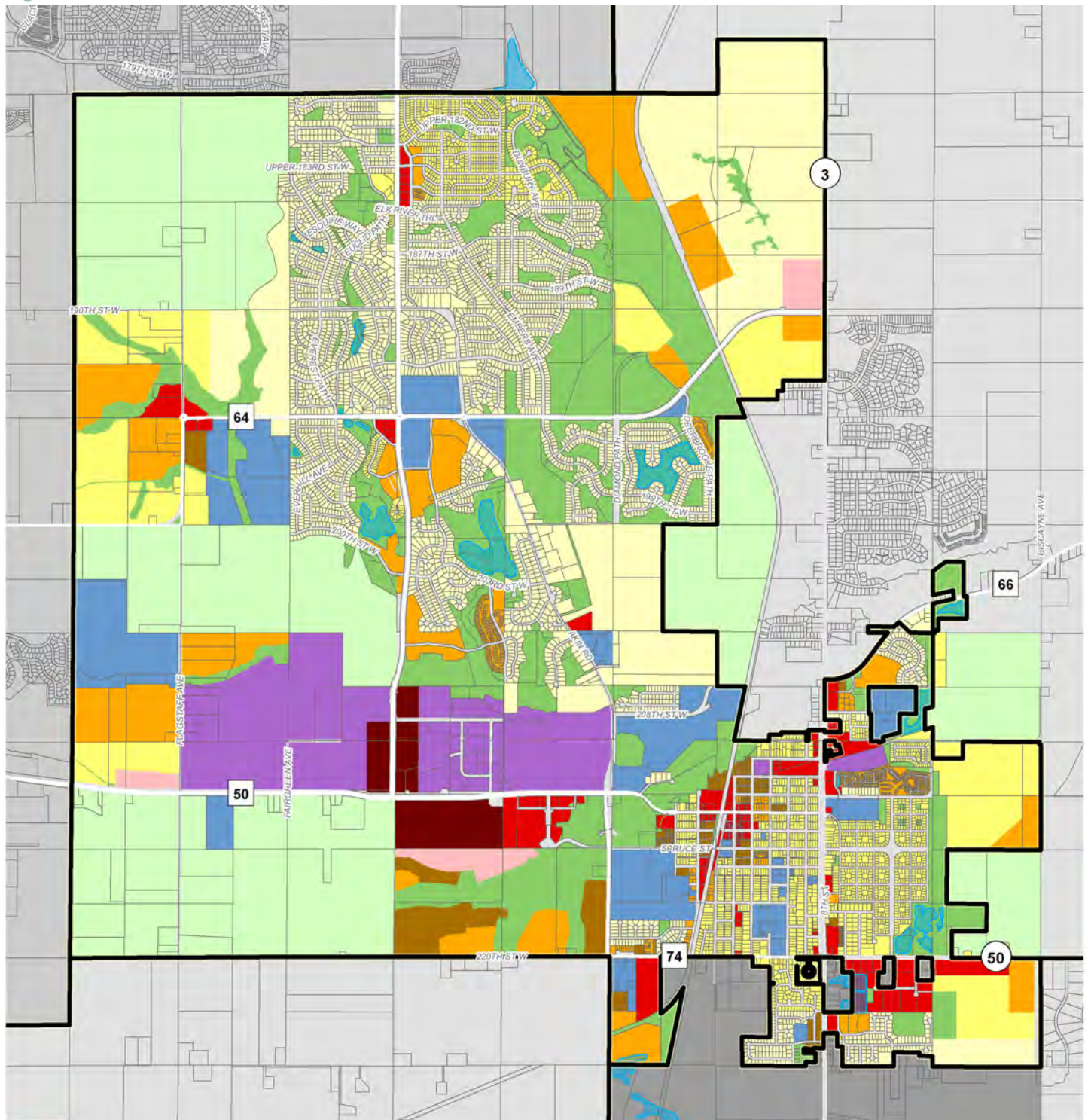
### High Density Residential

Land guided for high density multi-family housing types, including apartments and condominiums, in areas with access to jobs, services, public facilities, transit and urban services with a density range of 12.0 to 40 dwelling units per net acre.

### Commercial

Land guided for commercial businesses, such as retail sales of goods, services, food and beverage, entertainment, and offices.

**Figure 3.3 2040 Future Land Use**



- |                                                                                                                              |                                                                                                                       |
|------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------|
|  Agriculture                               |  Mixed-Use (Commercial/Industrial) |
|  Low Density Residential [1.0-3.5 u/a]     |  Industrial                        |
|  Low Medium Residential [3.5-6.0 u/a]      |  Public/Semi-Public                |
|  Medium Density Residential [6.0-12.0 u/a] |  Park/Open Space                   |
|  High Density Residential [12.0-40.0 u/a]  |  ROW                               |
|  Mixed-Use (Comm./Res.) [6.0-40.0 u/a]     |  Non-Designated                    |
|  Commercial                                |                                                                                                                       |

### **Mixed Use (Commercial/Residential)**

Land guided for the integration of commercial and residential land uses either vertically (e.g. multi-story buildings with residential and/or office uses above and commercial uses at street level) or horizontally as a planned development (e.g. planned mixed use developments designed to integrate complementary land uses). Density allowed is 6.0 to 40.0 dwelling units per net acre including local access streets. Residential uses should generally represent a minimum of 50 percent of the overall mixed use area.

### **Mixed Use (Commercial/Industrial)**

Land guided for the integration of commercial and industrial land uses which are compatible with each other, including office, light industrial, and retail uses. Intent of this land use designation is to provide additional flexibility that supports the creation of employment centers on large sites, generally characterized by a broader diversity of jobs, higher development densities and jobs per acre, higher quality site and architectural design, and increased tax revenues.

### **Industrial**

Land guided for primarily manufacturing and/or processing of products, warehousing, or warehousing in order to increase the city's tax base and provide employment opportunities.

### **Public/Semi-Public**

Land guided for public, semi-public and private government, educational, religious, social and healthcare facilities.

### **Park/Open Space**

Land guided for recreational and leisure opportunities through publicly owned land and recognizes vital environmental resources including steep slopes, wetlands, and floodplains.

### **Right-of-Way**

Land guided for public or private vehicular, transit and/or pedestrian rights-of-way.

## **FUTURE LAND USE DISTRIBUTION**

Table 3.3 and Figure 3.3 show the land use proposed in the 2040 Comprehensive Plan.

**Table 3.3 2040 Future Land Use Acreage**

LAND USE CATEGORY	CURRENT CITY BOUNDARY			ORDERLY ANNEXATION AREA			TOTAL AREA		
	GROSS	NET	% NET	GROSS	NET	% NET	GROSS	NET	% NET
Agricultural	1,709.4	1,570.1	16.5%	514.5	443.5	31.4%	2,223.9	2,013.6	18.5%
Low Density (1.0-3.5 u/a)	2,008.8	1,947.4	20.5%	7.3	7.3	0.5%	2,016.1	1,954.7	17.9%
Low Medium Density (3.5-6.0 u/a)	1,009.9	985.9	10.4%	18.3	18.3	1.3%	1,028.1	1,004.2	9.2%
Medium Density (6.0-12.0 u/a)	698.7	654.7	6.9%	0.0	0.0	0.0%	698.7	654.7	6.0%
High Density (12.0-40.0 u/a)	141.3	141.0	1.5%	-	-	0.0%	141.3	141.0	1.3%
Mixed-Use (Commercial/Residential) (6.0-40.0 u/a)	81.7	81.4	0.9%	-	-	0.0%	81.7	81.4	0.7%
Commercial	228.6	212.2	2.2%	3.7	3.7	0.3%	232.3	215.9	2.0%
Mixed-Use (Commercial/Industrial)	123.0	118.8	1.3%	-	-	0.0%	123.0	118.8	1.1%
Industrial	558.9	510.8	5.4%	-	-	0.0%	558.9	510.8	4.7%
Public/Semi-Public	532.0	526.6	5.5%	24.8	24.6	1.7%	556.8	551.3	5.1%
Park/Open Space	1,428.5	831.6	8.8%	-	-	0.0%	1,428.5	831.6	7.6%
ROW	973.7	955.1	10.1%	19.0	19.0	1.3%	992.7	974.1	8.9%
Non-Designated/OAA	2.0	2.0	0.0%	825.6	662.0	46.8%	827.6	664.0	6.1%
Water/Wetlands	-	958.9	10.1%	-	234.7	16.6%	-	1,193.7	10.9%
	<b>9,496.6</b>	<b>9,496.6</b>	<b>100.0%</b>	<b>1,413.0</b>	<b>1,413.0</b>	<b>100.0%</b>	<b>10,909.6</b>	<b>10,909.6</b>	<b>100.0%</b>

# Staging of Development

## STAGING OF MUSA

Figure 3.4 shows the city’s current 2020 MUSA along with planned MUSA expansion areas for 2030 and 2040. Overall, the city currently has a substantial amount of developable land within its MUSA to accommodate its growth projections for 2020, 2030 and 2040. As a result of slower growth than anticipated over the last decade, the city’s current MUSA includes significant developable (vacant) land. For example, the planned Fairhill neighborhood in the city’s northeast area covers approximately 965 acres within the current MUSA that is anticipated to begin development in 2018. Due to the amount of developable land within the current 2020 MUSA, limited expansion of the MUSA is anticipated between 2020 and 2040. The two expansion areas are west along Hwy 50 to the high school and the city’s western boundary and west along CSAH 64 (195th Street) in conjunction with the extension of this major east-west roadway.

## GROWTH & FORECASTS

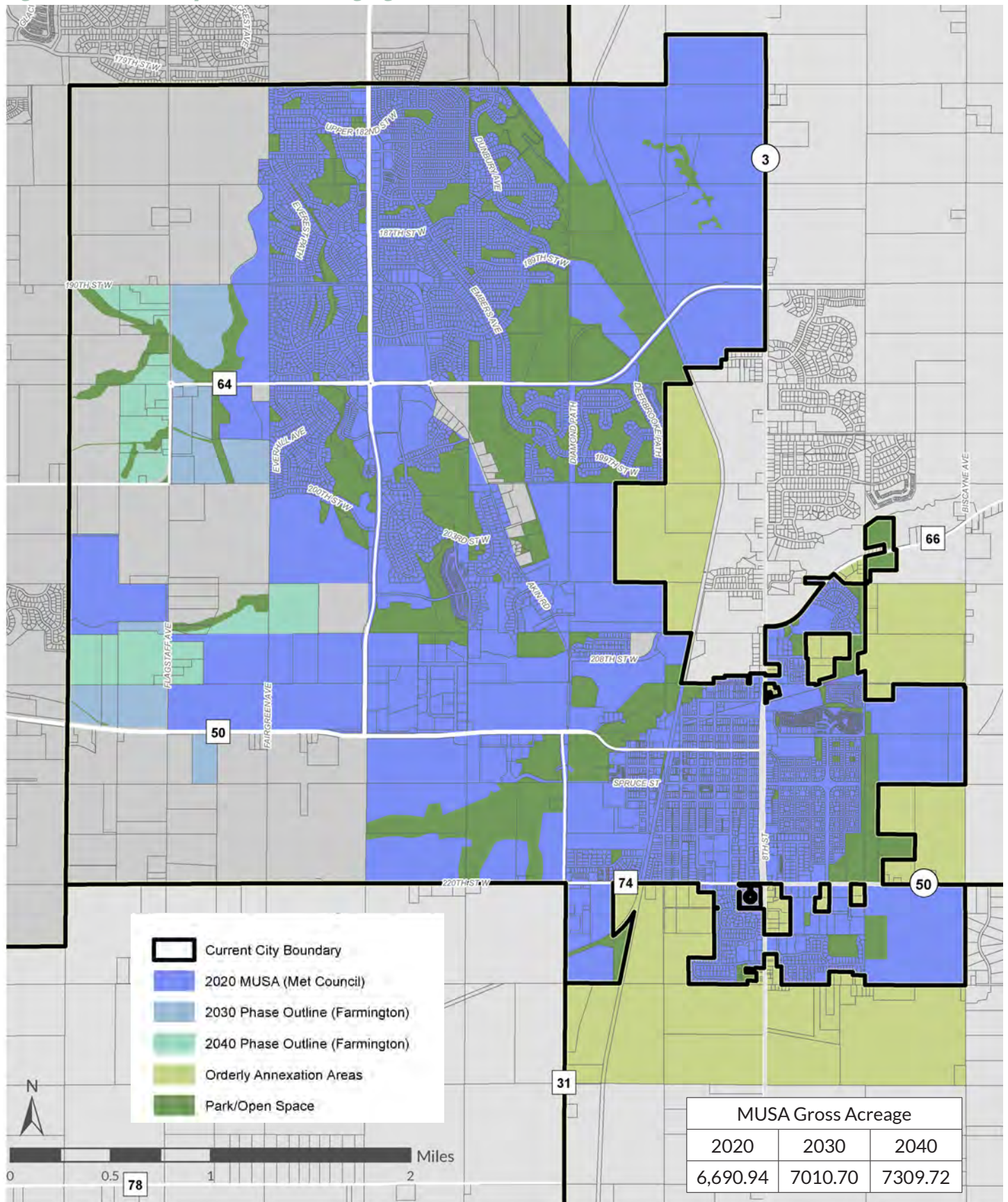
In 2014, the Metropolitan Council designated Farmington as an “Emerging Suburban Edge” community with its adoption of Thrive MSP 2040, the new regional development guide for the Twin Cities metro area. An Emerging Suburban Edge community is defined as “[a community] that is in the early stages of transitioning into urbanized levels of development.” Typical of an Emerging Suburban Edge community, Farmington is located between a Suburban Edge community (Lakeville, to the west and north) and Agricultural communities (Empire Township to the east, Castle Rock and Eureka Townships to the south). Chapter 1 of this document discusses the role of Farmington as an Emerging Suburban Edge community and how it will achieve the Metropolitan Council’s policies and objectives for communities with this designation.

In order to meet the Metropolitan Council’s System Statement forecasts as shown in Table 3.4, the city has measured its capacity to accommodate future development. Through this 2040 Comprehensive Plan, the city has used the projected phasing of development to verify population and job projections over time. Employment was verified by using general floor area ratios for commercial and industrial uses. For these calculations, this plan assumes an FAR of 0.20 for Commercial uses and 0.25 for Industrial uses.

**Table 3.4 Metropolitan Council Forecasts 1990-2040**

	1990	2000	2010	2020	2030	2040
Population	5,940	12,365	21,086	24,300	28,300	32,500
Households	2,065	4,169	7,066	8,500	10,100	11,800
Employment	2,342	3,833	4,438	5,600	6,200	6,800

**Figure 3.4 Anticipated MUSA Staging**



To accommodate Farmington’s projected growth for 2020, 2030 and 2040, Table 3.5 and Figure 3.5 show how the city anticipates staging or phasing of this growth.

Table 3.6 shows the range of housing units estimated to develop by phase and by land use designation. By 2040 between 3,681 and 9,223 additional housing units are estimated to be developed on 1,052.5 acres of net residential land, generating a minimum density of 3.50 dwelling units per acre.

**Table 3.5 Estimated Phasing of Development**

FUTURE LAND USE	NET ACRES DEVELOPED				
	2017-2020	2020-2030	2030-2040	POST 2040	TOTAL
Low Density	12.65	195.42	184.50	382.00	774.57
Low Medium Density	147.56	66.02	125.67	133.69	472.94
Medium Density	38.00	30.96	181.59	192.83	443.38
High Density	1.38	28.10	-	73.40	102.88
Mixed-Use (Commercial/ Residential)	-	81.36	-	-	81.36
Commercial	23.17	27.07	13.58	-	63.81
Mixed-Use (Commercial/ Industrial)	-	93.85	21.96	-	115.81
Industrial	-	0.09	349.33	-	349.42
<b>TOTAL</b>	<b>222.76</b>	<b>522.86</b>	<b>876.63</b>	<b>781.92</b>	<b>2,404.17</b>

\*Developable Land identified as any 2017 Existing Land Use of “Vacant,” “Agricultural,” or “Rural Residential”

Source: HKGi 2017

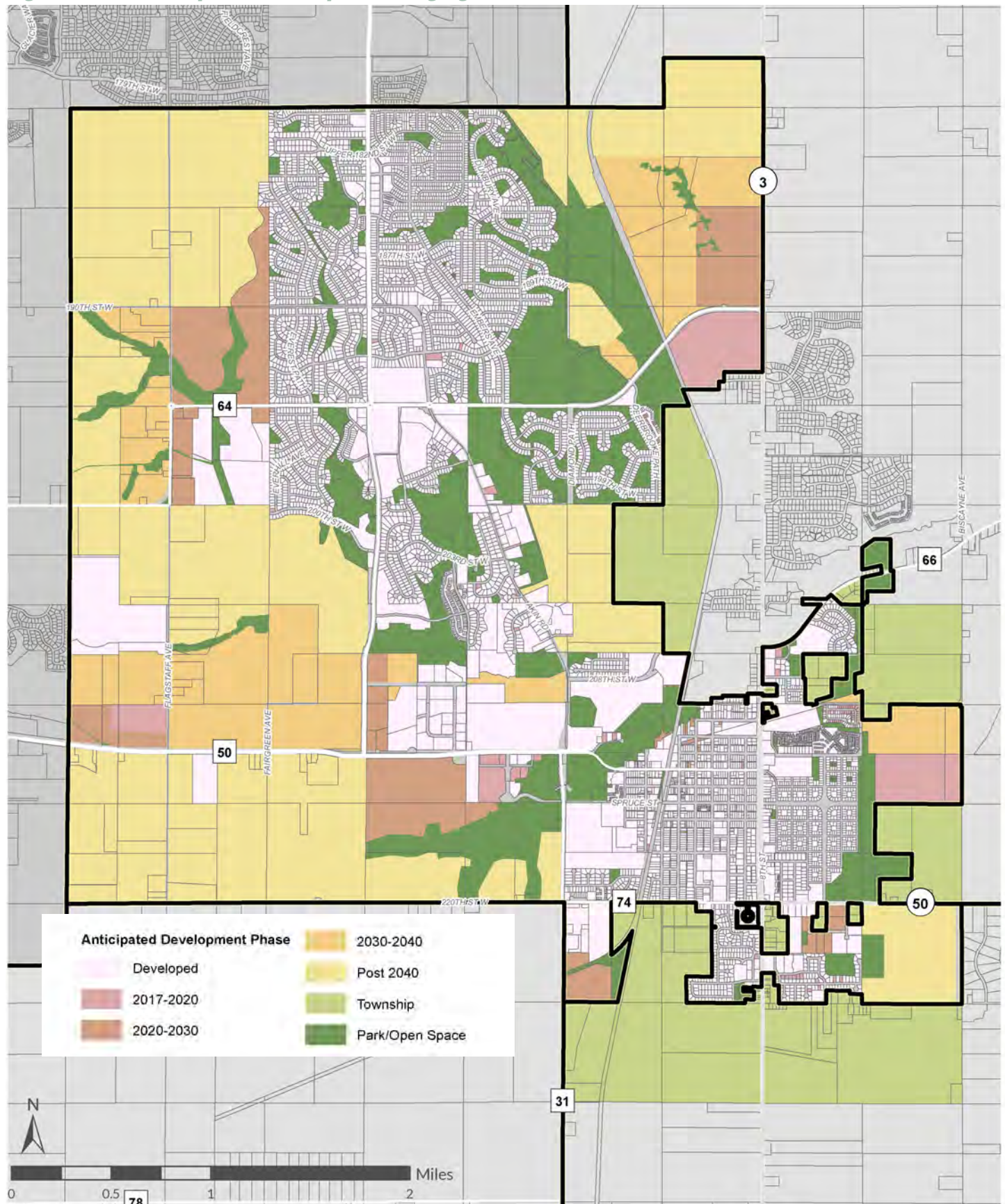
**Table 3.6 Estimated Housing Units by Development Phase**

FUTURE LAND USE	UNITS/ACRE		% RES	UNITS 2017-2020		UNITS 2020-2030		UNITS 2030-2040		UNIT TOTAL BY 2040		UNITS POST 2040	
	MIN	MAX		MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX
Low Density	1.0	3.5	100%	13	44	195	684	185	646	393	1,374	393	1,374
Low Medium Density	3.5	6.0	100%	516	885	231	396	440	754	1,187	2,035	1,187	2,035
Medium Density	6.0	12.0	100%	228	456	186	372	1,090	2,179	1,503	3,007	1,503	3,007
High Density	12.0	40.0	100%	17	55	337	1,124	-	-	354	1,179	354	1,179
Mixed-Use (Commercial/ Residential)	6.0	40.0	50%	-	-	244	1,627	-	-	244	1,627	244	1,627
<b>TOTAL</b>				<b>774</b>	<b>1,441</b>	<b>1,194</b>	<b>4,203</b>	<b>1,714</b>	<b>3,579</b>	<b>3,681</b>	<b>9,223</b>	<b>2,888</b>	<b>7,389</b>
Residential Acres				199.6		361.2		491.8		1,052.5		781.9	
<b>MINIMUM UNITS/ACRE</b>				<b>3.88</b>		<b>3.30</b>		<b>3.49</b>		<b>3.50</b>		<b>3.69</b>	

Source: HKGi 2017



**Figure 3.5 Anticipated Development Staging**



## 2020 GROWTH AREAS

For 2020, anticipated residential growth areas include the recently platted Regetta Fields northwest of the Flagstaff/Hwy 50 intersection, the portion of the planned Fairhill neighborhood south of CSAH 64 and west of Hwy 3, Winkler property in East Farmington, and scattered platted residential lots. The primary commercial growth area by 2020 is planned for the Spruce Street Area.

## 2030 GROWTH AREAS

For the 2020 - 2030 time period, anticipated residential growth areas include the Fairhill neighborhood, Spruce Street Area, Denmark/225th, Flagstaff/Hwy 50 (west of Flagstaff), Flagstaff/195th St. (east of Flagstaff) and scattered downtown sites. Mixed use (commercial & residential) growth areas include the Spruce Street Area, Fairhill neighborhood, and Flagstaff/195th St. Commercial and mixed use (commercial & industrial) growth areas include the Spruce Street Area, Farmington Industrial Park (Pilot Knob Rd/Hwy 50) and Farmington Business Park (Hwy 50 east of downtown).

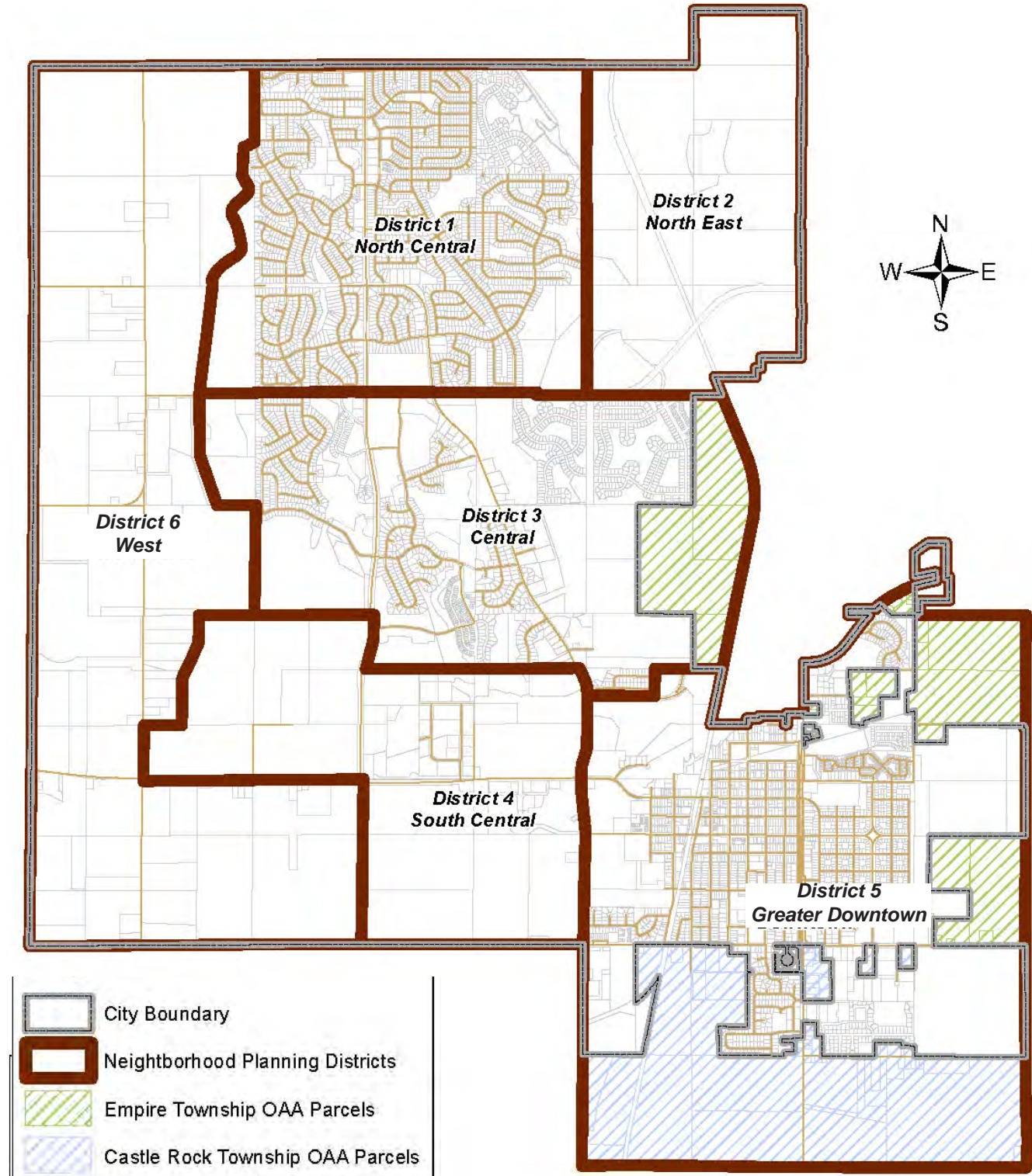
## 2040 GROWTH AREAS

For the 2030 - 2040 time period, anticipated residential growth areas include the Fairhill neighborhood, Spruce Street Area (south of the Vermillion River and South Creek), Flagstaff/Hwy 50 (west of Flagstaff), Flagstaff/195th St. (west of Flagstaff) and Devney property in East Farmington. Industrial growth areas are planned for the Farmington Industrial Park, north side of Hwy 50 between Pilot Knob Road and Flagstaff.

# Neighborhood Planning Districts

The 2040 Land Use Plan has been divided into six separate neighborhood planning districts as illustrated on Figure 3.6 in order to discuss each district in detail. The districts include the North Central, North East, Central, South Central, Downtown and West districts.

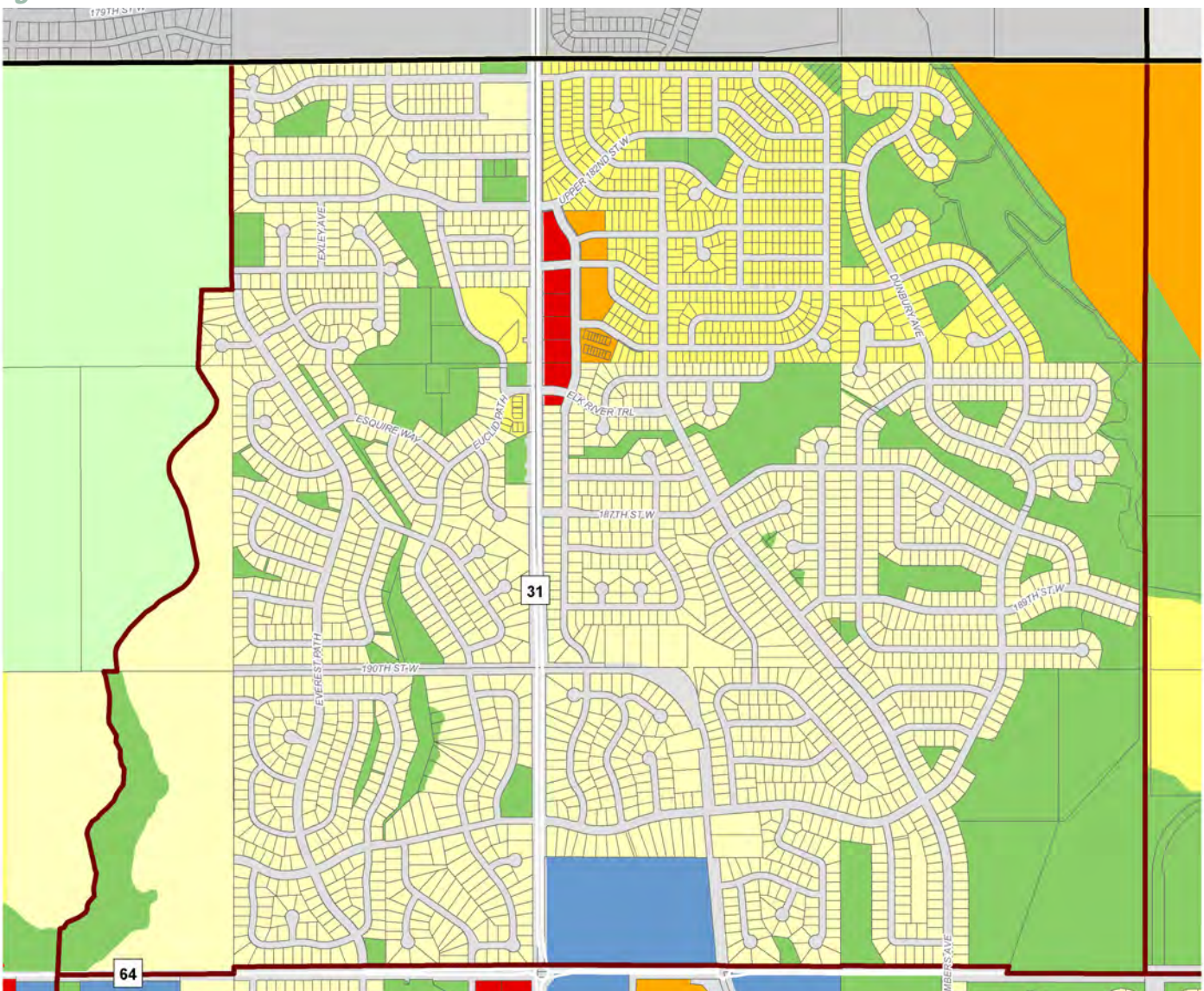
**Figure 3.6** *Neighborhood Planning Districts*



## DISTRICT 1 - NORTH CENTRAL

This district is located in the north central portion of the city and consists primarily of fully developed single-family detached residential neighborhoods, including low density and low-medium density residential areas as shown in Figure 3.7. The low-medium density residential area is located in the northeast corner of District 1 from 185th Street to the city's northern boundary, including the Dakota County Estates subdivision directly east of Pilot Knob Road and the Riverbend subdivision to the east. A small neighborhood commercial area is located along the east side of Pilot Knob Road between Elk River Trail north to Upper 182nd Street. In addition, a pocket of medium density residential is located adjacent to the commercial area. A two-building senior housing (Cameron Woods) complex is located on the west side of Pilot Knob Road, just south of Upper 183rd. City parks, natural open spaces and a school (Akin Road Elementary) make up the remaining land uses within District 1.

**Figure 3.7** District 1 - North Central



Pilot Knob Road is the primary north-south roadway in this area. Dakota County's planned east-west Minor Arterial just north of Farmington in Lakeville, also known as 179th Street, will soon provide traffic flow to the west from Pilot Knob Road to Cedar Avenue. 195th Street, which is also a County roadway, has recently been extended east to Highway 3, providing an east-west corridor from Highway 3 to Flagstaff Avenue and ultimately to Cedar Avenue.

Additional low density residential is planned on District 1's western edge culminating at the Middle Creek open space corridor. This expanded land use pattern is consistent with existing land uses and attempts to maintain and enhance the existing residential character of the district. The currently agricultural quarter section (160 acres) at the northwest corner of Pilot Knob Road and 195th Street will expire from the Agricultural Preserve Program in 2020, so may have development potential in the near future.

The northeastern corner of the district, outside of the North Creek floodplain and within the current MUSA area is guided for medium density residential. This parcel is currently landlocked, however, with the potential northerly extension of Diamond Path from the south as part of the development of the future Fairhill neighborhood or a connection north to future 179th Street in Lakeville, a future roadway access for this parcel is possible.

The southeastern corner of the district largely consists of natural open space and city parkland. The strip of land on the east side of Limerock Ridge and west of Autumn Glen 3rd Addition showing park and open space coincides with the city's vision of maintaining its natural features. In this case, an existing 20% slope consisting of oak and hardwood trees was conserved in order to meet this vision. The wetland area to the east of Autumn Glen 3rd Addition was also preserved and portions of the wetland area are city parkland as shown on the eastern border of the district.

## DISTRICT 2 - NORTH EAST

The 965 acres of the property generally known as the “Seed Property” was annexed into the city of Farmington in 2006 and 2007. In 2007 the Metropolitan Council approved an amendment to the Farmington Comprehensive Plan for the entire development known as Fairhill, while also approving a 520-acre MUSA expansion for the southern portion of the property. The developer, Newland Communities, Inc. revised its original development layout and a second amendment to the Farmington Comprehensive Plan was approved in 2008. The developer also requested and received expansion of the MUSA from the Metropolitan Council for the remaining 445 acres of the 965 total acres in Fairhill.

The vision for the Fairhill neighborhood subdivision took shape through the use of a market analysis. The analysis looked at how residents view Farmington, including discussion of the city’s development and long-range planning. The Fairhill neighborhood is intended to attract first-time homebuyers who want to establish roots in Farmington, allowing the residents to remain within the residential neighborhood through all life stages by offering a range of housing types.

An important feature of the project is the dedication of land for two future community parks. 42 acres have been dedicated for a community park/youth athletic complex located at the southwest corner of Fairhill. Additionally, the dedication of 11 miles of trails throughout the site will allow the linkage of other trails throughout Farmington. An additional 38-acre public Central Park will be located in the center of Fairhill to allow easy access because of its close proximity to the housing proposed for the project.

The most important part of this plan is the collaboration of the developer, city of Farmington, and Dakota County to provide the east-west roadway connection for 195th Street to Highway 3, which was completed and opened in the fall of 2009. The construction included a bridge spanning wetlands, floodplains, and the railroad tracks for Farmington’s first separated grade crossing of this area. This roadway connection provides open access for emergency vehicles to get east and west through the central part of the city. The 195th Street alignment was part of an AUAR Update that was approved in July 2011 and updated in 2017.

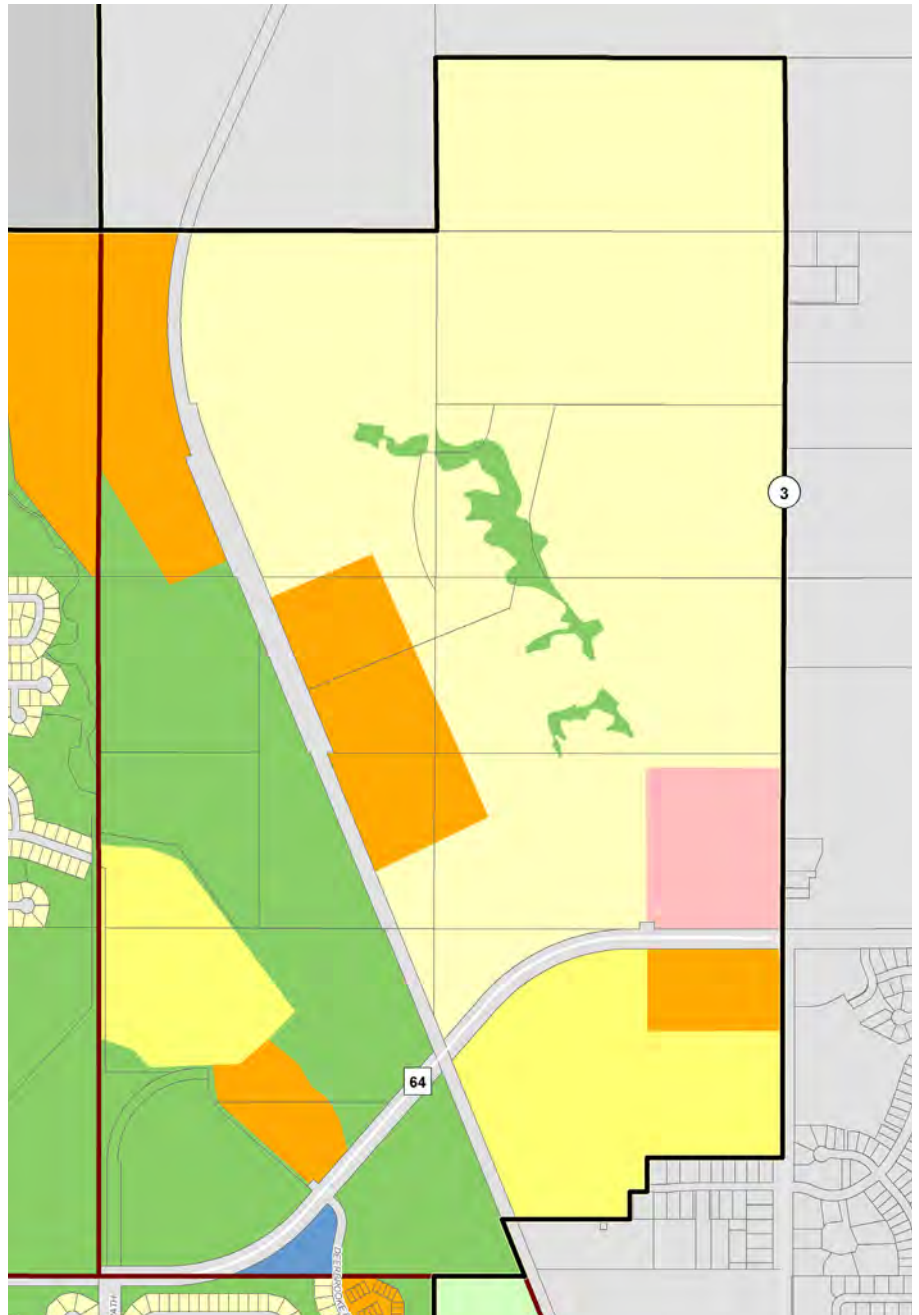
The developer proposes to construct low density detached houses on lots from 45 feet wide up to 75 feet wide with densities ranging between 1.0 to 3.5 units per acre. House sizes will begin at 1,800 square feet up to 4,500 square feet. The low density residential land use designation allows a maximum of 1,796 single family lots.

Low-medium density residential will provide for attached and detached townhomes with a maximum unit count of 240 units at a density of between 2.5 and 5.5 units per acre.

Medium density will provide attached villas with single-level living. The developer proposes a maximum of 1,680 units with a density range between 5.5 and 14.0 units per acre.

The final housing component proposed by the developer is the 200 housing units in the mixed-use area adjacent to the proposed commercial development located at the northwest corner of 195th Street and Highway 3. The commercial area will only support smaller neighborhood business uses and will not detract from the downtown business area. This area will provide convenience-type services that may be accessed by walking or through short vehicle trips.

**Figure 3.8** District 2 - North East



## DISTRICT 3 - CENTRAL

This district consists of a variety of land uses as illustrated in Figure 3.9. Residential dominates this district but it also has a number of institutional uses, and a small neighborhood commercial node at Pilot Knob Road & 195th St. The variety of housing types includes single-family detached houses, two-level townhouses, and one-level townhouses.

To the west of Pilot Knob Road, the Charleswood subdivision was expanded in 2000-2001 and consisted of 160 single-family units and 96 townhouse units. To the east of Pilot Knob Road, Vermillion Grove, Middle Creek, Middle Creek Estates, Parkview Ponds, and Mystic Meadows were developed between 2001 and 2006 and provided an upswing in higher-end market prices for homes. Vermillion Grove consists of 90 single-family houses and 281 townhouses. Middle Creek, south of Vermillion Grove, also consists of a mix of housing types, including 261 single-family houses and 341 townhouses. Parkview Ponds, east of Akin Road, was platted in 2004 and consists of 147 single-family houses. Finally, Mystic Meadows, east of Parkview Ponds, was platted in 2005 and consists of 243 single-family houses and a mixture of 40 townhomes and detached townhome units. Mystic Meadows was annexed into the city in 2004.

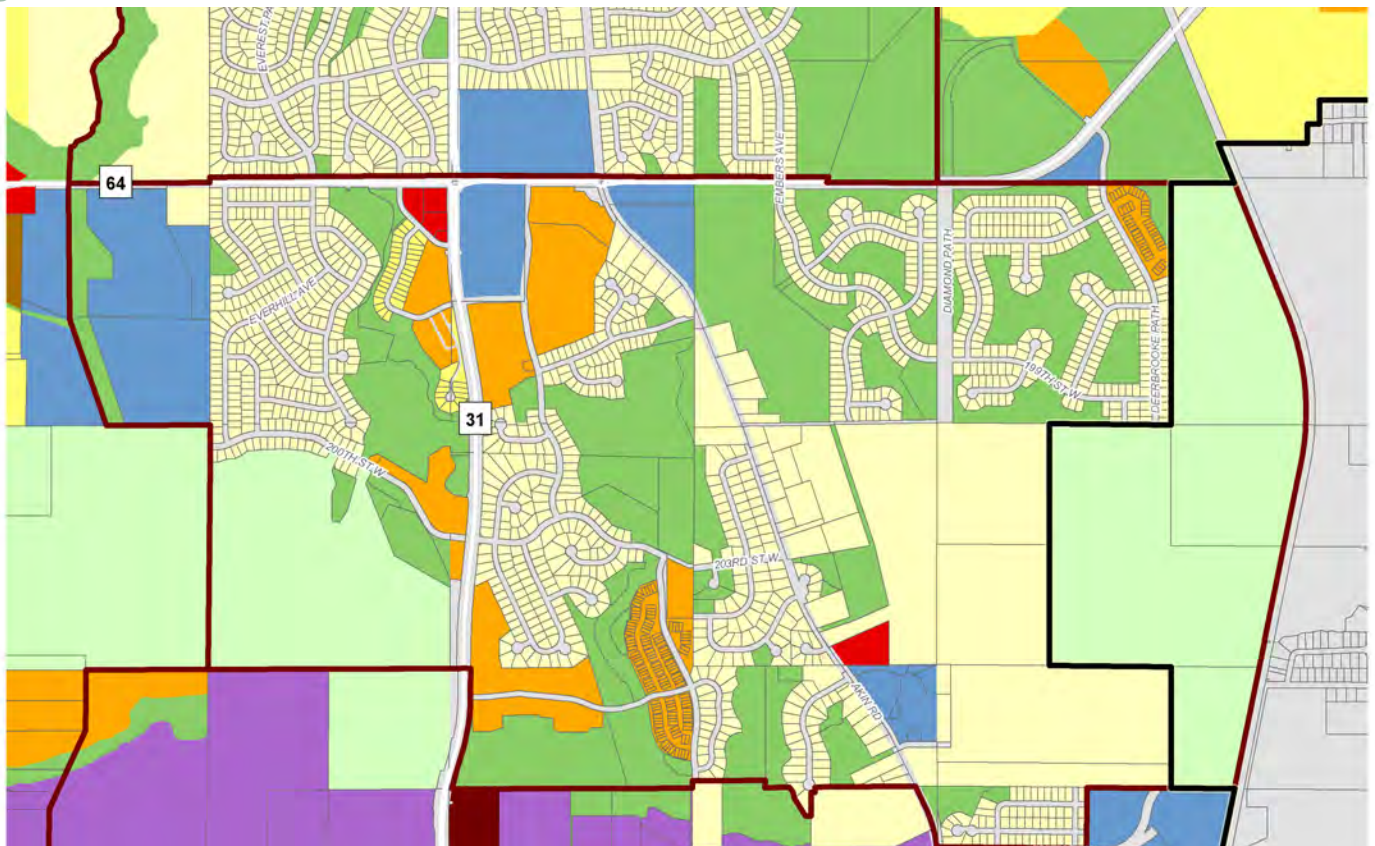
The city of Farmington Maintenance Facility is located at the southeast corner of Pilot Knob Road & 195th St. Meadowview Elementary School was added to the northwest portion of the district in 2002. Farmington Lutheran Church relocated its facility from the downtown area to this district in 2003. Farmington Bible Baptist Church is located on Akin Road.

The district also consists of natural open spaces and a city park. The natural open space involves much of the Middle Creek drainage way on the southwestern portion of the district along with drainage ways from the north connecting to Middle Creek. Wetland features reside throughout the district located in the southwest corner and the central portion of the area which has been designated as a protected wetland.

Developable land in District 3 consists of approximately 200 acres of agricultural land in the southeast corner under single ownership, which is guided for Low Density Residential.



**Figure 3.9 District 3 - Central**



A key goal for development in this district was to better connect the northern portion of the community to the southern or downtown portion of the community. Due to the developments in this district, Farmington became much more connected via transportation routes and pedestrian routes. 203rd Street provides an adequate “local” east-west connection between Pilot Knob Road and Akin Road passing through the Middle Creek neighborhood. 200th Street connects with 203rd Street on the west at Pilot Knob Road and eventually this street will be connected to Flagstaff and possibly beyond to Cedar Avenue on CSAH 64 (200th St). The city is interested in discussing this connection with Dakota County and the City of Lakeville because of the close proximity to the future connection of 202nd St (CR 50) to Cedar Avenue. To the east of Akin Road, the Transportation Plan proposes the extension of 203rd to connect to extensions of Diamond Path and/or Deerbrooke Path, which would provide connections to 195th St. The Transportation Plan also shows a potential 203rd connection across the rail line to Hwy 3 and 195th St.

In 2009, construction of the 195th St roadway extension and bridge was completed to Hwy 3, which provided a key east-west roadway connection for District 3 and central Farmington in general.

Pedestrian trails and sidewalks have increased greatly in the district due to developments and the city's requirement for looped trails. Trails are now located along 195th Street from Meadowview Elementary School to Mystic Meadows, along 200th and 203rd Streets from the west side of Charleswood to Akin Road, and on the east side of Akin Road from 195th Street to CSAH 50.

#### **DISTRICT 4 – SOUTH CENTRAL**

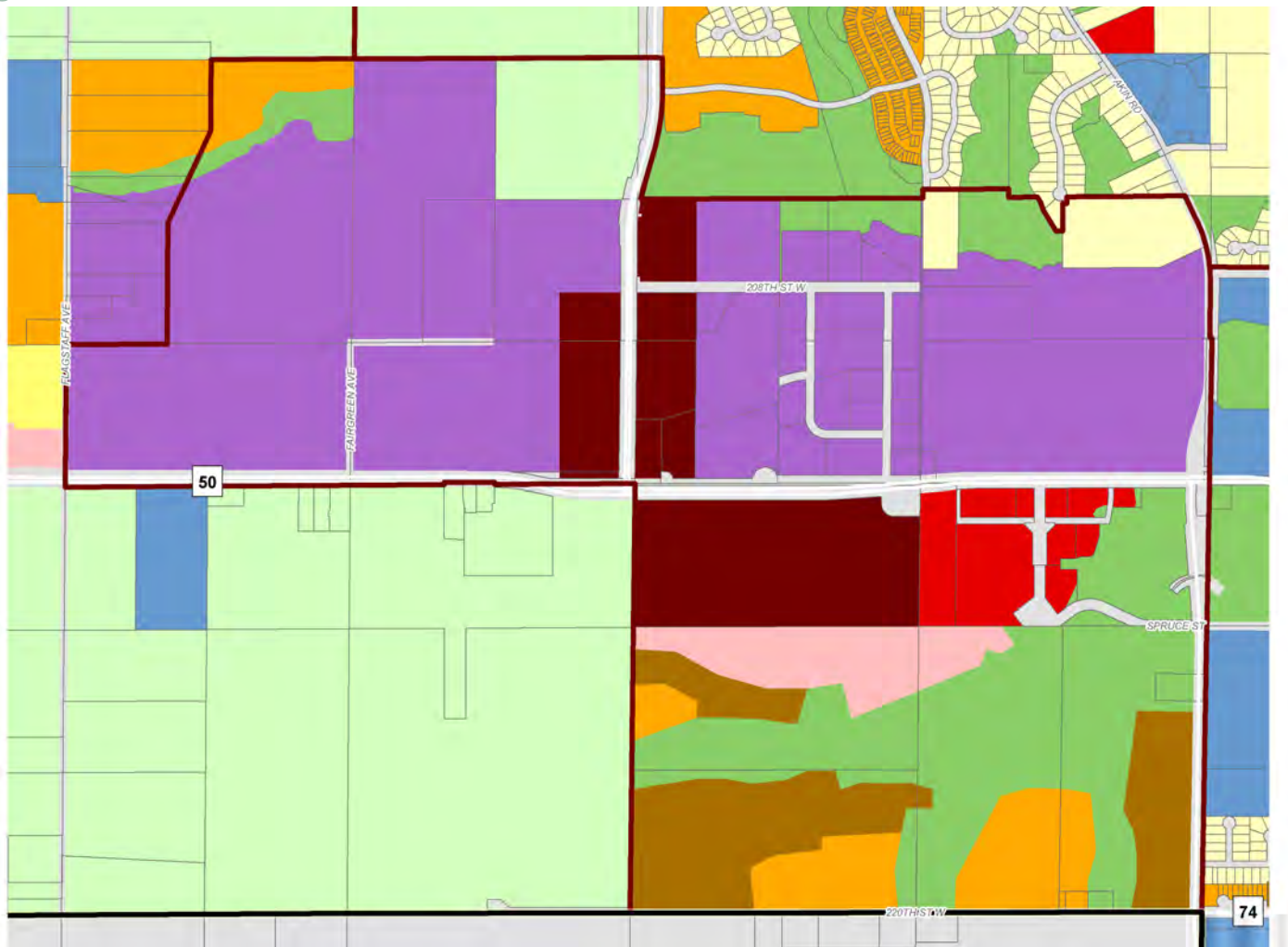
District 4 consists of the Farmington Industrial Park, including its planned future expansion west of Pilot Knob Road, and the Spruce Street Area. The current Farmington Industrial Park is located on the north side of Hwy 50 between Akin Road and Pilot Knob Road. The accessibility to CSAH 31 and Hwy 50 makes this area a logical location for industrial land uses, with Fairgreen Avenue acting as a north south spine through the industrial park. Within this area, expansion of industrial uses is guided for the area north of the natural gas plant and the electrical substation along with a vacant property on Hwy 50 and vacant properties along Pilot Knob Road. Land along both sides of Pilot Knob Road is guided for Mixed Use (Commercial/Industrial).

Since some industrial and commercial uses can be planned and designed to be compatible with each other, the Mixed Use (Commercial/Industrial) designation enables more flexibility in the types of development that could occur along Pilot Knob Road and Hwy 50.

West of Pilot Knob Road, approximately 350 acres of agricultural and rural residential land is guided for future industrial land uses. A 2007 Market Study for Farmington highlighted that the city had significantly more square feet of Office Showroom/Office Warehouse than the City of Apple Valley. Due to the large amount of commercial in the area where Apple Valley is proposing industrial, it was concluded that Farmington had an opportunity to promote its lower cost per square footage for industrial development.

A small area in the northwest corner of the district is guided for future Medium Density Residential due to its location north of the Middle Creek drainage and proximity to the Farmington High School.

**Figure 3.10 District 4 - South Central**



### **Spruce Street Area Master Plan**

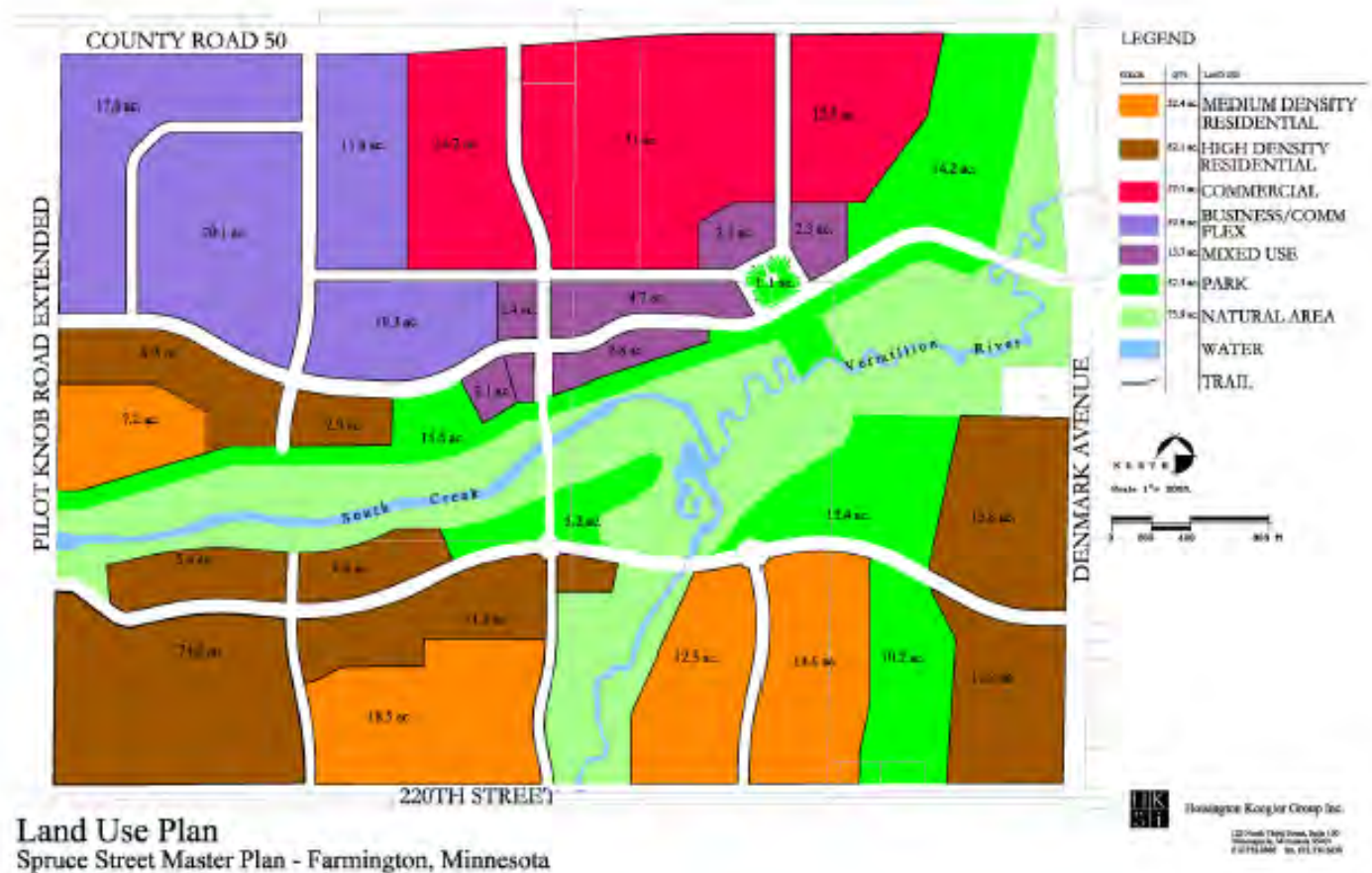
In 2002, the Metropolitan Council awarded the city of Farmington the full amount of the \$40,000 Opportunity Grant that the city had requested through its Livable Communities Demonstration Account (LCDA) program. Because of the grant approval, in September of 2002, the city approved a temporary development moratorium within the Spruce Street Area for 18 months in order to allow the master planning of the area. The city then organized a task force of 16 members of the community including business owners, realtors, school district officials, and residents to determine the future development of the area.

The city’s application focused on the portion of Farmington bounded on the north by CSAH 50, on the east by Denmark Avenue, on the south by 220th Street West, and on the west by the future southerly extension of Pilot Knob Road as illustrated on the map (Figure 3.10). The city’s Opportunity Grant application indicated that the goal of the project was to “create a comprehensive, progressive development plan for a currently undeveloped site located in close proximity to a rapidly growing suburb’s “historic” downtown, and to do so in a way that creates new commercial, residential and mixed-use opportunities that complement rather than conflict with existing businesses and neighborhoods.”

Goals cited in the application included the following:

- » Creation of a business/office park in close proximity to downtown to increase access and the ease of vehicle and pedestrian mobility.
- » Location of a wide range of desirable and affordable housing in close proximity to the business/office park.
- » Protection of the Vermillion River.
- » Creation of new green spaces for the enjoyment of residents.

**Figure 3.11 Spruce Street Area Master Plan**



There are multiple private and one public property owner (Dakota County). City staff believed that the development of a comprehensive master plan for this area would greatly facilitate a logical, orderly, progressive and coordinated approach to the many issues that might arise as the city engaged in discussions with owners, prospective developers, adjoining landowners, and other interested parties.

The project area contained approximately 450 acres of undeveloped land, exceptions being a few large lot residential homes, a city Fire Station along Denmark Avenue, and a Dakota County highway maintenance facility along CSAH 50. With those exceptions, the site has been used for agricultural crop production. Located adjacent to major roadway facilities, the site is very accessible and visible. CSAH 50 is designated as a minor arterial and provides the major east-west connection into Farmington. Pilot Knob Road (CSAH 31) is a minor arterial providing a north-south connection through the south metro. It will eventually be extended along the west property boundary of the Spruce Street Area to connect with 220th Street, also designated as a future minor arterial. Planning efforts are underway for a future realignment of County Road 70. One of the possible alignments is at 220th Street. Denmark Avenue forms the eastern border of the site and is designated as a collector street.

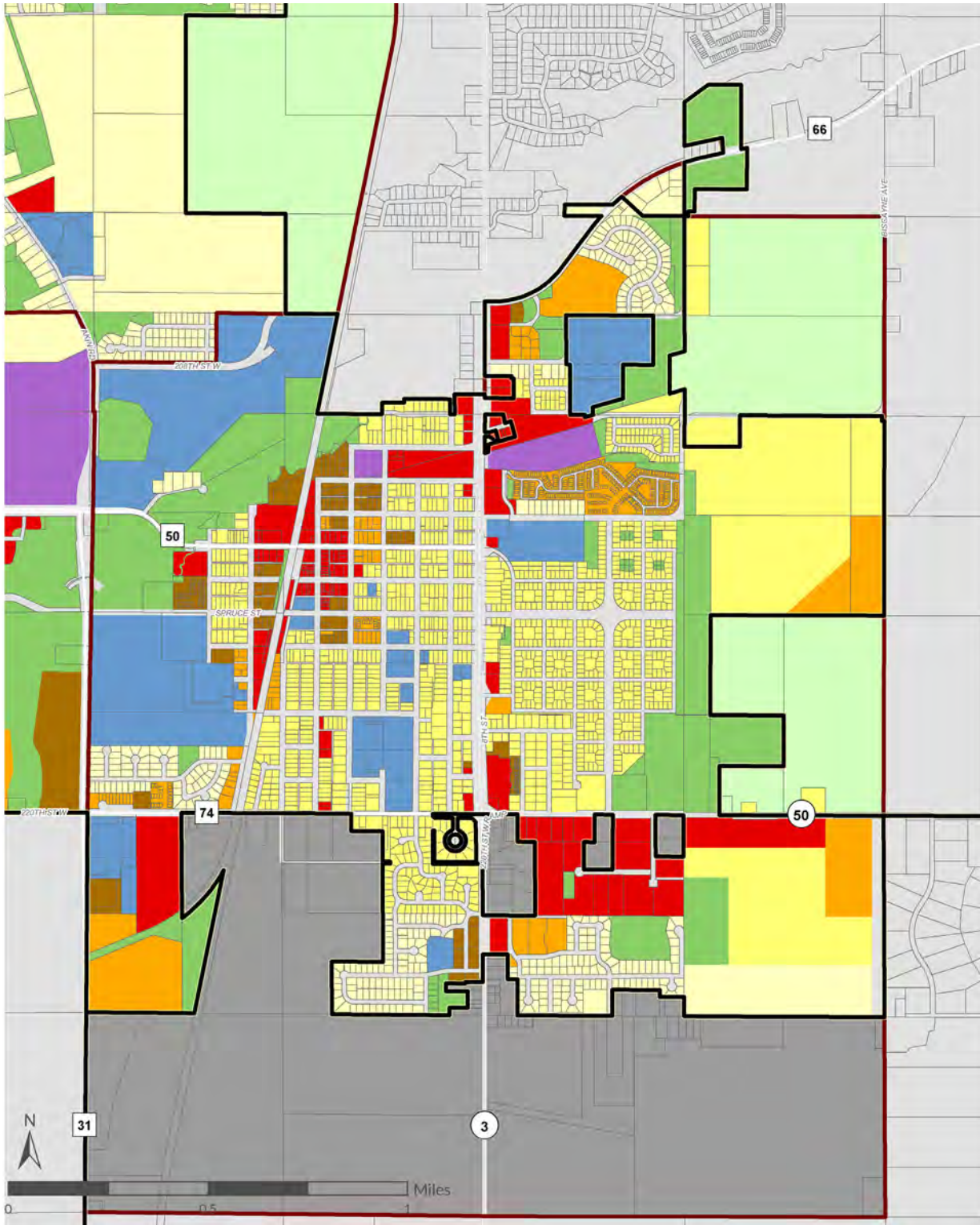
The Vermillion River and South Creek flow in a northeasterly direction through the project area. Floodplain areas are adjacent to each containing wetland areas and native grasses. The Vermillion River is one of the few rivers in the metropolitan area that supports trout. The Minnesota Pollution Control Agency recently designated it as a 2a water, meaning that water quality is protected to support aquatic life and recreation. Because of this designation, the city has adopted more stringent surface water management regulations. The Master Plan accommodated additional area for treatment of surface water.

As shown in Figure 3.11, the heart of the Spruce Street Area between Spruce Street and Hwy 50 is guided for Commercial and development of this area is in progress, including major retail development. The expansion to the west is guided for Mixed Use (Commercial/Industrial) to provide flexibility in the development of this area with compatible retail, office and industrial uses. This land use designation is also intended to offer a variety of opportunities for start-up businesses, high-tech offices, high-tech industries, hotels and restaurants. The area between Spruce Street and the Vermillion River is guided for Mixed Use (Commercial/Residential), Medium Density Residential, and High Density Residential to enable development of a residential neighborhood with walkable access to commercial, parks and open space, and a variety of housing options. On the south side of the Vermillion River and South Creek, the land is also guided for a mix of Medium and High Density Residential land uses.

## DISTRICT 5 - GREATER DOWNTOWN

The Greater Downtown District consists of the original downtown of Farmington concentrated near the rail line and eastward to Hwy 3, the western portion between the rail line and Denmark Ave, and the eastern portion east of Hwy 3 out to the city's eastern boundary, referred to as East Farmington.

Figure 3.12 District 5 - Greater Downtown



The original downtown area currently contains a diverse mix of land uses, including commercial, industrial, public/semi-public, multi-family residential, and single-family residential. There are also some vacant properties scattered throughout downtown. The commercial land uses include traditional downtown retail, service, and office uses in the downtown core. Outside of the downtown core west of the rail line, there is a large suburban retail development and businesses not oriented to a downtown environment, such as self-storage, automotive repair, etc. The residential uses are primarily single-family with just two apartment buildings and two townhouse developments.

In 2016, the Downtown Redevelopment Plan was adopted by the City Council. The Downtown Redevelopment Plan is intended to provide a shared vision for downtown that guides reinvestment efforts by both the private and public sectors, including key redevelopment opportunities. The Downtown Plan's study area, which encompassed approximately 20 blocks, was defined as four downtown districts: Downtown Core, Downtown Edge, Riverside North, and Riverside West (Figure 3.13). The Downtown Plan used these downtown districts for identification of unique redevelopment initiatives, connectivity improvements, and redevelopment phasing. Figure 3.14 shows the Plan's Illustrative Downtown Redevelopment Concept, including redevelopment sites, park and open space enhancements, historic building revitalization opportunities, and proposed pedestrian/trail connections including a proposed riverwalk along the south side of the Vermillion River.

**Figure 3.13 Downtown Districts Concept - 2016**

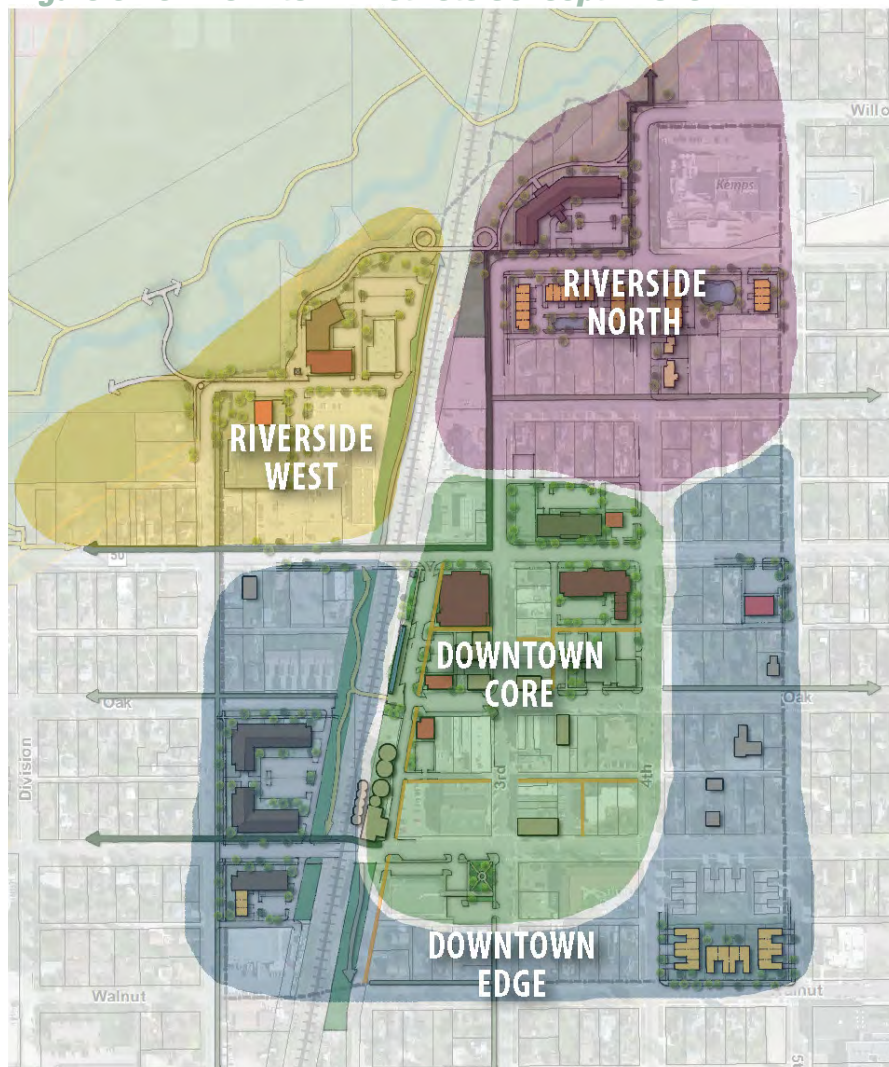


Figure 3.14 Illustrative Downtown Redevelopment Plan - 2016





The Downtown Redevelopment Plan also recommends changes to the 2040 Future Land Use Plan map, which include the following:

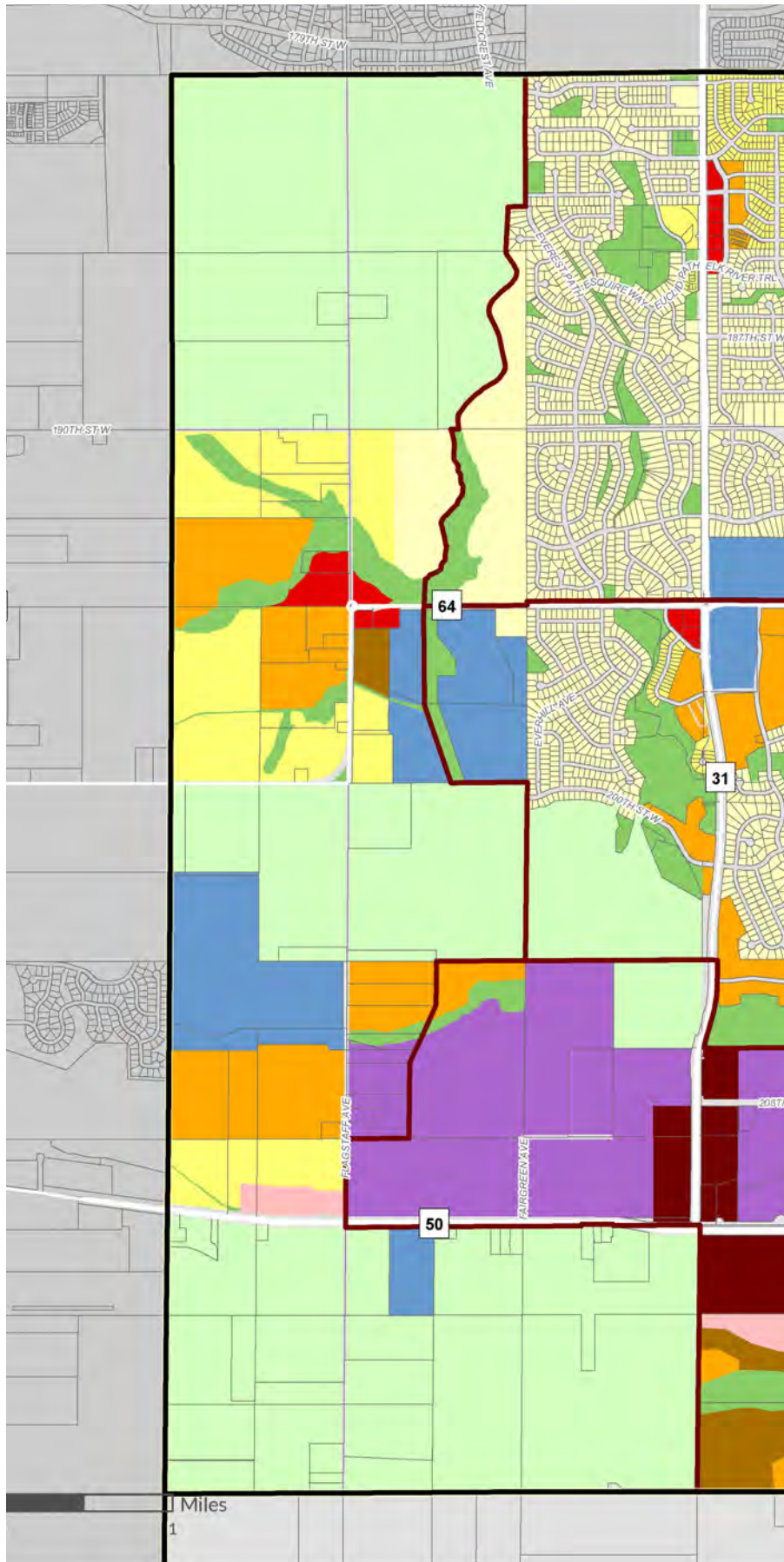
- » Reguide properties along Hwy 50 east of 4th St, as well as 3rd St north of Hwy 50, from Commercial to Medium Density Residential
- » Reguide properties along the south side of the Vermillion River and along Pine St (between 3rd and 5th) from Commercial to High Density Residential
- » Reguide some properties on the south edge of downtown (vicinity of 3rd St and Walnut St) from Commercial and Public/Semi-Public to Medium and High Density Residential
- » Reguide the city hall property from Commercial to Public/Semi-Public
- » Reguide properties west of the rail line to 1st St from Commercial and Low Medium Density Residential to High Density Residential
- » The pockets of industrial land designations within the downtown area have been decreased due to the need for expansion of the business district and expansion of medium to high-density residential areas in the district.

These changes are reflected on the 2040 Future Land Use Plan map are intended to concentrate downtown's commercial area around the historic downtown area and Hwy 50 rather than creating a disconnected commercial area. The addition of properties guided for Medium and High Density Residential is intended to provide opportunities for adding new housing options for Farmington residents in a walkable historic downtown environment with excellent access to natural and recreational amenities. Bringing new housing options to downtown will also increase the number of downtown residents who can support downtown businesses.

The most recent residential developments in the Greater Downtown area have been east of Hwy 3, north of 213th Street and south of the Vermillion River, including Tamarack Ridge, Hometown, Sunrise Ponds, Bristol Square with a mix of single-family houses and townhouses. In the southeast corner of the district, residential includes Executive Estates single-family homes that were annexed into the city in 2005 and townhouses built in 2012 by the Dakota County Community Development Agency. Future residential development in this area could include the Devney, Winkler, and Fountain Valley Golf Course properties east of current residential development with a total of 302 acres.

The Greater Downtown district also includes a wealth of public, institutional, and open space land uses, including schools, churches, parks, Minneapolis Air Route Traffic Control Center, and the Vermillion River corridor.

Figure 3.15 District 6 - West



## DISTRICT 6 - WEST

This district contains most of the agricultural lands within the community as illustrated in Figure 3.15. The agricultural land use is prevalent in this area because of the large number of properties identified as agricultural preserve. As discussed earlier in this chapter, many properties in this Planning District will be coming out of the agricultural preserve program in the next few years.

One use that has been approved in this agricultural area is Farmington's High School. Independent School District #192 constructed a 478,250 square foot school building on a high school campus that is 110 acres in size. A Comprehensive Plan Amendment and the expansion of MUSA to the site was approved by the Metropolitan Council in 2006 and was completed in 2009.

As part of the high school project, Flagstaff Avenue was upgraded and paved with bituminous material from CSAH 50 on the south to the Farmington city limits on the north. An intersection at Flagstaff Avenue and 208th Street will be constructed in the future when development pressures require the east/west roadway.

The sanitary sewer service to the high school has been extended from an existing Metropolitan Council Environmental Services (MCES) sewer south of CSAH 50 north to the high school and north to 200th Street. The MCES and the City of Lakeville assisted in the cost of the sewer line because it became a trunk line and Lakeville expanded the line to its easterly area near the northwest corner of Farmington.

The sewer extension provided immediate service to the high school and is designed and sized to accommodate future development in the vicinity of the site. The city constructed and installed a looped water main from the intersection of CSAH 50 and Pilot Knob Road to the new high school's south entry way. From the existing water main at CSAH 50 and Pilot Knob Road, the city installed a 16" main running west along the north side of CSAH 50 and an 18" main running north in the right-of-way of Flagstaff Avenue, per the requirements of Farmington's Water Supply Plan. Storm water ponds have been constructed on the south and east sides of the site to handle runoff from the northwest.

Future developments in this area will depend on expansion of services and infrastructure into areas no longer under agricultural preserve. The two main areas of growth for this plan are the Highway 50 / High School residential growth area, and the CSAH 64 and Flagstaff Avenue intersection, which will be more of a mixed use node, with commercial, and a variety of residential uses.

The timing of these areas will depend on the expansion of sewer and water to these areas, as well as County plans to expand CSAH 64 to Cedar Avenue.

### **FARMINGTON/EMPIRE TOWNSHIP ORDERLY ANNEXATION AGREEMENT**

On March 19, 2008, Empire Township and the city of Farmington approved an Orderly Annexation Agreement (OAA) of 588.49 acres on the eastern boundary of the city as shown in Figure 3.12 in District 5. The Office of Administrative Hearings accepted the joint resolution on April 17, 2008. The city agrees that future planning for this area is critical; however, at this time the city has decided to guide these properties as Agriculture as they are not in the municipal limits of Farmington. The city began discussions with Empire Township concerning possible land use scenarios in the OAA in early 2009 so in the event a property owner wishes their property to be annexed into the city, the transition to a city guided property can occur seamlessly. These discussions are ongoing.

### **FARMINGTON/CASTLE ROCK TOWNSHIP ORDERLY ANNEXATION AGREEMENT**

The Farmington/Castle Rock Discussion Group formed in October of 2004 in an effort to improve communications and foster a better relationship between the city and the Township. The structure of the Discussion Group was modeled after a similar group, the Empire/Farmington Planning Advisory Committee, or "EF-PAC" that had been successful in improving relations between the city of Farmington and Empire Township. The Discussion Group was composed of three Township representatives and three city representatives. The Discussion Group met for the first time on October 8, 2004.

The Discussion Group focused on the potential benefits, to the township and the city, of a long-term Orderly Annexation Agreement (OAA) that would establish a mutually acceptable “outer boundary” for annexations that would remain in effect for a specific period of time, in exchange for which the township would agree to not oppose the annexation of parcels located inside that boundary. The OAA consists of a total of 758.5 acres, with 532.8 acres being public acres including the Dakota County Fairgrounds and the ISD #192 school site.

The Discussion Group approved the OAA stating that it would remain in effect from the date of adoption through December 31, 2016. A new joint resolution was approved by both the township and city in 2017 that extends the termination date of the OAA to December 31, 2030. During this period, the city could not annex any property located “beyond the line” without the Township’s express consent, but the Township would not oppose the annexation of any property located “inside the line.”

The OAA requires that all annexations be initiated by the property owner rather than by the city. That is, the owner of any property located “inside the line” who wished to remain in the township could do so through at least 2030, without regard to what may be happening with adjoining properties. Even after 2030, such a property owner could continue to remain in the township if the city had not (in the meantime) changed its current practice, under which no property is annexed unless or until the owner of the property petitions for annexation.

The current properties that are either developing or are proposed for development within the OAA include the Mock property and the Fountain Valley Golf Course. The acreage of these properties consists of 164 acres, of which 15 acres are designated for commercial use.

The township requests that the city illustrate future land uses in the Orderly Annexation Area [OAA] in order to maintain “a good working relationship” between the city and township. The city agrees that future planning for this area is critical; however, at this time the city does not wish to guide these properties as they are not in the municipal limits of Farmington. The city will continue to have discussions with Castle Rock Township concerning possible land use scenarios in the OAA on an as needed basis so in the event a property owner wishes their property to be annexed into the city, the transition to a city guided property can occur seamlessly.

# Environmental Resource Conservation

Minnesota Statute Section 473.859 requires that local comprehensive plans address the conservation, preservation or restoration of natural resources in the community. It is the city's intent to conserve its environmental resources, including surface water and woodland/tree resources.

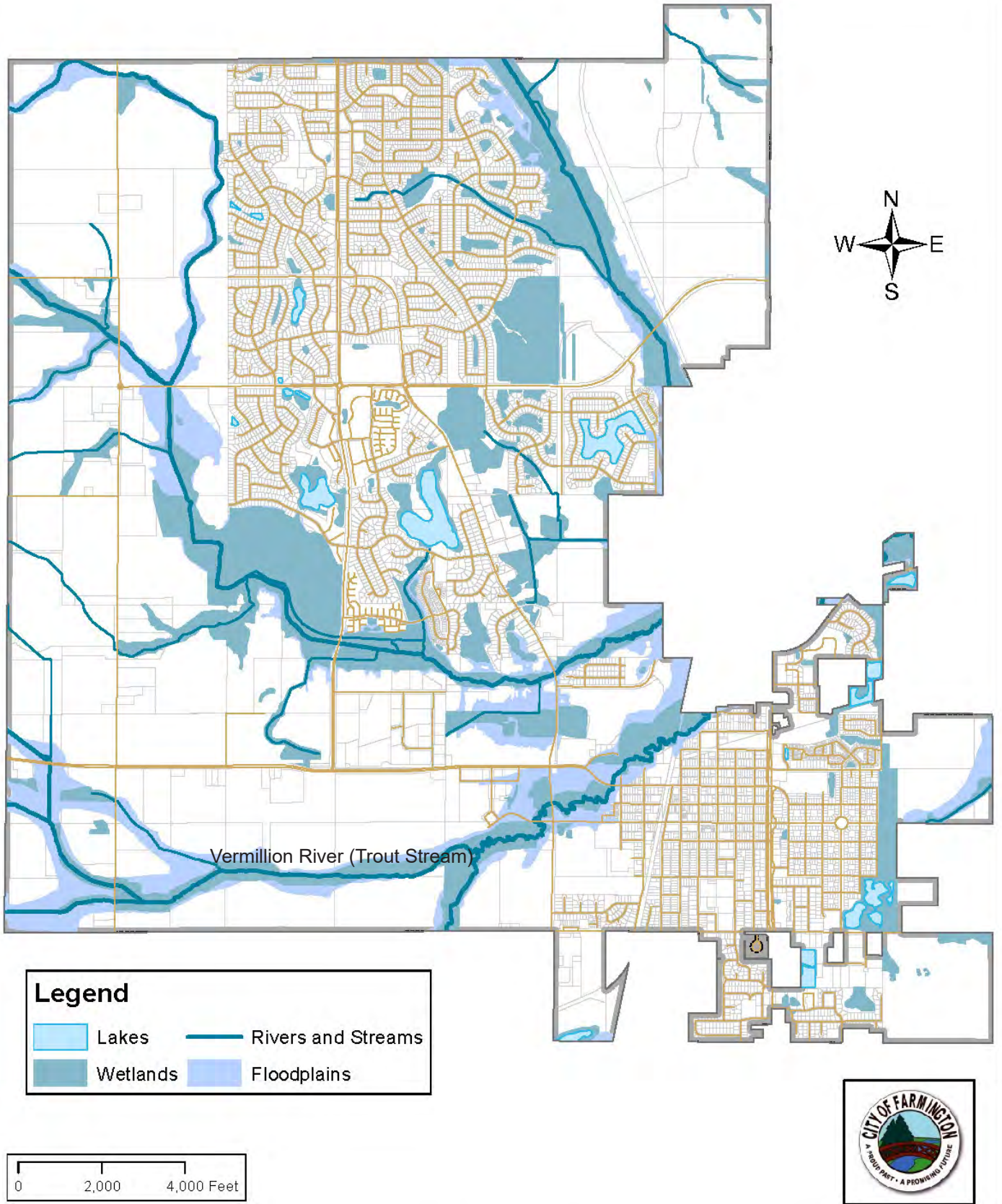
## SURFACE WATER RESOURCES

Farmington values and protects its surface water resources for their environmental, visual and recreational benefits. Figure 3.16 identifies all surface water resources in Farmington including the Vermillion River, streams/creeks, wetlands, floodplains, lakes and drainage courses. Mapping these surface water resources enables the city to identify the areas that should be protected for their environmental function and potentially as public open spaces. The city of Farmington has adopted shoreland, floodplain, and wetland ordinances to protect its surface water resources during the subdivision and development planning processes involved with the community's future growth.

## WOODLAND & VEGETATION RESOURCES

The city of Farmington will attempt to preserve wooded areas throughout the city and with respect to future site development, to retain, as far as practicable, substantial existing tree cover. Figure 3.17 identifies forests, woodlands, and other vegetation that currently exist in Farmington. The city will accomplish that goal through placing structures on lots in such a way that maximizes the number of trees to be preserved. New trees planted will be of a variety and trees damaged by natural causes will, however, be allowed to be removed. In 2011 the City Council adopted an ordinance creating additional Woodland and Tree Preservation regulations. These new regulations were in response to a Natural Resources Inventory that was completed in early 2011. The Woodland and Tree regulations apply to new development in all zoning districts (i.e., new building construction, expansion of existing commercial, industrial or institutional buildings and any project that requires a city land disturbance permit). A key component to these regulations is the requirement of a developer to survey all significant trees (those being a minimum six inches in diameter for hardwood deciduous trees and eight inches in diameter for coniferous/evergreen trees) within a development project area. Once the significant trees have been identified the developer is allowed to remove up to 30% of significant trees measured at twelve inch caliper or larger. The city will adhere to the City Code to insure that woodland & tree preservation is accomplished.

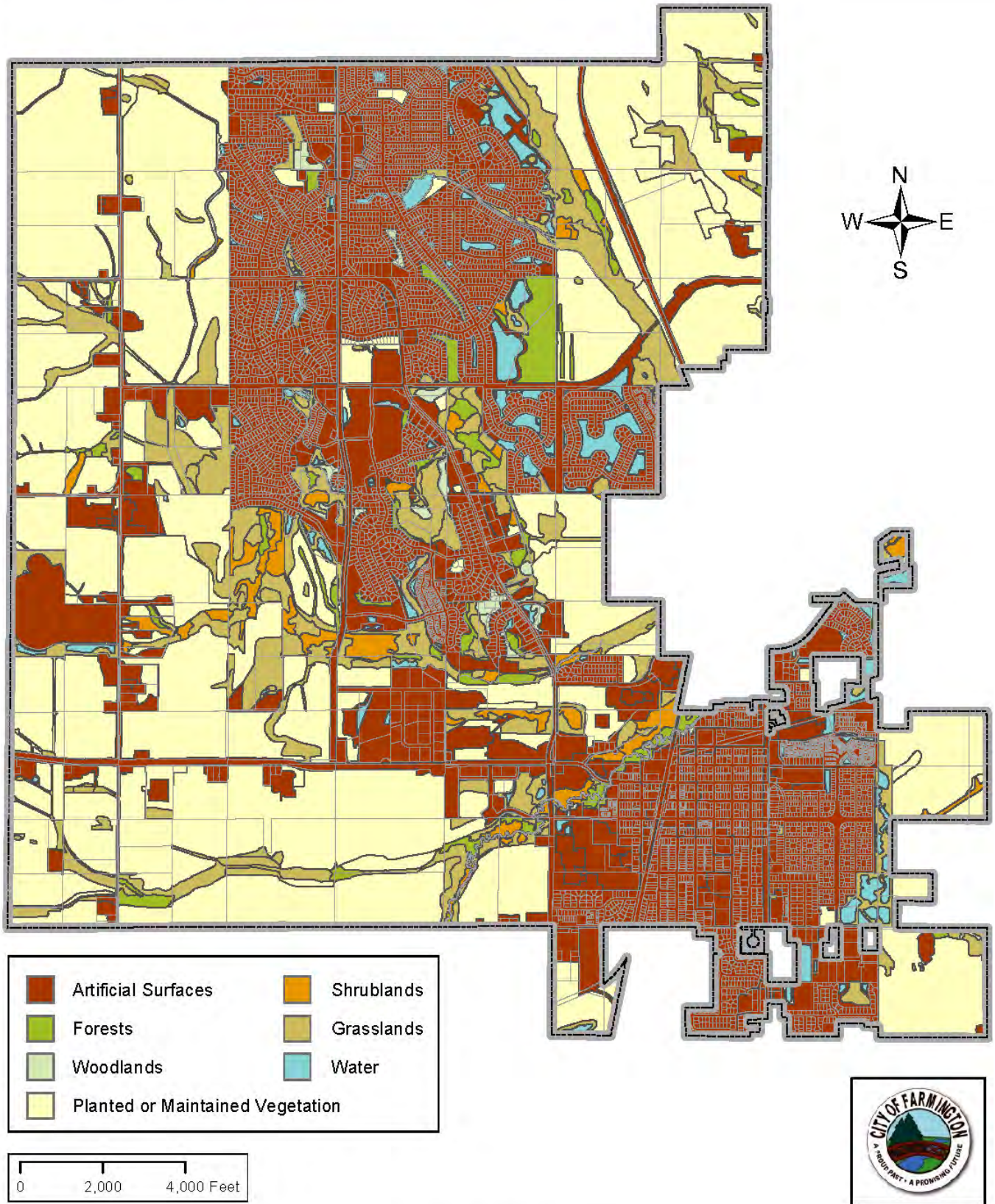
Figure 3.16 Surface Water



Prepared for the Farmington Community Development Department by the Dakota County Office of GIS.

Map dated October 24, 2017.

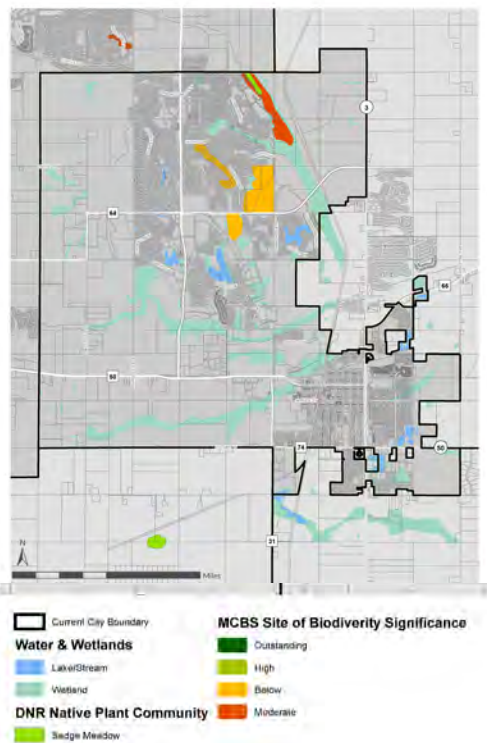
Figure 3.17 Woodland and Vegetation Resources



Prepared for the Farmington Community Development Department by the Dakota County Office of GIS.

Map dated October 26, 2017

**Figure 3.18 Native Plant Communities & Sites of Biodiversity**



## PROTECTION OF ENVIRONMENTAL AREAS

Where land proposed for subdivision is deemed environmentally sensitive by the city, the design of said subdivision shall clearly reflect all necessary measures of protection to ensure against adverse environmental impact.

Based upon the necessity to control and maintain certain sensitive areas, the city shall determine whether said protection will be accomplished through lot enlargement and redesign or dedication of those sensitive areas in the form of outlots.

In general, measures of protection shall include design solutions which allow for construction and grading involving a minimum of alteration to sensitive areas. Where these areas are to be incorporated into lots within the proposed subdivision, the subdivider shall be required to demonstrate that the proposed design will not require construction on slopes over twenty percent (20%), or result in significant alteration to the natural drainage system such that adverse impacts cannot be contained within the plat boundary. Figure 3.17 shows the city's Woodland and Vegetation Resources Inventory identifying artificial surface (developed), forests, woodlands, planted or maintained vegetation, shrublands, grasslands, and water.

## Special Resources

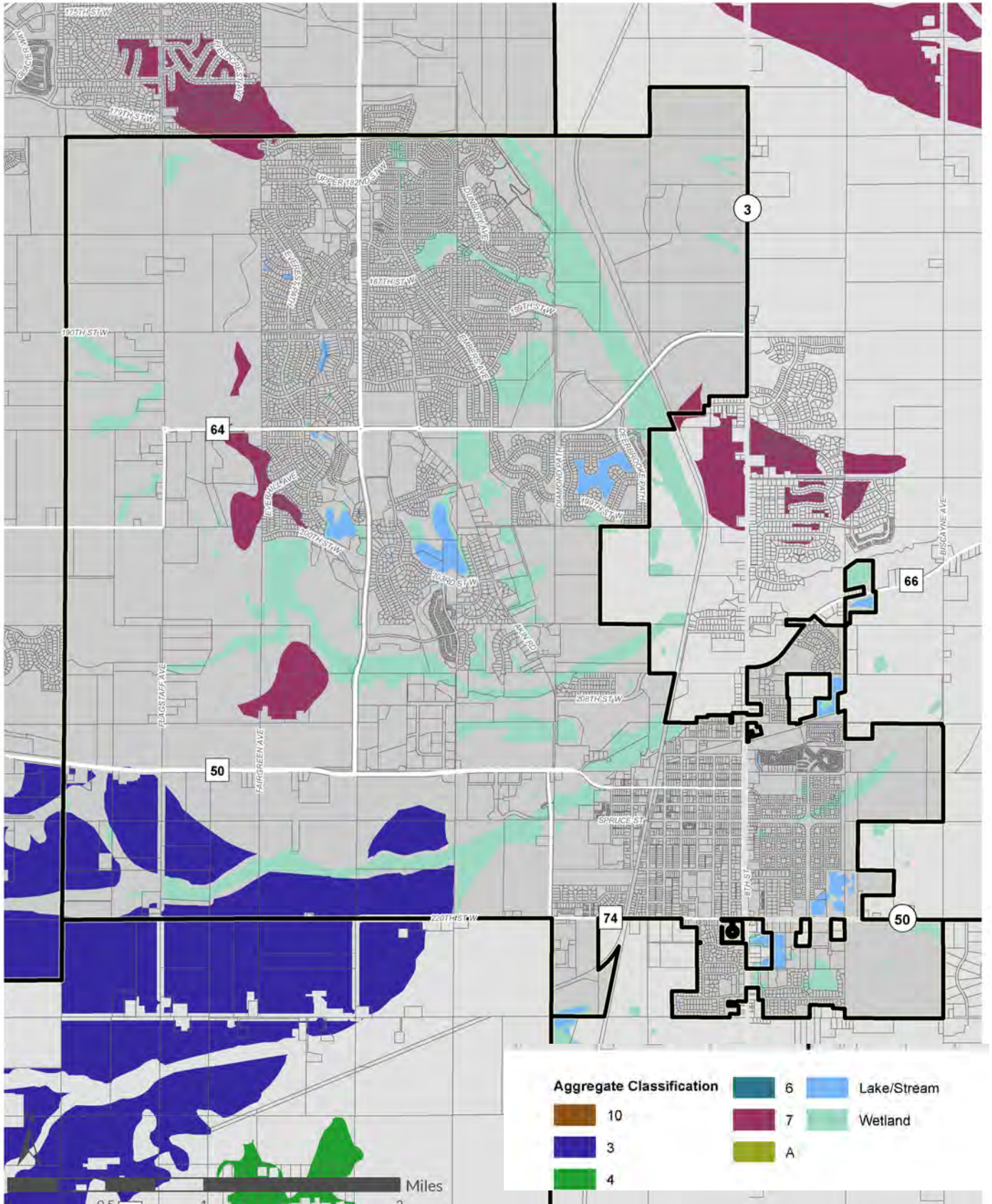
Minnesota Statute Section 473.859 requires that local comprehensive plans address the protection of aggregate resources, access to solar resources, and historic sites.

## AGGREGATE RESOURCES

Aggregate deposits have been identified by the Metropolitan Council as a regional resource to be protected for extraction in support of anticipated regional growth. The Minnesota DNR has mapped a generalized inventory of sand and gravel deposits within the Twin Cities Metropolitan Area. Figure 3.19 illustrates larger concentrations of primary aggregate resources from excellent to good in the southwest corner of the city. While a few gravel pits have existed within the city in the past, there are no active mining pits within the city limits. Extraction of sand and gravel deposits is anticipated to be an ongoing land use within undeveloped areas of the city. This activity must be regulated in a manner so as to be compatible with existing and planned development of the surrounding area and to not negatively impact the natural environment or city infrastructure. New gravel mining operations will be limited to an interim use. The city will also continue to regulate gravel mining through the Extraction and Mining Ordinance included within the City Code. The city utilizes this ordinance to evaluate gravel mining plans and operations in issuing an annual license. These regulations allow the city to proactively mitigate potential land use compatibility issues and negative impacts during the



Figure 3.19 Aggregate Resources



operation. A plan for reclamation of the gravel mine and future land use is also required for approval of a license to ensure that the ultimate plan for the parcel is consistent with the Comprehensive Plan.

## SOLAR RESOURCES

Solar resources protection is addressed in Chapter 8. Sustainability.

## HERITAGE RESOURCES

Preservation of the community's heritage resources is an important local government responsibility, and the time, effort, and financial resources we spend on heritage preservation is a wise community investment. Modest expenditures on research, planning, protective measures, technical assistance, and education can bring multiple benefits to the community, including community character, revitalization, and economic growth.

The primary objectives of the city's heritage resource preservation program are:

- » Preservation of significant historical, architectural, and archaeological resources;
- » Fostering the wise use of Farmington's heritage resources through comprehensive planning and education;
- » Facilitating public participation in preservation planning; and
- » Dissemination of information about Farmington's heritage.

Farmington's heritage preservation program also promotes the goals of the National Historic Preservation Act of 1966, as amended, and the city is an active participant in the federal-state-local government preservation partnership known as the Certified Local Government (CLG) program.

The city's heritage preservation program includes seven basic areas: preservation planning, identification, evaluation, registration, design review, public education and disaster management.

### Preservation Planning

Heritage preservation planning is a dynamic process that organizes preservation activities in a logical sequence and assures that decisions about heritage resources are based on the best possible information. Planning determines when an area needs to be surveyed for heritage resources, whether a particular property is historically significant, and how an individual historic property should be treated.

### Identification

Heritage resources are identified through the process known as survey. Survey activities include planning and background research, field survey (i.e., the physical search for and recording of heritage resources on the ground), organization and presentation of survey data, and the development of a heritage resources inventory (i.e., a compilation of information on individual heritage resources).

## **Evaluation**

Evaluation applies defined criteria of historical, architectural, archeological and cultural significance to determine whether a property is eligible for designation as a Farmington Heritage Landmark. Generally, to be considered significant (and therefore worthy of preservation) a property must meet at least one of the following criteria: (a) association with an important historical event or pattern of events; (b) association with important people; (c) be representative of a style or period of architecture, or the work of an important architect or builder; (d) contain information of value in answering questions important to prehistory or history.

## **Registration**

For preservation purposes, the city council formally recognizes properties of historical and architectural importance through the process called registration. Historic districts, individual buildings, prehistoric and historic archaeological sites, and cemeteries are examples of heritage resource types that can be designated Farmington Heritage Landmarks.

## **Design Review**

The HPC is charged with carrying out the design review provisions contained in Farmington's preservation ordinance, which requires mandatory review of applications for certain types of city permits affecting significant heritage resources. Property owners are required to obtain a Certificate of Appropriateness to demolish or move a historic building, and for new construction that affects heritage resources. The HPC is empowered only to advise property owners on exterior changes, alterations, and other improvements to designated heritage landmarks. Working in conjunction with the Planning Commission, the HPC also reviews development projects involving heritage resources.

## **Public Education**

Preservation planning, identification, evaluation, registration and design review includes public participation to develop informed public involvement in the decision making process. The city actively promotes heritage preservation through education programs, preservation plans, heritage tourism, and publications.

## **Disaster Management**

Because historic buildings and sites can be damaged or destroyed as the result of structure fires, tornadoes, wind storms, lightning, winter storms, floods, hazardous materials spills, and other disasters, the city needs to consider the special problems inherent in disaster response and emergency management situations involving heritage resources.

### Existing Heritage Resources Inventory

The Farmington heritage resources inventory documents properties that have been evaluated as significant as well as those which may not be eligible for landmark designation. To avoid duplication of effort and to minimize confusion in future project planning, the Farmington heritage resources inventory also incorporates the results of heritage resources surveys conducted before the establishment of the city preservation program in 1992, as well as the data on Farmington properties produced by surveys carried out under the auspices of state and federal government agencies.

To facilitate the heritage resources survey effort, the city was subdivided into eighteen heritage preservation planning areas (HPPAs), half of which were urban, half rural, in order to allow for a systematic, cost-effective effort to characterize the preservation potential of different parts of the community. Beginning in 1996, the HPC began a reconnaissance survey of the city, starting with the Downtown HPPA. A survey of the Oak Street HPPA, completed in 1997, was followed by reconnaissance-level studies of the older buildings present in the Main Street HPPA. A reconnaissance of rural heritage resources outside the urban service area was completed in 2003-2004. In 2009, an intensive survey of the city's Feely Farm, Ice House, and Seventh Street heritage preservation planning areas was completed. At the end of 2011, about 10% of the city remained unsurveyed for above-ground heritage resources. However, intensive surveys, which are designed to produce all of the information needed to fully evaluate individual properties and prepare landmark nomination studies, have been carried out at less than half of the estimated two hundred or so buildings within the city limits that are over fifty years old. Surveys for below-ground heritage resources have been limited to a very small area within the Highway 50 and Pilot Knob Road highway corridors, where archaeological surveys were conducted under the auspices of the Minnesota Department of Transportation in the late-1990s.

### Existing Historic Contexts

In 1994-1995, the HPC conducted a study which identified 13 local historic contexts for organizing information about Farmington's heritage resources. One of the products of the historic context study was establishment of heritage resource identification goals and priorities for future heritage resource surveys. While background knowledge of Farmington's historical development indicated that important heritage resources were most likely to be concentrated in particular areas (such as the downtown and older residential neighborhoods), very little survey work had been carried out in the city prior to 1995.

To qualify for designation as a Farmington Heritage Landmark, a heritage resource must be significant, i.e., it must represent a significant aspect of the history, architecture, archaeology, or culture of the city; and the significance of a heritage resource can be evaluated only within its historic context. Historic contexts are those themes or patterns in history by which a specific event, building, or area is understood and its meaning is made clear—the basic premise is, that heritage resources do not occur in a vacuum, but reflect and illustrate larger trends or patterns in local history. The concept of historic context is the cornerstone of the heritage resource preservation planning process.

The local historic contexts are briefly summarized below. These historic context study units have been developed on the basis of historical information obtained through documentary research and heritage resource surveys. The themes, patterns, and resource types described in these historic context study units are unique to Farmington and the surrounding area, but also reflect aspects of the history of the state and region as a whole. (The State Historic Preservation Office has also developed historic contexts as part of its statewide plan for implementing the National Register program in Minnesota; the city's historic context are coordinated with the statewide planning efforts.) Some of the context study units are defined in broad, general terms, while others are more tightly focused on a particular geographical area or group of related heritage resources. Historic contexts are always subject to new interpretations and are continually refined, modified, added to, and elaborated on as new information and interpretations are generated by the ongoing heritage resources survey.

### *Prehistoric American Indians*

Prior to Euroamerican settlement, American Indians had occupied the Farmington area for thousands of years. The plainest evidence that prehistoric people lived in and utilized the natural resources from what is now Minnesota comes from archaeological sites, which indicate that the ancestral American Indians first appeared in the region about 11,500 years ago. Undeveloped lands in Farmington, particularly in the northern and western parts of the city, may contain significant archaeological sites associated with the Paleoindian, Archaic, Woodland, and Oneota cultural traditions. However, relatively little archaeological work has been done in the Farmington area and no significant prehistoric heritage preservation resources have been identified within the city limits.

### *Historic American Indians*

The first European explorers and fur traders appeared in Minnesota about 1650 but more than 150 years passed before they came here to live in significant numbers. Until tribal sovereignty was extinguished

by treaty in 1851, Dakota County was part of the tribal estate of the Mdewakanton Dakota or Sioux nation. Historical accounts suggest prolonged Mdewakanton occupation and utilization of the natural resources of the Vermillion River Valley and there is no reason to believe they were not present within the present-day city limits up until the Dakota War of 1862.

### *Agriculture and Rural Lifeways*

For more than a century, farming was the most important enterprise in Dakota County. As a consequence, the greatest single influence on the development of Farmington between the 1850s and the 1950s was agriculture. The first settlements were made along the Vermillion River in 1854 and by about 1856 a rural community known as Farmington had evolved. But the Panic of 1857, the Dakota War of 1862, and the Civil War slowed local development, and it was not until the late 1860s that Castle Rock and Empire townships began to fill up with farms. Wheat was the chief crop but its importance diminished after about 1880 and by the turn of the century local agriculture had become diversified. The town of Farmington was a transportation nexus and trade center for a prosperous agricultural hinterland, and the accessibility of Twin Cities markets favored the development of agricultural product processing, shipping, and storage. The town also had important merchandising, manufacturing, educational and recreational industries that were heavily dependent upon agriculture and was the home of the county agricultural fair for many years.

### *Town Planning and Development*

No human activity has been more important in shaping the built environment of Farmington than urbanization. Platted in 1864, the general plan of the village was based on a model that had evolved over two centuries in the northeastern United States. Street patterns, lot lines, and the differentiation between commercial and residential areas have their roots in the pre-1950 past and essentially define the suburban landscape that emerged during the late twentieth century. This historic context uses the concept of historic landscape as a means of identifying and interpreting historic urban land use patterns and trends.

### *Commercial Architecture and the Development of Downtown Farmington*

Farmington was founded in 1864 as a trade center and its central place functions developed rapidly. This historic context focuses on the buildings, sites, and streetscapes that give downtown Farmington its defining historic character and sense of place. The architecture of the downtown area reflects regional and local patterns of economic development, changing building styles and construction technologies, and social and cultural change. Individual buildings document the histories of locally significant business, civic and social organizations.

### *Domestic Architecture and the Development of Residential Neighborhoods*

This historic context is focused on social and architectural history themes represented by historic properties found in Farmington's residential districts. Individual houses, outbuildings, and streetscapes document the histories of families, neighborhoods and the community as a whole and give each part of the city its unique sense of time and place. The most important architecture history themes are those represented by well preserved examples of Late Victorian, Eclectic and late nineteenth and early twentieth century vernacular houses.

### *Commercial and Industrial Development*

Functionally, Farmington was the first link between the agricultural hinterland of Dakota County and the world market. Agricultural product processing, storage and shipping were the oldest industries in town, and for a number of years Farmington flourished as a grain market and shipping point. Between 1865 and 1950, the village became a trading and banking center, with commercial activity dominated by small-scale family-owned businesses providing goods and services to rural customers and the villagers themselves. Farmington's manufacturing sector was modest before 1900; twentieth century industries were more diversified. Intensive thematic surveys are planned to identify and evaluate individual stores, shops, mills, and factories.

### *Transportation*

Farmington developed as a transportation nexus and prospered as a shipping point. When settlers came to Dakota County, the most important overland routes were Native American trails. The earliest government roadways were laid out in the 1850s and stimulated inland settlement. Railroads came to Dakota County at a comparatively early date and Farmington itself was originally platted as a railway village. The village was for many years the junction of important north-south and east-west rail lines, part of the Milwaukee Road system. Modern highways signaled the decline of the railroads and produced significant changes in the built environment, especially after World War II.

### *Churches and Other Religious Properties*

Churches of several denominations played an important part in the social history of Farmington. Individual church buildings, parsonages and related structures also represent an important set of architectural landmarks worthy of preservation for their historical, aesthetic, cultural and artistic values.

### *Cemeteries and Burial Grounds*

Cemeteries were also an important aspect of historic landscape architecture. Like the study unit concerning churches, this historic context deals with historic resources not normally eligible for

the National Register of Historic Places, but which may warrant designation as Farmington Heritage Landmarks.

#### *Education, Public and Private*

Schools were closely linked to the growth of Farmington and were both a product and a part of the town's historical development. A rural schoolhouse was built near Farmington in 1862 and the village's public school system was established in 1868. Public and private schools played an important part in the development of Farmington and dominated the civic architecture of the town. Intensive thematic surveys are planned to identify and evaluate individual school buildings.

#### *Tourism, Recreation and Leisure*

While Minnesota had earned a reputation as a summer haven for tourists during the Territorial period, it was not until the gaslight era of the late nineteenth century that tourism, sports and recreation became significant in the lives of small inland towns like Farmington. As the amount of leisure time available to the average person increased, community investment in sports and recreational activities also increased. The automobile further expanded families' recreational opportunities and between about 1900 and 1940 Farmington became something of a minor tourist mecca for both rural and urban folk. Potentially significant historic property types associated with tourism, recreation and leisure include tourist campgrounds, cabins, public halls, theaters, athletic fields and skating rinks, as well as the homes of local sports heroes.

#### *Geographical Features of Historical Interest*

Geology, topography, climate and vegetation form the physical context within which Farmington's historical development has taken place. Landforms, water resources, weather, soil, plants and animals represent the resource base that forms the background against which all aspects of Farmington history are viewed. This historic context embraces the physical geography of Farmington, and as such is an integral part of all other historic contexts. Potential historic resources include springs, red ocher (vermillion) deposits, and preserved specimens of natural vegetation.

#### **Heritage Preservation Regulations**

To preserve and protect Farmington's significant heritage resources, the City Council has enacted Title 2, Chapter 11 of the City Code, which establishes the city's heritage resource preservation regulations.





# 4 ■ HOUSING

## Introduction

Throughout all stages of the 2040 Comprehensive Plan process, residents expressed the sense of pride that they have about their neighborhoods and the community resonated. While there are many characteristics that create great neighborhoods, quality, affordable housing is one of the fundamental elements. As a growing community, Farmington will need to focus on connecting its neighborhoods to amenities, supporting greater variety of housing to meet the needs of people at different parts of life, and to balance housing development with employment opportunities.

## Goals & Policies

### HSG G1. MAINTAIN HIGH-QUALITY HOUSING OPTIONS.

- HSG P1.1 Provide programs to assist home owners and property owners of multi-unit buildings with the maintenance and improvements of their property.
- HSG P1.2 Emphasize design standards and the use of high-quality materials for new development .

### HSG G2. PROVIDE A WIDE VARIETY OF HOUSING TYPES FOR PEOPLE IN ALL STAGES OF LIFE.

- HSG P2.1 Encourage a mixture of housing types and densities within the same neighborhood.
- HSG P2.2 Promote the mixing of types and densities close to schools and other amenities.
- HSG P2.3 Explore ways to allow for more senior-friendly housing opportunities (one-floor living, accessory dwelling units [ADUs], group living, assisted living, etc.).

**HSG G3. HAVE HOUSING THAT IS AFFORDABLE TO ALL RESIDENTS AT ALL STAGES OF LIFE.**

- HSG P3.1 Achieve identified regional allocation of need for affordable housing by planning enough residential areas throughout the city at densities that are high enough to allow for affordable development.
- HSG P3.2 Explore opportunities with agencies and organizations to develop more subsidized affordable housing within the city to meet the housing needs of very low-income residents.
- HSG P3.3 Streamline housing development processes and consider other methods, such as incentive bonuses, to encourage the building of market-rate/unsubsidized affordable housing by private developers.

**HSG G4. ENSURE THAT HOUSING IS LOCATED WITHIN LIVABLE, WELL-CONNECTED NEIGHBORHOODS.**

- HSG P4.1 Build connections between residential neighborhoods and centers of employment, transit access, schools, and commercial nodes.
- HSG P4.2 Emphasize high-quality design of neighborhoods that connect to one another as well as area parks, open space, and trail corridors.

**HSG G5. ENCOURAGE MEASURED RESIDENTIAL GROWTH THAT MEETS PENT-UP REGIONAL DEMAND FOR HOUSING, WHILE ALSO RECOGNIZING THE REGIONAL CONSTRAINTS FOR UNCHECKED GROWTH.**

- HSG P5.1 Develop housing in areas served by infrastructure and phase growth appropriately.
- HSG P5.2 Locate housing in areas that can be well-connected to other city services and amenities.

# Current Housing Conditions

Farmington is a growing community. In 2010, the United States Census indicated the number of housing units within the city was 7,412. Since then, calculations by the Metropolitan Council estimate 7,779 units in 2017, with approximately 400 additional units platted or soon to be platted within the city.

## HOUSING OVER TIME

The average number of housing units built per year was relatively slow until the building boom of the 1990s and 2000s, when a total of 5,131 units were built in the span of twenty years as seen in Table 4.1. Since 2010, construction of new housing units has tapered, as the community continued to feel the ramifications of the Great Recession (2018-2012).

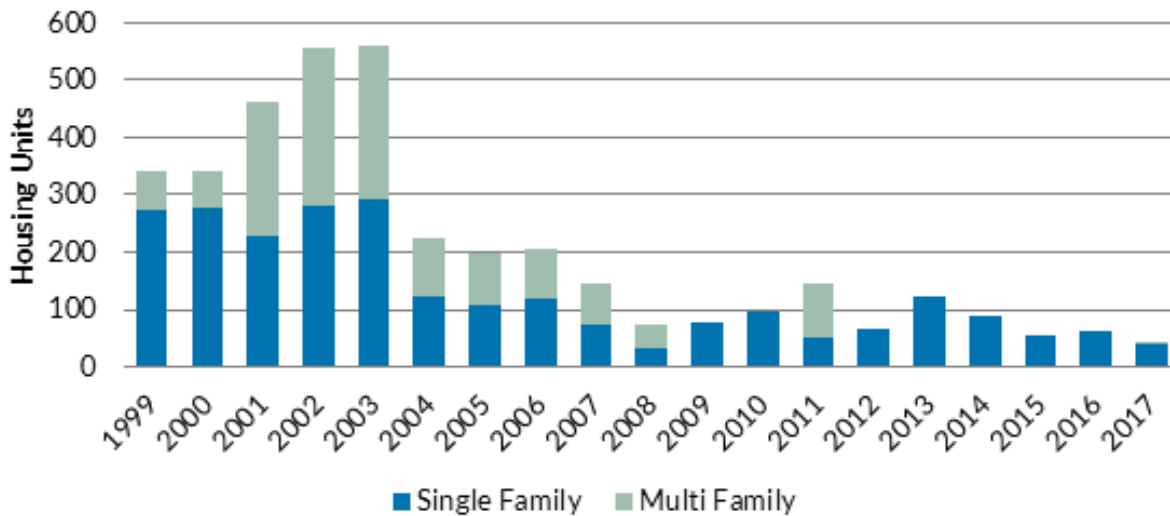
As can be seen in Figure 4.1, Farmington has not seen any new multi-family units (including townhomes) since 2011. Housing construction peaked around 2003; dipping significantly in the years that followed. Since the mid-2000s, single-family homes have been the majority of units built, but still at lower volumes than in the previous decade.

**Table 4.1 Number of Housing Units Built Since 1970**

DECADE	HOUSING UNITS BUILT	AVG. HOUSING UNITS/YEAR
1970-1979	457	46
1980-1989	553	55
1990-1999	2,286	229
2000-2009	2,845	285
2010-2017	675	84

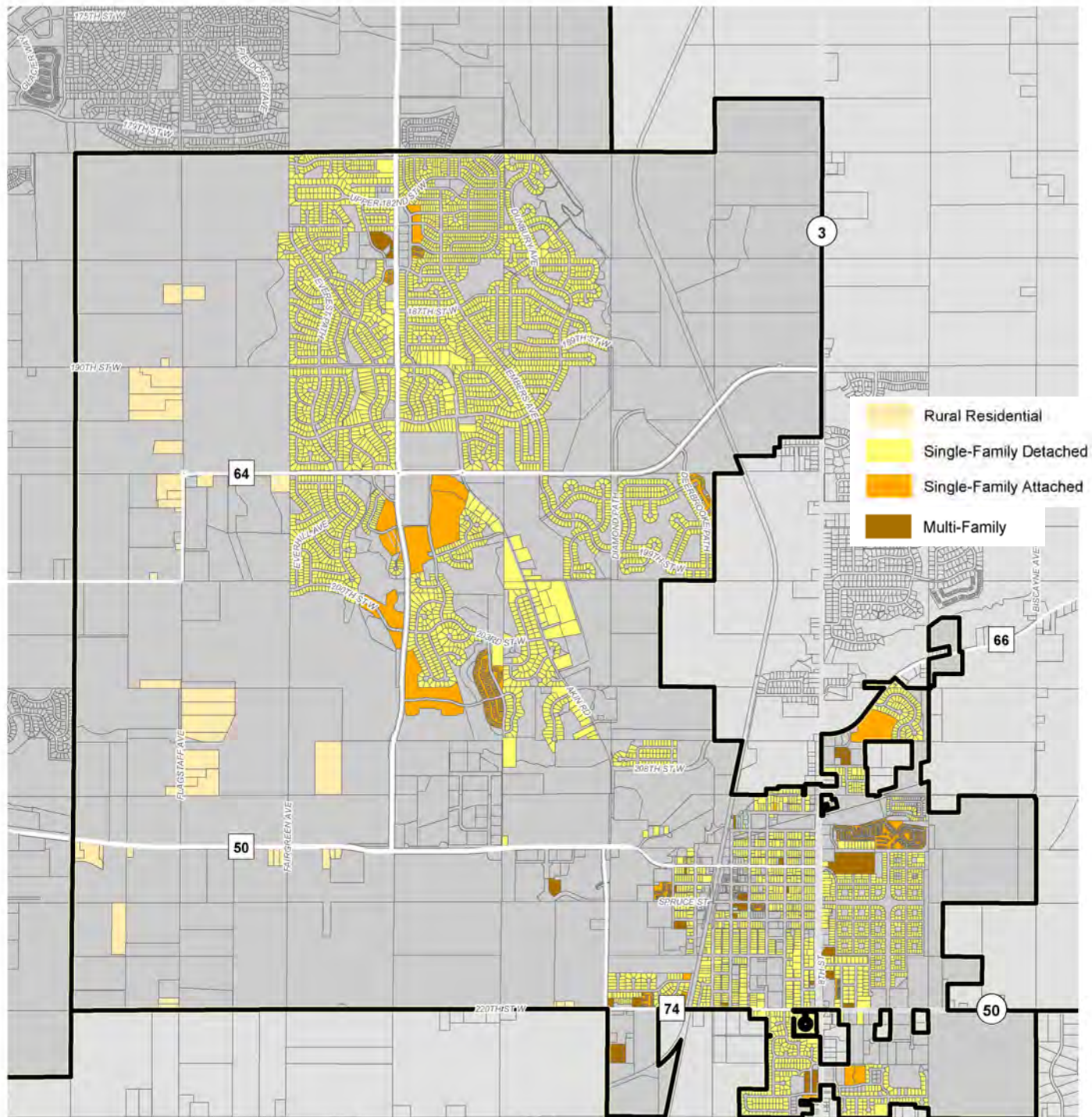
Source: City of Farmington – Building Inspections Division

**Figure 4.1 Housing Building Permits by Year**



Source: City of Farmington - Building Inspections Division

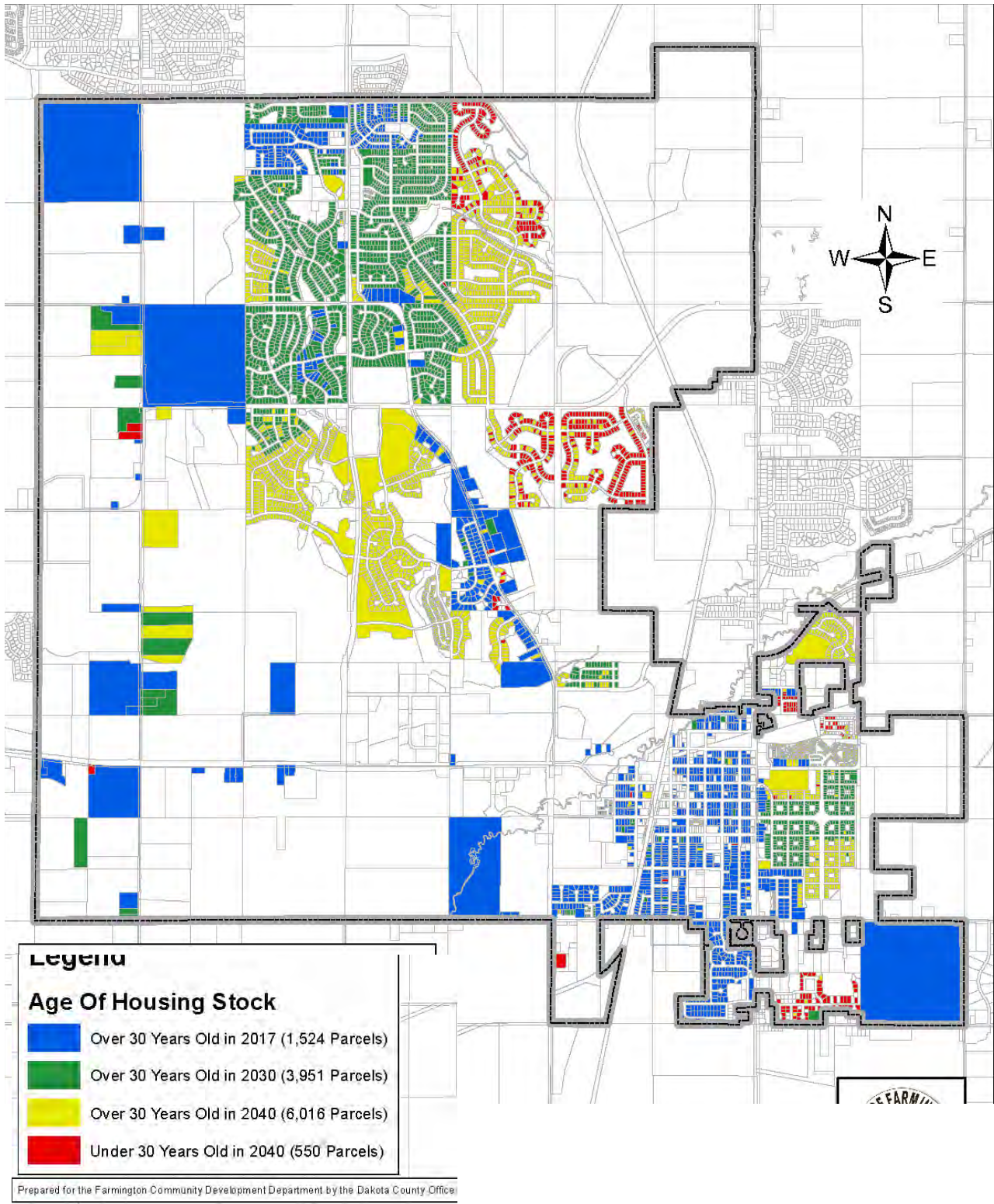
**Figure 4.2 Housing Types in Farmington**



### TYPES OF HOUSING

According to the Metropolitan Council, there are an estimated 5,736 single-family detached units of housing in Farmington, 110 duplexes and twin homes, 1,099 single-family attached units, and 1,025 multi-family units in the city in 2016. Figure 4.2 shows the location of different housing types throughout the city.

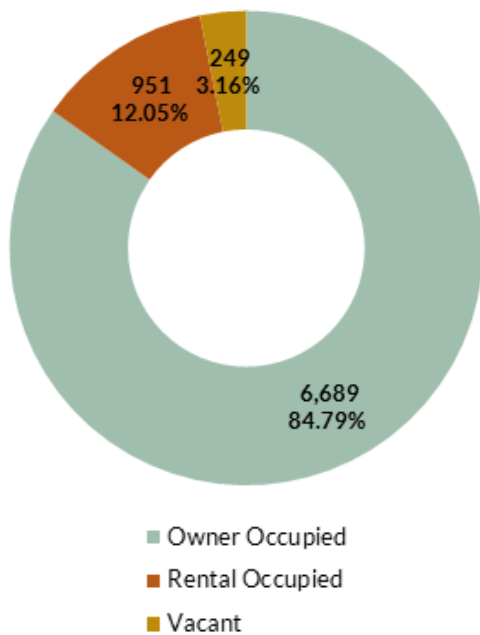
**Figure 4.3 Age of Housing**



## AGE OF HOUSING

Shown as Figure 4.3, Farmington’s historical core is in the southeast corner of the city, near the downtown. The newest residential developments have been developing along Diamond Path on the eastern border of the town.

**Figure 4.4 Units by Tenure Type**



Source: American Community Survey 2011-2015

## TENURE OF HOUSING

According to the 2011-2015 American Community Survey, owner-occupied homes made up 84.79% of the total amount of housing units in the city, leaving 12.05% for renter-occupied housing. There were a total of 249 vacant units at the time as well.

Of the variety of different housing types currently offered in the city, apartment rental units have become increasingly difficult to attain totaling to only 158 units in 2016 as identified in Table 4.2. The overall rental vacancy rate for Farmington in 2016 was 3.55%, down from 3.55% in 2011 and 4.40% in 2008. Notably, this vacancy rate means that there were only five vacant rental units in 2016, at the time of the survey. This inflexibility in the rental market shows the need for more rental units of all types in the city. This trend is reflected in Table 4.3, which shows that rentals are even more rare and expensive in Dakota County as a total. As the city focuses on growth of employment centers such as industrial, business parks, retail, and services, the need for a more flexible rental housing market and affordable workforce housing will be needed.

**Table 4.2 Summary of Farmington’s Rental Data - 2016**

BEDROOMS	0 BR	1 BR	2 BR	3 BR	TOTALS
# OF UNITS	15	65	75	3	158
% OF MARKET	9.49%	41.14%	47.47%	1.90%	100.00%
AVERAGE RENT	\$545.58	\$750.41	\$852.56	\$1,010.48	\$789.76
# OF VACANCY	0	3	2	0	5
VACANCY RATE	0.00%	4.62%	2.67%	0.00%	3.16%

Source: Dakota County Community Development Agency - 2016 Rental Housing Survey

**Table 4.3 Summary of Dakota County Rental Data - 2016**

	0 BR	1 BR	2 BR	3 BR	TOTALS
# OF UNITS	546	7,798	10,659	1,713	20,716
% OF MARKET	2.64%	37.64%	51.45%	8.27%	100.00%
AVERAGE RENT	\$702.98	\$915.87	\$1,185.47	\$1,527.34	\$1,082.67
# OF VACANCY	15	125	219	89	448
VACANCY RATE	2.75%	1.60%	2.05%	5.20%	2.16%

Source: Dakota County Community Development Agency - 2016 Rental Housing Survey

## COST OF HOUSING

The cost of housing is typically the most significant expense in a household’s budget. According to the American Community Survey, the median value for an owner-occupied home in 2015 was \$208,300 and the median household income in Farmington was \$87,925. The median gross monthly rent in 2015 dollars was \$869.

### Estimated Market Value of Residential Properties

Figure 4.5 represents 2016 estimated market values for owner-occupied housing units as presented by the Metropolitan Council. As seen in the graphic, a number of owner-occupied homes in Farmington are \$238,500 or less in value, which is considered the “affordable” threshold for owner-occupied homes. Many of these units are those that are considered “Naturally Occurring Affordable Housing” or NOAH. NOAH are market-rate units, typically older homes on small lots, that are affordable to moderate income (80% Area Median Household Income) households. These affordable homes are found mostly in the southeast older corner of the city, as well as in the neighborhoods east of Pilot Knob Road at the north end of the community.

### Housing Cost Burden

A residence is considered “affordable” when 30% or less of the household’s gross income is spent on housing. If a household spends more than 30% of their gross income on housing, it is experiencing a “Housing Cost Burden”. According to the Metropolitan Council, Farmington has the following breakdown of households experiencing housing cost burden, as seen in Table 4.4.

Another important aspect when looking at housing costs is the total number of households that are cost burdened, and what their tenure looks like. As seen in Table 4.5, 22% of all households in Farmington are housing cost burdened, according to the American Community Survey. In addition, the percentage significantly rises when looking at just renters. 42% of rental households in Farmington experience a housing cost burden; this trend is not unique to Farmington, as reflected in the table, however, tools should be looked at to decrease housing burden for renters.

**Table 4.5 Percent of Households Spending 30% or More on Housing Costs, 2015**

	RENTER OCCUPIED	OWNER OCCUPIED	ALL HOUSEHOLDS
<b>FARMINGTON</b>	42%	19%	22%
<b>DAKOTA COUNTY</b>	46%	21%	27%
<b>TWIN CITIES METROPOLITAN REGION</b>	49%	22%	31%

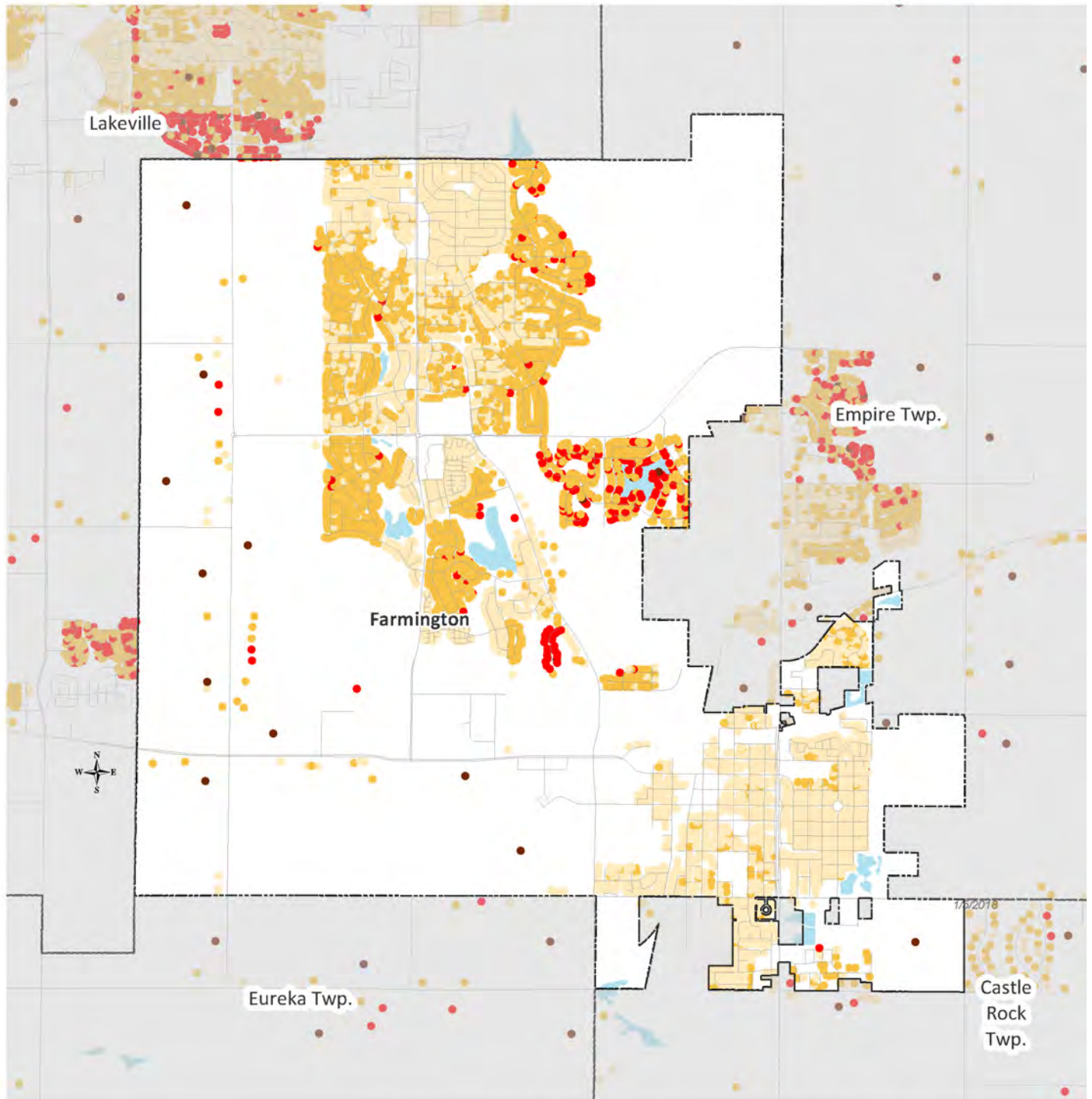
Source: American Community Survey 2011-2015

**Table 4.4 Housing Cost Burdened Households, 2015**

	NUMBER OF HOUSEHOLDS	% OF TOTAL HOUSEHOLDS
<b>INCOME AT OR BELOW 30% OF AMI</b>	335	4.23%
<b>INCOME 31% TO 50% OF AMI</b>	358	4.52%
<b>INCOME 51% TO 80% OF AMI</b>	377	4.26%
<b>SUBTOTAL AT OR BELOW 80% AMI</b>	1,070	13.52%
<b>TOTAL HOUSEHOLDS</b>	7,916	100.00%

Source: Metropolitan Council. Local Planning Handbook 2016

**Figure 4.5 Owner Occupied Housing Estimated Market Value 2016**



- County Boundaries
- City and Township Boundaries
- Streets
- Lakes and Rivers

**Owner-Occupied Housing  
Estimated Market Value, 2016**

- \$243,500 or Less
- \$243,501 to \$350,000
- \$350,001 to \$450,000
- Over \$450,000

1 in = 0.75 miles



Source: MetroGIS Regional Parcel Dataset, 2016 estimated market values for taxes paid in 2017.

Note: Estimated Market Value includes only homesteaded units with a building on the parcel.



## Housing Affordability

As seen in Table 4.6, the city has a limited number of housing units that are considered affordable to very low income households (those households with 30% or less of the Area Median Income [AMI]). Very low income households are the most difficult to find units that are affordable, as they often require public subsidy to house at an affordable threshold. There are a fair number of homes considered in the affordable range for low income households (31% to 50% AMI) and moderate income households (51% to 80% AMI).

**Table 4.6 Affordability of Housing Units to Different Income Levels**

	UNITS AFFORDABLE TO HOUSEHOLDS	% OF TOTAL HOUSING UNITS
<b>INCOME AT OR BELOW 30% OF AMI</b>	168	2.12%
<b>INCOME 31% TO 50% OF AMI</b>	1,706	21.55%
<b>INCOME 51% TO 80% OF AMI</b>	3,372	43.60%
<b>TOTAL HOUSING UNITS</b>	7,916	100.00%

Source: Metropolitan Council. Local Planning Handbook 2016

## Publicly Subsidized Housing

Sometimes the cost of housing is so out of reach for individuals or families that the only way to make a unit affordable is through public subsidy. Table 4.7 shows the number of publicly subsidized units currently in Farmington.

**Table 4.7 Publicly Subsidized Housing Units**

ALL PUBLICLY SUBSIDIZED UNITS	PUBLICLY SUBSIDIZED SENIOR UNITS	PUBLICLY SUBSIDIZED UNITS FOR PEOPLE WITH DISABILITIES	PUBLICLY SUBSIDIZED UNITS: ALL OTHERS
406	84	0	322

Source: Metropolitan Council. Local Planning Handbook 2016

## HOUSING ASSESSMENT

It is important in analyzing the existing housing conditions data to keep in mind the local context. Farmington is a growing city on the outer edge of the Twin Cities region. Thus, the city is a bedroom community with most residents leaving via automobile for employment in other locations.

Farming continues to be a desirable place to live. However, the city recognizes that as more than 74% of its units are single-family residential it is primarily serving the needs of those seeking to live in those types of homes. There is increasing interest from people of all ages for more options, like townhomes or senior living facilities. In addition, most of the city's options for multi-family complexes are more than twenty-five years old and not up to modern standards.

Thus, the city would benefit from the creation of new, market rate apartments, as well as modernization of existing complexes.

As noted with the City's multi-family structures, many of the city's original neighborhoods near downtown have houses that are over 30 years old. While new developments of housing continue to grow in the northern half of the city, rehabilitation and maintenance of these old homes is also a priority. The City continues to be interested in supporting property maintenance and investment to ensure resident health, safety and welfare, as well as thriving neighborhoods.

The amenities that make Farmington an attractive residential community also impact cost. Development of new housing involves expansion of infrastructure and construction costs, all items that add to the cost of housing. While higher density projects are not necessarily less expensive, the diversification of the housing stock will likely include some lower cost options. In addition, the addition of new options may provide existing single-family homeowners an alternative which may free up some other naturally occurring affordable housing options. The City continues to seek opportunities to partner on the creation of affordable housing options. The City recognizes, however, that there may not be many opportunities as due to limited transit and employment options, the City is a more appropriate location for those able to have an automobile.

## **Community Housing Needs**

Through community engagement and analysis of current housing trends, the city has identified the following housing needs:

### **NEED FOR AFFORDABLE HOUSING**

- » Designate areas for higher densities to provide opportunity for affordable housing
- » Work with area agencies on programs to make housing more affordable in the city
- » Address issues of affordability for people at all stages of life

### **NEED FOR A VARIETY OF HOUSING TYPES**

- » Housing that meets the needs of people at all stages of life
- » Allow for more housing types within neighborhoods as well as between neighborhoods
- » Seek out opportunities for single-floor living for seniors
- » Provide greater variety of housing for renters and those seeking low-maintenance/no-maintenance options

### **NEED FOR EMPLOYMENT/HOUSING LINKAGES**

- » Increase affordable housing near employment and transit
- » Locate employment near existing affordable housing
- » Provide linkages by transit and trails and corridors for bicycles and pedestrian access
- » Encourage more workforce housing in a variety of neighborhoods

## NEED FOR MAINTENANCE AND IMPROVEMENT OF EXISTING HOUSING

- » Address concentrations of existing substandard housing
- » Provide maintenance opportunities for older housing, especially older multi-family buildings
- » Deconcentrate areas where multi-family housing is allowed; allow for more housing types within neighborhoods as well as between neighborhoods

## Anticipated Housing Needs

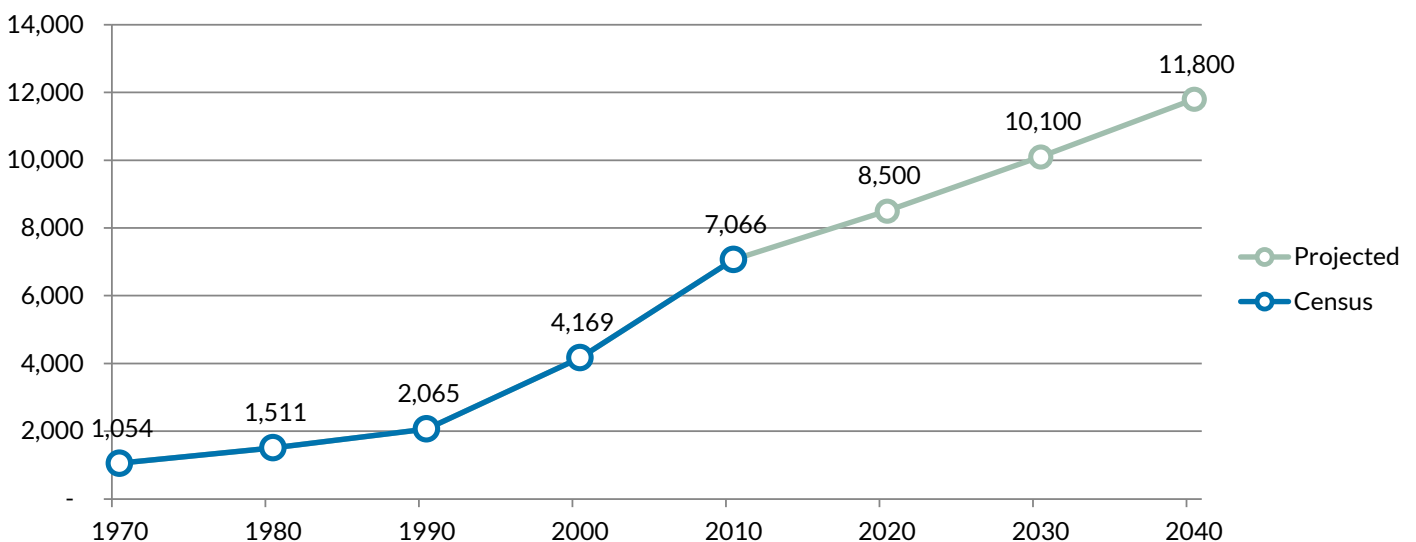
### PROJECTIONS

Figure 4.6 shows the Metropolitan Council’s projected population and household growth for the city of Farmington. The city estimates an additional 4,388 housing units will be added between the years 2010-2040, this is with an assumed average forecasted growth rate between 140 and 150 households constructed per year. The estimated total number of households in 2040 is 11,800. Between 2010 and 2040 it is expected that the number of people per household will grow slightly by 2020, and then decrease after that.

### AFFORDABLE HOUSING ALLOCATION

Through its regional planning efforts, the Metropolitan Council has prioritized housing affordability in the Thrive MSP 2040 Regional Plan. The Metropolitan Council determined the allocation of affordable housing needed to meet the rising need of affordable housing across the Twin Cities metropolitan area. Housing is considered “affordable” when no more than 30 percent of household income goes to housing. As such, households with different income levels have different thresholds of “affordable,” as seen in Table 4.8.

**Figure 4.6** Projected Household Growth



Source: Metropolitan Council, 2015

**Table 4.8 Twin Cities Metropolitan Regional Household Income Levels, 2015**

HOUSEHOLD SIZE	30% AMI*	50% AMI	80% AMI
One-person	\$18,050	\$30,050	\$46,000
Two-person	\$20,600	\$34,350	\$52,600
Three-person	\$23,200	\$38,650	\$59,150
Four-person	\$25,750	\$42,900	\$65,700
Five-person	\$28,440	\$46,350	\$71,000
Six-person	\$32,580	\$49,800	\$76,250
Seven-person	\$36,730	\$53,200	\$81,500
Eight-person	\$40,890	\$56,650	\$86,750

\*Area Median Income

Source: Metropolitan Council. Local Planning Handbook 2016

The Metropolitan Council has selected the four-person household thresholds as a general measurement for affordable housing needs at each income level. This allocation of affordable housing need is calculated based on a variety of factors:

- » Projections of growth of households experiencing housing cost burden
- » Current supply of existing affordable housing, whether subsidized or naturally occurring
- » Disparity of low-wage jobs and housing for low-wage households within a community

Through these calculations, the Metropolitan Council has determined the Affordability Housing Need Allocation for Farmington between now and 2030, as shown in Table 4.9.

**Table 4.9 Affordable Housing Need Allocation 2030**

HOUSEHOLD INCOME LEVEL	UNITS
At or below 30% AMI*	240
31 to 50% AMI	77
51 to 80% AMI	124
<b>TOTAL UNITS</b>	<b>441</b>

Source: Metropolitan Council. Local Planning Handbook 2016

The way that communities accomplish this affordable housing allocation is by designating adequate vacant land or redevelopable land at minimum densities (units/acre) that are high enough for affordable housing to be an option. The more units per acre allowed on a site, the less cost per unit to be built. This makes the development an option for both affordable housing and market-rate developers. The affordable housing allocation does not mean that the city must force the building of this many affordable units by 2030. Rather,

through future land use guidance, the city needs to ensure that the opportunity for affordable housing exists by having adequate vacant or redeveloped land guided for higher densities to meet the stated share.

In order to determine if Farmington can achieve the calculated number of units, the Farmington residential future land use designations that count towards Affordable Housing Allocation Need must be determined. According to the Metropolitan Council, any residential future land use designation that has a minimum density of six units per acre or more can count towards affordable housing allocation calculations for AMI 51%-80%; future land uses with minimum densities 12 units per acre or higher may count towards allocation for AMI at or below 50%. Table 4.10 features all residential future land use designations for Farmington and their minimum units per acre.

**Table 4.10 Farmington FLU Designations for Affordable Allocation**

FUTURE LAND USE	MIN. UNITS / ACRE	QUALIFY?
Low Density	1.0	No
Low Medium	3.5	No
Medium Density	6.0	<b>YES – 51%-80% AMI</b>
High Density	12.0	<b>YES</b>
Mixed-Use (Commercial/ Residential)	6.0	<b>YES – 51%-80% AMI</b>

Source: HKGi, City of Farmington, Metropolitan Council

Vacant or redevelopable land designated as Medium Density Residential, High Density Residential, or Mixed-Use (Commercial/ Residential) that is phased to be developed between 2021 -2030 may count toward affordable housing allocation calculations.

As seen in Table 4.11, the net developable or redevelopable acres of each applicable land use have been multiplied by the minimum units per acre to determine the minimum number of units that could be developed on this available land. Mixed-Use only requires a proportion of their developable lands to be residential, so those percentages apply to the unit count for this calculation.

**Table 4.11 Farmington Development Potential for Affordable Allocation**

FUTURE LAND USE	ACRES (NET) 2021-2030	MINIMUM UNITS PER ACRE	MINIMUM % RES.	UNITS	AFFORDABILITY LEVEL
<b>MEDIUM DENSITY</b>	44.67	6.0	100%	268	51%-80% AMI
<b>HIGH DENSITY</b>	28.10	12.0	100%	337	50% AMI and Below
<b>MIXED-USE (COMMERCIAL/ RESIDENTIAL)</b>	81.36	6.0	50%	244	51%-80% AMI
<b>TOTAL</b>	154.13			849	

Source: HKGi, City of Farmington, Metropolitan Council

As seen in Table 4.12 with the available vacant land within areas designated as Medium Density Residential, High Density Residential, or Mixed-Use (Commercial/Residential), Farmington is more than able to meet its allocation of affordable housing need.

**Table 4.12 Farmington Units Allocated by Affordability Level 2030**

HOUSEHOLD INCOME LEVEL	UNITS REQUIRED	UNITS ALLOCATED
At or below 30% AMI*	317	337
31 to 50% AMI		
51 to 80% AMI	124	512
<b>TOTAL UNITS</b>	<b>441</b>	<b>849</b>

Source: HKGI, City of Farmington

## Housing Implementation

Table 4.13 outlines tools that can be utilized by the city, residents, developers, and financiers to meet the identified housing needs in Farmington. The City plans to continue their relationship with Dakota County Community Development Agency and does not foresee the need to create their own HRA to meet their housing needs. The table identifies each widely-available tool/action, when it would be considered, and what housing need(s) it addresses.

**For purposes of this plan, the following terms refer to specific bands of household income:**

- » **Very-low income: 30% Area Median Income (AMI) and below**
- » **Low income: 31% - 50% AMI**
- » **Moderate Income: 51% - 80% AMI**

**Table 4.13 Housing Implementation Tools**

TOOL	DESCRIPTION	CIRCUMSTANCES & SEQUENCE OF USE	HOUSING NEED
Community Development Block Grants (CDBG)	<p>CDA administers CDBG program on behalf of Dakota County. Funding is split between Municipalities (75 percent) and Countywide Activities (25 percent). These county-wide programs include:</p> <ul style="list-style-type: none"> <li>» Homeowner well-sealing program</li> <li>» Septic system repair</li> <li>» Fair housing activities</li> </ul> <p>CDBG funding can be used for programs under the following categories:</p> <ul style="list-style-type: none"> <li>» Safety/Blight hazard removal</li> <li>» Public service (Senior, Youth)</li> <li>» Public facility improvement</li> <li>» Direct homeownership assistance</li> <li>» Rehabilitation (housing)</li> </ul>	<p>Following HUD's schedule of annual CDBG allocations, the city will continue to reserve a large portion of our CDBG allocation each year to continue our home rehabilitation loans and grant programs for low- and moderate-income homeowners. Historically this percentage has been approximately 50% that has fluctuated based on the amount of funding actually received.</p>	<ul style="list-style-type: none"> <li>» Need for Maintenance and Improvement of Existing Housing</li> <li>» Need for Affordable Housing</li> </ul>
HOME – Home Investment Partnership Program	<p>CDA administers the HOME program for Dakota County. They allocate funding from a consortium with Anoka, Ramsey, Washington, and Dakota Counties as well as the Cities of Coon Rapids and Woodbury. Funds are used to develop affordable medium and high density housing development. Eligible activities under HOME include new construction of affordable units, rehabilitation of owner and rental properties, homebuyer assistance, rent assistance and acquisition.</p>	<p>The city will continue to support the CDA's efforts for the procurement and spending of HOME funds to provide rental assistance to very-low, low, and moderate income households.</p>	<ul style="list-style-type: none"> <li>» Need for Variety of Housing Types</li> <li>» Need for Affordable Housing</li> <li>» Need for Maintenance and Improvement of Existing Housing</li> </ul>
Home Improvement Loan Program	<p>Administered through CDA utilizing CDBG and MHFA funds to provide rehabilitation loans to low- and moderate-income homeowners for projects ranging from:</p> <ul style="list-style-type: none"> <li>» Window replacement</li> <li>» Roofing and siding replacement</li> <li>» HVAC updates</li> <li>» Kitchen or bathroom remodels</li> </ul>	<p>The city will continue to allocate CDBG funds and to refer those that may benefit from said programs to the CDA.</p>	<ul style="list-style-type: none"> <li>» Need for Maintenance and Improvement of Existing Housing</li> </ul>
MHFA Rehabilitation Loan Program	<p>CDA administers Minnesota Housing Finance Agency loan funds through their Home Improvement Loan Program (above). MHFA Rehabilitation Loan Program funds are specifically meant to serve very low-income homeowners at or below 30 percent AMI.</p>	<p>The city will support, through its partnership with the CDA, the application of funds through the MHFA, to provide very low-income homeowners with these funds</p>	<ul style="list-style-type: none"> <li>» Need for Maintenance and Improvement of Existing Housing</li> </ul>
Weatherization/Weatherization Plus	<p>CDA program utilizing funding from federal low-income Weatherization Assistance Program (WAP), providing weatherization services to homeowners and renters.</p>	<p>The city will continue to refer those that may benefit from said programs to the CDA.</p>	<ul style="list-style-type: none"> <li>» Need for Maintenance and Improvement of Existing Housing</li> </ul>

TOOL	DESCRIPTION	CIRCUMSTANCES & SEQUENCE OF USE	HOUSING NEED
Energy Assistance Program	CDA partners with Scott-Carver-Dakota County CAP Agency and provides grants to help income qualified homeowners pay their heating bills	The city will continue to refer those that may benefit from said programs to the CDA.	» Need for Maintenance and Improvement of Existing Housing
Housing Counseling	CDA provides free one-on-one sessions as well as in-depth classes for a fee regarding a variety of topics for homeownership and financing. » Homebuyer counseling » Homebuyer education » Refinance counseling » Foreclosure counseling	The city will continue to refer those that may benefit from said programs to the CDA.	» Tool to address multiple housing needs and improve our housing strategy capacity in general
First Time Homebuyers Program	CDA provides low-interest mortgage financing for first time-homeowners.	The city will continue to refer those that may benefit from said programs to the CDA.	» Need for Variety of Housing Types » Need for Affordable Housing
Downpayment & Closing Cost Assistance Program	CDA program designed to help the first time homebuyer with the initial costs of owning a home. The CDA offers two types of downpayment and closing cost assistance. These options are a 4% grant and zero interest deferred loans up to \$10,000	The city will continue to refer those that may benefit from said programs to the CDA.	» Need for Variety of Housing Types » Need for Affordable Housing
Family Housing Partnership Program	The CDA program forms public-private limited partnerships to syndicate low income housing tax credits and to raise the equity from the private sector through the financing of below market loans and grants.	The city will continue to refer those that may benefit from said programs to the CDA.	» Need for Affordable Housing
Family Townhome Program	CDA program designed for moderate-income families with children under the age of 18 years. Applicants must meet eligibility requirements prior to becoming a resident of the program. This includes meeting program income guidelines, providing good landlords and credit references and passing a criminal history check.	The city will continue to refer those that may benefit from said programs to the CDA.	» Need for Variety of Housing Types » Need for Affordable Housing
Senior Housing Program	The CDA has partnered with Dakota County to develop and construct affordable senior housing throughout the county.	The city will continue to work with the CDA to assist in finding appropriate sites for affordable housing.	» Need for Affordable Housing
Max 200 Short Term Rent Assistance Program	CDA program that is a locally funded rent assistance program for seniors age 55+ in Dakota County	The city will continue to refer those that may benefit from said programs to the CDA.	» Need for Affordable Housing
Workforce Housing Program	The CDA partners with private corporations to fund the construction of workforce housing for moderate-income families. These developments often utilize low income housing tax credits in their financing as well.	The city will continue to work with the CDA to assist in finding appropriate sites for affordable housing.	» Need for Affordable Housing » Need for Employment / Housing Linkages



TOOL	DESCRIPTION	CIRCUMSTANCES & SEQUENCE OF USE	HOUSING NEED
HOPE (Housing Opportunities Enhancement) Program	CDA and Dakota County program to provide gap-financing for the acquisition, new construction, and preservation of affordable housing – both rental and ownership. HOPE assisted units are rental units affordable to households at or below 50 percent AMI, or homeownership units affordable to households at or below 80 percent AMI	The city will continue to support the CDA in its HOPE funding program to provide options for rental units affordable to households at or below 50 percent AMI, or homeownership units affordable to households at or below 80 percent AMI	» Need for Affordable Housing
Low-Income Housing Tax Credits	CDA allocates Minnesota housing tax credits to housing developers for projects that have subsidized units. The CDA has also been a developer of units that utilize low-income housing tax credits.	The city will continue to support the CDA in its Low-Income Housing Tax Credit projects. The city will also work with Dakota County, advocacy organizations, and property owners to explore opportunities to preserve properties currently under low-income tax credit programs	» Need for Affordable Housing
Housing Improvement Areas (HIA)	CDA program to provide homeowners associations loan funding to make improvements to common areas within their subdivisions. The City has an adopted HIA policy.	The city will review and approve HIA applications consistent with adopted policies and funding availability	» Need for Maintenance and Improvement of Existing Housing
Tax Increment Financing (TIF)	State Statutes allow for the use of TIF for affordable housing. The Dakota County CDA administers the existing affordable housing TIF districts located in the city.	The city will continue to work with the CDA in securing a broad range of funding sources to advance affordable housing in the city, placing priority on projects that provide housing units affordable to very-low, low, and moderate income households	» Need for Variety of Housing Types » Need for Affordable Housing
Tax Abatement	State Statutes allow for the City to abate city portion of property taxes for various purposes including affordable housing.	The city does not plan on using Tax Abatement for residential development	
Housing Bonds	Housing Bond financing is a tool that can provide direct financing or indirect conduit financing support. The City is not a direct financier of housing projects and relies on the CDA to finance public affordable housing programs in the City. The City from time to time may engage in conduit financing for affordable housing projects.	The city will continue to work with the CDA to identify a variety of housing funding options on a project specific basis. Further the city will consider issuing municipal bonds on a case by case basis that meet the overall goals and objectives of the city, placing priority on projects that provide housing units affordable to very-low, low, and moderate income households	» Need for Affordable Housing
Scattered Site Public Housing Program	The “scattered site” concept disperses and integrates affordable rental housing in neighborhoods throughout Dakota County	The city will utilize the goals and policies of the Land Use Plan and the Housing Plan to assist Dakota County CDA in identifying areas throughout the city for affordable rental housing potential	» Need for Variety of Housing Types » Need for Affordable Housing

TOOL	DESCRIPTION	CIRCUMSTANCES & SEQUENCE OF USE	HOUSING NEED
Home Remodeling Grants	Dakota County CDA grant which provides up to \$4,500 to assist low-to-moderate single-family homeowners in bringing their homes up to code.	The city will continue to support CDA affordable housing tools.	» Need for Variety of Housing Types
Twin Cities Land Bank	Land Bank is a Twin Cities-based organization specializing in land acquisition, development and preservation, as well as real estate financing and brokering.	The city does not plan on becoming an active partner with the Land Bank for development	
Tax Base Revitalization Account (TBRA)	Program through the Livable Communities Act promoting brownfield redevelopment, job creation, and affordable housing with linked to existing transit.	The city will apply for grant funding as qualified projects arise that provide housing units affordable to very-low, low, and moderate income households	» Need for Variety of Housing Types
Livable Communities Demonstration Account (LCDA)	Program through the Livable Communities Act promoting development/redevelopment to create efficient and connected jobs housing, and services.	The city would strongly consider an application to Livable Community Account programs for residential proposals that provide units that are affordable to very low-, low-, or moderate-income households, especially if those projects meet other Housing Goals	» Need for Variety of Housing Types » Need for Affordable Housing » Need for Employment / Housing Linkages
Local Housing Incentives Account (LHIA)	Program through the Livable Communities Act to preserve and create affordable housing.	The city would strongly consider supporting/ sponsoring an application to Livable Community Account programs for residential proposals that provide units that are affordable to very low-, low-, or moderate-income households.	» Need for Affordable Housing
Rental Licensing Program	The City does not currently have a rental licensing program.	The Council is not looking to pursue such a program.	
Inclusionary Housing Ordinances	State Statutes that allow for cities to adopt an ordinance requiring developers to provide for a certain number of affordable housing units under certain circumstances.	The city is not looking to implement an inclusionary housing ordinance at this time	
Habitat for Humanity	The City partners with organizations such as Twin Cities Habitat for Humanity and others to provide affordable home ownership opportunities in Farmington.	The city will continue to advise of potential sites for Habitat for Humanity homes.	» Need for Affordable Housing
Site Assembly	A City can proactively purchase small individual parcels in an area designated for redevelopment to assemble	The city does not plan on actively assembling sites for residential development at this time	
Guiding land at densities that support affordable housing	Medium and High densities are deemed to provide more opportunities for future affordable housing.	See our future land use plan and projected housing needs section of the housing chapter of this comprehensive plan	» Tool to address multiple housing needs and improve our housing strategy capacity in general

TOOL	DESCRIPTION	CIRCUMSTANCES & SEQUENCE OF USE	HOUSING NEED
Fair Housing Policy	Fair housing policy is a means to identify how the City will advance Federal Fair housing requirements.	The city will be adopting a Fair Housing Policy by 2019	» Tool to address multiple housing needs and improve our housing strategy capacity in general
Zoning and Subdivision Ordinances	Adopted ordinances are the way the city implements the Comprehensive Plan	The city will continue to review our zoning and subdivision ordinances on an annual basis to identify any regulations that inhibit the housing priorities in this plan.	» Tool to address multiple housing needs and improve our housing strategy capacity in general
Referrals	The city is often the entity that residents first look to for resources. It is important for the city to not only be able to provide information on city programs, but also programs available from other entities, such as Dakota County CDA	The city will review reference procedures and training for applicable staff on an annual basis to maintain our ability to refer our residents to any applicable housing programs outside the scope of our local services.	» Tool addresses multiple housing needs and improve our housing strategy capacity in general
Community Land Trust	A community land trust model can create and preserve affordable homeownership opportunities	The City would explore opportunities to collaborate with a community land trust to support affordable housing options for very-low, low, and moderate income households for any type of housing density.	» Need for Affordable Housing
NOAH Impact Fund	Program through the Greater Minnesota Housing Fund to preserve naturally occurring affordable housing (NOAH)	The City will explore opportunities with the Minnesota Housing Fund on the use of NOAH Impact Funds to finance the acquisition and preservation of naturally occurring affordable housing.	» Need for Affordable Housing
Local 4d Tax Incentives	A possible program where cities help apartment building owners obtain property tax reductions if they agree to keep a certain percentage of their rental units affordable	The City will evaluate the appropriateness of a local 4d tax incentive policy.	» Need for Affordable Housing
Consolidated RFP through the MHFA	Process through Minnesota Housing provides a means of “one stop shopping” by consolidating and coordinating multiple housing resources into one multifamily application process	The City would strongly consider supporting/ sponsoring an application to the Consolidated RFP programs through MHFA for residential project proposals in areas guided for high density residential and mixed use (commercial/residential), prioritizing projects that provide units that are affordable to very low-, low-, or moderate-income households.	» Need for Variety of Housing Types » Need for Affordable Housing
Participation in Housing Related Organizations: Regional Council of Mayors	A group facilitated through Urban Land Institute (ULI) Minnesota as an opportunity for mayors within the Twin Cities Metropolitan Regional to collaborate	The Mayor of Farmington may participate or designate an appropriate representative to actively engage in the Council of Mayors Group.	» Tool to address multiple housing needs and improve our housing strategy capacity in general

Source: HKGi, City of Farmington, Metropolitan Council

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# 5 ■ TRANSPORTATION

## Introduction

### BACKGROUND AND PURPOSE

The original thoroughfare plan for the City of Farmington was developed in 1982 and updated in 1990. In 2000, the City prepared a Transportation Plan as part of its 2020 Comprehensive Plan, and in 2009 and 2011, the Transportation Plan was updated as part of the 2030 Comprehensive Plan for the City. This chapter provides the 2040 update of Farmington's Transportation Plan, and has been prepared consistently with Metropolitan Council requirements as outlined in its Local Planning Handbook. It is a summarized version of the City's full 2040 Transportation Plan.

There are three primary objectives of the full Transportation Plan and this chapter:

- » To provide guidance for City staff and elected officials regarding the implementation of effective and appropriate transportation facilities and systems over the planning horizon.
- » To give local citizens and businesses background on transportation issues and allow them to be better informed regarding the City's decision-making on these issues.
- » To communicate to other government agencies Farmington's perspectives and intentions regarding transportation planning issues.

The preparation of this document as part of the City's overall 2040 Comprehensive Plan Update process also has provided stakeholders with the opportunity to have input into the City's transportation planning process.

## TRANSPORTATION GOALS AND OBJECTIVES

The overarching policy goals that will guide further development of the City's transportation system are to:

- » Provide a transportation system that is integrated with City land use and development plans, that preserves City historical resources, and conserves and, where possible, enhances environmental features and resources.
- » Provide a system which supports the efficient and effective movement of people and goods in a comprehensive yet cost-effective manner.

To realize these goals, the City will address more focused objectives as summarized below:

- » In a thorough and systematic manner, consider the impacts of transportation improvements on economic development, land use, environmental resources, and social, historical, and cultural resources.
- » Promote transportation alternatives ensuring that non-motorized, transit, and motorized travel needs are met in a balanced manner consistent with community values and preferences.
- » Facilitate an appropriate level of mobility for persons and goods within and through the City by providing effective connections to the regional transportation network.
- » Provide a roadway system which is consistent with the principals of functional classification and access management, thus helping ensure that roads are planned and designed in an integrated and efficient manner.
- » Provide sufficient capacity in the transportation system to accommodate existing and future travel demand, thus limiting the potential for congestion and safety concerns.
- » Improve the transportation system in a cost-feasible manner, in which each expenditure satisfies a clearly defined public transportation priority.
- » Enlist and encourage private sector participation in meeting the travel needs of the City's citizens and businesses.
- » Ensure that applicable professional/engineering standards are met in the planning and design of transportation improvements.

# Existing Roadway Conditions and Context

## EXISTING TRAFFIC VOLUMES

The most basic characteristic of a given roadway is the volume of traffic that it carries. Existing traffic volumes on roadways within Farmington are provided on Figure 5.1. This includes heavy commercial traffic.

## CRASH DATA AND EVALUATION

### Data Summary

Public safety responsibility of the roadway system in Farmington is shared by the City, Dakota County, and the Minnesota Department of Transportation (MnDOT). Crash data for the most recent available five-year time period from January 1, 2011, through December 31, 2015, are presented in Figure 5.2 (sheets A through D). These data were analyzed to determine where current safety issues are located. A five-year period of time was used for this analysis to allow for a crash frequency pattern that is based on the current intersection configuration, except as identified below. Locations with the highest crash frequency are detailed below.

High crash frequency signalized intersections:

- » County State Aid Highway (CSAH) 50 (212th St) at Akin Rd/CSAH 31 (Denmark Ave)
- » CSAH 50 (212th St) at CSAH 31 (Pilot Knob Rd)
- » CSAH 50 (Elm St) at 3rd St
- » TH 3 (Chippendale Ave) at CSAH 50 (Elm St)/9th St

All of these intersections are located along the CSAH 50 corridor. While these signalized intersections have a high number of crashes, this may not necessarily indicate a crash issue. The intersection crash rate was also reviewed to determine if the crash rate is outside of the normal expected range based on similar types of intersections throughout the state. Based on the crash rates, none of the signalized intersections are experiencing crash rates outside of the expected normal range and do not appear to be a crash concern in need of immediate attention. Consistent with regional statistics, signalized intersections generally have a higher crash rate than unsignalized intersections.

High crash frequency unsignalized intersections:

- » CSAH 50 (212th St) at Flagstaff Ave
- » CSAH 31 (Pilot Knob Rd) at 180th St
- » CSAH 31 (Pilot Knob Rd) at Euclid Path
- » CSAH 31 (Pilot Knob Rd) at Akin Rd
- » TH 3 (Chippendale Ave) at Willow St
- » CR 64 (195th St) at Everest Path

Figure 5.1 Existing Traffic

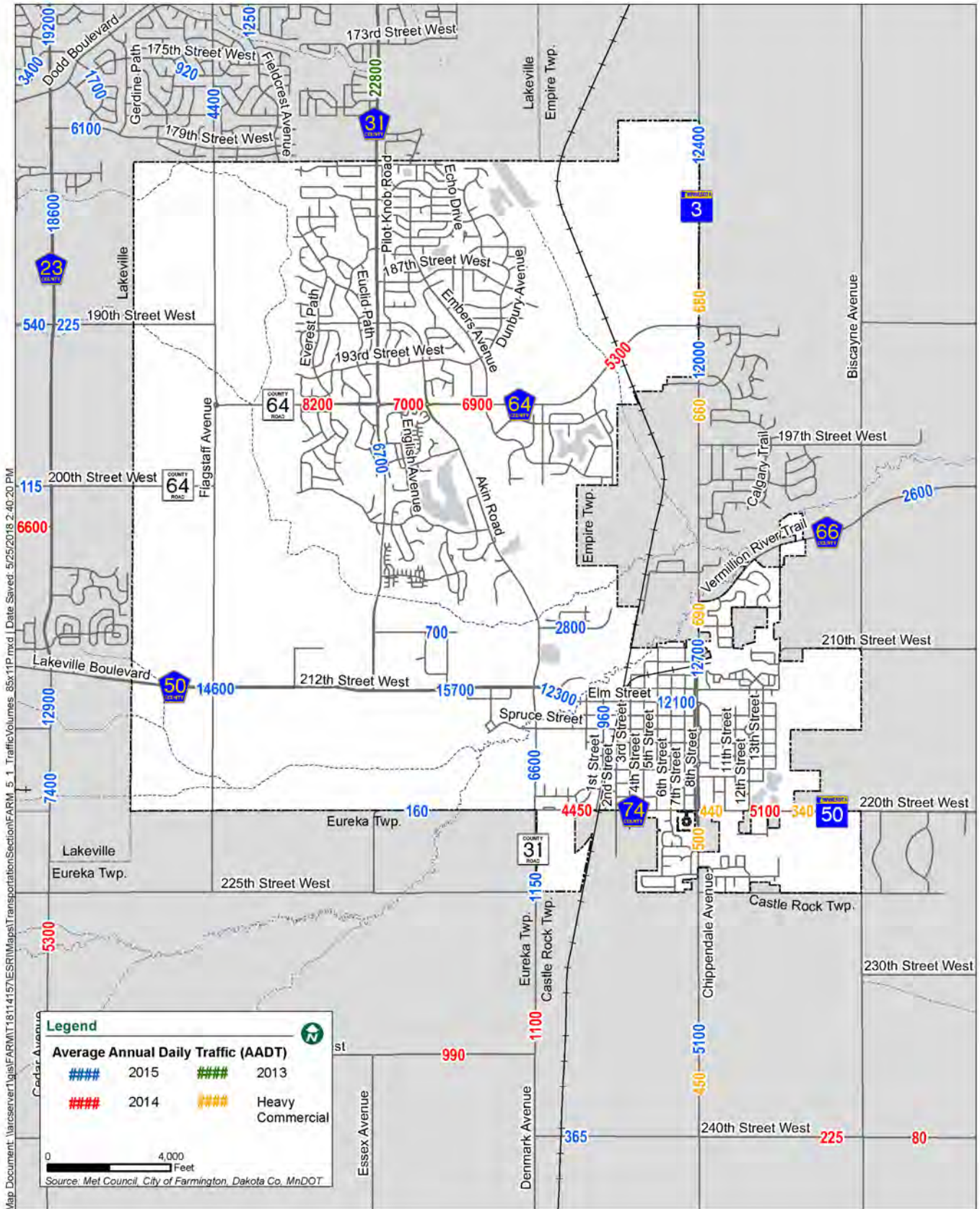




Figure 5.2 Crash Information (Overview)

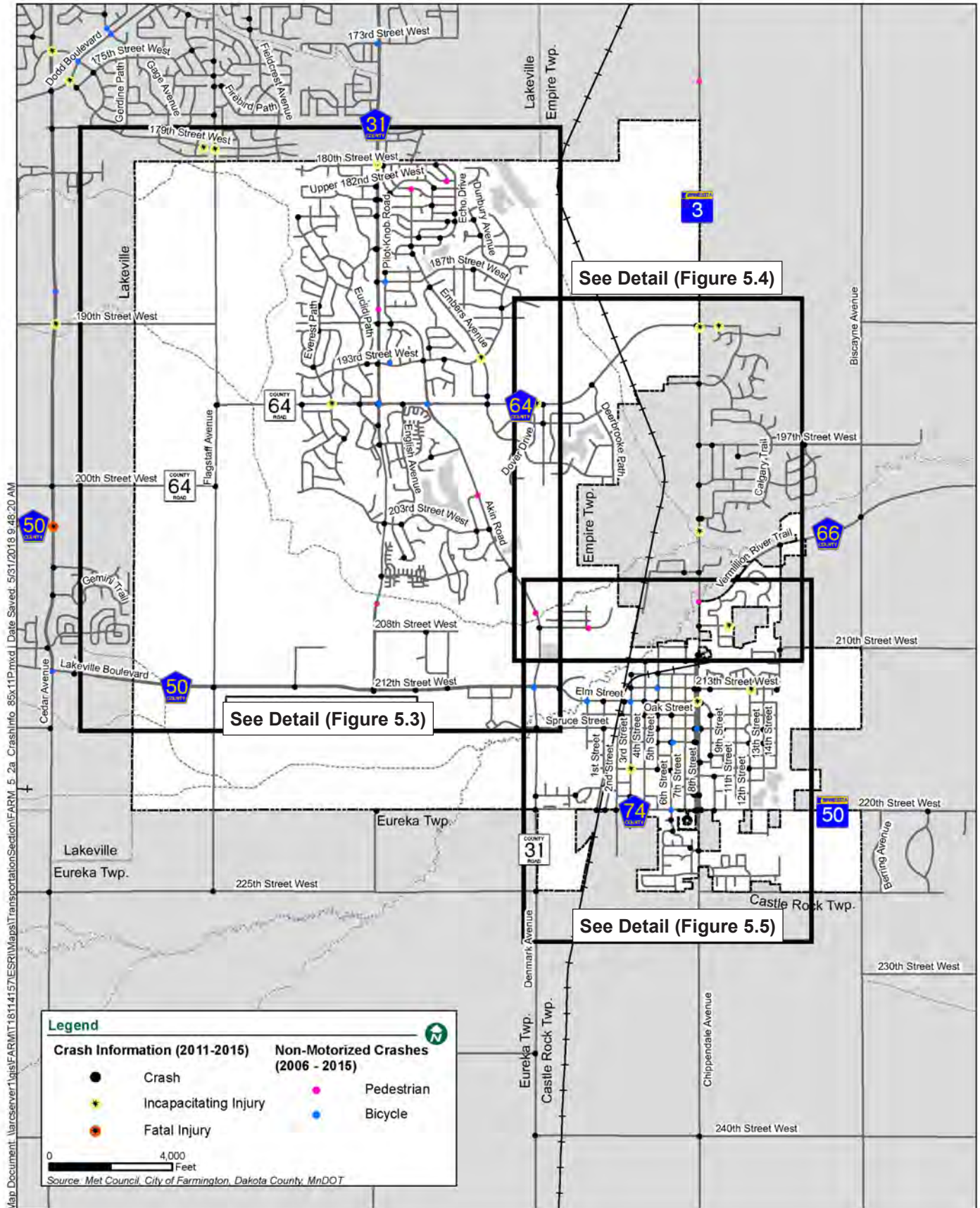


Figure 5.3 Crash Information

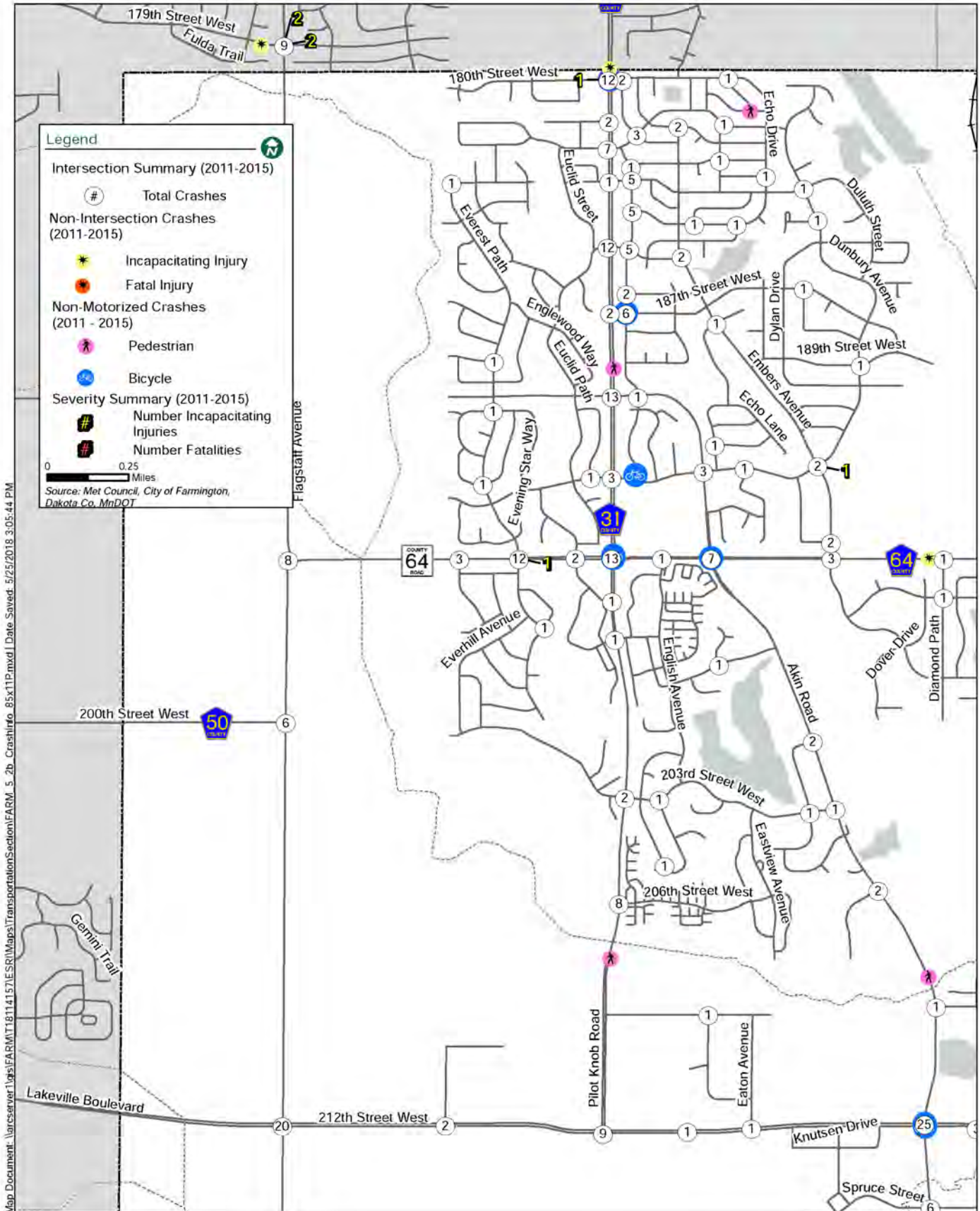


Figure 5.4 Crash Information

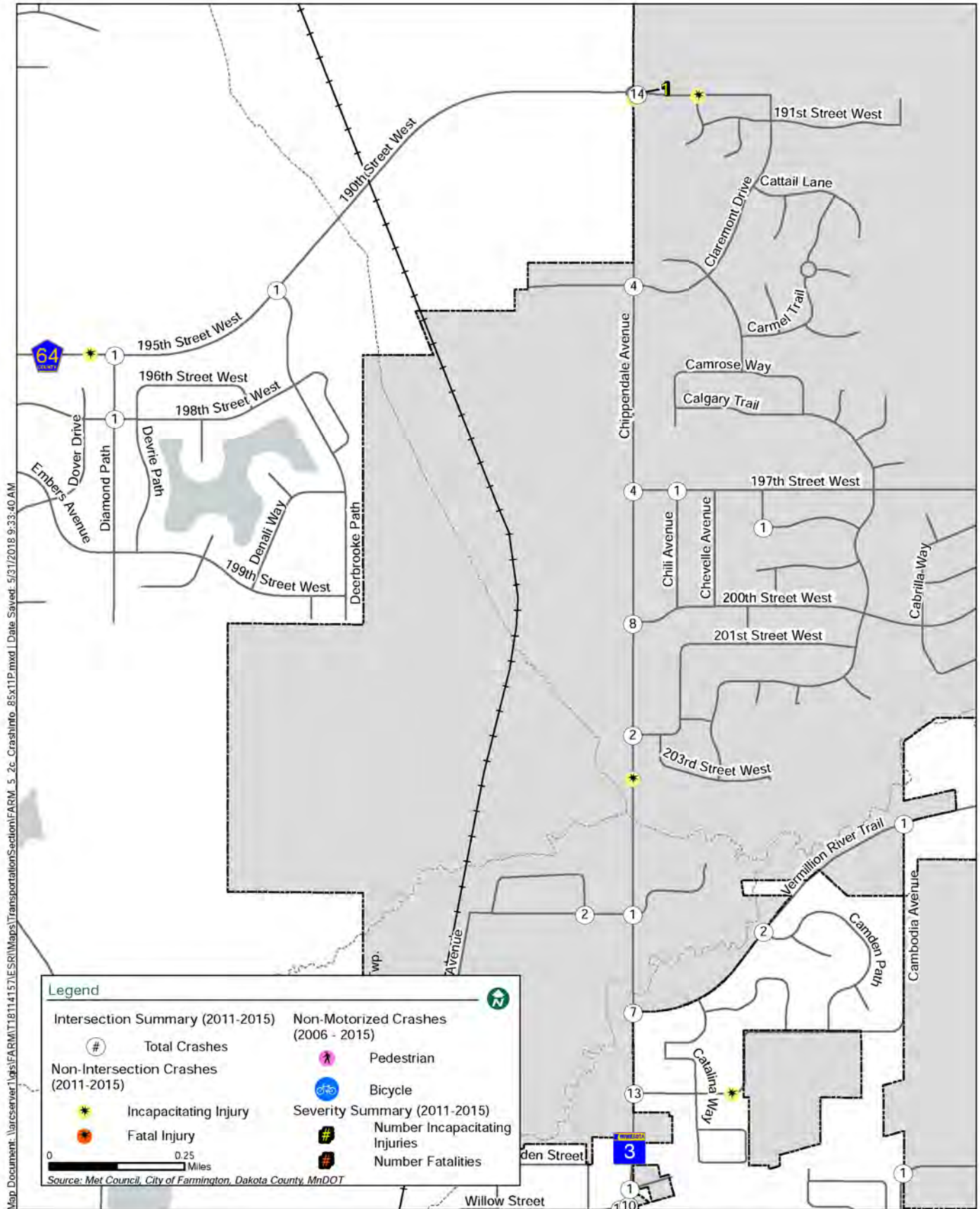
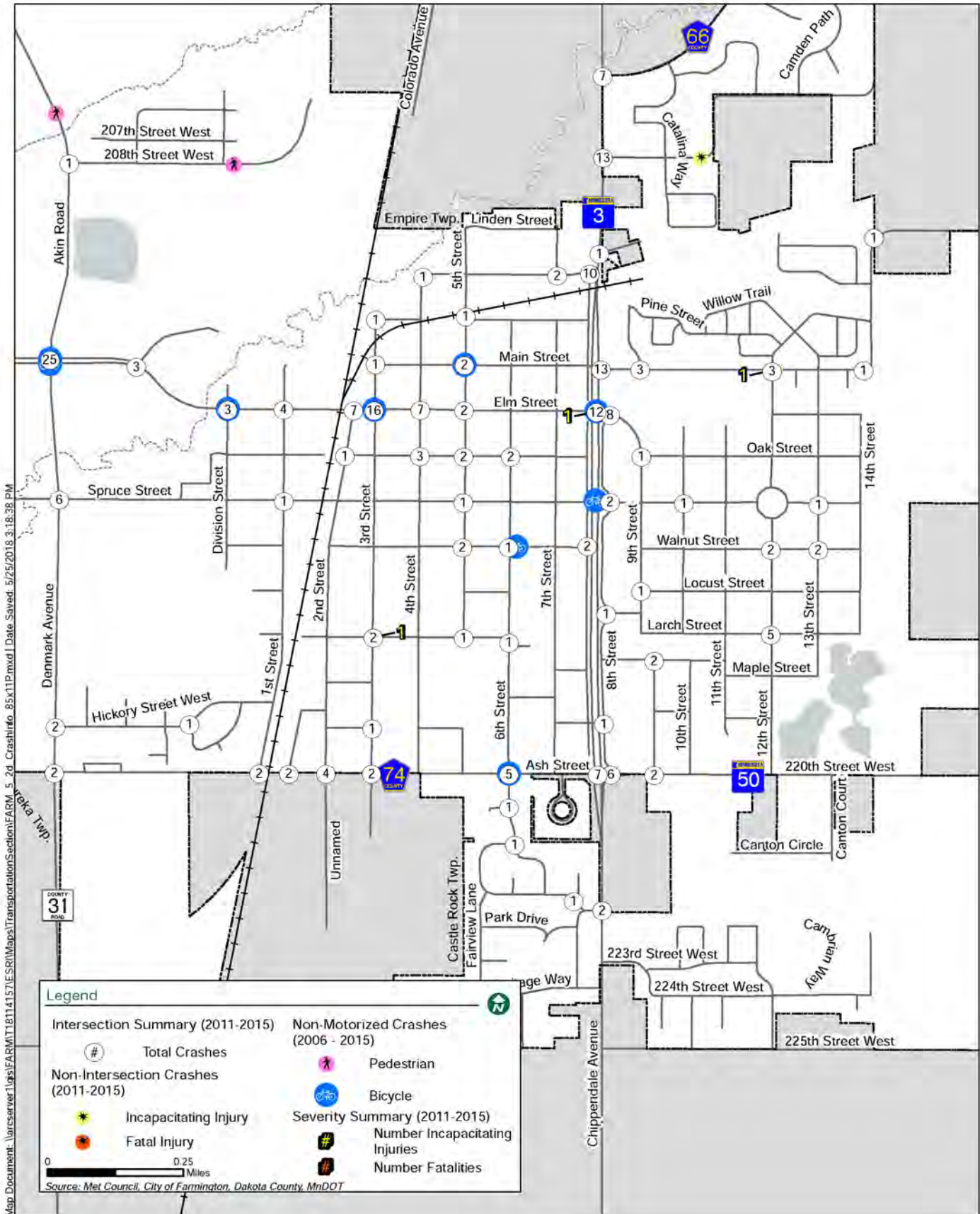


Figure 5.5 Crash Information



The unsignalized intersections with a high frequency of crashes are primarily located along the county and state highways in Farmington. The county and state highways generally accommodate higher traffic volumes and serve the regional purpose which may result in a higher number of crashes. The safety of these intersections should be reviewed concurrent with a larger corridor study or reviewed on a case-by-case basis to determine if the crash concerns could be alleviated with spot safety improvements.

One exception is the intersection of CSAH 50 (212th St) at Flagstaff Ave. Due to the high volume of crashes the crash rate was reviewed. The crash rate is higher than the average crash rate for similar intersections state-wide but more importantly, the critical index (1.71) indicates that the intersection is operating out of the normal expected range and should be reviewed for potential mitigation to reduce the number of crashes.

### **Recent, Planned and Proposed Projects**

There are a few intersections that may show higher crash frequencies but have had recent projects or have projects planned or proposed that would alleviate the safety concerns.

- » CSAH 31 (Pilot Knob Rd) at CR 64 (195th St) – Constructed Roundabout
- » CR 64 (195th St) at Akin Rd – Constructed Roundabout
- » TH 3 (Chippendale Ave) at CSAH 64 (195th St) – Constructed Roundabout
- » TH 3 (Chippendale Ave) at 197th St – Planned Turn Lanes
- » TH 3 (Chippendale Ave) at 200th St – Planned Turn Lanes
- » TH 3 (Chippendale Ave) at 209th St – Planned Turn Lanes
- » TH 3 (Chippendale Ave) at CR 66 (Vermillion River Trl) – Proposed Turn Lanes

### **Non-motorized Crashes**

There have been a few pedestrian crashes within Farmington. They have generally been located within neighborhood streets or along the more rural sections of roadways including Akin Road and CSAH 31 (Pilot Knob Road). Bicyclist crashes have occurred through the city. Based on the bicyclist crash locations, bicyclist facilities may be needed along CSAH 50 between Akin Rd and TH 3.

### Future Study Recommendations

Locations recommended for future study based on the crash frequency and patterns identified above and as identified by a high frequency of crashes along the corridor includes the following intersections and corridors:

Near Term:

- » CSAH 50 (212th St) at Flagstaff Ave – revisions to intersection movements or design

Mid to Long Term:

- » TH 3 (Chippendale Ave) from CSAH 50 (Elm St) to CR 66 (Vermillion River Tr)
- » CSAH 50 (Elm St) from Akin Rd to TH 3 with special focus on the urban section from Division St to 5th St.
- » CR 64 (195th St) at Everest Path
- » Flagstaff Ave from CSAH 50 to CR 64
- » English Ave from Akin Rd to Upper 182nd St

### ROADWAY JURISDICTIONAL CLASSIFICATION

Roadways are classified on the basis of which level of government owns and has jurisdiction over them. For Farmington, roadways are under the jurisdiction of MnDOT, Dakota County, or the City. Figure 5.6 depicts the existing roadway jurisdictional classification system for roadways in Farmington.

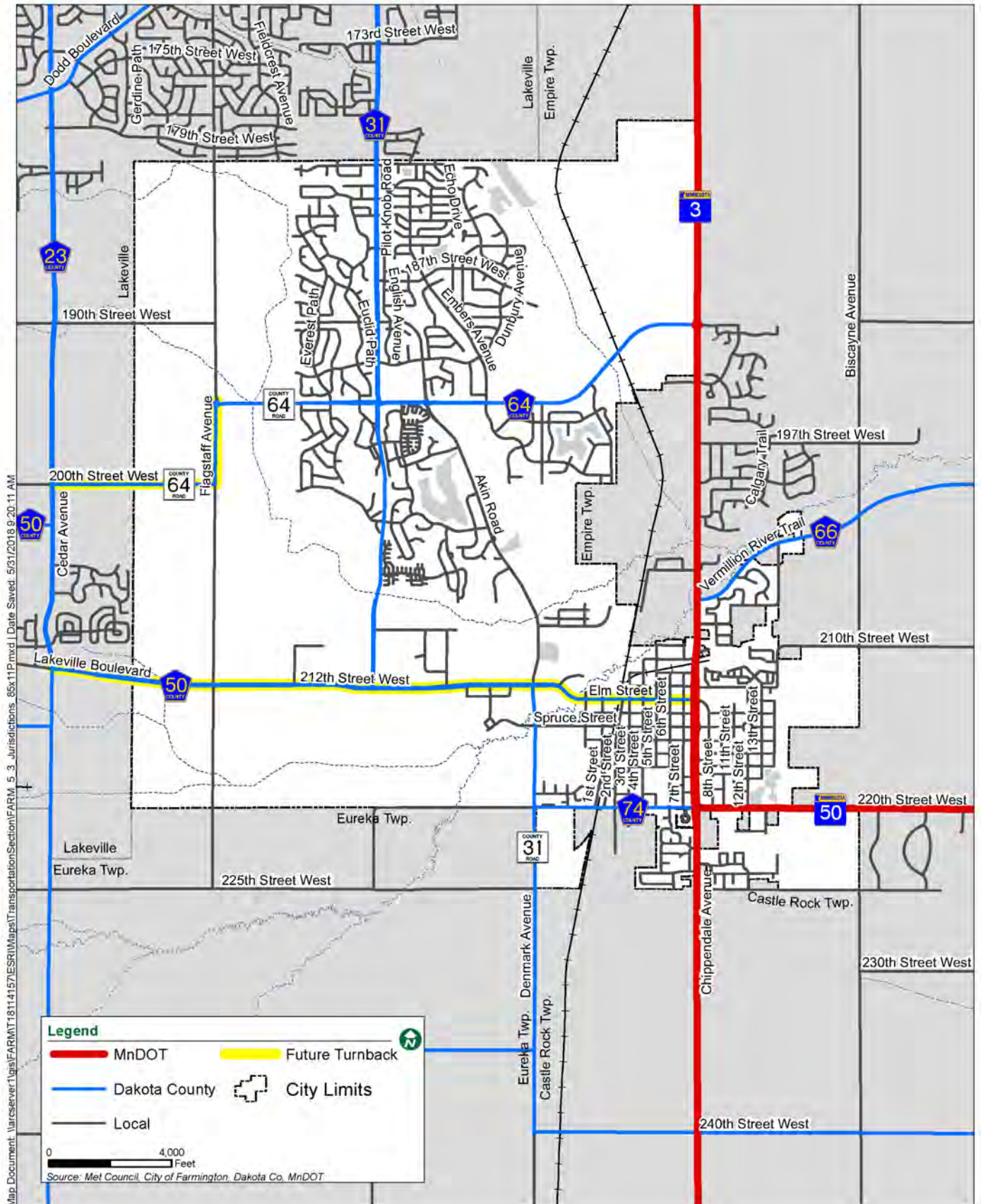
### ROADWAY FUNCTIONAL CLASSIFICATION

The functional classification system is a roadway network that distributes traffic from neighborhood streets to collector roadways, then to minor arterials, and ultimately to principal arterials which generally are freeways. Roads are placed into categories based on the degree to which they provide access to adjacent land uses and lower level roadways versus providing higher-speed and distance mobility for “through” traffic. Functional classification is a cornerstone of transportation planning. Within this approach, roads are located and designed to perform their designated function.

The functional classification map for Farmington is presented in Figure 5.7. The metro area roadway system presently consists of six functional roadway classifications:

- » Principal arterial
- » “A” minor arterial
- » Other arterial
- » Major collector
- » Minor collector
- » Local street

Figure 5.6 Jurisdictional Classification



The Metropolitan Council has defined four sub-categories of “A” minor arterials: reliever, expander, connector, and augments. These sub-categories have to do primarily with Metropolitan Council’s allocation of federal funding roadway improvements, but do not translate into specific design characteristics or requirements. While “A” minor arterials are eligible for federal funding, “other arterials” are not.

For arterial roadways, the Metropolitan Council has designation authority. Local agencies may request that their roadways become arterials (or are downgraded from arterial to collector), but such designations or re-designations must be approved by the Metropolitan Council. The agency which has jurisdiction over a given roadway (e.g. Dakota County or the City of Farmington) has the authority to designate collector status.

### **Principal Arterials**

Principal arterials are the highest roadway classification and make up the Metropolitan Highway System. The primary function of these roadways is to provide mobility for regional trips, and they should not provide a direct land access function. They are intended to interconnect regional business concentrations in the metropolitan area, including the central business districts of Minneapolis and St. Paul. These roads also connect the Twin Cities with important locations outside the metropolitan area. Principal arterials are generally constructed as limited access freeways, but may also be multiple-lane divided highways.

There are currently no principal arterials within or adjacent to Farmington. The closest principal arterials are I-35, approximately four miles to the west, TH 52, approximately five miles to the east, and CSAH 42, approximately three miles to the north. As will be discussed in the Roadway System Plan portion of this Transportation chapter, Dakota County and its study partners are evaluating additional principal arterials which could affect Farmington.

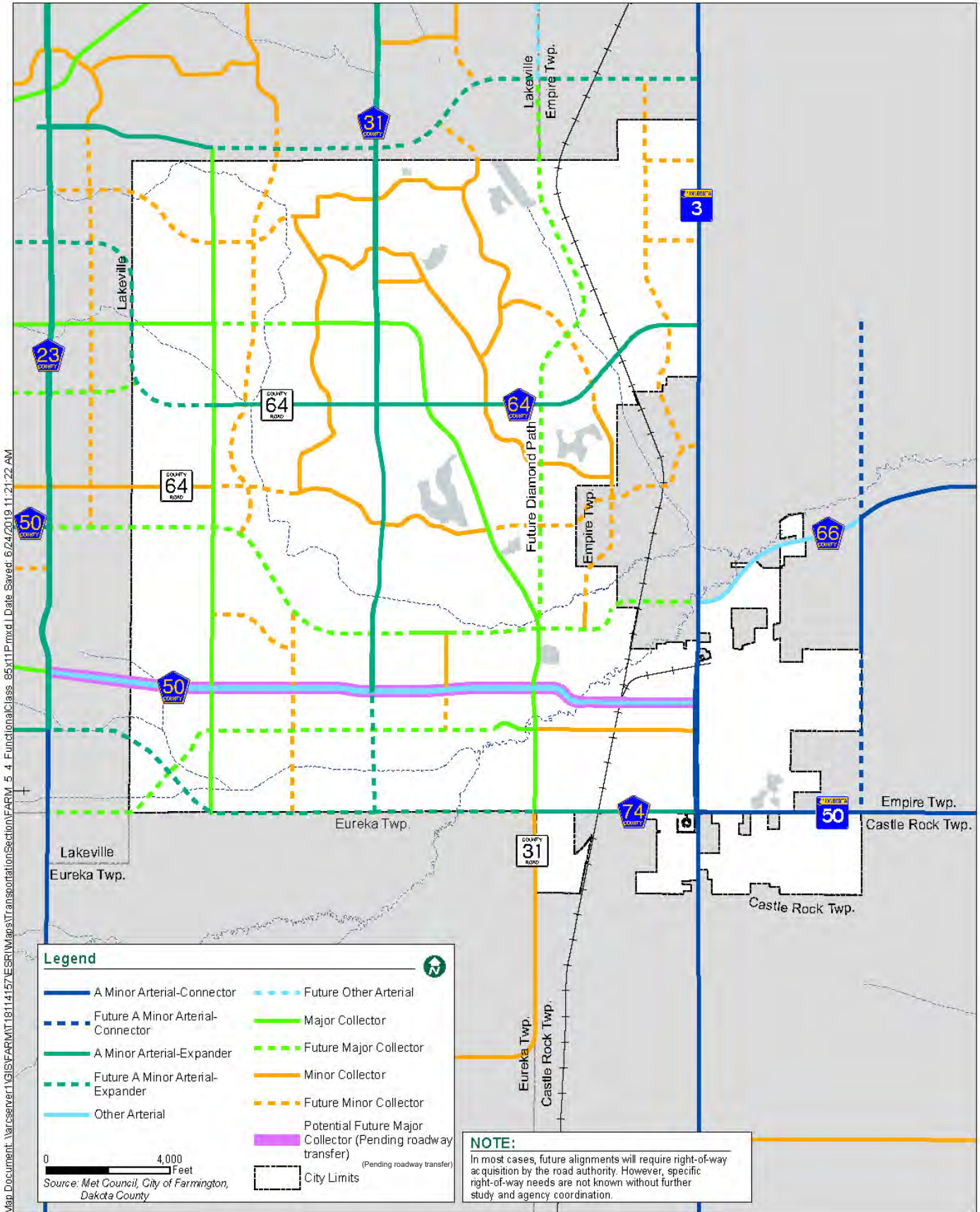
### **“A” Minor Arterials**

These roads connect important locations within the City with access points of the Metropolitan Highway System and with important locations outside the City. These arterials are also intended to carry short to medium trips that would otherwise use principal arterials. While “A” minor arterial roadways provide more access than principal arterials, their primary function is still to provide mobility rather than access to lower level roadways or adjacent land uses.

Existing “A” minor arterials within the Farmington area are depicted in Figure 5.7 and summarized in Table 5.1.



**Figure 5.7 Functional Classification**



**Table 5.1 “A” Minor Arterial Roadways**

ROADWAY	FROM	TO	JURISDICTION
CR/CSAH 64 (195th St/190th St)	Flagstaff Ave	TH 3	Dakota County
CSAH 74 (220th St)	CSAH 31 (Denmark Ave)	TH 3	Dakota County
TH 50 (220th St)	TH 3	East City limit	MnDOT
CSAH 31	North City limit	CSAH 50 (212th St)	Dakota County
TH 3 (Chippendale Ave)	North City limit	South City limit	MnDOT

**Table 5.2 “Other” Arterials**

ROADWAY	FROM	TO	JURISDICTION
CSAH 66 (Vermillion River Trl)	East City limit	TH 3	Dakota County
CSAH 50 (212th St/Elm St)	West City limit	TH 3	Dakota County

### Other Arterials

Like “A” minor arterials, these roadways also serve more of a mobility function than access function. However, they generally do not have as much regional importance as “A” minor arterials and are not eligible for federal roadway improvement funding. This classification used to be termed “B” minor arterials. The Metropolitan Council now refers to them as “other arterials.”

Existing other arterials within the Farmington area are depicted in Figure 5.7 and summarized in Table 5.2, below.

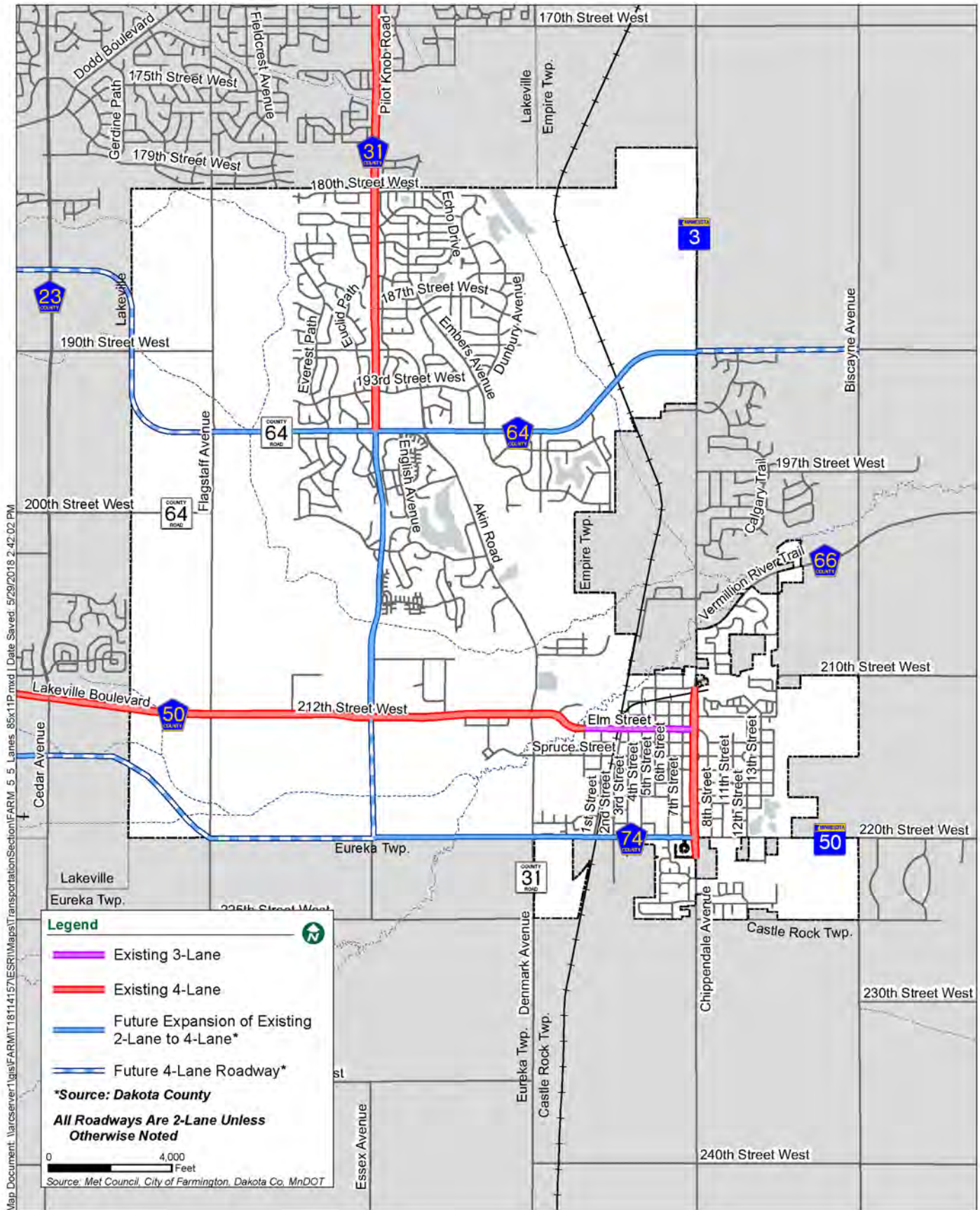
### Major and Minor Collectors

Collector roadways provide a balance of the mobility and land-use access functions discussed above. They generally serve trips that are entirely within the City and connect neighborhoods and smaller commercial areas to the arterial network. Minor collectors generally are shorter in length, with lower volumes and lower speeds than major collectors. Major and minor collectors are all City roadways and are depicted in Figure 5.7. No changes in existing City collector roadways are anticipated other than the extensions identified in Figure 5.7. The specific alignments of these extensions may change pending further study, stakeholder outreach, and agency coordination. As identified in Figure 5.7, if CSAH 50 (212th St/Elm St) through town is turned back to the City, it would likely become a major collector roadway

## NUMBER OF TRAVEL LANES

The current and anticipated future number of travel lanes on roadways within Farmington are depicted in Figure 5.8.

Figure 5.8 Number of Travel Lanes



## RELEVANT TRANSPORTATION STUDIES

### *Dakota County East-West Corridor Preservation Study*

(Dakota County and study partners, Phase I – 2003, Phase II – 2006)

Dakota recognized that there are travel deficiencies associated with the disjointed system of east-west roadways in the southern portion of the County including the Cities of Lakeville and Farmington, and Empire Township. These deficiencies will be exacerbated with extensive future growth that is anticipated for these communities.

The County, working in partnership with the Lakeville, Farmington, and Empire Township, identified five east-west corridors for corridor preservation and implementation planning. One of these, Alignment A, is a short segment in Lakeville and does not directly involve Farmington. The remaining corridors, B through E, are identified in Figure 5.9. Phase II of the study refined alignments for B and C in Farmington, and addressed an extension of Corridor C east of Farmington. Figure 5.9 depicts the Phase II alignments for Corridor B and C.

The primary recommendations for the corridors may be summarized as follows:

- » Corridor B: potential four-lane arterial facility under County jurisdiction; 150 foot right-of-way (ROW) width west of Cedar Ave, 120 foot ROW width east of Cedar Ave
- » Corridor C: potential four-lane arterial facility under County jurisdiction; 150 foot ROW width
- » Corridor D: potential two/three-lane collector facility under local jurisdiction; 100 foot ROW width, potentially reduced ROW in restricted areas
- » Corridor E: potential four-lane arterial facility under County jurisdiction; 150 foot ROW width

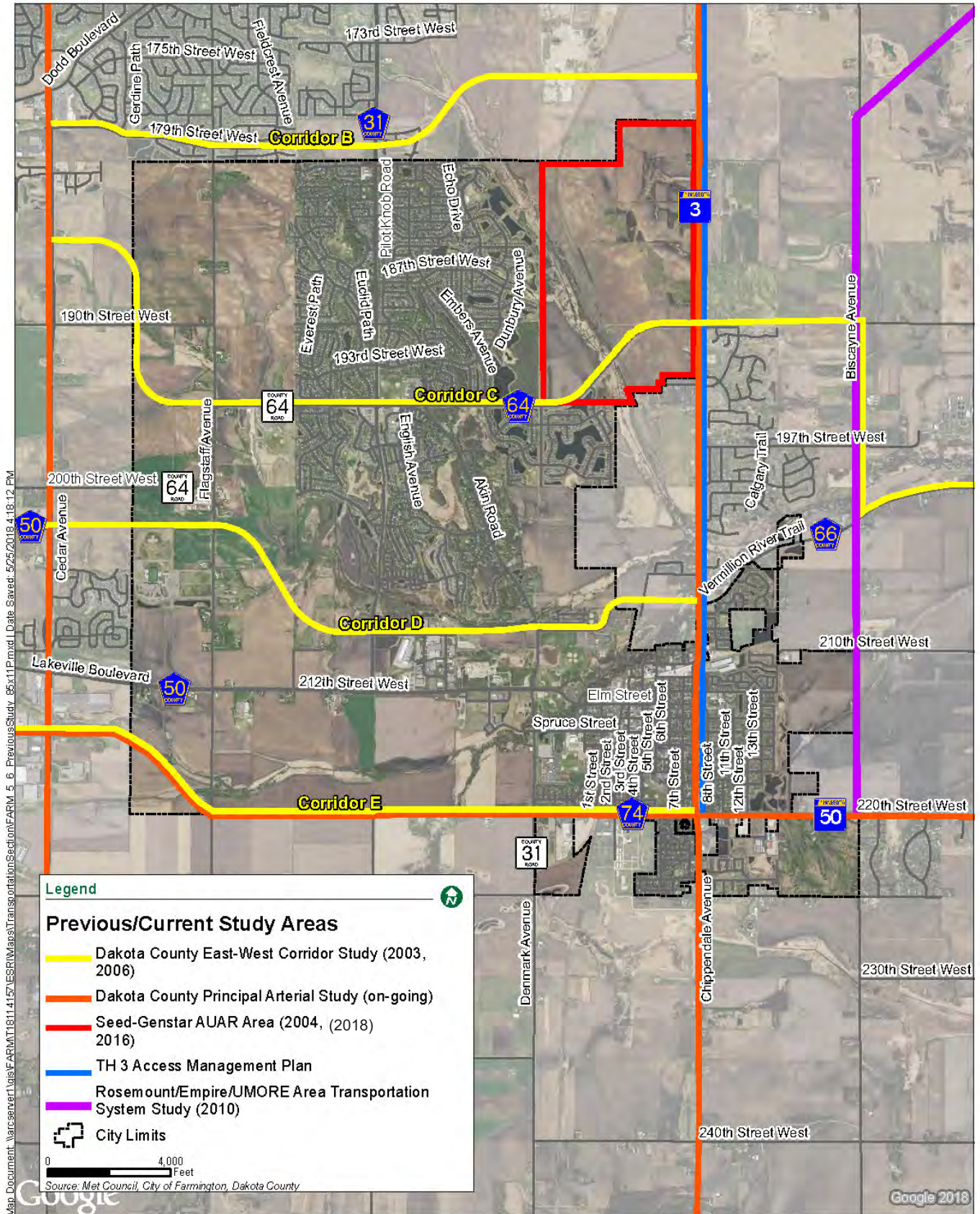
A portion of Corridor B has been constructed as 179th St in Lakeville. Portions of Corridor D have been constructed as 208th St in Farmington.

### *Seed-Genstar Alternative Urban Areawide Review (AUAR)*

(City of Farmington as Responsible Government Unit, 2004, updated 2016)

This document provides a comprehensive review of potential impacts associated with the development of approximately 965 acres in the northeast portion of the City as depicted in Figure 5.9. The area was, and remains, mostly undeveloped farmland. The development scenario analyzed in the AUAR consists of mostly single-family residential land use with interspersed pockets of multi-family residential and a small mixed-use commercial/residential area at the northwest corner of

Figure 5.9 Previous/Current Study Areas



190th St and TH 3. Per requirements established in Minnesota Rule 4410.3610, Subpart 7, updates to the AUAR have been completed every five years, most recently in 2016.

An important portion of the overall analysis concerned transportation impacts. At full buildout, the project is projected to generate 31,160 daily trips. These trips were assigned to the surrounding roadway network to analyze improvement needs.

The AUAR identifies that TH 3 would need to be expanded to a four-lane facility even without the AUAR development over the planning horizon (2036). The traffic associated with the AUAR development would exacerbate this need, and the traffic analysis in the AUAR assumes an expanded TH 3. It identifies three access roadways from the AUAR area to TH 3 (all north of CSAH 64 [190th St], and south of Corridor B of the Dakota County East-West Corridor Preservation Study summarized above) and two access roadways to CSAH 64. The recommendations for these access points are as follows:

- » Northerly access road to TH 3
  - Reasonable to expect signal/roundabout intersection control
  - Northerly connection to Alignment B of the Dakota County East West Corridor Study summarized above should be studied to support operations at the northerly access to TH 3
- » Middle and southerly access roads to TH 3, respectively
  - Signal or roundabout control if warranted through engineering study (full buildout)
- » Westerly access to CSAH 64
  - Signal or roundabout if warranted through engineering study (full buildout)
- » Easterly access to CSAH 64 (main development driveway providing access to the proposed commercial area on 190th St)
  - Signal or roundabout required

In a January 2017 comment letter on the current AUAR, MnDOT identified that only two primary intersections would be allowed from the AUAR area to TH 3. An additional intersection would be acceptable, but it would need to be a secondary intersection. A secondary intersection would likely not be a full movement intersection and would not have traffic control in the form of signal or roundabout. The access intersections would need to be consistent with MnDOT access spacing standards relative to Alignment B in the Dakota County East West Corridor Study and CSAH 64 (190th St). The depiction of the TH 3 primary access points from the Seed Genstar area in Figure 5.7 is consistent with MnDOT access spacing requirements for this segment of TH 3.

In a January 2017 comment letter on the current AUAR, Dakota County stated that the five arterial access points identified in the AUAR (three to TH 3, and two to CSAH 64) would be inadequate to serve the overall development. It goes on to state that the City should plan for two access connections to future Alignment B from the Dakota County East West Corridor Study.

The recession of 2008 slowed development in Farmington as in most cities. Only a small percentage of the overall AUAR area, in southwest portion of the TH 3/CSAH 64 (190th St) intersection, has had recent development activity and discussion.

### ***TH 3 Access Management Plan*** (MnDOT and study partners, 2004)

This study addressed TH 3 between TH 50 (220th St) at the southern edge of Farmington to CSAH 46 (160th St) at the border between Empire Township and the City of Rosemount. The following background points were made:

- » While TH 3 serves the traffic volumes and commuting patterns of a principal arterial, access on portions of TH 3 has been allowed similar to on a collector street. The number of public street and private driveway access to points on TH 3 greatly exceeds recommendations for a roadway in TH 3's access category ("4B"). This compromises traffic safety and mobility conditions.
- » Based on projected traffic volumes, the ultimate vision for TH 3 is expansion to a four-lane divided roadway. One of the key drivers of this need for expansion will be development of the Seed-Genstar AUAR area.
- » Due to funding constraints, TH 3 has been identified as a preservation corridor by MnDOT. Therefore, funding is only available for preserving the corridor through maintenance projects. TH 3 needs to be managed effectively through methods such as access management so that it operates adequately until capacity improvements can be made.

The following recommendations were made:

- » Primary full movement public street intersections should be spaced at ½ mile intervals. The cross streets at these intersections should be designated as arterials or collectors.
- » If traffic signals are warranted per traffic engineering analysis, there should be located only at primary full-movement public intersections. Signals should be constructed only if they meet applicable warrants.
- » Existing public street intersections that do not conform to spacing standards may remain in place, but may be subject to modification or closure when adjacent property is developed or highway improvements are made.

- » If additional secondary public street connections are necessary, they should be located  $\frac{1}{4}$  mile from the nearest full-movement intersections. Turning movements at secondary intersections may be restricted to right-in/right-out to enhance mobility and safety conditions.
- » A series of potential access modifications were identified, as well as potential frontage and backage roads which would allow removal of private driveways from TH 3. The identified potential access improvements from the 2004 study is summarized on mapping provided in Appendix B.

In 2006 a TH 3 Road Safety Audit was completed covering this same portion of TH 3. The recommendations generally included geometric and/or signing/stripping improvements at specific locations, as well as refining speed limit transition locations. A more global recommendation was to convert TH 3 to a 3-lane design (exclusive left-turn lanes at intersections with 2-way left turn lanes in between) from the current 4-lane divided design north of CSAH 50 (Elm St) north to 194th St, or the northerly extent of significant development.

It may be noted that one of the modifications recommended in TH 3 Access Management Plan for the southern portion of Farmington was implemented as part of pavement rehabilitation project performed by MnDOT in 2016. This was the closure of TH 3 access at Main St. In addition, this project converted the TH 3/Larch St from a full movement intersection to a  $\frac{3}{4}$  intersection, with westbound left turning being prohibited. While it is somewhat dated, the TH 3 Access Study continues to be considered the guiding document for access planning and improvements for the corridor.

#### *Farmington Area Transportation Study* (Dakota County and City of Farmington, 2009)

Dakota County and the City of Farmington studied the roadway system needs associated with future residential and commercial growth anticipated in the Farmington area and the opening of the Farmington High School. Based in technical analysis and agency coordination, the study accomplished the following tasks:

- » Provided short-term recommendations regarding roadway improvements to support the opening of the Farmington High School (now open)
- » Forecasted 2030 traffic volumes on roadways within Farmington
- » Identified a long-term collector and arterial network to meet long-term needs (which provides the basis for the network identified in this document)
- » Provided an access management plan for CSAH 31 to support continued development around this corridor



### ***Farmington/Empire/Umore Transportation System Study***

(Dakota County and study partners, 2010)

Dakota County conducted this study in partnership with the City of Rosemount, Empire Township, University of Minnesota (Umore development area), and the Minnesota Department of Natural Resources. The study area was bounded by TH 3 on the west, CSAH 42 on the north, County Road 81 on the east, and TH 50 on the south. The purpose of the study was to identify mid- to long-term north-south and east-west arterial corridors to support extensive anticipated development within the study area. Some of these corridors use improved roadways, and others require new segments.

From the City of Farmington's perspective, the most significant result of this study was the recommendation that Biscayne Ave be connected with County Road 73 (Akron Ave) at CSAH 42 in Rosemount. This corridor would, thus, provide a continuous Dakota County arterial roadway from CSAH 32 (Cliff Rd) in Inver Grove Heights to TH 50 (220th St) in Farmington. The linking segment would connect to existing Biscayne Ave approximately one mile south of 170th St as depicted in Figure 5.9.

The study identified at a planning level that this corridor would initially 4-lane south to 170th St, and 2-lane south of this with the potential to expand to 4-lane further in the future. The overall corridor in the Empire Township/Farmington area would have a 150 foot right-of-way width. No specific timeframe was identified, only that improvements in this corridor would be driven by area development and associated transportation needs. While this corridor is not identified as a "replacement" for TH 3, the study identifies the potential that it could relieve traffic volumes on TH 3. The degree of relief that would be realized would require further analysis.

### ***Dakota County Principal Arterial System Study***

(Dakota County and study partners including the City of Farmington, 2018)

Dakota County recognized that it currently has large gaps in its functional classification system regarding principal arterial roadways. This is particularly true in the middle and southern portions of the County, including Farmington. It therefore commissioned this study to review and identify potential future principal arterials. The purpose of this study was to identify appropriate corridors for future principal arterial designation; this will accordingly guide future studies and planning.

Two routes identified for study pass through Farmington: TH 3, and Alignment E from the 2003/2006 Dakota County East West Corridor Preservation Study summarized above (linking CSAH 70 on the west with TH 50 on the east, using new roadway between CSAH 23 (Cedar Ave) and TH 3). Both TH 3 and Alignment E are identified as “Recommended Future Principal Arterial (PA)” category, which lies between the “Short Term PA Designation” and the “Not Recommended” designation.

## **AUTONOMOUS VEHICLES**

Advances in self-driving car technology suggest that in the next few decades, these may become much more widely used. Some experts predict that by 2040, autonomous vehicles will be the primary personal transportation mode. However, there are many uncertainties regarding such a shift and what it would look like.

General factors to be mindful of include:

- » Infrastructure markings, signage, and lane structure would likely be of central importance for future transitions to reliance on autonomous vehicles.
- » The potential for substantial shifts away from parking for single-occupant vehicles to a more pooled vehicle model (with potential for redevelopment of old parking facilities).
- » The need for inter-jurisdictional coordination on how facilities and standards may change across borders – and what new standards might look like.

# Roadway System Plan

## 2040 TRAFFIC FORECASTS AND CAPACITY DEFICIENCY ANALYSIS

### Forecast Process and Results

The Metropolitan Council’s activity-based travel demand model was used to generate 2040 traffic forecasts for collector and arterial roadways in the Farmington area. This is a regional travel model, tailored in this case for Farmington, which uses inputs organized by Transportation Analysis Zone (TAZ). Each TAZ is a geographic area with data for population, households, and jobs. The model uses this data, along with assumed 2040 network parameters, to project and allocate 2040 trips to individual roadways. The 2040 traffic modeling for Farmington assumed the arterial and major collector network as depicted in Figure 5.7.

A map of the TAZs for the Farmington Area is provided as Figure 5.10. The anticipated future land use patterns discussed in the Land Use chapter of this 2040 Comprehensive Plan were assumed for the 2040 TAZ allocations identified in Table 5.3, below. It may be noted that this table also includes TAZ projections for 2020 and 2030 per Metropolitan Council requirements for the 2040 comprehensive planning process.

The results of the 2040 traffic modeling for Farmington are presented in Figure 5.11.

**Table 5.3 Farmington Transportation Analysis Zone Projections**

TAZ	2020			2030			2040		
	HH	POP	JOBS	HH	POP	JOBS	HH	POP	JOBS
639	1,961	6,278	126	1,961	6,278	126	2,043	6,481	126
640*	664	1,956	463	720	2,091	475	719	2,093	475
641	874	1,868	1,961	879	1,881	1,965	879	1,881	1,966
642*	86	238	775	370	949	926	405	1,034	919
643	1,051	2,672	925	1,051	2,672	982	1,051	2,672	1,056
644*	763	2,460	352	1,216	3,593	446	1,424	4,106	641
645*	1,082	3,339	149	1,327	3,952	187	1,327	3,952	187
684*	10	32	0	10	32	0	131	330	127
685*	109	313	0	109	313	0	450	1,155	56
697*	243	573	267	397	959	267	397	959	267
711*	92	268	250	92	268	354	92	268	354
713*	1,563	4,298	332	1,563	4,298	336	1,819	4,929	336
715*	1	2	0	260	651	0	383	954	0
716*	1	3	0	145	363	136	680	1,686	290
<b>TOTAL</b>	<b>8,500</b>	<b>24,300</b>	<b>5,600</b>	<b>10,100</b>	<b>28,300</b>	<b>6,200</b>	<b>11,800</b>	<b>32,500</b>	<b>6,800</b>

\*TAZ is only partially in Farmington; data depicted is for Farmington portion of TAZ

Figure 5.10 Transportation Analysis Zones

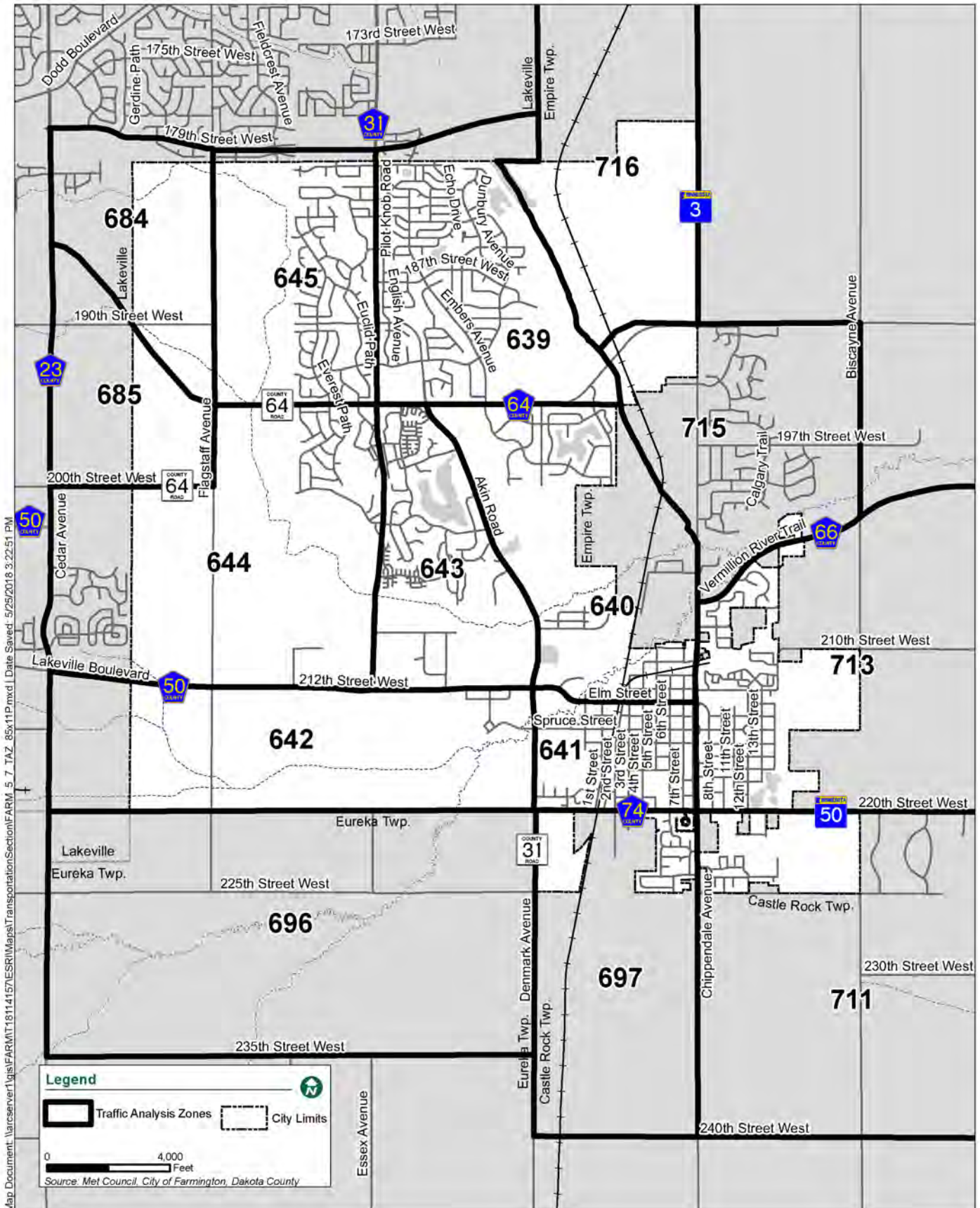
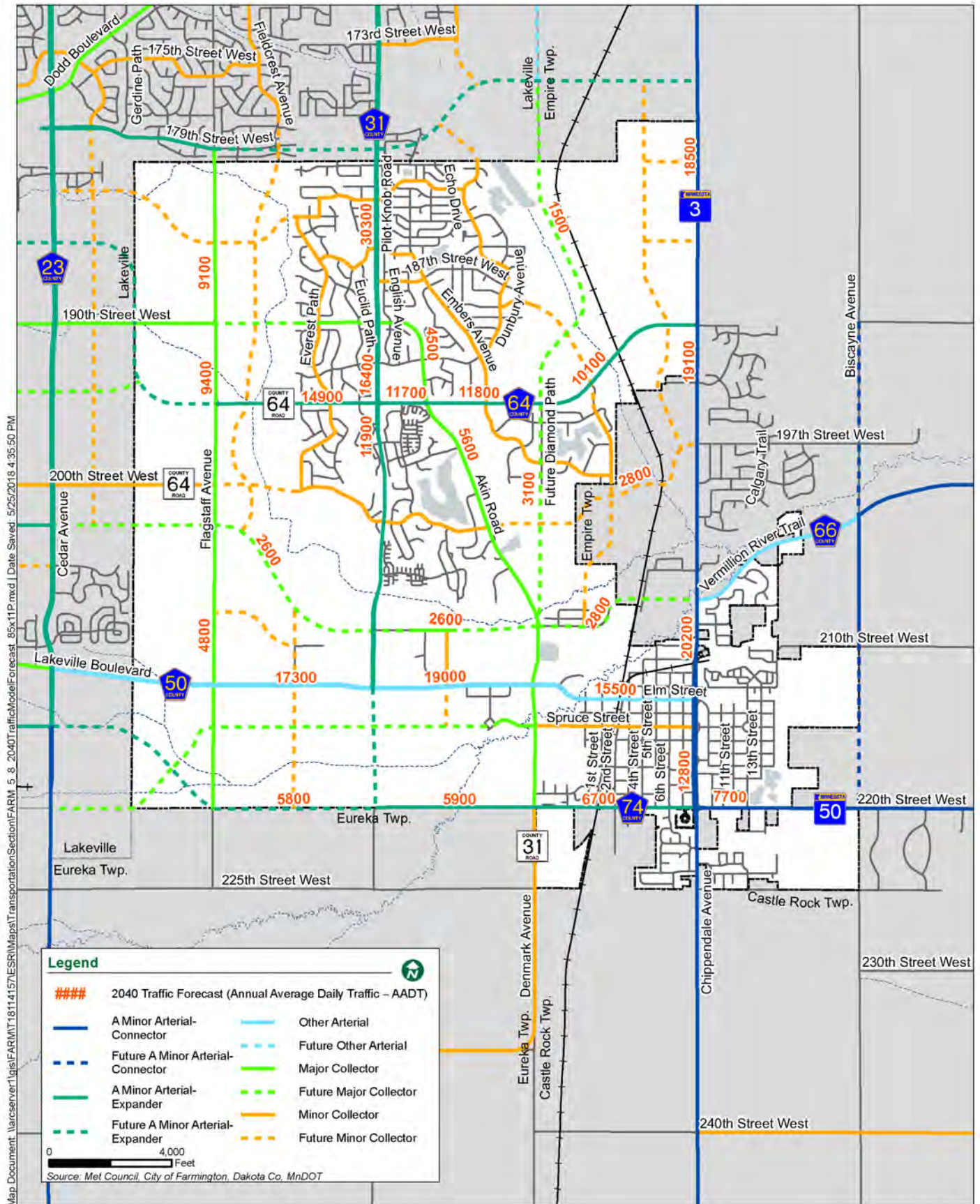


Figure 5.11 2040 Traffic Forecast



### Capacity Deficiency and Potential Roadway Improvement Needs

A planning-level assessment was performed to identify roadway segments where capacity problems (congestion) could occur by 2040. The volumes were taken from the 2040 projections discussed under the previous heading. The capacity is based on typical capacity levels for different classifications and configurations of roadways as summarized in Table 5.4.

**Table 5.4 Planning Level Roadway Capacity by Roadway Type**

ROADWAY TYPE	CAPACITY (AVERAGE ANNUAL DAILY TRAFFIC – AADT)
Rural 2-lane undivided major collector/minor arterial	16,000
Urban 2-lane undivided major collector/minor arterial	11,000
Urban 3-lane major collector/minor arterial	22,000
Rural 4-lane divided minor arterial	37,000
Urban 4-lane divided minor arterial	32,000

Source: Bolton & Menk, Inc., Sixth Edition Highway Capacity Manual methods and procedures

Based on this review, only one segment is projected to be over capacity in 2040:

- » TH 3 from Main Street to north City limit (currently rural 2-lane undivided minor arterial)

The projected volumes exceed planning level capacity by 15 to 26 percent, depending on location within the segment. As previously discussed in the summary of MnDOT’s 2004 TH 3 Access Management Plan, MnDOT ultimately plans to expand TH 3 to 4-lane in this area. However, there is no funding for this improvement and it is unlikely that such funding will be available into the foreseeable future. Further information is provided under the Future Study/Coordination Issues heading, below.

In addition, one other segment is projected to be “approaching capacity” (0.85 to 0.99 of capacity):

- » CSAH 31 (Pilot Knob Rd) from 190th St to north City limit (currently urban section 4-lane divided minor arterial)

This is a County roadway. The City of Farmington will work with Dakota County to monitor traffic conditions in this segment and evaluate improvements as needed. Dakota County’s draft 2040 Transportation Plan identifies that CSAH 31 (Pilot Knob Rd) will ultimately be expanded to 6-lane north of Farmington.

**Please note** that this capacity review is for overall roadway segments, and does not cover any detailed intersection analyses which will likely be required over the planning horizon.

## FLAGSTAFF AVENUE IMPROVEMENTS

In 2009, Flagstaff Ave was reconstructed from gravel to paved, with a two lane, rural section design. This project supported the opening of the new Farmington High School. Since that time, significant areas of land have come out of agricultural reserve status by landowner choice in the western portion of Farmington, or is anticipated to come out in the coming years. Thus, there are large agricultural/undeveloped areas on either side of Flagstaff that are now attractive for development, and Flagstaff Ave will be a key roadway to support this development.

It is recommended that Flagstaff Ave be reconstructed with a three lane section in support of anticipated development. The timing would be driven by the timing of development. This design will enhance safety conditions by providing a continuous dedicated left turn lane, along with one travel lane in each direction. It is also recommended that right turn lanes be provided at public streets, and that traffic studies be performed for individual developments to determine the potential need for additional right turn lanes.

## FUTURE ROADWAY JURISDICTION

In its 2030 Transportation Plan (2012), Dakota County identifies the turnbacks of County roadways to the City of Farmington summarized in Table 5.5, below.

The City is agreeable to the proposed transfers pending further coordination regarding transfer terms including roadway condition.

**Table 5.5 County Roadway Turnbacks to City – Proposed by Dakota County**

ROADWAY	SEGMENT	TIMEFRAME FROM 2012*
CR 64 (200th St W, Flagstaff Ave)	From west City limit to 195th St	5-10 years; actual timing to be determined by development of Corridor D (CSAH 50-CSAH 66 link)
CSAH 50 (212th St W/ Elm St)	From west City limit to TH 3	10-20 years; actual timing to be determined by development of Corridor E (CSAH 70-TH 50 link)

\*As identified in 2040 Dakota County Transportation Plan

## FUTURE FUNCTIONAL CLASSIFICATION

Anticipated future collector roadways are depicted in Figure 5.7. If CSAH 50 (212th St/Elm St) is turned back from the County to the City as discussed above, the City would consider changing the functional classification from “A” minor arterial to major collector. Dakota County’s 2018 Principal Arterial Study recommends that TH 3 ultimately be upgraded to a principal arterial classification. This study also recommends that an extension of CSAH 70 (215th St in Lakeville) east of CSAH 23 (Cedar Ave), connecting with CSAH 74 and TH 50 (220th St) at TH 3, be classified as a principal arterial. The City of Farmington was a study partner in the Principal Arterial Study. Its recommendations relative to roadways in Farmington are considered long term, but should guide future planning.

## ACCESS MANAGEMENT

Access management refers to balancing the need for connections to local land uses (access) with the need for network-level movement (mobility) on the overall roadway system. This is based on the roadway functional classification system discussed previously. Arterials generally have limited access in the form of driveways and low volume side streets because their role in the network is to support relatively long, high speed traffic movements. Collectors allow a greater degree of access given their combined mobility/access function. Finally, local streets have relatively few limits on access since their primary function is to connect travelers to individual land uses. Appropriate access control preserves the capacity on arterial and collector streets, and improves safety by separating local turning movements from higher-speed “through” traffic. Moreover, it concentrates higher volume traffic linkages at intersections controlled with traffic signals, roundabouts, or other measures.

MnDOT and Dakota County roadways in Farmington are identified in Figure 5.6. For MnDOT roadways, MnDOT access management guidelines apply. Similarly, for County roadways, Dakota County’s access management guidelines apply. MnDOT’s guidelines are described in detail in their Access Management Manual. A summary page with information pertaining to TH 3 is provided in Appendix C. When reviewing this information, TH 3 through Farmington is classified as 4B. Based on this classification, minimum spacing for primary full-movement intersections is ½ mile, and minimum spacing for secondary intersections is ¼ mile. Dakota County guidelines are also provided in Appendix C.

The City of Farmington is currently reviewing its access management guidelines. Further information will be provided in the full Transportation Plan.



## FUTURE STUDY/COORDINATION ISSUES

Future study and/or coordination issue locations are depicted in Figure 5.12, and are discussed under the following headings.

### Potential Diamond Path (County Road 33) Extension

Diamond Path is currently a Dakota County “other arterial” roadway which begins at CSAH 31 (Pilot Knob Road) in Apple Valley and extends south along the Apple Valley/Rosemount border until CSAH 46 (160th St) at Lakeville on the west and Empire Township on the east. This southerly terminus is approximately 1.9 miles north of the Farmington City limit.

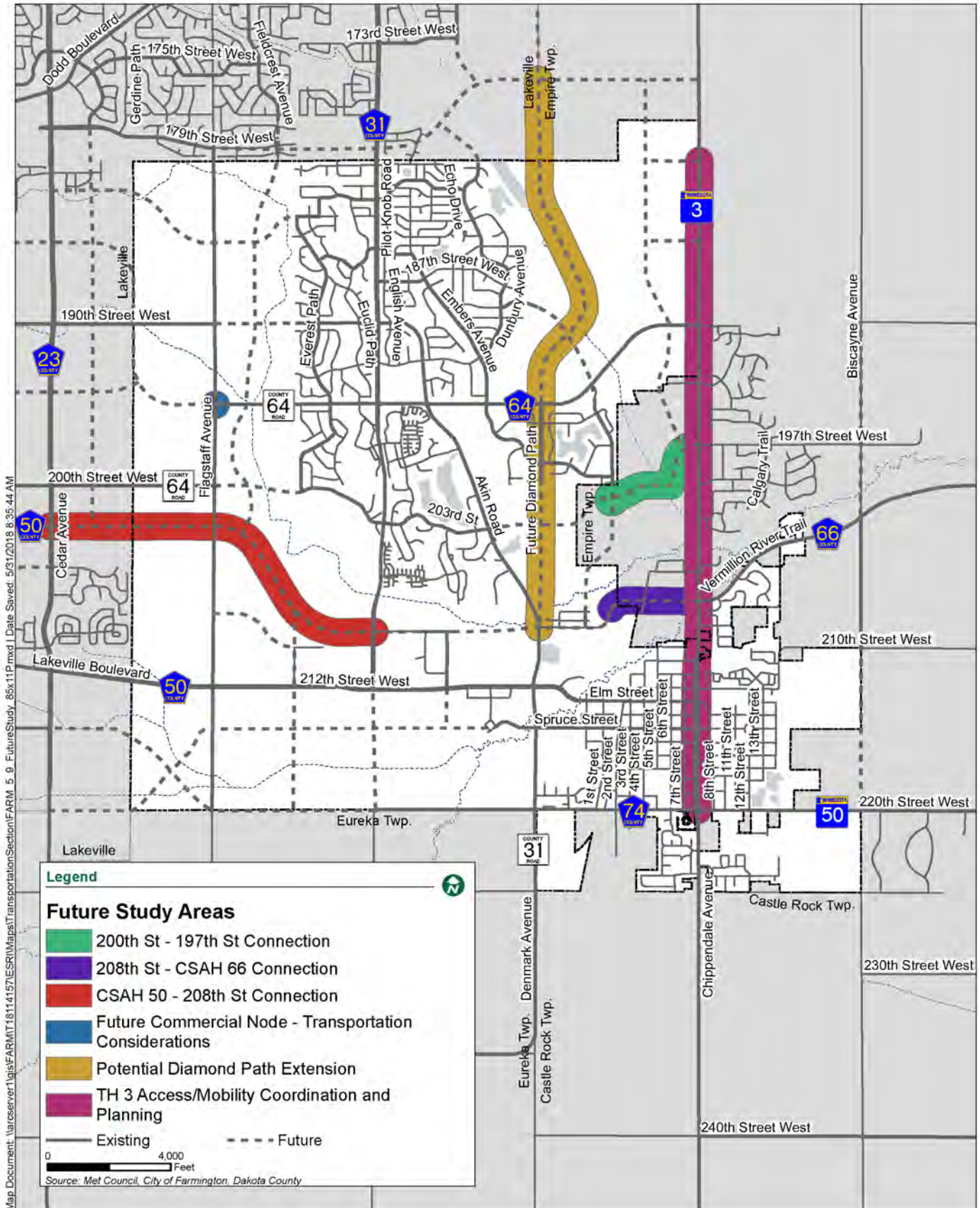
Dakota County has identified an extension of this roadway in various documents. In the County’s 2030 Transportation Plan and Draft 2040 Transportation Plan, Diamond Path is shown to extend as an “other arterial” south to future 180th St (Corridor B in Figure 5.9). In the earlier Dakota County East-West Corridor Preservation Study, Phase II (2006), an extension of Diamond Path south to Aikin Road in Farmington is shown. This extension is on the CSAH 31/Denmark Ave alignment approximately one half mile to the south. It is also shown in the Farmington Area Transportation Study (2009) jointly prepared by Dakota County and the City of Farmington. A half mile segment of Diamond Path has been constructed as a City roadway extending south from CSAH 64 (195th St) to support new development. Some right-of-way for additional Diamond Path construction in Farmington has been secured.

The City’s 2030 Transportation Plan identifies the extension of Diamond Path as a future major collector roadway as it is depicted in Figure 5.7. This is the same alignment as presented in the Dakota County East-West Corridor Preservation Study, Phase II and the Farmington Area Transportation Study referenced above. The 2004 Seed Genstar AUAR assumed Diamond Path to be constructed through the AUAR area, but the most current version of this document does not include it.

The potential extension of Diamond Path through Farmington was discussed with Dakota County Transportation staff as part of the 2040 planning process. There was agreement that the issue needs to be jointly studied by City and the County, with input from Empire Township, considering the following factors:

- » Timing considerations – development in Empire Township, completion of aggregate mining operations south of CSAH 46 (160th St).
- » Likely limited value of extension relative to Seed Genstar development area due to presence of railroad between alignment and development. Greater value as local collector south of CSAH 64 (190th/195th St).

Figure 5.12 Future Coordination and Study Areas



- » Construction and roadway linkage challenges including creek directly west of alignment south of future 180th St.
- » Potential value as a regional roadway (north-south linkage from Apple Valley to CSAH 31 (Denmark Ave) at CSAH 50 (220th St).
- » Overall jurisdictional and design standard considerations.

The Diamond Path extension was assumed in the 2040 modeling and traffic projections as depicted in Figure 5.11. However, the ultimate development of a Diamond Path extension would be subject to the coordination and study efforts summarized above.

### **East-West City Collector Roadway Planning – West Segment**

As previously discussed, Dakota County has studied the development of east-west arterial/collector corridors through and close to Farmington. These are identified in Figure 5.9. One of these is intended to be a City collector roadway, Corridor D. This is an extension of the CSAH 50 (202nd St in Lakeville) alignment at Cedar Ave to the east, dropping south to align with existing sections of 208th St in Farmington. The intent is to continue this roadway east to TH 3, linking with CSAH 66 (Vermillion River Trail).

The west portion of Corridor D requires further coordination and study (the east portion of this corridor is addressed under a separate heading, below). The City of Farmington understands that there is growing development pressure in Lakeville in the vicinity of this alignment, so Farmington and Lakeville should coordinate regarding timing and design considerations. Dakota County should also be involved because CSAH 50 is a County roadway. In addition, there is a relatively large transition from the CSAH 50 alignment to the 208th St alignment (over half a mile to the south). This transition requires further study considering environmental conditions, potential linkage to other roadways, and other factors. The results of this study would serve as a guide for City staff as well as future developers.

### **East-West City Collector Roadway Planning – East Segment**

As discussed under the previous heading, an east-west City collector roadway has been identified linking CSAH 50 at Cedar Ave with CSAH 66 (Vermillion River Trail) at TH 3 (Corridor D in Figure 5.9). This will include existing segments of 208th St in Farmington. The connection of this corridor to CSAH 66 (Vermillion Trl) at TH 3 will be challenging due primarily to the presence of Union Pacific railroad tracks which the collector would need to cross directly north and east of Riverview Elementary School. Another construction constraint for this link would be the requirement to cross the Vermillion River approximately 275 feet west of TH 3 were the connection would take place.

It is unlikely that Union Pacific would allow a new at-grade crossing at this location, and bridging options would be very expensive. It is possible that Union Pacific would consider a new at-grade crossing here if current at-grade crossings were grade-separated or closed elsewhere on this line.

This location requires further coordination and study regarding the following factors:

- » Most of this linkage would be constructed within Empire Township, so the City needs to coordinate effectively with the Township on all analysis and decision-making. In addition, the potential linkage affects County roadways (CSAH 66, CSAH 64, and CSAH 50), so Dakota County would need to be included in the review process.
- » Need to better understand the transportation value of this connection relative to the City's overall roadway network.
- » Need to better understand the physical constraints referenced above, options to address these constraints, and costs associated with the options. Coordination with Dakota County, neighboring communities, and Union Pacific regarding potential removal of one or more at-grade crossings elsewhere on this line which could allow an at-grade design at this locations.

The Corridor D connection to TH 3 was assumed in the 2040 modeling and traffic projections as depicted in Figure 5.11. However, this connection would be contingent on the coordination and study efforts summarized above.

### **200th/203rd Street – 197th Street Connection**

Figure 5.7 depicts a future easterly extension of 200th/203rd St serving as a minor collector and connecting with 197th St at TH 3. This linkage was also identified in Farmington's 2030 Comprehensive Plan. This is a similar situation to the East-West City Collector – East location described above. The travel/connectivity value of this linkage relative to the overall local transportation network would need to be weighed against the construction challenges and associated costs associated with the creek and railroad. The City would need to coordinate closely with Empire Township regarding this study and potential implementation. While no County roadway is directly involved, the County would likely have an interest in this work due to its potential ramifications to County roads in the area. MnDOT would also have an interest due to the linkage at TH 3.

The 200th/203rd Street extension to TH 3 at 197th St was assumed in the 2040 modeling and traffic projections as depicted in Figure 5.11. However, this connection would be contingent on the coordination and study efforts summarized above.

### CSAH 64/Flagstaff Avenue Commercial Node

As addressed in the Land Use chapter of this 2040 Comprehensive Plan Update, western portions of the City are becoming increasingly important future development areas as parcels formerly held as agriculture preserve are being withdrawn from that status. The intersection of Flagstaff Ave and CSAH 64 (195th St) as depicted in Figure 5.12 will be a very important intersection for this development. It is anticipated that this node will be developed within the next ten years.

As discussed previously, CSAH 64 (195th St) will be extended north and west to connect with CSAH 60 (185th St in Lakeville) as part of Corridor C depicted in Figure 5.9. The City understands that Dakota County refined its initial alignment for this corridor in the Phase II East-West Corridor Preservation Study. However, the City will continue to coordinate with the County regarding roadway timing and design considerations as the CSAH 64/Flagstaff Ave commercial node advances. Transportation and access design considerations will be addressed in anticipated master planning for this area.

### Trunk Highway 3

As discussed previously, projected 2040 traffic volumes exceed capacity for TH 3 north its current 4-lane segment which ends at Main Street. Future increases in volumes will be driven to an important degree by adjacent development, including the Seed Genstar AUAR area. MnDOT has identified ultimate expansion of the current 2-lane portion of TH 3 to 4-lane for some time. However, funding is not available for this expansion, and it appears unlikely that such funding will be available into the foreseeable future. Thus, it will be very important to effectively manage access to TH 3, including the evaluation and implementation of individual improvement projects in a strategic manner. Turn lane needs on TH 3 should follow the policies in MnDOT's Road Design Manual (Chapter 5).

Dakota County's 2018 Principal Arterial Study recommends that TH 3 ultimately be upgraded to a principal arterial classification. Such a reclassification would reinforce the need for capacity and access management improvements for this corridor.

MnDOT's TH 3 Access Management Plan (2004) is somewhat dated, but is still considered the guiding document in terms of managing access along this stretch of TH 3. The City of Farmington will continue to coordinate with MnDOT, Empire Township, and Dakota County regarding capacity, access, and safety improvements along TH 3. As the Seed Genstar area develops north of CSAH 64 (190th St), it will be very important that access from this area to TH 3 be designed consistent with MnDOT spacing requirements as identified in the 2004 study. This includes ½ mile spacing for primary, full movement intersections.

## Transit

The Metropolitan Council has categorized Farmington as being Transit Market Area IV:

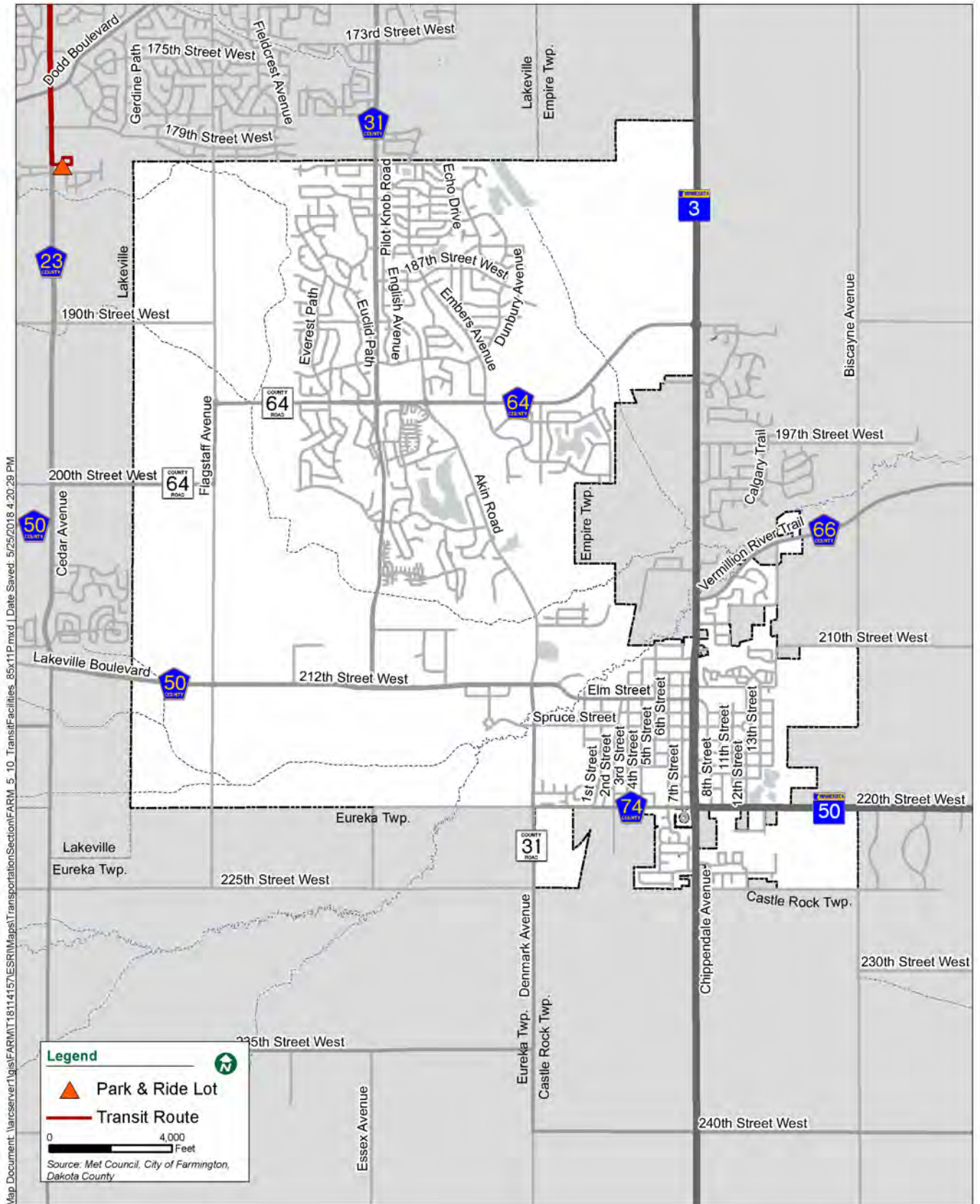
*Transit Market Area IV has lower concentrations of population and employment and a higher rate of auto ownership. It is primarily composed of Suburban Edge and Emerging Suburban Edge communities. This market can support peak-period express bus services if a sufficient concentration of commuters likely to use transit service is located along a corridor. The low-density development and suburban form of development presents challenges to fixed-route transit. General public dial-a-ride services are appropriate in Market Area IV. (2015 Farmington System Statement, Metropolitan Council)*

There currently is no scheduled transit service within Farmington. The closest transit service is Minnesota Valley Transit Authority (MVTA) Route 477. This is a commuter route with morning and late afternoon service to and from downtown Minneapolis. Route 477's southerly terminus is the Lakeville Cedar Park & Ride at CSAH 23 (Cedar Avenue) and 181st St in Lakeville (see Figure 5-10).

Red Line Bus Rapid Transit (BRT) service currently extends from the Apple Valley Transit Station to the Mall of America Transit Center along the CSAH 23/TH 77 (Cedar Avenue) corridor. The Apple Valley Transit Station is approximately three miles north-northwest of the City of Farmington. Proposed extension of Red Line service to a future station at CSAH 23 (Cedar Avenue) and CSAH 70 (215th St) in Lakeville is identified in the Cedar Avenue Transitway Implementation Plan Update (December 2015).

Dial-a-Ride services in the Farmington area are available through Transit Link, a service of the Metropolitan Council.

Figure 5.13 Transit Facilities and Service



Map Document: \\arscserver1\gis\FARMAP\18114157\ESRIMaps\Transportation\Section\FARM\_5\_10\_TransitFacilities\_85x11P.mxd | Date Saved: 5/25/2018 4:20:28 PM

# Bicycling and Walking

## LOCAL FACILITIES

Good bicycling and walking facilities in Farmington are key to promoting transportation alternatives and enhancing overall quality of life for City residents. The current non-motorized transportation conditions may generally be characterized as follows:

- » The portions of Farmington developed with a traditional street grid pattern, including downtown and the residential areas in the southeast portion of the city, are well served by sidewalks; the newer development area north of TH 50 (220th St) and east of TH 3 also has a comprehensive sidewalk network.
- » The more recent residential developments in the northern portion of the city typically have sidewalks and/or multi-purpose trails adjacent to the higher volume local streets.
- » Multi-purpose trails currently are located adjacent to major County and City roadways, including CSAH 50 (212th St/Elm St), CSAH 31 (Pilot Knob Rd), CSAH 64 190th/195th St, and Akin Rd.
- » City parks generally have trails that connect to the local trail network.

The current and planned trail facilities are depicted in Figure 5.14, which was prepared by the city's Parks and Recreation Department. It can be seen that future city trail alignments generally correspond with future collector roadways. The city's policy regarding new roadways is to provide the non-motorized transportation facilities as summarized below:

Collector Roadways (Major and Minor):

- » Multi-purpose trail on one side, sidewalk on the other side.

Local Streets:

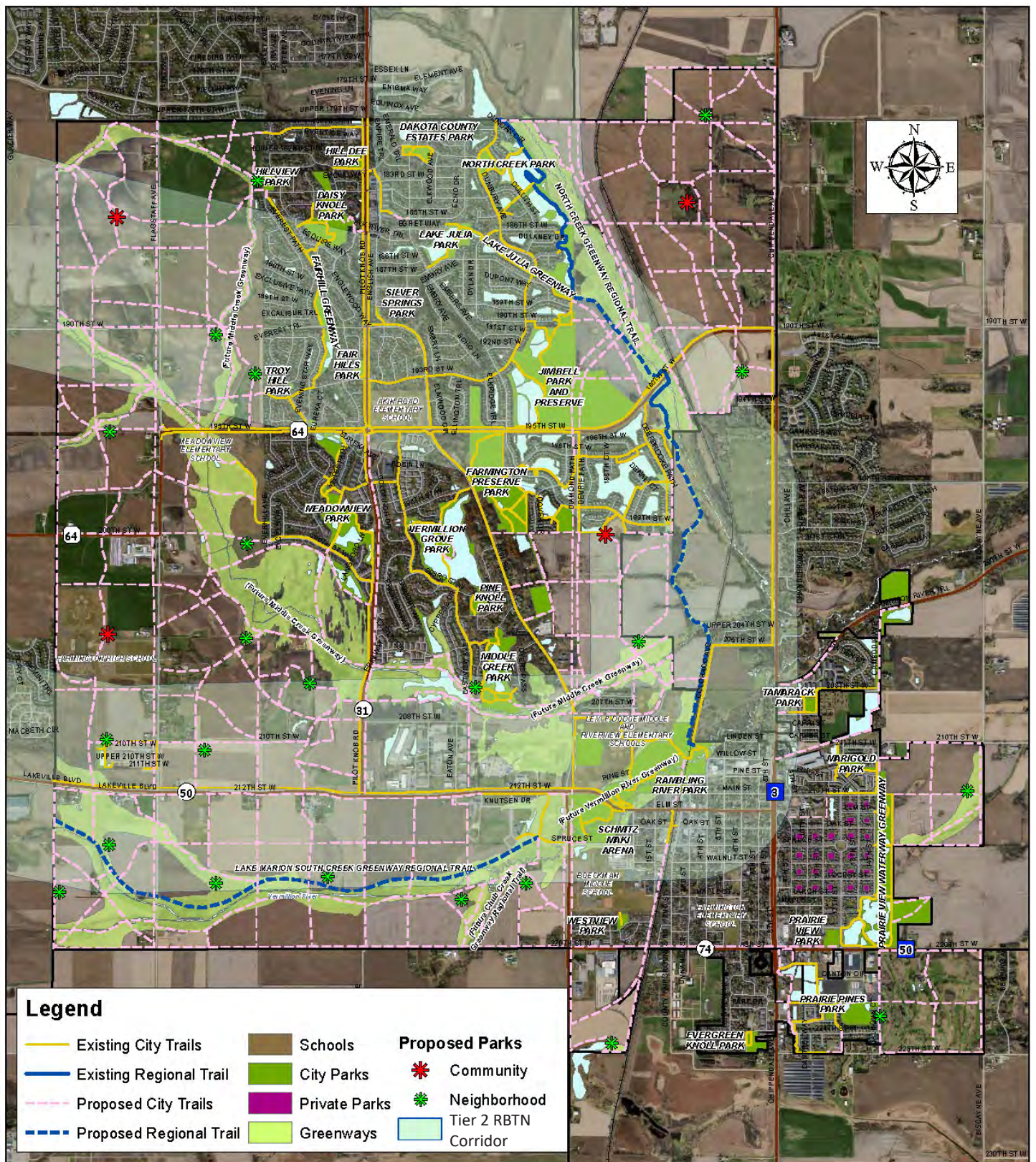
- » Sidewalk on, at minimum, one side; both sides if conditions allow.

Potential barriers to the trail and sidewalk system serving the city:

- » TH 3
- » TH 50 (220th St), east of TH 3
- » CSAH 50 (212th St/Elm St), west of TH 3
- » CSAH 31 (Pilot Knob Rd), north of CSAH 50
- » CR 31 (Denmark Ave), south of CSAH 50
- » Union Pacific railroad tracks (generally north-south orientation through the eastern portion of the city)
- » Waterways including: Vermillion River, Middle Creek, South Creek, North Creek
- » Flagstaff Ave
- » Gaps in connections to existing development and current facilities
- » Gaps in walking routes to schools



Figure 5.14 Existing and Proposed Park, Trail, and Open Space Plan with RBTN



Map dated June, 2019.

0 1 2 Miles

Prepared for the Farmington Parks Department by the Dakota County Office of GIS.

The city anticipates that it will be performing a Bicycle and Pedestrian Master Plan in 2018. Addressing the barriers referenced above will be an important part of this project.

## REGIONAL TRAILS

### Dakota County Trails

The City of Farmington has worked with Dakota County on a regional trail system plan. This includes two approved master planned regional greenway corridors in Farmington; Lake Marion (South Creek) Greenway and North Creek Greenway, as depicted in Figure 5.14. The Chub Creek greenway corridor has also been identified as depicted in Figure 5.14, but it has not yet been master planned. As a result of participating in this regional planning, the City will be connected to regional parks and trails, not only in Dakota County, but throughout the metro region as well.

### Regional Bicycle Transportation Network (RBTN)

The Metropolitan Council has defined the Regional Bicycle Transportation Network in an effort to establish “an integrated seamless network of on-street bikeways and off-road trails to most effectively improve conditions for bicycle transportation at the regional level and to encourage planning and implementation of future bikeways by cities, counties, parks agencies, and the state, in support of the network vision.”

The network, as seen in Figure 5.14, is broken into two tiers of bicycle corridors. Tier 1 Priority corridors are the highest priority for regional transportation planning and investment. They were determined through the Metropolitan Council’s Regional Bicycle System Study (2014) to provide the highest transportation function by connecting the most regional activity centers through the developed urban and suburban areas of the region. Tier 2 corridors have less potential for regional use and should be given the second highest priority for transportation investment.

There are three Tier 2 RBTN corridors in Farmington. These corridors, along with local/regional planning considerations are summarized below:

- » Along CSAH 50 between the westerly city limit and downtown. A multi-purpose city trail exists on the north side of CSAH 50 from the westerly city limit, to Division St with sidewalk east of Division St.
- » Generally along a potential future alignment of a southerly extension of Diamond Path (County Road 33) or North Creek – It is not known if this extension will be constructed or what the potential timing of development would be, or ultimate jurisdiction.
- » In the general vicinity of Corridor C and Corridor D from Dakota County’s East West Corridor Preservation Study (see Figure 5.9). Presumably this alignment would be along a roadway corridor.

The City does not have any regional activity centers or employment clusters according to the RBTN.

RBTN Corridors are conceptual, and actual connections between local facilities and potential future RBTN facilities are not known at this time. The City will coordinate with Dakota County and the Metropolitan Council regarding further evaluation of these RBTN corridors.

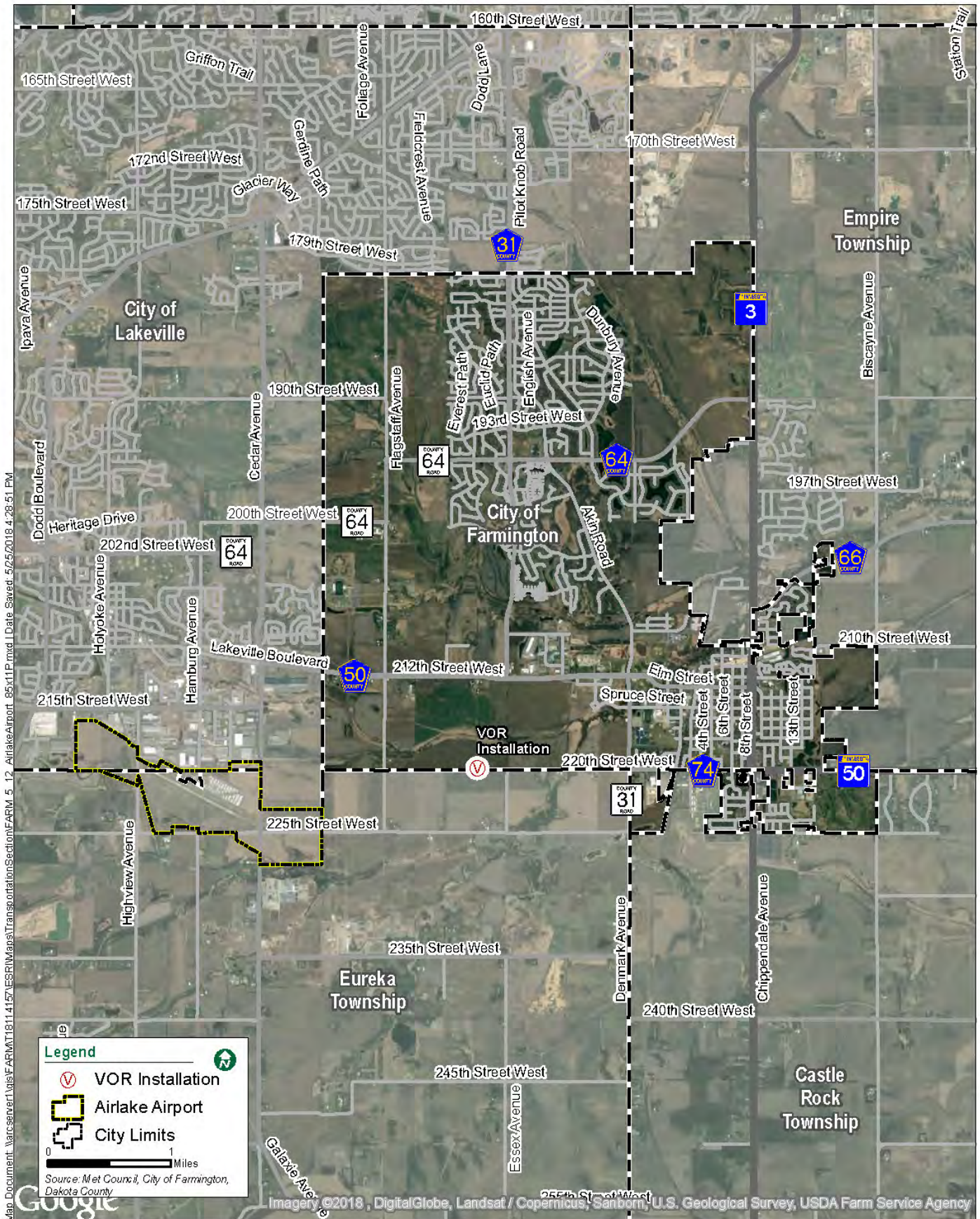
## Aviation

There are no existing or planned airports within Farmington. However, the City has a responsibility to account for airspace protection in the comprehensive plan. Airspace protection should be included in local codes/ordinances to control height of structures, especially when conditional use permits would apply. The City has included this in Section 10-4-5 of the City Code. Any person(s) proposing a structure of two hundred feet or more above ground level within the City limits shall obtain approval by the Federal Aviation Administration (FAA) and the MnDOT. Any proposed construction or alteration must include notification to the FAA should such activity contain a potential hazard to air navigation or electronic interference as defined by federal regulation CFR – Part 77.

There are two existing regional aviation facilities that affect or potentially affect the City of Farmington: a) the Farmington VHF Omnidirectional Range (VOR) installation, and b) Airlake Airport located southwest of the City. The Farmington VOR is located in the southwest corner of the City west of Denmark Avenue along 220th Street West as depicted in Figure 5.15. It is a radio navigation aid that is owned and operated by the Federal Aviation Administration (FAA). FAA owns the access to the VOR off 220th Street, as well as an area approximately 125 feet surrounding the VOR. According to the FAA Advisory Circulars, no objects can be above the height of the VOR within 500 feet of the facility.

Airlake Airport (FAA Identifier LVN) is a reliever airport in the Metropolitan Airport Commission (MAC) system. As depicted in Figure 5.15, it primarily lies within the borders of Eureka Township, and a small portion is within the City of Lakeville. It has one paved runway (12/30), which is 4,099 feet long and 75 feet wide. The eastern-most edge of Runway 12/30 is approximately 4,000 feet (0.76 mile) west-southwest of the southwest corner of the Farmington City limits. Based on the Airlake Airport 2035 Long-Term Comprehensive Plan (LTCP, adopted April 2018), approximately 137 aircraft were based at LVN in 2015, and the facility accommodated approximately 37,000 aircraft operations (takeoffs and landings).

Figure 5.15 Airlake Airport



Farmington lies outside of “Zone A” and “Zone B” of the LVN Runway 30 end (to the east, closest to Farmington), and thus is not subject to associated zoning restrictions based on MnDOT guidelines to ensure compatible land uses with airport operations. The 2035 LTCP for LVN identifies an ultimate extension of Runway 12/30 to 4,850 feet (271 feet added to the Runway 12 end, and 480 feet added to the Runway 30 end). As identified in the 2035 LTCP, this would necessitate relocating a portion of 225th Street in Eureka Township, but would not affect CSAH 23 (Cedar Avenue).

Given that Farmington is not within either flight path of Runway 12/30, noise from Airlake has not been a significant problem for Farmington residents or businesses. The noise contours for the proposed runway extension at LVN do not enter City property. There is no known reason why this would change in the future. The MAC does not identify future land/easement acquisition within or adjacent to Farmington.

## Freight

One railroad passes through the eastern portion of Farmington on generally a north-south alignment (see Figure 5.1). It is a Union Pacific line, and MnDOT information indicates that approximately 11 trains per day pass through Farmington on it. There are three at-grade roadway crossings of this line in Farmington at CSAH 74 (Ash St), Spruce St, and CSAH 50 (Elm St), and one grade-separated crossing at CSAH 64 (190th St).

There are no manufacturing or distribution centers in Farmington, or major commercial areas, and there are no notable local roadway issues or problem areas for goods movement. As such, freight movement is not a major factor for the City. Existing heavy commercial (truck) traffic volumes are depicted in Figure 5.1.

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# 6 ■ WATER RESOURCES

## Introduction

Management of the region’s water supply, protection of surface water resources, and treatment of its wastewater directly affect the health of citizens of all municipalities. A growing metro population with increasing water-related demands presents a challenge to the Metropolitan Council’s mission that is reflected in the 2040 Water Resources Policy Plan: protect ground and surface water resources so that the region will continue to have a safe and adequate water supply.

Farmington’s Comprehensive Sanitary Sewer Plan, Water Supply and Distribution Plan, and Local Surface Water Management Plan all correspond to the background and forecast information provided in the land use chapter of this 2040 Farmington Comprehensive Plan. Summaries of each of these plans, respectively, are provided under the following headings. **The full plans are stand-alone documents being routed for review separate from this Comprehensive Plan consistent with Metropolitan Council and other applicable agency requirements.** This 2040 Comprehensive Plan formally incorporates the full plans as summarized below.

## Comprehensive Sanitary Sewer Plan

The City of Farmington was connected to the Metropolitan Council Environmental Services (MCES) trunk sanitary sewer system in 1977 when the Empire Wastewater Treatment Facility replaced the City of Farmington Wastewater Treatment Facility. The MCES provides wastewater treatment at Empire for the Lakeville, Apple Valley, Rosemount, Farmington, Empire, and the Elko-New Market areas. Phase 1 of the Elko New Market Interceptor was completed in 2011.

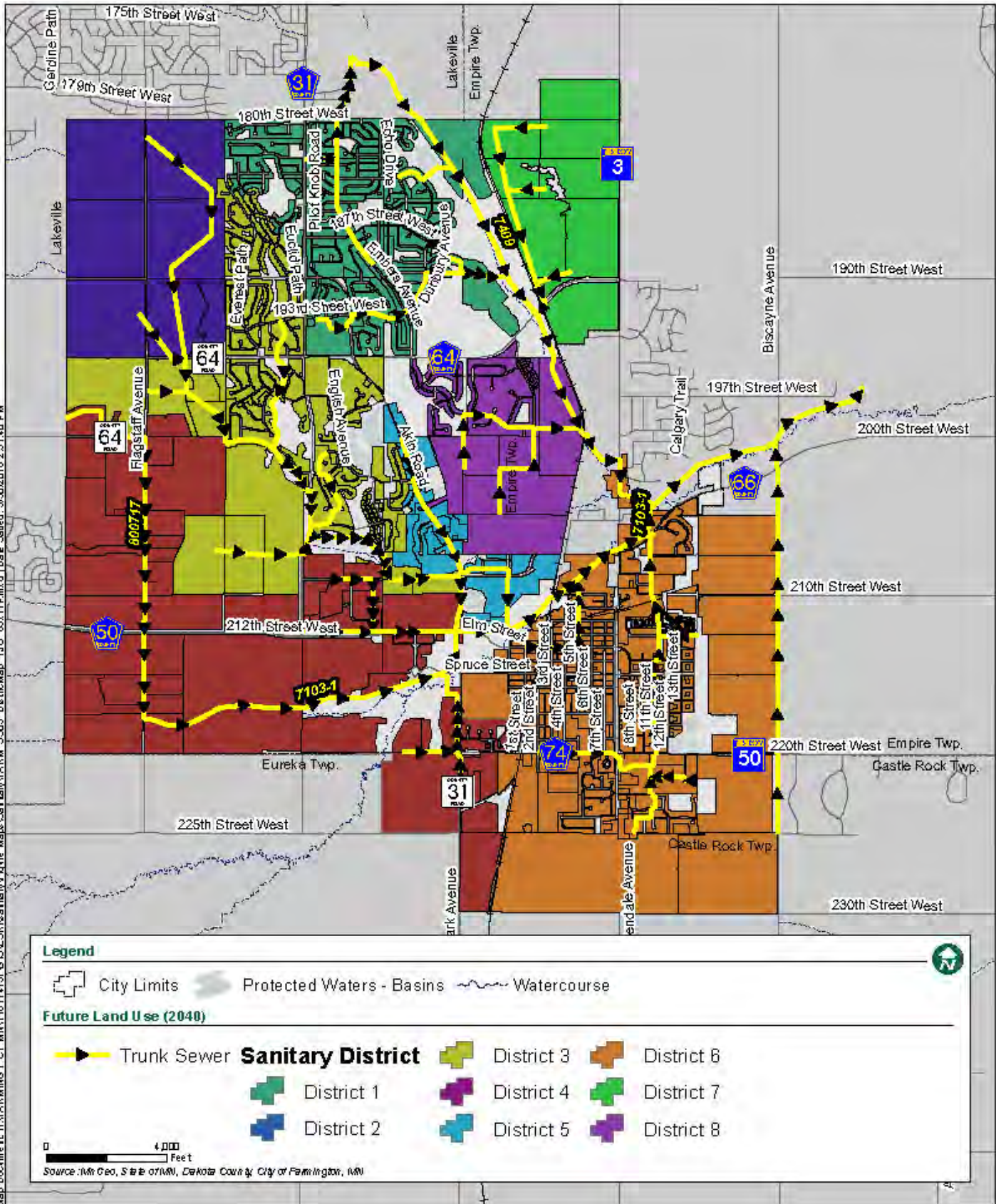
**Figure 6.1 Sewershed District Map**



City of Farmington, MN 55120

May 2010

Real People. Real Solutions.





The Phase 2 portion of the proposed interceptor was not included in this comprehensive plan since the estimated construction date for that interceptor is 40-50 years out.

The City of Farmington has eight major sewer districts, named Districts 1 through 8, which define the limits of service for a separate trunk system. These districts are depicted in Figure 6.1. The City's existing and proposed sanitary sewer system for 2040 is shown in Figure 6.2. The existing trunk system, which covers areas D1, D3, D4, D5, D6, and D8, is shown in red lines. Two trunk lines (in magenta) are proposed to serve areas D2, and D7 in the future. The trunk line to D2 in the far northwest portion of the City is currently not planned to be installed until after 2030. Additional proposed trunk lines are also shown in areas D4 and D6 as possible new trunk lines depending on the timing of Phase 2 of the Elko- New Market Interceptor.

Projected MUSA acreage is summarized in Table 6.1.

Farmington's trunk sanitary sewer system discharges to three existing MCES interceptors that travel through the City as depicted in Figure 6.2. Interceptor #7103-1 (Lakeville-Farmington Interceptor) enters Farmington from Lakeville to the west, and districts D2, D3, D4, D5, and D6 discharge to this interceptor. Interceptor #800717 (Flagstaff Interceptor) enters Farmington from Lakeville to the west near 200th Street and carries flow from district D2. Interceptor #7409 (Apple Valley Interceptor) enters Farmington from Lakeville to the north, and also carries sewer flow from Apple Valley and Rosemount. Districts D1, D7, and D8 discharge to this interceptor.

Modeling of the sanitary sewer system was based on a variety of parameters, such as: land use, population density, standard wastewater generation rates, topography, and future land use plans. Based on the topography of the undeveloped areas, the sewersheds were created and the most cost-effective locations for future trunk line facilities were determined. The location of smaller sewer laterals and service lines are dependent upon future land development plats and cannot be accurately located from a study of this type.

**Table 6.1 MUSA Summary**

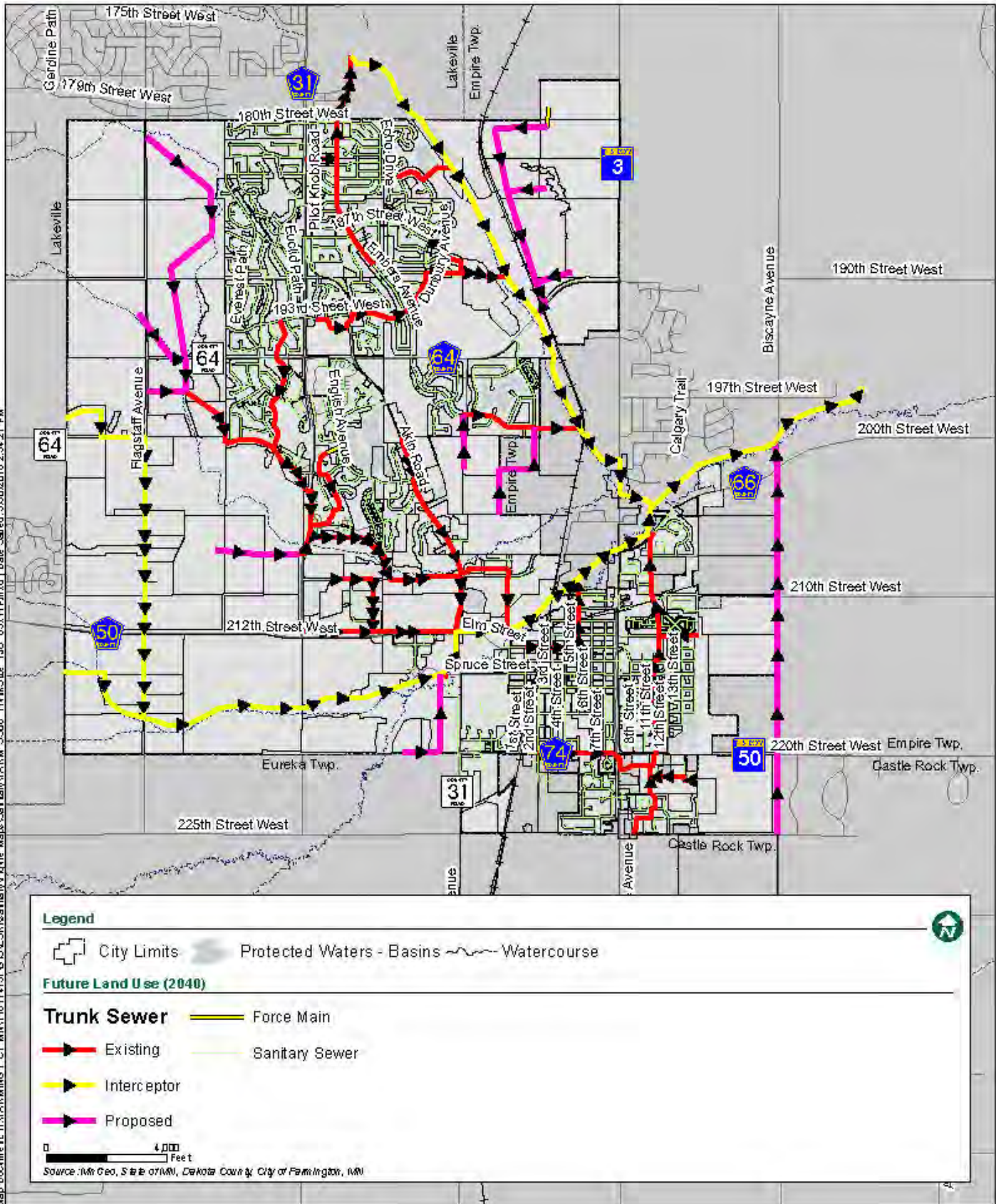
BOUNDARY	ACRES
2020	6,690
2030	6,773
2040	8,853

**Figure 6.2 Trunk Sewer Map**

City of Farmington, Minnesota

May 2010

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## INFLOW / INFILTRATION

Inflow and infiltration (I/I) are the ways that clear water (stormwater and groundwater) makes its way into sanitary sewer pipes, potentially causing basement backups and taking up capacity in sewers and wastewater treatment plants.

The addition of clear water into the local sewer systems creates multiple problems:

- » Additional flow takes up capacity that was built to accommodate wastewater flow from existing and new development. In some cases, the additional flow causes flows to exceed the available sewer system capacity. When the capacity of the sewer is exceeded, the wastewater backs up into basements or spills out of a manhole causing water quality concerns.
- » Clear water that gets into the wastewater system is eventually treated and discharged into the rivers.
- » The Metropolitan Council charges communities the same rate for its clear water as it does for sewage. Therefore, communities have a fiscal as well as a public policy reason for ensuring that the total system functions effectively and conforms to regulations.

### Sources, Extent, & Significance of Existing I/I

The City sewer flows are impacted by both infiltration and inflow. The sources of I/I are the municipal and private sewer systems. In the case of infiltration, groundwater seeps into cracked or broken wastewater pipes. Infiltration is a steady contributor to the problem, causing water that should be filtering down and recharging the region's aquifers to end up in rivers. With inflow, clear water enters the wastewater system through sources including rain leaders, storm sewer cross connections, sump pumps or foundation drains that are connected to sewer lines. Private service laterals can also be a source of inflow. Factors that contribute to their susceptibility include age, condition, pipe material, construction, soils, and water table elevation. The sources of I/I within the private sewer system include: sump pumps discharging into sanitary sewer lines, and service line issues including cracking, root intrusion and non-sealed joints.

The City has done extensive work to identify and reduce I/I sources. A full description of this analysis can be found in the Comprehensive Sewer Plan in Appendix D.

Currently the City of Farmington has approximately 2100ac of residential zoned land or 5896 parcels. Of those parcels, 1238 were construction pre-1970 and are prone to causing inflow and infiltration issues in the sanitary sewers. The City has been systematically replacing the sanitary sewer in these areas since 2005 and has substantially decreased their I/I. A map of the pre-1970 properties can be found in Appendix D.

District 6 was largely constructed pre-1970. A recent I/I analysis of this district was completed by Bolton & Menk, Inc. The results of the analysis showed little to no evidence of inflow in the system and approximately a 30 gpm or 18% increase in baseflow due to infiltration during wet weather periods. A full copy of the memo regarding the I/I analysis of district 6 can be found in Appendix D

### **Requirements & Standards for Minimizing I/I**

Section 8-2-8 of the City's Code of Ordinances prohibits discharge of clean water sources into the city's sanitary sewer system and requires the disconnection of such sources. These sources include any roof, surface, groundwater sump pump, footing tile or swimming pool or other natural precipitation into the city sewer system. A copy of the ordinance can be found in Appendix F.

The majority of I/I in the City is caused by deterioration of the existing VCP pipe system, manhole deterioration, illegal building connections to the sanitary service line, and private service line issues. To reduce I/I within the City, the programs and improvements include:

1. Sanitary sewer main lining
2. Manhole replacements
3. Sewer line replacements
4. Flow testing to further identify problem areas
5. Ongoing maintenance projects or activities
6. Foundation drain disconnect program (future)

The City of Farmington will continue to proactively identify I/I sources and take corrective actions.

### **I/I Reduction Goals and Strategies**

The Metropolitan Council identified Farmington as a community with at least one Infiltration and Inflow (I/I) exceedance event recorded between June 1, 2004 and June 30, 2006, and assessed a surcharge to begin in 2007 and last for five years, until 2011. A letter from the MPCA dated September 20th, 2010 states:

*June 30th, 2010 marked the end of the exceedance measurement period under the current I/I program. However, the council will continue to monitor the peak wet weather flows from the City and notify the City of peak I/I events in excess of your goals.*

The City has continued its I/I reduction plan and is currently meeting the MPCA requirements. The plan outlines six components to reduce the I/I within the city.

The six components are as follows:

1. Monitor wastewater flow in the City System
2. A sump pump cross connection inspection and removal program
3. A program to investigate known or suspected areas of foundation drains, leaking, cleanouts, and leaking services
4. A manhole inspection and repair program
5. Ongoing sewer cleaning, televising, and repair program
6. Stringent requirements for new sanitary sewer and home construction.

Further I/I information is provided in the Comprehensive Sanitary Plan provided as Appendix D to this 2040 Comprehensive Plan.

The full Comprehensive Sanitary Sewer Plan (Appendix D) provides an inventory of City of Farmington's existing sanitary sewer trunk facilities and a guide for expanding the trunk sewer system to service future development in the City. Based on the information analyzed and summarized in that study, the following outcomes are desired:

1. That the Metropolitan Council use the City's flow projections in determining the appropriate capacity for its own facilities.
2. That the City Council adopt the sanitary sewer layout, as presented in the Trunk Sewer System Map, as the development guide for sanitary sewer construction within the study area.
3. That the system design flows and criteria in Appendices C and D of the full Comprehensive Sanitary Sewer Plan be used for sizing all future sanitary sewer trunk facilities, but that flow projections of Section 2 of the full Plan be used when representing the impact of Farmington's system on the Metropolitan Disposal System and the Empire Wastewater Treatment Facility.

# Water Supply and Distribution Plan

Water needs will continue to increase as the City grows to the estimated 2040 population. This section addresses the supply, distribution and storage needs criteria that should be followed as growth continues in the community. Part of the need is to address water conservation efforts of the City and regional sustainability of the underlying aquifers.

## WATER SYSTEM DESIGN CRITERIA

The City of Farmington's existing average daily demand is approximately 1.93 million gallons per day (MGD) and the maximum daily demand is approximately 5.33 MGD. The projected demands for 2040 are 2.86 MGD and 7.72 MGD for average daily and maximum daily demands respectively.

The City's recommended firm water supply capacity is 5.33 MGD for the existing system and 7.72 MGD for the future system. The recommended water storage volume for the current system is 2.49 million gallons (MG) and the future system has a recommended storage volume of 3.65 MG.

Watermains should have a minimum working pressure of 35 pounds per square inch (psi) with normal working pressures ranging from 60–80 psi. Pipe velocities should be between 2 and 5 feet per second on average.

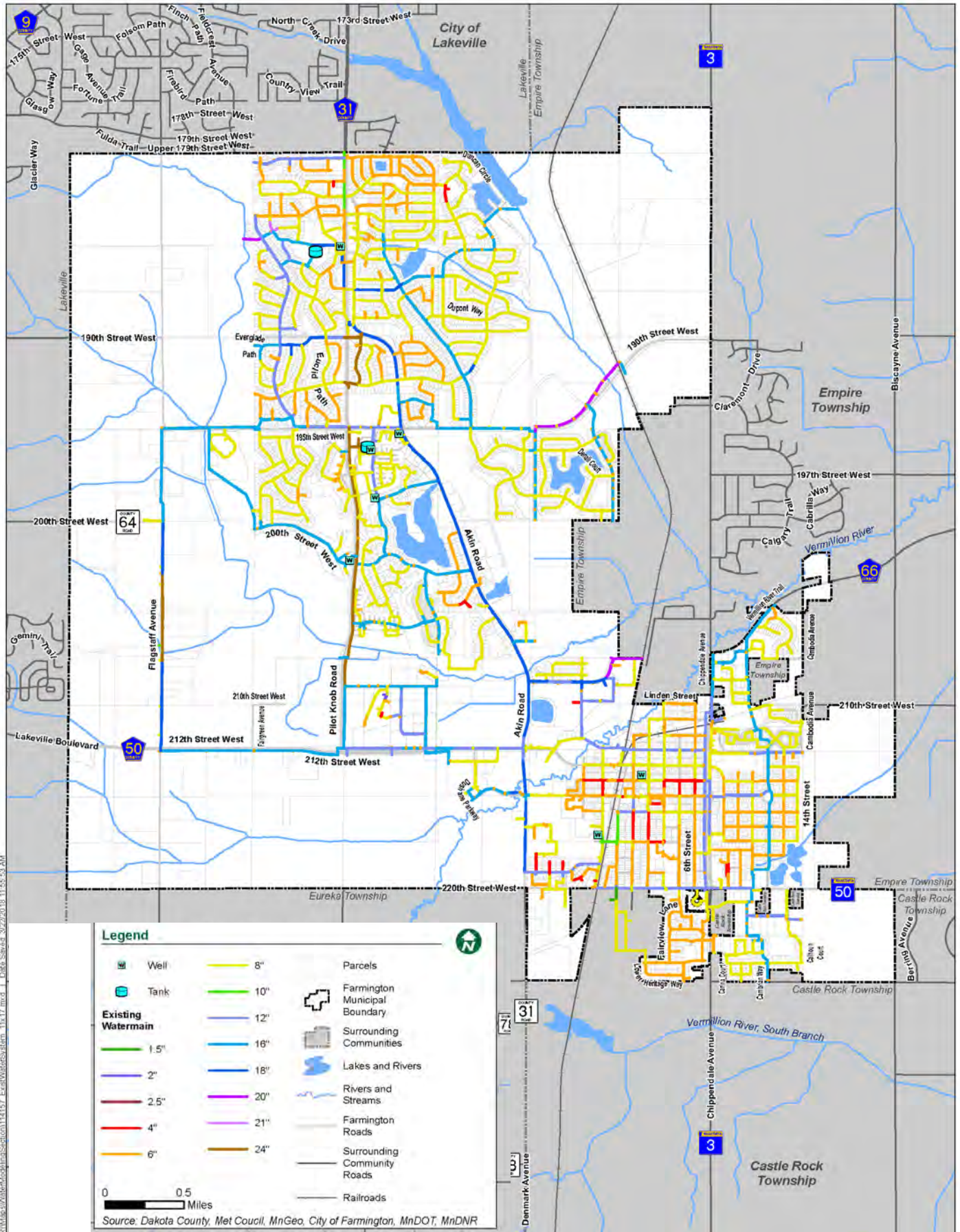
A water model of Farmington's system was developed for evaluation purposes. This model was used to predict the City's pressure, fire flows, pipe velocities, and headloss throughout the system. The model was also used to simulate the future system, predict the impact of future growth, and the effect of future water system infrastructures.

## EXISTING WATER SYSTEM FACILITIES AND INFRASTRUCTURE

The City's existing water supply infrastructure is presented in Figure 6.3. This system consists of seven active wells, one elevated storage tank, one standpipe, and a network of trunk and lateral watermains varying in sizes from 4-inches to 24-inches. The Farmington water system is contained within a single pressure zone.

Farmington's existing firm capacity is 10.37 MGD or 7,200 gallons per minute (gpm); however, a municipal well's typical lifespan is approximately 40 to 60 years. Well No. 1 has exceeded 60 years of service, Well No. 3 has served the City for approximately 60 years, and Well No. 4 has served the city for roughly 45 years. Without Well No. 1 and Well No. 3, the City's remaining firm capacity is 8.06 MGD or 5,600 gpm. Without Well No. 1, Well No. 3, and Well No. 4, the remaining firm well capacity is 6.62 MGD or 4,600 gpm. The City of

**Figure 6.3 Existing System**



Farmington also shares an interconnection with the City of Lakeville to be used in case of an emergency.

The City of Farmington has two storage tanks: a 1.5 MG elevated storage tank and a 0.67 MG standpipe. While the total storage capacity is 2.27 MG, the effective storage capacity is 1.79 MG, as the standpipe has an effective storage capacity of 0.29 MG.

The City of Farmington treats raw water with fluoride, chlorine and polyphosphate at each well house prior to entering the distribution system. No other treatment is provided.

The existing distribution system consists of watermains varying from 4-inches to 24-inches in diameter. Most of the City's watermains are constructed of ductile iron pipe (DIP), with older parts of the City being served by cast iron pipe (CIP). Static pressure readings as reported within the system generally range from approximately 45 pounds per square inch (psi) to 100 psi.

The City's drinking water meets all primary drinking water standards, as indicated in the 2017 Consumer Confidence Report. The City also meets most secondary aesthetic water quality standards, except for iron and manganese. The aesthetic quality of the water due to iron and manganese does not support further treatment at this time.

## **WATER CONSERVATION**

Water conservation can include a broad range of techniques and strategies from the addition of rain barrels to capture rainfall for lawn irrigation, to drip irrigation systems for larger gardens, to even replacing regular household appliances with energy and water-efficient appliances. This section of the full Water Supply and System Plan addresses concepts for reducing water use, peak day demands along with the current water rates, and water losses throughout the system.

Farmington currently has an ordinance for odd-even day watering that has helped reduce peak day and seasonal demands. The City has also been proactive in implementing an increasing block rate structure that bills more for higher water usage. This has helped reduce water usage over the past years.

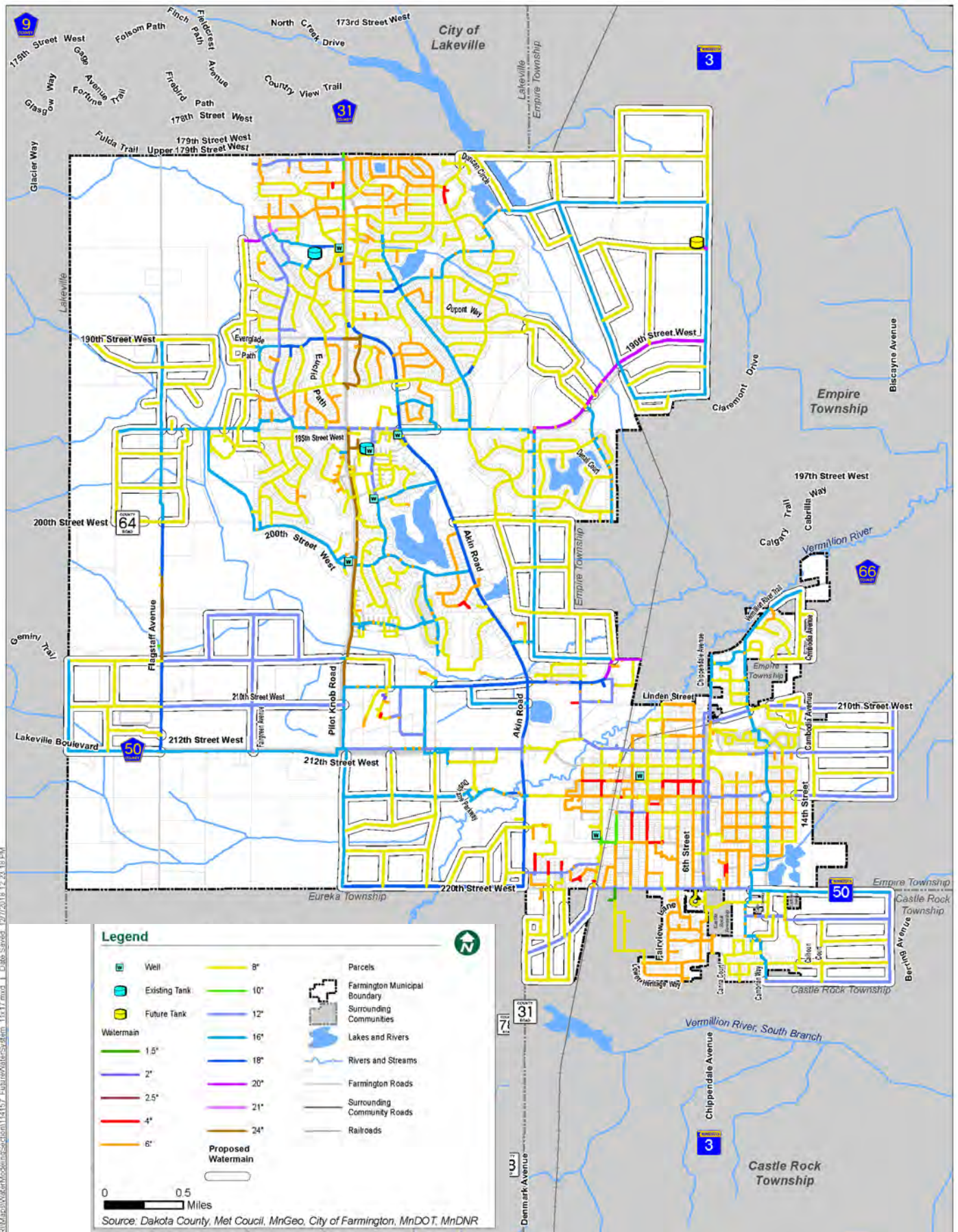
Farmington's unaccounted for water is estimated at approximately 8.5 percent. This is within the DNR's recommendation of maintain unaccounted for water below than 10 percent. The City periodically conducts a leak survey as needed, when monthly water audits indicate a leak is occurring.

## **RECOMMENDED FUTURE IMPROVEMENTS**

The City currently has sufficient water supply capacity for the existing system; however, a few of the supply wells have surpassed or will surpass their typical life expectancy during the 20 year design period.



**Figure 6.4 Future Water System**



With the loss of these wells, it is recommended that the City install at least one replacement well having a capacity of 1.10 MGD or a 770 gpm well prior to all three wells being removed from service.

Farmington's existing recommended storage volume is 2.49 MG and the future recommended storage volume is 3.65 MG. Farmington's existing effective storage volume is 1.79 MG, so the City is deficient in their recommended storage volumes by 0.70 MG for the existing system, and 1.86 MG for the future system. It is recommended the City install a 2.0 MG storage tank or install a 1.0 MG tank with the intent of installing another 1.0 MG tank by 2022.

Farmington's raw water quality is moderately high in iron and manganese. Secondary standards are indicative of aesthetic water quality and does not necessarily constitute a health hazard; however, the City may choose to treat iron and manganese based on consumer complaints on water color and clarity.

Based on the water model referenced above, the City of Farmington appears to have adequate available fire flows and good pressure coverage except for a few areas, particularly dead-end lines. It is recommended that the City provide watermain loops or larger watermains in these areas where possible.

Figure 6.4 depicts the anticipated ultimate water distribution system. The City will continue to coordinate with adjacent communities regarding shared connections.

## Surface Water Resources

### BACKGROUND

The full Local Surface Water Management Plan (LSWMP) will serve as a comprehensive planning document to guide the City of Farmington (City) in conserving, protecting, and managing its surface water resources. The current LSWMP replaces the 2008 Farmington Local Surface Water Management Plan and may be periodically amended to remain current with local practices and policies.

The LSWMP was created to meet the requirements detailed in Minnesota Statutes 103B and Minnesota Rules 8410, administered by the Minnesota Board of Water and Soil Resources. It is consistent with the goals and policies of the Metropolitan Council's 2040 Water Resources Management Policy Plan.

Figure 6.5 Public Waters



Barr Footer: ArcGIS 10.4.1, 2018-03-29 10:39 File: I:\Client\Farmington, MN\Work\_Orders\SWMP\_23191355.00\Maps\Report\Figure 2-7 - Public Waters.mxd User: rcs2

2017 USDA NAIP Imagery via MnGeo

**PUBLIC WATERS**  
 Local Surface Water  
 Management Plan  
 City of Farmington, MN

The LSWMP is also consistent with the Vermillion River Watershed Joint Powers Organization (VRWJPO) Watershed Plan, adopted by the VRWJPO in June 2016. The VRWJPO plan provides a summary of water and natural resources within the watershed, and acknowledges the potential impact of urban development on the hydrology of the Vermillion River and adjacent resources. The City shares in the benefits and responsibilities of addressing those issues. The City will maintain full authority for watershed management permitting of land alteration activities within the City. The LSWMP must be consistent with the Watershed Plan, updated and approved as revisions are made. The full LSWMP was submitted to the VRWJPO for review and approved by the board on October 25, 2018.

## GOALS

Farmington is a growing community. Development and changes in land use will continue into the future and have the potential to decrease water quality, increase flooding, impact water resources, and increase public expenditures on surface water management. The goals identified in the LSWMP are to:

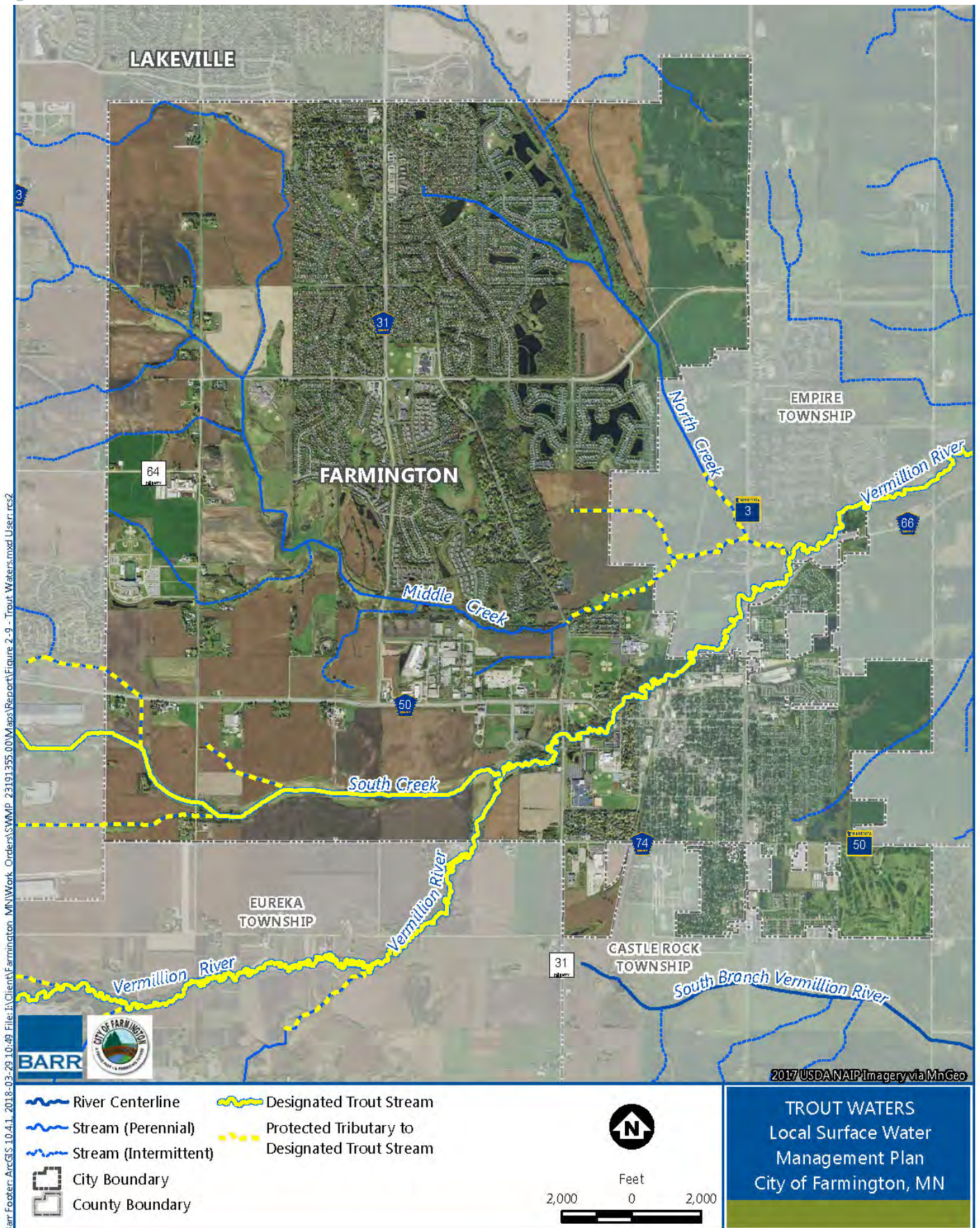
1. Effectively and responsibly manage local water resources.
2. Protect and enhance surface water quality in the city.
3. Provide flood risk reduction measures for persons and property, and manage the rate and volume of runoff entering rivers, streams, lakes, and wetlands within the city.
4. Protect groundwater quality and quantity to preserve it for sustainable and beneficial purposes.
5. Maintain and enhance the functions and values of wetlands within the city.
6. Preserve floodplains and manage adjacent uses to minimize flood risks and associated damages.
7. Develop or improve recreational open space areas, fish and wildlife habitat, and public accessibility in conjunction with water quality improvement projects.
8. Protect and conserve water and natural resources by promoting sustainable growth and integrated land use planning.
9. Increase public awareness of the function and value of surface water resources and the impacts associated human activities.
10. Maintain adequate funding for surface water management.

## INFORMATION SUMMARY

### Inventory

The city contains no public waters basins. There are six public waters wetlands within Farmington, identified by their public water inventory number in Figure 6.5. Public watercourses within Farmington include the main channels and tributaries of the Vermillion River, North Creek, Middle Creek, and South Creek. Portions of the Vermillion River and

Figure 6.6 Trout Waters



Barr Footer: ArcGIS 10.4.1, 2018-03-29 10:49 File: \\Client\Farmington\_MN\Work\_Orders\SWMP\_23191355\_00\Maps\Report\Figure 2-9 - Trout Waters.mxd User: rcs2

**Figure 6.7 Impaired Waters**

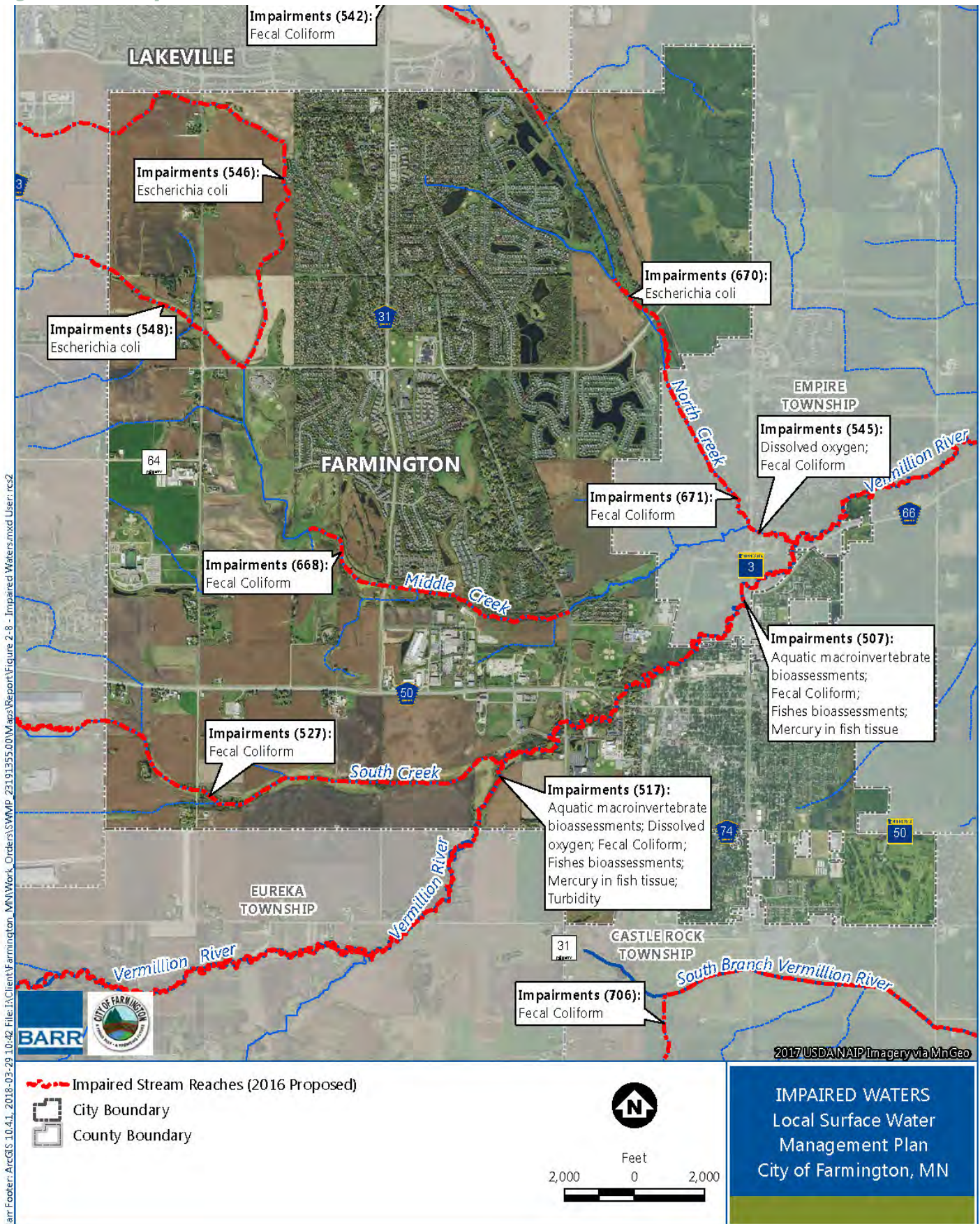
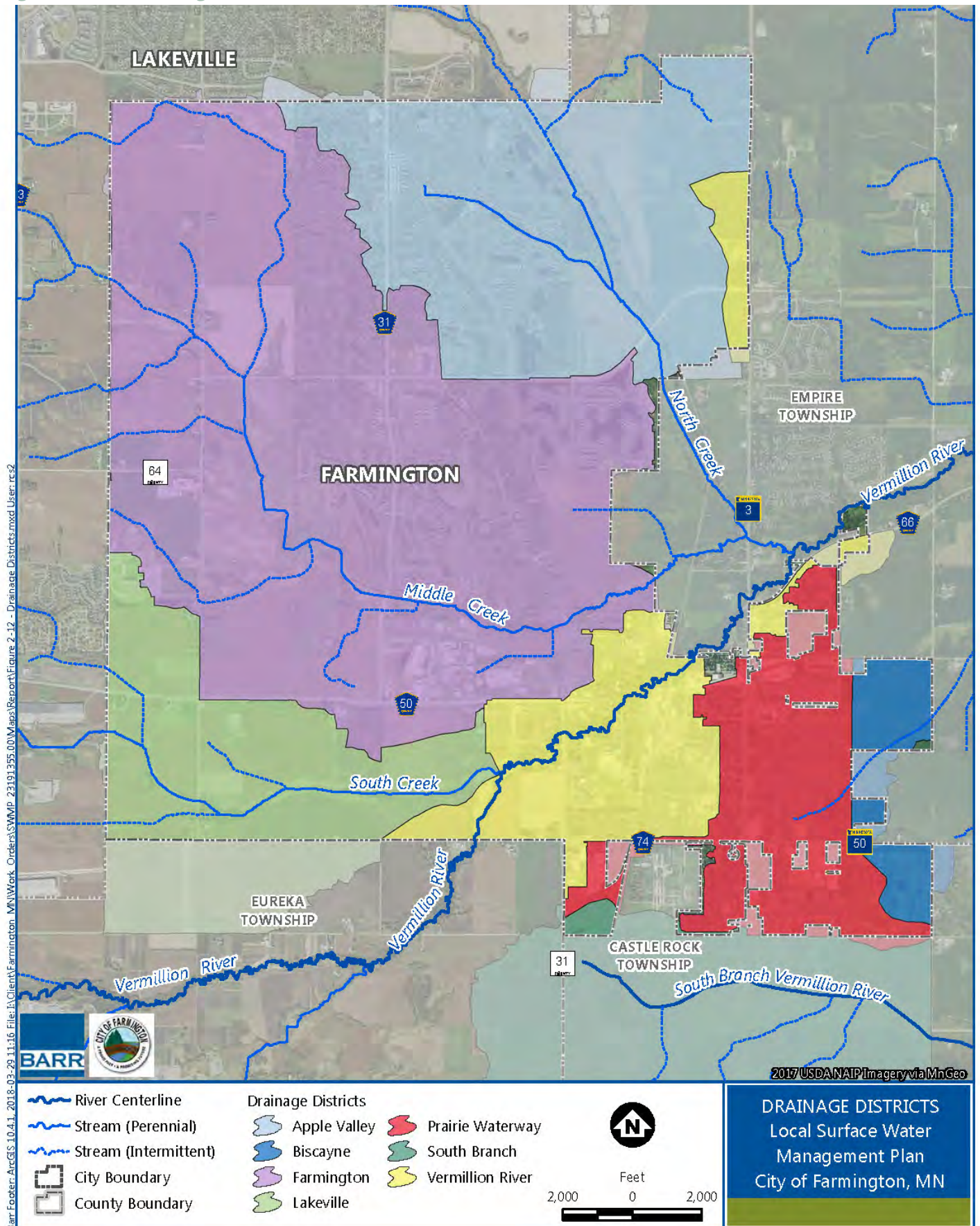


Figure 6.8 Drainage Districts



its tributaries are designated trout streams, listed in Minnesota Rule 6264.005, Subpart 4. Designated trout stream are shown in Figure 6.6.

The 2016 Impaired Waters List contains twelve water bodies that either lie within city boundaries or receive runoff from land within the city. These water bodies include sections, or “reaches”, of North Creek, Middle Creek, South Creek, the Vermillion River, and the South Branch of the Vermillion River, and are identified by the last three digits of their Assessment Unit Identifier (AUID) in Figure 6.7. The 2018 Impaired Waters List (still in draft form) does not include any new listings within Farmington.

### **Vermillion River Watershed Joint Powers Organization (VRWJPO)**

In 1982, the legislature approved the Metropolitan Surface Water Management Act, Chapter 103B of Minnesota Statutes. This act required all metro-area local governments to address surface water management through participation in a watershed management organization (WMO). The VRWJPO was established in September 2002 through a joint powers agreement between Dakota and Scott Counties, to protect the water resources in the Vermillion River watershed. The Vermillion River Watershed Joint Powers Board (VRWJPB), which governs the VRWJPO, consists of two Dakota County Commissioners and one Scott County Commissioner.

The Vermillion River watershed is approximately 335 square miles, and includes all or parts of the following cities: Apple Valley, Burnsville, Coates, Elko-New Market, Farmington, Hampton, Hastings, Lakeville, Rosemount, and Vermillion. In addition, all or parts of the following townships are in the Vermillion River watershed: Castle Rock, Douglas, Empire, Eureka, Hampton, Marshan, New Market, Nininger, Ravenna, and Vermillion.

The current Vermillion River Watershed Management Plan was adopted by the VRWJPO in June 2016. The plan provides an overview of the watershed’s physical and biological conditions and water quality, and includes a range of actions to protect and improve surface water and groundwater quality in the watershed. The plan also updates the Watershed Standards, which establish the actions local governments must take to provide an acceptable level of water management and protection. The city is required to implement codes and standards consistent with the Watershed Standards.

The VRWJPO has established intercommunity boundary standards for peak flow rate and runoff volume at locations where stormwater runoff crosses a municipal boundary from one community to another. The VRWJPO manages intercommunity boundary standards to



prevent increases beyond the capacity of downstream stormwater management systems. The City is required to maintain existing intercommunity flow rates unless otherwise specified by an agreement. In some cases, reduction of intercommunity flow rates below existing conditions may be necessary to resolve existing flooding issues downstream from the city.

The city has been divided into seven major drainage districts (Figure 6.8). Within these drainage districts the City maintains stormwater ponds to enhance water quality and provide runoff rate reduction. The City also maintains a storm sewer network to safely convey stormwater runoff into and between ponds and other surface waters.

### **Hydrologic/Hydraulic Analysis**

The city has been divided into seven major drainage districts (Figure 6.8). Within these drainage districts the City maintains stormwater ponds to enhance water quality and provide runoff rate reduction. The City also maintains a storm sewer network to safely convey stormwater runoff into and between ponds and other surface waters.

Recent (2014) updated hydrologic and hydraulic modeling analyses of the current stormwater system have identified several areas throughout the city where the desired 1-percent annual-chance event level of protection may not currently be provided. The City's storm sewer system and associated ponds were designed to minimize impacts to the extent reasonable and possible at the time the existing improvements were installed. However, it may not be feasible to achieve the 1-percent annual-chance event level of protection in all areas under current conditions. The City will place a high priority on providing 1 percent-annual-chance level of protection for the City's stormwater detention and conveyance systems, where detention is provided (e.g., low-point intersections, ponds, planned flood areas, etc.). Existing systems (level of service, conveyance, and detention) that currently do not provide 1-percent annual-chance level of protection will be modified to provide that level of protection when feasible.

### **Municipal Separate Storm Sewer System Permit**

The City is included in a group of communities with populations greater than 10,000 that are required to maintain a Municipal Separate Storm Sewer System (MS4) permit from the MPCA for managing non-point source storm water. The NPDES MS4 permit addresses how the City will regulate and improve storm water discharges. The SWPPP addresses six minimum control measures outlined in the permit requirements:

1. Public education and Outreach
2. Public Participation / Involvement
3. Illicit Discharge Detection & Elimination
4. Construction Site Stormwater Runoff Control
5. Post-construction Stormwater Management in New Development and Redevelopment
6. Pollution prevention / Good Housekeeping (in municipal operations)

### **Funding**

Surface water management activities in Farmington are funded through a combination of stormwater utility revenue and area charges for new development. The City will periodically review and update the schedule of utility fees and area charges to maintain adequate support for the stormwater management program.



# 7. PARKS & RECREATION

## Introduction

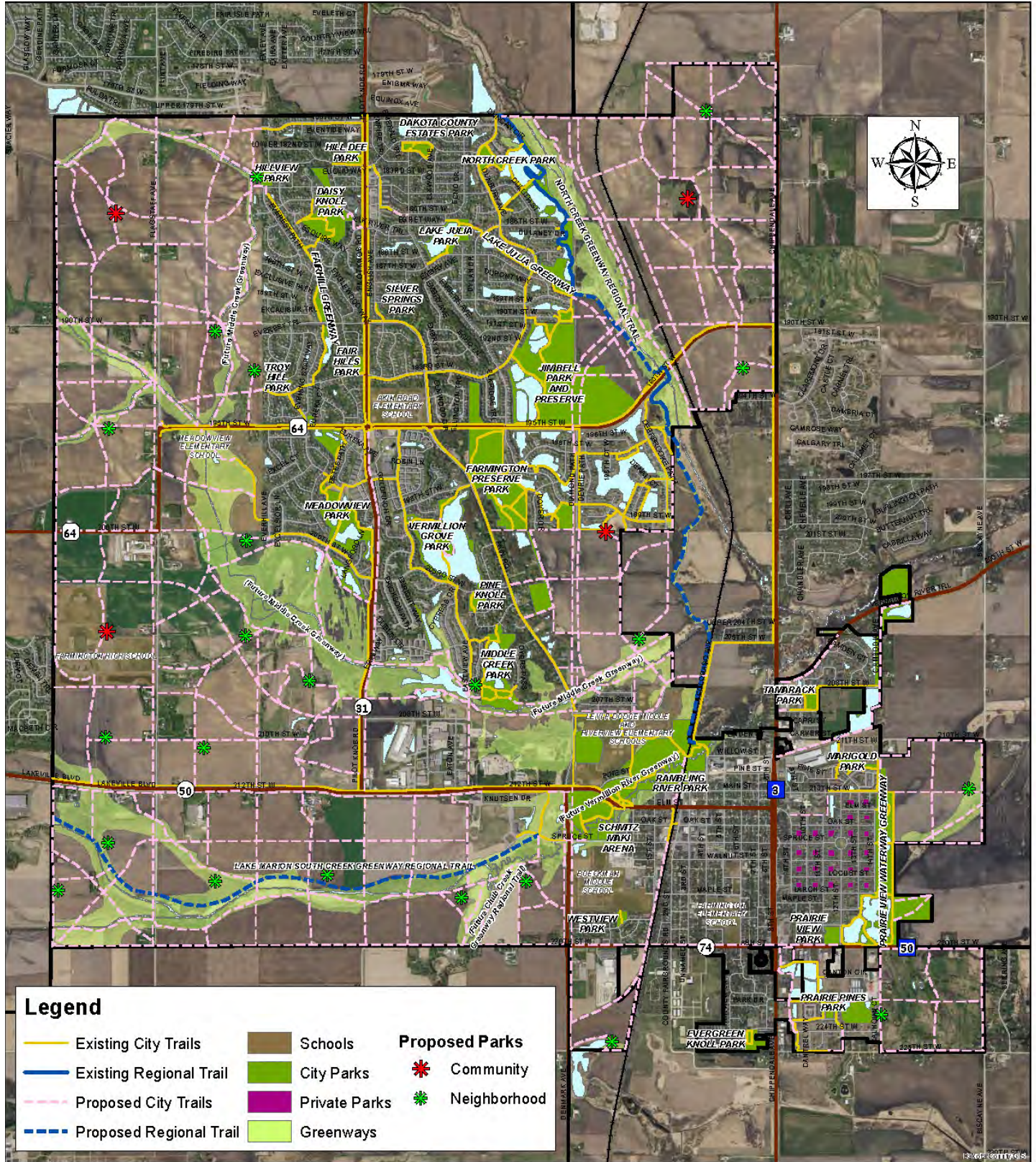
Parks and recreation plays an important role in creating a high quality of life for city residents. It provides opportunities to learn and play, meditate and rejuvenate, create and imagine, and enjoy life. As required by the Metropolitan Council, a regional planning agency serving the Twin Cities seven-county metropolitan area whose responsibilities lie with providing essential services to the region, a city's park and open space plan is required to be updated every 10 years as part of the city's Comprehensive Plan update.

In 2008, a 2030 Comprehensive Plan was approved containing a Park and Recreation Master Plan chapter. This plan has reached a ten-year threshold, requiring it to be updated to be in compliance with the Metropolitan Council requirements. This required update enhances and updates city information and data allowing elected/appointed officials and staff to accurately assess the current and future direction for parks and recreation in the community. The 2040 Comprehensive Plan is the document that will provide the guidance upon which the city continues to make its decisions for parks, trails, recreational programs and facilities. The new updated plan will create a blueprint for making well-informed decisions that will move parks, open space, trails, and recreation forward in the community for the next 20+ years.

Figure 7.1 shows Farmington's Existing and Proposed Park, Trail and Open Space Plan Map, including community parks, neighborhood parks, city trails, regional trails, and greenways.

Figure 7.1 Existing and Proposed Park, Trail and Open Space Plan

City of Farmington



Map dated March, 2018.

0 1 2 Miles

Prepared for the Farmington Parks Department by the Dakota County Office of GIS.

## Historical Perspective

The city began its parks and open space system with the acquisition and development of Rambling River Park and Evergreen Knoll Park in the early 1970s. From these initial park developments and during the next 30+ years, additional acreage has been added to the system bringing the total in 2017 to 930 acres. The city has not experienced much new residential development since the 2030 Comprehensive Plan was approved. In 2017, one new residential development was platted resulting in one new park being dedicated. Because of this recent development activity in Farmington, it is expected the park and open space system will continue to grow in the coming years.

Parks and Recreation was first organized through the creation of the Park and Recreation Advisory Commission in the 1970s. Hiring of the first Parks and Recreation Department staff member occurred in 1974. In subsequent years the city of Farmington added staff in the areas of facilities, park maintenance and recreation programs. The Parks and Recreation Department currently consists of 10 full-time staff, two part time staff and numerous seasonal staff making it the largest department (staffing wise) in the city.

Over the years, the city of Farmington has been fiscally responsible in its development of the parks and recreation system. Acquisition of parkland has been accomplished through creation of a park dedication ordinance and thus has only used fee acquisition in a limited basis to secure public parkland. This park dedication process has also generated money that has been used to develop the park and trail system resulting in a zero debt parks and trail system. In 1974 the city did issue general obligation bonds from a voter approved referendum for the construction of the current ice arena. These bonds have long since been paid off. In previous years development of some park facilities were completed due to the efforts of volunteer organizations and individuals in the community.

Recreation programs began to be offered to residents in the 1990s when the first full-time recreation staff member was hired and whose time was solely dedicated to planning and providing recreational programs. When recreation programs were first provided, only a handful of programs were offered. Today the community enjoys a diverse mix of programs and classes year-round.

Currently the city operates a senior center known as the Rambling River Center, which provides services to older adults in the community while allowing the community to rent the building for gatherings. The Rambling River Center was started by a group of citizens who raised funds to purchase and renovate an existing building in the downtown area of the city in order to create a senior center. When the senior

center was not able to make it financially in the 1980s, its operations were taken over by the city. In 2009 the Rambling River Center relocated to the former City Hall building after it had been renovated.

The city also operates Schmitz-Maki Arena, which provides ice skating, event and indoor turf opportunities during the year. It was constructed in 1975 and opened in 1976 for use. In 2010 and 2012, it received major upgrades to its refrigeration, dehumidification and dasher board systems. In 2016, an electric Zamboni resurfacers was purchased, resulting in cleaner air standards being met.

The city operated an outdoor pool from 1971 to 2017. The city attempted to replace the existing outdoor pool in 2016 by holding a General Obligation Bond Referendum to construct a new aquatic facility. However, the referendum that would have provided the funds needed to construct a new aquatic facility, failed by a just-over five percent (5%) margin. A decision was made to close the pool after the 2017 season. The 2018 budget includes funds to complete demolition of the outdoor pool.

## Demographic Profile

The city of Farmington has seen a rapid pace in its growth over the past twenty years. U.S. Census data showed that in 1990, the population of the city was 5,940. In 2000 the population of the city had increased to 12,365 people. In 2010 the population had increased to 21,086. Since the Census in 2010, the city has continued to grow. It is estimated at the end of 2015 there were 22,159 residents living in Farmington. This represents a 5 percent increase in the population from the 2010 Census and a 79 percent increase from the 1990 Census. Most of the growth since 1990 has occurred in the northern and central parts of Farmington. There has however been some smaller residential growth in the east and south areas of Farmington, which has allowed the growth to spread and connect with older established neighborhoods.

The age group distribution of Farmington based on 2015 Census estimates indicates a heavy concentration of families and the overall median age of 33.9 years is lower than the national median age average of 37.9 years. Although Farmington can be classified as a young community with the median age being 4 years lower than the national level, the age groups that will experience the most growth over the next 40 years is likely to be between the ages of 45 to 74. Median household income in 2015 is estimated to be \$87,925, which is about 55 percent higher than the national median household income of \$56,516. Age and household incomes are two significant factors that impact participation in Parks and Recreation services.

While the city has not experienced rapid growth since the 2030 Plan, there are still many acres yet to be developed before the community is considered “built out”. The final population will of course depend

on the development of existing properties in the city as well as what properties outside of the city are annexed into the city. Based on the number of available residential lots and future allocation of MUSA by the Metropolitan Council, the 2040 population is projected by the Metropolitan Council to be 32,500 residents.

While the city has seen some change in the distribution of housing types in the past ten years, it is important to remember that residents, who live in multi-family neighborhoods without sizeable yards of their own, or with a small common park area, often look for a public neighborhood or community park to meet their recreational needs. While it is important for the city to provide park and open space for all residents, it is especially critical the city continue to provide park and open space in multi-family housing neighborhoods in the future.

## **Park And Open Space Areas**

As of the 2040 Plan update, the city of Farmington owned park and open space land totaling 930 acres, which represents about 9.8 percent of the total land of 9,490 acres in the city. The breakdown of this acreage includes 490 acres of park land and 440 acres of open space. In addition, the Farmington School District owns and provides land for athletic fields. The School District also utilizes its school buildings for indoor recreational spaces. However for the purposes of creating an updated 2040 Plan for the city, the school district facilities, while mentioned, should not be used to determine the city's needs. Even though the School District facilities are available to the public, the city has no control over their scheduled use and said facilities are to be used first and foremost for school related programs and activities. Furthermore, the School District's boundaries extend beyond the city's boundaries and so only the area inside the city's boundaries should be addressed in the 2040 Plan.

With the city's estimated population of 22,159 in 2015, the city parks and open space acreage of 930 acres provides a ratio of 41.96 acres of park and open space per 1,000 residents. However a further analysis finds that of the 930 acres, only 490 acres is active park acreage. The remaining 440 acres consists of open space areas. This means the ratio for active park acreage is 22.11 acres of park land for every 1,000 residents, well within the minimum commonly accepted standard identified by the National Recreation and Park Association (NRPA) of at least 10 acres of active park acreage per 1,000 residents. Previously the city had adopted, in its 2020 Plan, a policy of at least 20 acres of active park acreage per 1,000 residents should be provided to residents living in Farmington. This policy was carried forward in the 2030 Plan. The current ratio of 22.11 acres per 1,000 residents meets the policy adopted in the 2020 Plan and carried over into the 2030 Plan. While a past acceptable practice has been to follow park acreage standards established by the National Recreation and

Park Association, it is not the only method. Parks and recreation professionals and professional planners also incorporate community demand/benefits into the formula when determining park acreage standards for communities. The thinking is that minimum park acreage requirements for communities should not solely be based on minimum number of acres needed per 1,000 residents but rather park acreage should be determined according to what each community needs based on the demand being made by park users. The city may want to continue to further explore this notion of having the park and open space acreage standards based on demand rather than a standard based solely on the population.

The city lacks adequate athletic facilities based on the minimum standards developed by the NRPA. Of most concern is the shortage of outdoor athletic facilities that the city provides. There is a low inventory in the number of existing ballfields that are provided for youth baseball and adult softball. There is intense pressure currently in the community for green space for soccer. With youth lacrosse now firmly established in the community, the pressure for additional green space has only intensified. The city should focus on correcting these field shortages by constructing additional outdoor athletic facilities for both youth and adult sports in order to meet the increased growth in participation that has occurred in the community.

The city maintains 22 neighborhood parks and 2 community parks. During the warm months of the year maintenance tasks performed typically include: mowing grass; trimming weeds and grass around fixed objects; dragging ballfields; marking fields; repairing playground equipment; removing weeds from landscaped areas; fertilizing grass areas; and planting and trimming park trees. During colder months of the year maintenance tasks performed typically include: removing snow from trails and parking lots; trimming trees; removing dead and diseased trees; flooding outdoor rinks; and repairing playground equipment.



# Trails

The city currently owns and maintains 45 miles of paved trails, a mile of soft trails and about a half mile of boardwalks. Traditionally community surveys show trails scoring highest in the areas of the most used and most favored park and recreation facility by city residents.

A majority of the paved trail system was constructed during the peak development that occurred from the 1980s through 2006. As a result the city did not initially have to provide much funding to build the trail system that is currently in place. The city has done a nice job of ensuring the trail system is relatively well connected. It has made an effort to fund the construction of paved trails where gaps have occurred. The city should continue to make an effort to ensure that gaps in trail connections are completed either when new development occurs or when the city has funds to do so when no development is imminent or feasible in areas where there is a gap in a trail connection. A good way to do this is to develop a Bike and Pedestrian Plan that can be used to identify where these gaps currently occur along with ensuring that future new trails are connected to the existing trail network.

The city implemented an annual pavement management program for trail maintenance in 2012. The pavement management program provides annual funding for crack sealing and fog sealing trails. The city is broken into five areas, which results in every trail in the city receiving maintenance work at least once every five years.

While there is annual funding in place for pavement management of trails, there is currently inadequate funding for replacement of trail sections that have so badly deteriorated that crack sealing and fog sealing hold no benefit. This is due to parts of the trail system being initially constructed more than 30 years ago. As a result, if the city wishes to continue to have a usable, safe and connected trail system, then a long term funding plan and source should be explored to be implemented in order to provide the funds needed to replace the city's existing trail infrastructure over time.

The city has also worked with Dakota County on a regional trail system plan. This includes two approved master planned regional greenway trail corridors in Farmington - North Creek and Lake Marion(South Creek) - with a third regional greenway trail corridor yet to be master planned (Chub Creek). As a result of trail planning occurring on a regional basis rather than a local basis, the city will be connected to regional parks and trails not only in Dakota County, but will also be connected to regional parks and trails in other metro area counties.

Since the city began constructing trails in the 1980s, it has placed a requirement that all trails be accessible according the requirements outlined in the Americans with Disabilities Act (ADA). The ADA

requires trails to be relatively flat with a slope of 5% or less. In situations where ADA requirements could not be met, the city has provided a secondary or alternative trail route that accommodates people of all ages and abilities to use the trail system.

In 2017, a trail wayfinding signage program was initiated. Three different park and open space areas were identified that contained highly used trail loops. Then a design of the maps occurred identifying where the trails signs should be located and what kind of information should be included on the sign. The trail wayfinding maps included information such as: distance of the loop, so people using the trail were made aware of how far they would have to travel to complete the various trail loops in the park; park and trail use rules; a map legend explaining symbols used on the map; a “You are Here” symbol so users could orientate themselves to the trail; and a depiction of the where the trails were located in the park and open space areas. The wayfinding signage program was funded by the municipal Farmington Liquor Store operational profits.

## **Recreation Programs**

The Department’s recreational programming has been staffed by professionals who are imaginative, resourceful and comprehensive in the planning and facilitating of programs. The innovative and imaginative programs that have been provided to the community has resulted in several recreational programs being recognized in the past with Awards of Excellence, which is a state-wide award provided by the Minnesota Recreation and Park Association.

Recreational programs have been offered in such areas as youth and adult sports, pre-school activities, arts and crafts, fitness, team sports, individual sports, senior citizen programs and trips. Department staff plan and facilitate some of its own special events that are sprinkled throughout the year. There is also involvement through partnerships with other local organizations to provide seasonal special events and celebrations.

## **Park And Recreation Administration**

The Parks and Recreation Department provides the administrative oversight for the recreational services, recreational facilities, parks and trails that are offered to the community. The City Council approves the operating and capital improvement budgets that provide the annual funding for the Department. In 2018 operational costs for all Divisions within the Department was budgeted at just over \$1.6 million. Capital improvement costs for park and trail improvements, was budgeted at \$75,000.00. Table 7.1 shows how the budget is distributed to the various divisions within the Department

**Table 7.1 Department's Annual Budget by Division**

DIVISION	AMOUNT OF DEPARTMENT'S 2018 BUDGET
Park Maintenance	39%
Park and Trail Improvements	4.4%
Recreational Programs	6.7%
Park and Recreation Administration	15.8%
Schmitz-Maki Arena	19%
Rambling River Center	10.6%
Outdoor Pool	4.5%

Since the 2030 Master Plan was approved in 2008, the City has focused on developing new parks and redeveloping existing parks to make them accessible, attractive and safe. In order to ensure that all parks received a review and a master plan, the Parks and Recreation Department developed a planning and improvement schedule. Design standards were also developed for neighborhood parks, which provided equity in the design and amenities provided in neighborhood parks.

## **2040 Park And Recreation Master Plan Public Input**

Public input on the 2040 Plan was received in many different ways. Some of the input occurred through earlier studies where the public was invited to participate on task forces and committees. Further input was solicited through attendance at pop-up events, public meetings and from a web-based questionnaire. A community-wide survey was held in 2015 that provided insight about how satisfied residents were with existing services and facilities and what the community desires in the future. The recommended actions being offered in the 2040 Plan reflect the results of the public input received during the community survey, public meetings and from web-based questionnaires.

This includes the following:

- » Improve recreational facilities/parks/trail facilities
- » Create additional larger community parks
- » Trails are important
- » Develop a wide variety of parks
- » Develop a wide variety of recreational programs
- » Community values the open space and natural beauty of the area
- » Community favors community parks, neighborhood parks, trails and ballfields

## **Guidance for Implementing the 2040 Plan**

The city has seen small growth in its parks and recreation system since the 2030 Plan was approved. However, the growth of the park and recreation system has not kept pace with the city's population growth since 2008. The city has completed several studies, surveys and plans related to parks, recreation, facilities and trails in the past fifteen years. Studies that have been completed include: Recreational Facility Needs Study, Community Center Feasibility Study, a Community Center Facility Site Plan Study, Community Attitude and Interest Citizen Survey and Aquatic Feasibility Study.

A summary of the highest priorities for parks and recreation based on the information collected from the public studies, community surveys and during public meetings are identified below. It will be important for the city to continue to review these priorities and modify these priorities on an annual basis.

1. Develop a park and open space system that includes active and athletic spaces.
2. Develop a park and open space system that includes natural areas and environmentally sensitive areas for passive and un-programmed spaces.
3. Expand the city's trail and sidewalk system, including adding regional trails that are safe and provide connections between schools, parks, neighborhoods, commercial areas, open space/natural areas, other communities and regional parks.
4. Develop a long-term financial plan for the development and redevelopment of parks, open space and trails.
5. Develop maintenance standards for recreational facilities.
6. Increase marketing of parks and recreation (recreational programs, parks, open space, trails and recreational facilities) to the community.
7. All city parks should have approved master plans to guide their development.

8. Construct new recreational facilities when it may not be financially feasible or structurally possible to make improvements to existing recreational facilities.
9. Acquire land in a manner that maximizes the size of parks when possible.
10. Explore opportunities to expand youth, teen, adaptive, adult and senior programs including possible partnerships with other organizations or governmental agencies
11. Maximize and optimize recreational facility usage when possible.
12. Look for ways to expand community gathering spaces and events.
13. Develop and implement a Bike and Pedestrian Plan.
14. In new residential developments make sure there are adequate pedestrian connections through sidewalk and trail construction.
15. Utilize volunteer resources to assist with parks, open space, recreational facilities and recreation maintenance and operations.
16. Implement sustainability practices in recreational facilities, parks and open spaces.
17. When financially feasible, utilize existing and emerging technology in the parks and recreation department's maintenance and operations.
18. Continue to maintain parks and recreation system so it continues to be a community asset.
19. Construct the facilities identified in the Jim Bell Park and Preserve Master Plan and in the Aquatic Feasibility Study including athletic facilities and a new aquatic facility.
20. Create a system that is equitable and diverse, so it accommodates uses by all demographic groups represented in the community.

## **CAPITAL IMPROVEMENT PLAN**

A five year capital improvement budget is vital in determining future parks and trail projects and the funds needed to complete the projects. The capital improvement projects in parks and trails have been funded over the years through two funding sources. The first funding source has been through funds received from residential, commercial and industrial development. These funds were received as cash in lieu of land through the park dedication process. The second source of funding has been through the City's municipal liquor store profit transfers.

As a result, a capital improvement budget for its parks and trails has been developed and ties to the schedule that has been created. By the year 2020, all new and all but one existing parks will have received a review resulting in a master plan developed. Then, based on the approved master plan for each park, improvements are completed based on the funding available. The city's most recent five-year capital improvement plan is included in Chapter 10. Implementation.

Table 7.2 below provides the most recent five year capital improvement plan for the years 2018-2022. It identifies which park improvements are to be made in, the type of park and/or trail improvement to be made, the year in which the improvements are to be made and the estimated cost of the improvements. No improvements are currently planned in 2021 and 2022 in order to allow the fund balance to grow.

**Table 7.2 Five Year Parks and Trail Improvement Budget**

NAME OF PARK AND PROJECTS	2018	2019	2020	2021	2022
Prairie Pines Park: grading turf seeding and site improvements	\$50,000	\$150,000			
Marigold Park: playground, shelter, turf seeding, shelter, landscaping, trees planted, grills, waste containers, picnic tables and bike rack		\$70,000			
Dakota County Estates Park: basketball court surface improvements and painting new lines	\$5,000				
Evergreen Knoll Park: basketball court surface improvements and painting new lines	\$5,000				
Rambling River Park Feely Fields: outfield fence replacement	\$15,000				
Westview Park: basketball court surface improvements and painting new lines		\$5,000			
Farmington Preserve Park: basketball court surface improvements and painting new lines			\$5,000		
Town Square Park: master plan development and park signage			\$15,000		



# 8 ■ SUSTAINABILITY

## Introduction

The sustainability chapter of the 2040 Comprehensive Plan set the groundwork for protecting and restoring the natural environments that people, economies, and ecological systems depend on. This plan seeks to build off of the successes achieved since the 2030 Comprehensive Plan, with a focus on energy use and energy sources.

Looking to the future, creating a sustainable energy infrastructure and reduced energy use will enhance reliability of the electricity grid while mitigating climate change impacts and other unforeseen changes to system-wide energy use and resources.

Farmington has demonstrated a commitment to creating a sustainable future, as seen in the actions taken through the Minnesota GreenStep Cities program. The 2040 Comprehensive Plan acknowledges steps taken so far, and outlines goals and policies for the future.

This chapter contains:

- » Goals and Policies
- » Sustainability in Farmington
- » Minnesota GreenStep Cities Accomplishments
- » Existing Conditions
  - Building Energy Use and Expenditures
  - Transportation Energy Use
  - Greenhouse Gas Emissions
  - Energy Efficiency Resources/Options
  - Solar Resources
  - Wind Resources

## SUSTAINABILITY THROUGHOUT THE 2040 COMPREHENSIVE PLAN

Creating and maintaining a sustainable community for Farmington means taking action to protect the resources that we have today, while laying the groundwork to foster prosperity for future generations. This approach is not limited to the Sustainability chapter in the 2040 Comprehensive Plan; elements of sustainability can be found within the following chapters as well:

- » Chapter 1. Plan Purpose & Vision
- » Chapter 3. Land Use
- » Chapter 5. Transportation
- » Chapter 6. Water Resources
- » Chapter 7. Parks & Recreation

## MINNESOTA GREENSTEP CITIES ACCOMPLISHMENTS IN FARMINGTON

The following Best Practices and Actions are among those that have been implemented in Farmington since 2011:

### BUILDINGS AND LIGHTING BEST PRACTICES

- » Made no/low cost indoor lighting and operational changes in city-owned/ school buildings to reduce energy costs.
- » Adopted an historic preservation ordinance/regulations to encourage adaptive reuse.
- » Adopted development/design standards and programs that facilitate infill, redevelopment and adaptable buildings.

### LAND USE BEST PRACTICES

- » Adopted a land use plan that was approved by the Metropolitan Council (comprehensive plan).
- » Demonstrated that regulatory ordinances comply with the comprehensive plan including but not limited to having the zoning ordinance explicitly reference the comprehensive plan as the foundational document for decision making.
- » Included requirements in the comprehensive plan for intergovernmental coordination addressing regional land use and watershed/wellhead impacts, infrastructure, transportation, economic development and city/ regional services.
- » Increased higher density housing.

## Goals and Policies

### GOAL 1: ACHIEVE RECOGNITION AS A STEP 3 MINNESOTA GREENSTEP CITY

- » Policy 1.1: Continue to monitor, lead, coordinate, report to and engage community members on the implementation of GreenStep best practices.
- » Policy 1.2: Regularly prioritize and evaluate best practices and actions to be implemented on an annual basis.

### GOAL 2: ENVIRONMENTAL IMPACTS ARE REDUCED IN FARMINGTON

- » Policy 2.1: Continue to support the actions and initiatives of The Green Team
- » Policy 2.2: Develop programs, events, and incentives for residents to increase involvement in sustainability initiatives.
- » Policy 2.3: Participate in tracking and monitoring programs, such as the Regional Indicators Initiative, to inform future sustainability initiatives.
- » Policy 2.4: Develop standards and review procedures that support adequate indoor and outdoor space for improved recycling opportunities (including organics such as food waste, as appropriate) in commercial development.
- » Policy 2.5: Incorporate environmental impact considerations into municipal decision-making.

### GOAL 3: INCREASED CONSERVATION OF NON-RENEWABLE ENERGY

- » Policy 3.1: Encourage residents and property owners to take advantage of energy monitoring and conservation programs offered through the local utilities.
- » Policy 3.2: Research, evaluate, and promote LEED principles and other green infrastructure practices for new buildings, developments, and public projects.

### GOAL 4: REDUCTION OF GREENHOUSE GAS EMISSIONS

- » Policy 4.1: Follow the state energy goal guidelines of reducing greenhouse gas emissions to 20% of the city's 2015 baseline levels by the year 2050.
- » Policy 4.2: Establish interim goals every 5 to 10 years.



## GOAL 5: INCREASED USE OF RENEWABLE ENERGY

- » Policy 5.1: Protect solar access in new developments and subdivisions to enable potential development of solar energy systems.
- » Policy 5.2: Encourage businesses and residents to participate in renewable energy programs or install renewable energy systems.

## Sustainability in Farmington

Acknowledgement of sustainability in Farmington began in 2006, with the establishment of “The Green Team”. This group was formed by city staff to promote and support sound environmental practices within the work place. Recycling at all city facilities, energy conservation, purchasing of environmentally-friendly products, and reducing waste and toxic materials were the goals outlined by this group. To accomplish these goals, the team focuses on projects that help decrease waste and creates and distributes educational resources to staff and residents.

Some of the efforts of The Green Team have included:

- » Reviewing new city-owned building projects
- » Enhancing recycling and waste reduction efforts
- » Providing recycling opportunities at city-owned buildings and parks through Recycle On the Go
- » Instigated city participation in Minnesota GreenStep Cities Program

With the backing of The Green Team, the city of Farmington has benefited from these initiatives with:

- » Reduced impacts on the environment
- » Increased economic benefits
- » Collaboration across sectors to improve sustainability
- » Increased government leadership towards sustainable practices
- » Compliance with state and federal standards and requirements

## MINNESOTA GREENSTEP CITIES

Minnesota GreenStep Cities is a voluntary challenge, assistance, and recognition program to help cities achieve their sustainability and quality-of-life goals. The program is based on 29 identified best practices, which can be implemented by completing one or more actions at a 1, 2, or 3-star level, for each best practice. The actions are tailored to Minnesota cities, and focus on cost savings, energy use reduction, and civic innovation.

## MINNESOTA GREENSTEP CITIES ACCOMPLISHMENTS IN FARMINGTON CONTINUED

### TRANSPORTATION BEST PRACTICES

- » Phased in no-idling practices, operational and fuel changes and equipment changes for city and local transit fleets.
- » Phased in bike, foot, and/or horseback modes for police, inspectors and other city staff.

### ENVIRONMENTAL MANAGEMENT BEST PRACTICES

- » Adopted a sustainable purchasing policy.
- » Lowered the environmental footprint of meetings and events in the city by converting to paperless council meetings.
  - This action saved 162,000 pieces of paper from 2011-2016!
- » Certified Farmington as a Tree City USA.
- » Adopted a tree preservation/native landscaping ordinance.
- » Achieved minimum levels of city green space.
- » Adopted a shoreland ordinance for all river and lake shoreland areas.
- » Improved and expanded recycling services.

### ECONOMIC AND COMMUNITY DEVELOPMENT

- » Formed a committee to lead, coordinate, report to, and engage community members on the implementation of GreenStep best practices.
- » Created, assisted with, and promoted local food production and distribution within the city.

In 2011, the City Council passed a resolution to participate in the Minnesota GreenStep Cities program. In 2012, the city was awarded Step 2 status, and as of 2017, the city has implemented 9 Best Practices, and has completed 25 actions.

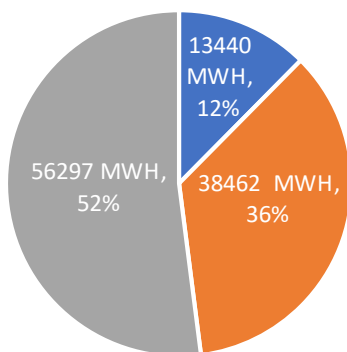
In order to qualify for Step 3 status, the city needs to implement a total of 17 Best Practices and complete a total of 27 actions.

## Existing Conditions

The city is committed to understanding how energy is used in the community, exploring opportunities to reduce energy consumption, and increasing the use of clean energy resources. The following energy use profiles illustrate energy consumption and greenhouse gas emissions from buildings and transportation.

**Figure 8.1 Electricity Usage By Sector**

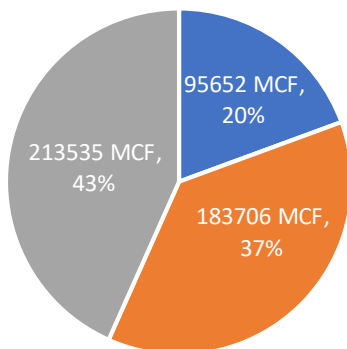
■ Industrial ■ Commercial ■ Residential



Source: US Department of Energy, 2013

**Figure 8.2 Natural Gas Usage By Sector**

■ Industrial ■ Commercial ■ Residential



Source: US Department of Energy, 2013

## BUILDING ENERGY USE AND EXPENDITURES

The types of energy used in Farmington for buildings and industrial processes are primarily electricity and natural gas. While some types (e.g. heating fuel for residential use) are also used within the community, they were not captured in this assessment. Natural gas is primarily used for water and space heating, cooking, and some industrial processes. Electricity is generally used for appliances, space heating, and lighting, as well as other electronic devices. Figure 8.1 shows electricity use by sector (industrial, commercial, and residential) in Farmington, while Figure 8.2 shows natural gas use by sector.

These figures indicate that residential consumers use approximately the same amount of electrical energy as commercial and industrial consumers combined. Industrial and commercial consumers (combined) use more natural gas energy than residential consumers in Farmington. It should be noted that there are far more residential energy customers (3,430 accounts with Xcel Energy in 2016) than commercial and industrial customers (362 accounts with Xcel Energy in 2016).

According to the U.S. Department of Energy statistics for 2013, residents in Farmington spent \$8,607,000 on energy expenditures, and all sectors combined spent \$14,750,000 as shown in Table 8.1.

**Table 8.1 Electricity and Natural Gas Expenditures, City of Farmington**

SECTOR	ELECTRICITY (\$1000)	NATURAL GAS (\$1000)	TOTALS EXPENDITURES
INDUSTRIAL	1021	253	\$1,274,000
COMMERCIAL	3707	1162	\$4,869,000
RESIDENTIAL	6810	1797	\$8,607,000
<b>Total</b>			<b>\$14,750,000</b>

Source: US Department of Energy, 2013

## TRANSPORTATION ENERGY USE

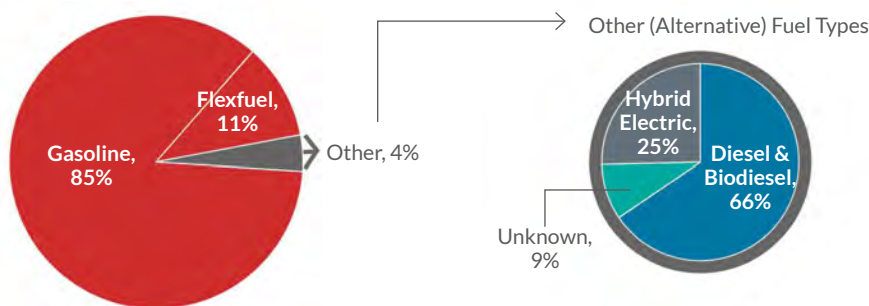
Transportation energy is almost exclusively attributable to car and truck travel and is estimated by the vehicle miles travelled (VMT) within city boundaries (regardless of through traffic or with an origin or destination in the city).

VMT includes commercial and freight vehicles, personal cars, and mass transit vehicles. VMT does not capture energy attributable to rail and airplanes, but those are generally a very small portion of transportation energy. U.S. Department of Energy statistics for 2013 show that 68,654,400 vehicle miles are travelled annually in Farmington. The majority of the VMT in Farmington occurs on arterial and collector roads. VMT per capita in Farmington is 3,400 miles per person per year.

The average fuel economy of light-duty vehicles in Farmington is 22.3 miles per gallon (MPG), and there were 25,000 light-duty vehicles as shown in Figure 8.3 operating in Farmington in 2016. The fuel mix for light-duty vehicles predominantly includes gasoline, which makes up 85% of all fuels. The remaining 15% of light-duty vehicles in Farmington are fueled primarily by flex fuel (E85, which is a blended fuel with up to 85% ethanol). Diesel, biodiesel, and hybrid electric cars make up the rest of alternative fuels.

It should be noted that the percentage of gasoline-fueled light-duty vehicles in Farmington decreased by 2% between 2013 and 2016.

**Figure 8.3** Light-Duty Alternative Fuel and Conventional Vehicles in Farmington



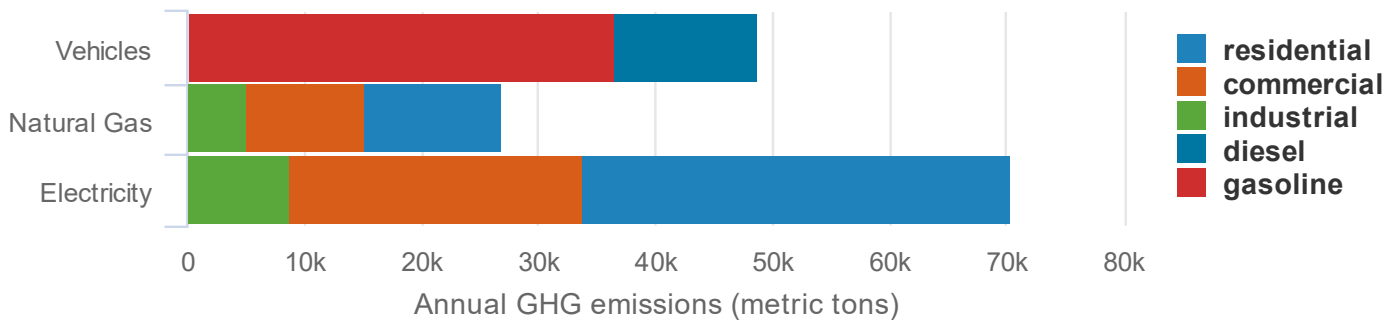
Source: US Department. of Energy, 2016

## GREENHOUSE GAS EMISSIONS

Greenhouse gases (GHG) are emitted from burning conventional fuels like coal and natural gas, which are both inputs for the production of electricity. While the resource mix continues to get cleaner with an increasing amount of renewable energy added each year, emissions from electricity remain higher than those from natural gas. Emissions from vehicles remain higher than natural gas as well. Figure 8.4 shows the total annual GHG emissions for Farmington to be 145,100 metric tons, which is seven metric tons per person.

Additional sources of emissions not included here come from air travel, waste, and wastewater treatment processes. These emissions can be reported in a deeper analysis of GHG emissions or as part of a community-wide GHG inventory.

**Figure 8.4** GHG Emissions by Source in Farmington, 2013



Source: US Dept. of Energy, 2013

## EFFICIENCY RESOURCES AND OPTIONS

Xcel Energy offers incentives to residential and business customers to help increase energy efficiency actions for buildings. Participation rates for these programs are found in Xcel Energy's Community Energy Reports. For 2016, participation rates in Farmington by businesses and residents are noted in Table 8.2, including number of projects, electric energy savings, electric demand savings, rebates or incentives paid.

Utility companies can manage the electric load through demand response programs. These programs incentivize consumers to allow the utility to ramp down appliances or other larger electric equipment to relieve congestion from the electric grid during times of high use. 1,671 businesses and residents participated in the Demand Response program through Xcel Energy in 2016, creating 2,910 kW of available capacity. \$130,076 in rebates or incentives were paid to customers through this program.

A number of natural gas energy-efficiency rebates and programs are available for residents and businesses in Farmington, through Minnesota Energy Resources, the natural gas utility provider. A community-wide energy inventory or analysis will show the participation rate of these programs.

Transportation energy efficiency is another significant resource, comprising one-third (33.44%) of GHG emissions in Farmington and representing a significant portion of energy expenditures. Dakota County, along with the Metropolitan Council and the city of Farmington are encouraging transit use and increased multi-modal transportation infrastructure. As the market for electric vehicles expands in the future, the city has further opportunities to reduce GHG emissions associated with vehicle use and transportation fuels.

**Table 8.2 Energy Conservation Report, 2016**

ENERGY CONSERVATION	NUMBER OF PROJECTS	ELECTRIC ENERGY SAVINGS (KWH)	ELECTRIC DEMAND SAVINGS (KWH)	REBATES OR INCENTIVES PAID
FARMINGTON BUSINESS TOTAL	9	353,500	49	\$30,072
FARMINGTON RESIDENTIAL TOTAL	92	36,952	34	\$14,870
			<b>TOTAL</b>	<b>\$44,942</b>

Source: Xcel Energy Community Energy Report, 2016

## SOLAR RESOURCES

Solar reserves are those quantities of solar energy that can be estimated with reasonable certainty to be economically producible. The Metropolitan Council has developed a solar resource calculation and map to help Farmington determine how much solar energy is available for development and to identify where there are good sites for solar development, and where there may be land use conflicts.

As shown in Table 8.3, the total capacity of the rooftop solar resource in Farmington is 1,029,305 Mwh/yr, which exceeds total electricity consumption in Farmington (2016, Excel Energy Annual Community Report).

Solar installations are not limited to rooftop applications. This analysis does not include ground-mount systems, but the city should consider criteria for potential future locations of ground-mounted solar fields, such as commercial parking lots, public rights of way, and future development sites.

Farmington is committed to protecting solar access in new development and subdivisions. The city will work with developers at the beginning of projects to ensure that platting of lots and streets can maximize the amount of solar exposure on paved surfaces in winter and ensure that potential private solar energy systems on lots will not be obstructed from solar resources. The city has established a definition for solar energy systems in its Zoning Code. The city will explore the possibility of enacting an ordinance to protect solar access that will benefit property owners as well as the environment.

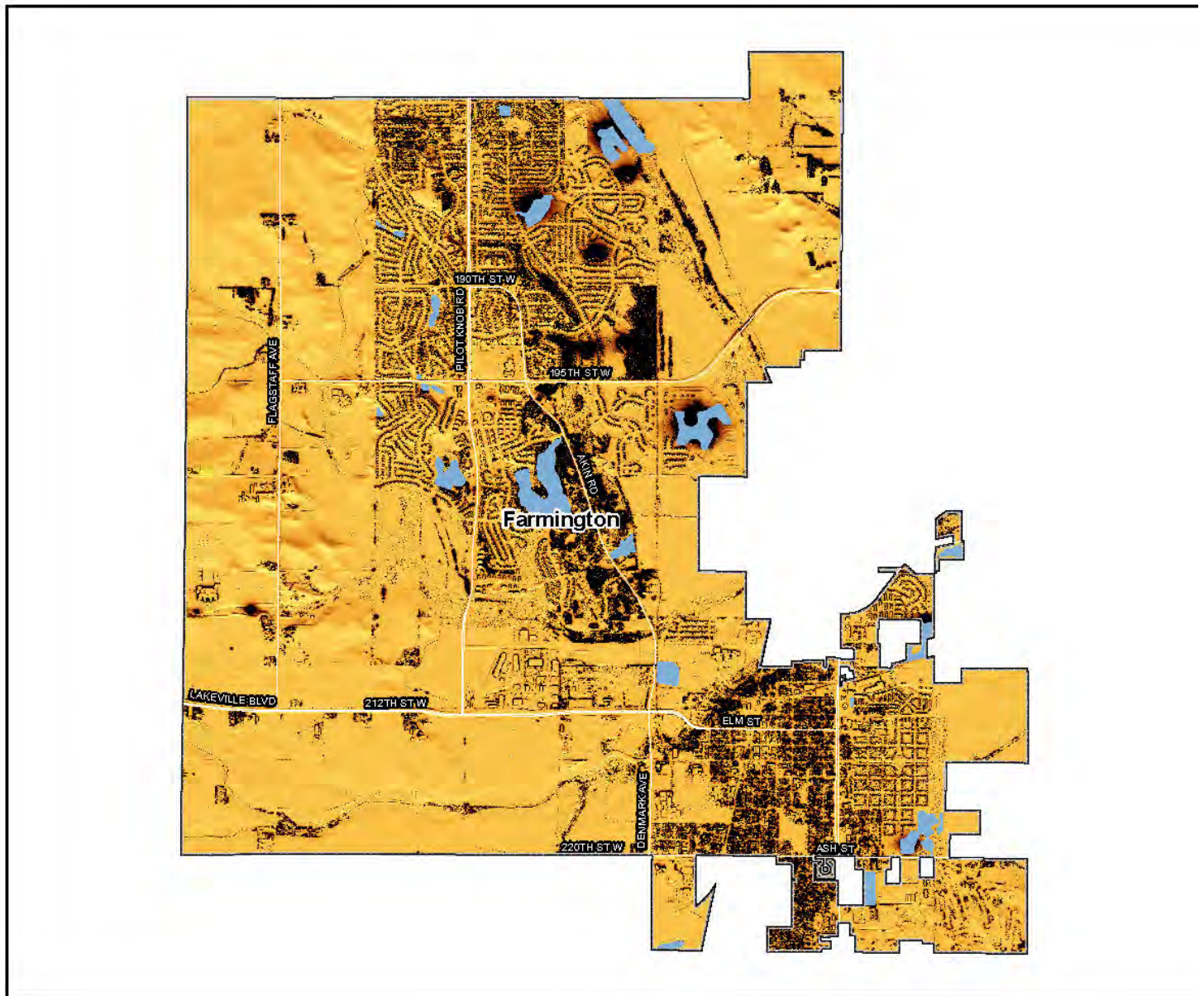
The Ursa Community Solar Garden in Farmington was completed in 2017, which is a joint project between Dakota Electric and Great River Energy.

**Table 8.3 Rooftop Solar Resource Calculations**

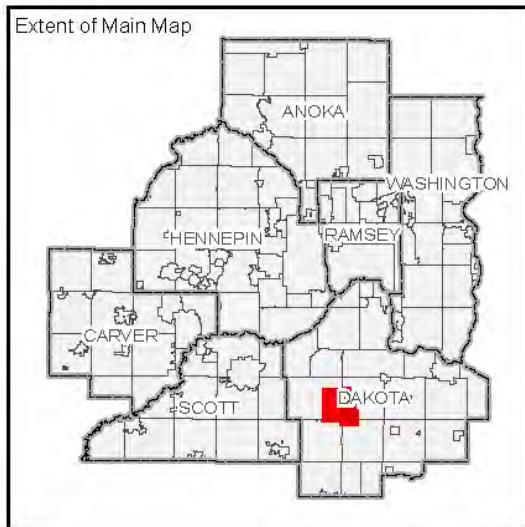
COMMUNITY	GROSS POTENTIAL (MWH/YR)	ROOFTOP POTENTIAL (MWH/YR)	GROSS GENERATION POTENTIAL (MWH/YR)	ROOFTOP GENERATION POTENTIAL (MWH/YR)
FARMINGTON	36,211,302	1,029,305	3,621,130	102,930

Source: Metropolitan Council

**Figure 8.5** Gross Solar Potential, Farmington, Dakota County






12/12/2016



**Gross Solar Potential  
(Watt-hours per Year)**

High : 1292292  
Low : 900001

-  Solar Potential under 900,000 watt-hours per year
-  County Boundaries
-  City and Township Boundaries
-  Wetlands and Open Water Features

Source: University of Minnesota U-Spatial Statewide Solar Raster.

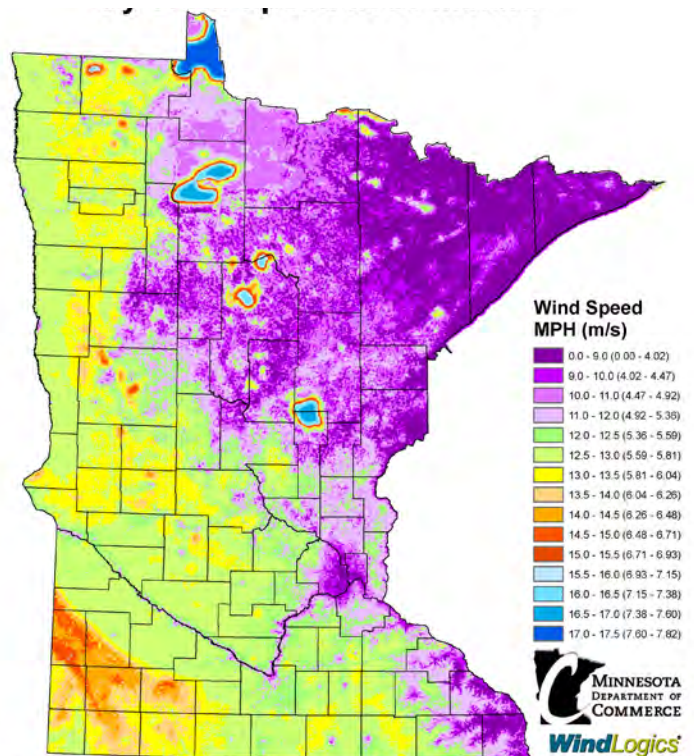
## WIND RESOURCES

Farmington is a suburban community that may not be suitable for tall wind towers above certain heights. Appropriate tower heights are likely 30 meters. The Minnesota Department of Commerce has developed wind speed maps at a 500-meter resolution to give a general sense of the wind resources at various tower heights. Any potential wind energy resource project site will need to be assessed for appropriate height, soil capacity, adjacent land uses, impeded views and noise related to wind energy.

Typically, 12 mph is the minimum average annual wind speed necessary for a good wind resource. At 30 meters, most of Dakota County has an annual average wind speed between 11 and 12.5 mph, putting Farmington on the cusp of being a good wind energy resource location. Taller wind towers (80 meters) would be a more viable option economically.

Residents and businesses can participate in Xcel Energy's Windsource program. According to Xcel Energy's 2016 data, only one business participated in the program, while 131 residential customers participated. In total, 224,539 kWh of wind energy were subscribed in Farmington through this program.

**Figure 8.6** Minnesota's Wind Resource by Wind Speed at 30m



This map has been prepared under contract by WindLogics for the Department of Commerce using the best available weather data sources and the latest physics-based weather modeling technology and statistical techniques. The data that were used to develop the map have been statistically adjusted to accurately represent long-term (40 year) wind speeds over the state, thereby incorporating important decadal weather trends and cycles. Data has been averaged over a cell area 500 meters square, and within any one cell there could be features that increase or decrease the results shown on this map. This map shows the general variation of Minnesota's wind resource and should not be used to determine the performance of specific projects. January 2006

Source: Minnesota Department of Commerce





# 9

## ECONOMIC DEVELOPMENT

### Introduction

This Economic Development Plan provides a high level and long-term roadmap for the city of Farmington and its partners (public, private, and nonprofit sectors) to work together to enhance employment, investment and quality of life opportunities that benefit the entire community. The city recognizes that local government has a responsibility for creating an environment in which economic development can occur. This plan also serves to examine and strengthen the city's ability to compete effectively and prosper in the both the regional and increasingly global economy.

For Farmington, there are a number of motivating factors for having and maintaining this long-term economic development plan, which include:

- » Defining the role and direction for the activities of the city's Economic Development Authority
- » Enhancing the city's reputation as a proactive city that embraces partnerships with local and regional economic and business development organizations
- » Acknowledging the important contribution of existing businesses to the city's long-term economic sustainability
- » Welcoming new businesses
- » Ensuring that municipal development costs are competitive with other jurisdictions, especially within the industry sectors that are important to the city's economic success
- » Providing an environment of "certainty" for businesses by establishing clear, consistent policies for development, regulation, and taxation.
- » Streamlining regulatory and permit processes while balancing community goals

- » Providing responsive and flexible customer service at City Hall
- » Incorporating economic impact considerations in municipal decision-making
- » Acknowledging that communities must compete for investment, human resources and infrastructure
- » Presenting a positive image of Farmington through the media, citizens, and existing businesses

The most obvious ways in which economic development is influenced by local government are through decisions on land use and property taxation, but there are many other ways in which economic development can also be either positively or negatively affected. Examples include the working relationship between local government and the business community, the cost and time required to move through municipal review and approval processes and the effort made to understand and respond to the needs of business. The single most important thing a community can do to support and encourage development is manage and reduce developer/ investor's risk, provide as much certainty as possible about the permitting process, and provide as much clarity as possible about economic development policies.

Economic development is about more than attracting companies and investments to a community. These opportunities are part of stimulating growth, but they should not be pursued at the expense of overlooking the needs of the community and existing businesses. In fact, research from numerous sources shows that existing businesses create 60%-90% of all new economic growth in a community.

## **Economic Development Goals**

1. Healthy and diversified growth of existing and new businesses to achieve the community's 2030 and 2040 employment projections.
2. A desirable commercial environment for residents is created through growth from existing and new businesses.
3. Redevelopment of vacant and underutilized properties in older areas to revitalize these vital community areas.
4. A well-trained and adaptable workforce is maintained within the community to support the projected business and job growth.
5. Diverse housing options and quality of life amenities that support the needs and preferences of the community's workforce into the future.
6. A three-year Strategic Plan for Economic Development that provides a dynamic and actionable tool for achieving the community's economic development vision.
7. Public and private sector reinvestment in downtown to revitalize it as the community's commercial, cultural, and recreational center.
8. Cultivation of strong relationships between existing businesses and the city to increase business retention.

# Economic Development Authority (EDA)

All cities have authority from the State Legislature to create an economic development authority (EDA). The purpose of a local EDA is to promote a city's economic growth by providing business assistance and development programs tailored to the local community. Per MN Statute, an EDA is a public body corporate and politic and a political subdivision of the state with the right to sue and be sued in its own name. An authority carries out an essential governmental function when it exercises its power, but the authority is not immune from liability.

The primary powers of an EDA are:

- » Promotion of local businesses and recruitment of new businesses
- » Issuing revenue bonds
- » Issuing general obligation bonds (approved by referendum)
- » Acquiring (via purchase, lease, gift or eminent domain) property; property owned by the EDA and used for governmental purposes is tax-exempt
- » Selling property
- » Developing property
- » Serving as a limited partner in a partnership
- » Making loans to businesses
- » Operating a revolving loan fund to facilitate small business investment
- » Acquiring rights or easements for creation of an economic development district
- » Creating and administering tax increment financing districts and plans
- » Operating and maintaining a public parking facility or other public facility to promote economic development or avoid potential slum and blight conditions
- » Conducting economic development studies, research and analysis

The role of the Farmington EDA is to serve as an advisory board to the City Council on matters related to economic development. Through policy development and implementation of new and existing tools, the EDA serves as the voice of economic development.

## FARMINGTON'S EDA MISSION

To improve the economic vitality of the City of Farmington and to enhance the overall quality of life by creating partnerships, fostering employment opportunities, promoting workforce housing, providing convenient shopping options for residents, and expanding and diversifying the tax base through development and redevelopment. To achieve this mission, a key aspect of the EDA's efforts is to promote the retention and expansion of existing businesses, and the attraction of new businesses to the community.

## Brief History of Farmington's Economic Development Planning

The Farmington Housing and Redevelopment Authority (HRA) transitioned into an Economic Development Authority (EDA) in February 2006. The Farmington EDA consists of seven commissioners. By MN Statute, a seven-member EDA, two of whom must be members of the city council, shall be appointed by the mayor with the approval of the City Council and serve six-year terms.

In 2007, the Farmington City Council and EDA completed an economic development strategy which addressed the following topics:

- » assessment of current conditions,
- » review of competitive environment/common practices,
- » identification of internal capacity,
- » review of best practice,
- » facilitation of a strategic planning process.

Also in 2007, a city-wide commercial and industrial market study was completed that conducted research and analysis of past trends, both retail and business park, and established future growth projections for the Farmington trade area. The results of the study were used in the City of Farmington's Comprehensive Plan Update as well as to provide additional guidance in the creation of work plans for the City's Economic Development Staff. The Summary of Findings and Development Strategy provided insights into development potential, space absorption and strategies that serve as a guide for future development activities.

As part of the city's development of its 2030 Comprehensive Plan, the city's first Economic Development chapter was established.

In 2010, the EDA established a 2011-2015 Economic Development Strategic Plan. This plan identified four economic development priorities: organizational plan, marketing, business retention and expansion, business attraction. The Economic Development chapter of the 2030 Comprehensive Plan was updated substantially as part of the 2012 Comprehensive Plan Amendment.

Concurrently, another economic development initiative began with the premise of aligning economic development goals of both the public and private sectors and became known as GROW Farmington. GROW's foundation is to assist existing businesses to prosper while discussing the current state of Farmington's business climate. In 2013, the EDA developed and adopted the GROW Farmington Business Attraction Plan, which identifies a variety of business attraction tools for Farmington to develop a proactive business climate.

In 2015, the EDA developed and adopted its 2016 – 2018 Strategic Plan for Economic Development, which is a three-year strategic plan that provides direction and prioritization for implementing the city's economic development initiatives.

In 2017, the City Council, EDA, Planning Commission, and staff participated in a ULI Minnesota Navigating Your Competitive Future workshop, which addressed a broad range of economic development challenges and opportunities facing the City of Farmington.

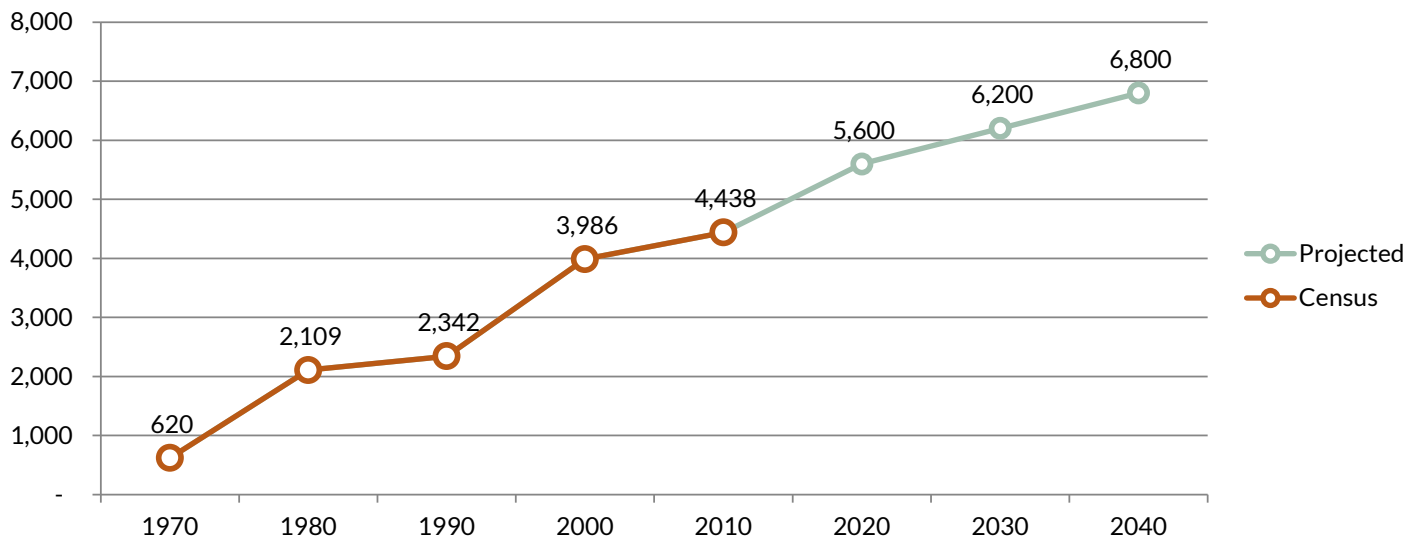
## Existing Economic Conditions

As seen in Table 9.1, the number of unemployed is a small percentage of the population.

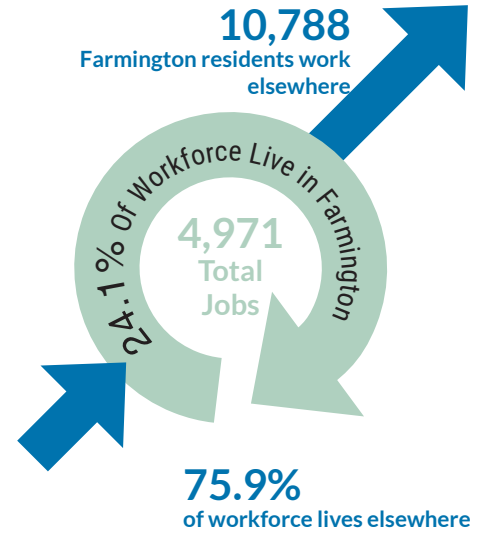
According to data from the US Census, the majority of employees in the Farmington are not actually residents. Figure 9.2 displays the employment inflow and outflow from the year 2015, which shows that 24.1% of Farmington's 4,971 jobs were taken by residents of the community. The inflow/outflow of employment in Farmington highlights the city's status as a bedroom community; the number of residents who leave the city for work is over double the amount of total jobs within the city. This shows a need for a wider variety of jobs and economic development opportunities in Farmington.

Figure 9.3 depicts the major employment industries throughout the City. Education is the top industry, with the Farmington School District being a major employer in the city. This is reflected further in the list of top employers in Table 9.2.

**Figure 9.1** *Historic Growth & Projections of Farmington's Employment*



**Figure 9.2 2015 Employment Inflow Outflow**

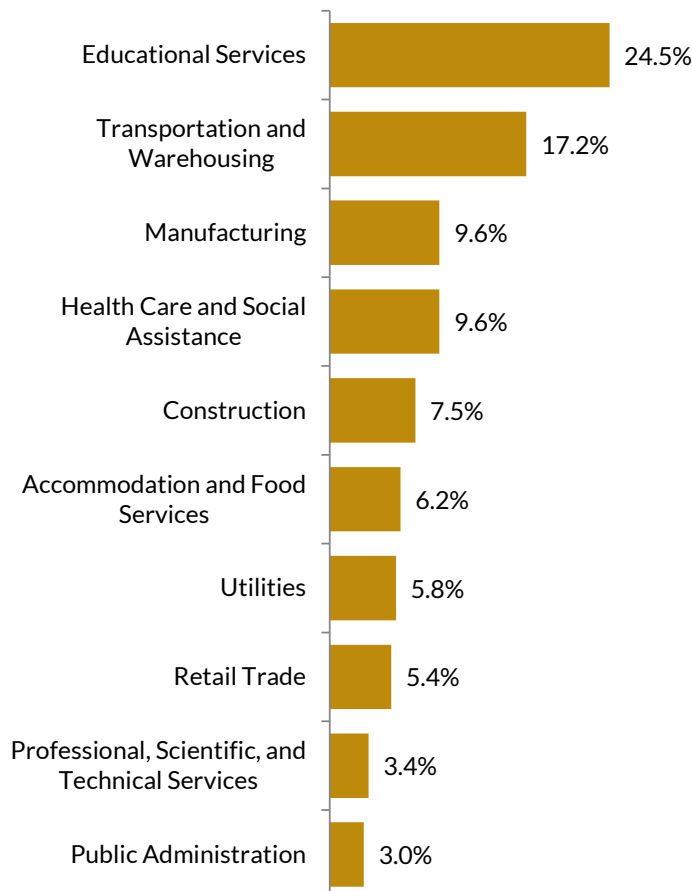


**Table 9.1 Employment Status 2015**

STATUS	2015		2000	
	NUMBER	%	NUMBER	%
<b>POPULATION 16 YEARS AND OVER</b>	<b>15,666</b>	-	<b>8,604</b>	-
<b>In labor force</b>	<b>12,801</b>	<b>81.7%</b>	<b>6,868</b>	<b>79.8%</b>
Civilian labor force	12,775	81.5%	6,851	79.6%
Employed	12,410	79.2%	6,687	77.7%
Unemployed	365	2.3%	164	1.9%
Armed Forces	26	0.2%	17	0.2%
<b>Not in labor force</b>	<b>2,865</b>	<b>18.3%</b>	<b>1,736</b>	<b>20.2%</b>

Source: 2011-2015 ACS, 2000 Census

**Figure 9.3 Top Industry Sectors of Employment**



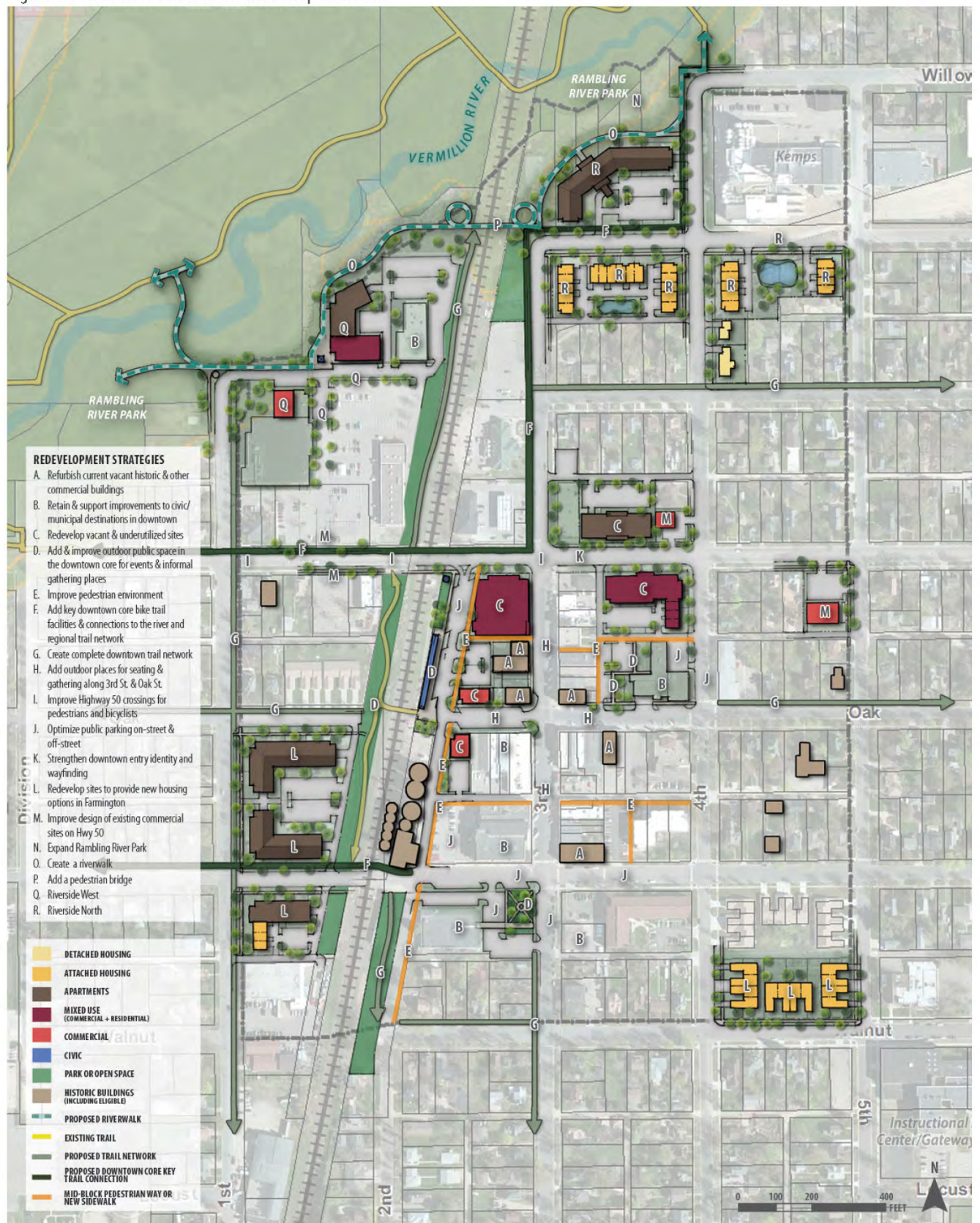
**Table 9.2 Top Employers in Farmington**

EMPLOYER	EMPLOYEES
Farmington Public Schools - ISD#192	899
Federal Aviation Administration	800
Dakota Electric Association	200
Trinity Care Center and Trinity Terrace	160
Marschall Line Inc	150
River Valley Home Care	148
City of Farmington	147
R & L Carriers	133
Kemps LLC	133
Valmont Industries	110

Source: City of Farmington, 2018

# Figure 9.4 Illustrative Downtown Redevelopment Plan - 2016

Figure 10: Illustrative Downtown Redevelopment Plan



Illustrative plan shows key redevelopment and reinvestment location opportunities, including redevelopment initiatives.



# Downtown Redevelopment Plan

In 2016, the Downtown Redevelopment Plan was adopted by the City Council. The Downtown Redevelopment Plan is intended to provide a shared vision for downtown that guides reinvestment efforts by both the private and public sectors, including key redevelopment opportunities. The Downtown Plan identifies redevelopment initiatives, connectivity improvements, and redevelopment phasing. Figure 9.4 shows the Plan's Illustrative Downtown Redevelopment Concept, including redevelopment sites, park and open space enhancements, historic building revitalization opportunities, and proposed pedestrian/trail connections including a proposed riverwalk along the south side of the Vermillion River. Specific redevelopment initiatives are identified by the downtown sub-districts: Downtown Core, Downtown Edge, Riverside North, and Riverside West.

## DOWNTOWN CORE REDEVELOPMENT INITIATIVES

- A. Refurbish vacant historic buildings and other commercial buildings
- B. Proactively support the retention of and improvements to current civic/municipal destinations and expand events in downtown
- C. Redevelop vacant and under-utilized sites for new business and possibly housing
- D. Improve and add outdoor public space for informal gathering places and events
- E. Improve the pedestrian environment
- F. Add key downtown core bike trail facilities and connections to the river and regional trail network
- G. Create a complete downtown trail network
- H. Add outdoor places for seating and gathering along 3rd Street and Oak Street
- I. Improve Highway 50 crossings for pedestrians and bicyclists
- J. Optimize public parking on-street and off-street
- K. Strengthen downtown identity and wayfinding

## DOWNTOWN EDGES REDEVELOPMENT INITIATIVES

- L. Redevelop sites to provide new housing options in Farmington
- M. Improve design of existing commercial sites on Hwy 50

## DOWNTOWN CORE REDEVELOPMENT INITIATIVES

- N. Expand Rambling River Park
- O. Create a Riverwalk on the south side of the river and connect to the regional trail network

- P. Add a pedestrian/bike bridge over the rail line
- Q. Redevelop Riverside West
- R. Redevelop Riverside North

## IMPLEMENTATION

The City Council must be committed to implementing this Plan. Important redevelopment powers reside solely with the City Council. Among the powers that may be needed to undertake redevelopment powers in the downtown are approving the establishment of TIF districts, approving the establishment of special service districts and levying service charges on properties in the district, levying special assessments for public improvements, and issuance of general obligation bonds to finance redevelopment and improvement projects.

Other important actions by the City Council can enhance the downtown. Some examples include keeping and adding community events to make downtown a focal point, keeping civic institutions concentrated in downtown, avoiding subsidizing non-downtown projects that include businesses that should be located in downtown, and providing staff capacity and resources needed to plan and undertake projects in downtown.

The Farmington Economic Development Authority (EDA) should play a key role in implementing the Plan. Many municipal development powers for redevelopment are given to the EDA (using the powers of a housing and redevelopment authority). Additionally, EDAs often have more time to focus on plan implementation than a City Council. Some important EDA powers include acquiring property, making loans, constructing and operating public facilities, and establishing TIF districts.

# Focus on Enterprise Development

The city's economic development strategy generally focuses on enterprise development rather than the attraction or recruitment of outside businesses to relocate to Farmington. This "grow your own" businesses strategy simply means supporting the development of small to medium sized businesses in the community through a variety of proactive measures. Enterprise development is generally recognized as a relatively low-cost economic development strategy that is particularly well-suited for a variety of rural and urban communities. The following factors support the rationale for focusing on a "grow your own" strategy for economic development:

1. The majority of businesses are small or medium sized, and they employ the majority of people in the United States.
2. Entrepreneurial growth companies account for "at least two-thirds of net new jobs in the American economy."
3. Small businesses incubate innovation leading to new businesses opportunity. They are responsible for more than 50 percent of all innovations, 67 percent of inventions, and 95 percent of all radical innovations.
4. We are living in a "new 'Entrepreneurial Age' in which entrepreneurs and their companies are transforming the economic landscape."
5. Entrepreneurs, those focused on innovation and fast growth, comprise 5 to 15 percent of all U.S. businesses, and there are some in every location.
6. Entrepreneurs and the companies they lead play a critical role in fostering economic prosperity and are vital to our ability to compete internationally.
7. Fast growth companies occupy a variety of business sectors, but they often start at the kitchen table or in the garage with less than \$50,000.
8. Both our defense capability and homeland security require a robust small business sector.
9. Once established, a strong entrepreneurial environment in distressed or remote communities can lead to success in regional relocations of related businesses.

If the first element in a proactive approach to entrepreneurship is well-organized and effective business support services, then the second essential element is community leadership. City leaders play key roles in businesses success by:

- » Creating a compelling vision;
- » Communicating the vision to others;
- » Developing a plan to support business success;
- » Demonstrating commitment.

This approach resulted in the adoption of the GROW Farmington Business Attraction Plan in 2013.

## **2016-2018 Strategic Plan for Economic Development**

### **INTRODUCTION**

Strategic planning is a key component of economic development. A three-year strategic plan is a valuable tool for both elected and appointed officials, as well as staff to provide work direction and prioritization of new initiatives. The following document outlines the EDA's areas of focus for 2016-2018.

### **MISSION**

The Economic Development Authority's mission is to improve the economic vitality of the city of Farmington and to enhance the overall quality of life by creating partnerships, fostering employment opportunities, promoting workforce housing, and expanding the tax base through development and redevelopment.

### **ROLE OF THE EDA**

The role of the Farmington EDA is to serve as an advisory board to the City Council on matters related to economic development. Through policy development and implementation of new and existing tools, the EDA serves as the voice of economic development.

### **STRATEGIC PRIORITIES**

The following five priorities were ranked by the EDA at their strategic planning session and are defined below. These priorities will serve as the focus and primary guidance of the EDA from 2016-2018.

Because new opportunities and ideas will arise during this timeframe, these priorities are meant to serve as the focus areas of the EDA while allowing flexibility to thoughtfully explore other topics deemed important.

1. Develop tools for promoting growth and development in Farmington.
2. Develop strong incentive policies to ensure proper use of tools.
3. Explore plans for acquiring land for new industrial development.
4. Complete the development of Vermillion River Crossings.
5. Define and utilize the existing or future resources of the EDA.

## **IMPLEMENTATION STRATEGIES**

### **Develop tools for promoting growth and development in Farmington.**

- » Identify traditional economic development tools
- » Identify tools that can be unique to Framington
- » Identify existing resources
- » Identify potential resources partners
- » Recommend tools to City Council

### **Develop strong incentive policies to ensure proper use of tools.**

- » Discuss criteria and thresholds desired for individual tools (i.e. job creations, wages, etc.)
- » Recommend policies to City Council
- » Allocate necessary resources
- » Promote available tools
  - Website, etc.

### **Explore plans for acquiring land for new industrial development.**

- » Provide input on the 2040 Comprehensive Plan and land use designations
  - Encourage additional collaboration between advisory bodies
  - Joint meeting(s) with Planning Commission
- » Maintain relationship with local landowners
- » Explore additional ways to facilitate land development

### **Complete the development of Vermillion River Crossings.**

- » Maintain relationship with broker/landowners
- » Consider alternate land use options
- » Discuss existing assessments

### **Define and utilize the existing or future resources of the**

## EDA.

- » Do current resources align with desired tools/initiatives?
- » Explore economic development revenue opportunities
- » Joint meeting(s) of the EDA and City Council

## RETAIL DEVELOPMENT STRATEGY

Growing population and households in Farmington's trade area will provide support for a growing number of retailers over the next 20 years. Farmington's comprehensive plan emphasizes maintaining Downtown as a major retail area and also provides for retail expansion into the Spruce Street Commercial Area. Additional future planned retail areas are at the intersection of Hwy 3 & 195th Street, Flagstaff Ave & 195th Street, and Flagstaff Ave & Hwy 50. These should be convenience shopping areas. These convenience shopping areas should be five to ten acres in size and designed to accommodate the types of uses found at Marketplace and Charleswood.

Downtown Farmington is the area's dominate retail location due to its historic base of retail stores and services. It is important to improve Downtown's attractiveness to retailer stores and services.

Retail potential in Downtown Farmington can be strengthened by locating new businesses that serve as major customer draws in the downtown area. This is similar to the city's decision to build its new City Hall in Downtown.

To encourage retail development in Downtown Farmington, the city could consider establishing a retail incubator to attract new retail stores to Farmington at affordable occupancy costs. The key to maintaining the vitality of Downtown Farmington is to have a growing number and diverse mix of attractive retail stores, restaurants and services that can meet the needs of trade area residents and visitors.

Building owners and retailers in Farmington's older retail areas (Downtown and Highway 3) should be encouraged to update and modernize their space to present a more contemporary appearance. This includes updating storefronts and interior finishes and fixtures. Downtown retailers should seek to be comparable to their competitors on Pilot Knob and in Apple Valley, Lakeville and Rosemount.

Over the next 25 years, some of Farmington's existing retail buildings are likely to be redeveloped to accommodate expansion of existing retailers or new retailers choosing to locate in these areas. The City of Farmington should encourage these redevelopment activities and should establish programs to enable redevelopment to be economically feasible.

## BUSINESS PARK DEVELOPMENT STRATEGY

Since 1990, significant business park space has been developed in Farmington. Industrial Park tenants indicated they located in Farmington due to the availability of affordable land and friendly business climate. Farmington should capitalize on this “good will” in its business development activities. This will help to mitigate development industry misconceptions of Farmington identified in broker interviews.

A strategy that will help Farmington achieve a balanced growth would include the following:

- » Land use policy that promotes a balanced growth that includes a mix of office and industrial users to help support Farmington’s tax base and minimize the real estate tax on homeowners.
- » Target industries that are not heavily dependent on transportation. Because Farmington is not on a primary transportation corridor like I-35, industries that depend on a road network to receive and ship large quantities of raw materials and finished goods will find Farmington less accessible than other locations.
- » Building values tend to reflect the wages and talent of the people working inside. It is important to create jobs that enable employees to live within the community. These employees are likely to have higher disposable income to support local businesses. This will reduce traffic congestion created by commuters that leave the community to find employment.
- » Development covenants for the industrial park will be important to ensuring that higher value real estate is developed. However, some communities create covenants that are overly restrictive and complex, which will often discourage industry from locating in their area. Covenants that are extensive and detailed are not necessary and can suggest an unfriendly local business climate.
- » Focus on the creation of wealth rather than the number of jobs created. High value investment will create jobs for highly paid skilled workers to operate the facility. High value investment tends to create a sense of permanence. Light assembly and warehouse tenants and owners are fairly mobile. The spaces they occupy are flexible and commodity real estate that is easily adaptable for new users. High value investment often includes expensive equipment that is very difficult and costly to move and often requires customized buildings.
- » The area to the west of the Industrial Park should be guided business park and sized to accommodate projected demand in this report.
- » It is very important to control the cost of land to promote business park development. In order to minimize up front acquisition and infrastructure cost, the EDA should investigate several scenarios to control land and cost. These include:

- This could be as simple as acquiring a renewable option on the proposed business park property. Option money is not subjected to ordinary income tax until the option is exercised. Therefore, a land owner could continue to farm the land and collect option money not immediately subject to income tax.
- The EDA could enter into a purchase agreement with a land owner that includes a “take down” provision that would allow the EDA to exercise a purchase at a predetermined price when a buyer is found or to take down land on a scheduled basis over an extended number of years.
- The EDA could enter into an option agreement for a nearby farm at a lower price and facilitate a 1031 tax free exchange with another land owner near to the business park allowing the owner to avoid paying a capital gain tax.
- » It is important to develop a business park layout that is flexible. Utilities should not be extended beyond the entrance. To do so would commit the city to a final design and preclude flexible lot configuration and size for potential users. A preliminary plat can be developed and finalized as each lot is sold.
- » The EDA should consider developing a business incubator building. This could be a multi-tenant building with added improvements that would allow emerging companies with new technologies to become established and hopefully later grow into the business park. It may be necessary to provide TIF, deferred assessments or other incentives to encourage a private developer to create a building with these added amenities.
- » The EDA should create a targeted marketing program focusing on specific industries and businesses south of the river. This would include direct mail and personal contact by EDA staff.

Farmington’s development strategy should focus on local and regional businesses that are likely to have more flexible location criteria than national firms. Farmington’s favorable business climate is a significant advantage. Farmington has the ability to build on the success of the existing Industrial Park.





# 10 ■ IMPLEMENTATION

The 2040 Comprehensive Plan provides high level, long-term guidance for making decisions about the community’s future growth, redevelopment, and infrastructure investments. While the Comprehensive Plan is the city’s most important comprehensive and long-term plan, its vision, goals, policies, and maps can only achieve the community’s vision for the future if it is used on a regular basis. Using the Comprehensive Plan requires striking a balance between adhering to the enduring vision, goals and policies described in the plan while also adapting to conditions that will change over the life of this plan. Implementation of city-led initiatives will also involve further planning and budgeting to ensure new actions can be fully achieved and sustained over time.

## **Official Controls**

### **ZONING ORDINANCE**

The City of Farmington has a Zoning Ordinance, Title 10 of the City Code, which defines each of the city’s zoning districts including permitted uses, divides the city into the various districts as shown by the district boundaries on the zoning map, establishes general zoning regulations for development of lots and buildings, and establishes performance standards for specific uses and areas of the city. The Zoning Ordinance establishes the following 19 base zoning districts and three overlay zoning districts:

- » A-1 Agriculture District
- » R-1 Low Density Residential District
- » R-2 Low/Medium Density Residential District
- » R-3 Medium Density Residential District
- » R-4 Medium/High Density Residential District
- » R-5 High Density Residential District
- » R-T Downtown Transitional Mixed Use District

- » R-D Downtown Residential District
- » B-1 Highway Business District
- » B-2 Downtown Business District
- » B-3 Heavy Business District
- » B-4 Neighborhood Business District
- » BCF Business/Commercial Flex
- » I-1 Industrial District
- » IP Industrial Park District
- » SSC Spruce Street Commercial District
- » MU Mixed Use District
- » MUCR Mixed Use Commercial/Residential District
- » P/OS Parks and Open Space District
- » Downtown Commercial Overlay District
- » Planned Unit Development Overlay District
- » Floodplain Overlay District

## ZONING MAP

Figure 10.1 shows the city's current Zoning Map.

## SUBDIVISION ORDINANCE

The City of Farmington has a Subdivision Ordinance, Title 11 of the City Code, that requires all land subdivisions to be referred to the city's Planning Commission and approved by the City Council as having fulfilled the minimum regulations and requirements for the platting of land within the city pursuant to the authority contained in Minnesota Statutes and in order to guide the design of new subdivisions in a manner consistent with the City's Comprehensive Plan.

## WATER RESOURCES ORDINANCES

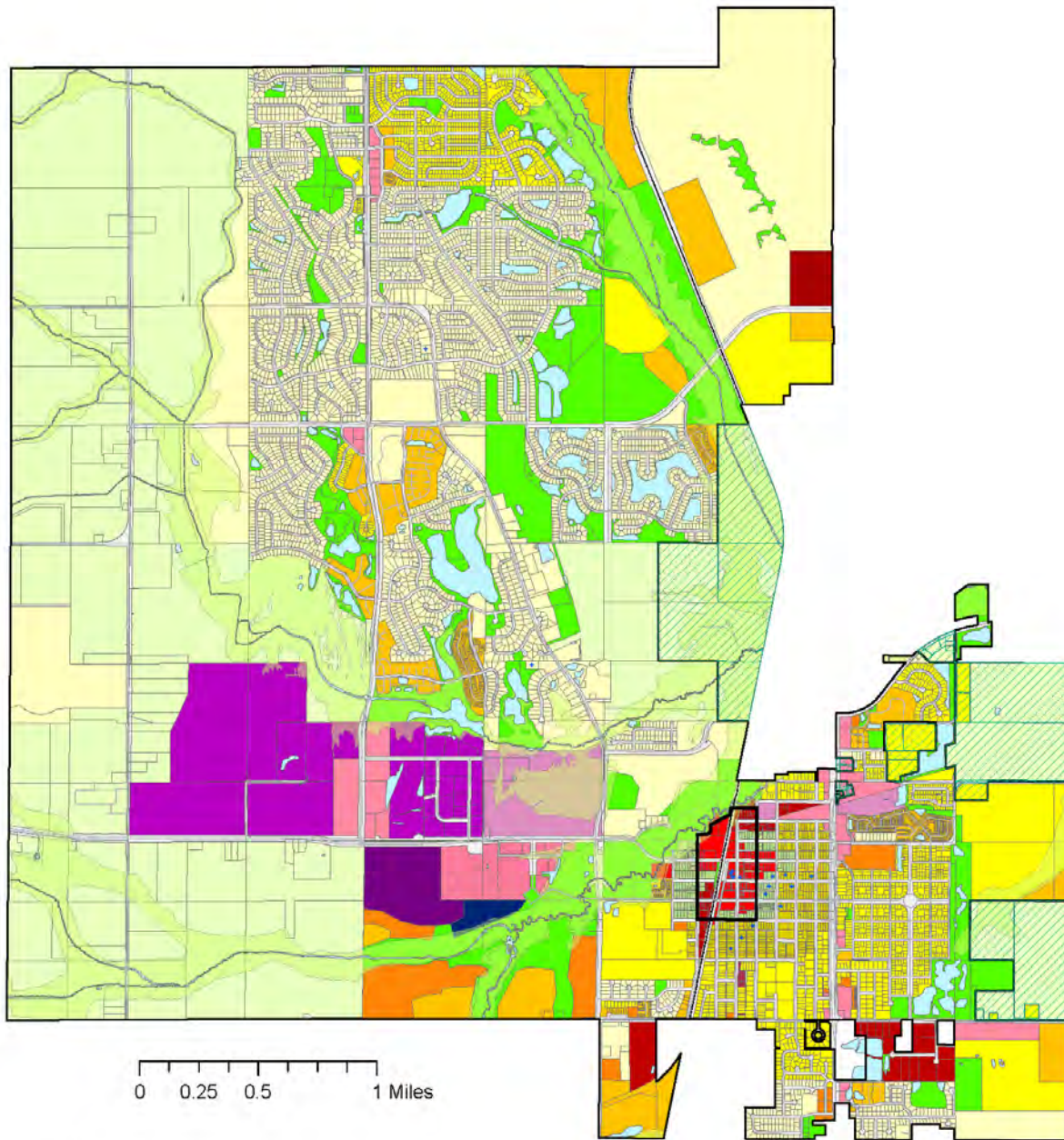
### Shore Land Management Ordinance

The City of Farmington's City Code, Section 10-6-18, regulates the subdivision, use and development of the shore lands of public waters and thus preserve and enhance the quality of surface waters, conserve the economic and natural environmental values of shore lands, and provide for the wise use of waters and related resources.

### Private Sewer Systems Ordinance

The City of Farmington's City Code, Section 8-2-5 (Private Sewer System Unlawful), prohibits the installation of a private or community sanitary sewer system within the city limits except in cases where the public sanitary sewer system is not accessible to the premises where such private systems are requested. Upon determination of the utilities supervisor that it is not feasible to connect the applicant's premises to the public sanitary sewer system then the applicant shall be granted a permit to install a private sanitary sewer system. All properties using a private or community sewer system in the city shall connect to the public sanitary sewer system of the city within two (2) years after the time that said system is available to the property.

**Figure 10.1 Current Zoning Map, City of Farmington**



**Legend**

**Zoning**

- |                                  |                                                        |
|----------------------------------|--------------------------------------------------------|
| A-1 (Agriculture)                | P/OS (Park/Open Space)                                 |
| B-1 (Highway Business)           | R-1 (Low Density Residential - 1.0-3.5 du/ac)          |
| B-2 (Downtown Business)          | R-2 (Low/Medium Density Residential - 3.5 - 6.0 du/ac) |
| B-3 (Heavy Business)             | R-3 (Medium Density Residential - 6.0-12.0 du/ac)      |
| B-4 (Neighborhood Business)      | R-5 (High Density Residential - 12.0+ du/ac)           |
| Business/Commercial Flex         | R-D (Downtown Residential)                             |
| I-1 (Industrial)                 | R-T (Downtown Transitional Mixed Use)                  |
| IP (Industrial Park)             | ROW (Right-of-Way)                                     |
| Mixed-Use                        | SSC (Spruce Street Commercial)                         |
| Mixed-Use Commercial/Residential | Water                                                  |

**Other**

- |                             |                              |
|-----------------------------|------------------------------|
| Vermillion River Floodplain | Downtown Commercial District |
| Historic Properties         | Empire OAA                   |



Map dated December 7, 2018.  
 Prepared for the City of Farmington  
 Community Development Department  
 by the Dakota County Office of GIS.

For existing private sewer systems, the City of Farmington has adopted by reference the Dakota County Subsurface Sewage Treatment System Ordinance No. 113, as amended. This ordinance regulates the siting, design, installation, alterations, operation, maintenance, monitoring, and management of all subsurface sewage treatment systems (SSTS) including but not limited to individual SSTS and cluster or community SSTS, privy vaults, and other non-water carried SSTS. All sewage generated in unsewered areas shall be treated and dispersed by an approved SSTS that is sited, designed, installed, operated, and maintained in accordance with the provisions of Dakota County Ordinance No. 113 or by a system that has been permitted by the Minnesota Pollution Control Agency (MPCA).

### **Water Supply Ordinance**

The City of Farmington's City Code, Section 8-3-5 (Private Water System Unlawful), prohibits the installation of a private or community water system in the city in cases where the public water system is accessible to the premises where such private system is requested. Upon determination of the council that it is not feasible to connect the applicant's premises to the public water system, then the applicant shall be granted a permit to install a private community water system. All properties using a water system in the city, except those properties which are considered as agricultural, shall connect to the water system of the city within one year after the time that said system is available to the property.

### **Outdoor Water Use Policy**

The City of Farmington also has an Outdoor Water Use Policy for odd-even day watering that has helped reduce peak day and seasonal demands. The City has also been proactive in implementing an increasing block rate structure that bills more for higher water usage. This has helped reduce water usage over the past years.

## **City Wide System Policy Plans**

The 2040 Comprehensive Plan refers to other system policy plans that the City of Farmington uses to guide city infrastructure and investments. These plans include:

- » Comprehensive Sanitary Sewer Plan
- » Water Supply and Distribution Plan
- » Local Surface Water Management Plan
- » Parks and Recreation System Master Plan

These system policy plans serve as ongoing tools for implementing the goals and policies in the Comprehensive Plan. These plans may be updated and modified over time without updating the Comprehensive Plan.

## Specific Area and Topic Plans

The City uses specific area and topic plans as tools for implementing the Comprehensive Plan. Current studies that will continue to provide direction to the city include:

- » Spruce Street Area Master Plan
- » Downtown Redevelopment Plan
- » 2016-2018 Strategic Plan for Economic Development
- » GROW Farmington Business Attraction Plan.

The City will continue to use these plans and additional future plans to provide the information needed to implement the Comprehensive Plan. Future plans and studies may ultimately lead to amendments to the Comprehensive Plan.

## Capital Improvement Program

State Law requires that the implementation component of a city's Comprehensive Plan contain a capital improvement program (CIP) for transportation, sanitary sewer, water supply, stormwater management system, parks/trails/open spaces and public facilities. The 2040 Comprehensive Plan serves as the foundation for ongoing capital improvements planning by the city necessary for the community's planned growth and improvements. The city has created a CIP that matches the estimated project costs over a five-year period with funding sources. The CIP allows the city to prioritize projects and to make best use of available revenues. By looking at future needs, the city is better able to find funding sources to fill gaps and to coordinate projects with other jurisdictions. The CIP is updated and approved annually. The city's adopted CIP is included in Appendix A.

## Fiscal Devices

### TAX INCREMENT FINANCING

Tax increment financing (TIF) is the primary development finance tool available to Minnesota cities (Minnesota Statutes, Sections 469.174 through 469.179). TIF is simple in concept, but complex in its application. Through tax increment financing, the property taxes created by new development (or redevelopment) are captured and used to finance activities needed to encourage the development. The challenge in using TIF lies with the complex and ever-changing statutory limitations. These complexities make it impractical to provide a thorough explanation of tax increment financing as part of this plan. Instead, this section highlights the use of TIF as it relates to the implementation of the plan.

Tax increment financing can be used to finance many of the important implementation actions facing the city: land acquisition, site preparation, parking, and public improvements. In addition, TIF creates a means to borrow money needed to pay for redevelopment costs.

## TAX ABATEMENT

Tax abatement acts like a simpler and less powerful version of tax increment financing. With TIF, the city controls the entire property tax revenue from new development. Under the abatement statute (Minnesota Statutes, Sections 469.1812 through 469.1815), the city, county and school district have independent authority to grant an abatement. Acting alone, the city cannot use tax abatement to generate the same amount of revenue as TIF. Nonetheless, tax abatement provides a valuable tool for redevelopment initiatives. Certain projects may be of sufficient importance to encourage county and/or school district abatement and achieve additional funding capacity.

Abatement in Minnesota works more like a rebate than an abatement. The city (and other units abating taxes) adds a tax levy equal to the amount of taxes to be abated. The revenue from the abatement levy can be returned to the property owner or retained and used to finance development activities. Tax abatement can be used to finance key redevelopment actions; such as land acquisition, site preparation and public improvements. Tax abatement is perhaps best suited as an incentive for reinvestment in existing property. While TIF deals with only the value from new development, abatement can apply to both new and existing value. This power provides the means to encourage building rehabilitation and storefront improvements. The city could agree to abate all or part of the municipal share of taxes to encourage reinvestment tied to the plan.

The statute grants the authority to issue general obligation bonds supported by the collection of abated taxes. The proceeds of the bonds may be used to pay for (1) public improvements that benefit the property, (2) land acquisition, (3) reimbursement to the property owner for improvements to the property, and (4) the costs of issuing the bonds.

## SPECIAL ASSESSMENTS

Public improvements are often financed using the power to levy special assessments (Minnesota Statutes Chapter 429). A special assessment is a means for benefiting properties to pay for all or part of the costs associated with improvements, and to spread the impact over a period of years. From a city perspective, this authority provides an important means of raising capital.

Special assessments can be used to finance many of the public improvements needed to implement the plan. Eligible improvements include streets, sidewalks, street lighting, streetscape, and parking. Special assessments provide a means to borrow money to finance public improvements. Chapter 429 conveys the power to issue general obligation improvement bonds to finance the design and construction

of public improvements. Important factors in the use of improvement bonds include:

- » A minimum of 20% of the cost of the improvement to the city must be assessed against benefited properties;
- » Beyond the 20% threshold, any other legally available source of municipal revenue may be used to pay debt service on improvement bonds;
- » Improvements bonds are not subject to any statutory debt limit;
- » Improvement bonds may be issued without voter approval.

## SPECIAL SERVICE DISTRICT

A special service district is a tool for financing the construction and maintenance of public improvements within a defined area. Minnesota Statutes Sections 428A.01 through 428A.10 govern the creation and use of special service districts. This legislation is currently scheduled to expire in 2028. A special service district provides a means to levy taxes (service charges) and fund improvements to and services for a commercial area.

A special service district could have several applications for Farmington:

- » The district can provide an alternative to special assessments as a means of financing some of the public improvements in areas like downtown or the Highway 3 corridor. The service district approach avoids the benefits test imposed by special assessments. The test for the service district is that the amount of service charges imposed must be reasonably related to the special services provided. The costs of shared parking or streetscape improvements, for example, may be better spread across a district than through assessments to individual properties.
- » A special service district can provide for maintenance of public improvements. Some of the improvements described in the Downtown Redevelopment Plan require a level of maintenance above the typical public improvement. Items such as banners and planted materials must be maintained and replaced at a faster rate than that expected for streets or utilities. A higher standard of cleaning and snow removal may be expected in downtown and other commercial areas. Without a special service district, these costs are typically borne through the General Fund of the city.
- » A special service district could provide a means for developing and operating a downtown parking system. Use of a special service district should be considered during the negotiation of a development agreement. If the city is going to use a special service district, the city should seek agreement to a petition and waiver of veto and other objections related to the use of a special service district. The development agreement must address both the establishment of the service district and the levy of a service charge.

## Implementation Actions

Timing of implementation actions may shift based on development trends, funding availability, agency coordination, and other factors. Implementation timeframes are categorized as:

- » On-Going
- » Short Term: 0-5 years
- » Long Term: 5+ years

### LAND USE

- » The City of Farmington will review and update its official controls within nine months of adopting its 2040 Comprehensive Plan. If updates are required to bring any of the city's official controls into alignment with the 2040 Comprehensive Plan, the city will provide copies of all updated official controls to the Metropolitan Council following the city's adoption of the updated official controls. Potential official control changes that may be needed include the following: (Short Term)
  - Rezoning of land on the Zoning Map to bring it into alignment with updates to the Future Land Use Map in the 2040 Comprehensive Plan.
  - Since the 2030 Comprehensive Plan's land use categories were actually the city's zoning districts, the land use categories in the 2040 Comprehensive Plan are more general in definition than a zoning district and there are less categories than zoning districts. As a result of these new land use categories, zoning district definitions, particularly densities, will need to be updated to align with the land use categories.
  - The city currently has more zoning districts than are probably needed, so some zoning districts will be considered for consolidation or elimination.
  - Update the city's Shore Land Management Ordinance.
- » Pursue the Downtown Core and Downtown Edge redevelopment initiatives of the Downtown Redevelopment Plan. (Short Term)
- » Complete development of Spruce Street Area north of the Vermillion River. (Short Term)
- » Pursue development of neighborhood commercial node at Hwy 3/195<sup>th</sup> St in the new Fairhill neighborhood. (Short Term)
- » Pursue the Downtown Riverside redevelopment initiatives of the Downtown Redevelopment Plan. (Long Term)

### HOUSING

The implementation section of Chapter 4. Housing outlines tools that can be utilized by the city, residents, developers, and funders to implement Farmington's housing goals and policies. "Table 4.13 Housing Implementation Tools" identifies each widely available tool/action, when it would be considered for use, and what housing need(s) it addresses.



## TRANSPORTATION

The “Future Study/Coordination Issues” Section of Chapter 5. Transportation defines further efforts the City will pursue in collaboration with partnering agencies to refine transportation network needs to support the growth defined in the plan. Other ongoing tasks include:

- » Traffic/safety studies as dictated by development and safety trends. (On-Going)
- » General extension of city collector roadway network as dictated by development. (On-Going)

## WATER RESOURCES

The City will plan for and support the public improvements identified in each of the water resource plans as it relates to future trunk improvements for water, sanitary sewer and surface water. The identified improvements are incorporated into the City’s overall Capital Improvement Plan (CIP) discussed earlier in this chapter.

## PARKS & RECREATION

- » Complete Farmington Bicycling and Pedestrian Master Plan. (Short Term)
- » Develop a long-term financial plan for the development and redevelopment of parks, open space and trails. (Short Term)
- » Develop maintenance standards for recreational facilities. (Short Term)
- » Increase marketing of parks and recreation (recreational programs, parks, open space, trails and recreational facilities) to the community. (Short Term)
- » All city parks should have approved master plans to guide their development. (Short Term)
- » Develop and implement a Bike and Pedestrian Plan. (Short Term)
- » Implement sustainability practices in recreational facilities, parks and open spaces. (On-Going)
- » Construct the facilities identified in the Jim Bell Park and Preserve Master Plan and in the Aquatic Feasibility Study including athletic facilities and a new aquatic facility. (Long Term)
- » Collaborate with Dakota County on development of the North Creek Regional Greenway through Farmington. (Long Term)

## SUSTAINABILITY

- » Achieve GreenStep Cities Step 3 Status and higher. (Long Term)

## ECONOMIC DEVELOPMENT

- » Implement Downtown Redevelopment Plan (Short Term)
- » Conduct Highway 3 Corridor Plan (Short Term)
- » Continue to develop and implement Three-Year Economic Development Strategic Plans (On-Going)

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# APPENDIX A. CAPITAL IMPROVEMENT PLAN

# City of Farmington



**2019-2023**

## Capital Improvement Plan



<b>CAPITAL IMPROVEMENT PROGRAM</b>					
<b>PARK IMPROVEMENT FUND</b>					
<b>PROJECTS</b>	<b>2019</b>	<b>2020</b>	<b>2021</b>	<b>2022</b>	<b>2023</b>
RESURFACE WESTVIEW ACRES BASKETBALL COURT	\$5,000				
REPLACE BACKSTOP AT FEELY FIELDS #1	\$30,000				
REPLACE PRAIRIE WATERWAY SHELTER ROOF	\$3,000				
MARIGOLD PARK AND PRAIRIE PINES PARK IMPROVEMENTS	\$265,000				
RESURFACE FARMINGTON PRESERVE BASKETBALL COURT		\$5,000			
RESURFACE PINE KNOLL PARK BASKETBALL COURT					\$5,000
MEADOWVIEW PARK IMPROVEMENTS					\$100,000
<b>PARK IMPROVEMENT FUND TOTAL</b>	<b>\$303,000</b>	<b>\$5,000</b>	<b>\$0</b>	<b>\$0</b>	<b>\$105,000</b>
<b>REVENUES</b>					
BEGINNING FUND BALANCE	\$449,258	\$246,258	\$322,258	\$422,258	\$512,258
TRANSFERS IN/LIQUOR STORE	\$75,000	\$75,000	\$75,000	\$75,000	\$75,000
LOCAL GOVERNMENT AID	\$0	\$0	\$0	\$0	\$0
PARK DEDICATION FEES	\$20,000	\$1,000	\$20,000	\$10,000	\$20,000
OTHER FUNDS	\$5,000	\$5,000	\$5,000	\$5,000	\$5,000
MISCELLANEOUS INCOME	\$0	\$0	\$0	\$0	\$0
<b>TOTAL REVENUE</b>	<b>\$100,000</b>	<b>\$81,000</b>	<b>\$100,000</b>	<b>\$90,000</b>	<b>\$100,000</b>
<b>EXPENDITURES</b>					
PROJECTS	\$303,000	\$5,000	\$0	\$0	\$105,000
<b>TOTAL EXPENDITURES</b>	<b>\$303,000</b>	<b>\$5,000</b>	<b>\$0</b>	<b>\$0</b>	<b>\$105,000</b>
<b>ENDING FUND BALANCE</b>	<b>\$246,258</b>	<b>\$322,258</b>	<b>\$422,258</b>	<b>\$512,258</b>	<b>\$507,258</b>

<b>CAPITAL IMPROVEMENT PROGRAM</b>					
<b>EQUIPMENT REPLACEMENT FUND-GENERAL FUND</b>					
<b>2019-2023</b>					
<b>PROJECTS</b>	<b>2019</b>	<b>2020</b>	<b>2021</b>	<b>2022</b>	<b>2023</b>
<b>GENERAL FUND</b>					
BUILDING INSPECTIONS		\$32,860			\$34,500
ENGINEERING		\$37,100	\$34,880		\$37,950
POLICE	\$157,590	\$93,280	\$208,626	\$154,560	\$101,200
FIRE		\$37,100	\$1,128,150	\$61,600	\$126,500
STREETS		\$89,040	\$264,870	\$299,040	\$17,250
PARKS		\$260,760	\$207,100	\$133,280	\$56,350
NATURAL RESOURCES				\$39,200	
<b>EQUIPMENT REPLACEMENT FUND</b>	<b>\$157,590</b>	<b>\$550,140</b>	<b>\$1,843,626</b>	<b>\$687,680</b>	<b>\$373,750</b>
<b>REVENUES</b>					
BEGINNING FUND BALANCE	\$162,702	\$95,112	\$344,972	\$49,546	\$203,466
TRANSFERS IN	\$0	\$800,000	\$480,000	\$542,000	\$542,000
LOCAL GOVERNMENT AID	\$90,000	\$0	\$0	\$299,600	\$0
SALE OF BONDS	\$0	\$0	\$1,068,200	\$0	\$0
OTHER FUNDS	\$0	\$0	\$0	\$0	\$0
MISCELLANEOUS INCOME	\$0	\$0	\$0	\$0	\$0
<b>TOTAL REVENUE</b>	<b>\$90,000</b>	<b>\$800,000</b>	<b>\$1,548,200</b>	<b>\$841,600</b>	<b>\$542,000</b>
<b>EXPENDITURES</b>					
EQUIPMENT	\$157,590	\$550,140	\$1,843,626	\$687,680	\$373,750
<b>TOTAL EXPENDITURES</b>	<b>\$157,590</b>	<b>\$550,140</b>	<b>\$1,843,626</b>	<b>\$687,680</b>	<b>\$373,750</b>
<b>ENDING FUND BALANCE</b>	<b>\$95,112</b>	<b>\$344,972</b>	<b>\$49,546</b>	<b>\$203,466</b>	<b>\$371,716</b>

<b>CAPITAL IMPROVEMENT PROGRAM</b>					
<b>EQUIPMENT REPLACEMENT FUND-UTILITY FUNDS</b>					
<b>2019-2023</b>					
<b>PROJECTS</b>	<b>2019</b>	<b>2020</b>	<b>2021</b>	<b>2022</b>	<b>2023</b>
<b>FUND</b>					
WATER				\$299,600	
SANITARY SEWER	\$216,300	\$79,500	\$430,550		\$241,500
STORMWATER		\$222,600			\$227,700
SOLID WASTE	\$38,110		\$465,430		
FLEET		\$37,100		\$47,600	
<b>EQUIPMENT REPLACEMENT FUND</b>	<b>\$254,410</b>	<b>\$339,200</b>	<b>\$895,980</b>	<b>\$347,200</b>	<b>\$469,200</b>
<b>REVENUES</b>					
BEGINNING FUND BALANCE	\$0	\$0	\$0	\$0	\$0
WATER FEES	\$0	\$0		\$299,600	
SANITARY SEWER FEES	\$216,300	\$79,500	\$430,550		\$241,500
STORMWATER FEES	\$0	\$222,600			\$227,700
SOLID WASTE FEES	\$38,110		\$465,430		
FLEET TRANSFERS		\$37,100		\$47,600	
<b>TOTAL REVENUE</b>	<b>\$254,410</b>	<b>\$339,200</b>	<b>\$895,980</b>	<b>\$347,200</b>	<b>\$469,200</b>
<b>EXPENDITURES</b>					
EQUIPMENT	\$254,410	\$339,200	\$895,980	\$347,200	\$469,200
<b>TOTAL EXPENDITURES</b>	<b>\$254,410</b>	<b>\$339,200</b>	<b>\$895,980</b>	<b>\$347,200</b>	<b>\$469,200</b>
<b>ENDING FUND BALANCE</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>

<b>CAPITAL IMPROVEMENT PROGRAM</b>					
<b>STREET RECONSTRUCTION FUND</b>					
<b>PROJECTS</b>	<b>2019</b>	<b>2020</b>	<b>2021</b>	<b>2022</b>	<b>2023</b>
WESTVIEW ACRES	\$4,151,724				
TURN LANES AT 225TH STREET				\$144,240	
CARVER LANE/BACKAGE ROAD				\$768,511	
SPRUCE STREET (RR TRACKS TO DENMARK AVENUE)				\$1,616,657	
WILLOW STREET/LINDEN STREET				\$1,823,784	
SECOND STREET/HONEYSUCKLE LANE					\$2,420,829
<b>STREET RECONSTRUCTION FUND</b>	<b>\$4,151,724</b>	<b>\$0</b>	<b>\$0</b>	<b>\$4,353,192</b>	<b>\$2,420,829</b>
<b>REVENUES</b>					
BEGINNING FUND BALANCE	\$300,000	\$0	\$0	\$260,000	\$1,044,999
TRANSFERS IN/TAX LEVY	\$0	\$0	\$260,000	\$775,000	\$926,000
LOCAL GOVERNMENT AID	\$0	\$0	\$0	\$0	\$0
SALE OF BONDS	\$1,050,000	\$0	\$0	\$2,281,846	\$1,122,895
WATER FUND CONTRIBUTION	\$928,608	\$0	\$0	\$793,400	\$507,431
STORM WATER FUND CONTRIBUTION	\$258,508	\$0	\$0	\$628,762	\$339,685
SANITARY SEWER FUND CONTRIBUTION	\$996,608	\$0	\$0	\$659,183	\$450,817
MSA CONTRIBUTION	\$618,000	\$0	\$0	\$0	\$0
MISCELLANEOUS INCOME	\$0	\$0	\$0	\$0	\$0
<b>TOTAL REVENUE</b>	<b>\$3,851,724</b>	<b>\$0</b>	<b>\$260,000</b>	<b>\$5,138,191</b>	<b>\$3,346,828</b>
<b>EXPENDITURES</b>					
PROJECTS	\$4,151,724	\$0	\$0	\$4,353,192	\$2,420,829
<b>TOTAL EXPENDITURES</b>	<b>\$4,151,724</b>	<b>\$0</b>	<b>\$0</b>	<b>\$4,353,192</b>	<b>\$2,420,829</b>
<b>ENDING FUND BALANCE</b>	<b>\$0</b>	<b>\$0</b>	<b>\$260,000</b>	<b>\$1,044,999</b>	<b>\$1,970,998</b>



<b>CAPITAL IMPROVEMENT PROGRAM</b>					
<b>STREET MAINTENANCE FUND</b>					
<b>PROJECTS</b>	<b>2019</b>	<b>2020</b>	<b>2021</b>	<b>2022</b>	<b>2023</b>
CRACK SEALING	\$33,000	\$34,320	\$35,640	\$36,960	\$38,280
SEAL COATING	\$145,000	\$150,800	\$156,600	\$162,400	\$168,200
MILL AND OVERLAY	\$415,000	\$550,000	\$200,000	\$230,000	\$260,000
<b>STREET MAINTENANCE FUND</b>	<b>\$593,000</b>	<b>\$735,120</b>	<b>\$392,240</b>	<b>\$429,360</b>	<b>\$466,480</b>
<b>REVENUES</b>					
BEGINNING FUND BALANCE	\$790,111	\$597,111	\$404,024	\$742,992	\$945,685
TRANSFERS IN/TAX LEVY	\$400,000	\$425,000	\$650,000	\$575,000	\$500,000
LOCAL GOVERNMENT AID	\$0	\$117,033	\$81,208	\$57,053	\$67,033
SALE OF BONDS	\$0	\$0	\$0	\$0	\$0
OTHER FUNDS	\$0	\$0	\$0	\$0	\$0
MISCELLANEOUS INCOME	\$0	\$0	\$0	\$0	\$0
<b>TOTAL REVENUE</b>	<b>\$400,000</b>	<b>\$542,033</b>	<b>\$731,208</b>	<b>\$632,053</b>	<b>\$567,033</b>
<b>EXPENDITURES</b>					
PROJECTS	\$593,000	\$735,120	\$392,240	\$429,360	\$466,480
<b>TOTAL EXPENDITURES</b>	<b>\$593,000</b>	<b>\$735,120</b>	<b>\$392,240</b>	<b>\$429,360</b>	<b>\$466,480</b>
<b>ENDING FUND BALANCE</b>	<b>\$597,111</b>	<b>\$404,024</b>	<b>\$742,992</b>	<b>\$945,685</b>	<b>\$1,046,238</b>

<b>CAPITAL IMPROVEMENT PROGRAM</b>					
<b>TRAIL MAINTENANCE FUND</b>					
<b>PROJECTS</b>	<b>2019</b>	<b>2020</b>	<b>2021</b>	<b>2022</b>	<b>2023</b>
CRACK SEALING	\$7,000	\$7,280	\$7,560	\$7,840	\$8,120
FOG SEALING	\$15,000	\$15,600	\$16,200	\$16,800	\$17,400
PAVEMENT REPLACEMENT	\$285,000	\$90,000	\$75,000	\$30,000	\$60,000
<b>TRAIL MAINTENANCE FUND</b>	<b>\$307,000</b>	<b>\$112,880</b>	<b>\$98,760</b>	<b>\$54,640</b>	<b>\$85,520</b>
<b>REVENUES</b>					
BEGINNING FUND BALANCE	\$153,803	\$28,168	\$25,288	\$16,528	\$11,888
TRANSFERS IN/TAX LEVY	\$60,278	\$50,000	\$60,000	\$0	\$50,000
LOCAL GOVERNMENT AID	\$1,087	\$60,000	\$30,000	\$50,000	\$60,000
SALE OF BONDS	\$0	\$0	\$0	\$0	\$0
OTHER FUNDS	\$120,000	\$0	\$0	\$0	\$0
MISCELLANEOUS INCOME	\$0	\$0	\$0	\$0	\$0
<b>TOTAL REVENUE</b>	<b>\$181,365</b>	<b>\$110,000</b>	<b>\$90,000</b>	<b>\$50,000</b>	<b>\$110,000</b>
<b>EXPENDITURES</b>					
PROJECTS	\$307,000	\$112,880	\$98,760	\$54,640	\$85,520
<b>TOTAL EXPENDITURES</b>	<b>\$307,000</b>	<b>\$112,880</b>	<b>\$98,760</b>	<b>\$54,640</b>	<b>\$85,520</b>
<b>ENDING FUND BALANCE</b>	<b>\$28,168</b>	<b>\$25,288</b>	<b>\$16,528</b>	<b>\$11,888</b>	<b>\$36,368</b>
<b>2019 PAVEMENT REPLACEMENT PROJECTS</b>					
DOWNTOWN HANDICAP PARKING STALL	\$5,000				
NORTHCREEK GREENWAY TRAIL AT 187TH STREET	\$10,000				
SOUTHERN PRAIRIE WATERWAY TRAIL REPLACEMENT	\$150,000				
VRC TRAIL AND SIDEWALK REPLACEMENT	\$120,000				
	\$285,000				

CAPITAL IMPROVEMENT PROGRAM					
BUILDING MAINTENANCE FUND					
PROJECTS	2019	2020	2021	2022	2023
CITY HALL		\$20,000			
FIRE STATION #1	\$15,450	\$25,000			
FIRE STATION #2	\$500	\$25,000			
SCHMITZ-MAKI ARENA	\$126,300				
FIRST STREET GARAGE	\$5,000				
MAINTENANCE FACILITY	\$13,400				
POLICE DEPARTMENT	\$9,800	\$25,000			
RAMBLING RIVER CENTER	\$26,825				
FUTURE SALT SHED			\$125,000		
FUTURE FUEL STATION				\$200,000	
<b>BUILDING MAINTENANCE FUND</b>	<b>\$197,275</b>	<b>\$95,000</b>	<b>\$125,000</b>	<b>\$200,000</b>	<b>\$0</b>
REVENUES					
BEGINNING FUND BALANCE	\$201,435	\$25,368	\$16,975	\$43,582	\$189
TRANSFERS IN/TAX LEVY	\$0	\$0	\$0	\$0	\$0
LOCAL GOVERNMENT AID	\$21,208	\$86,607	\$151,607	\$156,607	\$136,607
SALE OF BONDS	\$0	\$0	\$0	\$0	\$0
OTHER FUNDS/LIQUOR STORE REVENUE	\$0	\$0	\$0	\$0	\$0
MISCELLANEOUS INCOME	\$0	\$0	\$0	\$0	\$0
<b>TOTAL REVENUE</b>	<b>\$21,208</b>	<b>\$86,607</b>	<b>\$151,607</b>	<b>\$156,607</b>	<b>\$136,607</b>
EXPENDITURES					
PROJECTS	\$197,275	\$95,000	\$125,000	\$200,000	\$0
<b>TOTAL EXPENDITURES</b>	<b>\$197,275</b>	<b>\$95,000</b>	<b>\$125,000</b>	<b>\$200,000</b>	<b>\$0</b>
<b>ENDING FUND BALANCE</b>	<b>\$25,368</b>	<b>\$16,975</b>	<b>\$43,582</b>	<b>\$189</b>	<b>\$136,796</b>

<b>CAPITAL IMPROVEMENT PROGRAM</b>					
<b>FIRE EQUIPMENT FUND</b>					
<b>PROJECTS</b>	<b>2019</b>	<b>2020</b>	<b>2021</b>	<b>2022</b>	<b>2023</b>
SCBA	\$85,000	\$64,800	\$0	\$0	\$0
PORTABLE RADIOS	\$0	\$0	\$45,000	\$45,000	\$45,000
RADIO BATTERIES	\$0	\$6,000	\$0	\$8,000	\$0
MOBILE RADIOS	\$0	\$0	\$0	\$9,750	\$9,750
EXTRICATION TOOLS	\$0	\$0	\$0	\$0	\$40,000
THERMAL IMAGING CAMERAS	\$5,000	\$0	\$7,500	\$5,000	\$0
RAD 57 CO MONITOR	\$0	\$0	\$0	\$7,000	\$0
HOSE	\$0	\$7,500	\$11,000	\$7,500	\$11,000
GAS MONITOR	\$0	\$0	\$8,000	\$0	\$9,000
<b>TOTAL</b>	<b>\$90,000</b>	<b>\$78,300</b>	<b>\$71,500</b>	<b>\$82,250</b>	<b>\$114,750</b>
<b>REVENUES</b>					
BEGINNING FUND BALANCE	\$0	\$1,545	\$14,790	\$34,835	\$44,130
TRANSFERS IN/TAX LEVY	\$91,545	\$91,545	\$91,545	\$91,545	\$111,545
LOCAL GOVERNMENT AID	\$0	\$0	\$0	\$0	\$0
SALE OF BONDS	\$0	\$0	\$0	\$0	\$0
OTHER FUNDS	\$0	\$0	\$0	\$0	\$0
MISCELLANEOUS INCOME	\$0	\$0	\$0	\$0	\$0
<b>TOTAL REVENUE</b>	<b>\$91,545</b>	<b>\$91,545</b>	<b>\$91,545</b>	<b>\$91,545</b>	<b>\$111,545</b>
<b>EXPENDITURES</b>					
EQUIPMENT	\$90,000	\$78,300	\$71,500	\$82,250	\$114,750
<b>TOTAL EXPENDITURES</b>	<b>\$90,000</b>	<b>\$78,300</b>	<b>\$71,500</b>	<b>\$82,250</b>	<b>\$114,750</b>
<b>ENDING FUND BALANCE</b>	<b>\$1,545</b>	<b>\$14,790</b>	<b>\$34,835</b>	<b>\$44,130</b>	<b>\$40,925</b>

CAPITAL IMPROVEMENT PROGRAM					
POLICE EQUIPMENT FUND					
PROJECTS	2019	2020	2021	2022	2023
PORTABLE RADIOS	\$0	\$71,715	\$52,851	\$14,366	\$0
MOBILE RADIOS	\$0	\$0	\$10,498	\$61,710	\$0
BODY CAMERAS	\$13,452	\$13,452	\$13,452	\$13,452	\$13,452
SQUAD CAMERAS	\$8,424	\$18,129	\$18,129	\$18,129	\$18,129
THERMAL IMAGING CAMERA	\$10,000	\$0	\$0	\$0	\$0
<b>POLICE EQUIPMENT FUND</b>	<b>\$31,876</b>	<b>\$103,296</b>	<b>\$94,930</b>	<b>\$107,657</b>	<b>\$31,581</b>
REVENUES					
BEGINNING FUND BALANCE	\$79,152	\$98,276	\$45,980	\$2,050	-\$50,607
TRANSFERS IN/TAX LEVY	\$51,000	\$51,000	\$51,000	\$55,000	\$55,000
LOCAL GOVERNMENT AID	\$0	\$0	\$0	\$0	\$0
SALE OF BONDS	\$0	\$0	\$0	\$0	\$0
OTHER FUNDS	\$0	\$0	\$0	\$0	\$0
MISCELLANEOUS INCOME	\$0	\$0	\$0	\$0	\$0
<b>TOTAL REVENUE</b>	<b>\$51,000</b>	<b>\$51,000</b>	<b>\$51,000</b>	<b>\$55,000</b>	<b>\$55,000</b>
EXPENDITURES					
EQUIPMENT	\$31,876	\$103,296	\$94,930	\$107,657	\$31,581
<b>TOTAL EXPENDITURES</b>	<b>\$31,876</b>	<b>\$103,296</b>	<b>\$94,930</b>	<b>\$107,657</b>	<b>\$31,581</b>
<b>ENDING FUND BALANCE</b>	<b>\$98,276</b>	<b>\$45,980</b>	<b>\$2,050</b>	<b>-\$50,607</b>	<b>-\$27,188</b>

<b>CAPITAL IMPROVEMENT PROGRAM</b>					
<b>WATER FUND</b>					
<b>PROJECTS</b>	<b>2019</b>	<b>2020</b>	<b>2021</b>	<b>2022</b>	<b>2023</b>
WATERMAIN REPLACEMENT IN WESTVIEW ACRES	\$1,203,345				
WELL #2 MAINTENANCE	\$41,200				
WELL #6 MAINTENANCE	\$41,200				
WATER TOWER REFURBISHMENT	\$1,648,000				
WATER TOWER CONSTRUCTION		\$5,830,000			
WELL #5 MAINTENANCE		\$42,400			
WELL #7 MAINTENANCE		\$42,400			
WELLS #1 AND 2 SEAL AND ABANDON		\$26,500			
WELL #4 MAINTENANCE			\$43,600		
WELL #8 MAINTENANCE			\$43,600		
WATERMAIN REPLACEMENT WITH STREET PROJECTS				\$783,400	\$507,431
FLEET COSTS				\$64,400	
<b>STREET RECONSTRUCTION FUND</b>	<b>\$2,933,745</b>	<b>\$5,941,300</b>	<b>\$87,200</b>	<b>\$847,800</b>	<b>\$507,431</b>
<b>REVENUES</b>					
BEGINNING FUND BALANCE	\$0	\$186,861	\$0	\$0	\$0
TRANSFERS IN/TAX LEVY	\$0	\$0	\$0	\$0	\$0
LOCAL GOVERNMENT AID	\$0	\$0	\$0	\$0	\$0
SALE OF BONDS	\$2,238,206	\$0	\$0	\$0	\$0
WATER FUND CONTRIBUTION	\$82,400	\$5,754,439	\$87,200	\$847,800	\$507,431
STORM WATER FUND CONTRIBUTION	\$0	\$0	\$0	\$0	\$0
SANITARY SEWER FUND CONTRIBUTION	\$0	\$0	\$0	\$0	\$0
MSA CONTRIBUTION	\$0	\$0	\$0	\$0	\$0
MISCELLANEOUS INCOME	\$800,000	\$0	\$0	\$0	\$0
<b>TOTAL REVENUE</b>	<b>\$3,120,606</b>	<b>\$5,754,439</b>	<b>\$87,200</b>	<b>\$847,800</b>	<b>\$507,431</b>
<b>EXPENDITURES</b>					
PROJECTS	\$2,933,745	\$5,941,300	\$87,200	\$847,800	\$507,431
<b>TOTAL EXPENDITURES</b>	<b>\$2,933,745</b>	<b>\$5,941,300</b>	<b>\$87,200</b>	<b>\$847,800</b>	<b>\$507,431</b>
<b>ENDING FUND BALANCE</b>	<b>\$186,861</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>

# APPENDIX B. TH 3 ACCESS IMPROVEMENT STUDY, 2004



205th St to 197th St

New Backage Road

New Frontage Road

New Frontage Road


**Legend**

- Proposed Frontage Roads
- Railroad
- City Limits

**2004 MnDOT Mapping Recreated by Bolton & Menk, 2017**

0 300 Feet

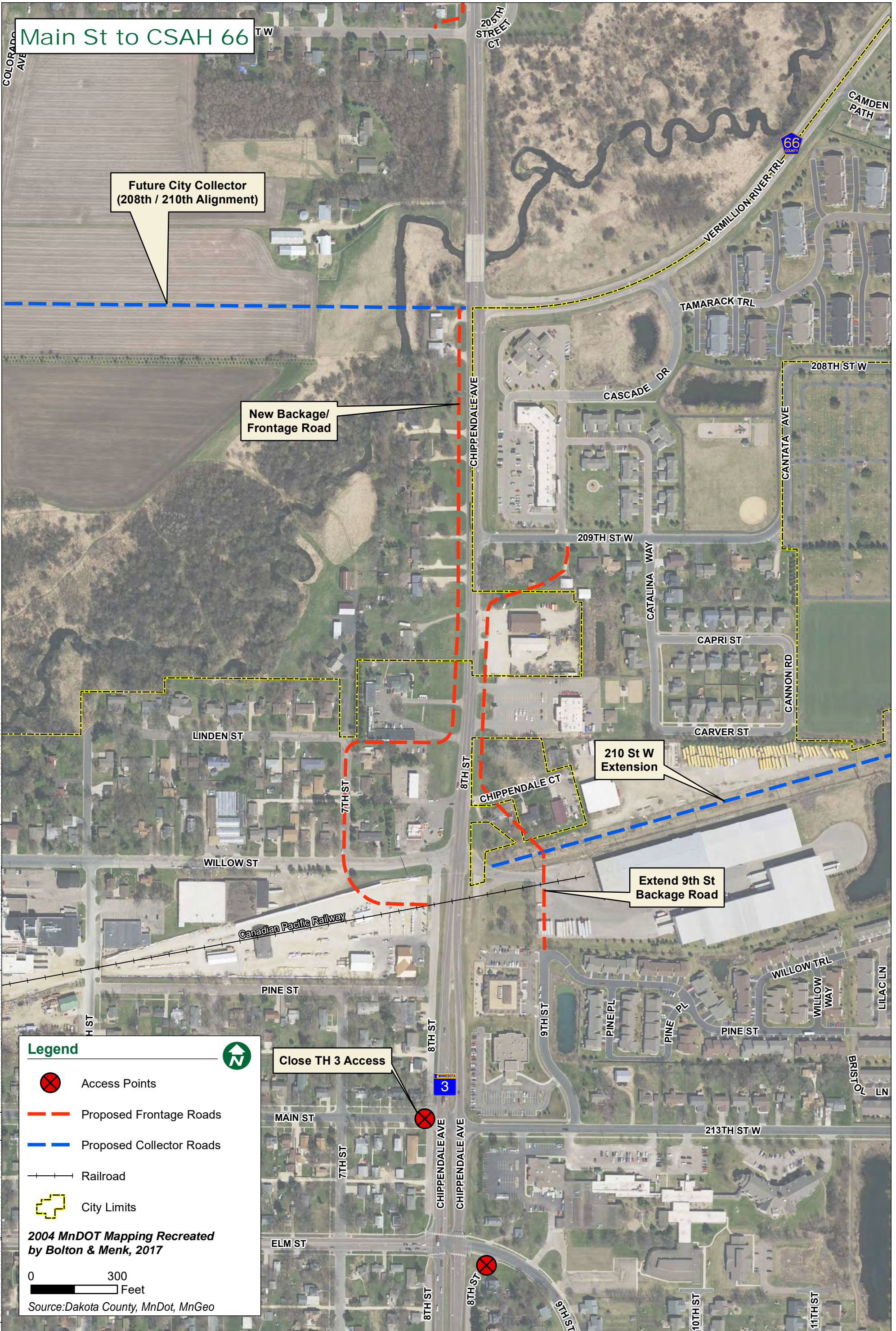
Source: Dakota County, MnDot, MnGeo



Map Document: \\arcserver1gis\FARM\T18114157\ESRI\Maps\Transportation\Section\TH3\_CorridorDiscussion\Maps\114157\_205thSt\_to\_197thSt\_11x17.mxd | Date Saved: 5/29/2018 2:51:02 PM









# APPENDIX C. MNDOT & DAKOTA COUNTY ACCESS MANAGEMENT GUIDELINES

# Mn/DOT Access Management Manual

Figure 3.2 – Summary of Recommended Street Spacing for Non-IRCs

Category	Area or Facility Type	Typical Functional Class	Public Street Spacing		Signal Spacing
			Primary Full-Movement Intersection	Secondary Intersection	
<b>4 Principal Arterials in the Twin Cities Metropolitan Area and Primary Regional Trade Centers (Non-IRCs)</b>					
<b>4AF</b>	Non-Interstate Freeway	Principal Arterials	Interchange Access Only (see Section 3.2.7 for interim spacing)		Interim
<b>4A</b>	Rural		1 mile	1/2 mile	See Section 3.2.5
<b>4B</b>	Urban/ Urbanizing		1/2 mile	1/4 mile	1/2 mile
<b>4C</b>	Urban Core		300-660 feet, dependent upon block length		1/4 mile
<b>5 Minor Arterials</b>					
<b>5A</b>	Rural	Minor Arterials	1/2 mile	1/4 mile	See Section 3.2.5
<b>5B</b>	Urban/ Urbanizing		1/4 mile	1/8 mile	1/4 mile
<b>5C</b>	Urban Core		300-660 feet, dependent upon block length		1/4 mile
<b>6 Collectors</b>					
<b>6A</b>	Rural	Collectors	1/2 mile	1/4 mile	See Section 3.2.5
<b>6B</b>	Urban/ Urbanizing		1/8 mile	Not Applicable	1/4 mile
<b>6C</b>	Urban Core		300-660 feet, dependent upon block length		1/8 mile
<b>7 Specific Area Access Management Plans</b>					
<b>7</b>	All	All	By adopted plan		

**Table 10: Dakota County Access Guidelines (Spacing and Configuration)**

Road Type (A)	Posted or Design Speed	Projected 2030 Average Daily Traffic	Full Movement Intersection	Partial Movement Intersection (B)
Principal Arterial	All	All	½ mile	¼ mile (C)
Divided Highway	All	> 35,000	½ mile	¼ mile (C)
	All	< 35,000	¼ mile	⅛ mile
Undivided Highway	(≤ 40 mph)	All	⅛ mile	N/A
	(≥ 45 mph)	> 1,500	¼ mile	N/A
	(≥ 45 mph)	< 1,500	Allowed per (D)	N/A

- (A) Road type refers to the anticipated future roadway cross-section and functional classification.
- (B) Partial Movement intersections do not allow left turns from the minor street to the major street or movements straight across the major street. Movements that are allowed will be based on engineering study.
- (C) Right-in/right-out access may be permitted *at approximately ⅛ mile* for public or private (See Note #3) streets if the County determines the access improves the overall safety and/or efficiency of the transportation system.
- (D) Private street or driveway access requests will be considered based on engineering judgment and the following factors: location, distance from other driveways and intersections, alignment with other access points, easement/access rights that allow widespread usage and system connectivity, the potential to combine accesses, visibility, adjacent land use, and other operational/safety issues.

N/A – Not Applicable to undivided roadway segments.

Access Spacing Notes:

1. These are minimum access spacing guidelines. The County may require accesses be spaced at distances greater than the minimums considering conditions specific to any County highway segment.
2. County roadways with full movement access spacing of ½ mile are shown in Figure 31. Considerations include regional transitways, adopted studies, principal arterials, system continuity and projected ADT > 35,000.
3. Access to County roadways is typically provided through public street connections. Private access will be considered along the County roadway system based on engineering assessment of the function and use of the private access point in consideration of the spacing criteria.
4. Specific corridor access plans or project designs developed through a public process and adopted by the County Board shall supersede these guidelines.
5. Medians may be added or median openings may be removed or modified at any time by the County to address safety and/or operational issues identified through engineering review.
6. Where there is opportunity for access on more than one public roadway, access shall be provided from the lower-function roadway, unless deemed impractical by the County. To support the objectives of system efficiency and connectivity, access to the higher-function County roadway may be allowed in addition to the lower-function roadway, provided there is adequate distance to accommodate access based on these access guidelines.

# APPENDIX D. COMPREHENSIVE SEWER PLAN, SEPTEMBER 2019 DRAFT



**BOLTON  
& MENK**

Real People. Real Solutions.

Feasibility Report

# Comprehensive Sewer Plan City of Farmington

September 2019

**Submitted by:**

Bolton & Menk, Inc.  
1960 Premier Drive  
Mankato, MN 56001  
P: 507-625-4171  
F: 507-625-4177

# DRAFT

# Certification

Feasibility Report  
for  
Comprehensive Sewer Plan  
City of Farmington  
T18.114157  
September 2019

I hereby certify that this plan, specification or report was prepared by me or under my direct supervision, and that I am a duly Licensed Professional Engineer under the laws of the State of Minnesota.

By: \_\_\_\_\_  
Jordan Thole, P.E., CFM  
License No. 54147

Date: \_\_\_\_\_



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## EXECUTIVE SUMMARY

The Metropolitan Land Planning Act (amended 1995) requires local governments to prepare comprehensive plans and submit them to the Metropolitan Council to determine their consistency with metropolitan system plans. The local Comprehensive Plan is to include a sanitary sewer element covering the collection and disposal of wastewater generated by the community. Similarly, the Metropolitan Sewer Act requires local governments to submit a Comprehensive Sewer Plan (CSP) which describes the current and future service needs required from MCES.

The City of Farmington was connected to the Metropolitan Council Environmental Services (MCES) trunk sanitary sewer system in 1977 when the Empire Wastewater Treatment Facility replaced the City of Farmington Wastewater Treatment Facility. The MCES provides wastewater treatment at Empire for the Lakeville, Apple Valley, Rosemount, Farmington, Empire, and the Elko-New Market areas. Phase 1 of the Elko New Market Interceptor was completed in 2011. The Phase 2 portion of the proposed interceptor was not included in this comprehensive plan since the estimated construction date for that interceptor is 40-50 years out.

The City of Farmington's existing and proposed sanitary sewer system for the 2040 development of the City is shown in Appendix F at the back of this report. A summary of the developable acreage for the 2020, 2030, and 2040 MUSA boundary is listed in Table 1 below. The City has eight major sewer districts, named Districts 1 through 8, which each define the limits of service for a separate trunk system. The existing trunk system, which covers areas D1, D3, D4, D5, D6, and D8, is shown in red lines. Two trunk lines (in magenta) are proposed to serve areas D2, and D7 in the future. The trunk line to D2 in the far northwest portion of the City is currently not planned to be installed until after 2030. Additional proposed trunk lines are also shown on Appendix A in areas D4 and D6 as possible new trunk lines depending on the timing of Phase 2 of the Elko- New Market Interceptor.

Table 1 MUSA Summary

MUSA Summary	
Boundary	Acres
2020	6690.94
2030	7010.70
2040	7309.72

Farmington's trunk sanitary sewer system discharges to three existing MCES interceptors that travel through the City, which are shown in Appendix F. Interceptor #7103-1 (Lakeville-Farmington Interceptor) enters Farmington from Lakeville to the west, and districts D2, D3, D5, and D6 discharge to this interceptor. Interceptor #7409 (Apple Valley Interceptor) enters Farmington from Lakeville to the north, and also carries sewer flow from Apple Valley and Rosemount. Districts D1, D7, and D8 discharge to this interceptor. Interceptor 800717 (Flagstaff interceptor) enters from the NW and flows south to the Lakeville-Farmington Interceptor where it collects drainage from D4.

Modeling of the sanitary sewer system was based on a variety of parameters, such as: land use, population density, standard wastewater generation rates, topography, and future land use plans. Based on the topography of the undeveloped areas, the sewersheds were created and the most cost- effective locations for future trunk line facilities were determined. The location of smaller sewer laterals and service lines are dependent upon future land development plats and cannot be accurately located from a study of this type.

Farmington currently has 84 individual subsurface sewage treatment systems (ISTS) within the 2040 MUSA. A map of the ISTS can be found in Appendix A of the CSP and more detail regarding the tracking and design of ISTS in section 4.3 of the CSP. City code requires that all SSTS be removed within 2 years from when City sanitary sewer services are extended to the properties. No new SSTS may be

constructed where sewer services are available.

The Metropolitan Council identified Farmington as a community with at least one Infiltration and Inflow (I/I) exceedance event recorded between June 1, 2004 and June 30, 2006, and assessed a surcharge to begin in 2007 and last for five years, until 2011. A letter from the MPCA dated September 20<sup>th</sup>, 2010 states:

*June 30<sup>th</sup>, 2010 marked the end of the exceedance measurement period under the current I/I program. However, the council will continue to monitor the peak wet weather flows from the City and notify the City of peak I/I events in excess of your goals.<sup>1</sup>*

The City has continued its I/I reduction plan and is currently meeting the MPCA requirements. The plan outlines 6 components to reduce the I/I within the city. The 6 components are as follows

1. Monitor wastewater flow in the City System
2. A sump pump cross connection inspection and removal program
3. A program to investigate known or suspected areas of foundation drains, leaking, cleanouts, and leaking services
4. A manhole inspection and repair program
5. Ongoing sewer cleaning, televising, and repair program
6. Stringent requirements for new sanitary sewer and home construction.

A full copy of the letter can be found in the attached appendix.

The Comprehensive Sanitary Sewer Plan presented herein is intended to serve as an inventory of City of Farmington's existing sanitary sewer trunk facilities and as a guide for expanding the trunk sewer system to service future development in the City. Based on the information analyzed in this study and presented in this report, the following outcomes are desired:

1. That the Metropolitan Council use the City's flow projections in determining the appropriate capacity for its own facilities.
2. That the City Council adopt the sanitary sewer layout, as presented in the Trunk Sewer System Map, as the development guide for sanitary sewer construction within the study area.
3. That the system design flows and criteria in Appendices C and D be used for sizing all future sanitary sewer trunk facilities, but that flow projections of Section 2 be used when representing the impact of Farmington's system on the Metropolitan Disposal System and the Empire WWTF.

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<sup>1</sup> Moore, W. G. (2010, September 20). Metropolitan Council I/I Surcharge Program Response to 2011 Work Plan [Letter to Kevin Schorzman, City Engineer]. Farmington, Minnesota.

# 1. BACKGROUND

## 1.1 INTRODUCTION

The Metropolitan Land Planning Act (amended 1995) requires local governments to prepare comprehensive plans and submit them to the Metropolitan Council to determine their consistency with metropolitan system plans. The local Comprehensive Plan is to include a sanitary sewer element covering the collection and disposal of wastewater generated by the community. Similarly, the Metropolitan Sewer Act requires local governments to submit a Comprehensive Sewer Plan (CSP) which describes the current and future service needs required from MCES.

In May, 2015 the Metropolitan Council adopted a revised Water Resources Management Policy Plan (WRMPP). The 2040 WRMPP includes the metropolitan wastewater system plan with which local comprehensive plans must conform. Farmington has chosen to demonstrate conformance through a separate Comprehensive Sewer Plan (CSP). The Farmington CSP updates previous sewer planning efforts and describes in detail the expansion of the City's sanitary sewer system to serve urban development.

The Farmington CSP projects increases in sanitary sewer flows that the Metropolitan Council can then use in its planning of the Metropolitan Disposal System or MDS, which is operated by the Metropolitan Council Environmental Services (MCES). MCES also uses the CSP to determine whether capacity upgrades will be needed at the Empire WWTF, to which Farmington discharges. This CSP update is necessary to reflect land use changes that have occurred since Farmington's previous comprehensive plan and trunk sewer lines that have been constructed since that time.

## 1.2 LOCATION AND HISTORY

The City of Farmington is located in the central portion of Dakota County about 30 miles south of Minneapolis and St. Paul in Minnesota as shown in Exhibit 1. The City is bordered by Lakeville on the west and north, Empire Township on the east, Eureka Township to the southwest and Castle Rock Township to the southeast.

The topography within the City varies from nearly flat to fairly steep slopes. The Vermillion River passes from the southwest to the northeast through the City. Land surface elevations vary from a low of 890 to a high of 1,020 feet above sea level. This is a fairly flat area with sandy soils that have high groundwater influenced by the river levels. The study area includes parts of the adjacent townships that may be served by the City.

The City of Farmington principally serves as a convenient goods and service center for the surrounding farming area. It is expected that its close proximity to the Twin Cities will draw more commuters to the area and encourage the continued growth of the City.

The City of Farmington was connected to the Metropolitan Council Environmental Services (MCES) trunk sanitary sewer system in 1977 when the Empire Wastewater Treatment Facility replaced the City of Farmington Wastewater Treatment Facility. The MCES provides wastewater treatment at Empire for the Lakeville, Apple Valley, Rosemount, Farmington, Empire, and in the Elko-New Market areas.

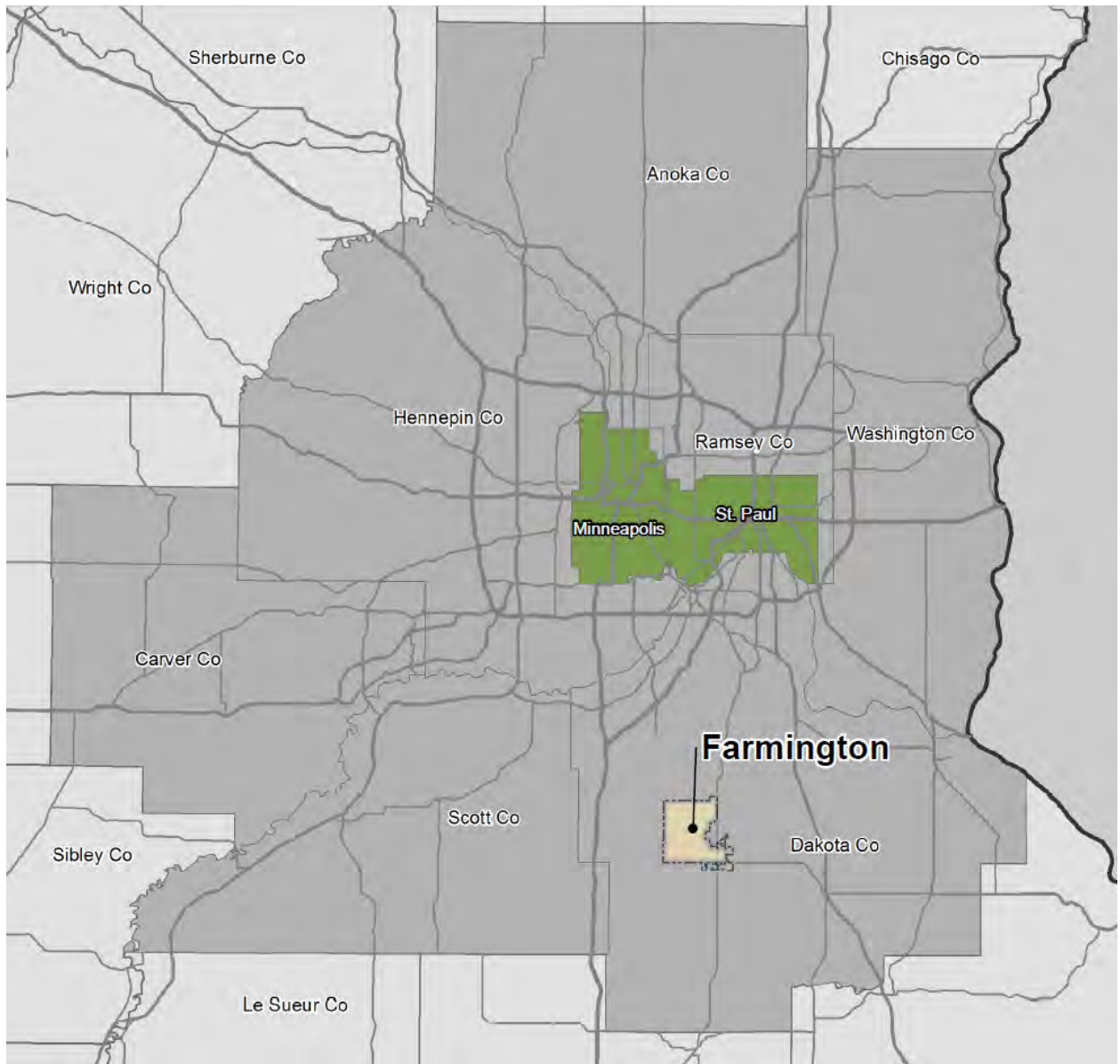


Exhibit 1 Location Map

### 1.3 EXISTING SANITARY SEWER SYSTEM

This study is concerned with Farmington’s trunk sanitary sewer system which includes all lines 10 inches in diameter and larger, other main lines, and other facilities (such as lift stations) which are a vital part of the sewer trunk system. Since the sewer trunk design determines the ultimate service area for the system, it is essential that an overall trunk plan be available as a guide for future development. Such a plan should be flexible enough to absorb some changes in planning and development patterns. Periodic review with updating which shows the relationship of construction of facilities to future planning and which reevaluates costs is required.

The City of Farmington’s existing and proposed sanitary sewer system for the ultimate development of the City is shown on Appendix A at the back of this report. The City has eight major sewer districts, named Districts 1 through 8, which each define the limits of service for a separate trunk system. The existing trunk system, which covers areas D1, D3, D4, D5, D6, and

D8 is shown in red lines. Two trunk lines (in magenta) are proposed to serve areas D2 and D7 in the future. The trunk line to D2 in the far northwest portion of the City is currently not planned to be installed until after 2030. Additional proposed trunk lines are also shown on Appendix A in areas D4 and D6 as possible new trunk lines depending on the timing of Phase 2 of the Elko-New Market Interceptor.

Farmington's trunk sanitary sewer system discharges to three existing MCES interceptors that travel through the City, which are shown in Appendix A. Interceptor #7103-1 (Lakeville-Farmington Interceptor) enters Farmington from Lakeville to the west, and districts D2, D3, D4, D5, and D6 discharge to this interceptor. Interceptor #7409 (Apple Valley Interceptor) enters Farmington from Lakeville to the north, and also carries sewer flow from Apple Valley and Rosemount. Districts D1, D7, and D8 discharge to this interceptor. Interceptor #80017 (Elko-New Market Phase 1 Interceptor) combines to the west of interceptor 800717 (Flagstaff Interceptor) but does not carry flow from within the 2040 growth boundary.

The Apple Valley Interceptor joins the Lakeville-Farmington Interceptor just north of downtown Farmington in Empire, and the Lakeville-Farmington Interceptor then discharges to the Empire WWTF. According to the Metropolitan Council, the Lakeville-Farmington Interceptor currently has an available capacity of 5.5 MGD to provide for Farmington's long term needs. The Apple Valley Interceptor has an available capacity of 1.7 MGD for the long-term needs of the City.

Sewer line 437 to 424 down Flagstaff Avenue has been constructed and carries approximately 1.6 MGD average flow from Lakeville, as well as flow from Farmington. Because of its inter-jurisdictional nature, this sewer line has become part of the MCES interceptor system. For the purposes of this report, this line will be referred to as the Flagstaff Interceptor.

## 2. FORECASTS

Table 2 presents the Metropolitan Council’s projections of population, households, and employees for the City of Farmington from the Metropolitan Council Water Resources Management Policy Plan.

Table 2 Forecasts by Sewer District

Forecasts by Sewer District										
		2020			2030			2040		
Intercep.	District	Households	Pop	Employ	Households	Pop	Employ	Households	Pop	Employ
7409	1	2394	7614	286	2394	7614	186	2476	7817	186
7103-1	2	10	33	-	255	645	38	376	943	165
7103-1	3	2362	6915	89	2815	8047	183	3364	9402	434
7103-1	4	-	-	2052	286	721	2260	343	869	2327
7103-1	5	290	769	56	297	785	57	296	786	57
7103-1	6	2858	7261	2870	3025	7678	2984	3280	9309	2985
7409	7	2	5	-	405	1014	136	1063	2640	290
7409	8	498	1467	347	540	1568	356	539	1570	356
Unsewered		86	237	-	84	228	-	62	165	-
<b>Total</b>		<b>8500</b>	<b>24300</b>	<b>5700</b>	<b>10100</b>	<b>28300</b>	<b>6200</b>	<b>11800</b>	<b>33500</b>	<b>6800</b>

The facilities described in this report are designed to serve the City under conditions of ultimate development, which will occur after the year 2040. It is estimated that the ultimate population of Farmington will be 65,000. Actual growth rates will affect only the timing of trunk sewer construction and not the actual design of the system. Therefore, the discrepancy between the City's population projections and the Metropolitan Council's population projections does not impact the City's ultimate system and is insignificant as far as this report is concerned.

Table 3 presents projected sewer flows for the City of Farmington. The most recent (2010) average flow for the City of Farmington was estimated to be 1.43 MGD using the Metropolitan Council mid 2010-present flow metering at the City’s limits, within the City, and at the Empire Treatment Plant, as well as land use calculations for the portion of Empire draining into the interceptor between Farmington city limits and the Empire WWTP. However this value may underestimate the actual average flow because of the large number of Farmington trunk discharges into the interceptors, and the difficulty of metering them all. For this reason, the Metropolitan Council’s projections in the Metropolitan Council Water Resources Management Policy Plan have been adopted exactly. It is assumed that the Metropolitan Council projections pertain to Farmington only and do not include flows entering the interceptors from outside City limits. Flows for 2025 and 2035 have been linearly interpolated.



Table 3 Metro Council Wastewater Flow Projections

Year	Farmington Projected Average Flow (MGD) <sup>1</sup>
2010 (actual)	1.43
2015 <sup>2</sup>	1.52
2020	1.60
2025 <sup>2</sup>	1.70
2030	1.80
2035 <sup>2</sup>	1.91
2040	2.02

<sup>1</sup>The Metropolitan Council’s Water Resources Management Policy Plan (May 2005)

<sup>2</sup>Values interpolated

This CSP must accomplish two things:

1. Provide the Metropolitan Council with sufficient detailed information so that it can make reasonable plans for upgrades to its interceptors and Empire WWTF.
2. Provide a trunk system that allows the City a certain measure of reserve capacity in the event that a high sewage generating use does appear within its borders.

Section 2 forecasts when combined with the sewer map and modeling information contained in the appendices gives the Metropolitan Council the information they need to plan and maintain the metropolitan system. The subsequent sections of the CSP discuss sizing and planning the City’s own trunk system and the hydrodynamic sanitary sewer flow models in the appendices support this purpose.

The flow projections presented in the appendices originate from the land use statistics of Appendix A which are based directly on the City’s ultimate land use plan (included in Appendix A). Certain reductions in land use area are made to account for wetlands, steep slopes, floodplains, right-of-way, etc. and a net developable acreage for each land use category is created. The net acreage is multiplied by standard unit flow rates to obtain an average flow for each sewershed. Appendix B provides these average flows and totals them for all the districts within the Farmington CSP. The Appendix B total average flow is 7.98 MGD. This exceeds the projected average flow for 2040 by a factor of 4 to 1. One reason for this is that Farmington’s ultimate build out will not occur by 2040. The ultimate buildout will account for the full development of 11,000 acres shown as the 2040 area in Appendix A. The City’s 2040 land use on the other hand, also shown in Appendix A, shows that of the 11,000 acres assumed within the City’s 2040 boundaries, almost 2,500 acres will remain agricultural for 2040, and almost 1,500 acres that are currently within the Castle Rock Township OAA area have not been designated.

The other reason the average flow shown in Appendix B is 4 times the 2040 flow shown in Table 3 is that the purpose of the sewer model shown in the appendix tables is to conservatively estimate demand at the municipal level so that no City trunk is undersized for its projected sewershed. The unit flow rates used in Appendix B to generate average flows in part represent the “old economy” where commercial and industrial land use meant manufacturing and thus the potential for high sewage flows. In the “new economy” commercial and industrial land use means retail, offices and warehousing which generate very little sewage compared to the old industrial facilities. Nonetheless, typical land use categories allow for a wide range of uses and the chance remains that localized heavy users of sanitary sewer capacity might locate in Farmington.

To cover this possibility, Farmington continues to use the high design rates shown in Table 5 below.

### 3. SANITARY SEWER DESIGN CRITERIA

#### 3.1 LAND USE

The ultimate land use plan for the City of Farmington (see Appendix A) served as the basis for the development of the sanitary sewer flow projections and analysis of the trunk system. The Metropolitan Council requires phased flow projections through 2040, so the City’s 2040 land use plan is also shown in Appendix A. This is the 2040 land plan included in the City of Farmington’s 2040 Comprehensive Plan.

Using the ultimate land use plan, the area of each land use was determined for each sewershed. Several land uses were consolidated for this study because of similar sanitary flow rates. Table 4 shows the Existing and Comprehensive Plan land use and the corresponding land use for this study.

Table 4 Sanitary Land Use

Land Use Designations	
Existing Parcel Land Use	Comprehensive Plan Land Use
Ag	Agriculture
Ag-ag Preserve	
Ag-Green Acres	
Commercial	Commercial
Commerciap - Open Space	
Commercial- Preferred	
Industrial	Industrial
Industrial Preferred	
Machinery	
Residential	Low Density
Residential - Municipal	Low Medium
Residential - Townhouse	Medium Density
Apartment	High Density
Utilities - Preferred	ROW
School	Public/Semi-Public
Municipal	
	Mixed-Use (Commercial/Residential)
	Park/Open Space
	Non-Designated

In an effort to increase the accuracy of the existing conditions flowrates in the model, the existing parcel information provided by the City was used to establish the base flowrates. This data better represents the flows produced by the residential areas as it accounts for the number of homes instead of a generic flowrate per acre. Multi-family dwellings such as townhomes and condominiums were also counted per unit. Per the 2010 census data, the average dwelling in the City of Farmington has 2.95 residents.

Detailed descriptions of the various land uses are found in the City of Farmington Comprehensive Plan. Areas of each land use by sewershed are presented in Appendix A. The acreage in

Appendix A is gross acreage which is the City's total acreage including the undevelopable areas. Undevelopable acres include floodplain, waterbodies, and streets right-of-way. Floodplain was removed from the gross acreage using the City of Farmington's Floodplain Overlay district, and waterbodies were removed using data from the City's Surface Water Management Plan. The sewer modeling is based on the remaining developable acreage.

A portion of Eureka Township is not included in the City's 2040 or ultimate land use plans, but is shown on Appendix A as serviced by the existing interceptor. It was necessary to evaluate the existing sanitary sewer system based on potential for the increased development. Based on City projections, net development in this portion of Eureka (D1-117) would develop in the following densities:

- Low Density Residential – 3.1 units per acre over 50% of the net developable acreage.
- Medium Density Residential – 7.9 units per acre over 45% of the net developable acreage.
- High Density Residential – 12.8 units per acre over 5% of the net developable acreage.

Area's identified as non-designated land uses were also estimated using this distribution.

### 3.2 ESTIMATED AVERAGE WASTEWATER FLOWS

Municipal wastewater is made up of a mixture of domestic sewage, commercial and industrial wastes, groundwater infiltration, and surface water inflows. With proper design and construction, groundwater infiltration and surface water inflows, often called Infiltration/Inflow (I/I), can be minimized. The flows due to I/I are accounted for in the analysis and design of the trunk sewer system.

The anticipated average wastewater flows from the various sewersheds were determined by applying unit flow rates to each of the land use categories. The "system design" unit flow rates are presented in Table 5. The average wastewater flows for each sewershed are presented in Appendix B.

For most land uses unit rates/acre were used to generate average flow projections. The exception is existing residential areas where parcel data exists, in which lots were counted and average flows were projected on a rate/unit basis. The flowrate per lot was developed using the current 2010 census data to determine the average residents per dwelling and the 10 state standards average waste water production of 100 gallons per person per day<sup>2</sup>. The population densities are in accordance with our experience in Farmington as well as other communities in the Twin Cities area. The estimated flows are in accordance with standard engineering practice and are generally considered conservative.

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<sup>2</sup> Recommended Standards for Wastewater Facilities, 11.243 (b) Hydraulic Capacity for Wastewater Facilities to serve New Collection Systems, (2004 Edition)

Table 5 System Design Waste Water Unit Flow Rates

System Design Unit Flowrates			
Land Use	Persons/unit	Units/Acre	Gal/Acre/Day
Low Density	2.95	3.1	915
Low Medium	2.95	5	1475
Medium Density	2.5	7.9	1975
High Density	2.5	12.8	3200
Mixed-Use (Commercial/Residential)	-	-	2350
Industrial	-	-	1500
Commercial	-	-	1500
Agriculture	-	-	60
Public/Semi-Public	-	-	800
ROW	-	-	0
Park/Open Space	-	-	0
Non-Designated <sup>1</sup>	-	-	1506

<sup>1</sup> assumed 50% Low Density, 45% Medium Density, 5% High Density

Existing System Unit Flowrates			
Residential Land Use			
Land Use	Persons/unit	Gal/Person/Day	Gal/Parcel/Day
RESIDENTIAL	2.95	100	295
RESIDENTIAL-TOWNHOUSE	2.95	100	295
RESIDENTIAL-CONDOMINIUM	2.95	100	295
Other Land Uses			
Land Use	Gal/Acre/Day		
APARTMENT	2958		
APARTMENT-NURSING HOME	2958		
INDUSTRIAL	1500		
INDUSTRIAL-PREFERRED	1500		
COMMERCIAL	1500		
COMMERCIAL-OPEN SPACE	0		
COMMERCIAL-PREFERRED	1500		
COMMERCIAL-PREFERRED OPEN SPACE	1500		
EXEMPT	0		
UTILITIES-PREFERRED	0		
AG-GREEN ACRES	44		
MUNICIPAL	1500		
AG-GREEN ACRES	66		
AG-AG PRESERVE	0		
SCHOOL	2000		

### 3.3 DAILY FLOW VARIATION

Previous analyses of the Farmington sanitary sewer system used a steady-state spreadsheet based model and established the peak flows by applying a peaking factor. The peaking factor is an empirically derived variable used to estimate the peak flow in a pipe based on the total upstream sewershed area. The resulting peak flows tend to trend very conservative and may not accurately reflect the capacity remaining in the pipe. As part of this Comprehensive Plan cycle, the City of Farmington has updated its methodology to a hydrodynamic model completed using Autodesk's Storm and Sanitary Sewer Analysis (SSA).

In the SSA model, the peaking factors have been replaced with a more accurate distribution known as a diurnal curve, seen in Exhibit 2 below. This curve represents the percent of average flowrate to vary the influent sanitary flows throughout the day. This creates a hydrodynamic model which accounts for the travel time in the sanitary sewer instead of assuming a constant peak flowrate. The curve in Exhibit 1 shows a peak in both the morning and evening when residential production of waste water is at its highest.

Since the diurnal curve method does not directly account for I/I, an additional 50% of average flow was added to all design flows in the model to simulate increased pipe flow from I/I. The design flows for each sewershed are presented in Appendix C.

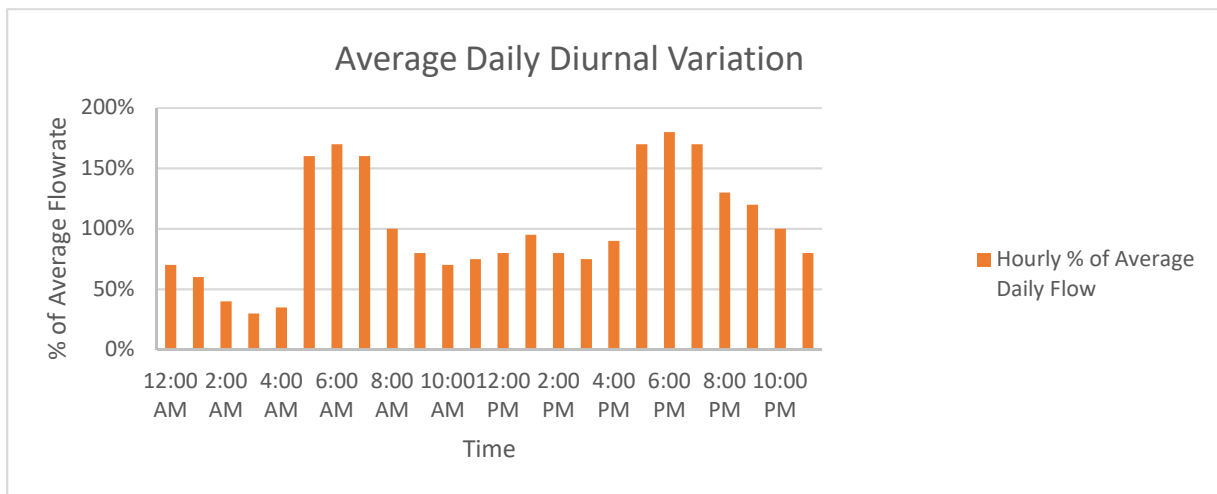


Exhibit 2 Typical Diurnal Curve

## 4. SANITARY SEWER TRUNK SYSTEM

### 4.1 GENERAL

The trunk sewer system layout for the City of Farmington is presented in Appendix A. This map shows the main sanitary sewersheds, existing and proposed trunk sanitary sewers, existing and proposed Metropolitan Council Interceptors and existing and proposed lift stations and forcemains.

Modeling of the sanitary sewer system was based on a variety of parameters, such as: land use, population density, standard wastewater generation rates, topography, and future land use plans. Based on the topography of the undeveloped areas, the sewersheds were created and the most cost-effective locations for future trunk line facilities were determined. The location of smaller sewer laterals and service lines are dependent upon future land development plats and cannot be accurately located from a study of this type.

Both the existing and proposed pipe systems were evaluated and broken up into design segments. Each end of a design segment has a node assigned to it. The nodes were designated for the following reasons:

1. Flow from a sewershed entering the pipe network.
2. Significant grade change has occurred.
3. Change in pipe size.
4. Two or more trunks connect.
5. Manmade elements (roads, railroads, etc.) affecting location and installation costs for the trunk system or lateral service of the sewersheds.

The proposed alignments shown in the figures of Appendix F generally follow the natural drainage of the land to minimize the use of lift stations and consequently provide the City with the most economical ultimate design sanitary sewer system. Adjustments in the routing and size of the trunk facilities will take place as determined by the specific land use and development conditions at the time of final design. Any such adjustments are expected to deviate minimally from this plan.

Each sewershed contains at least one collection point where the sewershed's sewage is defined to enter the pipe network. Upstream of that collection point, a lateral network of 8" gravity lines can serve unserviced areas. Lift stations and force mains will be required to service certain areas.

### 4.2 INTERCOMMUNITY FLOWS

Currently no other City sends sewage flow across the Farmington city limits except through MCES Interceptors. Lakeville will send 0.22 MGD average flow through the Flagstaff Interceptor, but because of its interjurisdictional nature, this line will be managed under the MCES interceptor system.

In the future, it is possible that the proposed sanitary sewer between nodes 625 to 633 (Biscayne Interceptor) may carry flow from Empire Township as the proposed sewer line is immediately adjacent to the Township.

A small section of sanitary trunk sewer between manholes 106 and 107 is shared with the City of Lakeville. The trunk line eventually connects to the Apple Valley Interceptor that flows south through Farmington. The MCES metering station for Farmington flow through this line was relocated to the city limit boundary with recent development on the border. Each city meters and bills property owners within their cities directly for the contributing flows. The City is currently working on a cooperative agreement with Lakeville to address future ownership and maintenance of the pipe.

There are eight properties located on the south side of 209th Street West in District 618 that were annexed into the City from Empire Township in 2000. These eight properties were connected to the Empire collection system before annexation and allowed to remain connected as part of the annexation agreement. The agreement defines how the City of Farmington reimburses Empire Township for the contributing flows.

All flow leaving the City of Farmington is via interceptor to the Empire WWTF.

#### 4.3 INDIVIDUAL SEWAGE TREATMENT SYSTEMS (ISTS)

There are currently 84 ISTS included in the City’s tracking and notification database. Most are located on agricultural or large lot properties in the west and south portions of the City.

The City of Farmington is committed to the proper design, location, installation, and ongoing maintenance of ISTS. Title 7, Chapter 3 of the Farmington City Code requires that all new systems be installed according to Minnesota Pollution Control Agency (MPCA) rule 7080 permit requirements and Dakota County Environmental Management Department Ordinance 113. Groundwater conditions, soil borings, distance to surface water, percolation tests, and design and type of selected ISTS are further factors included in the developer’s site evaluation. An owner must have a City permit before using an ISTS.

The City of Farmington currently abides by the Minnesota Pollution Control Agency's Chapter 7080.0175 for maintenance reviews of the ISTS systems. The City will soon comply with the MPCA's new reporting and maintenance code under Chapter 7080.2430 and 7080.2450 respectively.

The complete ISTS ordinance is included in Appendix G.

#### 4.4 PUBLICLY OWNED SEWAGE TREATMENT SYSTEMS

There are no publicly owned on-site treatment systems.

#### 4.5 SYSTEM DESIGN AND RECOMMENDATIONS

The City of Farmington is divided into eight sewer districts, each defining the limits of service. These districts are further subdivided into smaller sewersheds that were used to develop design flows and then determine cumulative design flows in the various pipe segments. The major sanitary sewer districts and their corresponding prefix abbreviations are given in Table 6

*Table 6 Sanitary Sewer Districts*

Sewer Districts	Abbreviation
North Central - District 1	D1
Northwest - District 2	D2
West Central - District 3	D3
Southwest - District 4	D4
East Central - District 5	D5
Southeast - District 6	D6
Northeast - District 7	D7
East Central - District 8	D8

A summary of characteristics and special issues within each district is provided below.

#### 4.5.1 North Central - District 1

District 1 serves the north central portion of Farmington up to the border with Lakeville. This district is served by the Apple Valley Interceptor operated by the MCES. District 1 is almost completely built out. The 2040 land use within the City of Farmington is tabulated below. A detailed breakdown is provided in Appendix A.

The trunk sewer in this district is completely installed. The majority of this trunk was installed in 1975 and flowed north, where it was intended to reach the Apple Valley wastewater treatment facility. The old portion of the trunk line now travels north from Node 101 out of the City into Lakeville, where it connects with the Apple Valley Interceptor at Node 107. Another portion of the trunk line, which was installed in 1996, travels east from Node 113 to Node 118. This newer trunk line picks up the trunk line from Node 113 to Node 116, a portion of which was once directed north. The Fair Hills lift station at Node 305 once flowed into the north trunk as well, but was abandoned in 1998. These improvements eliminated a capacity problem that once existed in the trunk line heading north.



Table 7 District 1 Land Use Summary

District 1 Land Use Summary	
Land Use Existing	Acres
Ag	0.0
Ag-ag Preserve	0.0
Ag-Green Acres	0.0
Apartment	0.0
Commercial	1.1
Commercial-Open Space	0.0
Commercial-Preferred	6.8
Industrial	0.0
Industrial-Preferred	0.0
Municipal	0.0
Machinery	0.0
Residential	572.2
Residential-Condominium	4.9
Residential-Townhouse	6.4
School	31.1
Utilities-Preferred	0.0
Design Land Use	Acres
Low Density	10.1
Low Medium	40.4
Medium Density	66.6
High Density	0.0
Mixed-Use (Commercial/Residential)	0.0
Industrial	0.0
Commercial	0.0
Agriculture	0.0
Public/Semi-Public	0.0
ROW	0.0
Park/Open Space	0.0
Non-Designated	0.0
<b>Total Area</b>	<b>739.6</b>

Approximately 150 ac of new land has be rezoned in this area for potential development in the 2040 Comp Plan. The new developments will be routed to Node 118 which has enough capacity to handle the additional flows.

No capacity issues for this district are shown in Appendix D.

#### 4.5.2 Northwest – District 2

District 2 is located in the northwest corner of Farmington. The district will be served by the District 3 trunk sewer and the Lakeville-Farmington Interceptor. This district is completely undeveloped, and the majority of this district will remain agriculture until

after 2040. The 2040 land use within the City of Farmington is tabulated below. A detailed breakdown is provided in Appendix A.

Table 8 District 2 Land Use Summary

District 2 Land Use Summary	
Land Use Existing	Acres
Ag	0.0
Ag-ag Preserve	0.0
Ag-Green Acres	0.0
Apartment	0.0
Commercial	0.0
Commercial-Open Space	0.0
Commercial-Preferred	0.0
Industrial	0.0
Industrial-Preferred	0.0
Municipal	0.0
Machinery	0.0
Residential	0.0
Residential-Condominium	0.0
Residential-Townhouse	0.0
School	0.0
Utilities-Preferred	0.0
Design Land Use	Acres
Low Density	78.0
Low Medium	0.0
Medium Density	0.0
High Density	0.0
Mixed-Use (Commercial/Residential)	0.0
Industrial	0.0
Commercial	0.0
Agriculture	819.2
Public/Semi-Public	0.0
ROW	0.0
Park/Open Space	0.0
Non-Designated	0.0
<b>Total Area</b>	<b>897.2</b>

No portion of the District 2 trunk pipe has been constructed. Construction of the trunk pipe in District 3 is completed to Node 302, therefore allowing for expansion of development in this district with only limited construction of trunk sewer.

Although a significant portion of Lakeville naturally drains to this district, it has been routed into District 4 rather than District 2. During the design phase of the Middle Creek Trunk Sewer (from Node 302 to 419) Lakeville declined to participate in the costs of the line. As a result, the sewer line was not sized to accommodate future sewage flows from

Lakeville. This is a major change from the 1996 CSP and also affects District 3. Flows will instead be routed into the newly constructed Flagstaff interceptor.

4.5.3 West Central – District 3

District 3 is located in the west central portion of Farmington. This district is served by the Middle Creek trunk line, which discharges to the Lakeville-Farmington Interceptor. The district is partially developed, and the majority of development within the district will likely not occur until after 2040. The 2040 land use within the City of Farmington is tabulated below. A detailed breakdown is provided in Appendix A.

Table 9 District 3 Land Use Summary

<b>District 3 Land Use Summary</b>	
Land Use Existing	Acres
Ag	0.0
Ag-ag Preserve	0.0
Ag-Green Acres	0.0
Apartment	0.0
Commercial	0.0
Commercial-Open Space	0.0
Commercial-Preferred	4.6
Industrial	0.0
Industrial-Preferred	0.0
Municipal	23.5
Machinery	11.6
Residential	422.6
Residential-Condominium	0.0
Residential-Townhouse	125.6
School	29.5
Utilities-Preferred	0.0
Design Land Use	Acres
Low Density	32.6
Low Medium	0.6
Medium Density	0.6
High Density	0.0
Mixed-Use (Commercial/Residential)	0.0
Industrial	231.8
Commercial	6.1
Agriculture	318.9
Public/Semi-Public	61.0
ROW	0.0
Park/Open Space	1.5
Non-Designated	0.0
<b>Total Area</b>	<b>1270.5</b>

The trunk service for this district was completed in 1988, as noted above. A portion of this district has been redirected from the 1996 CSP west into the Flagstaff trunk line in District 4 (Nodes 437-424). A large section of District 1 was redirected into District 3 when the Fair Hills lift station was taken offline and the trunk line from Node 305 to 308 was completed. Appendix D shows several minor capacity issues where pipes are nearing their maximum gravity flow capacity in District 3, but these are the result of the conservative nature of the unit flow rates in the model. No surcharging issues have been observed in District 3's trunk sewer, so no improvements are scheduled at this time.

One proposed sanitary trunk line is proposed to reach a currently unserved section between D3 and D4 to the west. A 12" trunk extending west from Node 314 is proposed to reach the unserved areas. The downstream sewers have enough capacity to serve the proposed industrial use area.

#### 4.5.4 Southwest – District 4

District 4 is located in the southwestern portion of the City along the border with Lakeville. The majority of the trunk sewer in this district is the existing Lakeville-Farmington Interceptor and the Flagstaff Interceptor. This district is primarily agriculture, and the majority of development within the district will likely not occur until after 2040. The 2040 land use within the City of Farmington is tabulated below.

*Table 10 District 4 Land Use Summary*

<b>District 4 Land Use Summary</b>	
Land Use Existing	Acres
Ag	0.0
Ag-ag Preserve	0.0
Ag-Green Acres	0.0
Apartment	0.0
Commercial	0.0
Commercial-Open Space	0.0
Commercial-Preferred	0.0
Industrial	0.0
Industrial-Preferred	0.0
Municipal	0.0
Machinery	0.0
Residential	0.0
Residential-Condominium	0.0
Residential-Townhouse	0.0
School	0.0
Utilities-Preferred	0.0
Design Land Use	Acres
Low Density	0.0
Low Medium	158.3
Medium Density	76.8
High Density	85.8
Mixed-Use (Commercial/Residential)	0.0
Industrial	62.3
Commercial	148.6
Agriculture	532.3
Public/Semi-Public	0.0
ROW	0.0
Park/Open Space	0.0
Non-Designated	47.8
<b>Total Area</b>	<b>1111.9</b>

A detailed breakdown is provided in Appendix A.

A proposed trunk line is shown from Node 439 on the border of Eureka Township to Node 420. The necessity of this sewer line will be determined by timing of development in this portion of Eureka and the installation of the Phase 2 Elko-New Market Interceptor. If the interceptor is constructed before development occurs, this area will be served by the Elko-New Market Interceptor and this trunk line will be unnecessary. The Lakeville-Farmington interceptor has capacity to handle this additional flow if necessary.

One small section of trunk located between 414-004 and 414-005 is nearing full capacity in the 2040 Design flow model. The pipe has a remaining capacity of approximately 80 gpm. Due to the conservative nature of the model however this pipe has enough capacity to handle the future flows.

No other capacity issues are shown for the District 4 trunk line in Appendix D.

#### 4.5.5 East Central - District 5

District 5 is located in the center of Farmington, along Akin Road, Riverview Elementary, and Dodge Middle School. The trunk sewer system for District 5 is completely constructed. This district is served by the Lakeville-Farmington interceptor. District 5 is almost fully developed. The majority of land use in the district is large lot residential properties and the two middle schools. The 2040 land use within the City of Farmington is tabulated below.

A detailed breakdown is provided in Appendix A.

*Table 11 District 5 Land Use Summary*

<b>District 5 Land Use Summary</b>	
Land Use Existing	Acres
Ag	0.0
Ag-ag Preserve	0.0
Ag-Green Acres	0.0
Apartment	0.0
Commercial	0.0
Commercial-Open Space	0.0
Commercial-Preferred	4.8
Industrial	0.0
Industrial-Preferred	0.0
Municipal	9.2
Machinery	0.0
Residential	94.6
Residential-Condominium	0.0
Residential-Townhouse	0.0
School	60.8
Utilities-Preferred	0.0
Design Land Use	Acres
Low Density	42.4
Low Medium	0.0
Medium Density	0.0
High Density	0.0
Mixed-Use (Commercial/Residential)	0.0
Industrial	0.0
Commercial	0.0
Agriculture	0.0
Public/Semi-Public	25.6
ROW	0.0
Park/Open Space	0.0
Non-Designated	0.0
<b>Total Area</b>	<b>237.4</b>

No capacity issues are shown for the District 5 trunk line in Appendix D.

#### 4.5.6 Southeast - District 6

District 6 is located in the southeast portion of the City and includes the oldest part of town, commercial downtown area and OAA areas in Empire and Castle Rock Townships south to 230th Street and east to Biscayne Avenue. The OAA areas are shown on the 2040 Land Use map in Appendix A. This is the largest district with 2362 acres of contributing sewersheds. This district is currently served by two trunks that both connect to the Lakeville- Farmington interceptor. The area on the south and east edges of the district have yet to develop and only a portion is expected to develop by 2040. The 2040 land use within the City of Farmington is tabulated below. A detailed breakdown is provided in Appendix A.

Table 12 District 6 Land Use Summary

District 6 Land Use Summary	
Land Use Existing	Acres
Ag	0.0
Ag-ag Preserve	0.0
Ag-Green Acres	0.0
Apartment	8.8
Commercial	9.4
Commercial-Open Space	0.0
Commercial-Preferred	46.8
Industrial	1.3
Industrial-Preferred	1.7
Municipal	13.0
Machinery	0.0
Residential	139.3
Residential-Condominium	0.0
Residential-Townhouse	26.1
School	65.2
Utilities-Preferred	0.0
Design Land Use	Acres
Low Density	43.6
Low Medium	186.9
Medium Density	41.7
High Density	4.2
Mixed-Use (Commercial/Residential)	0.0
Industrial	0.0
Commercial	15.3
Agriculture	256.5
Public/Semi-Public	30.4
ROW	0.0
Park/Open Space	0.0
Non-Designated	153.2
<b>Total Area</b>	<b>1043.4</b>



The sewers that serve downtown are old and have deteriorated joints. For the past several years the City has undertaken a sewer replacement program when downtown streets are reconstructed that has reduced I/I.

Four lift stations are in use in District 6, all non-trunk. Two of these lift stations are proposed to be eliminated: Dakota Electric and Hunter. The Hunter lift station at Node 609 currently pumps flows north to Node 602. This lift station will be replaced with a gravity sewer south to 610. The Dakota Electric lift station at Node 423 currently pumps flow north into the lateral sewer, which then gets carried to the West View Lift Station, and on to Node 601. The Dakota Electric lift station would be replaced with a gravity sewer west to Node 420. The new trunk line (named Legacy of Farmington Trunk) has been constructed to Node 421 which is approximately 1,200 ft south of the intersection of Ash st and Denmark Ave.

A proposed trunk line is shown extending down the east side of the district along Biscayne Avenue. This proposed trunk line is designed to convey the flows from sewersheds D6-633 through D6-627 along with potentially conveying flow from parcels on the east side of Biscayne Ave which are currently part of Empire Township.

If development pressure occurs along the entire length of Biscayne Avenue at once, the new trunk line will need to be constructed. If one of the other sewersheds develops first, that sewershed can be routed into the existing trunk sewer as long as the total additional flow into the existing sewer does not exceed 0.24 MGD. Using the average daily flowrates listed in Table 5 this allows for approximately 200 new single family homes to be added to the system before it reaches its full capacity.

The south branch of the Vermillion River intersects sewersheds D6-611 and D6-633, limiting development in these regions. Therefore no flow from the floodway designated areas was assumed from this district. The flood fringe portion was included since it is possible to develop within the flood fringe.

District 6 is nearing capacity downstream of Node 618 where only 0.24 MGD of capacity remains in the sewer. The new trunk under Biscayne may be able to relieve the stress on this sewer.

If sewershed 611 on the south end of D6 is developed it will dramatically increase the flow through the existing trunk. If developed, it will be necessary to upsize the existing trunk line to accommodate the flow. The costs associated with this would be considerable and are summarized in Appendix E.

#### 4.5.7 Northeast - District 7

District 7 is located in the northeastern portion of the City, on the east side of the railroad tracks. This district is completely undeveloped but will be developed by a single owner over the next fifteen years. The proposed land use is low and medium density housing, with a mixed-use commercial/residential corridor at the intersection of Hwy. 3 and 195th Street. The 2040 land use within the City of Farmington is tabulated below. A detailed breakdown is provided in Appendix A.

Table 13 District 7 Land Use Summary

District 7 Land Use Summary	
Land Use Existing	Acres
Ag	0.0
Ag-ag Preserve	0.0
Ag-Green Acres	0.0
Apartment	0.0
Commercial	0.0
Commercial-Open Space	0.0
Commercial-Preferred	0.0
Industrial	0.0
Industrial-Preferred	0.0
Municipal	0.0
Machinery	0.0
Residential	0.0
Residential-Condominium	0.0
Residential-Townhouse	0.0
School	0.0
Utilities-Preferred	0.0
Design Land Use	Acres
Low Density	466.7
Low Medium	76.4
Medium Density	59.4
High Density	0.0
Mixed-Use (Commercial/Residential)	28.5
Industrial	0.0
Commercial	0.0
Agriculture	0.0
Public/Semi-Public	0.0
ROW	0.0
Park/Open Space	4.4
Non-Designated	0.0
<b>Total Area</b>	<b>635.4</b>

The proposed trunk sewer system will cross under the railroad tracks at Node 707. A lift station is needed at Node 709 to serve the low area in D7-709. The design for this trunk line is currently in the preliminary approval stage, and the trunk and lift station will be funded completely by the developer.

4.5.8 East Central - District 8

District 8 is located in the central part of the City, along North Creek to the east. This district is served by a trunk line that runs west to east and connects into the Apple Valley Interceptor. This is the smallest sewershed, and the district is partially developed. There remains undeveloped property in the south portion of the district that’s development is dependent on market forces. The ultimate land use within the City of Farmington is tabulated below. A detailed breakdown is provided in Appendix A.

Table 14 District 8 Land Use Summary

<b>District 8 Land Use Summary</b>	
Land Use Existing	Acres
Ag	0.0
Ag-ag Preserve	0.0
Ag-Green Acres	0.0
Apartment	0.0
Commercial	0.0
Commercial-Open Space	0.0
Commercial-Preferred	0.0
Industrial	0.0
Industrial-Preferred	0.0
Municipal	0.0
Machinery	0.0
Residential	142.6
Residential-Condominium	0.0
Residential-Townhouse	3.7
School	0.0
Utilities-Preferred	0.0
Design Land Use	Acres
Low Density	168.5
Low Medium	0.0
Medium Density	6.7
High Density	0.0
Mixed-Use (Commercial/Residential)	0.0
Industrial	0.0
Commercial	0.0
Agriculture	186.9
Public/Semi-Public	4.3
ROW	0.0
Park/Open Space	0.0
Non-Designated	0.0
<b>Total Area</b>	<b>512.7</b>

The trunk system serving District 8 was designed and constructed within the past few years and has sufficient capacity to serve the existing development and future development. When future development occurs an additional 10” trunk line will be extended south from Node 802 to serve this area

## 5. INFILTRATION AND INFLOW

The Metropolitan Council identified Farmington as a community with at least one Infiltration and Inflow (I/I) exceedance event recorded between June 1, 2004 and June 30, 2006, and assessed a surcharge to begin in 2007 and last for five years, until 2011. A letter from the MPCA dated September 20<sup>th</sup>, 2010 states:

*June 30<sup>th</sup>, 2010 marked the end of the exceedance measurement period under the current I/I program. However, the council will continue to monitor the peak wet weather flows from the City and notify the City of peak I/I events in excess of your goals.<sup>3</sup>*

The City has continued its I/I reduction plan and is currently meeting the MPCA requirements. A full copy of the letter can be found in the attached appendix

Additionally, Farmington's current dry weather flow is approximately 66 gallons of wastewater per capita per day (gcd). A typical annual flow is 85 gcd (75 gcd dry weather flow plus 10 gcd I/I), showing that Farmington has significantly less I/I than average. Recent metering also does not show much variability around these values indicating limited infiltration and inflow even in the spring. Farmington has also been systematically replacing older sanitary sewer within the downtown area since 1991, which has already significantly reduced I/I. Finally, the City requires new homes be constructed two feet above the highest groundwater level recorded, which is often three to six feet below the surface. This reduces infiltration in new development sewer systems, which is harder to avoid in older parts of town where basements may be constructed in the groundwater table.

Table 15 Pre & Post 1970 Development

Pre & Post 1970 Residential		
	(ac)	% of Total
Pre 1970	722.91	34%
Post 1970	1374.33	66%

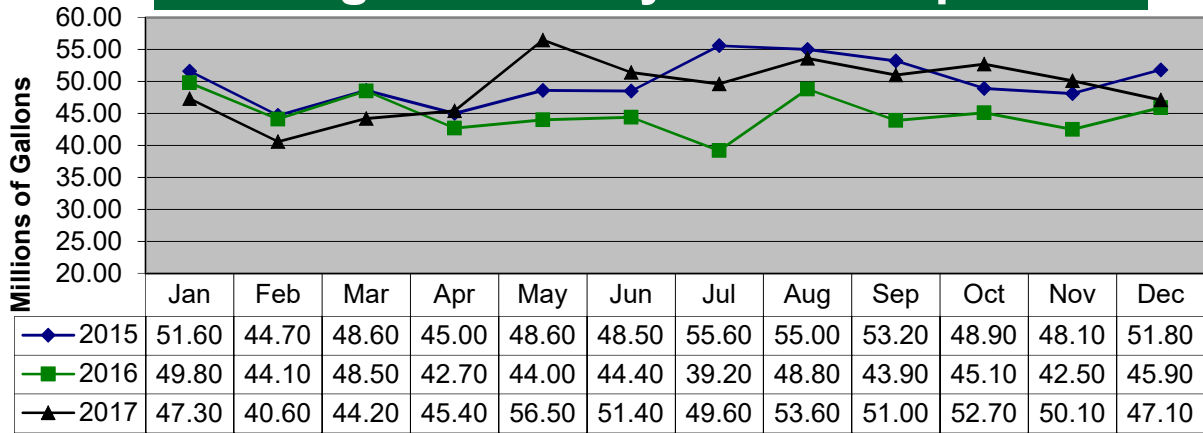
Currently the City of Farmington has approximately 2100ac of residential zoned land or 5896 parcels. Of those parcels, 1238 were construction pre-1970 and are prone to causing inflow and infiltration issues in the sanitary sewers. The City has been systematically replacing the sanitary sewer in these areas since 2005 and has substantially decreased their I/I. A map of the pre-1970 properties can be found in the attached Appendix F.

District 6 was largely constructed pre-1970. A recent I/I analysis of this district was completed by Bolton & Menk, Inc. The results of the analysis showed little to no evidence of inflow in the system and approximately a 30 gpm or 18% increase in baseflow due to infiltration during wet weather periods. A full copy of the memo regarding the I/I analysis of district 6 can be found in the attached appendix.

Average monthly waste water production volumes for the City can be seen in Exhibit 3.

<sup>3</sup> Moore, W. G. (2010, September 20). Metropolitan Council I/I Surcharge Program Response to 2011 Work Plan [Letter to Kevin Schorzman, City Engineer]. Farmington, Minnesota.

## Farmington Monthly Flow Comparison



*Exhibit 3 Monthly Flow Comparison*

Flowrates collected from December to February (Dry Weather) were compared to flowrates collected from April to October (Wet Weather) for the last 5 recorded years. The compiled data can be found in Table 16 below. The numbers indicate that on average over the last 5 years the City has averaged approximately 4.1 MG of I/I per summer month or approximately 0.13 MGD.

*Table 16 Dry Vs. Wet Weather Flow*

Dry Weather Vs. Wet Weather I&I			
Year	Winter Flow	Summer Flow	Difference
2013	40.53	46.74	6.21
2014	46.40	55.39	8.99
2015	49.37	50.69	1.32
2016	46.60	44.01	-2.59
2017	45.00	51.46	6.46
5-Year Avg	45.58	49.66	4.08

A second method used to quantify I/I in the system is to compare the water usage rates in the winter to the sanitary sewer flows. In a perfect system these flowrates would be nearly the same. Summer months were excluded since large volumes of water may be used to irrigate lawns and will not make its way back into the sewer system. The summary of this data is found in Table 17 below.

*Table 17 I/I Based on Water Usage*

I/I Estimate based on Water Usage	
Average Flow (MGD)	1.578
Peak Month Flow (MGD)	1.741
Base Flow (MGD) using winter water usage avg	1.231
Average Annual I/I (MGD)	0.348
Peak Month I/I (MGD)	0.510

From both analyses, it is estimated that the City of Farmington's sanitary sewer flows are approximately 9-22% clearwater or 0.13-.35 MGD.

## 6. SCHEDULE, COST ESTIMATES, AND FINANCING

### 6.1 NEW CONNECTIONS SCHEDULE

Two new connections will be added to the Met Council Interceptor system. District 7 is an entirely new section of sewer that will connect to MCES Interceptor #7409. The district 7 connection falls within the 2020 MUSA boundary.

A new trunk line is also proposed to the south of District 6 to alleviate the development pressure that would be placed on that region. This trunk would connect directly to MCES Interceptor #7103-1. This trunk line is within the 2040 MUSA boundary. It is possible that the line will be installed earlier than 2040 if an agreement can be reached with Empire Township to share the capacity in the line.

Table 18 MCES Connection Schedule

Connection Schedule	
District	Connection Est
District 6	2040
District 7	2025

### 6.2 COST ESTIMATES

Cost estimates have been prepared for the proposed trunk facilities outlined in this report.

The total estimated cost of all proposed trunk facilities shown in Appendix E is \$12,610,000. Trunk facilities include lift stations, force mains, and all gravity lines greater than or equal to 10” in diameter. A breakdown of the cost estimates for proposed trunk sewer is presented in Table 19 and in detail in Appendix E. For the City of Farmington, no new lift stations or force mains are proposed other than in District 7, which is in the design phase and not included as part of this report, so the table includes only gravity lines. The cost estimates include construction, design, legal, administration, and planning contingency costs. Land and easement acquisition costs are not included. The planning contingency costs account for unexpected costs. Examples include route changes by the developer or difficulties in construction such as unexpected bedrock or the requirement of excessive dewatering.

Table 19 Summary of Cost Estimates

Trunk Sewer Cost Estimates	
District	Total Cost
District 1	\$ -
District 2	\$ 2,795,977
District 3	\$ 700,534
District 4	\$ 221,415
District 5	\$ -
District 6	\$ 6,535,279
District 7	\$ 1,639,094
District 8	\$ 718,138
<b>Total Cost</b>	<b>\$ 12,610,436</b>

### 6.3 FINANCING

The City of Farmington finances new trunk sanitary sewer with area and connection charges. The existing area and connection charges should be revised according to the cost estimates provided in this report to provide adequate funding for anticipated expansion. These charges should be reviewed and adjusted annually, according to the ENR construction cost index.



## 7. SUMMARY AND OUTCOMES

The Comprehensive Sanitary Sewer Plan presented herein is intended to serve as an inventory of City of Farmington's existing sanitary sewer trunk facilities and as a guide for expanding the trunk sewer system to service future development in the City. Based on the information analyzed in this study and presented in this report, the following outcomes are desired:

1. That the Metropolitan Council use the City's population and flow projections in determining the appropriate capacity for its own facilities.
2. That the City Council adopt the sanitary sewer layout, as presented in the Trunk Sewer System Map, as the development guide for sanitary sewer construction within the study area.
3. That the system design flows and criteria in Appendices C and D be used for sizing all future sanitary sewer trunk facilities, but that flow projections of Section 2 be used when representing the impact of Farmington's system on the Metropolitan Disposal System and the Empire WWTF.

## Appendix A: Sewer District Land Use

APPENDIX A - AREAS FOR 2040 SYSTEM

District 1 - Existing Conditions Sewershed Summary																	
Sewershed ID	Ag	Ag-ag Preserve	Ag-Green Acres	Apartment	Commercial	Commercial-Open Space	Commercial-Preferred	Industrial	Industrial-Preferred	Municipal	Machinery	Residential	Residential-Condominium	Residential-Townhouse	School	Utilities-Preferred	Total
	(ac)	(ac)	(ac)	(ac)	(ac)	(ac)	(ac)	(ac)	(ac)	(ac)	(ac)	(ac)	(ac)	(ac)	(ac)	(ac)	(ac)
101	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	18.0	0.0	0.0	0.0	0.0	18.0
102	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.7	0.0	0.0	0.0	0.0	3.7
103	0.0	0.0	0.0	0.0	1.1	0.0	2.6	0.0	0.0	0.0	0.0	84.7	4.9	1.5	0.0	0.0	94.9
104	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	61.2	0.0	0.0	0.0	0.0	61.2
105	0.0	0.0	0.0	0.0	0.0	0.0	4.2	0.0	0.0	0.0	0.0	55.7	0.0	4.9	0.0	0.0	64.7
106	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	81.0	0.0	0.0	0.0	0.0	81.0
109	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	31.8	0.0	0.0	0.0	0.0	31.8
110	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	13.1	0.0	0.0	0.0	0.0	13.1
111	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	53.3	0.0	0.0	0.0	0.0	53.3
112	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	14.2	0.0	0.0	0.0	0.0	14.2
113	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	11.5	0.0	0.0	0.0	0.0	11.5
114	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	45.5	0.0	0.0	31.1	0.0	76.6
115	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	35.8	0.0	0.0	0.0	0.0	35.8
116	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	54.9	0.0	0.0	0.0	0.0	54.9
117	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	7.8	0.0	0.0	0.0	0.0	7.8
118	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Totals	0.0	0.0	0.0	0.0	1.1	0.0	6.8	0.0	0.0	0.0	0.0	572.2	4.9	6.4	31.1	0.0	622.5

District 1 - 2040 Land Use Sewershed Summary													
	Low Density	Low Medium	Medium Density	High Density	Mixed-Use (Commercial/Residential)	Industrial	Commercial	Agriculture	Public/Semi-Public	ROW	Park/Open Space	Non-Designated	Totals
	(ac)	(ac)	(ac)	(ac)	(ac)	(ac)	(ac)	(ac)	(ac)	(ac)	(ac)	(ac)	(ac)
101	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
102	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
103	3.9	1.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	5.1
104	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3
105	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
106	0.0	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2
109	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5
110	0.0	0.0	52.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	52.9
111	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4
112	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
113	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4
114	2.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.2
115	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
116	2.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.5
117	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
118	0.0	38.9	13.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	52.6
Totals	10.1	40.4	66.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	117.1

DISTRICT 1 TOTAL AREA (ac) 739.6
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APPENDIX A - AREAS FOR 2040 SYSTEM

District 2 - Existing Conditions Sewershed Summary																	
Sewershed ID	Ag	Ag-ag Preserve	Ag-Green Acres	Apartment	Commercial	Commercial-Open Space	Commercial-Preferred	Industrial	Industrial-Preferred	Municipal	Machinery	Residential	Residential-Condominium	Residential-Townhouse	School	Utilities-Preferred	Total
	(ac)	(ac)	(ac)	(ac)	(ac)	(ac)	(ac)	(ac)	(ac)	(ac)	(ac)	(ac)	(ac)	(ac)	(ac)	(ac)	(ac)
201	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
202	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
203	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
204	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
205	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
206	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Totals	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

District 2 - 2040 Land Use Sewershed Summary													
	Low Density	Low Medium	Medium Density	High Density	Mixed-Use (Commercial/Residential)	Industrial	Commercial	Agriculture	Public/Semi-Public	ROW	Park/Open Space	Non-Designated	Totals
	(ac)	(ac)	(ac)	(ac)	(ac)	(ac)	(ac)	(ac)	(ac)	(ac)	(ac)	(ac)	(ac)
201	48.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	48.2
202	0.0	0.0	0.0	0.0	0.0	0.0	0.0	106.1	0.0	0.0	0.0	0.0	106.1
203	0.0	0.0	0.0	0.0	0.0	0.0	0.0	128.1	0.0	0.0	0.0	0.0	128.1
204	29.8	0.0	0.0	0.0	0.0	0.0	0.0	282.2	0.0	0.0	0.0	0.0	312.0
205	0.0	0.0	0.0	0.0	0.0	0.0	0.0	146.5	0.0	0.0	0.0	0.0	146.5
206	0.0	0.0	0.0	0.0	0.0	0.0	0.0	156.3	0.0	0.0	0.0	0.0	156.3
Totals	78.0	0.0	0.0	0.0	0.0	0.0	0.0	819.2	0.0	0.0	0.0	0.0	897.2

DISTRICT2 TOTAL AREA (ac) 897.2
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APPENDIX A - AREAS FOR 2040 SYSTEM

District 3 - Existing Conditions Sewershed Summary																	
Sewershed ID	Ag	Ag-ag Preserve	Ag-Green Acres	Apartment	Commercial	Commercial-Open Space	Commercial-Preferred	Industrial	Industrial-Preferred	Municipal	Machinery	Residential	Residential-Condominium	Residential-Townhouse	School	Utilities-Preferred	Total
	(ac)	(ac)	(ac)	(ac)	(ac)	(ac)	(ac)	(ac)	(ac)	(ac)	(ac)	(ac)	(ac)	(ac)	(ac)	(ac)	(ac)
301	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
302	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	29.5	0.0	29.5
303	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
305	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.0	0.0	0.0	0.0	203.3	0.0	0.0	0.0	0.0	203.5
306	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	38.7	0.0	0.0	0.0	0.0	38.7
307	0.0	0.0	0.0	0.0	0.0	0.0	4.4	0.0	0.0	0.0	0.0	8.4	0.0	12.3	0.0	0.0	25.0
308	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	44.2	0.0	0.0	0.0	0.0	44.2
309	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	13.1	0.0	0.0	13.1
310	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	23.5	0.0	38.4	0.0	65.1	0.0	0.0	127.0
312	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	19.4	0.0	0.0	0.0	0.0	19.4
313	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	15.5	0.0	24.8	0.0	0.0	40.3
314	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
316	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	54.7	0.0	10.3	0.0	0.0	65.0
317	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	11.6	0.0	0.0	0.0	0.0	0.0	11.6
319	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
320	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Totals	0.0	0.0	0.0	0.0	0.0	0.0	4.6	0.0	0.0	23.5	11.6	422.6	0.0	125.6	29.5	0.0	617.4

District 3 - 2040 Land Use Sewershed Summary													
	Low Density	Low Medium	Medium Density	High Density	Mixed-Use (Commercial/Residential)	Industrial	Commercial	Agriculture	Public/Semi-Public	ROW	Park/Open Space	Non-Designated	Totals
	(ac)	(ac)	(ac)	(ac)	(ac)	(ac)	(ac)	(ac)	(ac)	(ac)	(ac)	(ac)	(ac)
301	0.0	0.0	0.0	0.0	0.0	0.0	0.0	116.1	0.0	0.0	0.0	0.0	116.1
302	4.4	0.0	0.0	0.0	0.0	0.0	0.0	45.2	20.5	0.0	0.0	0.0	70.0
303	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	29.8	0.0	0.0	0.0	29.8
305	1.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.4
306	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3
307	0.0	0.6	0.0	0.0	0.0	0.0	0.3	0.0	0.0	0.0	0.0	0.0	1.0
308	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3
309	0.0	0.0	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2
310	6.2	0.0	0.3	0.0	0.0	0.0	0.0	0.0	8.9	0.0	0.0	0.0	15.3
312	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
313	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
314	0.0	0.0	0.0	0.0	0.0	26.2	5.8	84.0	0.0	0.0	0.0	0.0	115.9
316	3.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.9
317	3.8	0.0	0.0	0.0	0.0	21.4	0.0	0.0	0.0	0.0	1.5	0.0	26.7
319	0.0	0.0	0.0	0.0	0.0	72.1	0.0	0.0	0.0	0.0	0.0	0.0	72.1
320	0.0	0.0	0.0	0.0	0.0	82.9	0.0	0.0	0.0	0.0	0.0	0.0	82.9
Totals	20.3	0.6	0.5	0.0	0.0	202.6	6.1	245.2	59.2	0.0	1.5	0.0	536.1

DISTRICT 3 TOTAL AREA (ac)	1153.6
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APPENDIX A - AREAS FOR 2040 SYSTEM

District 4 - Existing Conditions Sewershed Summary																	
Sewershed ID	Ag	Ag-ag Preserve	Ag-Green Acres	Apartment	Commercial	Commercial-Open Space	Commercial-Preferred	Industrial	Industrial-Preferred	Municipal	Machinery	Residential	Residential-Condominium	Residential-Townhouse	School	Utilities-Preferred	Total
	(ac)	(ac)	(ac)	(ac)	(ac)	(ac)	(ac)	(ac)	(ac)	(ac)	(ac)	(ac)	(ac)	(ac)	(ac)	(ac)	(ac)
414	0.0	0.0	0.0	0.0	0.0	0.0	47.3	0.0	16.1	2.7	0.0	108.6	0.0	0.0	98.4	0.0	273.1
415	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
416	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
417	0.0	0.0	0.0	0.0	0.0	0.0	24.0	2.0	17.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	43.3
418	0.0	0.0	0.0	0.0	1.4	0.0	20.1	5.7	18.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	45.2
419	0.0	0.0	0.0	0.0	19.3	0.0	7.7	10.0	0.0	0.0	78.8	1.0	2.4	0.0	0.0	0.8	120.0
420	0.0	0.0	0.0	1.2	0.0	0.0	20.0	0.0	0.0	8.0	0.0	22.2	0.7	3.6	0.0	0.0	55.7
421	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
422	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
423	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
424	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
425	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
438	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
426	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
438	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
439	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Totals	0.0	0.0	0.0	1.2	20.7	0.0	119.0	17.7	51.5	10.6	78.8	131.8	3.1	3.6	98.4	0.8	537.2

District 4 - 2040 Land Use Sewershed Summary													
	Low Density	Low Medium	Medium Density	High Density	Mixed-Use (Commercial/Residential)	Industrial	Commercial	Agriculture	Public/Semi-Public	ROW	Park/Open Space	Non-Designated	Totals
	(ac)	(ac)	(ac)	(ac)	(ac)	(ac)	(ac)	(ac)	(ac)	(ac)	(ac)	(ac)	(ac)
414	0.0	0.0	0.0	22.9	0.0	0.0	16.4	0.0	0.0	0.0	0.0	0.0	39.4
415	0.0	0.0	0.0	0.0	0.0	51.3	16.2	0.0	0.0	0.0	0.0	0.0	67.4
416	0.0	0.0	0.0	0.0	0.0	11.1	19.9	0.0	0.0	0.0	0.0	0.0	31.0
417	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
418	0.0	0.0	0.0	0.0	0.0	0.0	4.1	0.0	0.0	0.0	0.0	0.0	4.1
419	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
420	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
421	0.0	0.0	25.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	47.8	73.6
422	0.0	0.0	23.6	62.9	0.0	0.0	91.9	0.0	0.0	0.0	0.0	0.0	178.3
423	0.0	0.0	0.0	0.0	0.0	0.0	0.0	314.9	0.0	0.0	0.0	0.0	314.9
424	0.0	0.0	0.0	0.0	0.0	0.0	0.0	101.9	0.0	0.0	0.0	0.0	101.9
425	0.0	0.0	0.0	0.0	0.0	0.0	0.0	67.6	0.0	0.0	0.0	0.0	67.6
426	0.0	0.0	0.0	0.0	0.0	0.0	0.0	47.8	0.0	0.0	0.0	0.0	47.8
438	0.0	79.1	7.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	86.5
439	0.0	79.1	20.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	99.3
Totals	0.0	158.3	76.8	85.8	0.0	62.3	148.6	532.3	0.0	0.0	0.0	47.8	1111.9

DISTRICT 4 TOTAL AREA (ac)	1649.1
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APPENDIX A - AREAS FOR 2040 SYSTEM

District 5 - Existing Conditions Sewershed Summary																	
Sewershed ID	Ag	Ag-ag Preserve	Ag-Green Acres	Apartment	Commercial	Commercial-Open Space	Commercial-Preferred	Industrial	Industrial-Preferred	Municipal	Machinery	Residential	Residential-Condominium	Residential-Townhouse	School	Utilities-Preferred	Total
	(ac)	(ac)	(ac)	(ac)	(ac)	(ac)	(ac)	(ac)	(ac)	(ac)	(ac)	(ac)	(ac)	(ac)	(ac)	(ac)	(ac)
501	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	11.1	0.0	0.0	0.0	0.0	11.1
502	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	12.7	0.0	0.0	0.0	0.0	12.7
504	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
505	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	10.2	0.0	0.0	0.0	0.0	10.2
506	0.0	0.0	0.0	0.0	0.0	0.0	4.8	0.0	0.0	9.2	0.0	42.5	0.0	0.0	0.0	0.0	56.4
507	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	14.9	0.0	0.0	0.0	0.0	14.9
508	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.2	0.0	0.0	60.8	0.0	64.0
Totals	0.0	0.0	0.0	0.0	0.0	0.0	4.8	0.0	0.0	9.2	0.0	94.6	0.0	0.0	60.8	0.0	169.4

District 5 - 2040 Land Use Sewershed Summary													
	Low Density	Low Medium	Medium Density	High Density	Mixed-Use (Commercial/Residential)	Industrial	Commercial	Agriculture	Public/Semi-Public	ROW	Park/Open Space	Non-Designated	Totals
	(ac)	(ac)	(ac)	(ac)	(ac)	(ac)	(ac)	(ac)	(ac)	(ac)	(ac)	(ac)	(ac)
501	6.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	6.4
502	13.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	13.2
504	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
505	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
506	22.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	5.6	0.0	0.0	0.0	28.4
507	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
508	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	20.0	0.0	0.0	0.0	20.0
Totals	42.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	25.6	0.0	0.0	0.0	68.0

DISTRICT 5 TOTAL AREA (ac) 237.4
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APPENDIX A - AREAS FOR 2040 SYSTEM

District 6 - Existing Conditions Sewershed Summary																	
Sewershed ID	Ag	Ag-ag Preserve	Ag-Green Acres	Apartment	Commercial	Commercial-Open Space	Commercial-Preferred	Industrial	Industrial-Preferred	Municipal	Machinery	Residential	Residential-Condominium	Residential-Townhouse	School	Utilities-Preferred	Total
	(ac)	(ac)	(ac)	(ac)	(ac)	(ac)	(ac)	(ac)	(ac)	(ac)	(ac)	(ac)	(ac)	(ac)	(ac)	(ac)	(ac)
601	0.0	0.0	0.0	1.8	1.4	0.0	8.9	1.3	0.8	9.5	0.0	17.7	0.0	1.4	65.2	0.0	108.0
602	0.0	0.0	0.0	3.2	6.8	0.0	10.2	0.0	0.8	3.5	0.0	23.5	0.0	0.5	0.0	0.0	48.5
618	0.0	0.0	0.0	0.0	0.2	0.0	22.3	0.0	0.0	0.0	0.0	27.3	0.0	9.8	0.0	0.0	59.7
619	0.0	0.0	0.0	3.9	1.0	0.0	4.2	0.0	0.0	0.0	0.0	23.3	0.0	14.4	0.0	0.0	46.8
620	0.0	0.0	0.0	0.0	0.0	0.0	1.2	0.0	0.0	0.0	0.0	47.6	0.0	0.0	0.0	0.0	48.7
625	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
627	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
628	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
629	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
630	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
631	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
632	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
633	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Totals	0.0	0.0	0.0	8.8	9.4	0.0	46.8	1.3	1.7	13.0	0.0	139.3	0.0	26.1	65.2	0.0	311.7

District 6 - 2040 Land Use Sewershed Summary													
	Low Density	Low Medium	Medium Density	High Density	Mixed-Use (Commercial/Residential)	Industrial	Commercial	Agriculture	Public/Semi-Public	ROW	Park/Open Space	Non-Designated	Totals
	(ac)	(ac)	(ac)	(ac)	(ac)	(ac)	(ac)	(ac)	(ac)	(ac)	(ac)	(ac)	(ac)
601	0.0	0.2	0.0	4.2	0.0	0.0	0.5	0.0	5.8	0.0	0.0	0.0	10.7
602	0.0	0.2	0.0	0.0	0.0	0.0	0.6	0.0	0.0	0.0	0.0	0.0	0.8
618	0.1	1.0	6.3	0.0	0.0	0.0	0.0	0.0	9.2	0.0	0.0	0.0	16.7
619	6.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	15.4	0.0	0.0	0.0	21.9
620	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
625	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
627	0.0	9.1	0.0	0.0	0.0	0.0	0.0	66.4	0.0	0.0	0.0	0.0	75.5
628	0.0	0.0	0.0	0.0	0.0	0.0	0.0	76.6	0.0	0.0	0.0	0.0	76.6
629	0.0	71.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	71.8
630	0.0	41.9	20.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	62.5
631	0.0	3.0	0.0	0.0	0.0	0.0	0.0	113.5	0.0	0.0	0.0	0.0	116.5
632	37.0	59.6	14.7	0.0	0.0	0.0	14.2	0.0	0.0	0.0	0.0	0.0	125.5
633	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	153.2	153.2
Totals	43.6	186.9	41.7	4.2	0.0	0.0	15.3	256.5	30.4	0.0	0.0	153.2	731.7

DISTRICT 6 TOTAL AREA (ac) 1043.4
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APPENDIX A - AREAS FOR 2040 SYSTEM

District 7 - Existing Conditions Sewershed Summary																	
Sewershed ID	Ag	Ag-ag Preserve	Ag-Green Acres	Apartment	Commercial	Commercial-Open Space	Commercial-Preferred	Industrial	Industrial-Preferred	Municipal	Machinery	Residential	Residential-Condominium	Residential-Townhouse	School	Utilities-Preferred	Total
	(ac)	(ac)	(ac)	(ac)	(ac)	(ac)	(ac)	(ac)	(ac)	(ac)	(ac)	(ac)	(ac)	(ac)	(ac)	(ac)	(ac)
702	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
703	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
704	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
705	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
706	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
707	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
708	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
709	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Totals	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

District 7 - 2040 Land Use Sewershed Summary													
	Low Density	Low Medium	Medium Density	High Density	Mixed-Use (Commercial/Residential)	Industrial	Commercial	Agriculture	Public/Semi-Public	ROW	Park/Open Space	Non-Designated	Totals
	(ac)	(ac)	(ac)	(ac)	(ac)	(ac)	(ac)	(ac)	(ac)	(ac)	(ac)	(ac)	(ac)
702	11.8	76.4	14.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	102.9
703	57.1	0.0	43.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	100.9
704	70.5	0.0	0.0	0.0	28.5	0.0	0.0	0.0	0.0	0.0	4.4	0.0	103.4
705	44.9	0.0	1.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	45.8
706	71.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	71.3
707	57.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	57.1
708	74.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	74.4
709	79.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	79.7
Totals	466.7	76.4	59.4	0.0	28.5	0.0	0.0	0.0	0.0	0.0	4.4	0.0	635.4

DISTRICT 7 TOTAL AREA (ac) 635.4
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APPENDIX A - AREAS FOR 2040 SYSTEM

District 8 - Existing Conditions Sewershed Summary																	
Sewershed ID	Ag	Ag-ag Preserve	Ag-Green Acres	Apartment	Commercial	Commercial-Open Space	Commercial-Preferred	Industrial	Industrial-Preferred	Municipal	Machinery	Residential	Residential-Condominium	Residential-Townhouse	School	Utilities-Preferred	Total
	(ac)	(ac)	(ac)	(ac)	(ac)	(ac)	(ac)	(ac)	(ac)	(ac)	(ac)	(ac)	(ac)	(ac)	(ac)	(ac)	(ac)
802	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	39.6	0.0	0.0	0.0	0.0	39.6
803	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	103.0	0.0	3.7	0.0	0.0	106.6
804	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
805	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
806	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
807	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
808	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Totals	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	142.6	0.0	3.7	0.0	0.0	146.3

District 8 -2040 Land Use Sewershed Summary													
	Low Density	Low Medium	Medium Density	High Density	Mixed-Use (Commercial/Residential)	Industrial	Commercial	Agriculture	Public/Semi-Public	ROW	Park/Open Space	Non-Designated	Totals
	(ac)	(ac)	(ac)	(ac)	(ac)	(ac)	(ac)	(ac)	(ac)	(ac)	(ac)	(ac)	(ac)
802	0.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.7
803	0.0	0.0	6.7	0.0	0.0	0.0	0.0	0.0	4.3	0.0	0.0	0.0	11.1
804	40.4	0.0	0.0	0.0	0.0	0.0	0.0	61.5	0.0	0.0	0.0	0.0	101.9
805	36.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	36.0
806	36.7	0.0	0.0	0.0	0.0	0.0	0.0	105.0	0.0	0.0	0.0	0.0	141.7
807	54.7	0.0	0.0	0.0	0.0	0.0	0.0	20.3	0.0	0.0	0.0	0.0	75.1
808	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Totals	168.5	0.0	6.7	0.0	0.0	0.0	0.0	186.9	4.3	0.0	0.0	0.0	366.4

DISTRICT 8 TOTAL AREA (ac) 512.7
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## Appendix B: Average Flows (MGD) for 2040 Land Use

APPENDIX B - AREAS FOR 2040 SYSTEM

**District 1 - Existing Conditions Average Influent Waste Water Summary**

Sewershed ID	Ag (MGD)	Ag-ag Preserve (MGD)	Ag-Green Acres (MGD)	Apartment (MGD)	Commercial (MGD)	Commercial-Open Space (MGD)	Commercial-Preferred (MGD)	Industrial (MGD)	Industrial-Preferred (MGD)	Municipal (MGD)	Machinery (MGD)	Residential (MGD)	Residential-Condominium (MGD)	Residential-Townhouse (MGD)	School (MGD)	Utilities-Preferred (MGD)	Total (MGD)
101	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.00	0.00	0.00	0.00	0.02
102	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
103	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.08	0.03	0.01	0.00	0.00	0.12
104	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.06	0.00	0.00	0.00	0.00	0.06
105	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.10	0.00	0.02	0.00	0.00	0.12
106	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.12	0.00	0.00	0.00	0.00	0.12
109	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.04	0.00	0.00	0.00	0.00	0.04
110	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.01
111	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.06	0.00	0.00	0.00	0.00	0.06
112	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.00	0.00	0.00	0.00	0.02
113	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.01
114	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.04	0.00	0.00	0.06	0.00	0.10
115	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.00	0.00	0.00	0.00	0.03
116	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.06	0.00	0.00	0.00	0.00	0.06
117	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.01
118	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Totals	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.67	0.03	0.03	0.06	0.00	0.79

**District 1 - 2040 Average Influent Waste Water Summary**

	Low Density (MGD)	Low Medium (MGD)	Medium Density (MGD)	High Density (MGD)	Mixed-Use (Commercial/Residential) (MGD)	Industrial (MGD)	Commercial (MGD)	Agriculture (MGD)	Public/Semi-Public (MGD)	ROW (MGD)	Park/Open Space (MGD)	Non-Designated (MGD)	Totals (MGD)
101	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
102	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
103	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01
104	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
105	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
106	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
109	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
110	0.00	0.00	0.10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.10
111	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
112	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
113	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
114	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
115	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
116	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
117	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
118	0.00	0.06	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.08
Totals	0.01	0.06	0.13	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.20

DISTRICT 1 TOTAL (MGD)	1.0
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APPENDIX B - AREAS FOR 2040 SYSTEM

**District 2 - Existing Conditions Average Influent Waste Water Summary**

Sewershed ID	Ag	Ag-ag Preserve	Ag-Green Acres	Apartment	Commercial	Commercial-Open Space	Commercial-Preferred	Industrial	Industrial-Preferred	Municipal	Machinery	Residential	Residential-Condominium	Residential-Townhouse	School	Utilities-Preferred	Total
	(MGD)	(MGD)	(MGD)	(MGD)	(MGD)	(MGD)	(MGD)	(MGD)	(MGD)	(MGD)	(MGD)	(MGD)	(MGD)	(MGD)	(MGD)	(MGD)	(MGD)
201	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
202	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
203	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
204	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
205	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
206	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Totals	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

**District 2 - 2040 Average Influent Waste Water Summary**

	Low Density	Low Medium	Medium Density	High Density	Mixed-Use (Commercial/Residential)	Industrial	Commercial	Agriculture	Public/Semi-Public	ROW	Park/Open Space	Non-Designated	Totals
	(MGD)	(MGD)	(MGD)	(MGD)	(MGD)	(MGD)	(MGD)	(MGD)	(MGD)	(MGD)	(MGD)	(MGD)	(MGD)
201	0.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.04
202	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.01
203	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.01
204	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.00	0.00	0.00	0.00	0.04
205	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.01
206	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.01
Totals	0.07	0.00	0.00	0.00	0.00	0.00	0.00	0.05	0.00	0.00	0.00	0.00	0.12

DISTRICT 2 TOTAL (MGD) 0.12
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APPENDIX B - AREAS FOR 2040 SYSTEM

District 3 - Existing Conditions Average Influent Waste Water Summary																	
Sewershed ID	Ag	Ag-ag Preserve	Ag-Green Acres	Apartment	Commercial	Commercial-Open Space	Commercial-Preferred	Industrial	Industrial-Preferred	Municipal	Machinery	Residential	Residential-Condominium	Residential-Townhouse	School	Utilities-Preferred	Total
	(MGD)	(MGD)	(MGD)	(MGD)	(MGD)	(MGD)	(MGD)	(MGD)	(MGD)	(MGD)	(MGD)	(MGD)	(MGD)	(MGD)	(MGD)	(MGD)	(MGD)
301	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
302	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.06	0.00	0.06
303	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
305	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.19	0.00	0.00	0.00	0.00	0.19
306	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.04	0.00	0.00	0.00	0.00	0.04
307	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.01	0.00	0.03	0.00	0.00	0.05
308	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.05	0.00	0.00	0.00	0.00	0.05
309	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.00	0.00	0.03
310	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.04	0.00	0.03	0.00	0.08	0.00	0.00	0.15
312	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.00	0.00	0.00	0.00	0.02
313	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.06	0.00	0.00	0.08
314	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
316	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.00	0.04	0.00	0.00	0.07
317	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
319	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
320	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Totals	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.04	0.00	0.39	0.00	0.25	0.06	0.00	0.74

District 3 - 2040 Average Influent Waste Water Summary													
	Low Density	Low Medium	Medium Density	High Density	Mixed-Use (Commercial/Residential)	Industrial	Commercial	Agriculture	Public/Semi-Public	ROW	Park/Open Space	Non-Designated	Totals
	(MGD)	(MGD)	(MGD)	(MGD)	(MGD)	(MGD)	(MGD)	(MGD)	(MGD)	(MGD)	(MGD)	(MGD)	(MGD)
301	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.01
302	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.00	0.00	0.00	0.02
303	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.00	0.00	0.00	0.02
305	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
306	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
307	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
308	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
309	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
310	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.01
312	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
313	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
314	0.00	0.00	0.00	0.00	0.00	0.04	0.01	0.01	0.00	0.00	0.00	0.00	0.05
316	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
317	0.00	0.00	0.00	0.00	0.00	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.04
319	0.00	0.00	0.00	0.00	0.00	0.11	0.00	0.00	0.00	0.00	0.00	0.00	0.11
320	0.00	0.00	0.00	0.00	0.00	0.12	0.00	0.00	0.00	0.00	0.00	0.00	0.12
Totals	0.02	0.00	0.00	0.00	0.00	0.30	0.01	0.01	0.05	0.00	0.00	0.00	0.40

DISTRICT 3 TOTAL (MGD)	1.1
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APPENDIX B - AREAS FOR 2040 SYSTEM

District 4 - Existing Conditions Average Influent Waste Water Summary																	
Sewershed ID	Ag	Ag-ag Preserve	Ag-Green Acres	Apartment	Commercial	Commercial-Open Space	Commercial-Preferred	Industrial	Industrial-Preferred	Municipal	Machinery	Residential	Residential-Condominium	Residential-Townhouse	School	Utilities-Preferred	Total
	(MGD)	(MGD)	(MGD)	(MGD)	(MGD)	(MGD)	(MGD)	(MGD)	(MGD)	(MGD)	(MGD)	(MGD)	(MGD)	(MGD)	(MGD)	(MGD)	(MGD)
414	0.00	0.00	0.00	0.00	0.00	0.00	0.07	0.00	0.02	0.00	0.00	0.00	0.00	0.00	0.20	0.00	0.30
415	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
416	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
417	0.00	0.00	0.00	0.00	0.00	0.00	0.04	0.00	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.06
418	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.01	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.07
419	0.00	0.00	0.00	0.00	0.03	0.00	0.01	0.02	0.00	0.00	0.12	0.00	0.00	0.00	0.00	0.00	0.17
420	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.00	0.00	0.01	0.00	0.02	0.00	0.01	0.00	0.00	0.08
421	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
422	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
423	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
424	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
425	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
426	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
438	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
439	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
<b>Totals</b>	0.00	0.00	0.00	0.00	0.03	0.00	0.18	0.03	0.08	0.02	0.12	0.03	0.00	0.01	0.20	0.00	0.69

District 4 - 2040 Average Influent Waste Water Summary													
	Low Density	Low Medium	Medium Density	High Density	Mixed-Use (Commercial/Residential)	Industrial	Commercial	Agriculture	Public/Semi-Public	ROW	Park/Open Space	Non-Designated	Totals
	(MGD)	(MGD)	(MGD)	(MGD)	(MGD)	(MGD)	(MGD)	(MGD)	(MGD)	(MGD)	(MGD)	(MGD)	(MGD)
414	0.00	0.00	0.00	0.07	0.00	0.00	0.02	0.00	0.00	0.00	0.00	0.00	0.10
415	0.00	0.00	0.00	0.00	0.00	0.08	0.02	0.00	0.00	0.00	0.00	0.00	0.10
416	0.00	0.00	0.00	0.00	0.00	0.02	0.03	0.00	0.00	0.00	0.00	0.00	0.05
417	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
418	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.01
419	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
420	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
421	0.00	0.00	0.05	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.07	0.12
422	0.00	0.00	0.05	0.20	0.00	0.00	0.14	0.00	0.00	0.00	0.00	0.00	0.39
423	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.00	0.00	0.00	0.00	0.02
424	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.01
425	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
426	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
438	0.00	0.12	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.13
439	0.00	0.12	0.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.16
<b>Totals</b>	0.00	0.23	0.15	0.27	0.00	0.09	0.22	0.03	0.00	0.00	0.00	0.07	1.08

DISTRICT 4 TOTAL (MGD)	1.8
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APPENDIX B - AREAS FOR 2040 SYSTEM

District 5 - Existing Conditions Average Influent Waste Water Summary																	
Sewershed ID	Ag	Ag-ag Preserve	Ag-Green Acres	Apartment	Commercial	Commercial-Open Space	Commercial-Preferred	Industrial	Industrial-Preferred	Municipal	Machinery	Residential	Residential-Condominium	Residential-Townhouse	School	Utilities-Preferred	Total
	(MGD)	(MGD)	(MGD)	(MGD)	(MGD)	(MGD)	(MGD)	(MGD)	(MGD)	(MGD)	(MGD)	(MGD)	(MGD)	(MGD)	(MGD)	(MGD)	(MGD)
501	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
502	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.01
504	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
505	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.01
506	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.01	0.00	0.01	0.00	0.00	0.00	0.00	0.03
507	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.00	0.00	0.00	0.00	0.02
508	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.12	0.00	0.12
Totals	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.01	0.00	0.04	0.00	0.00	0.12	0.00	0.19

District 5 - 2040 Average Influent Waste Water Summary													
	Low Density	Low Medium	Medium Density	High Density	Mixed-Use (Commercial/Residential)	Industrial	Commercial	Agriculture	Public/Semi-Public	ROW	Park/Open Space	Non-Designated	Totals
	(MGD)	(MGD)	(MGD)	(MGD)	(MGD)	(MGD)	(MGD)	(MGD)	(MGD)	(MGD)	(MGD)	(MGD)	(MGD)
501	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01
502	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01
504	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
505	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
506	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.03
507	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
508	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.00	0.00	0.00	0.02
Totals	0.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.00	0.00	0.00	0.06

DISTRICT 5 TOTAL (MGD)	0.25
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APPENDIX B - AREAS FOR 2040 SYSTEM

District 6 - Existing Conditions Average Influent Waste Water Summary																	
Sewershed ID	Ag	Ag-ag Preserve	Ag-Green Acres	Apartment	Commercial	Commercial-Open Space	Commercial-Preferred	Industrial	Industrial-Preferred	Municipal	Machinery	Residential	Residential-Condominium	Residential-Townhouse	School	Utilities-Preferred	Total
	(MGD)	(MGD)	(MGD)	(MGD)	(MGD)	(MGD)	(MGD)	(MGD)	(MGD)	(MGD)	(MGD)	(MGD)	(MGD)	(MGD)	(MGD)	(MGD)	(MGD)
601	0.00	0.00	0.00	0.01	0.00	0.00	0.01	0.00	0.00	0.01	0.00	0.02	0.00	0.01	0.13	0.00	0.20
602	0.00	0.00	0.00	0.01	0.01	0.00	0.02	0.00	0.00	0.01	0.00	0.03	0.00	0.00	0.00	0.00	0.08
618	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.00	0.00	0.00	0.00	0.03	0.00	0.08	0.00	0.00	0.15
619	0.00	0.00	0.00	0.01	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.02	0.00	0.04	0.00	0.00	0.08
620	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.01
625	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
627	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
628	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
629	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
630	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
631	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
632	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
633	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Totals	0.00	0.00	0.00	0.03	0.01	0.00	0.07	0.00	0.00	0.02	0.00	0.12	0.00	0.13	0.13	0.00	0.52

District 6 - 2040 Average Influent Waste Water Summary													
	Low Density	Low Medium	Medium Density	High Density	Mixed-Use (Commercial/Residential)	Industrial	Commercial	Agriculture	Public/Semi-Public	ROW	Park/Open Space	Non-Designated	Totals
	(MGD)	(MGD)	(MGD)	(MGD)	(MGD)	(MGD)	(MGD)	(MGD)	(MGD)	(MGD)	(MGD)	(MGD)	(MGD)
601	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02
602	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
618	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.02
619	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.02
620	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
625	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
627	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02
628	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
629	0.00	0.11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.11
630	0.00	0.06	0.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.10
631	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.01
632	0.03	0.09	0.03	0.00	0.00	0.00	0.02	0.00	0.00	0.00	0.00	0.00	0.17
633	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.23	0.23
Totals	0.04	0.28	0.08	0.01	0.00	0.00	0.02	0.02	0.02	0.00	0.00	0.23	0.70

DISTRICT 6 TOTAL (MGD)	1.22
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APPENDIX B - AREAS FOR 2040 SYSTEM

District 7 - Existing Conditions Average Influent Waste Water Summary																	
Sewershed ID	Ag	Ag-ag Preserve	Ag-Green Acres	Apartment	Commercial	Commercial-Open Space	Commercial-Preferred	Industrial	Industrial-Preferred	Municipal	Machinery	Residential	Residential-Condominium	Residential-Townhouse	School	Utilities-Preferred	Total
	(MGD)	(MGD)	(MGD)	(MGD)	(MGD)	(MGD)	(MGD)	(MGD)	(MGD)	(MGD)	(MGD)	(MGD)	(MGD)	(MGD)	(MGD)	(MGD)	(MGD)
702	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
703	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
704	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
705	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
706	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
707	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
708	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
709	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Totals	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

District 7 - 2040 Average Influent Waste Water Summary													
	Low Density	Low Medium	Medium Density	High Density	Mixed-Use (Commercial/Residential)	Industrial	Commercial	Agriculture	Public/Semi-Public	ROW	Park/Open Space	Non-Designated	Totals
	(MGD)	(MGD)	(MGD)	(MGD)	(MGD)	(MGD)	(MGD)	(MGD)	(MGD)	(MGD)	(MGD)	(MGD)	(MGD)
702	0.01	0.11	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.15
703	0.05	0.00	0.09	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.14
704	0.06	0.00	0.00	0.00	0.07	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.13
705	0.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.04
706	0.07	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.07
707	0.05	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.05
708	0.07	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.07
709	0.07	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.07
Totals	0.43	0.11	0.12	0.00	0.07	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.72

DISTRICT 7 TOTAL (MGD) 0.72
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APPENDIX B - AREAS FOR 2040 SYSTEM

District 8 - Existing Conditions Average Influent Waste Water Summary																	
Sewershed ID	Ag	Ag-ag Preserve	Ag-Green Acres	Apartment	Commercial	Commercial-Open Space	Commercial-Preferred	Industrial	Industrial-Preferred	Municipal	Machinery	Residential	Residential-Condominium	Residential-Townhouse	School	Utilities-Preferred	Total
	(MGD)	(MGD)	(MGD)	(MGD)	(MGD)	(MGD)	(MGD)	(MGD)	(MGD)	(MGD)	(MGD)	(MGD)	(MGD)	(MGD)	(MGD)	(MGD)	(MGD)
802	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.04	0.00	0.00	0.00	0.00	0.04
803	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.07	0.00	0.01	0.00	0.00	0.09
804	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
805	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
806	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
807	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
808	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Totals	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.12	0.00	0.01	0.00	0.00	0.13

District 8 - 2040 Average Influent Waste Water Summary													
	Low Density	Low Medium	Medium Density	High Density	Mixed-Use (Commercial/Residential)	Industrial	Commercial	Agriculture	Public/Semi-Public	ROW	Park/Open Space	Non-Designated	Totals
	(MGD)	(MGD)	(MGD)	(MGD)	(MGD)	(MGD)	(MGD)	(MGD)	(MGD)	(MGD)	(MGD)	(MGD)	(MGD)
802	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
803	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02
804	0.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.04
805	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.03
806	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.04
807	0.05	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.05
808	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Totals	0.15	0.00	0.01	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.18

DISTRICT 8 TOTAL (MGD) 0.31
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## Appendix C: Design Flows (MGD) for 2040 Land Use

APPENDIX C - DESIGN FLOWS (MGD) FOR SANITARY SYSTEM

District 1 - Design Flow Summary							
MH ID		Flow Added			Total Flow		
From	To	Current	Average 2040	Design 2040	Current	Average 2040	Design 2040
		Estimated			Estimated		
		Flow	Flow	Flow	Flow		
		MGD	MGD	MGD	MGD	MGD	MGD
101	102	0.04	0.04	0.05	0.04	0.04	0.05
102	103	0.01	0.01	0.01	0.05	0.05	0.06
103	105	0.21	0.22	0.28	0.26	0.27	0.34
104	105	0.11	0.11	0.14	0.11	0.11	0.14
105	106	0.22	0.22	0.28	0.59	0.60	0.77
106	107	0.22	0.22	0.28	0.80	0.81	1.04
107	110	0.00	0.00	0.00	0.80	0.81	1.04
109	110	0.06	0.07	0.08	0.06	0.07	0.08
110	118	0.02	0.21	0.27	0.88	1.07	1.38
111	112	0.12	0.12	0.15	0.12	0.12	0.15
112	117	0.03	0.03	0.04	0.15	0.15	0.19
113	114	0.02	0.02	0.02	0.02	0.02	0.02
114	115	0.18	0.19	0.24	0.20	0.20	0.26
115	116	0.06	0.06	0.08	0.26	0.26	0.34
116	117	0.11	0.12	0.15	0.37	0.38	0.49
117	118	0.02	0.02	0.02	0.54	0.54	0.70
118	701	0.00	0.16	0.20	1.40	1.74	2.25

District 2 - Design Flow Summary							
MH ID		Flow Added			Total Flow		
From	To	Current	Average 2040	Design 2040	Current	Average 2040	Design 2040
		Estimated			Estimated		
		Flow	Flow	Flow	Flow		
		MGD	MGD	MGD	MGD	MGD	MGD
201	302	--	0.00	0.00	--	0.12	0.16
202	201	--	0.00	0.00	--	0.01	0.02
203	202	--	0.01	0.02	--	0.01	0.02
204	201	--	0.08	0.10	--	0.11	0.14
205	204	--	0.02	0.02	--	0.03	0.04
206	205	--	0.02	0.02	--	0.02	0.02

APPENDIX C - DESIGN FLOWS (MGD) FOR SANITARY SYSTEM

District 3 - Design Flow Summary							
MH ID		Flow Added			Total Flow		
From	To	Current	Average 2040	Design 2040	Current	Average 2040	Design 2040
		Estimated			Estimated		
		Flow	Flow	Flow	Flow		
		MGD	MGD	MGD	MGD	MGD	MGD
301	302	--	0.01	0.02	--	0.01	0.02
302	303	0.11	0.15	0.19	0.11	0.28	0.36
303	308	0.00	0.04	0.06	0.11	0.31	0.41
305	306	0.35	0.35	0.45	0.35	0.35	0.45
306	307	0.07	0.07	0.10	0.42	0.42	0.54
307	308	0.09	0.10	0.12	0.51	0.52	0.66
308	309	0.09	0.09	0.11	0.71	0.90	1.17
309	313	0.05	0.05	0.07	0.76	0.95	1.23
310	311	0.28	0.30	0.38	0.28	0.30	0.38
311	312	0.00	0.00	0.00	0.28	0.00	0.00
312	313	0.03	0.03	0.04	0.30	0.03	0.04
313	315	0.14	0.14	0.18	1.20	1.11	1.44
314	315	0.00	0.10	0.12	0.00	0.51	0.66
315	316	0.00	0.00	0.00	1.19	1.61	2.08
316	317	0.13	0.13	0.17	1.31	1.74	2.24
317	318	0.00	0.06	0.08	1.31	1.79	2.32
318	419	0.00	0.00	0.00	1.31	1.79	2.32
319	314	--	0.19	0.25	--	0.42	0.53
320	319	--	0.22	0.29	--	0.22	0.29

APPENDIX C - DESIGN FLOWS (MGD) FOR SANITARY SYSTEM

District 4 - Design Flow Summary							
MH ID		Flow Added			Total Flow		
From	To	Current	Average 2040	Design 2040	Current	Average 2040	Design 2040
		Estimated			Estimated		
		Flow	Flow	Flow	Flow		
		MGD	MGD	MGD	MGD	MGD	MGD
414	419	0.93	0.73	0.93	0.95	2.53	3.21
415	418	0.00	0.18	0.23	0.00	0.18	0.23
416	417	0.00	0.08	0.11	0.00	0.08	0.11
417	418	0.12	0.12	0.15	0.12	0.20	0.26
418	419	0.12	0.13	0.17	0.24	0.52	0.66
419	508	0.31	0.31	0.40	2.75	5.10	6.54
420	414	0.00	0.15	0.08	0.03	0.92	1.06
421	420	0.03	0.25	0.32	0.03	0.25	0.32
422	414	--	0.69	0.89	--	1.01	1.34
423	422	--	0.03	0.04	--	0.39	0.51
424	423	--	0.01	0.01	--	0.37	0.47
425	424	--	0.01	0.01	--	0.36	0.46
426	425	--	0.01	0.01	--	0.35	0.45
427	426	--	0.04	0.05	--	0.35	0.45
428	427	--	0.00	0.00	--	0.31	0.40
429	428	--	0.26	0.33	--	0.31	0.40
430	429	--	0.01	0.01	--	0.06	0.08
431	430	--	0.01	0.02	--	0.05	0.07
432	431	--	0.00	0.00	--	0.04	0.05
433	432	--	0.00	0.00	--	0.04	0.05
434	433	--	0.02	0.03	--	0.03	0.04
435	434	--	0.00	0.00	--	0.01	0.02
436	435	--	0.01	0.02	--	0.01	0.02
437	436	--	0.00	0.00	--	0.00	0.00
438	420	--	0.24	0.30	--	0.52	0.66
439	438	--	0.28	0.36	--	0.28	0.36

APPENDIX C - DESIGN FLOWS (MGD) FOR SANITARY SYSTEM

District 5- Design Flow Summary							
MH ID		Flow Added			Total Flow		
From	To	Current	Average 2040	Design 2040	Current	Average 2040	Design 2040
		Estimated	Flow	Flow	Estimated	Flow	Flow
		Flow	MGD	MGD	Flow	MGD	MGD
501	502	0.00	0.01	0.02	0.00	0.01	0.02
502	503	0.01	0.03	0.04	0.01	0.04	0.06
503	504	0.00	0.00	0.00	0.01	0.05	0.06
504	505	0.00	0.00	0.00	0.01	0.05	0.06
505	506	0.01	0.01	0.01	0.02	0.06	0.07
506	507	0.06	0.11	0.14	0.09	0.16	0.21
507	508	0.03	0.03	0.04	0.12	0.19	0.25
508	605	0.22	0.25	0.32	3.06	5.52	7.07



APPENDIX C - DESIGN FLOWS (MGD) FOR SANITARY SYSTEM

District 6- Design Flow Summary							
MH ID		Flow Added			Total Flow		
From	To	Current	Average 2040	Design 2040	Current	Average 2040	Design 2040
		Estimated			Estimated		
		Flow	Flow	Flow	Flow		
		MGD	MGD	MGD	MGD	MGD	MGD
601	602	0.50	0.40	0.51	0.50	0.40	0.51
602	604	0.14	0.14	0.18	0.64	0.54	0.69
604	605	0.10	0.10	0.13	0.73	0.64	0.82
605	619	0.06	0.07	0.08	3.79	6.17	7.92
607	608	0.11	0.35	0.44	0.11	0.35	0.44
608	610	0.31	0.38	0.49	0.43	0.73	0.94
610	614	0.05	0.05	0.06	0.47	0.77	0.99
611	613	0.00	0.39	0.49	0.00	0.39	0.49
612	613	0.00	0.00	0.00	0.00	0.00	0.22
613	614	0.06	0.09	0.12	0.06	0.48	0.74
614	615	0.12	0.14	0.18	0.66	1.37	1.80
615	617	0.10	0.13	0.16	0.75	1.41	1.98
616	617	0.00	0.00	0.00	0.00	0.00	0.04
617	618	0.34	0.38	0.48	1.08	1.76	2.47
618	619	0.26	0.30	0.38	1.32	2.00	2.64
619	620	0.15	0.18	0.24	5.21	8.32	10.12
620	625	0.02	0.02	0.02	6.68	11.70	14.51
625	WWTP	0.00	0.00	0.00	6.67	12.76	15.92
626	625	--	0.00	0.00	--	1.14	1.47
627	626	--	0.03	0.04	--	1.15	1.47
628	627	--	0.01	0.01	--	1.12	1.43
629	628	--	0.19	0.24	--	1.11	1.43
630	629	--	0.18	0.24	--	0.93	1.19
631	630	--	0.02	0.03	--	0.75	0.95
632	631	--	0.31	0.40	--	0.73	0.93
633	632	--	0.42	0.53	--	0.42	0.53

APPENDIX C - DESIGN FLOWS (MGD) FOR SANITARY SYSTEM

District 7- Design Flow Summary							
MH ID		Flow Added			Total Flow		
From	To	Current	Average 2040	Design 2040	Current	Average 2040	Design 2040
		Estimated			Estimated		
		Flow	Flow	Flow	Flow		
		MGD	MGD	MGD	MGD	MGD	MGD
701	804	--	0.00	0.00	--	2.86	3.71
702	701	--	0.27	0.35	--	1.17	1.49
703	702	--	0.25	0.32	--	0.90	1.15
704	703	--	0.24	0.30	--	0.24	0.30
705	703	--	0.08	0.10	--	0.41	0.53
706	705	--	0.12	0.15	--	0.12	0.15
707	705	--	0.09	0.12	--	0.22	0.28
708	707	--	0.12	0.16	--	0.12	0.16
709	708	--	0.13	0.17	--	0.13	0.17

District 8- Design Flow Summary							
MH ID		Flow Added			Total Flow		
From	To	Current	Average 2040	Design 2040	Current	Average 2040	Design 2040
		Estimated			Estimated		
		Flow	Flow	Flow	Flow		
		MGD	MGD	MGD	MGD	MGD	MGD
802	803	0.08	0.08	0.10	0.08	0.21	0.27
803	804	0.16	0.19	0.24	0.24	0.49	0.63
804	620	0.00	0.07	0.10	1.57	3.39	4.39
805	802	--	0.06	0.08	--	0.13	0.17
806	805	--	0.07	0.09	--	0.07	0.09
807	803	--	0.09	0.12	--	0.09	0.12
808	807	--	0.00	0.00	--	0.00	0.00

## Appendix D: Pipe Capacity Summary

APPENDIX D -PIPE CAPACITIES

District 1 Proposed Pipe Capacity												
Node ID #		Design Flow	Existing/Proposed	Size (in)	Length (ft)	Rim (ft)	US Invert (ft)	DS Invert (ft)	Slope %	Capacity		Capacity/Design Flow
From	To	(MGD)								gpm	MGD	
101	102-002	0.05	Existing	12	245	915.94	909.98	909.6	0.16	546	0.79	15.80
102	103-007	0.06	Existing	15	278	916.29	909	908.52	0.17	1043	1.50	24.73
102-001	102	0.05	Existing	12	78	916.1	909.12	909	0.15	544	0.78	15.76
102-002	102-001	0.05	Existing	12	312	916.88	909.6	909.12	0.15	544	0.78	15.74
103	105-009	0.34	Existing	15	185	914.34	906.26	906.12	0.08	692	1.00	2.90
103-001	103	0.09	Existing	15	125	913.87	906.48	906.26	0.18	1053	1.52	17.28
103-002	103-001	0.06	Existing	15	275	913.6	906.95	906.48	0.17	1038	1.50	24.61
103-003	103-002	0.06	Existing	15	289	915.02	907.45	906.95	0.17	1046	1.51	24.77
103-004	103-003	0.06	Existing	15	125	914.56	907.67	907.45	0.18	1053	1.52	24.96
103-005	103-004	0.06	Existing	15	175	915.73	907.97	907.67	0.17	1041	1.50	24.69
103-006	103-005	0.06	Existing	15	215	915.63	908.34	907.97	0.17	1043	1.50	24.72
103-007	103-006	0.06	Existing	15	102	915.18	908.52	908.34	0.18	1057	1.52	25.06
104	105-002	0.14	Existing	8	291	920.93	908.43	907.39	0.36	281	0.40	2.85
105	106-004	0.77	Existing	18	155	914.9	904.52	904.34	0.12	1392	2.01	2.62
105-001	105	0.14	Existing	8	400	917.04	905.95	904.52	0.36	281	0.40	2.86
105-002	105-001	0.14	Existing	8	400	919.26	907.39	905.95	0.36	282	0.41	2.87
105-003	105	0.35	Existing	15	193	916.22	904.73	904.52	0.11	829	1.19	3.45
105-004	105-003	0.34	Existing	15	173	915.18	904.92	904.73	0.11	833	1.20	3.49
105-005	105-004	0.34	Existing	15	287	916.44	905.24	904.92	0.11	839	1.21	3.52
105-006	105-005	0.34	Existing	15	110	915.72	905.36	905.24	0.11	830	1.20	3.48
105-007	105-006	0.34	Existing	15	150	916.81	905.53	905.36	0.11	846	1.22	3.55
105-008	105-007	0.34	Existing	15	260	916.64	905.82	905.53	0.11	839	1.21	3.52
105-009	105-008	0.34	Existing	15	273	916.15	906.12	905.82	0.11	833	1.20	3.49
106	107-006	1.04	Existing	18	135	916.56	903.14	902.96	0.13	1490	2.15	2.06
106-001	106	0.77	Existing	18	130	917.02	903.29	903.14	0.12	1386	2.00	2.60
106-002	106-001	0.76	Existing	18	406	916.1	903.76	903.29	0.12	1391	2.00	2.62
106-003	106-002	0.77	Existing	18	252	916.62	904.05	903.76	0.11	1385	1.99	2.61
106-004	106-003	0.77	Existing	18	258	916.3	904.34	904.05	0.11	1371	1.97	2.58
107	110-T3	1.04	Existing	48	373	918.91	900.04	899.41	0.17	22961	33.06	31.79
107-001	107	1.04	Existing	18	342	918.95	900.5	900.04	0.13	1499	2.16	2.08

APPENDIX D -PIPE CAPACITIES

District 1 Proposed Pipe Capacity - Continued												
Node ID #		Design Flow (MGD)	Existing/Proposed	Size (in)	Length (ft)	Rim (ft)	US Invert (ft)	DS Invert (ft)	Slope %	Capacity		Capacity/Design Flow
From	To									gpm	MGD	
107-002	107-001	1.04	Existing	18	400	920.24	901.04	900.5	0.13	1501	2.16	2.08
107-003	107-002	1.04	Existing	18	400	918.79	901.58	901.04	0.14	1501	2.16	2.08
107-004	107-003	1.04	Existing	18	400	918.51	902.12	901.58	0.13	1501	2.16	2.08
107-005	107-004	1.04	Existing	18	400	917.43	902.66	902.12	0.13	1501	2.16	2.08
107-006	107-005	1.04	Existing	18	220	917.67	902.96	902.66	0.14	1509	2.17	2.09
109	110-008	0.08	Existing	10	160	921.75	898.61	898.05	0.35	504	0.73	8.71
110	118-T2	1.38	Existing	48	859	909.92	891.18	889.52	0.19	24558	35.36	25.67
110-001	110	0.08	Existing	10	195	910.83	891.86	891.18	0.35	503	0.72	8.70
110-002	110-001	0.08	Existing	10	315	910.97	892.97	891.86	0.35	506	0.73	8.75
110-003	110-002	0.08	Existing	10	355	912.33	894.21	892.97	0.35	504	0.73	8.71
110-004	110-003	0.08	Existing	10	300	921.33	895.26	894.21	0.35	504	0.73	8.72
110-005	110-004	0.08	Existing	10	289	920.26	896.27	895.26	0.35	504	0.73	8.71
110-006	110-005	0.08	Existing	10	136	921.15	896.75	896.27	0.35	506	0.73	8.75
110-007	110-006	0.08	Existing	10	132	921.43	897.21	896.75	0.35	503	0.72	8.70
110-008	110-007	0.08	Existing	10	240	920.37	898.05	897.21	0.35	504	0.73	8.72
110-T1	110	1.04	Existing	48	1418	905	893.56	891.18	0.17	22891	32.96	31.76
110-T2	110-T1	1.04	Existing	48	2304	905	897.42	893.56	0.17	22868	32.93	31.66
110-T3	110-T2	1.04	Existing	48	1189	910	899.41	897.42	0.17	22855	32.91	31.70
111	112-002	0.15	Existing	10	393	913.95	897.46	896.46	0.25	430	0.62	4.18
112	117-004	0.19	Existing	12	245	915.25	895.39	894.7	0.28	735	1.06	5.63
112-001	112	0.15	Existing	10	265	915.6	896.07	895.39	0.26	432	0.62	4.20
112-002	112-001	0.15	Existing	10	150	915.04	896.46	896.07	0.26	435	0.63	4.23
113	114-009	0.02	Existing	12	168	961.42	950.51	949.81	0.42	895	1.29	56.07
114	115-004	0.26	Existing	12	387	964.08	942.39	929.4	3.36	2539	3.66	13.97
114-001	114	0.02	Existing	12	150	972.94	943.02	942.39	0.42	898	1.29	56.28
114-002	114-001	0.02	Existing	12	180	973	943.77	943.02	0.42	895	1.29	56.02
114-003	114-002	0.02	Existing	12	180	967.92	944.52	943.77	0.42	895	1.29	56.05
114-004	114-003	0.02	Existing	12	180	965.17	945.28	944.52	0.42	901	1.30	56.42
114-005	114-004	0.02	Existing	12	450	954.85	947.16	945.28	0.42	896	1.29	56.06
114-006	114-005	0.02	Existing	12	112	954.09	947.63	947.16	0.42	898	1.29	56.25

APPENDIX D -PIPE CAPACITIES

District 1 Proposed Pipe Capacity - Continued												
Node ID #		Design Flow (MGD)	Existing/Proposed	Size (in)	Length (ft)	Rim (ft)	US Invert (ft)	DS Invert (ft)	Slope %	Capacity		Capacity/Design Flow
From	To									gpm	MGD	
114-007	114-006	0.02	Existing	12	273	962.95	948.77	947.63	0.42	895	1.29	56.08
114-008	114-007	0.02	Existing	12	49	963.2	948.98	948.77	0.43	907	1.31	56.88
114-009	114-008	0.02	Existing	12	198	961.99	949.81	948.98	0.42	897	1.29	56.29
115	116-008	0.34	Existing	12	136	919.96	906.3	905.7	0.44	922	1.33	3.92
115-001	115	0.26	Existing	12	155	925.13	911.5	906.3	3.35	2538	3.66	13.97
115-002	115-001	0.26	Existing	12	260	935.46	920.23	911.5	3.36	2540	3.66	13.97
115-003	115-002	0.26	Existing	12	208	943.36	927.22	920.23	3.36	2539	3.66	13.97
115-004	115-003	0.26	Existing	12	65	945.54	929.4	927.22	3.37	2543	3.66	13.99
116	117-008	0.49	Existing	12	125	911.27	896.76	896.34	0.34	804	1.16	2.38
116-001	116	0.34	Existing	12	237	913.69	897.81	896.76	0.44	922	1.33	3.92
116-002	116-001	0.34	Existing	12	188	912.02	898.64	897.81	0.44	921	1.33	3.92
116-003	116-002	0.34	Existing	12	370	913.59	900.28	898.64	0.44	923	1.33	3.93
116-004	116-003	0.34	Existing	12	215	912.02	901.23	900.28	0.44	921	1.33	3.92
116-005	116-004	0.34	Existing	12	261	913.15	902.38	901.23	0.44	920	1.32	3.92
116-006	116-005	0.34	Existing	12	247	915.3	903.48	902.38	0.45	925	1.33	3.94
116-007	116-006	0.34	Existing	12	385	917.7	905.18	903.48	0.44	921	1.33	3.92
116-008	116-007	0.34	Existing	12	118	918.11	905.7	905.18	0.44	920	1.32	3.92
117	118-004	0.70	Existing	12	400	907.44	892.47	889.98	0.62	1093	1.57	2.26
117-001	117	0.19	Existing	12	5	907.74	892.48	892.47	0.2	620	0.89	4.75
117-002	117-001	0.19	Existing	12	87	892.73	892.73	892.48	0.29	741	1.07	5.68
117-003	117-002	0.19	Existing	12	353	916.68	893.73	892.73	0.28	738	1.06	5.65
117-004	117-003	0.19	Existing	12	345	914.9	894.7	893.73	0.28	735	1.06	5.63
117-005	117	0.49	Existing	12	70	908.53	892.71	892.47	0.34	811	1.17	2.41
117-006	117-005	0.49	Existing	12	335	910.97	893.84	892.71	0.34	805	1.16	2.39
117-007	117-006	0.49	Existing	12	334	915	894.98	893.84	0.34	810	1.17	2.40
117-008	117-007	0.49	Existing	12	400	911.55	896.34	894.98	0.34	808	1.16	2.40
118	701	2.25	Existing	48	1617	902.97	883.3	880.61	0.17	22791	32.82	14.61
118-001	118	0.70	Existing	12	72	902.69	883.75	883.3	0.62	1093	1.57	2.26
118-002	118-001	0.70	Existing	12	200	902.7	885	883.75	0.63	1096	1.58	2.27
118-003	118-002	0.70	Existing	12	400	907.18	887.49	885	0.62	1093	1.57	2.26

APPENDIX D -PIPE CAPACITIES

District 1 Proposed Pipe Capacity - Continued												
Node ID #		Design Flow (MGD)	Existing/Proposed	Size (in)	Length (ft)	Rim (ft)	US Invert (ft)	DS Invert (ft)	Slope %	Capacity		Capacity/Design Flow
From	To									gpm	MGD	
118-004	118-003	0.70	Existing	12	401	906.59	889.98	887.49	0.62	1093	1.57	2.26
118-T1	118	1.38	Existing	48	408	900	884.09	883.3	0.19	24576	35.39	25.71
118-T2	118-T1	1.38	Existing	48	2817	905	889.52	884.09	0.19	24531	35.32	25.66

APPENDIX D -PIPE CAPACITIES

District 2 Proposed Pipe Capacity												
Node ID #		Design Flow (MGD)	Existing/P roposed	Size (in)	Length (ft)	Rim (ft)	US Invert (ft)	DS Invert (ft)	Slope %	Capacity		Capacity/D esign Flow
From	To									gpm	MGD	
201	302	0.16	Proposed	12	1079.68	927.44	908.5	904.9	0.33	800	1.15	7.3
202	201	0.02	Proposed	12	412.18	922.7	909.1	908.5	0.15	529	0.76	43.8
203	202	0.02	Proposed	18	1899.39	935	914.42	909.1	0.28	2162	3.11	176.2
204	201	0.14	Proposed	12	4849.92	943.4	922.08	908.5	0.28	733	1.06	7.4
205	204	0.04	Proposed	18	1489.61	948.81	926.25	922.08	0.28	2162	3.11	75.6
206	205	0.02	Proposed	12	2740	962.28	933.92	926.25	0.28	733	1.06	49.1



APPENDIX D -PIPE CAPACITIES

District 3 Proposed Pipe Capacity												
Node ID #		Design Flow (MGD)	Existing/P roposed	Size (in)	Length (ft)	Rim (ft)	US Invert (ft)	DS Invert (ft)	Slope %	Capacity		Capacity/ Design
From	To									gpm	MGD	
301	302	0.02	Proposed	10	1262.01	927.5	917.5	904.9	1	852	1.23	76.51
302	303-006	0.36	Existing	18	305.9	917.82	904.9	904.46	0.14	1550	2.23	6.29
303	308-013	0.41	Existing	18	192	917.03	901.56	901.25	0.16	1642	2.36	5.81
303-001	303	0.35	Existing	18	236.49	920	901.89	901.56	0.14	1526	2.20	6.21
303-002	303-001	0.35	Existing	18	389.1	920	902.47	901.89	0.15	1578	2.27	6.42
303-003	303-002	0.35	Existing	18	401.58	920	903.04	902.47	0.14	1539	2.22	6.26
303-004	303-003	0.35	Existing	18	369.53	916.84	903.57	903.04	0.14	1547	2.23	6.29
303-005	303-004	0.35	Existing	18	368.26	915.85	904.11	903.57	0.15	1565	2.25	6.36
303-006	303-005	0.35	Existing	18	245.17	916.36	904.46	904.11	0.14	1544	2.22	6.27
305	306-006	0.45	Existing	10	173.7	939.57	926.74	925.66	0.62	672	0.97	2.16
305-005	308-004	0.66	Existing	10	188.19	924.57	906.15	905.23	0.49	596	0.86	1.29
306	307-004	0.54	Existing	10	333.11	934.51	918.21	916.19	0.61	664	0.96	1.76
306-001	306	0.45	Existing	10	113.42	931.58	918.92	918.21	0.63	674	0.97	2.17
306-002	306-001	0.45	Existing	10	248	936.85	920.46	918.92	0.62	672	0.97	2.16
306-003	306-002	0.45	Existing	10	35	937.66	920.68	920.46	0.63	676	0.97	2.18
306-004	306-003	0.45	Existing	10	363.5	935.53	922.95	920.68	0.62	674	0.97	2.17
306-005	306-004	0.45	Existing	10	147	930.04	923.87	922.95	0.63	674	0.97	2.17
306-006	306-005	0.45	Existing	10	287	932.24	925.66	923.87	0.62	673	0.97	2.17
307	308-006	0.66	Existing	10	267.49	935.76	909.37	907.85	0.57	642	0.93	1.39
307-001	307	0.54	Existing	10	444.05	938.09	912.06	909.37	0.61	663	0.96	1.76
307-002	307-001	0.54	Existing	10	236.68	935.75	913.49	912.06	0.6	662	0.95	1.76
307-004	607-003	0.54	Existing	10	43.29	927.16	916.19	915.91	0.65	685	0.99	1.82
308	309-305	1.17	Existing	24	240.39	919.51	898.78	898.51	0.11	2949	4.25	3.63
308-001	308	0.66	Existing	10	354.66	913.46	900.8	898.78	0.57	643	0.93	1.39
308-002	308-001	0.66	Existing	10	201.76	911.96	901.95	900.8	0.57	643	0.93	1.39
308-003	308-002	0.66	Existing	10	288.87	911.96	903.59	901.95	0.57	642	0.92	1.39
308-004	308-003	0.66	Existing	10	288.02	916.4	905.23	903.59	0.57	643	0.93	1.39
308-006	305-005	0.66	Existing	10	298.76	936.23	907.85	906.15	0.57	643	0.93	1.39
308-007	308	0.41	Existing	18	78.04	917.41	898.91	898.78	0.17	1668	2.40	5.81
308-008	308-007	0.41	Existing	18	274	919.07	899.35	898.91	0.16	1637	2.36	5.80
308-009	308-008	0.41	Existing	18	180	920.11	899.65	899.35	0.17	1668	2.40	5.91

APPENDIX D -PIPE CAPACITIES

District 3 Proposed Pipe Capacity - Continued												
Node ID #		Design Flow (MGD)	Existing/P roposed	Size	Length	Rim	US Invert	DS Invert	Slope	Capacity		Capacity/ Design
From	To			(in)	(ft)	(ft)	(ft)	(ft)	%	gpm	MGD	
308-010	308-009	0.41	Existing	18	272	919.33	900.09	899.65	0.16	1643	2.37	5.82
308-011	308-010	0.41	Existing	18	372	918.97	900.7	900.09	0.16	1655	2.38	5.86
308-012	308-011	0.41	Existing	18	137.49	919.79	900.92	900.7	0.16	1634	2.35	5.79
308-013	308-012	0.41	Existing	18	197.58	919.39	901.25	900.92	0.17	1670	2.40	5.91
309	313-002	1.23	Existing	24	434.28	918.37	896.51	896.21	0.07	2313	3.33	2.70
309-001	309	1.17	Existing	24	197.83	912.04	896.73	896.51	0.11	2935	4.23	3.61
309-002	309-001	1.17	Existing	24	403.35	911.82	897.19	896.73	0.11	2972	4.28	3.66
309-003	309-002	1.17	Existing	24	395.6	917.59	897.63	897.19	0.11	2935	4.23	3.61
309-004	309-003	1.17	Existing	24	497.49	911.85	898.2	897.63	0.11	2979	4.29	3.67
309-305	309-004	1.17	Existing	24	277.29	913.47	898.51	898.2	0.11	2942	4.24	3.62
311	312-009	0.00	Existing	8	146	950.23	939.43	936.7	1.87	643	0.93	#DIV/0!
312	313-013	0.04	Existing	10	370.57	919.06	905.87	903.84	0.55	631	0.91	24.84
312-001	312	0.00	Existing	8	385	924.56	913.07	905.87	1.87	643	0.93	#DIV/0!
312-002	312-001	0.00	Existing	8	217	930.21	917.12	913.07	1.87	642	0.92	#DIV/0!
312-003	312-002	0.00	Existing	8	79.9	931.5	918.62	917.12	1.88	644	0.93	#DIV/0!
312-004	312-003	0.00	Existing	8	132	935.48	921.08	918.62	1.86	642	0.92	#DIV/0!
312-005	312-004	0.00	Existing	8	171.51	938.18	924.29	921.08	1.87	643	0.93	#DIV/0!
312-006	312-005	0.00	Existing	8	220	942.7	928.4	924.29	1.87	642	0.93	#DIV/0!
312-007	312-006	0.00	Existing	8	195.96	939.41	932.07	928.4	1.87	643	0.93	#DIV/0!
312-008	312-007	0.00	Existing	8	120	938.87	934.31	932.07	1.87	642	0.92	#DIV/0!
312-009	312-008	0.00	Existing	8	128	942.84	936.7	934.31	1.87	642	0.92	#DIV/0!
313	315	1.44	Existing	24	348.51	915.69	895.72	895.35	0.11	2867	4.13	2.86
313-001	313	1.23	Existing	24	297.29	909.85	895.93	895.72	0.07	2339	3.37	2.73
313-002	313-001	1.23	Existing	24	397.52	917.22	896.21	895.93	0.07	2335	3.36	2.73
313-003	313	0.04	Existing	10	181.15	914.02	896.71	895.72	0.55	630	0.91	24.81
313-004	313-003	0.04	Existing	10	346	913.53	898.61	896.71	0.55	632	0.91	24.87
313-005	313-004	0.04	Existing	10	80.09	914	899.05	898.61	0.55	632	0.91	24.88
313-006	313-005	0.04	Existing	10	163	915.01	899.94	899.05	0.55	630	0.91	24.80
313-007	313-006	0.04	Existing	10	163.33	923.09	900.83	899.94	0.54	629	0.91	24.78
313-008	313-007	0.04	Existing	10	182.35	917.61	901.83	900.83	0.55	631	0.91	24.86
313-009	313-008	0.04	Existing	10	74	915.16	902.24	901.83	0.55	634	0.91	24.99

APPENDIX D -PIPE CAPACITIES

District 3 Proposed Pipe Capacity - Continued												
Node ID #		Design Flow (MGD)	Existing/P roposed	Size (in)	Length (ft)	Rim (ft)	US Invert (ft)	DS Invert (ft)	Slope %	Capacity		Capacity/ Design
From	To									gpm	MGD	
313-010	313-009	0.04	Existing	10	63	914.21	902.58	902.24	0.54	626	0.90	24.66
313-011	313-010	0.04	Existing	10	73.07	914.55	902.98	902.58	0.55	631	0.91	24.84
313-012	313-011	0.04	Existing	18	70	916.74	903.36	902.98	0.54	3011	4.34	118.57
313-013	313-012	0.04	Existing	10	87	920.71	903.84	903.36	0.55	633	0.91	24.93
314	315-002	0.66	Existing	12	256.89	906.71	897.63	896.97	0.26	702	1.01	1.54
315	316-005	2.08	Existing	18	401.34	906.88	895.35	894.95	0.1	1290	1.86	0.89
315-001	315	0.66	Existing	12	237.4	911.05	895.96	895.35	0.26	703	1.01	1.54
315-002	315-001	0.66	Existing	12	399.74	906.3	896.97	895.96	0.25	697	1.00	1.53
316	317-007	2.24	Existing	24	384.83	907.52	892.56	892.16	0.1	2837	4.09	1.82
316-001	316	2.08	Existing	24	484.43	906.36	893.05	892.56	0.1	2799	4.03	1.94
316-002	316-001	2.08	Existing	24	499.13	904.01	893.55	893.05	0.1	2785	4.01	1.93
316-003	316-002	2.08	Existing	24	404.66	904.4	893.96	893.55	0.1	2801	4.03	1.94
316-004	316-003	2.08	Existing	24	501.38	905.27	894.46	893.96	0.1	2779	4.00	1.92
316-005	316-004	2.08	Existing	24	477.4	905.86	894.95	894.46	0.1	2819	4.06	1.95
317	318-003	2.32	Existing	24	498.76	904.97	889.3	888.82	0.1	2730	3.93	1.69
317-001	317	2.24	Existing	24	324.65	903.83	889.64	889.3	0.1	2848	4.10	1.83
317-002	317-001	2.24	Existing	24	373.89	903.82	890.02	889.64	0.1	2805	4.04	1.80
317-003	317-002	2.24	Existing	24	357.56	906.29	890.39	890.02	0.1	2831	4.08	1.82
317-004	317-003	2.24	Existing	24	389.3	908.35	890.74	890.35	0.1	2785	4.01	1.79
317-005	317-004	2.24	Existing	24	501.11	907.67	891.24	890.74	0.10	2780	4.00	1.78
317-006	317-005	2.24	Existing	24	353.64	907.51	891.67	891.31	0.1	2808	4.04	1.80
317-007	317-006	2.24	Existing	24	472.9	909.41	892.16	891.67	0.1	2833	4.08	1.82
318	419	2.32	Existing	24	150.56	905.45	887.68	886.35	0.88	8271	11.91	5.14
318-001	318	2.32	Existing	24	300.95	903.4	887.97	887.68	0.1	2732	3.93	1.70
318-002	318-001	2.32	Existing	24	368.75	901.46	888.33	887.97	0.1	2750	3.96	1.71
318-003	318-002	2.32	Existing	24	500.96	899.54	888.82	888.33	0.1	2752	3.96	1.71
319	314	0.53	Proposed	12	1150.11	940.89	900.16	897.63	0.22	650	0.94	1.75
320	319	0.29	Proposed	10	1589.1	930.07	904.61	900.16	0.28	451	0.65	2.27

APPENDIX D - PIPE CAPACITIES

District 4 Proposed Pipe Capacity												
Node ID #		Design Flow (MGD)	Existing/P roposed	Size (in)	Length (ft)	Rim (ft)	US Invert (ft)	DS Invert (ft)	Slope %	Capacity		Capacity/ Design
From	To									gpm	MGD	
414	419	3.21	Existing	42	2653.48	903.42	887.9	886.35	0.06	9459	13.62	4.25
414-001	414	1.06	Existing	21	30	902.73	889.33	887.9	4.77	13457	19.38	18.28
414-002	414-001	1.06	Existing	21	253	901.17	889.64	889.33	0.12	2157	3.11	2.93
414-003	414-002	1.06	Existing	21	221	899.87	889.72	889.64	0.04	1173	1.69	1.59
414-004	414-003	1.06	Existing	21	139	901.44	889.99	889.72	0.19	2716	3.91	3.69
414-005	414-004	1.06	Existing	21	233	908.66	890.01	889.96	0.02	571	0.82	0.78
414-006	414-005	1.06	Existing	21	351	910.09	890.57	890.01	0.16	2462	3.55	3.34
414-007	414-006	1.06	Existing	21	185	910.11	890.92	890.57	0.19	2681	3.86	3.64
414-008	414-007	1.06	Existing	21	405	911.73	891.14	890.92	0.05	1437	2.07	1.95
414-009	414-008	1.06	Existing	21	405	912.69	891.52	891.14	0.09	1888	2.72	2.56
414-01	414	1.33	Existing	42	1005.19	896.44	888.27	887.9	0.04	7508	10.81	8.14
414-010	414-009	1.06	Existing	21	500	913.63	891.95	891.52	0.09	1808	2.60	2.45
414-02	414-01	1.31	Existing	42	1712.22	894.9	888.9	888.27	0.04	7507	10.81	8.25
415	418-007	0.23	Existing	18	215.07	918.06	897.26	896.86	0.19	1762	2.54	10.84
416	417-004	0.11	Existing	10	379	911.75	900.69	900.04	0.17	353	0.51	4.66
417	418-010	0.26	Existing	10	165.48	910.85	897.64	897.02	0.37	522	0.75	2.91
417-001	417	0.11	Existing	10	394.32	912.82	898.32	897.64	0.17	354	0.51	4.68
417-002	417-001	0.11	Existing	10	325.64	911	898.88	898.32	0.17	353	0.51	4.67
417-003	417-002	0.11	Existing	10	400.11	909.2	899.56	898.88	0.17	351	0.51	4.64
417-004	417-003	0.11	Existing	10	276.29	907.76	900.04	899.56	0.17	355	0.51	4.69
418	419-010	0.66	Existing	15	336.28	914.11	892.6	891.85	0.22	1187	1.71	2.58
418-001	418	0.23	Existing	15	382.96	911.98	893.32	892.6	0.19	1090	1.57	6.69
418-002	418-001	0.23	Existing	15	299.11	914.26	893.88	893.32	0.19	1087	1.57	6.67
418-003	418-002	0.23	Existing	15	267.04	916.44	894.38	893.88	0.19	1087	1.57	6.67
418-004	418-003	0.23	Existing	15	386	918.12	895.11	894.38	0.19	1093	1.57	6.70
418-005	418-004	0.23	Existing	15	401.89	916.18	895.86	895.11	0.19	1086	1.56	6.66
418-006	418-005	0.23	Existing	15	200	916.57	896.24	895.86	0.19	1095	1.58	6.73
418-007	418-006	0.23	Existing	15	329.42	917.52	896.86	896.24	0.19	1090	1.57	6.70
418-008	418	0.26	Existing	10	384.57	908.34	894.03	892.6	0.37	520	0.75	2.90

APPENDIX D - PIPE CAPACITIES

District 4 Proposed Pipe Capacity - Continued												
Node ID #		Design Flow (MGD)	Existing/P roposed	Size (in)	Length (ft)	Rim (ft)	US Invert (ft)	DS Invert (ft)	Slope %	Capacity		Capacity/ Design
From	To									gpm	MGD	
418-009	418-008	0.26	Existing	10	400.03	907.99	895.53	894.03	0.37	522	0.75	2.91
418-010	418-009	0.26	Existing	10	400.03	909.89	897.02	895.53	0.37	520	0.75	2.90
419	508	6.53	Existing	42	1735.82	908.48	886.35	883.2	0.18	16672	24.01	3.68
419.001	419	0.66	Existing	18	45.11	908.82	886.45	886.35	0.22	1924	2.77	4.21
419-002	419.001	0.66	Existing	18	220.33	909.72	886.94	886.45	0.22	1927	2.77	4.21
419-003	419-002	0.66	Existing	15	51.15	909.9	887.05	886.94	0.22	1165	1.68	2.54
419-004	419-003	0.66	Existing	15	285.14	910.97	887.68	887.05	0.22	1181	1.70	2.57
419-005	419-004	0.66	Existing	15	281.2	912.18	888.31	887.68	0.22	1189	1.71	2.58
419-006	419-005	0.66	Existing	15	318.61	913.43	889.01	888.31	0.22	1178	1.70	2.56
419-007	419-006	0.66	Existing	18	397.9	915.13	889.9	889.01	0.22	1932	2.78	4.20
419-008	419-007	0.66	Existing	15	402.59	916.57	890.79	889.9	0.22	1181	1.70	2.57
419-009	419-008	0.66	Existing	15	236.2	916.24	891.31	890.79	0.22	1179	1.70	2.56
419-010	419-009	0.66	Existing	15	244.45	914.6	891.85	891.31	0.22	1181	1.70	2.57
420	414-010	1.06	Existing	18	388	914.54	892.49	891.95	0.14	1524	2.20	2.07
420-001	420	0.32	Existing	18	232	911.18	893.73	892.49	0.53	2987	4.30	13.59
420-002	420-001	0.32	Existing	18	450	912.64	894.54	893.73	0.18	1734	2.50	7.89
420-003	420-002	0.32	Existing	18	385	914.39	895.05	894.54	0.13	1487	2.14	6.77
421	420-003	0.32	Existing	18	253	915.87	1790.9	895.05	354.09	76888	110.72	349.87
422	414-02	1.33	Existing	42	1225.12	898.7	889.35	888.9	0.04	7501	10.80	8.15
422-001	422	0.53	Existing	42	774.66	901.08	889.64	889.35	0.04	7572	10.90	20.59
423	422-001	0.50	Existing	42	1167.12	916.48	890.07	889.64	0.04	7512	10.82	21.46
423-001	423	0.47	Existing	42	1657.2	903.33	890.68	890.07	0.04	7508	10.81	22.91
424	423-001	0.48	Existing	42	2705.23	908.41	891.68	890.68	0.04	7524	10.84	22.57
425	424	0.46	Existing	30	135.94	926.23	891.76	891.68	0.06	3871	5.57	12.08
426	425	0.45	Existing	30	449.48	931.14	892.02	891.76	0.06	3837	5.53	12.21
427	426	0.45	Existing	30	866.53	929.52	892.52	892.02	0.06	3833	5.52	12.35
428	427	0.40	Existing	30	1283.46	933.87	893.26	892.52	0.06	3831	5.52	13.81
429	428	0.40	Existing	30	499.99	939.34	893.55	893.26	0.06	3843	5.53	13.79
430	429	0.08	Existing	30	814.67	946.11	894.02	893.55	0.06	3832	5.52	70.15
431	430	0.07	Existing	27	1308.03	963.62	894.9	894.02	0.07	3125	4.50	68.86
432	431	0.05	Existing	27	433.39	961.34	895.19	894.9	0.07	3116	4.49	93.00

APPENDIX D - PIPE CAPACITIES

District 4 Proposed Pipe Capacity - Continued												
Node ID #		Design Flow (MGD)	Existing/P roposed	Size (in)	Length (ft)	Rim (ft)	US Invert (ft)	DS Invert (ft)	Slope %	Capacity		Capacity/ Design
From	To									gpm	MGD	
433	432	0.05	Existing	27	500	977.42	895.53	895.19	0.07	3141	4.52	96.10
434	433	0.04	Existing	27	1245.48	981.03	896.36	895.53	0.07	3110	4.48	103.25
435	434	0.02	Existing	27	500	976.86	896.7	896.36	0.07	3141	4.52	266.91
436	435	0.01	Existing	27	1321.13	989.81	897.59	896.7	0.07	3127	4.50	311.13
437	436	0.00	Existing	27	3541.15	980.85	899.96	897.59	0.07	3117	4.49	4487.92
438	420	0.66	Proposed	10	2563.56	918.6	900.39	0	35.12	473	0.68	1.03
439	438	0.36	Proposed	10	1290.5	916.37	904	900.39	0.28	451	0.65	1.80

APPENDIX D - PIPE CAPACITIES

District 5 Proposed Pipe Capacity												
Node ID #		Design Flow (MGD)	Existing/P roposed	Size (in)	Length (ft)	Rim (ft)	US Invert (ft)	DS Invert (ft)	Slope %	Capacity		Capacity/ Design
From	To									gpm	MGD	
501	502-004	0.02	Existing	8	282	945.6	935.21	932.72	0.88	442	0.64	40.82
502	503	0.06	Existing	18	334.54	936.16	921.99	919.68	0.69	3395	4.89	86.02
502-001	502	0.02	Existing	8	80	933.99	922.7	921.99	0.89	443	0.64	40.96
502-002	502-001	0.02	Existing	8	377	942.12	926.02	922.7	0.88	441	0.64	40.81
502-003	502-002	0.02	Existing	8	400	945.15	929.54	926.02	0.88	441	0.63	40.75
502-004	502-003	0.02	Existing	8	361	950.03	932.72	929.54	0.88	441	0.64	40.77
503	504	0.06	Existing	10	10.41	927.9	919.68	914.62	48.61	5942	8.56	146.93
503	504	0.06	Existing	10	10.41	927.9	919.68	914.62	48.61	5942	8.56	146.93
505	506-008	0.07	Existing	10	105.5	913.15	900.73	900.3	0.41	544	0.78	10.98
505-001	505	0.06	Existing	10	231.5	917.8	905.65	900.73	2.13	1242	1.79	30.72
505-002	505-001	0.06	Existing	10	301.63	927.65	912.07	905.65	2.13	1243	1.79	30.75
506	507-009	0.21	Existing	12	193.14	901.74	892.78	892.3	0.25	691	0.99	4.74
506-001	506	0.07	Existing	10	395	904.13	894.21	892.78	0.36	513	0.74	10.35
506-002	506-001	0.07	Existing	10	269	905.79	895.18	894.21	0.36	512	0.74	10.33
506-003	506-002	0.07	Existing	10	93.71	908.08	895.52	895.18	0.36	513	0.74	10.36
506-004	506-003	0.07	Existing	10	173.29	908.42	896.15	895.52	0.36	514	0.74	10.37
506-005	506-004	0.07	Existing	10	387.5	909.96	897.55	896.15	0.36	512	0.74	10.34
506-006	506-005	0.07	Existing	10	366.71	909.7	898.87	897.55	0.36	511	0.74	10.32
506-007	506-006	0.07	Existing	10	51.79	909.71	899.06	898.87	0.37	516	0.74	10.42
506-008	506-007	0.07	Existing	10	356	906.3	900.3	899.06	0.35	503	0.72	10.15
507	508-008	0.25	Existing	12	302.84	902.11	887.78	887.1	0.22	657	0.95	3.82
507-001	507	0.21	Existing	12	277.69	900.69	888.47	887.78	0.25	691	0.99	4.74
507-002	507-001	0.21	Existing	12	283	900.97	889.18	888.47	0.25	694	1.00	4.76
507-003	507-002	0.21	Existing	12	282	901.72	889.89	889.18	0.25	695	1.00	4.77
507-004	507-003	0.21	Existing	12	330.87	903.49	890.71	889.89	0.25	690	0.99	4.73
507-005	507-004	0.21	Existing	12	128.52	905.97	891.04	890.71	0.26	702	1.01	4.81
507-006	507-005	0.21	Existing	12	170.12	905.62	891.46	891.04	0.25	689	0.99	4.72
507-007	507-006	0.21	Existing	12	68	905.11	891.63	891.46	0.25	693	1.00	4.75
507-008	507-007	0.21	Existing	12	108	902.18	891.9	891.63	0.25	693	1.00	4.75
507-009	507-008	0.21	Existing	12	158.05	901.59	892.3	891.9	0.25	697	1.00	4.78
508	605-T3	7.07	Existing	42	1788.88	905	883.2	878.46	0.26	20145	29.01	4.10

APPENDIX D - PIPE CAPACITIES

District 5 Proposed Pipe Capacity												
Node ID #		Design Flow (MGD)	Existing/P roposed	Size (in)	Length (ft)	Rim (ft)	US Invert (ft)	DS Invert (ft)	Slope %	Capacity		Capacity/ Design
From	To									gpm	MGD	
508-001	508	0.24	Existing	12	11.21	905	883.23	883.2	0.27	717	1.03	4.22
508-002	508-001	0.24	Existing	12	100	905	883.45	883.23	0.22	650	0.94	3.83
508-003	508-002	0.24	Existing	12	110	905	883.7	883.45	0.23	661	0.95	3.90
508-008	508-003	0.25	Existing	12	1517.57	905	887.1	883.7	0.22	656	0.94	3.82



APPENDIX D - PIPE CAPACITIES

District 6 Proposed Pipe Capacity												
Node ID #		Design Flow (MGD)	Existing/P roposed	Size (in)	Length (ft)	Rim (ft)	US Invert (ft)	DS Invert (ft)	Slope %	Capacity		Capacity/ Design
From	To									gpm	MGD	
601	602-003	0.51	Existing	10	464	904.06	899.45	894.73	1.02	860	1.24	2.43
602	604-003	0.69	Existing	18	441.52	901.91	881.54	880.97	0.13	1468	2.11	3.08
602-001	602	0.51	Existing	10	439.97	903.07	886.02	881.54	1.02	860	1.24	2.43
602-002	602-001	0.51	Existing	10	439.84	903.96	890.49	886.02	1.02	859	1.24	2.43
602-003	602-002	0.51	Existing	10	416.7	904.83	894.73	890.49	1.02	860	1.24	2.43
604	605-003	0.82	Existing	18	30.44	899.02	879.82	879.69	0.43	2670	3.85	4.71
604-001	604	0.69	Existing	18	132	899.87	879.99	879.82	0.13	1466	2.11	3.07
604-002	604-001	0.69	Existing	18	309.53	901.47	880.39	879.99	0.13	1469	2.12	3.08
604-003	604-002	0.69	Existing	18	439.08	901.09	880.97	880.39	0.13	1485	2.14	3.11
605	619-T3	7.92	Existing	48	955.86	892.06	875.63	874.16	0.15	21912	31.55	3.98
605-001	605	0.82	Existing	21	419.08	898.91	877.48	875.63	0.44	4095	5.90	7.22
605-002	605-001	0.82	Existing	21	68.12	898.33	877.78	877.48	0.44	4090	5.89	7.21
605-003	605-002	0.82	Existing	18	430.02	898.89	879.69	877.78	0.44	2723	3.92	4.80
605-T1	605	7.06	Existing	42	498.46	900	876.95	875.63	0.26	20139	29.00	4.10
605-T2	605-T1	7.07	Existing	42	444.62	900	878.13	876.95	0.27	20161	29.03	4.11
605-T3	605-T2	7.07	Existing	42	128.68	895	878.46	878.13	0.26	19819	28.54	4.04
607	608-004	0.44	Existing	8	441.68	910.08	891.89	890.67	0.28	247	0.36	0.80
607-003	307-002	0.54	Existing	10	403.71	927.23	915.91	913.49	0.6	660	0.95	1.75
608	610	0.94	Existing	15	446.82	903.23	886.99	885.43	0.35	1485	2.14	2.28
608-001	608	0.45	Existing	8	344.8	905.38	887.94	886.99	0.28	247	0.36	0.79
608-002	608-001	0.45	Existing	8	98	906.46	888.22	887.94	0.29	251	0.36	0.81
608-003	608-002	0.45	Existing	8	420	908.31	889.38	888.22	0.28	247	0.36	0.80
608-004	608-003	0.44	Existing	8	465.92	909.17	890.67	889.38	0.28	247	0.36	0.80
610	614-007	1.00	Existing	15	76.76	904.35	885.43	885.3	0.17	1034	1.49	1.49
611	613-014	0.50	Existing	10	200	921.43	891.63	891.04	0.3	463	0.67	1.32
612	613-004	0.25	Existing	10	400	898.64	889.3	887.96	0.33	493	0.71	2.84
613	614	0.74	Existing	10	368	899.43	883.78	882.2	0.43	558	0.80	1.09
613-001	613	0.28	Existing	10	400	900.41	885.12	883.78	0.34	493	0.71	2.58
613-002	613-001	0.28	Existing	10	400	902.99	886.46	885.12	0.34	493	0.71	2.57
613-003	613-002	0.25	Existing	10	326.53	902.97	887.55	886.46	0.33	492	0.71	2.84
613-004	613-003	0.25	Existing	10	122	902.28	887.96	887.55	0.34	494	0.71	2.84

APPENDIX D - PIPE CAPACITIES

District 6 Proposed Pipe Capacity												
Node ID #		Design Flow (MGD)	Existing/P roposed	Size (in)	Length (ft)	Rim (ft)	US Invert (ft)	DS Invert (ft)	Slope %	Capacity		Capacity/ Design
From	To									gpm	MGD	
613-005	613	0.55	Existing	10	400	899.78	884.97	883.78	0.3	465	0.67	1.23
613-006	613-005	0.54	Existing	10	182	903.59	885.5	884.97	0.29	460	0.66	1.22
613-007	613-006	0.54	Existing	10	78.83	908.83	885.74	885.5	0.3	470	0.68	1.26
613-008	613-007	0.53	Existing	10	154.82	909.47	886.2	885.74	0.3	465	0.67	1.26
613-009	613-008	0.53	Existing	10	359.11	912.89	887.26	886.2	0.3	463	0.67	1.26
613-010	613-009	0.52	Existing	10	130	913.37	887.65	887.26	0.3	467	0.67	1.29
613-011	613-010	0.52	Existing	10	319.64	908.76	888.59	887.65	0.29	462	0.67	1.29
613-012	613-011	0.51	Existing	10	220.34	911.18	889.25	888.59	0.3	466	0.67	1.31
613-013	613-012	0.52	Existing	10	293	910.98	890.12	889.25	0.3	464	0.67	1.30
613-014	613-013	0.51	Existing	10	311	916.61	891.04	890.12	0.3	464	0.67	1.31
614	615-008	1.80	Existing	15	139	899.69	882.2	881.97	0.17	1022	1.47	0.82
614-001	614	1.03	Existing	15	367	897.95	882.81	882.2	0.17	1024	1.48	1.44
614-002	614-001	1.02	Existing	15	251	897.96	883.22	882.81	0.16	1016	1.46	1.43
614-003	614-002	1.02	Existing	15	246	898.4	883.63	883.22	0.17	1026	1.48	1.45
614-004	614-003	1.02	Existing	15	175	901.57	883.92	883.63	0.17	1023	1.47	1.45
614-005	614-004	1.02	Existing	15	335.22	903.31	884.48	883.92	0.17	1027	1.48	1.46
614-006	614-005	1.01	Existing	15	284.12	905.98	884.95	884.48	0.17	1022	1.47	1.45
614-007	614-006	1.01	Existing	15	214.59	904.81	885.3	884.95	0.16	1015	1.46	1.45
615	617-012	1.98	Existing	15	262.17	900.44	879.4	879.06	0.13	905	1.30	0.66
615-001	615	1.81	Existing	15	147.84	900.07	879.64	879.4	0.16	1012	1.46	0.80
615-002	615-001	1.81	Existing	15	410	898.38	880.32	879.64	0.17	1023	1.47	0.81
615-003	615-002	1.81	Existing	15	103	898.98	880.48	880.32	0.16	990	1.43	0.79
615-004	615-003	1.81	Existing	15	77	899.56	880.61	880.48	0.17	1032	1.49	0.82
615-005	615-004	1.81	Existing	15	336	901.88	881.16	880.61	0.16	1017	1.46	0.81
615-006	615-005	1.81	Existing	15	101	901.97	881.33	881.16	0.17	1031	1.48	0.82
615-007	615-006	1.80	Existing	15	50	901.99	881.41	881.33	0.16	1005	1.45	0.80
615-008	615-007	1.80	Existing	15	341.82	899.69	881.97	881.41	0.16	1017	1.46	0.81
616	617-003	0.18	Existing	18	260	892.17	879.29	878.58	0.27	2135	3.07	16.76
617	618-009	2.29	Existing	18	268.87	897.51	875.65	875.26	0.15	1556	2.24	0.98
617-001	617	0.43	Existing	18	313.96	895.39	876.6	875.75	0.27	2126	3.06	7.12
617-002	617-001	0.43	Existing	18	232.28	894.62	877.23	876.6	0.27	2128	3.06	7.11

APPENDIX D - PIPE CAPACITIES

District 6 Proposed Pipe Capacity												
Node ID #		Design Flow	Existing/P roposed	Size	Length	Rim	US Invert	DS Invert	Slope	Capacity		Capacity/ Design
From	To	(MGD)		(in)	(ft)	(ft)	(ft)	(ft)	(ft)	%	gpm	MGD
617-002	617-001	0.43	Existing	18	232.28	894.62	877.23	876.6	0.27	2128	3.06	7.11
617-004	617	1.99	Existing	15	29.85	897.06	875.69	875.65	0.13	920	1.32	0.67
617-005	617-004	1.98	Existing	15	345	892.95	876.13	875.69	0.13	897	1.29	0.65
617-006	617-005	1.98	Existing	15	431.59	898.88	876.68	876.13	0.13	897	1.29	0.65
617-007	617-006	1.98	Existing	15	140	899.74	876.86	876.68	0.13	901	1.30	0.65
617-008	617-007	1.98	Existing	15	408	898.18	877.38	876.86	0.13	897	1.29	0.65
617-009	617-008	1.98	Existing	15	94	897.92	877.5	877.38	0.13	898	1.29	0.65
617-010	617-009	1.98	Existing	15	398	899.8	878.01	877.5	0.13	899	1.30	0.65
617-011	617-010	1.98	Existing	15	410	899.39	878.54	878.01	0.13	903	1.30	0.66
617-012	617-011	1.98	Existing	15	410	899.35	879.06	878.54	0.13	895	1.29	0.65
618	619-006	2.64	Existing	18	140.14	896.42	872.32	872.16	0.11	1381	1.99	0.75
618-001	618	2.31	Existing	18	313	897.21	872.82	872.32	0.16	1633	2.35	1.02
618-002	618-001	2.31	Existing	18	347	897.64	873.38	872.82	0.16	1641	2.36	1.02
618-003	618-002	2.31	Existing	18	179.72	896.05	873.67	873.38	0.16	1641	2.36	1.02
618-004	618-003	2.29	Existing	18	29.04	897.05	873.72	873.67	0.17	1695	2.44	1.07
618-005	618-004	2.29	Existing	18	444.56	895.62	874.43	873.72	0.16	1633	2.35	1.03
618-006	618-005	2.29	Existing	18	61	895.51	874.53	874.43	0.16	1654	2.38	1.04
618-007	618-006	2.29	Existing	18	246	895.28	874.92	874.53	0.16	1627	2.34	1.02
618-008	618-007	2.29	Existing	18	105.36	895.08	875.09	874.92	0.16	1641	2.36	1.03
618-009	618-008	2.29	Existing	18	104.72	896.79	875.26	875.09	0.16	1646	2.37	1.03
619	620	10.11	Existing	48	1025.97	888.33	871.26	869.87	0.14	20567	29.62	2.93
619-001	619	2.22	Existing	18	16.88	888.3	871.27	871.26	0.06	995	1.43	0.64
619-002	619-001	2.22	Existing	18	153.06	893.89	871.38	871.27	0.07	1095	1.58	0.71
619-003	619-002	2.64	Existing	18	340.72	896.89	871.62	871.38	0.07	1084	1.56	0.59
619-004	619-003	2.64	Existing	18	234.86	896.28	871.78	871.62	0.07	1067	1.54	0.58
619-005	619-004	2.64	Existing	18	108.62	896.63	871.86	871.78	0.07	1109	1.60	0.60
619-006	619-005	2.64	Existing	18	424	898.02	872.16	871.86	0.07	1087	1.57	0.59
619-T1	619	7.91	Existing	48	1055.23	881	872.89	871.26	0.15	21960	31.62	4.00
619-T2	619-T1	7.91	Existing	48	118.09	881	873.07	872.89	0.15	21815	31.41	3.97

APPENDIX D - PIPE CAPACITIES

District 6 Proposed Pipe Capacity												
Node ID #		Design Flow	Existing/P roposed	Size	Length	Rim	US Invert	DS Invert	Slope	Capacity		Capacity/
From	To	(MGD)		(in)	(ft)	(ft)	(ft)	(ft)	(ft)	%	gpm	MGD
619-T3	619-T2	7.92	Existing	48	705.33	885	874.16	873.07	0.15	21965	31.63	4.00
620	625-T1	14.50	Existing	60	2027.85	882	869.87	867.12	0.14	37307	53.72	3.71
620-T1	620	4.39	Existing	54	1196.33	881	872.16	869.87	0.19	33467	48.19	10.99
620-T2	620-T1	4.39	Existing	54	1081.05	890	874.24	872.16	0.19	33553	48.32	11.02
620-T3	620-T2	4.39	Existing	48	610.52	890	875.41	874.24	0.19	24460	35.22	8.03
625	WWTP1	15.91	Existing	60	1636.85	880.75	863.51	861.22	0.14	37893	54.57	3.43
625-T1	625	14.49	Existing	60	2658.26	881	867.12	863.51	0.14	37334	53.76	3.71
626	625	1.43	Proposed	24	843.3	894.22	864.61	863.51	0.13	3178	4.58	3.19
627	626	1.47	Proposed	24	1629.21	890.04	867.05	864.61	0.15	3405	4.90	3.34
628	627	1.43	Proposed	24	1896.48	888.96	869.89	867.05	0.15	3405	4.90	3.42
629	628	1.42	Proposed	24	742.28	890.79	871	869.89	0.15	3403	4.90	3.44
630	629	1.18	Proposed	21	1319.46	889.98	872.98	871	0.15	2388	3.44	2.91
631	630	0.95	Proposed	18	1319.45	900.9	874.96	872.98	0.15	1583	2.28	2.40
632	631	0.93	Proposed	18	2603.26	894.18	878.86	874.96	0.15	1582	2.28	2.46
633	632	0.53	Proposed	12	2702.66	924.16	894	878.86	0.56	1037	1.49	2.81

APPENDIX D - PIPE CAPACITIES

District 7 Proposed Pipe Capacity												
Node ID #		Design Flow (MGD)	Existing/P roposed	Size (in)	Length (ft)	Rim (ft)	US Invert (ft)	DS Invert (ft)	Slope %	Capacity		Capacity/ Design
From	To									gpm	MGD	
701	804-T2	3.70	Existing	48	1947.23	901.29	880.61	879.87	0.04	10893	15.69	4.24
702	701	1.49	Proposed	15	482.86	920.05	890.7	880.61	2.09	3632	5.23	3.50
703	702	1.14	Proposed	15	773.41	905.31	893.31	890.7	0.34	1460	2.10	1.84
704	703	0.30	Proposed	10	1201.44	918.69	906	893.31	1.06	876	1.26	4.17
705	703	0.52	Proposed	15	3189.07	918.26	911.1	893.31	0.56	1877	2.70	5.15
706	705	0.15	Proposed	10	1304.97	983.06	914.75	911.1	0.28	451	0.65	4.33
707	705	0.28	Proposed	12	2122.91	956.37	943.37	911.1	1.52	1709	2.46	8.90
708	707	0.16	Proposed	10	1754.52	977.87	970	943.37	1.52	1050	1.51	9.66

APPENDIX D - PIPE CAPACITIES

District 8 Proposed Pipe Capacity												
Node ID #		Design Flow (MGD)	Existing/P roposed	Size (in)	Length (ft)	Rim (ft)	US Invert (ft)	DS Invert (ft)	Slope %	Capacity		Capacity/ Design
From	To									gpm	MGD	
802	803-010	0.27	Existing	12	328.46	909.18	887.83	887.02	0.25	688	0.99	3.66
803	804-001	0.63	Existing	12	66	908.89	881.69	881.61	0.12	483	0.69	1.11
803-001	803	0.27	Existing	12	334.73	908.79	882.52	881.69	0.25	690	0.99	3.67
803-002	803-001	0.27	Existing	12	313.93	907.99	883.3	882.52	0.25	691	0.99	3.68
803-003	803-002	0.27	Existing	12	140	907.29	883.65	883.3	0.25	693	1.00	3.69
803-004	803-003	0.27	Existing	12	139	908.07	883.99	883.65	0.24	685	0.99	3.65
803-005	803-004	0.27	Existing	12	144	908.08	884.35	883.99	0.25	693	1.00	3.69
803-006	803-005	0.27	Existing	12	249.98	906.47	884.97	884.35	0.25	690	0.99	3.67
803-007	803-006	0.27	Existing	12	177	909.45	885.41	884.97	0.25	691	1.00	3.68
803-008	803-007	0.27	Existing	12	135.85	909.78	885.74	885.41	0.24	683	0.98	3.63
803-009	803-008	0.27	Existing	12	136	909.14	886.08	885.74	0.25	693	1.00	3.69
803-010	803-009	0.27	Existing	12	377	908.84	887.02	886.08	0.25	692	1.00	3.68
804	620-T3	4.39	Existing	48	1361.51	894.7	878.02	875.41	0.19	24464	35.23	8.03
804-001	804	0.62	Existing	12	1495	905.65	881.61	878.02	0.24	679	0.98	1.57
804-T1	804	3.69	Existing	48	403.87	890	878.37	878.02	0.09	16449	23.69	6.42
804-T2	804-T1	3.69	Existing	48	1735.28	900	879.87	878.37	0.09	16428	23.66	6.40
805	802	0.17	Proposed	12	672.52	902.2	889.31	887.83	0.22	650	0.94	5.59
806	805	0.09	Proposed	12	1115.02	901.6	891.76	889.31	0.22	650	0.94	10.19
807	803	0.12	Proposed	10	2498.88	899.33	888.55	881.69	0.27	447	0.64	5.46
808	807	0.00	Proposed	10	1515.63	899.92	892.8	888.55	0.28	451	0.65	#DIV/0!

## Appendix E: Cost Estimates

APPENDIX E -Cost Estimates

District 1 - Cost Estimates							
Node ID #		Existing/ Proposed	Size (in)	Length (ft)	Depth (ft)	Cost/Foot (\$)	Cost
From	To						
101	102-002	Existing	12	245	5.96	0	\$ -
102	103-007	Existing	15	278	7.29	0	\$ -
102-001	102	Existing	12	78	6.98	0	\$ -
102-002	102-001	Existing	12	312	7.28	0	\$ -
103	105-009	Existing	15	185	8.08	0	\$ -
103-001	103	Existing	15	125	#N/A	0	\$ -
103-002	103-001	Existing	15	275	6.65	0	\$ -
103-003	103-002	Existing	15	289	7.57	0	\$ -
103-004	103-003	Existing	15	125	6.89	0	\$ -
103-005	103-004	Existing	15	175	7.76	0	\$ -
103-006	103-005	Existing	15	215	7.29	0	\$ -
103-007	103-006	Existing	15	102	6.66	0	\$ -
104	105-002	Existing	8	291	12.5	0	\$ -
105	106-004	Existing	18	155	10.38	0	\$ -
105-001	105	Existing	8	400	11.09	0	\$ -
105-002	105-001	Existing	8	400	11.87	0	\$ -
105-003	105	Existing	15	193	11.49	0	\$ -
105-004	105-003	Existing	15	173	10.26	0	\$ -
105-005	105-004	Existing	15	287	11.2	0	\$ -
105-006	105-005	Existing	15	110	10.36	0	\$ -
105-007	105-006	Existing	15	150	11.28	0	\$ -
105-008	105-007	Existing	15	260	10.82	0	\$ -
105-009	105-008	Existing	15	273	10.03	0	\$ -
106	107-006	Existing	18	135	13.42	0	\$ -
106-001	106	Existing	18	130	13.73	0	\$ -
106-002	106-001	Existing	18	406	12.34	0	\$ -
106-003	106-002	Existing	18	252	12.57	0	\$ -
106-004	106-003	Existing	18	258	11.96	0	\$ -
107	110-T3	Existing	48	373	18.87	0	\$ -
107-001	107	Existing	18	342	18.45	0	\$ -
107-003	107-002	Existing	18	400	17.21	0	\$ -
107-004	107-003	Existing	18	400	16.39	0	\$ -
107-005	107-004	Existing	18	400	14.77	0	\$ -
107-006	107-005	Existing	18	220	14.71	0	\$ -
109	110-008	Existing	10	160	23.14	0	\$ -
110	118-T2	Existing	48	859	18.74	0	\$ -
110-001	110	Existing	10	195	18.97	0	\$ -
110-002	110-001	Existing	10	315	18	0	\$ -
110-003	110-002	Existing	10	355	18.12	0	\$ -
110-004	110-003	Existing	10	300	26.07	0	\$ -
110-005	110-004	Existing	10	289	23.99	0	\$ -
110-006	110-005	Existing	10	136	24.4	0	\$ -



APPENDIX E -Cost Estimates

District 1 - Cost Estimates Continued							
Node ID #		Existing/ Proposed	Size (in)	Length (ft)	Depth (ft)	Cost/Foot (\$)	Cost
From	To						
110-007	110-006	Existing	10	132	24.22	0	\$ -
110-008	110-007	Existing	10	240	22.32	0	\$ -
110-T1	110	Existing	48	1418	11.44	0	\$ -
110-T2	110-T1	Existing	48	2304	7.58	0	\$ -
110-T3	110-T2	Existing	48	1189	10.59	0	\$ -
111	112-002	Existing	10	393	16.49	0	\$ -
112	117-004	Existing	12	245	19.86	0	\$ -
112-001	112	Existing	10	265	19.53	0	\$ -
112-002	112-001	Existing	10	150	18.58	0	\$ -
113	114-009	Existing	12	168	10.91	0	\$ -
114	115-004	Existing	12	387	21.69	0	\$ -
114-001	114	Existing	12	150	29.92	0	\$ -
114-002	114-001	Existing	12	180	29.23	0	\$ -
114-003	114-002	Existing	12	180	23.4	0	\$ -
114-004	114-003	Existing	12	180	19.89	0	\$ -
114-005	114-004	Existing	12	450	7.69	0	\$ -
114-006	114-005	Existing	12	112	6.46	0	\$ -
114-007	114-006	Existing	12	273	14.18	0	\$ -
114-008	114-007	Existing	12	49	14.22	0	\$ -
114-009	114-008	Existing	12	198	12.18	0	\$ -
115	116-008	Existing	12	136	13.66	0	\$ -
115-001	115	Existing	12	155	13.63	0	\$ -
115-002	115-001	Existing	12	260	15.23	0	\$ -
115-003	115-002	Existing	12	208	16.14	0	\$ -
115-004	115-003	Existing	12	65	16.14	0	\$ -
116	117-008	Existing	12	125	14.51	0	\$ -
116-001	116	Existing	12	237	15.88	0	\$ -
116-002	116-001	Existing	12	188	13.38	0	\$ -
116-003	116-002	Existing	12	370	13.31	0	\$ -
116-004	116-003	Existing	12	215	10.79	0	\$ -
116-005	116-004	Existing	12	261	10.77	0	\$ -
116-006	116-005	Existing	12	247	11.82	0	\$ -
116-007	116-006	Existing	12	385	12.52	0	\$ -
116-008	116-007	Existing	12	118	12.41	0	\$ -
117	118-004	Existing	12	400	14.97	0	\$ -
117-001	117	Existing	12	5	15.26	0	\$ -
117-002	117-001	Existing	12	87	0	0	\$ -
117-003	117-002	Existing	12	353	22.95	0	\$ -
117-004	117-003	Existing	12	345	20.2	0	\$ -
117-005	117	Existing	12	70	15.82	0	\$ -
117-006	117-005	Existing	12	335	17.13	0	\$ -
117-007	117-006	Existing	12	334	20.02	0	\$ -
117-008	117-007	Existing	12	400	15.21	0	\$ -

APPENDIX E -Cost Estimates

District 1 - Cost Estimates Continued							
Node ID #		Existing/ Proposed	Size (in)	Length (ft)	Depth (ft)	Cost/Foot (\$)	Cost
From	To						
118	701	Existing	48	1617	19.67	0	\$ -
118-001	118	Existing	12	72	18.94	0	\$ -
118-002	118-001	Existing	12	200	17.7	0	\$ -
118-003	118-002	Existing	12	400	19.69	0	\$ -
118-004	118-003	Existing	12	401	16.61	0	\$ -
118-T1	118	Existing	48	408	15.91	0	\$ -
118-T2	118-T1	Existing	48	2817	15.48	0	\$ -
						Subtotal	\$ -

District 2 - Cost Estimates							
Node ID #		Existing/ Proposed	Size (in)	Length (ft)	Depth (ft)	Cost/Foot (\$)	Cost
From	To						
201	302	Proposed	12	1080	18.94	141	\$ 152,235
202	201	Proposed	12	412	13.6	141	\$ 58,117
203	202	Proposed	18	1899	20.58	268	\$ 509,037
204	201	Proposed	12	4850	21.32	221	\$ 1,071,832
205	204	Proposed	18	1490	22.56	268	\$ 399,215
206	205	Proposed	12	2740	28.36	221	\$ 605,540
						Subtotal	\$ 2,795,977

APPENDIX E -Cost Estimates

District 3 - Cost Estimates							
Node ID #		Existing/ Proposed	Size (in)	Length (ft)	Depth (ft)	Cost/Foot (\$)	Cost
From	To						
301	302	Proposed	10	1262	10	122	\$ 153,965
302	303-006	Existing	18	306	12.92	0	\$ -
303	308-013	Existing	18	192	15.47	0	\$ -
303-001	303	Existing	18	236	18.11	0	\$ -
303-002	303-001	Existing	18	389	17.53	0	\$ -
303-003	303-002	Existing	18	402	16.96	0	\$ -
303-004	303-003	Existing	18	370	13.27	0	\$ -
303-005	303-004	Existing	18	368	11.74	0	\$ -
303-006	303-005	Existing	18	245	11.9	0	\$ -
305	306-006	Existing	10	174	12.83	0	\$ -
305-005	308-004	Existing	10	188	18.42	0	\$ -
306	307-004	Existing	10	333	16.3	0	\$ -
306-001	306	Existing	10	113	12.66	0	\$ -
306-002	306-001	Existing	10	248	16.39	0	\$ -
306-003	306-002	Existing	10	35	16.98	0	\$ -
306-004	306-003	Existing	10	364	12.58	0	\$ -
306-005	306-004	Existing	10	147	6.17	0	\$ -
306-006	306-005	Existing	10	287	6.58	0	\$ -
307	308-006	Existing	10	267	26.39	0	\$ -
307-001	307	Existing	10	444	26.03	0	\$ -
307-002	307-001	Existing	10	237	22.26	0	\$ -
307-004	607-003	Existing	10	43	10.97	0	\$ -
308	309-305	Existing	24	240	20.73	0	\$ -
308-001	308	Existing	10	355	12.66	0	\$ -
308-002	308-001	Existing	10	202	10.01	0	\$ -
308-003	308-002	Existing	10	289	8.37	0	\$ -
308-004	308-003	Existing	10	288	11.17	0	\$ -
308-006	305-005	Existing	10	299	28.38	0	\$ -
308-007	308	Existing	18	78	18.5	0	\$ -
308-008	308-007	Existing	10	274	19.72	0	\$ -
308-009	308-008	Existing	18	180	20.46	0	\$ -
308-010	308-009	Existing	18	272	19.24	0	\$ -
308-011	308-010	Existing	18	372	18.27	0	\$ -
308-012	308-011	Existing	18	137	18.87	0	\$ -
308-013	308-012	Existing	18	198	18.14	0	\$ -
309	313-002	Existing	24	434	21.86	0	\$ -
309-001	309	Existing	24	198	15.31	0	\$ -
309-002	309-001	Existing	24	403	14.63	0	\$ -
309-003	309-002	Existing	24	396	19.96	0	\$ -
309-004	309-003	Existing	24	497	13.65	0	\$ -
309-305	309-004	Existing	24	277	14.96	0	\$ -
311	312-009	Existing	8	146	10.8	0	\$ -
312	313-013	Existing	10	371	13.19	0	\$ -

APPENDIX E -Cost Estimates

District 3 - Cost Estimates Continued							
Node ID #		Existing/ Proposed	Size (in)	Length (ft)	Depth (ft)	Cost/Foot (\$)	Cost
From	To						
312-001	312	Existing	8	385	11.49	0	\$ -
312-002	312-001	Existing	8	217	13.09	0	\$ -
312-003	312-002	Existing	8	80	12.88	0	\$ -
312-004	312-003	Existing	8	132	14.4	0	\$ -
312-005	312-004	Existing	8	172	13.89	0	\$ -
312-006	312-005	Existing	8	220	14.3	0	\$ -
312-007	312-006	Existing	8	196	7.34	0	\$ -
312-008	312-007	Existing	8	120	4.56	0	\$ -
312-009	312-008	Existing	8	128	6.14	0	\$ -
313	315	Existing	24	349	19.97	0	\$ -
313-001	313	Existing	24	297	13.92	0	\$ -
313-002	313-001	Existing	24	398	21.01	0	\$ -
313-003	313	Existing	10	181	17.31	0	\$ -
313-004	313-003	Existing	10	346	14.92	0	\$ -
313-005	313-004	Existing	10	80	14.95	0	\$ -
313-006	313-005	Existing	10	163	15.07	0	\$ -
313-007	313-006	Existing	10	163	22.26	0	\$ -
313-008	313-007	Existing	10	182	15.78	0	\$ -
313-009	313-008	Existing	10	74	12.92	0	\$ -
313-010	313-009	Existing	10	63	11.63	0	\$ -
313-011	313-010	Existing	10	73	11.57	0	\$ -
313-012	313-011	Existing	18	70	13.38	0	\$ -
313-013	313-012	Existing	10	87	16.87	0	\$ -
314	315-002	Existing	12	257	9.08	0	\$ -
315	316-005	Existing	18	401	11.53	0	\$ -
315-001	315	Existing	12	237	15.09	0	\$ -
315-002	315-001	Existing	12	400	9.33	0	\$ -
316	317-007	Existing	24	385	14.96	0	\$ -
316-001	316	Existing	24	484	13.31	0	\$ -
316-002	316-001	Existing	24	499	10.46	0	\$ -
316-003	316-002	Existing	24	405	10.44	0	\$ -
316-004	316-003	Existing	24	501	10.81	0	\$ -
316-005	316-004	Existing	24	477	10.91	0	\$ -
317	318-003	Existing	24	499	15.67	0	\$ -
317-001	317	Existing	24	325	14.21	0	\$ -
317-002	317-001	Existing	24	374	13.83	0	\$ -
317-003	317-002	Existing	24	358	15.94	0	\$ -
317-004	317-003	Existing	24	389	17.61	0	\$ -
317-005	317-004	Existing	24	501	16.43	0	\$ -
317-006	317-005	Existing	24	354	15.92	0	\$ -
317-007	317-006	Existing	24	473	17.35	0	\$ -
318	419	Existing	24	151	17.77	0	\$ -
318-001	318	Existing	24	301	15.43	0	\$ -

APPENDIX E -Cost Estimates

District 3 - Cost Estimates Continued							
Node ID #		Existing/ Proposed	Size (in)	Length (ft)	Depth (ft)	Cost/Foot (\$)	Cost
From	To						
318-002	318-001	Existing	24	369	13.13	0	\$ -
318-003	318-002	Existing	24	501	10.72	0	\$ -
319	314	Proposed	12	1150	40.73	221	\$ 254,174
320	319	Proposed	10	1589	25.46	184	\$ 292,394
						Subtotal	\$ 700,534

District 4 - Cost Estimates							
Node ID #		Existing/ Proposed	Size (in)	Length (ft)	Depth (ft)	Cost/Foot (\$)	Cost
From	To						
414	419	Existing	42	2653	15.52	0	\$ -
414-001	414	Existing	21	30	13.4	0	\$ -
414-003	414-002	Existing	21	221	10.15	0	\$ -
414-004	414-003	Existing	21	139	11.45	0	\$ -
415	418-007	Existing	18	215	20.8	0	\$ -
416	417-004	Existing	10	379	11.06	0	\$ -
417	418-010	Existing	18	165	13.21	0	\$ -
417-001	417	Existing	10	394	14.5	0	\$ -
417-002	417-001	Existing	10	326	12.12	0	\$ -
417-003	417-002	Existing	10	400	9.64	0	\$ -
417-004	417-003	Existing	10	276	7.72	0	\$ -
418	419-010	Existing	15	336	21.51	0	\$ -
418-001	418	Existing	15	383	18.66	0	\$ -
418-002	418-001	Existing	15	299	20.38	0	\$ -
418-003	418-002	Existing	15	267	22.06	0	\$ -
418-004	418-003	Existing	15	386	23.01	0	\$ -
418-005	418-004	Existing	15	402	20.32	0	\$ -
418-006	418-005	Existing	15	200	20.33	0	\$ -
418-007	418-006	Existing	15	329	20.66	0	\$ -
418-008	418	Existing	10	385	14.31	0	\$ -
418-009	418-008	Existing	10	400	12.46	0	\$ -
418-010	418-009	Existing	10	400	12.87	0	\$ -
419	508	Existing	42	1736	22.13	0	\$ -
419.001	419	Existing	18	45	22.37	0	\$ -
419-002	419.001	Existing	18	220	22.78	0	\$ -
419-003	419-002	Existing	15	51	22.85	0	\$ -
419-004	419-003	Existing	15	285	23.29	0	\$ -
419-005	419-004	Existing	15	281	23.87	0	\$ -
419-006	419-005	Existing	15	319	24.42	0	\$ -
419-007	419-006	Existing	18	398	25.23	0	\$ -
419-008	419-007	Existing	15	403	25.78	0	\$ -
419-009	419-008	Existing	15	236	24.93	0	\$ -
419-010	419-009	Existing	15	244	22.75	0	\$ -
419-010	419-009	Existing	15	244	22.75	0	\$ -

APPENDIX E -Cost Estimates

District 4 - Cost Estimates Continued							
Node ID #		Existing/ Proposed	Size (in)	Length (ft)	Depth (ft)	Cost/Foot (\\$)	Cost
From	To						
420	414-010	Existing	18	388	22.05	0	\$ -
420-001	420	Existing	18	232	17.45	0	\$ -
420-002	420-001	Existing	18	450	18.1	0	\$ -
420-003	420-002	Existing	18	385	19.34	0	\$ -
421	420-003	Existing	18	253	20.42	0	\$ -
422	414-02	Existing	42	1225	9.35	0	\$ -
422-001	422	Existing	42	775	11.44	0	\$ -
423	422-001	Existing	42	1167	26.41	0	\$ -
423-001	423	Existing	42	1657	12.65	0	\$ -
424	423-001	Existing	42	2705	16.73	0	\$ -
425	424	Existing	30	136	34.47	0	\$ -
426	425	Existing	30	449	39.12	0	\$ -
427	426	Existing	30	867	37	0	\$ -
428	427	Existing	30	1283	40.61	0	\$ -
429	428	Existing	30	500	45.79	0	\$ -
430	429	Existing	30	815	52.09	0	\$ -
431	430	Existing	27	1308	68.72	0	\$ -
432	431	Existing	27	433	66.15	0	\$ -
433	432	Existing	27	500	81.89	0	\$ -
434	433	Existing	27	1245	84.67	0	\$ -
435	434	Existing	27	500	80.16	0	\$ -
436	435	Existing	27	1321	92.22	0	\$ -
437	436	Existing	27	3541	80.89	0	\$ -
438	420	Proposed	10	524	18.21	122	\$ 63,974
439	438	Proposed	10	1291	12.37	122	\$ 157,441
						Subtotal	\$ 221,415

APPENDIX E -Cost Estimates

District 5 - Cost Estimates Continued							
Node ID #		Existing/ Proposed	Size (in)	Length (ft)	Depth (ft)	Cost/Foot (\$)	Cost
From	To						
501	502-004	Existing	8	282	10.39	0	\$ -
502	503	Existing	18	335	14.17	0	\$ -
502-001	502	Existing	8	80	11.29	0	\$ -
502-002	502-001	Existing	8	377	16.1	0	\$ -
502-003	502-002	Existing	8	400	15.61	0	\$ -
502-004	502-003	Existing	8	361	17.31	0	\$ -
503	504	Existing	10	10	8.22	0	\$ -
503	504	Existing	10	10	8.22	0	\$ -
505	506-008	Existing	10	106	12.42	0	\$ -
505-001	505	Existing	10	232	12.15	0	\$ -
505-002	505-001	Existing	10	302	15.58	0	\$ -
506	507-009	Existing	12	193	8.96	0	\$ -
506-001	506	Existing	10	395	9.92	0	\$ -
506-002	506-001	Existing	10	269	10.61	0	\$ -
506-003	506-002	Existing	10	94	12.56	0	\$ -
506-004	506-003	Existing	10	173	12.27	0	\$ -
506-005	506-004	Existing	10	388	12.41	0	\$ -
506-006	506-005	Existing	10	367	10.83	0	\$ -
506-007	506-006	Existing	10	52	10.65	0	\$ -
506-008	506-007	Existing	10	356	6	0	\$ -
507	508-008	Existing	12	303	14.33	0	\$ -
507-001	507	Existing	12	278	12.22	0	\$ -
507-002	507-001	Existing	12	283	11.79	0	\$ -
507-003	507-002	Existing	12	282	11.83	0	\$ -
507-004	507-003	Existing	12	331	12.78	0	\$ -
507-005	507-004	Existing	12	129	14.93	0	\$ -
507-006	507-005	Existing	12	170	14.16	0	\$ -
507-007	507-006	Existing	12	68	13.48	0	\$ -
507-008	507-007	Existing	12	108	10.28	0	\$ -
507-009	507-008	Existing	12	158	9.29	0	\$ -
508	605-T3	Existing	42	1789	21.8	0	\$ -
508-001	508	Existing	12	11	21.77	0	\$ -
508-002	508-001	Existing	12	100	21.55	0	\$ -
508-003	508-002	Existing	12	110	21.3	0	\$ -
508-008	508-003	Existing	12	1518	17.9	0	\$ -
						Subtotal	\$ -

APPENDIX E -Cost Estimates

District 6 - Cost Estimates							
Node ID #		Existing/ Proposed	Size (in)	Length (ft)	Depth (ft)	Cost/Foot (\\$)	Cost
From	To						
601	602-003	Existing	10	464	4.61	0	\$ -
602	604-003	Existing	18	442	20.37	0	\$ -
602-001	602	Existing	10	440	17.05	0	\$ -
602-002	602-001	Existing	10	440	13.47	0	\$ -
602-003	602-002	Existing	10	417	10.1	0	\$ -
604	605-003	Existing	18	30	19.2	0	\$ -
604-001	604	Existing	18	132	19.88	0	\$ -
604-002	604-001	Existing	18	310	21.08	0	\$ -
604-003	604-002	Existing	18	439	20.12	0	\$ -
605	619-T3	Existing	48	956	16.43	0	\$ -
605-001	605	Existing	21	419	21.43	0	\$ -
605-002	605-001	Existing	21	68	20.55	0	\$ -
605-003	605-002	Existing	18	430	19.2	0	\$ -
605-T1	605	Existing	42	498	23.05	0	\$ -
605-T2	605-T1	Existing	42	445	21.87	0	\$ -
605-T3	605-T2	Existing	42	129	16.54	0	\$ -
607	608-004	Proposed	10	442	18.19	122	\$ 53,885
607-003	307-002	Existing	10	404	11.32	0	\$ -
608	610	Existing	15	447	16.24	0	\$ -
608-001	608	Proposed	10	345	17.44	122	\$ 42,066
608-002	608-001	Proposed	10	98	18.24	122	\$ 11,956
608-003	608-002	Proposed	10	420	18.93	122	\$ 51,240
608-004	608-003	Proposed	10	466	18.5	122	\$ 56,842
610	614-007	Existing	15	77	18.92	0	\$ -
611	613-014	Proposed	15	200	29.8	244	\$ 48,800
612	613-004	Existing	18	400	9.34	0	\$ -
613	614	Existing	18	368	15.65	0	\$ -
613-001	613	Existing	18	400	15.29	0	\$ -
613-002	613-001	Existing	18	400	16.53	0	\$ -
613-003	613-002	Existing	18	327	15.42	0	\$ -
613-004	613-003	Existing	18	122	14.32	0	\$ -
613-005	613	Proposed	15	400	14.81	168	\$ 67,200
613-006	613-005	Proposed	15	182	18.09	168	\$ 30,576
613-007	613-006	Proposed	15	79	23.09	244	\$ 19,235
613-008	613-007	Proposed	15	155	23.27	244	\$ 37,776
613-009	613-008	Proposed	15	359	25.63	244	\$ 87,623
613-010	613-009	Proposed	15	130	25.72	244	\$ 31,720
613-011	613-010	Proposed	15	320	20.17	244	\$ 77,992
613-012	613-011	Proposed	15	220	21.93	244	\$ 53,763
613-013	613-012	Proposed	15	293	20.86	244	\$ 71,492
613-014	613-013	Proposed	15	311	25.57	244	\$ 75,884
614	615-008	Proposed	21	139	17.49	221	\$ 30,719
614-001	614	Existing	15	367	15.14	0	\$ -



APPENDIX E -Cost Estimates

District 6 - Cost Estimates Continued							
Node ID #		Existing/ Proposed	Size (in)	Length (ft)	Depth (ft)	Cost/Foot (\$)	Cost
From	To						
614-002	614-001	Existing	15	251	14.74	0	\$ -
614-003	614-002	Existing	15	246	14.77	0	\$ -
614-004	614-003	Existing	15	175	17.65	0	\$ -
614-005	614-004	Existing	15	335	18.83	0	\$ -
614-006	614-005	Existing	15	284	21.03	0	\$ -
614-007	614-006	Existing	15	215	19.51	0	\$ -
615	617-012	Proposed	21	262	21.04	329	\$ 86,254
615-001	615	Proposed	21	148	20.43	329	\$ 48,639
615-002	615-001	Proposed	21	410	18.06	221	\$ 90,610
615-003	615-002	Proposed	21	103	18.5	221	\$ 22,763
615-004	615-003	Proposed	21	77	18.95	221	\$ 17,017
615-005	615-004	Proposed	21	336	20.72	329	\$ 110,544
615-006	615-005	Proposed	21	101	20.64	329	\$ 33,229
615-007	615-006	Proposed	21	50	20.58	329	\$ 16,450
615-008	615-007	Proposed	21	342	17.72	221	\$ 75,542
616	617-003	Existing	18	260	12.88	0	\$ -
617	618-009	Proposed	21	269	21.86	329	\$ 88,458
617-001	617	Existing	18	314	18.79	0	\$ -
617-002	617-001	Existing	18	232	17.39	0	\$ -
617-002	617-001	Existing	18	232	17.39	0	\$ -
617-004	617	Proposed	21	30	21.37	329	\$ 9,821
617-005	617-004	Proposed	21	345	16.82	221	\$ 76,245
617-006	617-005	Proposed	21	432	22.2	329	\$ 141,993
617-007	617-006	Proposed	21	140	22.88	329	\$ 46,060
617-008	617-007	Proposed	21	408	20.8	329	\$ 134,232
617-009	617-008	Proposed	21	94	20.42	329	\$ 30,926
617-010	617-009	Proposed	21	398	21.79	329	\$ 130,942
617-011	617-010	Proposed	21	410	20.85	329	\$ 134,890
617-012	617-011	Proposed	21	410	20.29	329	\$ 134,890
618	619-006	Proposed	24	140	24.1	327	\$ 45,826
618-001	618	Proposed	21	313	24.39	329	\$ 102,977
618-002	618-001	Proposed	21	347	24.26	329	\$ 114,163
618-003	618-002	Proposed	21	180	22.38	329	\$ 59,128
618-004	618-003	Proposed	21	29	23.33	329	\$ 9,554
618-005	618-004	Proposed	21	445	21.19	329	\$ 146,260
618-006	618-005	Proposed	21	61	20.98	329	\$ 20,069
618-007	618-006	Proposed	21	246	20.36	329	\$ 80,934
618-008	618-007	Proposed	21	105	19.99	221	\$ 23,285
618-009	618-008	Proposed	21	105	21.53	329	\$ 34,453
619	620	Existing	48	1026	17.07	0	\$ -
619-001	619	Existing	18	17	17.03	0	\$ -
619-002	619-001	Proposed	24	153	22.51	327	\$ 50,051
619-003	619-002	Proposed	24	341	25.27	327	\$ 111,415

APPENDIX E -Cost Estimates

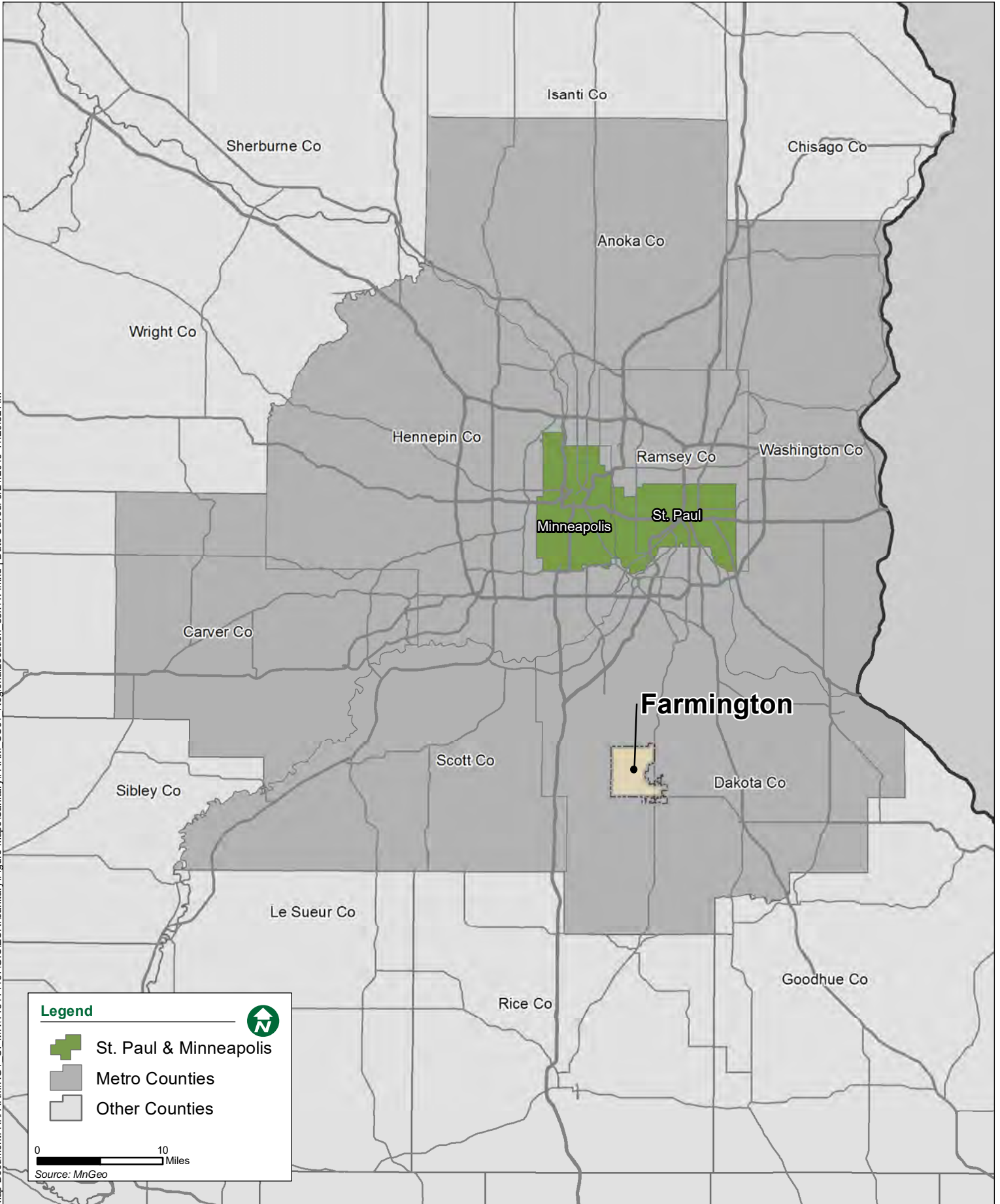
District 6 - Cost Estimates Continued							
Node ID #		Existing/ Proposed	Size (in)	Length (ft)	Depth (ft)	Cost/Foot (\\$)	Cost
From	To						
619-004	619-003	Proposed	24	235	24.5	327	\$ 76,799
619-005	619-004	Proposed	24	109	24.77	327	\$ 35,519
619-006	619-005	Proposed	24	424	25.86	327	\$ 138,648
619-T1	619	Existing	48	1055	8.11	0	\$ -
619-T2	619-T1	Existing	48	118	7.93	0	\$ -
619-T3	619-T2	Existing	48	705	10.84	0	\$ -
620	625-T1	Existing	60	2028	12.13	0	\$ -
620-T1	620	Existing	54	1196	8.84	0	\$ -
620-T2	620-T1	Existing	54	1081	15.76	0	\$ -
620-T3	620-T2	Existing	48	611	14.59	0	\$ -
625	WWTP1	Existing	60	1637	17.24	0	\$ -
625-T1	625	Existing	60	2658	13.88	0	\$ -
626	625	Proposed	24	843	29.61	327	\$ 275,759
627	626	Proposed	24	1629	22.99	327	\$ 532,752
628	627	Proposed	24	1896	19.07	250	\$ 474,120
629	628	Proposed	24	742	19.79	250	\$ 185,570
630	629	Proposed	21	1319	17	221	\$ 291,601
631	630	Proposed	18	1319	25.94	268	\$ 353,613
632	631	Proposed	18	2603	15.32	191	\$ 497,223
633	632	Proposed	12	2703	30.16	221	\$ 597,288
Subtotal							\$ 6,535,279

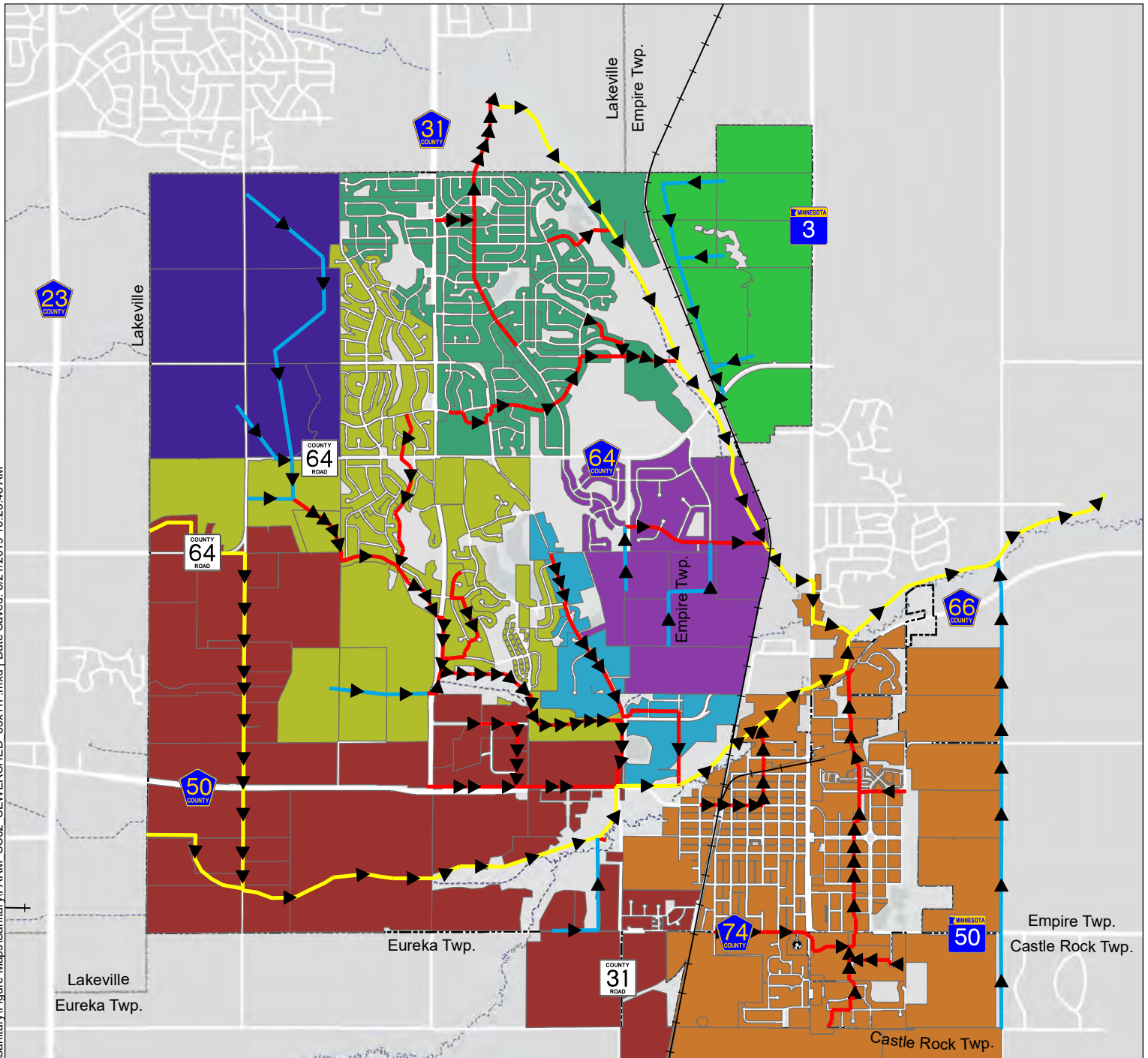
District 7 - Cost Estimates							
Node ID #		Existing/ Proposed	Size (in)	Length (ft)	Depth (ft)	Cost/Foot (\\$)	Cost
From	To						
701	804-T2	Existing	48	1947	20.68	0	\$ -
702	701	Proposed	15	483	29.35	244	\$ 117,818
703	702	Proposed	15	773	12	168	\$ 129,933
704	703	Proposed	10	1201	12.69	122	\$ 146,576
705	703	Proposed	15	3189	7.16	159	\$ 507,062
706	705	Proposed	10	1305	68.31	184	\$ 240,114
707	705	Proposed	12	2123	13	141	\$ 299,330
708	707	Proposed	10	1755	7.87	113	\$ 198,261
Subtotal							\$ 1,639,094

APPENDIX E -Cost Estimates

District 8 - Cost Estimates							
Node ID #		Existing/ Proposed	Size (in)	Length (ft)	Depth (ft)	Cost/Foot (\\$)	Cost
From	To						
802	803-010	Existing	12	328	21.35	0	\$ -
803	804-001	Existing	12	66	27.2	0	\$ -
803-001	803	Existing	12	335	26.27	0	\$ -
803-002	803-001	Existing	12	314	24.69	0	\$ -
803-003	803-002	Existing	12	140	23.64	0	\$ -
803-004	803-003	Existing	12	139	24.08	0	\$ -
803-005	803-004	Existing	12	144	23.73	0	\$ -
803-006	803-005	Existing	12	250	21.5	0	\$ -
803-007	803-006	Existing	12	177	24.04	0	\$ -
803-008	803-007	Existing	12	136	24.04	0	\$ -
803-009	803-008	Existing	12	136	23.06	0	\$ -
803-010	803-009	Existing	12	377	21.82	0	\$ -
804	620-T3	Existing	48	1362	16.68	0	\$ -
804-001	804	Existing	12	1495	24.04	0	\$ -
804-T1	804	Existing	48	404	11.63	0	\$ -
804-T2	804-T1	Existing	48	1735	20.13	0	\$ -
805	802	Proposed	12	673	12.89	141	\$ 94,825
806	805	Proposed	12	1115	9.84	132	\$ 147,183
807	803	Proposed	10	2499	10.78	122	\$ 304,863
808	807	Proposed	10	1516	7.12	113	\$ 171,266
						Subtotal	\$ 718,138
						Total	\$ 12,610,436.39

## Appendix F: Land Use Maps and Sewer Figures





**Legend**

- City Limits
- Protected Waters - Basins
- Watercourse

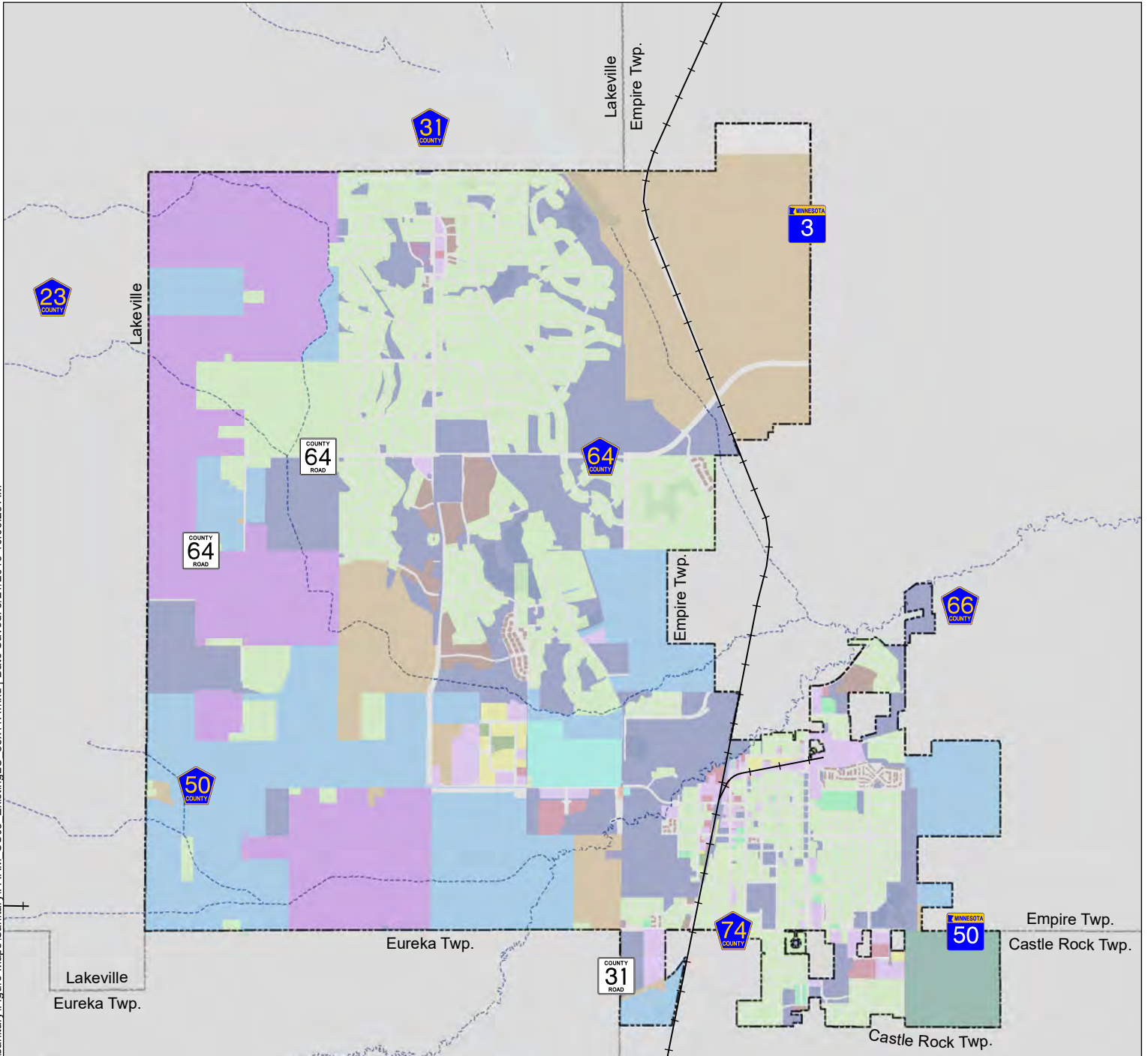
**Existing Land Use (2016)**

- |             |            |            |            |
|-------------|------------|------------|------------|
| Existing    | District 1 | District 3 | District 6 |
| Interceptor | District 2 | District 4 | District 7 |
| Proposed    | District 5 | District 8 |            |

0 4,000 Feet

Source: MnGeo, State of MN, Dakota County, City of Farmington, MN

Map Document: H:\FARMINGT.Cl.MNT\18114157\GIS\ESR\Sanitary\Figure Maps\Sanitary\FARM\_SS02\_SEWERSHED\_85x11P.mxd | Date Saved: 6/21/2019 10:23:48 AM



### Legend

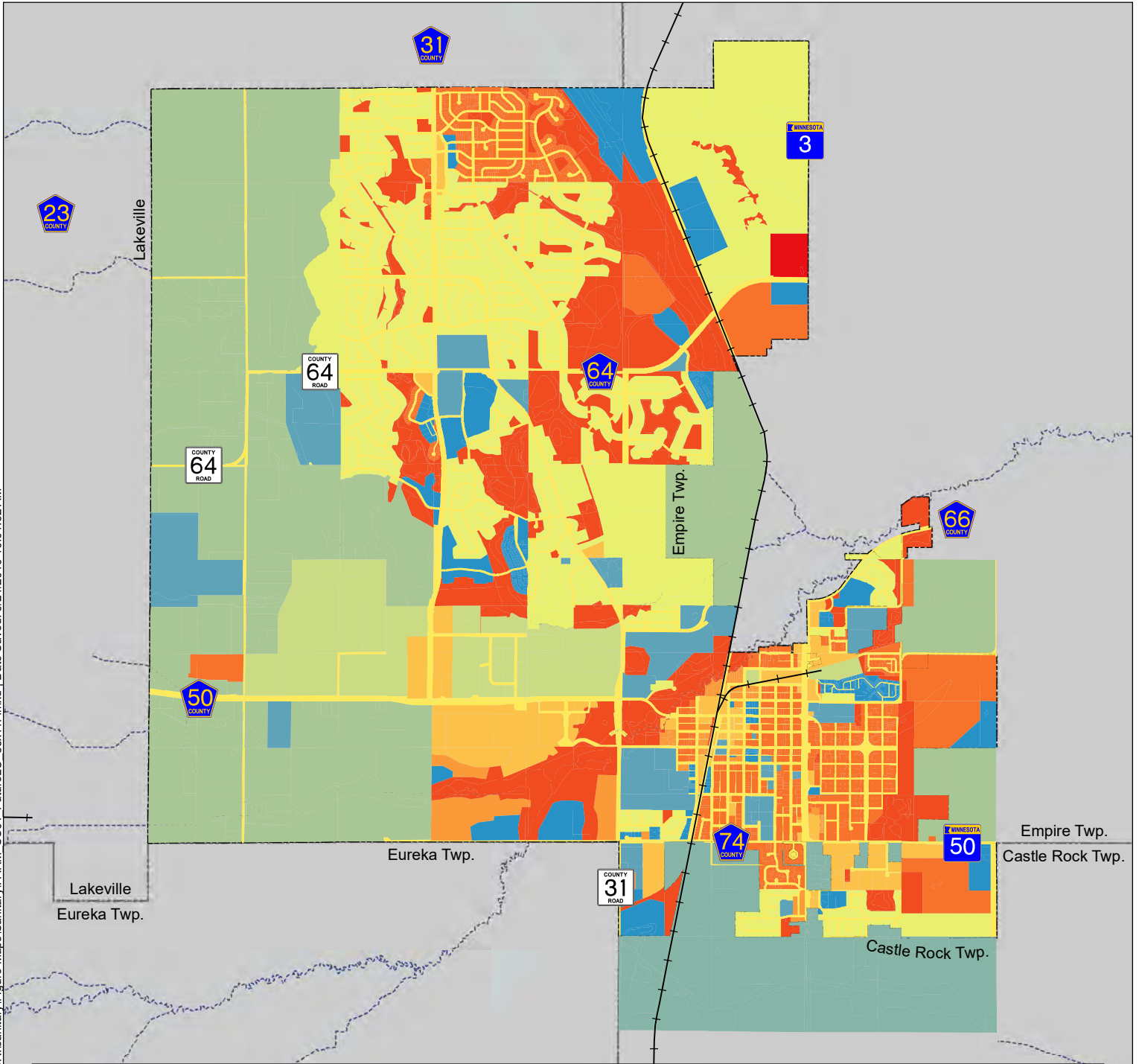
- City Limits
- Protected Waters - Basins
- Watercourse

### Existing Land Use (2016)

- |                |                       |                      |                         |
|----------------|-----------------------|----------------------|-------------------------|
| AG             | COMMERCIAL            | INDUSTRIAL           | RESIDENTIAL-CONDOMIN... |
| AG-AG PRESERVE | COMMERCIAL-OPEN SPACE | INDUSTRIAL-PREFERRED | RESIDENTIAL-TOWNHOUSE   |
| AG-GREEN ACRES | COMMERCIAL-PREFERRED  | MACHINERY            | UTILITIES-PREFERRED     |
| APARTMENT      | EXEMPT                | RESIDENTIAL          |                         |

0 4,000 Feet

Source: MnGeo, State of MN, Dakota County, City of Farmington, MN



### Legend

- City Limits
- Protected Waters - Basins
- Watercourse

### Future Land Use (2040)

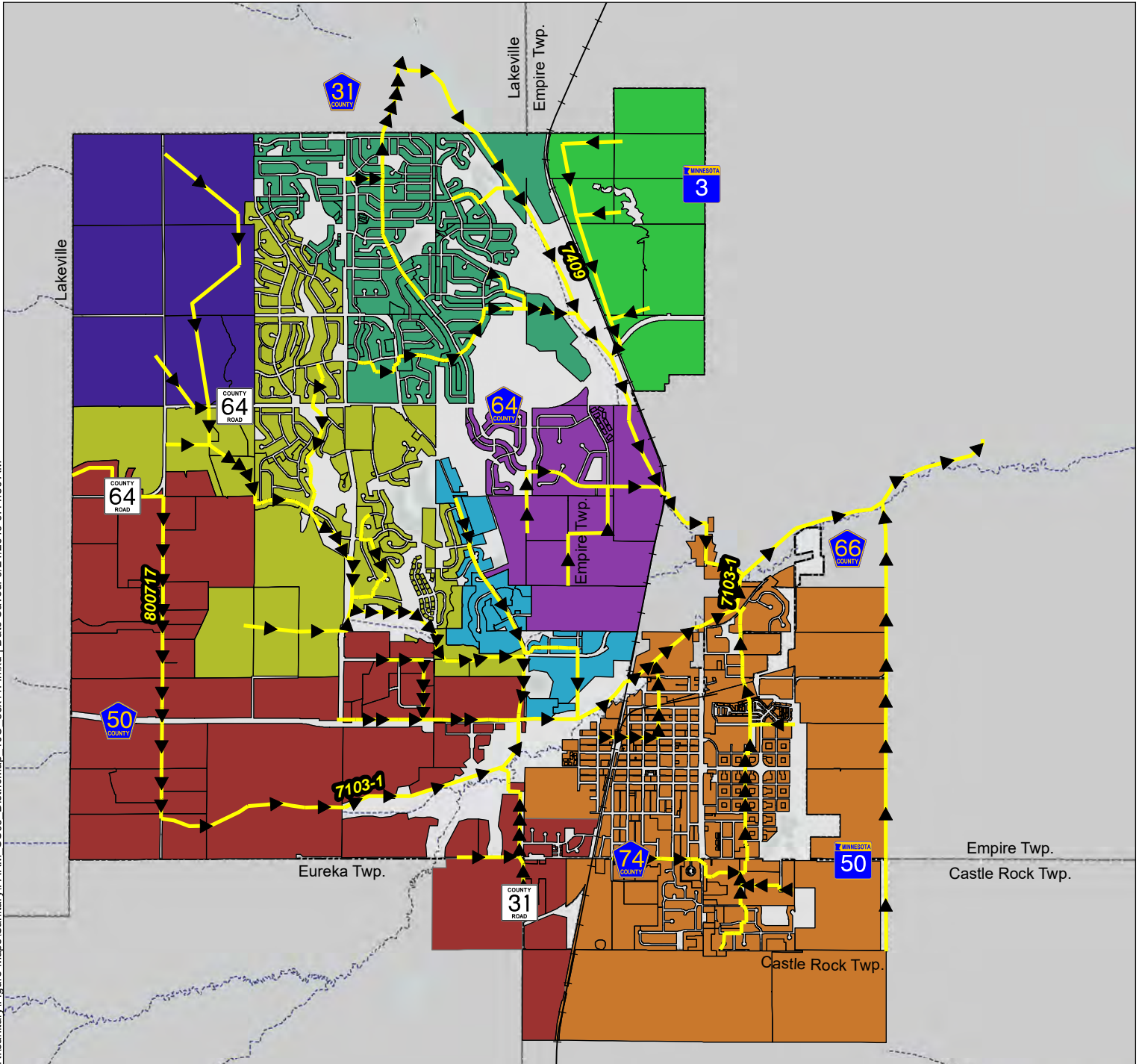
- |              |             |                                    |                    |
|--------------|-------------|------------------------------------|--------------------|
| Agriculture  | Industrial  | Medium Density                     | Park/Open Space    |
| Commercial   | Low Density | Mixed-Use (Commercial/Residential) | Public/Semi-Public |
| High Density | Low Medium  | Non-Designated                     | ROW                |

0 4,000 Feet

Source: MnGeo, State of MN, Dakota County, City of Farmington, MN

Map Document: H:\FARMINGT.Cl.MINT18114157\GIS\ESR\Sanitary\FARM\_SS04\_FutureLU\_85x11P.mxd | Date Saved: 6/21/2019 10:01:32 AM





**Legend**

- City Limits
- Protected Waters - Basins
- Watercourse

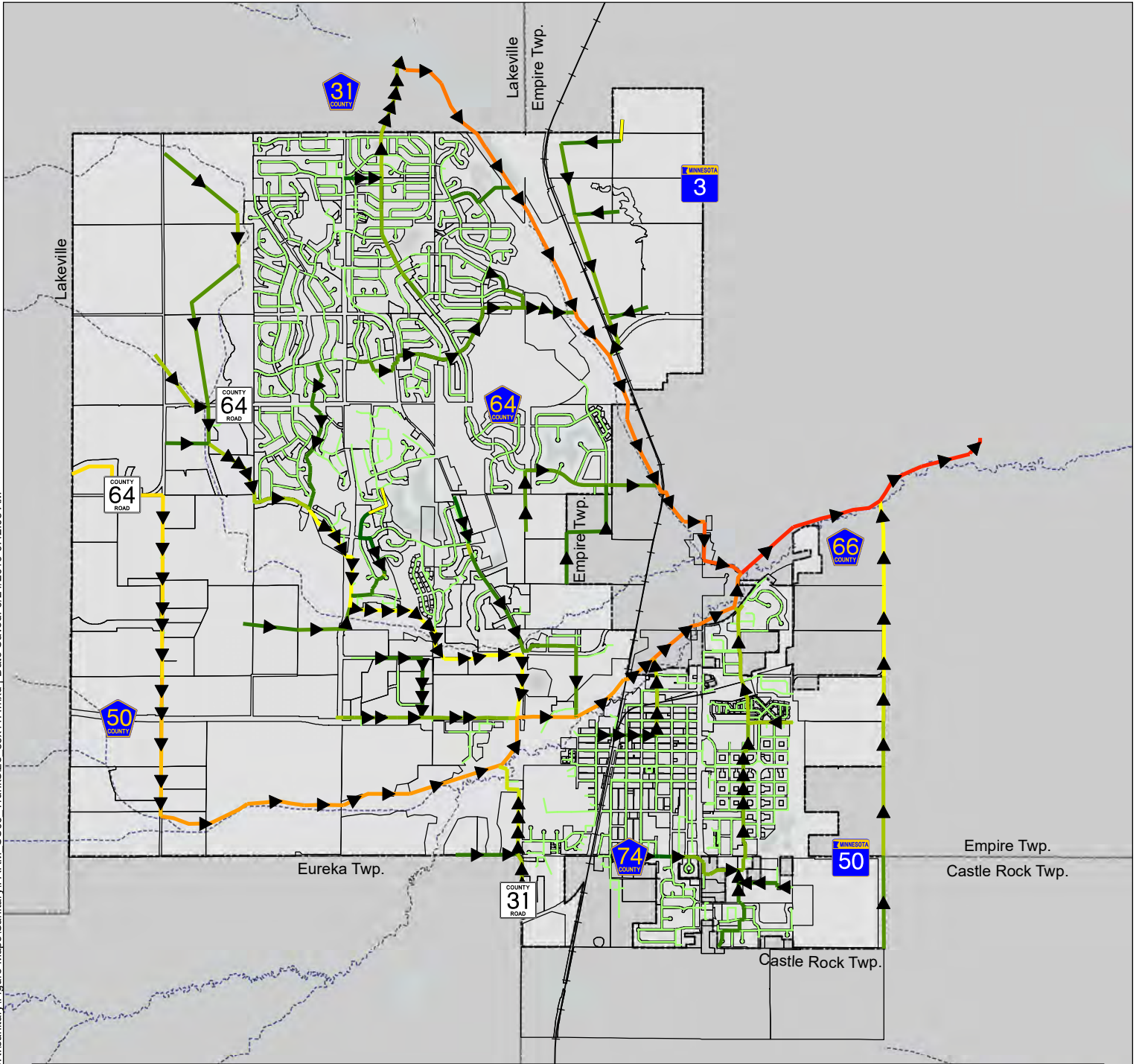
**Future Land Use (2040)**

- Trunk Sewer
- Sanitary District**
- District 1
- District 2
- District 3
- District 4
- District 5
- District 6
- District 7
- District 8

0 4,000 Feet

Source: MnGeo, State of MN, Dakota County, City of Farmington, MN





**Legend**

- City Limits
- Protected Waters - Basins
- Watercourse

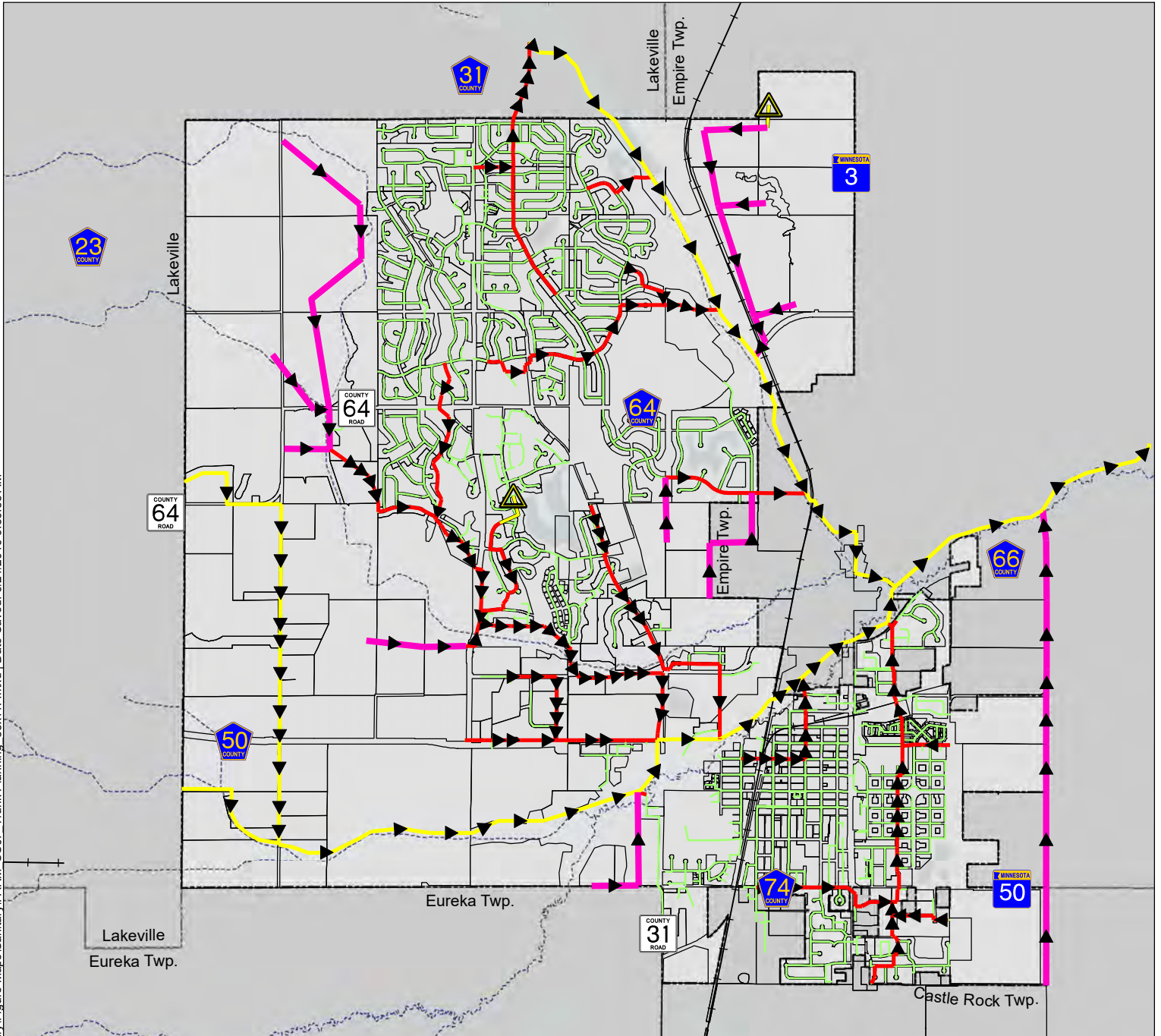
**Future Land Use (2040)**

<b>Pipe Dia (in)</b>						

0 4,000 Feet

Source: MnGeo, State of MN, Dakota County, City of Farmington, MN



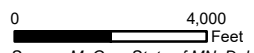


**Legend**

- City Limits
- Protected Waters - Basins
- Watercourse

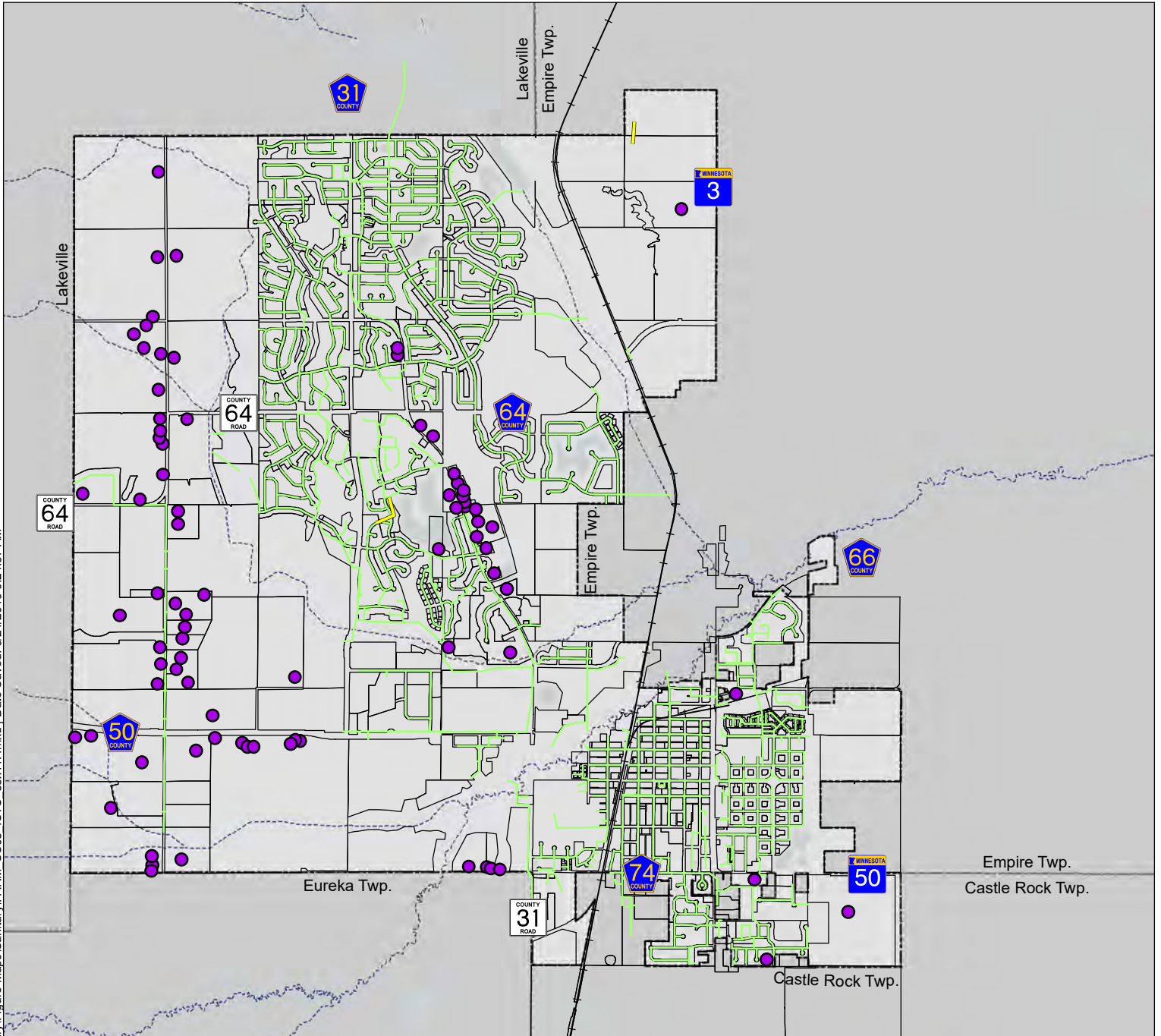
**Future Land Use (2040)**

- Trunk Sewer**
- Existing
  - Force Main
  - Interceptor
  - Proposed
  - Sanitary Sewer
  - Lift Stations



Source: MnGeo, State of MN, Dakota County, City of Farmington, MN

Map Document: H:\FARMINGT.Cl.MINT\18114157\GIS\ESR\Sanitary\Figure Maps\Sanitary\FARM\_SS07\_Trunk\_Planning\_85x11P.mxd | Date Saved: 6/21/2019 9:36:55 AM



**Legend**

- City Limits
- Protected Waters - Basins
- Watercourse

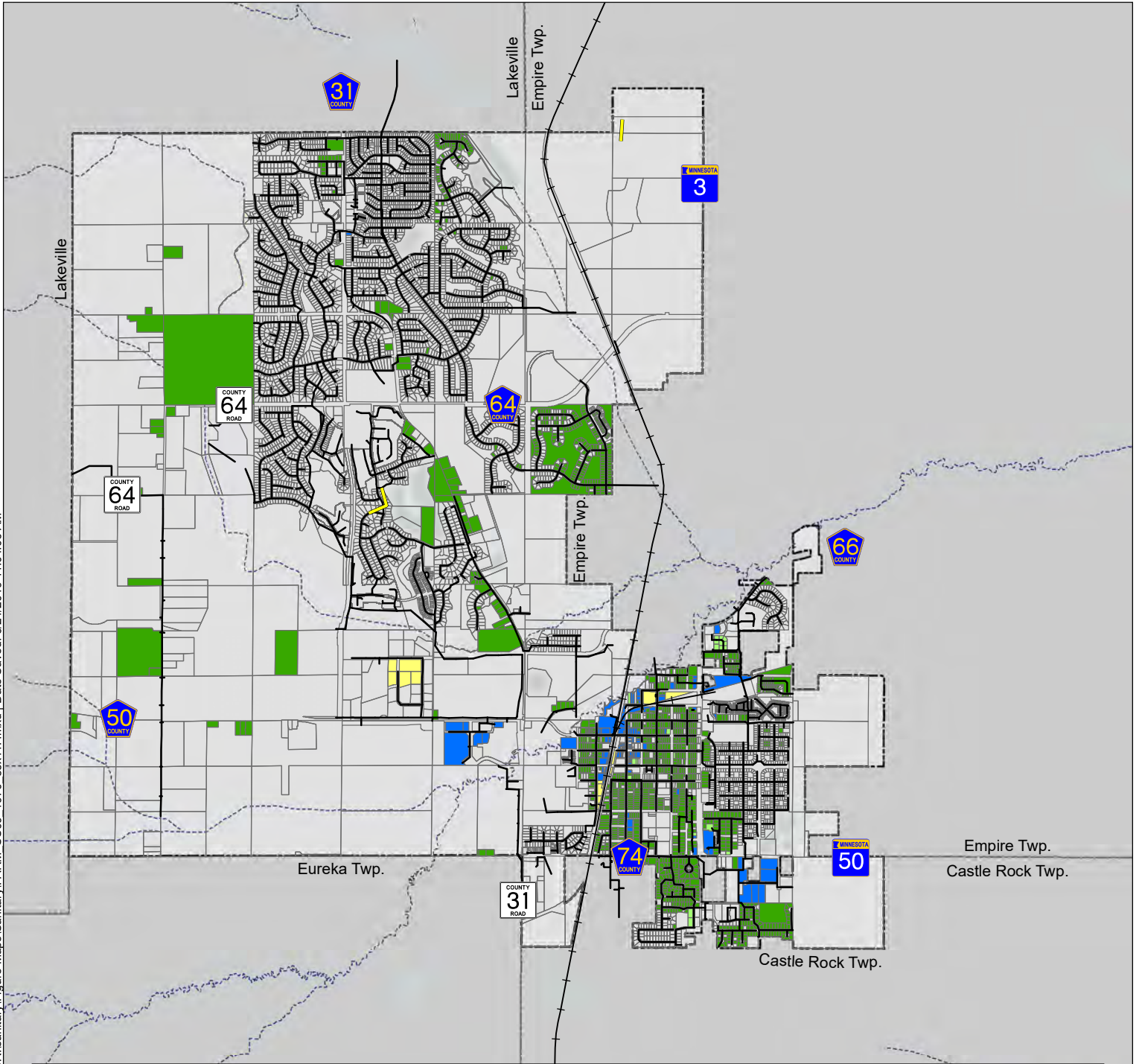
**Sanitary Sewage Systems**

- Septic Systems
- Force Main
- Sanitary Sewer

0 4,000 Feet

Source: MnGeo, State of MN, Dakota County, City of Farmington, MN





**Legend**

- City Limits
- Protected Waters - Basins
- Watercourse

**Future Land Use (2040)**

- Sanitary Sewer
- Force Main
- Post 1970 Parcels
- Pre-1970 Parcels**
- Residential
- Commercial
- Apartment
- Industrial

0 4,000 Feet

Source: MnGeo, State of MN, Dakota County, City of Farmington, MN



## Appendix G: ISTS Ordinance

CHAPTER 3  
DESIGN, INSTALLATION AND MAINTENANCE OF ON-SITE INDIVIDUAL  
SEWAGE TREATMENT SYSTEMS (ISTS)

**7-3-1 DEFINITIONS:**

The following terms in this Chapter shall have the following meanings as set forth below:

**ABANDONMENT:** The permanent and proper termination or decommissioning of an individual sewage treatment system (hereinafter ISTS) or part thereof.

**APPROVED TESTING METHODS:** All those relevant sample collection, preservation, analytical and statistical reporting methods known to accurately and precisely represent physical, chemical, biological and radiological parameters of interest or concern in wastewater or water. Approved testing methods shall be regulatory or consensus standards and shall not be limited to standard methods for examination of water and wastewater (APHA, AWWA, WPCF) methods for chemical analysis of water and waste (EPA) and, where applicable, test methods for evaluating solid waste (SW-846, EPA).

**BAFFLE:** A device installed in a septic tank for proper operation of the tank and to provide maximum retention of solids, and includes vented sanitary tees and submerged pipes in addition to those devices that are normally called baffles.

**COMMERCIAL AND INDUSTRIAL:** Any use of a building or property other than a single-family, duplex or triplex residential dwelling unit.

**CONTAMINANT:** Any physical, chemical, biological, or radiological substance or material in water which tends to degrade the environment by contributing toxicity, constituting a hazard or otherwise impairing its usefulness.

**CONTAMINATION:** The presence of certain infectious or toxic agents or certain hazardous characteristics capable of causing disease or other harm.

**DWELLING:** Any building or portion thereof, which is designed or used exclusively for residential purposes but not including rooms in motels, hotels, nursing homes, boarding houses, or trailers, tents, cabins or trailer coaches.

**FAILED INDIVIDUAL SEWAGE TREATMENT SYSTEM:** A soil treatment system that is allowing sewage, sewage tank effluent, or seepage from the soil treatment system to be discharged to the ground surface, abandoned wells, or bodies of surface water, or into any rock or soil formation the structure of which is not conducive to purification of water by filtration, or into any well or other excavation in the ground. "Failed individual sewage treatment system" also means an individual sewage treatment system that uses cesspools, leaching pits, seepage pits, or systems with less than three feet (3') of unsaturated soil or sand between the distribution device and the limiting soil characteristics.

**GROUND WATER:** Subsurface water in the vadose (unsaturated) and phreatic (saturated) zones occurring naturally in soil and rock formations, whether or not capable of yielding such water to wells, and shall specifically mean that subsurface water present in the saturated zone defined by a perched, free or confined ground water surface.

**HAZARDOUS MATERIALS:** Any substance, which when discarded, meets the definition of hazardous waste in Minnesota Rules 7045.

**HOLDING TANK:** A watertight tank for storage of sewage until it can be transported to a point of approved treatment and disposal.

**IMMINENT THREAT TO PUBLIC HEALTH OR SAFETY:** Situations with the potential to immediately and adversely impact or threaten public health or safety. An imminent threat to public health or safety shall include all ground surface or surface water discharge of wastewater and any systems causing sewage backup into a dwelling or other establishment shall constitute an imminent threat to public health or safety.

**INDIVIDUAL SEWAGE TREATMENT SYSTEM (hereinafter ISTS):** A sewage treatment system or part thereof, serving a dwelling, or other establishment, or group thereof, which uses subsurface soil treatment and disposal, including approved holding tanks.

**MOUND SYSTEM:** A system where the soil treatment area is built above the ground to overcome limits imposed by proximity to water table or bedrock or by rapidly or slowly permeable soils.

**OWNER:** All persons having possession of, control over, or title to an ISTS.

**POLLUTANT:** A contaminant whose form concentration or other attribute in an environmental medium such as soil or water, exceeds established, acceptable criteria and standards prescribed by the Minnesota Pollution Control Agency and, therefore, may be capable of causing disease, injury or death in humans, animals or plants, contributing to the risk thereof, otherwise degrading the environment or creating a public nuisance.

**PUBLIC NUISANCE OR PUBLIC HEALTH NUISANCE:** Defined as in MSA chapter 145A, as amended, and restricted in this Chapter to those conditions in which wastes, wastewaters, sewage, septage, sludge and other releases or related activities contribute to the annoyance or endangerment of persons or the degradation of the environment and which require appropriate prevention, control or abatement to resolve.

**PUMP OR PUMPED:** The removal and sanitary disposal of septage from the septic tank. Removal of septage also includes complete removal of scum and sludge.

**PUMPER OR CERTIFIED PUMPER:** A person or company that has been licensed to pump septic systems.

**RESERVE AREA:** That portion of a property that is designated to be protected from all vehicular traffic, construction and other disturbances to the original, natural soils such that a future wastewater treatment system or device may be constructed meeting all Chapter requirements when the existing primary system or device malfunctions, becomes irreparable or when it fails to comply with this Chapter.

**SECONDARY DISCHARGE:** Those solids and liquids discharged intermittently which are not part of the business; commercial and/or industrial process, including, but not limited to, floor drains and overflow from containment areas.

**SEPTAGE:** Those solids and liquids removed during periodic maintenance of a septic or aerobic tank or those solids and liquids which are removed from a holding tank.

**SEPTIC TANK:** Any watertight, covered receptacle designed and constructed to receive the discharge of sewage from a building sewer, separate solids from liquid, digest organic matter, and store liquids through a period of detention, and allow the clarified liquids to discharge to a soil treatment system.

**SEWAGE:** Any water-carried domestic waste, exclusive of footing and roof drainage, from any industrial, agricultural, or commercial establishment, or any dwelling or any other structure. Domestic waste includes liquid waste produced by toilets, bathing, laundry, culinary operations and the floor drains associated with these sources and specifically excludes animal waste and commercial or industrial waste water.

**SEWAGE TANK:** A watertight tank used in the treatment of sewage and includes, but is not limited to, septic tanks and aerobic tanks.



**SEWAGE TANK EFFLUENT:** Liquid which flows from a septic or aerobic tank under normal operations.

**SOIL TREATMENT AREA:** Area of trench or bed bottom which is in direct contact with the drainfield rock of the soil treatment system. For mounds, it is the area to the edges of the required absorption width and extends five feet (5') beyond the ends of the rock layer.

**SOIL TREATMENT SYSTEM:** A system where sewage tank effluent is treated and disposed of below the ground surface by filtration and percolation through the soil, and includes those systems commonly known as seepage bed, trench, drain field, disposal field and mounds.

**STANDARD SYSTEMS:** An ISTS employing a building sewer, sewage tank, and the soil treatment system consisting of trenches, seepage beds or mounds which are constructed on original soil which has a percolation rate equal to or faster than one hundred twenty (120) minutes per inch.

**WATER TABLE:** The highest elevation in the soil where all voids are filled with water, as evidenced by the presence of water or soil mottling or other information. (Ord. 094-343, 12-19-1994; amd. Ord. 097-389, 2-18- 1997)

### **7-3-2 ADMINISTRATION:**

Standards for installation, maintenance and repair of ISTS are as established herein. Adoption of MPCA Rule 7080 and any subsequent amendments thereto, and Dakota County Environmental Management Department Ordinance 113 and any subsequent amendments thereto, in the most current editions are hereby adopted by reference and shall be part of this Chapter as if set forth herein. (Ord. 097-389, 2-18-1997)

### **7-3-3 HOLDING TANKS:**

Holding tanks conforming to the requirements of this Code are limited to the following installations:

- A. Tanks with a capacity not exceeding two thousand (2,000) gallons may be used for collection of secondary discharge not suitable for on-site treatment.
- B. Replacement of failed ISTS on existing uses when no other means of treatment are possible. (Ord. 094- 343, 12-19-1994)

### **7-3-4 DESIGN OF ISTS:**

In addition to requirements contained within MPCA Rule 7080 and Dakota County Ordinance 113, as amended, all new, rebuilt or otherwise modified ISTS located in the City shall be designed by a person licensed as a site evaluator qualified to design such systems. Said person shall submit proof of certification to the City's Building Inspection Division at the time the ISTS design is submitted for approval. No building permit will be issued until the design is approved by the Building Inspection Division. (Ord. 097-389, 2-18- 1997)

### **7-3-5 INSTALLATION OF INDIVIDUAL SEWAGE TREATMENT SYSTEMS:**

The installation of an ISTS shall occur only at the location approved by the City's Inspection Division. Installation of the system at any other location shall require submission to and approval of revised design and location plans by the City's Building Inspection Division. The system shall only be installed by a

person or company licensed as qualified to install such a system. Failed systems shall be abandoned at the time a new system is installed by pumping the tank, removing the top and bottom, and placing fill material in the tank up to existing grade. (Ord. 094-343, 12-19-1994)

#### **7-3-6 TESTING FOR ISTS DESIGN:**

Prior to approval of any preliminary or final plat, waiver of platting or permit issuance for any and all buildable and existing lots of record in unsewered areas, the landowner shall submit to the City Building Inspection Division the following:

- A. Two (2) separate ISTS site evaluations for both a primary and secondary reserve area sewage/soil treatment system;
- B. A minimum of four (4) soil borings;
- C. Two (2) percolation test results;
- D. A complete site analysis for both the primary and secondary ISTS soil treatment systems per MPCA 7080.0110. Said analysis must show existence of adequate land area for both sites and take into account seasonably saturated soils, soil types and conditions, topographic features, flooding potential and mandatory setback requirements as dictated by City ordinance and applicable State and Federal regulations.

Failure to provide any of the above required information shall be grounds for denial of building and ISTS permits. (Ord. 097-389, 2-18-1997)

#### **7-3-7 PERMIT REQUIRED:**

Subject to Section 7-3-9 of this Chapter, no ISTS shall be used unless the owner of the ISTS has received a permit from the City and the permit is in force and effect.

- A. **Mandatory Pumping; Maintenance Permit:** The owner of every single-family residential sewage tank, septic tank or holding tank shall apply for the tank maintenance permit from the City's Building Inspection Division. The permit shall be issued by the Building Inspection Division only if the following requirements are met:
  1. The owner of the ISTS shows evidence to the Building Inspection Division in the form of a written certificate from the pumper that the septic or sewage tank has been pumped in accordance with subsection 7-3-7(C) of this Section, within twelve (12) months prior to permit application.
  2. The owner of the ISTS shall show evidence to the Building Inspection Division in the form of a written certificate from the pumper on the average pumping frequency and volume of holding tank(s).
  3. The owner of the ISTS or holding tanks pays the required permit fee as set forth from time to time by resolution of the City Council.
- B. **Commercial And Industrial Operational Permit:** The owner of every commercial and industrial ISTS shall apply for an individual sewage treatment system permit from the City's Building Inspection Division. The permit shall be issued by the Building Inspection Division only if the following requirements are met:
  1. The owner of the ISTS shows evidence to the Building Inspection Division in the form of a written certificate from the pumper that the septic or sewage tank has been pumped in accordance with subsection 7-3-7(C) of this Section, within twelve (12) months prior to

permit application.

2. The owner of the ISTS shall show evidence to the Building Inspection Division in the form of a written certificate from the pumper on the average pumping frequency and volume of holding tank(s).
  3. Inspection shall be completed by the City Building Inspection Division to verify water use and suitable effluent quality for on-site treatment. For an increase in discharge rate due to a change of use or building addition, the owner will be responsible to complete an ISTS evaluation to determine capacity of existing system. A permit will not be issued unless the system is capable of handling discharge.
  4. The owner of the ISTS pays the required permit fee as set forth from time to time by resolution of the City Council.
  5. A new operational permit is required when a change of ownership, building use or building addition occurs. (Ord. 094-343, 12-19-1994)
- C. ISTS Maintenance: Upon successful completion of ISTS maintenance per MPCA 7080.0175 and Dakota County Ordinance 113, as amended, the licensed pumper/inspector shall submit a sewage system maintenance log sheet to the Dakota County Environmental Management Department within thirty (30) days with the appropriate County recording fee. The log sheet must be completed in its entirety and all information recorded must be verified in writing by the signature and date of the licensed pumper/inspector completing the maintenance. The log sheet must state the condition of and work done on the following:
1. The sewerage or septic tank(s) has/have been thoroughly pumped by a licensed pumper to remove all solids and scum in accordance with the requirements of Minnesota Rules chapter 7080.0175. Exception: Pumping is not required if a licensed pumper/inspector determines the accumulated sludge and scum layers do not exceed the levels required for pumping per Minnesota Rules chapter 7080.0175.
  2. An ISTS evaluation is completed by the licensed pumper/inspector verifying that the baffles and tank
- D. (s) are in working order and in substantial compliance with Minnesota Rules chapter 7080 and if there is any evidence of ISTS surface discharge or failure. (Ord. 097-389, 2-18-1997)
- E. Duration: The duration of the permit shall be for three (3) years and shall be renewed by the owner again making application to the City for such permit. The permit shall be deemed revoked if the system becomes a failed ISTS. (Ord. 098-419, 12-21-1998)
- F. Relation To Zoning Code: Permits will not be issued if the building or property use is not in conformance with City zoning code. No building permits, variances or conditional use permits shall be issued unless a current maintenance permit has been issued.
- G. Timely Application: If an owner has not obtained the permit as required in subsections (A) through (E) of this Section by the date specified in the City letter of notification, the permit fee shall be doubled. (Ord. 094-343, 12-19-1994)

### **7-3-8 SYSTEMS CAUSING IMMINENT THREAT TO PUBLIC HEALTH AND SAFETY:**

The owner of any ISTS determined or found to be causing or having the potential to cause an imminent threat to public health or safety shall immediately replace, modify or reconstruct the ISTS in conformance with MPCA Rule 7080. (Ord. 097-389, 2-18-1997)

**7-3-9 SCHEDULE FOR INITIAL PERMITS:**

The owners of ISTS shall obtain a maintenance or operational permit as required no later than July 1, 1995. (Ord. 094-343, 12-19-1994)

**7-3-10 LIMITS ON COMMERCIAL AND INDUSTRIAL DISCHARGE:**

No animal waste or commercial wastewater or industrial wastewater shall be discharged on the surface or into the subsurface unless the person allowing or causing the discharge first obtains a State disposal system permit from the Minnesota Pollution Control Agency. Such discharges must comply with the terms and requirements of the State disposal system permit in order to continue. An ISTS that is used for the discharge of animal waste, commercial or industrial wastewater prior to the effective date of this Chapter, may continue to be used for such purposes until such system becomes a failed ISTS or the MPCA orders discontinuance, whichever occurs first; then, in such case, the new installed system must comply with this Chapter. (Ord. 094-343, 12-19-1994)

**7-3-11 FAILED ISTS:**

The City shall inspect all existing ISTS systems within the City within one year of the effective date of this Chapter, and periodically thereafter, to determine compliance with this Section. The owner of a failed ISTS shall replace, modify or reconstruct the failed system within ten (10) months of the inspection, either in conformance with MPCA Rule 7080 and Dakota County Ordinance 113, as amended, or if allowed by the Building Official, in conformance with MPCA Rule 7080.0190. In the alternative, the owner shall permanently discontinue use of a failed system within ten (10) months of the inspection. Upon application by the owner, the City Council may allow the failed system to be used up to one year from Council approval of the application. The City shall not issue a building permit, variance or conditional use permit until the existing ISTS is determined to be in compliance with MPCA Rule 7080 and Dakota County Ordinance 113, as amended. (Ord. 098-419, 12-21-1998)

**7-3-12 PENALTY:**

Violation of this Chapter shall be a misdemeanor. Presentation to the City of any false or intentionally misleading statements, certificates or applications by the owner or by the certified pumpers, or certified designers or installers of ISTS shall also be a misdemeanor. A separate offense shall be deemed committed each day during or upon which a violation occurs or continues to occur. (Ord. 097-389, 2-18-1997)

**7-3-13 INCONSISTENCY:**

If any provision of this Chapter is inconsistent with MPCA Rule 7080 or Dakota County Ordinance 113, as amended, then that provision which is more demanding or provides a greater level of requirements or restrictions, or provides an earlier date of compliance shall prevail and be controlling. If any provision of this Chapter is inconsistent with any City code, then that provision which is more demanding or provides a greater level of requirements or restrictions, or provides an earlier date of compliance shall prevail and be controlling. (Ord. 097-389, 2-18-1997)

## Appendix H: I&I Documentation

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# Infiltration/Inflow Reduction Plan

City of Farmington, MN  
August 2007

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The City of Farmington Sanitary Sewer Infiltration/Inflow Reduction Plan consists of six components. The six components are:

**1. Monitoring wastewater flow in the City system.** The City will continue replacing existing flow meters in the sanitary sewer system at key locations, including replacement of non-functioning flow meters with a modern monitoring system that reduces ongoing maintenance requirements and data recovery. The flow monitoring systems will allow the City to compare City flow data with MCES flow data, and to track flow in areas suspected as having potential for Infiltration/inflow. Monitoring flow data will assist the City in finding problem locations and targeting them for repair.

**2. A sump pump cross connection inspection and removal program.** A major portion of this program will include public education. The sump-pump cross connection and removal plan will consist of a phased structure by structure inspection and verification program. Information regarding the sump pump inspection program, including the City Ordinance requiring the program, sample notice letters, sample details, and a map showing the phasing of the inspections is attached.

**3. A program to investigate known or suspected areas of foundation drains, leaking cleanouts, and leaking services.** This process will include televising sewer mains and some services in targeted areas where sources of infiltration/inflow are suspected. If necessary, secondary investigation techniques such as smoke testing or dye testing may be necessary as part of this component.

**4. A manhole inspection and repair program.** This component of the Plan consists of inspection of every sanitary sewer manhole in the City, identification of leaks and other problems, and completion of repairs. Manhole lids with holes in them will continue to be replaced with solid covers. Approximately 425 manholes will be inspected each year for four years to complete all manhole inspections.

**5. An ongoing sewer cleaning, televising, and repair program.** The City Public Works staff will continue to annually clean and televise sewers. As part of this process, sewers that are identified as needing repair will be addressed through spot repairs or as part of a future CIP, depending on the extent of the repairs needed.

**6. Stringent requirements for new sanitary sewer and home construction.** The final component of the City's I/I Reduction plan will be to eliminate I/I from new construction, through enforcement of current City ordinances. New sewer construction will continue to be pressure tested and televised before it is accepted by the City. In addition, new home construction is required to provide hard plumbing of sump pumps to the outside of the home.

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September 20, 2010

*Environmental Services*

Mr. Kevin Schorzman  
City Engineer  
City of Farmington  
430 Third Street  
Farmington, MN 55024-1355

Re: Metropolitan Council I/I Surcharge Program  
Response to 2011 Work Plan

Dear Mr. Schorzman:

The Metropolitan Council has received and reviewed the information the City submitted regarding its 2011 I/I mitigation plan as outlined in your letter dated September 20, 2010. This work appears to qualify for credits against your 2011 surcharge. The Council will not add a surcharge to the City's wastewater treatment charges for 2011 because of the City's commitment to the I/I mitigation program.

The City's September 20, letter also identified and provided an update on its expected 2010 I/I credit expenses that is formally due to the Council by March 31, 2011. The City's 2010 eligible work credits appear to be in excess of \$17,000. In a letter from the Council to the City, the City was notified that it had a remaining balance of \$9,924 in its total 5-year I/I surcharge through 2009. Therefore, with the submittal of its anticipated 2010 work credits, the City will have completed its total 5-year mitigation plan and will be removed from the Council's I/I surcharge list in 2011.

June 30, 2010 marked the end of the of the exceedance measurement period under the current I/I Program. However, the council will continue to monitor the peak wet weather flows from the City and notify the City of peak I/I events in excess of your goals. The City is responsible for reducing its I/I to within its goals regardless of credits and surcharge amounts.

Consistent with the recommendations of the Demand Charge Task Force the Council will implement an on-going I/I Surcharge program in 2013. Although the City's work plan suggests that the City will have completed its total 5-year mitigation plan under the current program this year, it is important for the City to continue in controlling peak discharges to the system.

If you have any questions, in this regard, please contact Mr. Kyle Colvin of my staff at (651) 602-1151.

Sincerely,



William G. Moore  
General Manager, Environmental Services

cc: Wendy Wulff, Metropolitan Council Member, District 16  
Kris Keller, Staff Engineer, City of Farmington  
Jason Willett, Finance Director, MCES  
Bill Cook, Manager, Engineering Planning Group  
Kyle Colvin, Assistant Manager, Engineering Planning Group



**BOLTON  
& MENK**

Real People. Real Solutions.

2035 County Road D East  
Maplewood, MN 55109-5314

Ph: (651) 704-9970  
Fax: (651) 704-9971  
Bolton-Menk.com

## MEMORANDUM

**Date:** 7/9/2018  
**To:** Katie Gehler, P.E.  
**From:** Jordan Thole, P.E., CFM  
**Subject:** Sanitary Sewer Gage Analysis  
City of Farmington  
Project No.: T18.116107

Ms. Gehler,

Bolton & Menk, Inc. has completed sanitary flow and I & I analysis for the City of Farmington. The results outlined in this memo are based on the dry weather sanitary flow data collected between February 22<sup>nd</sup>, 2018 and June 5<sup>th</sup> 2018. This analysis focused on two key locations which were identified by the City as locations where sanitary sewer capacity was a concern. Location 1 is located on Tamarack Trail and is identified as manhole 618 in the preliminary Comprehensive Sewer Plan (CSP). The second location is at the west end of 208<sup>th</sup> St. W and is identified as manhole 317 in the preliminary CSP.

### Approach

During the studied period, flow data was measured on 15 minute intervals for 102 days to capture the base dry and wet weather flows in the sanitary sewer. The ground remained frozen for several months of the data collection period allowing for a solid dry weather base flow to be determined. The gages were left in place through the end of May in an attempt to capture several rain events after thaw to measure the effects that inflow and infiltration (I & I) had on the existing sanitary sewers.

During the 102 day sample period the City of Farmington experienced 31 precipitation forming storm events, 1 of which produced rains greater than 0.25" of depth. A total of 27 precipitation forming events occurred between May 1<sup>st</sup> and June 5<sup>th</sup>. For this analysis, all flow data collected on or after May 1<sup>st</sup> was analyzed and compared to the dry weather flow days to estimate the effects of I & I on the sanitary sewer. In total, 35 wet weather days were analyzed for both gaging stations.

The data was examined in two stages. First, the hourly low, mean, and peak flows were calculated for both the dry weather dataset and the wet weather dataset. Higher peak flowrates are typically a symptom of direct inflow of storm water while higher average and minimum flow rates are indicative of storm water slowly infiltrating into the sanitary sewer over time. If any evidence of I & I is present, further investigation into an isolated storm event will be completed to calculate the volume of I & I in comparison to a typical dry weather day.

The second analysis consists of comparing the wet weather flows to the typical dry weather diurnal variations. A major shift in the peak arrival times or a change in the amplitude of the peak may indicate that the storm had an effect on the flow patterns in the system.



**Results**

The first analysis of the average flowrates for the gaged data are summarized in Table 1 below. The data set was analyzed for 5 different scenarios detailed below.

1. Full Data – All collected gage data was used to develop the averages
2. No Weekend – Only weekday flowrates were included in this dataset to show a typical “work day” sanitary flow distribution
3. Weekend Only – Only weekend flowrates were included in this dataset to show a typical weekend sanitary flow distribution
4. Dry Weather – This data only includes the flow data recorded from February through April.
5. Wet Weather – This data set includes only the flow data recorded from May and the start of June as 87% of the precipitation forming events occurred in this time frame.

Location 1

The flowrates at location 1 for the wet weather days do significantly change in comparison to the other scenarios, particularly when they are compared only to the dry weather flow data. There is a measurable increase in the minimum, mean, and peak flowrates of the wet weather flow data.

*Table 1 Location 1 - Sanitary Flow Analysis*

<b>Location 1 - Sanitary Flow Analysis</b>					
	Full Data (gpm)	No Weekend (gpm)	Weekend Only (gpm)	Dry Weather (gpm)	Wet Weather (gpm)
Daily Minimum	64.0	68.7	65.0	64.8	82.3
Daily Mean	165.3	160.0	167.7	155.6	183.9
Daily Peak	276.7	260.3	293.5	280.2	297.5

Table 2 below shows that the wet weather average hourly flowrate falls well outside the standard deviation of the dry weather average hourly flow, which furthers the evidence of I & I in the sanitary sewer

*Table 2 Location 1 - Sanitary Flow Statistics*

<b>Location 1 - Sanitary Flow Statistics</b>		
	Dry Weather (gpm)	Wet Weather (gpm)
Average Hourly Flow	155.6	183.9
Standard Deviation	16.4	15.2

The dry weather flow in Figure 1 was estimated using the typical dry weather diurnal curve and average dry weather flow to compare the dry weather flows to the gaged wet weather flows and describe the changes in average hourly flowrate from the daily average flowrate. This figure shows a brief snapshot of the total wet weather data but an increase in base flow is evident after rainfall events indicating that infiltration may be present in the system. There are however no major spikes in flow immediately

Name: I & I Analysis  
Date: 7/9/2018

following rainfall events, indicating that direct inflow into the sanitary sewer is not occurring in any appreciable volumes.

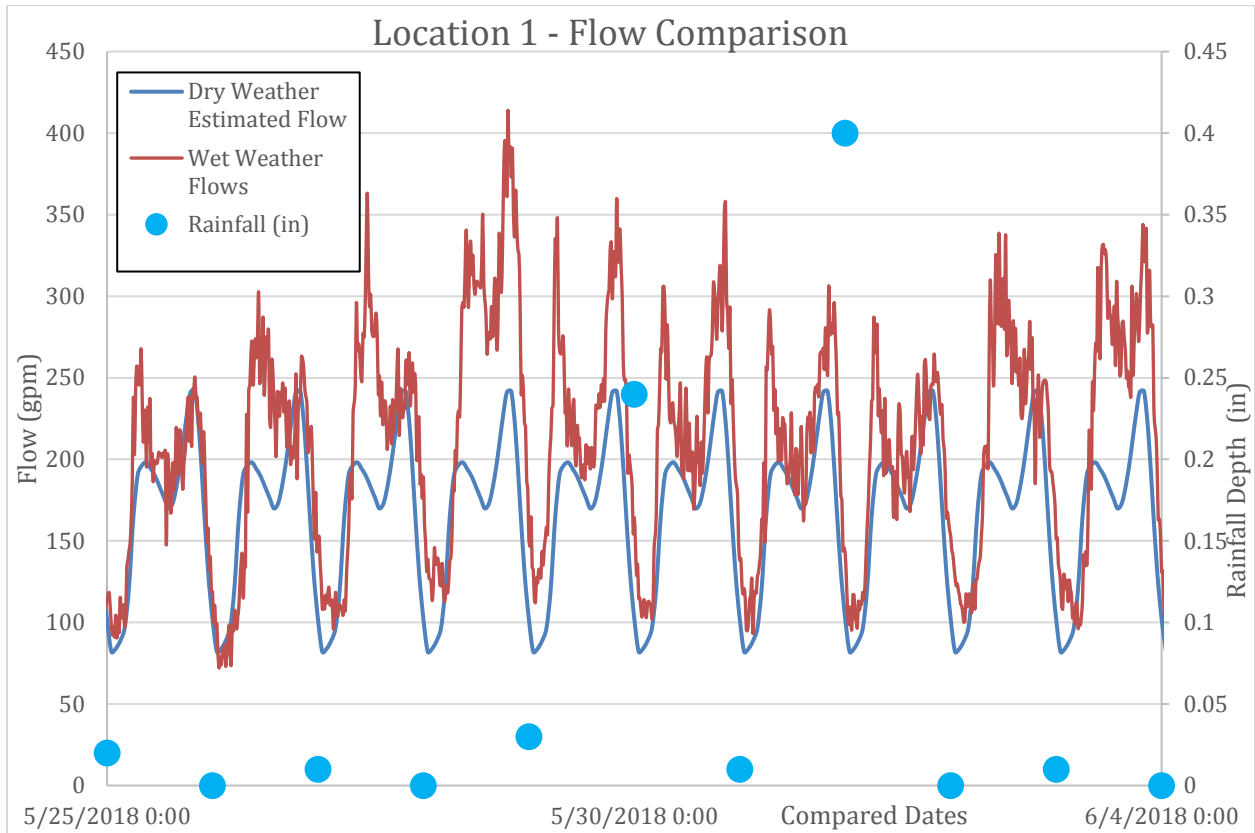


Figure 1- Location 1 Flow Comparison

A full copy of the estimated dry weather flows and the gaged wet weather flows can be found in the attached figures.

Location 2

The flowrates at location 2 for the wet weather days do not significantly change in comparison to the other scenarios. There is no measurable increase in the minimum, mean, and peak flowrates of the wet weather flow data. A comparison for all 5 scenarios in which the data was analyzed can be seen summarized in Table 3.

*Table 3 Location 2 - Sanitary Analysis*

<b>Sanitary Flow Analysis</b>					
	Full Data (gpm)	No Weekend (gpm)	Weekend Only (gpm)	Dry Weather (gpm)	Wet Weather (gpm)
Daily Minimum	45.5	42.0	54.8	46.8	41.7
Daily Mean	174.7	165.9	200.3	175.2	172.7
Daily Peak	364.1	349.8	367.7	363.3	361.9

Table 2 below shows that the wet weather average hourly flowrate is within the standard deviation of the dry weather average hourly flow. This further indicates that the measured rainfall did not have an appreciable impact on the base flows in this section of sanitary sewer.

*Table 4 Location 2 - Sanitary Flow Statistics*

<b>Sanitary Flow Statistics</b>		
	Dry Weather (gpm)	Wet Weather (gpm)
Average Hourly Flow	175.2	172.7
Standard Deviation	18.0	19.2

The dry weather flow in Figure 2 was estimated using the typical dry weather diurnal curve and average dry weather flow to compare the dry weather flows to the gaged wet weather flows and describe the changes in average hourly flowrate from the daily average flowrate. This figure shows a brief snapshot of the total wet weather data. There are no major spikes in flow immediately following rainfall events, indicating that direct inflow into the sanitary sewer is not occurring in any appreciable volumes. The modeled peaks, particularly the morning peaks are lower than the gage data, however the model is based on hourly flowrates while the gage measured on 15 minute intervals. The average hourly flows measured by the gage data closely matches the modeled flowrates and does not indicate the presence of I & I.

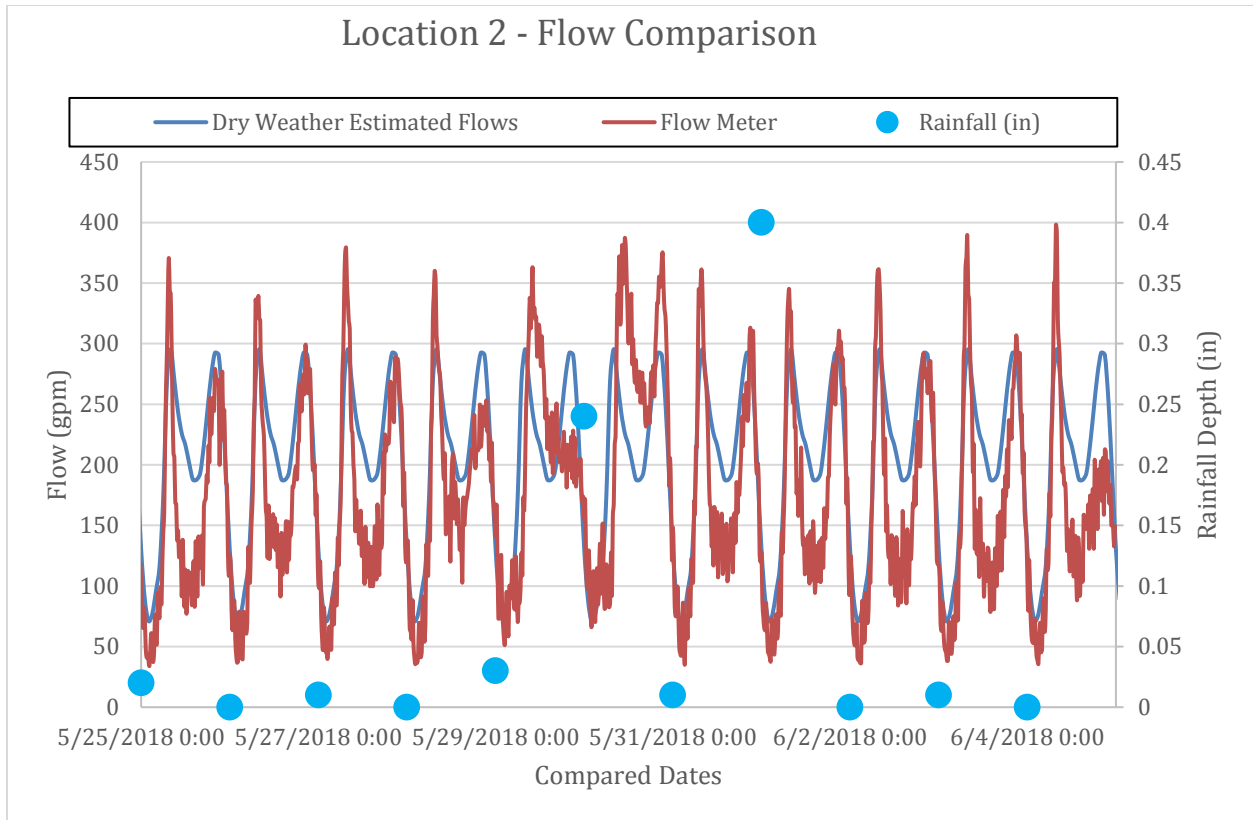


Figure 2 - Location 2 Flow Comparison

A full copy of the estimated dry weather flows and the gaged wet weather flows for Location 2 can be found in the attached figures.

## Conclusions

Upon reviewing the results of the analysis, there is evidence of I & I derived flows in Location 1. There are no substantial spikes in flow that can be attributed to direct inflow into the system, however since no rain events exceeded 0.5" it may be possible that there was not enough runoff for the flow to appear in the system and further analysis may be required. The increased base flows at Location 1 are most likely attributed to seepage and infiltration into the sanitary sewer and increased the base flows by nearly 20% during the month of May.

The 18" sanitary sewer downstream of manhole 618 has a maximum full flow capacity of approximately 1100 gpm. The highest recorded flowrate occurred on May 28<sup>th</sup> (Memorial Day) with a peak flow of 414 gpm. The average peak wet weather flow was calculated at 298 gpm. Given these results, despite the presence of I & I the sanitary sewer at this location is not nearing its recommended full capacity.

In Location 2, there is no evidence indicating that I & I noticeably affects the sanitary flowrates. The wet weather flows fall well within the standard deviation of the dry weather flows and the wet weather flows do not substantially deviate from the typical dry weather daily variations.

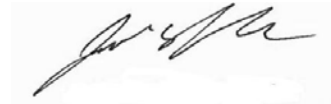
The 24" sanitary sewer directly upstream of manhole 317 has a full flow capacity of approximately 2780 gpm. The highest recorded flowrate in the pipe was recorded on April 1<sup>st</sup> with a peak flow of 412 gpm. The highest average peak flows occurs in the weekend only distribution and has a peak of approximately

Name: I & I Analysis  
Date: 7/9/2018

367 gpm. Given these results, the sanitary sewer at manhole 317 is not nearing its recommended full flow capacity at this time.

If you have any questions or comments please feel free to contact me at your earliest convenience at (612) 751-8804 or by email at [Jordanth@bolton-menk.com](mailto:Jordanth@bolton-menk.com).

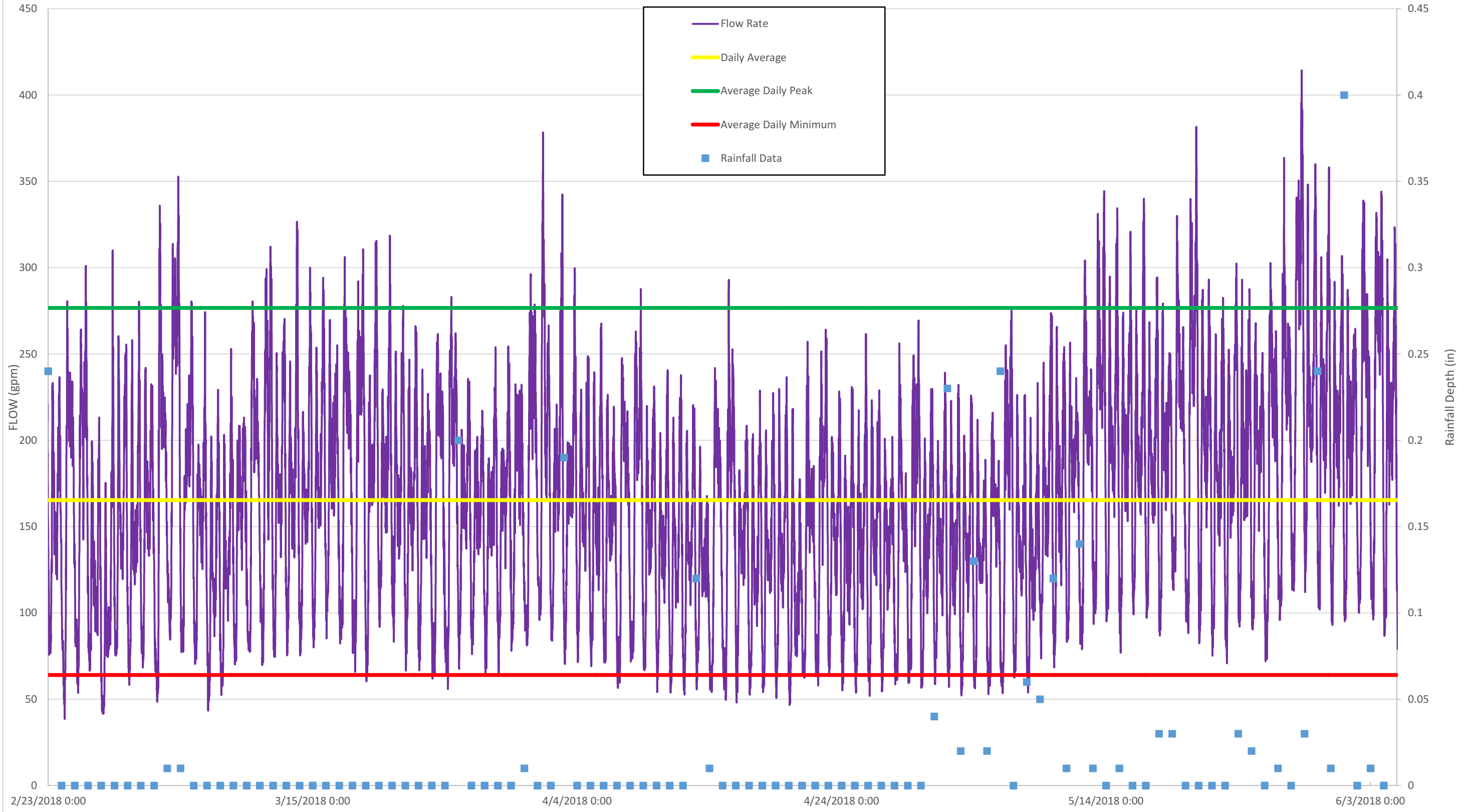
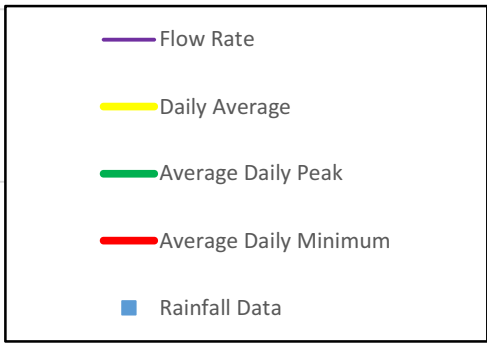
Sincerely,

A handwritten signature in black ink, appearing to read "Jordan Thole", is centered on a light gray rectangular background.

**Jordan Thole, PE, CFM**

Water Resource Design Engineer

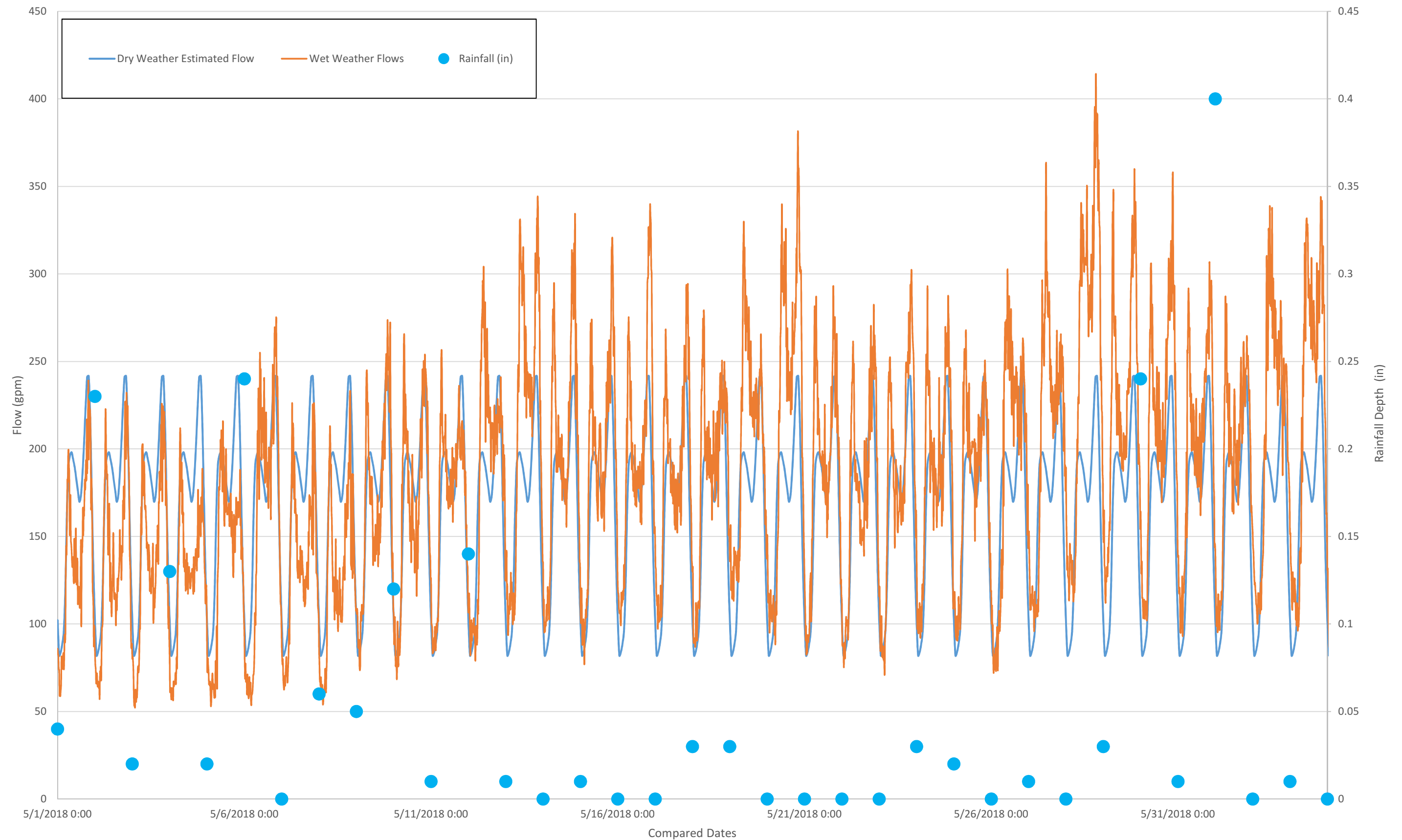
### Location 1 - Raw Gage Data



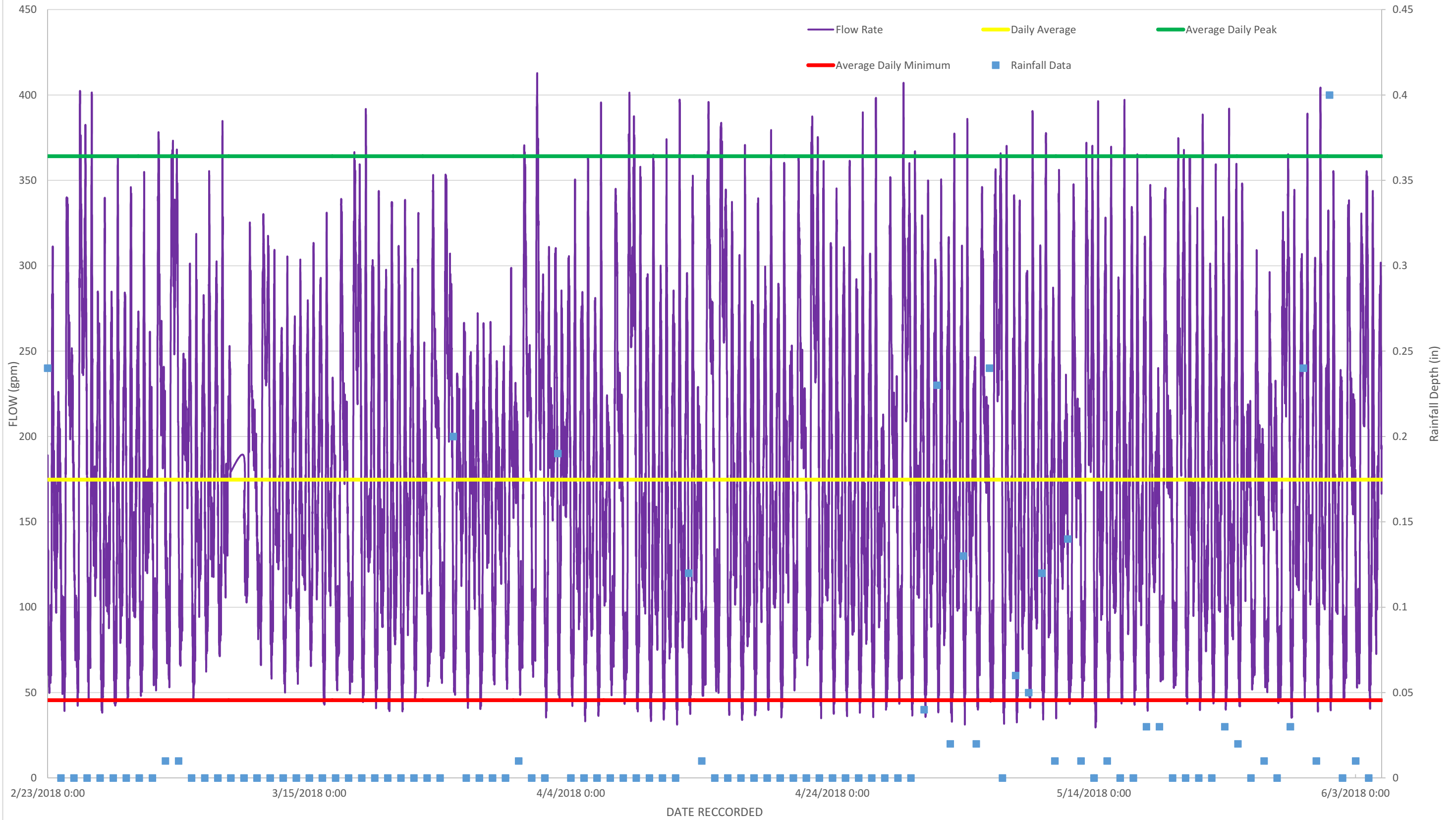
2/23/2018 0:00 3/15/2018 0:00 4/4/2018 0:00 4/24/2018 0:00 5/14/2018 0:00 6/3/2018 0:00

DATE RECORDED

Location 1 - Flow Comparison

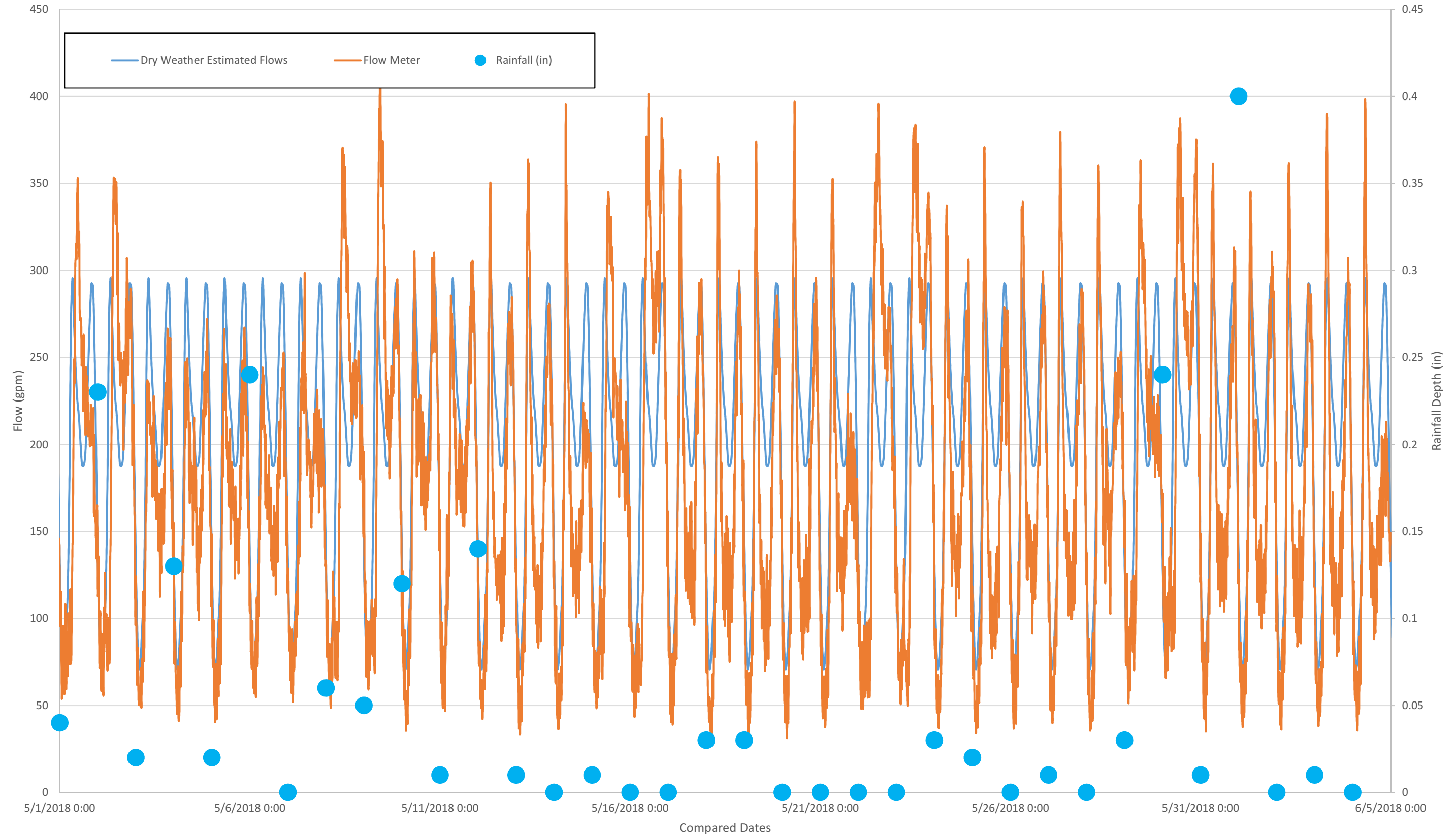


### Location 2 - Raw Gage Data





Location 2 - Flow Comparison



## Appendix I: Sanitary Sewer Ordinances

## Chapter 2

# SEWER SYSTEM

### **8-2-1: ESTABLISHMENT OF DEPARTMENT:**

There is hereby established the city utilities department. The sanitary sewer systems as they are now constituted or shall be hereafter enlarged or extended shall be operated and maintained under the provisions of this chapter subject to the authority of the council at any time to amend, alter, change and repeal the same. (Ord. 172, 5-5-1969)

### **8-2-2: COUNCIL TO MANAGE SYSTEM:**

The council shall have charge and management of the sanitary sewer system, subject to such delegation of their authority to other city employees as the council shall provide. (Ord. 172, 5-5-1969)

### **8-2-3: UTILITIES SUPERVISOR:**

For the purposes of this chapter, the "utilities supervisor" is defined as either the city engineer or the municipal services director. (Ord. 015-695, 3-16-2015)

### **8-2-4: APPLICATION, PERMITS AND FEES:**

No person shall make any type of connection to, repair of, or alteration in the sanitary sewer system except after making an application on a form provided by the city and receiving a permit issued by the city. The application shall include the legal description of the property to be served, the uses for which the connection is requested and the size of the service line to be used.

The utilities supervisor shall examine all applications before a permit is issued; and after the construction, enlargement, alteration or repair is complete the utilities supervisor shall be notified. It shall be unlawful to cover any connecting line until an inspection has been made and such connection and the work incident thereto has been approved by the utilities supervisor as a proper and suitable connection.

No permit shall be issued and no connection shall be made with respect to any sanitary sewer serving the property of any person or occupants of the land, parcel or premises affected that have not paid or provided for the payment of the current installment of any special assessment thereon.

All connection costs and charges, permit fees and user charges, together with the method of payment therefor, shall be established by the council from time to time, within the discretion of said council. (Ord. 172, 5-5-1969)

### **8-2-5: PRIVATE SEWER SYSTEM UNLAWFUL:**

It shall be unlawful for any person to install a private or community sanitary sewer system within the city limits except in cases where the public sanitary sewer system is not accessible to the premises where such private systems are requested. To determine whether or not such public sanitary sewer system is available for connection each person or corporation desiring to install a private or community sanitary sewer system must first make application for connection to a public system. Upon determination of the utilities supervisor that it is not feasible to connect the applicant's premises to the public sanitary sewer system then the applicant shall be granted a permit to install a private sanitary sewer system.

All properties using a private or community sewer system in the city shall connect to the public sanitary sewer system of the city within two (2) years after the time that said system is available to the property. (Ord. 094-336, 8-15-1994)

### **8-2-6: CONNECTION REQUIREMENTS:**

All new service pipes connected to the public sanitary sewer system shall be a type approved by the city engineer; however, under no circumstances shall such connection pipes be orangeburg pipe or shall the thickness of the pipe casing be less than one-eighth ( $\frac{1}{8}$ ) of an inch. Each principal use shall be connected separately to the public sanitary sewer system. Existing connection pipes shall be brought into compliance with this section upon the repair, alteration or replacement. (Ord. 015-695, 3-16-2015)

### **8-2-7: INSTALLATIONS OF CONNECTIONS:**

All connections to the sanitary sewer system shall be performed by a plumber licensed to do plumbing by the state; except that nothing in this chapter shall be construed to prohibit an individual owner from obtaining a permit and installing such connection by his own labor; provided, however, that said construction is conducted under the regulations of this chapter and requirements of the city engineer and the utilities supervisor. (Ord. 172, 5-5-1969)

### **8-2-8: PROHIBITING DISCHARGES INTO THE SANITARY SEWER SYSTEM AND PROVIDING PENALTIES FOR VIOLATIONS THEREOF:**

(A) Purpose: In adopting this section, the city council finds that the discharge of water from any roof, surface, groundwater sump pump, footing tile or swimming pool or other natural precipitation into the city sewer system will, and has on numerous occasions in the past, flooded and overloaded the sewer system to such an extent as to cause significant and grave damage to the property of large numbers of city residents. Such damage is caused by the backup of sewage into the living quarters of residents and in addition to other damage, creates a hazard to health. The city council, therefore, finds it essential to the maintenance of health, to the minimization of damage to property and to meet Minnesota pollution control agency and metropolitan council regulations, that the provisions of this section be strictly enforced to avoid emergencies in the future. (Ord. 015-695, 3-16-2015)

(B) Definition And Method: No water from any roof, surface, groundwater sump pump, footing tile, swimming pool or other natural precipitation shall be discharged into the sanitary sewer system.

Dwellings and other buildings and structures which require, because of the infiltration of water into basements, crawl spaces and the like, a sump pump discharge system shall have a permanently installed discharge line which shall not at any time discharge water into the sanitary sewer system, except as provided herein. A permanent installation shall be one which provides for year round discharge capability to either the outside of the dwelling, building or structure, or is connected to the city storm sewer or discharges through the curb and gutter to the street. It shall consist of a rigid discharge line, without valving or quick connections for altering the path of discharge, and if connected to the city storm sewer line, include a check valve and an air gap located in a small diameter structure as shown in the city's standard plates. (Ord. 093-309, 6-21-1993)

(C) Disconnection: All connections from a roof, surface, groundwater sump pump, footing tile or swimming pool now connected and/or discharging into the sanitary sewer system were to be disconnected prior to August 15, 1993. Future connections were and are prohibited. (Ord. 015-695, 3-16-2015)

(D) Inspection: Every person owning improved real estate that discharges into the city's sanitary sewer system shall allow an employee of the city or their designated representative to inspect the buildings to confirm that there is no sump pump or other prohibited discharge into the sanitary sewer system. In lieu of having the city inspect their property, any person may furnish a certificate from a licensed plumber certifying that their property is in compliance with this section.

Any person refusing to allow their property to be inspected or refusing to furnish a plumber's certificate within fourteen (14) days of the date city employee(s) or their designated representatives are denied admittance to the property, shall immediately become subject to the surcharge hereinafter provided for. Any property found to violate this section shall make the necessary changes to comply with this section and furnish proof of the changes to the city by August 15, 1993. (Ord. 093-309, 6-21-1993)

(E) Future Inspections: Each sump pump connection identified may be reinspected on a yearly basis. (Ord. 015-695, 3-16-2015)

(F) New Home Inspections: All new homes shall be required to have their sump pump system inspected within thirty (30) days of occupancy and a certificate of compliance completed.

(G) Penalty: A surcharge of one hundred dollars (\$100.00) per month is hereby imposed and added to every sewer billing mailed on and after August 15, 1993, to property owners who are not in compliance with this chapter. The surcharge shall be added every month until the property is in compliance. The surcharge shall continue to be levied monthly on properties not complying with this chapter. All properties found during yearly reinspection to have violated this chapter shall be subject to the one hundred dollars (\$100.00) per month penalty for all months between the two (2) most recent inspections. (Ord. 093-313, 8-16-1993; amd. Ord. 094-334, 8-1-1994)

## **8-2-9: EXCAVATION AND REPAIR WORK:**

All installation work or repairs of connections to the sanitary sewer system including grades, bends and backfilling shall be performed under the direction and supervision of the utilities supervisor. No work shall be covered or backfilled until directed by said supervisor. All work and excavations shall be protected by barricades and warning markers and lights reasonable and suitable to the purpose. The

city shall be held harmless of any claim or loss that might arise for damage, loss or injury caused by or arising by reason of such work being performed; and the applicant causing such work to be done shall give undertaking to the city with respect hereto.

No digging in a permanent type street shall be permitted except by special permission from the city, and upon posting of such security as may be required for the replacement of said street. (Ord. 172, 5-5-1969)

### **8-2-10: RIGHT TO ENTER LAND:**

The city by any authorized employee or agent shall have the right to enter and be admitted to any lands and property in the city for purpose of inspection of materials, plumbing work and fixtures of all kinds used by or in connection with the sanitary sewer systems. (Ord. 172, 5-5-1969)

### **8-2-11: SEWER CONNECTIONS PROHIBITED:**

It shall be unlawful for any person to make or have made on his behalf any connection to the city sewer system in the city for the purpose of, or resulting in, connecting property not then within the boundaries of the city to the city sewer system. (Ord. 157, 9-1-1965)

### **8-2-12: SEWER RENTAL CHARGES:**

Charges for use of the city utility system shall be established and billed for as provided in [chapter 12](#) of this title. (Ord. 013-659, 3-4-2013, eff. 4-1-2013)

### **8-2-13: SEWER OPERATIONS FUND:**

All funds received from the collection of the charges or rentals authorized by this chapter and all funds received from charges provided in contracts with special users of said sewer system, shall be deposited as collected in a fund designated as the sewer operations fund and disbursed from said fund to meet the cost of operating and maintaining the sewage disposal plant and the facilities connected therewith. (Ord. 015-695, 3-16-2015)

# APPENDIX E. JOINT POWERS AGREEMENT, EMPIRE TOWNSHIP, 2000

**JOINT RESOLUTION NO. 2000-1  
TOWN OF EMPIRE AND CITY OF FARMINGTON  
DAKOTA COUNTY**

**A JOINT RESOLUTION PROVIDING FOR ORDERLY  
ANNEXATION AND THE EXERCISE OF JOINT POWERS**

**WHEREAS**, Empire Township (the "Township") and the City of Farmington (the "City") desire to plan appropriately for growth and development in each community; and to provide for the efficient delivery of public services to residents of both political subdivisions, and

**WHEREAS**, the Township and City acknowledge it is in the best interests of the residents of each community to work cooperatively in the planning and development of the areas abutting the common borders of the communities and to align and/or realign services as necessary to provide for the efficient delivery of public services to areas affected by boundary adjustments, and;

**WHEREAS**, certain areas shown on Exhibits A and B attached hereto, which exist in the Township currently have Sanitary Sewer service provided by the Township, but no municipal water, and;

**WHEREAS**, as a result of a new development to be undertaken in the City, known as the Tamarack Development, it is possible that the wells used by the owners of property on Exhibits A and B may experience well failure, necessitating the installation of municipal water, and

**WHEREAS**, due to the location of existing municipal water lines, it is less expensive to provide municipal water for land shown on Exhibits A and B from the City than from the Township, and

**WHEREAS**, Minn. Stat. §414.033 authorizes orderly annexation agreements, and Minn. Stat. §471.59 authorizes two or more governmental units to enter into agreements to jointly or cooperatively exercise any power common to the contracting parties or any similar power

**WHEREAS**, the governing boards of both the Township and the City have concluded that, following annexation of the properties, continued



sanitary sewer service to the affected area can best be accomplished through the cooperative and joint efforts of the Township and the City

**NOW, THEREFORE, BE IT RESOLVED**, the Township and City agree to the following terms and conditions:

1. The Township and City hereby establish an Orderly Annexation Area ("OAA") as authorized by Minnesota Statute §414.0325, Subdivision 1, as shown on the attached Exhibit A and legally described on Exhibit B.
2. Properties located within the OAA, shown on Exhibit A and described in Exhibit B, shall be immediately annexed to the City without contest by the Township upon adoption of this joint resolution and filing with the State of Minnesota, Office of Strategic and Long-Range Planning, as provided by law.
3. Upon approval by the respective governing bodies of the City and the Township, this joint resolution and agreement shall confer jurisdiction upon the State of Minnesota, Office of Strategic and Long-Range Planning so as to accomplish the orderly annexation of the lands shown on the attached Exhibit A and legally described on Exhibit B in accordance with the terms of this joint resolution and agreement.
4. The City and the Township mutually state that no alteration by the Office of Strategic and Long-Range Planning to the OAA boundaries, as shown on Exhibit A and described in Exhibit B, is appropriate or permitted.
5. The City and the Township mutually state that the annexation will not affect electric service delivery, and that the current population of the affected area is approximately 15 persons.
6. Pursuant to Minn. Stat. §414.035 the Parties have determined the tax rate of the City on the area annexed shall be increased in substantially equal proportions over not more than six years to equality with the tax rate on the property already within the City. The appropriate period, if any, shall be based on the time

reasonably required to effectively provide full municipal services to the annexed area.

7. Pursuant to Minn. Stat. §414.036, upon annexation the City shall reimburse the Township for the taxable property annexed as part of this proceeding in accordance with the procedures specified in Minn. Stat. §414.033, Subd. 12. Property taxes payable on the annexed land shall continue to be paid to the affected town or towns for the year in which the annexation becomes effective. If the annexation becomes effective on or before August 1 of a levy year, the municipality shall levy on the annexed area beginning with that same levy year. If the annexation becomes effective after August 1 of a levy year, the town may continue to levy on the annexed area for that levy year, and the municipality may not levy on the annexed area until the following levy year. In the first year following the year when the municipality could first levy on the annexed area under this subdivision, and thereafter, property taxes on the annexed land shall be paid to the municipality. In the first year following the year the municipality could first levy on the annexed area, the municipality shall make a cash payment to the affected town or towns in an amount equal to 90 percent of the property taxes distributed to the town in regard to the annexed area in the last year the property taxes from the annexed area were payable to the town; in the second year, an amount equal to 70 percent; in the third year, an amount equal to 50 percent; in the fourth year, an amount equal to 30 percent; and in the fifth year, an amount equal to ten percent. The municipality and the affected township may agree to a different payment.
8. The Parties agree that, upon annexation of the lands shown on the attached Exhibit A and legally described on Exhibit B ownership of all public utilities serving those lands shall transfer from the Township to the City without further action or consideration. The City shall thereafter assume all ownership and responsibility for the repair, maintenance and upgrade of the public sanitary sewer facilities serving those properties in the annexed area. The sanitary sewer facilities to be transferred to the City shall be the sanitary sewer line Manhole 158 in TH 3

to and including Manhole 156 at 209<sup>th</sup> and Cantata Avenue (Manhole numbering per record plans of Empire Township dated March 2000.) The Township will retain ownership and maintenance responsibility for Manhole 158, but the City agrees to reimburse the Township fifty percent (50%) of the maintenance, repair, and replacement costs of Manhole 158 at TH 3 upon submittal of a bill by the Township to the City and audit by the Council.

9. The City has examined the Sanitary Sewer Facilities to be transferred to the City as described in 8 above and finds them to be in proper working order. The City agrees that it shall hold the township harmless for all future costs of repair, maintenance and upgrade of those Sanitary Sewer Facilities to be transferred to the City as described in 8 above. The City agrees not to charge or assess any of the property owners of the land shown on the attached Exhibits A and B for the Sanitary Sewer Facilities to be transferred to the City, except for future repair, maintenance, replacement and/or upgrade of them.
10. The Parties further agree that the City may continue the existing connection of the affected properties to the Township sanitary system. The Township shall bill the City for sanitary sewer service on the same basis as other customers, and the City shall bill the owners of the properties so served based on the City sanitary sewer charges.
11. Having designated the area illustrated on Exhibit A and described in Exhibit B as in need of orderly annexation, and having provided for all of the conditions of its annexation within this document, the parties to this agreement agree that no consideration by the Office of Strategic and Long-Range Planning is necessary.
12. The parties may amend this joint resolution by mutual consent at any time.

Approved and Adopted  
this 7 day of July, 2000.

**EMPIRE TOWNSHIP**

*De Stasio*  
Chair

*Karen McEwen*  
Clerk

Approved and Adopted  
this 17<sup>th</sup> day of July, 2000.

**CITY OF FARMINGTON**

*Deirdre Quinlan*  
Mayor

*Robin Kead*  
*acting* Administrator



# City of Farmington

325 Oak Street, Farmington, MN 55024  
(651) 463-7111 Fax (651) 463-2591  
[www.ci.farmington.mn.us](http://www.ci.farmington.mn.us)

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TO: Mayor and Council Members  
FROM: John F. Erar, City Administrator  
SUBJECT: Approve Joint Powers Agreement - Empire Township (Revised)  
DATE: July 17, 2000

## INTRODUCTION

At the July 3, 2000 Council meeting, Council approved an Orderly Annexation Agreement with Empire Township for properties located on the southside of 209<sup>th</sup> Street that will be receiving City water services.

## DISCUSSION

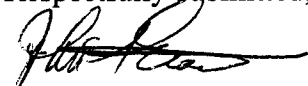
Staff attended the Empire Township Board meeting on July 11, 2000 to address any issues that the township had with the agreement. At this meeting, the Township Board's attorney had made several suggestions to the agreement that were relatively minor in scope, but appropriate in terms of the orderly annexation of the properties in question. In addition, it was suggested by the Township attorney that a separate provision be inserted to address liability issues associated with the transfer of ownership of the sanitary sewer line. This provision has been reviewed by the City Attorney and he concurs that these changes do not negatively affect the City's interests.

With respect to the two properties located on Highway 3, the City has received confirmation that only one of the two properties contacted desires water services at this time. In review, ownership of only a portion of the total line that services properties in two separate jurisdictions requires additional study and analysis relative to long-term maintenance, future repair and liability issues associated with having one service line being utilized by properties in two separate jurisdictions. Accordingly, staff will need to prepare a more in-depth analysis of this situation, along with additional discussions with Empire Township before making a final recommendation to Council. Consequently, the revised joint powers agreement does not include either of the two properties at this time.

## ACTION REQUESTED

Approve the revised joint powers agreement as presented. Empire Township has indicated that they will act on the agreement at their July 25, 2000 Board meeting.

Respectfully submitted,

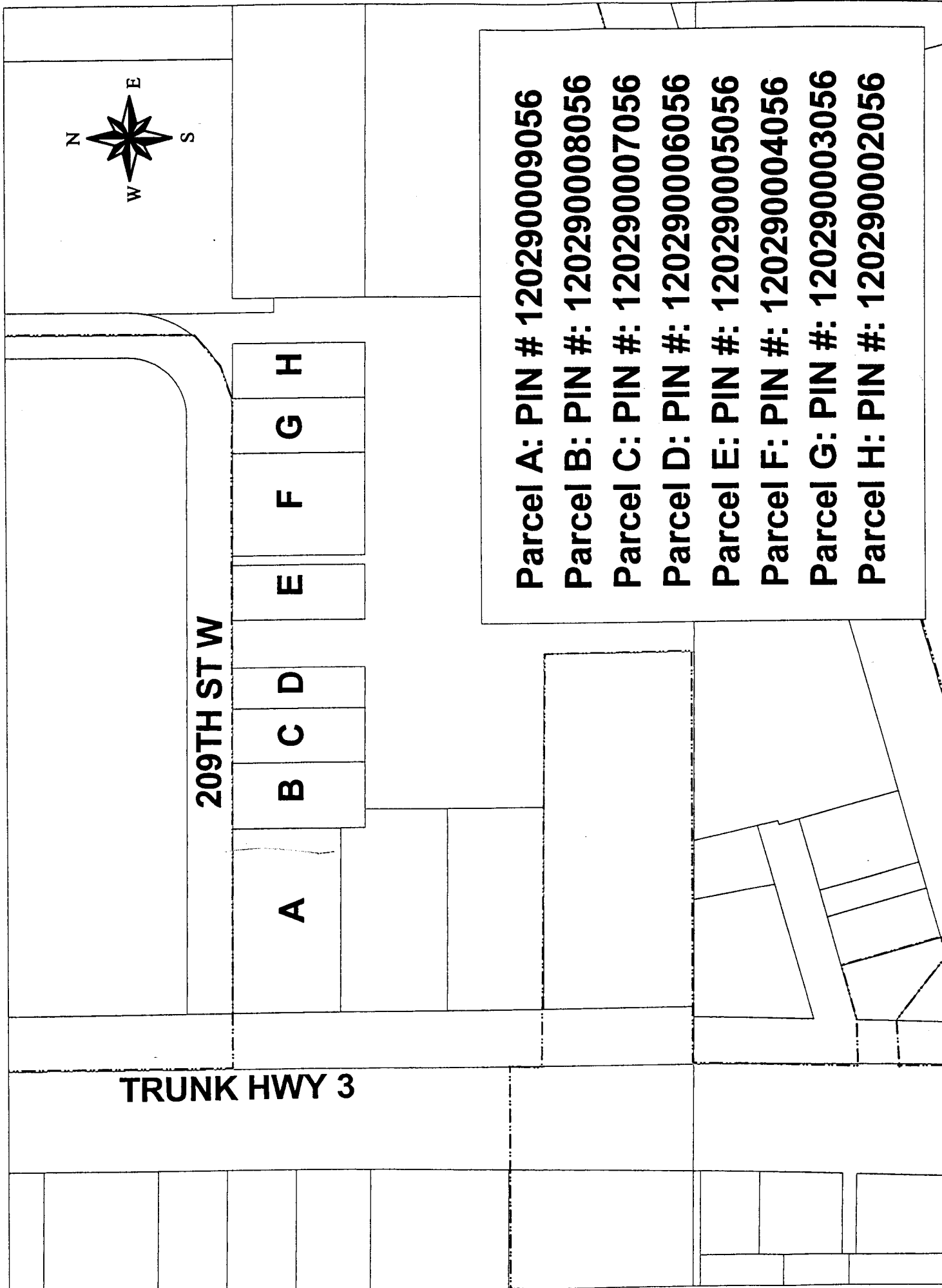


John F. Erar

Cc: Empire Township Board  
Empire Township Clerk  
Ron Roetzel, Township Engineer, Bolton & Menk, Inc., 1515 East Highway 13, Burnsville, MN  
55337-6857  
John Ophaug, Township Attorney Schmitx, Ophaug and Dowd, P.O. 237, 220 Division Street,  
Northfield, MN 55057

file

# 209th Street Anne tion Properties



**EXHIBIT "B"****Parcel A -- PIN #120290009056**

The West Three Hundred Fifty-three feet (353') of the North One Hundred Fifty-five feet (155') of the South Six Hundred Sixty-five feet (665') of the South Half of the Southwest Quarter of Section Twenty-nine (29), Township One Hundred Fourteen (114), Range Nineteen (19), according to the Government Survey thereof, Dakota County, Minnesota.

*(Torrens Property)*

**Parcel B -- PIN #120290008056**

All that part of the West Four Hundred Forty-nine and two-tenths feet (449.2') of the North One Hundred Ninety feet (290') of the South Six Hundred Sixty-five feet (665') of the South Half of the Southwest Quarter of Section Twenty-nine (29), Township One Hundred Fourteen (114), Range Nineteen (19), excepting the West Three Hundred Fifty-three feet (353') thereof, all according to the Government Survey thereof, Dakota County, Minnesota. (The foregoing being measured from the monument designating the Southwest corner of said section as described in Document No. 207921 filed May 11, 1950, in the office of the Register of Deeds within and for Dakota County, Minnesota.)

*(Abstract Property)*

**Parcel C -- PIN #120290007056**

The East 80.00 feet of the North 190.0 feet of the West 529.2 feet of the South 665.0 feet of the South Half of the Southwest Quarter, Section Twenty-nine (29), Township One Hundred Fourteen (114), Range



Nineteen (19), according to the Government Survey thereof, Dakota County Minnesota.

*(Torrens Property)*

**Parcel D -- PIN #120290006056**

The East 60.0 feet of the North 190.0 feet of the West 589.2 feet of the South 665.0 feet of the South Half of the Southwest Quarter, Section 29, Township 114, Range 19, according to the U.S. Government Survey thereof, Dakota County, Minnesota.

*(Torrens Property)*

**Parcel E -- PIN #120290005056**

The East 80.0 feet of the North 190.0 feet of the West 739.2 feet of the South 665.0 feet of the South Half of the Southwest Quarter of Section Twenty-nine (29), Township One Hundred Fourteen (114), Range Nineteen (19), according to the Government Survey thereof, Dakota County, Minnesota.

*(Torrens Property)*

**Parcel F -- PIN #120290004056**

The East One Hundred Fifty feet (150') of the North One Hundred Ninety feet (190') of the West Nine Hundred Two and seven-tenths feet (902.7') of the South Six Hundred Sixty-five feet (665') of the Southwest Quarter of Section Twenty-nine (29), Township One Hundred Fourteen (114), Range Nineteen (19), Dakota County, Minnesota.

**Parcel G -- PIN #120290003056**

The West Eighty feet (80') of the East One Hundred Sixty feet (160') of the North One Hundred Ninety feet (190') of the West Ten Hundred Sixty-two and seven-tenths feet (1062.7') of the South Six Hundred Sixty-five feet (665') of the Southwest Quarter of Section Twenty-nine (29), Township One Hundred Fourteen (114), Range Nineteen (19), according to the Government Survey thereof, Dakota County, Minnesota.

*(Torrens Property)*

**Parcel H -- PIN #120290002056**

The East 80 feet of the North 190 feet of the West 1062.7 feet of the South 665 feet of the South Half of the Southwest Quarter of Section Twenty-nine (29), Township One Hundred Fourteen (114), Range Nineteen (19), according to the Government Survey thereof, Dakota County, Minnesota.

AND

Commencing at the Southwest corner of Section 29, Township 114, Range 19, West of the Fifth Principal Meridian; thence north along and parallel with section line 665 feet; thence east and parallel with section line 1828.3 feet; thence south and parallel with section line 554 feet to the Chicago, Milwaukee and St. Paul right-of-way; thence westerly along said right-of-way to the intersection of the section line along the south side of said Section 29; thence west and parallel with section line to the place of beginning and containing 27.50 acres, more or less, all in the South Half of the Southwest Quarter of Section 29, Township 114, Range 19 West of the Fifth Principal Meridian, according to the Government Survey thereof, Dakota County, Minnesota.

Excepting therefrom the east 699.6 feet of the north 190 feet of the west 1828.3 feet thereof; and also excepting therefrom the east 310 feet of the west 1062.7 feet of the north 190 feet thereof; and also excepting therefrom the east 80 feet of the north 190 feet of the west 739.2 feet of

the south 665 feet of the South Half of the Southwest Quarter of Section 29, Township 114, Range 19, according to the Government Survey thereof; also excepting the east 96.2 feet of the west 449.2 feet of the north 190 feet thereof; also excepting therefrom the west 353 feet of the north 155 feet of the south 665 feet thereof; also excepting therefrom the west 605 feet of the south 216 feet of the Southwest Quarter, all in Section 29, Township 114, Range 19, according to the Government Survey thereof; also excepting therefrom the east 80 feet of the north 190 feet of the west 529.2 feet of the south 665 feet of the South Half of the Southwest Quarter; and also excepting therefrom the east 60 feet of the north 190 feet of the west 589.2 feet of the south 665 feet of the South Half of the Southwest Quarter, Section 29, Township 114, Range 19, according to the Government Survey thereof. Also excepting therefrom the east 699.6 feet of the west 1828.3 feet of the south 475 feet of that part of the South Half of the Southwest Quarter lying northerly of the right-of-way line of the Chicago, Milwaukee and St. Paul Railroad, in Section 29, Township 114, Range 19, Dakota County, Minnesota. Also excepting part of the Southwest Quarter of Section 29, Township 114, Range 19, Dakota County, Minnesota, described as follows: Beginning at the intersection of the west line of the said Southwest Quarter with the north line of the south 356 feet of said Southwest Quarter; thence north along the west line of the said Southwest Quarter 154 feet; thence east, parallel with the south line of the said Southwest Quarter 353 feet; thence south, parallel with the west line of the said Southwest Quarter 35 feet; thence east, parallel with the south line of the said Southwest Quarter 27 feet; thence south, parallel with the west line of the said Southwest Quarter 119 feet, more or less, to the north line of the south 356 feet of said Southwest Quarter; thence west, along said north line of the south 356 feet, a distance of 380 feet to the point of beginning. Also excepting the west 380 feet of the north 140 feet of the south 356 feet of the Southwest Quarter of Section 29, Township 114, Range 19, Dakota County, Minnesota.

*(Torrens Property)*

**APPENDIX F. ORDINANCE  
PROHIBITING DISCHARGE & REQUIRING  
DISCONNECTION, SEC. 8-2-8**

## **8-2-8: PROHIBITING DISCHARGES INTO THE SANITARY SEWER SYSTEM AND PROVIDING PENALTIES FOR VIOLATIONS THEREOF:**

- (A) Purpose: In adopting this section, the city council finds that the discharge of water from any roof, surface, groundwater sump pump, footing tile or swimming pool or other natural precipitation into the city sewer system will, and has on numerous occasions in the past, flooded and overloaded the sewer system to such an extent as to cause significant and grave damage to the property of large numbers of city residents. Such damage is caused by the backup of sewage into the living quarters of residents and in addition to other damage, creates a hazard to health. The city council, therefore, finds it essential to the maintenance of health, to the minimization of damage to property and to meet Minnesota pollution control agency and metropolitan council regulations, that the provisions of this section be strictly enforced to avoid emergencies in the future. (Ord. 015-695, 3-16-2015)
- (B) Definition And Method: No water from any roof, surface, groundwater sump pump, footing tile, swimming pool or other natural precipitation shall be discharged into the sanitary sewer system. Dwellings and other buildings and structures which require, because of the infiltration of water into basements, crawl spaces and the like, a sump pump discharge system shall have a permanently installed discharge line which shall not at any time discharge water into the sanitary sewer system, except as provided herein. A permanent installation shall be one which provides for year round discharge capability to either the outside of the dwelling, building or structure, or is connected to the city storm sewer or discharges through the curb and gutter to the street. It shall consist of a rigid discharge line, without valving or quick connections for altering the path of discharge, and if connected to the city storm sewer line, include a check valve and an air gap located in a small diameter structure as shown in the city's standard plates. (Ord. 093-309, 6-21-1993)
- (C) Disconnection: All connections from a roof, surface, groundwater sump pump, footing tile or swimming pool now connected and/or discharging into the sanitary sewer system were to be disconnected prior to August 15, 1993. Future connections were and are prohibited. (Ord. 015-695, 3-16-2015)
- (D) Inspection: Every person owning improved real estate that discharges into the city's sanitary sewer system shall allow an employee of the city or their designated representative to inspect the buildings to confirm that there is no sump pump or other prohibited discharge into the sanitary sewer system. In lieu of having the city inspect their property, any person may furnish a certificate from a licensed plumber certifying that their property is in compliance with this section.
- Any person refusing to allow their property to be inspected or refusing to furnish a plumber's certificate within fourteen (14) days of the date city employee(s) or their designated representatives are denied admittance to the property, shall immediately become subject to the surcharge hereinafter provided for. Any property found to violate this section shall make the necessary changes to comply with this section and furnish proof of the changes to the city by August 15, 1993. (Ord. 093-309, 6-21-1993)
- (E) Future Inspections: Each sump pump connection identified may be reinspected on a yearly basis. (Ord. 015-695, 3-16-2015)

- (F) New Home Inspections: All new homes shall be required to have their sump pump system inspected within thirty (30) days of occupancy and a certificate of compliance completed.
- (G) Penalty: A surcharge of one hundred dollars (\$100.00) per month is hereby imposed and added to every sewer billing mailed on and after August 15, 1993, to property owners who are not in compliance with this chapter. The surcharge shall be added every month until the property is in compliance. The surcharge shall continue to be levied monthly on properties not complying with this chapter. All properties found during yearly reinspection to have violated this chapter shall be subject to the one hundred dollars (\$100.00) per month penalty for all months between the two (2) most recent inspections. (Ord. 093-313, 8-16-1993; amd. Ord. 094-334, 8-1-1994)

# APPENDIX G. WATER SYSTEM

PLAN DRAFT, MARCH 2018



**BOLTON  
& MENK**

Real People. Real Solutions.

**DRAFT**

March 2018

# Water System Plan

## City of Farmington, Minnesota

T18.114157

**Submitted by:**

Bolton & Menk, Inc.

12224 Nicollet Ave

Burnsville, MN 55337

P: 952-890-0509

F: 952-890-8065



# Certification

Water System Plan

for

City of Farmington, Minnesota

T18.114157

March 2018

I hereby certify that this plan, specification or report was prepared by me or under my direct supervision, and that I am a duly Licensed Professional Engineer under the laws of the State of Minnesota.

By: \_\_\_\_\_

Seth Peterson, P.E.

License No. 26468

Date: \_\_\_\_\_

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## I. EXECUTIVE SUMMARY

### A. WATER SYSTEM DESIGN CRITERIA

This section of the Plan develops the performance criteria under which the water system will be evaluated and designed. This involves an evaluation of historical population and trends, water use patterns and projections, water supply requirements, water storage requirements, required fire flows, and distribution system pressure requirements.

The City of Farmington's existing average daily demand is approximately 1.93 MGD and the maximum daily demand is approximately 5.33 MGD. The projected demands for 2040 are 2.86 MGD and 7.72 MGD for average daily and maximum daily demands respectively.

The City's recommended firm water supply capacity is 5.33 MGD for the existing system and 7.72 MGD for the future system. The recommended water storage volume for the current system is 2.49 MG and the future system has a recommended storage volume of 3.65 MG.

Watermains should have a minimum working pressure of 35 psi with normal working pressures ranging from 60–80 psi. Pipe velocities should be between 2 and 5 feet per second on average. It is also recommended that minimum pipe diameters of 6-inches be used to allow for providing fire protection and serving fire hydrants, with larger mains required if necessary.

A water model of Farmington's system was developed to aid in the evaluation of Farmington's system. This model was used to predict the City's pressure, fire flows, pipe velocities, and headloss throughout the system. The model was also used to simulate the future system, predict the impact of future growth, and the effect of future water system infrastructures.

### B. EXISTING WATER SYSTEM FACILITIES AND INFRASTRUCTURE

The City of Farmington water system consists of seven (7) active wells, one (1) elevated storage tank, one (1) standpipe, and a system of trunk and lateral watermains varying in sizes from 4-inches to 24-inches. The Farmington water system is contained within a single pressure zone.

Farmington's existing firm capacity is 10.37 MGD or 7,200 gpm; however, a municipal well's typical lifespan is approximately 40 to 60 years. Well No. 1 has exceeded 60 years of service, Well No. 3 has served the City for approximately 60 years, Well No. 4 has served the city for roughly 45 years. Without Well No. 1 and Well No. 3, the City's remaining firm capacity is 8.06 MGD or 5,600 gpm. Without Well No. 1, Well No. 3, and Well No. 4, the remaining firm well capacity is 6.62 MGD or 4,600 gpm. The City of Farmington also shares an interconnection with the City of Lakeville to be used in case of an emergency.

The City of Farmington has two storage tanks: a 1.5 MG elevated storage tank and a 0.67 MG standpipe. While the total storage capacity is 2.27 MG, the effective storage capacity is 1.79 MG, as the standpipe has an effective storage capacity of 0.29 MG.

The City of Farmington treats raw water with fluoride and chlorine at each well house prior to entering the distribution system. No other treatment is provided.

The existing distribution system consists of watermains varying from 4 to 24 inches in diameter. Most of the City's watermains are constructed of ductile iron pipe (DIP), with older parts of the City being served by cast iron pipe (CIP). Static pressure readings as reported within the system generally range from approximately 45 pounds per square inch (psi) to 100 psi.

The City's drinking water meets all primary drinking water standards, as indicated in the 2016 Consumer Confidence Report. The City also meets most secondary aesthetic water quality standards, except for iron and manganese.

#### C. WATER CONSERVATION

Water conservation can include a vast range of techniques and strategies from the addition of rain barrels to capture rainfall for lawn irrigation, to drip irrigation systems for larger gardens, to even replacing regular household appliances with energy and water efficient appliances. This section will discuss concepts for reducing water use, and peak day demands along with the current water rates, and the water lost throughout the system and how they relate to water conservation.

Farmington currently has an ordinance for odd-even day watering that has helped reduce peak day and seasonal demands. The City has also been proactive in implementing an increasing block rate structure that bills more for higher water usage. This has helped reduce water usage over the past few years.

Farmington's unaccounted for water is estimated at approximately 8.5 percent. This is within the DNR's recommendation of maintain unaccounted for water below than 10 percent. The City periodically conducts a leak survey as needed, when monthly water audits indicate a leak is occurring.

#### D. RECOMMENDED FUTURE IMPROVEMENTS

This section details recommended future improvements for Farmington's water system to improve the water supply, treatment, distribution system, and storage facilities. The recommended improvements are based on evaluation of the existing facilities.

The City currently has sufficient water supply capacity for the existing system; however, a few of the supply wells have surpassed or will surpass their typical life expectancy during the 20-year design period. With the loss of these wells, it is recommended that the City install at least one replacement well having a capacity of 1.10 MGD or a 770 gpm well prior to all three wells being removed from service.

Farmington's existing recommended storage volume is 2.49 MG and the future recommended storage volume is 3.65 MG. Farmington's existing effective storage volume is 1.79 MG, so the City is deficient in their recommended storage volumes by 0.70 MG for the existing system, and 1.86 MG for the future system. It is recommended the City install a 2.0 MG storage tank or install a 1.0 MG tank with the intent of installing another 1.0 MG tank by 2022.

Farmington's raw water quality is moderately high in iron and manganese. Secondary standards are indicative of aesthetic water quality and does not necessarily constitute a health hazard; however, the City may choose to treat iron and manganese based on consumer complaints on water color and clarity.

Based on the water model, the City of Farmington appears to have adequate available fire flows and good pressure coverage except for a few areas, particularly dead-end lines. It is recommended that the City provide watermain loops or larger watermains in these areas where possible.

#### E. ECONOMIC ANALYSIS

This section is forthcoming.

## II. WATER SYSTEM DESIGN CRITERIA

### A. GENERAL

This section of the Plan develops the performance criteria under which the water system will be evaluated and designed. This involves an evaluation of historical population and trends, water use patterns and projections, water storage requirements, required fire flows, and distribution system pressure requirements. This section will form the design basis of the Water Plan. The water model for the City of Farmington will be instrumental in identifying issues with the existing distribution system and expanding the system for future developments in the City.

### B. DESIGN PERIOD

Typically, water systems and the infrastructure are designed for a 20-year design period, as there is significant capital improvements required to improve hydraulic capacity, efficiency, or by replacing process components. Therefore, the design period for this water plan update will go through 2040.

Future projections for water usage are based on Minnesota State Demographic Center population projections and the historical water usage for the City of Farmington. The historical water usage can be used to predict demand projections. This does not mean that the current trends will be exact in future years, but the trends are considered accurate enough that any departure from projected assumptions is considered minor and will not impact the timing of any recommendations proposed throughout the design period of this report.

This plan should be revisited and updated as necessary to ensure that the system implementation is keeping pace with development, forecasted populations, and water demands. Generally, every 10 years the recommendations and capital improvements should be refined based on new data and population projections. Another tool that is useful for water use planning purposes is the Minnesota Department of Natural Resources (MN DNR) Water Supply Plan (WSP). The WSP is required every 10 years by each community serving more than 1,000 people. The WSP must be approved by both the MN DNR and the Metropolitan Council as required by law. Since the WSP is required every 10 years, it is recommended to update this Comprehensive Plan and the WSP at the same time.

### C. PLANNING AREA

The planning area for this report is identified by the City and includes current land use and future land use for Farmington through 2040. The existing land use was provided via GIS data. The future land use map can be found in Appendix A.

### D. POPULATION AND WATER USE

Population projections are based on the Minnesota State Demographic Center population projections through 2040. These projections take into account historical and emerging patterns in births, deaths, and migration to predict populations.

#### 1. Historical Population and Water Use

Water use is associated with population more than any other factor. Once a per capita demand is established, it is possible to predict future water demands. The per capita demand is typically determined based on historical data over the last 10-years omitting extremely high or low demands as they can skew the data and make future projections unrealistic. Table 2.1 shows the historical population and water demand for the City of Farmington from 2005 to 2016.

<b>Table 2.1 – Historical Water Trends</b>					
<b>Year</b>	<b>Estimated Service Population</b>	<b>Average Daily Demand (MGD)</b>	<b>Average Daily Demand per Capita (gpcpd)</b>	<b>Maximum Daily Demand (MGD)</b>	<b>Peaking Factor (Max. Day/Avg. Day)</b>
2005	18,023	1.72	95	4.96	2.9
2006	17,495	2.01	115	6.01	3.0
2007	18,589	2.21	119	6.55	3.0
2008	18,735	2.16	115	5.79	2.7
2009	18,959	2.12	112	4.70	2.2
2010	21,086	1.86	88	4.00	2.2
2011	21,369	1.94	91	5.11	2.6
2012	21,792	2.20	101	6.57	3.0
2013	22,051	1.97	89	6.04	3.1
2014	22,386	1.86	83	5.21	2.8
2015	22,451	1.75	78	4.44	2.5
2016	22,821	1.86	82	4.37	2.3
<b>10-Year Average</b>		<b>1.99</b>	<b>96</b>	<b>5.28</b>	<b>2.6</b>
<b>5-Year Average</b>		<b>1.93</b>	<b>88</b>	<b>5.33</b>	<b>2.7</b>

From 2005 to 2016, the City of Farmington saw a 25.7 percent increase in population. The population has been steadily increasing since 2006. Based on the recent population trend, it is anticipated that the projected population will follow that trend.

The per capita demand averages 96 gallons per capita per day (gpcd) when looking at the 10-year average; however, the 5-year average is 88 gpcd, this decrease in average per capita demand reflects water conservation measures the City has been implementing for the last several years. Overall, per capita demand shows a decreasing trend over the last 10 years as water conservation measures were implemented and education about water conservation becomes more public and easier to find.

Average daily demand has remained relatively consistent over the recent historical period due to population growth which counteracts the reduced per capita demand. The 5-year historical average of the average daily demand is 1.93 MGD. In 2007 and 2012, there were slight peaks in average daily demand and per capita demand due to drought conditions and reduced precipitation during the summer. Overall, there has not been any major fluctuations in average daily demand.

Maximum daily demand fluctuates over the historical period. Two peaks occurred in 2007 and again 2012 due to drought conditions and decreased precipitation. Within the past few years, maximum daily demand has continued to decrease. As the demand continues to decrease, the peaking factor also decreases, since the max daily demand is closer to the average daily demand. Maximum daily demands are most likely decreasing due to the implementation of water conservation measures and education about conserving water being more easily accessible to customers. The 5-year average maximum daily demand is 5.33 MGD and the maximum day to average day peaking factor is 2.7.

## 2. Water Use by Category

One way to analyze water consumption and historical demands is to categorize water use. Categorizing water use within a community can provide insight on where to prioritize water conservation efforts, and provides valuable information when making future water demand projections. The average water consumption by category for residential, commercial, industrial, and other uses are shown in Table 2.2.

Table 2.2 – Categorized Water Use						
Year	Water Pumped (MG)	Water Sold (MG)			Unaccounted for Water (MG)	Percent Unaccounted for Water (%)
		Residential	C/I/I <sup>1</sup>	Total Sold		
2005	628	539	86	625	3	0.5
2006	734	N/A	N/A	N/A	N/A	N/A
2007	807	N/A	N/A	N/A	N/A	N/A
2008	788	649	62	711	77	9.8
2009	772	637	59	696	76	9.8
2010	680	565	56	621	59	8.7
2011	709	586	58	644	65	9.2
2012	801	658	53	711	90	11.2
2013	718	602	55	657	61	8.5
2014	681	573	55	628	53	7.8
2015	640	546	48	594	46	7.2
2016	683	579	51	629	53	7.8
<b>5-yr Average</b>	<b>705</b>	<b>592</b>	<b>52</b>	<b>644</b>	<b>61</b>	<b>8.5%</b>

<sup>1</sup> C/I/I: Commercial, Industrial, or Institutional

The majority of Farmington’s water use is for residential purposes. For the past five years with recorded values, the residential water use has averaged approximately 592 MG, commercial/institutional/industrial (C/I/I) water use has averaged approximately 52 MG, and unaccounted water use has averaged 61 MG. Unaccounted water has averaged 8.5 percent of total water sold for the past five years with recorded values, and has been decreasing over that same time period.

## 3. Projected Population and Water Use

Historic water use (average and maximum daily demands) and population projections can be utilized to make future water projections. It is also important to consider changing trends in the amount of growth expected in the industrial and commercial sectors. Industries may use large volumes of water for processing and general operation of their industries. Expansions of this sector can greatly influence future water demands. Historically, the City of Farmington does not have a large industrial or commercial water demand. Based on Table 2.2, the C/I/I water use averaged 8.5 percent of the total annual water delivered to the distribution system. There are currently no anticipated changes to significant industrial or commercial users in the City. C/I/I water use is anticipated to follow historical trends and grow as population increases. Future water projections are shown in Table 2.3.



<b>Table 2.3 – Projected Water Demand</b>			
<b>Year</b>	<b>Projected Population</b>	<b>Average Daily Demand (MGD)<sup>1</sup></b>	<b>Maximum Daily Demand (MGD)<sup>2</sup></b>
2016	22,821	2.01	5.42
2017	23,191	2.04	5.51
2018	23,560	2.07	5.60
2019	23,930	2.11	5.69
2020	24,300	2.14	5.77
2021	24,700	2.17	5.87
2022	25,100	2.21	5.96
2023	25,500	2.24	6.06
2024	25,900	2.28	6.15
2025	26,300	2.31	6.25
2030	28,300	2.49	6.72
2040	32,500	2.86	7.72
<sup>1</sup> Assuming an average daily usage of 88 gpcpd, per the 2017 WSP total per capita demand <sup>2</sup> Assuming a peaking factor of 2.7			

Water demand projections in Table 2.3 were based on historical per capita use, the maximum daily to average daily demand ratio, and projected population growth. The Minnesota State Demographic Center was used for population projections through 2040. It is assumed that the projected service population will equal the projected total population as all future residents will be required to connect to the City’s distribution system.

The 5-year average per capita demand of 88 gallons per capita per day (gpcd) was used to make water demand projections through 2040. The 5-year average per capita demand was used to reflect the reduced per capita demand following the implementation of water conservation measures. It is important to consider these water conservation measures when making projections as they can help make accurate projections with regards to the City’s plan of conserving water and reducing per capita demands. By 2040, a projected average daily demand of 2.86 MGD is expected. The projected maximum daily demand was calculated by multiplying the average daily demand by a peaking factor of 2.7. The maximum daily demand in 2040 is projected to be 7.72 MGD.

## E. WATER SYSTEM REQUIREMENTS

### 1. Water Supply Requirements

A general engineering practice to determine the required water supply capacity is to ensure that the firm pumping capacity of the wells is sufficient to meet the maximum daily demand. Firm capacity is defined as the sum capacity of all wells, with the largest well out of service.

Therefore, it is recommended that the City’s firm water supply be 5.33 MGD or approximately 3,700 gpm for the existing system. Farmington’s recommended firm capacity for the 2040 future system is 7.72 MGD or approximately 5,400 gpm.

## 2. Storage Requirements

The principal purpose of storage is to provide the ability to equalize pumping rates during periods of variable rate demand and to provide water for emergency fire service. Adequate storage allows a reduction in the size of the pumps required to supply a community because peak demands are diminished by the reserve provided in storage. Storage is typically provided in elevated tanks for communities the size of Farmington, to provide storage and a pressure source while the wells are not pumping.

The primary reasons for providing water storage are as follows:

- To equalize pressure in the distribution system.
- Provide water for fire protection.
- Other emergency reserve requirements (pump failure, power failure, etc.).

The typical design approach is to consider the recommended minimum storage volume for each individual storage component of equalization, fire demand, and emergency reserve, then sum the equalization volume and the larger volume of fire protection or emergency volume, as it is unlikely that water would be required for multiple emergencies at any given time. Storage for equalization is recommended to be 25 percent of the maximum daily demand. Storage for fire protection depends on zoning with a standard for residential areas being 3,500 gpm for 4 hours based on the International Organization for Standardization (ISO) Public Protection Classification grading for insurance purposes. Storage for emergency use is recommended to be equal to 60 percent of average daily demand. Water storage requirements for the City of Farmington using these approaches are summarized in Table 2.4.

<b>Category</b>	<b>Existing System Volume Recommendations (MG)</b>	<b>Future System Volume Recommendations (MG)</b>
Equalization	1.33	1.93
Fire Protection	0.84	0.84
Other Emergencies	1.16	1.72
<b>Recommended Storage Volume</b>	<b>2.49</b>	<b>3.65</b>

Summing the equalization volume and the emergency volume, as it is larger than the fire protection volume, results in a recommended storage volume of 2.49 MG for the existing system. Farmington’s future system is recommended to have a storage capacity of 3.65 MG.

## 3. Watermain Sizing Requirements

Ten States Standards recommends a minimum watermain size of 6-inches for providing fire protection and serving fire hydrants, with larger mains required, if necessary. In addition, velocities in long watermain segments should be between 2 and 10 feet per second (fps) with average flows less than 5 fps, with 10 fps being acceptable during emergency withdrawals for short durations.

#### 4. Pressure Requirements

Water pressures are subject to individual preference. What some may view as adequate pressure may be viewed as too much or too little pressure. Municipalities are challenged with balancing pressure with demand and capacity of the system along with conservation of water. Typically, higher pressures equate to higher flow rates, but increases the volume of water lost through cracked and broken pipes.

Ten States Standards recommends the minimum working pressure in the distribution system should be 35 psi with normal working pressures ranging from 60–80 psi. The Minnesota Department of Health (MDH), along with Ten States Standards, requires the system to maintain a minimum pressure of at least 20 psi at ground level at all points in the distribution system under all flow conditions. This ensures that there is adequate water pressure in the event of a long-term power failure or during an emergency.

#### 5. Water Distribution Model

A water model for Farmington is being developed along with this report to identify problem areas in the existing system and to show the impacts of future improvements to the system. Possible issues with the existing system include areas with pressures above or below the recommended pressure levels, pipes with high velocities or headloss, and inadequate fire flow protection. Future improvements are discussed in Section 5 of this report. The future model is based on projected water demand and the 2040 Land Use Figure provided by the City of Farmington, as found in Appendix A. The water model is used to represent the existing and proposed 20-year design system. The models are used to create distribution system maps, average daily and maximum daily pressure maps, maximum daily fire flow maps, and maximum daily headloss maps as provided in Section 3 and Section 5. The improvements relate to improving fire flow and pressures where possible and adding new watermain into areas that are slated for future development. The water model should be used as a tool to evaluate whether additional infrastructure is required in the distribution system.

### III. EXISTING WATER SYSTEM FACILITIES AND INFRASTRUCTURE

#### A. GENERAL

The City of Farmington water system consists of seven (7) active wells, one (1) elevated storage tanks one (1) standpipe, and a system of trunk and lateral watermains varying in sizes from 4-inches to 24-inches. The Farmington water system is contained within a single pressure zone. The existing watermain distribution system and major water system infrastructure are presented in Figure 3.1.

#### B. WATER SUPPLY

The City of Farmington supplies drinking water from seven groundwater wells. Well No. 1 and Well No. 3 are in the Prairie Du Chien-Jordan aquifer, while Wells 4 through 8 are in the Jordan aquifer. The Minnesota Department of Health’s Drinking Water Supply Management Area Vulnerability Maps are provided in Appendix B. These maps show that all of Farmington’s municipal wells are moderately vulnerable to surface contaminants, except for Well No. 4 which has a low vulnerability. Well vulnerability is assessed using geologic sensitivities from boring log data and water quality data for the Farmington wells. A summary of the existing well data and pumping capacities are presented in Table 3.1.

Table 3.1 – Well Construction Summary							
	Well No. 1	Well No. 3	Well No. 4	Well No. 5	Well No. 6	Well No. 7	Well No. 8
<b>Unique Well No.</b>	200932	201154	235586	603051	626785	655902	731123
<b>Year Constructed</b>	1938	1959	1973	1999	2002	2002	2006
<b>Well Pump Capacity (gpm)</b>	1,000	600	1,000	1,200	2,000	1,400	2,000
<b>Casing Diameter (inches)</b>	16	20 x 12	24 x 16	30 x 24	30 x 24	30 x 24	30 x 24
<b>Casing Depth (feet)</b>	197	132	392	417	386	408	368
<b>Overall Well Depth (feet)</b>	402	424	477	512	485	501	460

One way to evaluate the pumping capacity and the ability of the wells to meet maximum daily demands, is to evaluate the firm well capacities. The firm well capacity is the pumping capacity of all the wells without the largest producing well in service. Typically, firm well capacity is used to measure whether or not there is enough supply to meet demands. If the firm well capacity is not greater than or equal to the maximum daily demand, then there is insufficient water supply to provide enough water to meet demands.

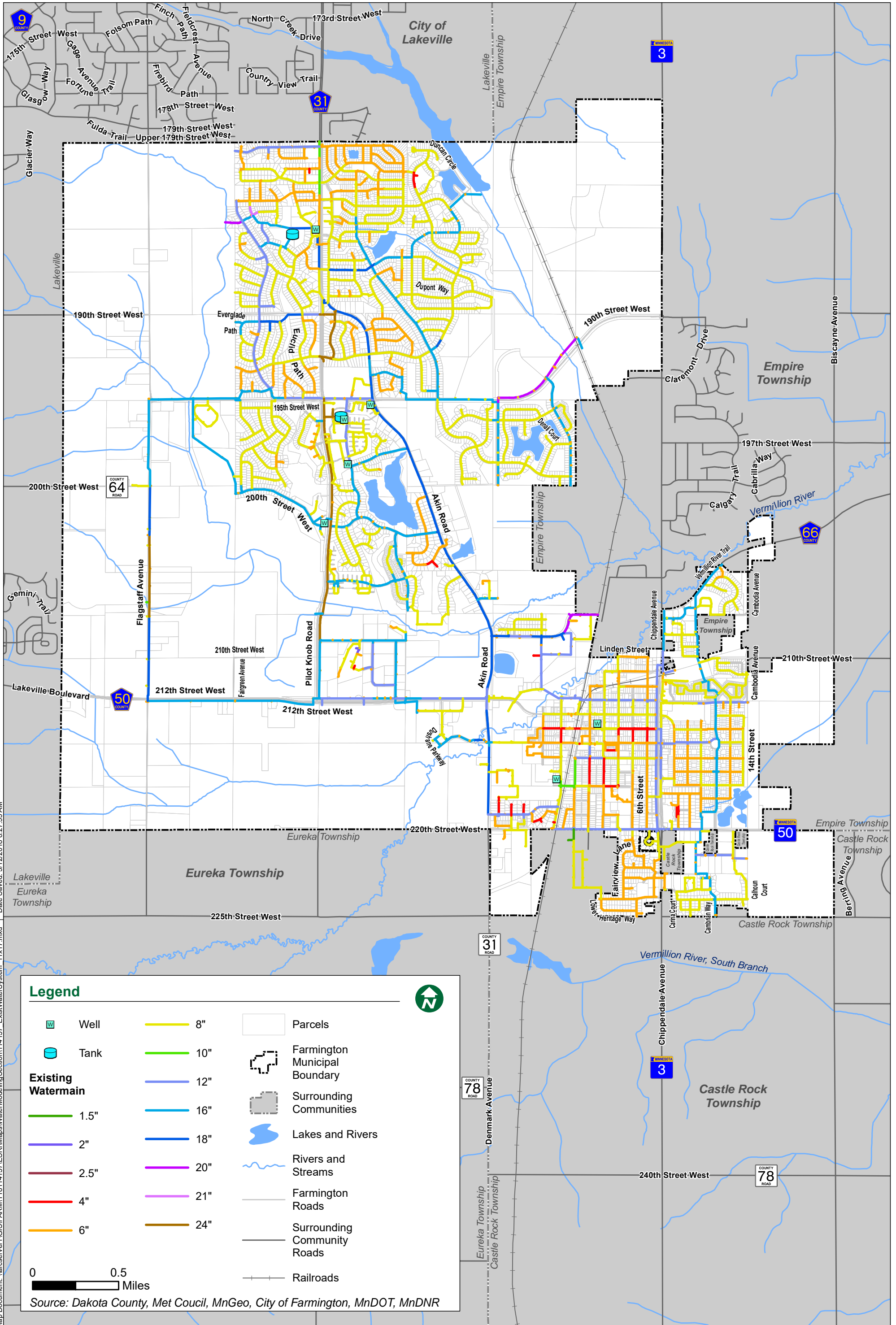
Farmington’s existing firm capacity is 10.37 MGD or 7,200 gpm. However the typical life span for a municipal well is approximately 40 to 60 years. Well No. 1 is approaching 80 years of service, Well No. 3 is approaching 59 years of service, and Well No. 4 is approaching 45 years of service. Therefore, the City should consider replacing these wells or completing major rehabilitation of these wells.

If the City were without Well No. 1 and Well No. 3, the City’s firm capacity is 8.06 MGD or 5,600 gpm. If the City were without Well No. 1, Well No. 3, and Well No. 4, the firm well capacity is 6.62 MGD or 4,600 gpm.

The City of Farmington also shares an interconnection with the City of Lakeville to be used in case of an emergency. This interconnection has a capacity of 1 MGD.



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**Legend**

	Well		8"		Parcels
	Tank		10"		Farmington Municipal Boundary
<b>Existing Watermain</b>			12"		Surrounding Communities
	1.5"		16"		Lakes and Rivers
	2"		18"		Rivers and Streams
	2.5"		20"		Farmington Roads
	4"		21"		Surrounding Community Roads
	6"		24"		Railroads

0 0.5 Miles

Source: Dakota County, Met Coucil, MnGeo, City of Farmington, MnDOT, MnDNR

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C. WATER STORAGE FACILITIES

The City of Farmington has two storage tanks: a 1.5 MG elevated storage tank and a 0.67 MG standpipe. While the total storage capacity is 2.27 MG, the effective storage capacity is 1.79 MG, as the standpipe has an effective storage capacity of 0.29 MG. The effective storage capacity is defined as the storage available while maintaining sufficient pressure. Therefore, as the standpipe’s water level approaches ground level, the pressure it supplies to the system is diminished and provides insufficient pressure. Table 3.2 provides a summary of the storage tanks.

<b>Table 3.2 – Existing Storage Facilities</b>			
	<b>Daisy Knoll Standpipe</b>	<b>Elevated Tower</b>	<b>Total Storage</b>
<b>Capacity (MG)</b>	0.67	1.50	2.17
<b>Effective Capacity (MG)</b>	0.29	1.50	1.79
<b>Year Constructed</b>	1973	1998	-
<b>High Water Level</b>	1117.33	1117.33	-
<b>Support Type</b>	Ground	Elevated	-

One way to evaluate the adequacy of storage capacity is to evaluate the minimum use to see if there is sufficient turnover of water during winter months to prevent freezing in the storage facilities. A good rule is to allow water to turnover every couple of days in the winter. Currently, the average daily demand is 1.93 MGD. Utilizing the effective storage capacity of 1.79 MG, the water turnover is about every 22 hours. Using the future demands, by 2040, the average day demand is anticipated to be 2.86 MGD, yielding a turnover every 15 hours (if no extra storage facility is constructed). Based on this simple analysis, there appears to be a shortage of storage capacity, as average daily demands aren’t met, but the water turnover is good and would prevent water from freezing in the storage tanks during winter months.

Water modeling can be used to evaluate available fire flows in a City. This can be beneficial for planning purposes when evaluating distribution system improvements. The guide for determining required fire flows is developed by the Insurance Service Office (ISO). When designing future improvements, it is important to account for needed fire flows. The needed fire flow differs between structures and building types such as residential, commercial, or industrial. For single-family homes, the following table should be considered for needed fire flows.

<b>Table 3.3 – Needed Fire Flows for Residential Homes</b>	
<b>Distance Between Buildings (ft)</b>	<b>Fire Flow (gpm)</b>
More than 100	500
31 - 100	750 – 1,000
11 - 30	1,001 - 1500
Less than 11	1,501 – 2,000
Continuous	2,500

Commercial and industrial needed fire flows are determined on an individual basis by evaluating the occupancy area, communication factor, exposure factor, and if a sprinkler

system is installed. Typically, most systems require only 500–1,000 gpm of needed fire flow if a sprinkler system is installed and up to 500 gpm of additional flow if a sprinkler system is not installed.

#### D. WATER TREATMENT FACILITIES

The City of Farmington treats raw water with fluoride and chlorine at each well house prior to entering the distribution system. No other treatment is provided.

#### E. WATER DISTRIBUTION SYSTEM

The existing distribution system consists of watermains varying from 4 to 24 inches in diameter. Most of the City’s watermains are constructed of ductile iron pipe (DIP), with older parts of the City being served by cast iron pipe (CIP). The distribution system receives water from individual wells. A network of larger distribution mains extend from the wells to the storage tanks and other points throughout the system.

The existing system operates under a single pressure zone. The static high water level is 1,117.33 feet above mean sea level. Static pressure readings, as reported within the system, generally range from approximately 45 pounds per square inch (psi) to 100 psi.

The watermains are looped within the City as to not have a dead end pipe, which could create water quality concerns. The watermains loop around and connect so the water flows in a path. Parts of the system do have branched systems that are not looped. Consideration should be given to looping larger diameter watermains with future expansion. Extending watermain to future developments, and providing looping can help with maintaining adequate system pressure.

Hydrant flushing is an important maintenance activity to clean out dead end watermains. The City has been proactive in performing hydrant flushes on critical watermains. The water distribution-piping network has been well maintained and will continue to serve the customers of Farmington.

#### F. WATER QUALITY

##### 1. General

The purpose of this section is to evaluate the water quality of Farmington’s water system and detail the treatment methods used. The section will also detail the current drinking water standards and how the water quality compares to these standards.

##### 2. Water Quality and Treatment

The City’s drinking water meets all primary drinking water standards, as indicated in the 2016 Consumer Confidence Report. The City also meets most secondary aesthetic water quality standards, except for iron and manganese. The 2016 Consumer Confidence Report shows that the average for all iron and manganese samples are above the secondary standard. The 2016 Consumer Confidence Report can be found in Appendix C.

Farmington’s raw water quality is moderately high in iron and manganese. Historic test results have shown that four of the wells exceed the secondary standards for both iron and manganese. Secondary standards are indicative of aesthetic water quality and does not necessarily constitute a health hazard; however, the City may choose to treat iron and manganese based on consumer complaints on water color and clarity. Excessive iron and manganese can cause red and black stains and colors when the water is used for irrigation and other household uses.

The City's current system treats raw water with fluoride and chlorine at each well house. Fluoride is added to aide in cavity protection for customers and prevents tooth decay. The City disinfects the raw water using chlorine as a primary disinfectant. This is achieved by breakpoint chlorination where chlorine is added at a specific dose, which oxidizes all of the natural or added ammonia in the water until only free chlorine is left. This type of disinfection provides a stable and powerful disinfectant that inactivates organisms in the water.

3. Current Drinking Water Standards

The City follows all of the enforcement standards set forth in the Environmental Protection Agency's National Primary Drinking Water Standards. These standards are enforceable limits that each public water supply system must adhere to and provide annual updates to the public. The City of Farmington accomplishes this in the annual drinking water report (Consumer Confidence Report).



## IV. WATER CONSERVATION

### A. GENERAL

The purpose of this section is to discuss how water conservation plays a key role in future water planning and how these concepts can be implemented by the City. Water conservation is becoming an important issue where water is viewed as an important resource. Conserving water may help with demand reduction and relaxes stress on the distribution system and wells during high usage months. Water conservation can include a vast range of techniques and strategies from the addition of rain barrels to capture rainfall for lawn irrigation, to drip irrigation systems for larger gardens, to even replacing regular household appliances with energy and water efficient appliances. This section will discuss concepts for reducing water use, and peak day demands along with the current water rates and the water lost throughout the system and how they relate to water conservation.

### B. REDUCING USE

Reducing water use is one of the largest factors for decreasing the per capita demand and how much water is lost through the system. Most of the water in a community goes towards residential use. Residential water use includes water used in all household appliances, cooking, cleaning, toilets, showers, and lawn irrigation. Seasonal usage can affect what water is used for with respect to residential demand. Typically, commercial and industrial demands can remain somewhat constant throughout the year, as the day-to-day operations of the facility do not change significantly. Reducing water use in these facilities involves discussion with the owner and what techniques may work for each industry or business.

During winter months, a baseline demand can be established because almost all of the residential water is used for normal household uses with the exception of lawn irrigation. This baseline demand can give an estimate to how much water is required for residential customers on a regular basis with no lawn irrigation; however, during summer months when lawn irrigation is at a peak, this seasonal demand can play a large role in how much water is required for customers.

Seasonal peak water demands are often the result of lawn irrigation, which may require additional supply wells and water storage to meet requirements for these peak demands. With an average of 90 percent of water sold going to residential use, lawn irrigation can play a major role in the seasonal demand for this customer category. Currently, the City has sufficient water supply to provide for the maximum daily demands and seasonal water use.

Reduction of lawn irrigation to help control demands is typically accomplished through odd-even day or even time-of-day watering restrictions. Farmington currently has an ordinance for odd-even day watering that has helped reduce peak day and seasonal demands. The City has also been proactive in implementing an increasing block rate structure that bills more for higher water usage. This has helped reduce water usage over the past few years as is evident in historical demands shown in Table 2.1.

Reducing water lost in the system is accomplished through leak detection and annual water audits. The City currently performs leak detection on a periodic as-needed basis. It is important to use the leak detection information yearly for capital improvement planning to target areas where the volume of water lost in the system is greatest. Water losses can also be targeted by installing new enhanced meters and repairing and recalibrating current meters.

Water conservation is a key factor in reducing water use. Conservation measures typically involve education along with an incentive and regulation to encourage water conservation. While some of these measures such as billing inserts on water conservation or rebates for installing a water efficient appliance, or grant programs for adding rain barrels, can help with

reducing water use, they will not completely eliminate the need for additional wells or water storage; however, they could delay the implementation of the infrastructure or reduce the total future required capacity.

### C. REDUCING PEAK DEMANDS

Historically, the maximum daily demands for Farmington frequently exceed 5 MGD as indicated in Table 2.1. These peak day demands typically occur in the summer months when lawn irrigation is at its highest. The water used for lawn irrigation is typically what drives the maximum daily demands. The volume of water devoted to lawn irrigation can be moderated by the odd-even day watering restriction. There has been moderate success in Farmington since this restriction has been implemented. This restriction may help reduce seasonal demands due to lawn irrigation, but it does not significantly reduce overall use.

Evaluation of historical demands indicates that over the past few years, peak demands have been decreasing and are lower than the 10-year average. Contribution factors could be that Farmington has been dedicated to improving the efficiency of the distribution system and increasing efforts related to water conservation. One of the key elements that has helped reduce peak demands is the implementation of the increasing rate structure that bills more for higher water use. By continuing to manage the rate structure and make changes as necessary, this may help by controlling the peak day demands experienced during summer months when water usage is greatest.

### D. WATER RATES

As stated above, the City of Farmington has an increasing rate structure for residential customers that bills quarterly with the volume reported in thousands of gallons of water used. This type of billing is considered conservation billing and has helped the City reduce overall water usage since its implementation. By having water bills reported in gallons, it allows customers to easily see how much water they use in a given billing period so they can manage their own water usage and how much they are willing to pay. The City currently has a three-tiered structure as follows:

- \$1.30 per 1,000 gallons for the first 20,000 gallons
- \$1.60 per 1,000 gallons for usage between 20,001 gallons and 40,000 gallons
- \$2.00 per 1,000 gallons above 40,000 gallons

An availability fee of \$12.00 is charged quarterly and is not dependent on usage.

### E. WATER LOSS

The City of Farmington recently submitted a Water Supply Plan (WSP) to the Minnesota Department of Natural Resources (DNR). In the WSP, unaccounted for water is estimated at approximately 8.5 percent. The unaccounted for water has been fairly consistent between 8 and 10 percent. The DNR has a threshold of keeping unaccounted for water less than 10 percent. Based on the available data, Farmington is below the 10 percent threshold; however, the 8.5 percent average unaccounted for water equates to approximately 61 million gallons of water lost.

Lost water can be attributed to leaks from the system, unmetered use (i.e. firefighting, street sweeping, ice rink flooding, hydrant flushing, construction etc.), or even unauthorized use. Water losses means lost revenue to the utility if the water is not metered or if it's lost due to leaks in the system.

Adding enhanced water meters on commercial buildings and automated meters in residential homes can help reduce the amount of water that goes unmetered in the system. Maintaining a

meter change-out schedule and/or a maintenance schedule can help reduce the errors due to water meters.

As stated earlier in this report, the City conducts a leak survey periodically as needed, when monthly water audits indicate a leak is occurring. This helps find and stop leaks that are occurring in the City and to reduce the amount of water lost. The leak detection is an important part in system maintenance that should continue yearly to stop leaks and prevent large volumes of water from leaking and not being metered. Identifying and correcting leaks early enables utilities to minimize costly repairs of large watermain failures, and to avoid premature expansion to supply and treatment and storage facilities.

Another important tool that can be used to help track water losses is a water audit. This can be as simple as tracking the total volume of water pumped in a year and comparing it to the volume of water billed to customers. These two numbers should be relatively close to each other. If they are significantly different, that could indicate that water is being lost in the system somewhere, which results in lost revenue. Overall, Farmington has a lower percentage of unaccounted for water and they conduct monthly water audits to indicate whether there is a leak in the distribution system. These efforts should help track water losses to keep them at a minimum.

## V. RECOMMENDED FUTURE IMPROVEMENTS

### A. GENERAL

This section details recommended future improvements for Farmington's water system to improve the water supply, treatment, distribution system, and storage facilities. The recommended improvements are based on evaluation of the existing facilities discussed in Section 3 and the projected water demands evaluated in Section 2. This Section includes a discussion of the water system model to show how the infrastructure improvements affect average and maximum daily pressures, as well as maximum daily fire flows.

### B. WATER SUPPLY

Analysis of the water supply indicates that the City of Farmington does not require additional wells to meet existing requirements. Recall that it is desirable to maintain a firm well capacity (capacity with the largest well out of service) greater than the projected maximum daily demand. The City of Farmington's current recommended firm water supply is 5.33 MGD or approximately 3,700 gpm for the existing system. The City's recommended firm capacity for the future system is 7.72 MGD or approximately 5,400 gpm.

Currently, by operating the wells 24 hours per day, the City has a firm well capacity of 10.37 MGD or 7,200 gpm. This exceeds existing and future maximum daily demands; however Well No. 1, Well No. 3, and Well No. 4 have surpassed their typical useful life and should be considered for replacement. Due to the age of Well No. 4, it may remain in service, but should be considered for replacement by 2040. By replacing Well No. 1 and Well No. 3, the firm capacity of the remaining wells is 8.06 MGD or 5,600 gpm. This firm capacity is greater than the existing and future requirement; however, by sealing and abandoning Well No. 1, Well No. 3, and Well No. 4, the firm capacity of the remaining wells is 6.62 MGD or 4,600 gpm. This firm capacity is greater than the existing maximum daily demand, but is insufficient for the future maximum daily demand. Therefore, it is recommended the City install a 1.10 MGD or 770 gpm well prior to all three wells being replaced by the year 2040.

### C. WATER STORAGE FACILITIES

Recommended storage capacity for larger cities, such as Farmington, are determined based on the following storage requirement categories:

1. Equalization storage
2. Fire storage
3. Emergency storage

The recommended storage for the City is the equalization storage plus the larger of either the fire storage or emergency storage. The equalization storage is equal to the average daily demand or 25 percent of the maximum daily demand, provided pumping rates can achieve average daily demands or greater, as is the case for Farmington. The fire storage is a standard recommended storage volume of 3,500 gpm for 4 hours or 0.84 MG. The emergency storage is either the average daily demand, which is typically used for small towns, or 60 percent of the average daily demand for larger cities. Farmington's recommended storage volumes for each category are displayed below in Table 5.1. Following these guidelines, Farmington's recommended storage volumes for the existing and future system are the sum of the equalization storage and emergency storage volumes. Farmington's existing recommended storage volume is 2.49 MG and the future recommended storage volume is 3.65 MG. Farmington's existing effective storage volume is 1.79 MG, so the City is deficient in their

recommended storage volumes by 0.70 MG for the existing system and 1.86 MG for the future system.

<b>Table 5.1 – Storage Requirements</b>		
<b>Category</b>	<b>Existing System Volume Recommendations (MG)</b>	<b>Future System Volume Recommendations (MG)</b>
Equalization	1.33	1.93
Fire Protection	0.84	0.84
Other Emergencies	1.16	1.72
<b>Recommended Storage Volume</b>	<b>2.49</b>	<b>3.65</b>

It is recommended the City install a 2.0 MG storage tank or install a 1.0 MG tank with the intent of installing another 1.0 MG tank by 2022. It is also recommended to continue with proper maintenance and to evaluate the towers as needed to determine the adequacy of the coating system to ensure that it has several more years of useful life.

**D. WATER TREATMENT FACILITIES**

The City currently meets all primary drinking water standards, as indicated in the 2016 Consumer Confidence Report, and most of the secondary aesthetic water quality standards, except for iron and manganese. Farmington’s raw water quality is moderately high in iron and manganese. Historic test results have shown that four of the wells exceed the secondary standards for both iron and manganese. Secondary standards are indicative of aesthetic water quality and does not necessarily constitute a health hazard; however, the City may choose to treat iron and manganese based on consumer complaints on water color and clarity. Excessive iron and manganese may cause red and black stains and colors when the water is used for irrigation and other household uses. The City may want to consider an iron and manganese removal plant to minimize consumer complaints regarding water quality and help with long term maintenance and operation of the system.

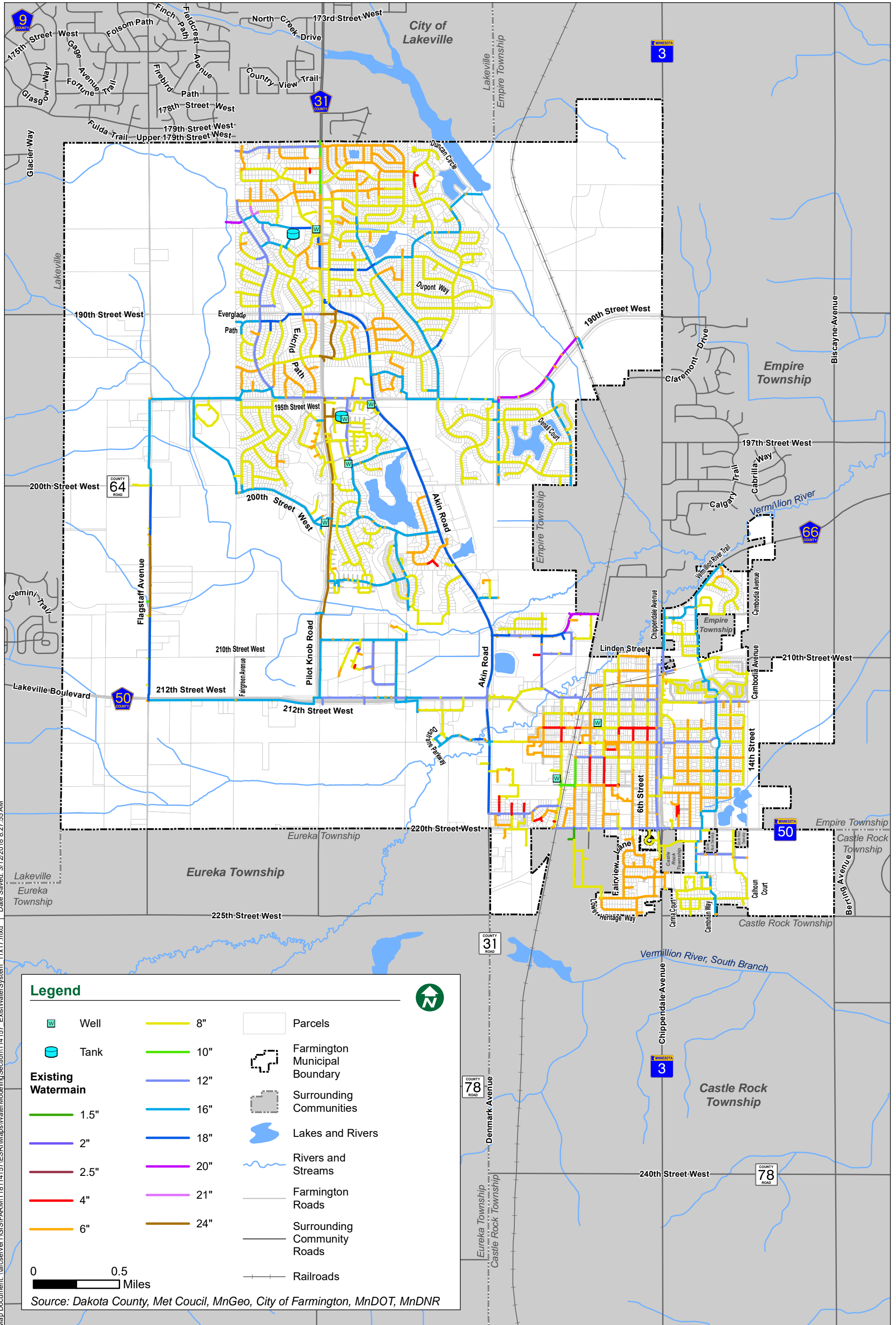
**E. WATER DISTRIBUTION SYSTEM**

The distribution system was analyzed using Innovyze’s InfoWater Version 12.3 water modeling program. Water models were developed to simulate the existing average daily demands and maximum daily demands. The existing system was calibrated with hydrant testing data obtained from the City. Calibration results show that the model is a good approximation of the City’s water distribution system. Figure 5.1 shows a map of the existing system’s watermain sizes and major water system infrastructure. The model was used to develop Farmington’s existing water system and a future system to represent the projected 2040 system. These systems were analyzed for the following:

- Average daily and maximum daily pressure
- Maximum daily fire flows
- Maximum daily pipe flows and headloss

**1. Existing System**

The water model calculated the existing system’s average daily pressure to be between 37 psi and 99 psi. While pressures are above the minimum recommendation of 35 psi and below the maximum recommendation of 100 psi, the pressures in the system nearly exceed both these recommendations. As stated in Section 2, it is recommended



**Legend**

	Well		8"		Parcels
	Tank		10"		Farmington Municipal Boundary
	Existing Watermain		12"		Surrounding Communities
			16"		Lakes and Rivers
			18"		Rivers and Streams
			20"		Farmington Roads
			21"		Surrounding Community Roads
			24"		Railroads

0 0.5 Miles

Source: Dakota County, Met Coucil, MnGeo, City of Farmington, MnDOT, MnDNR

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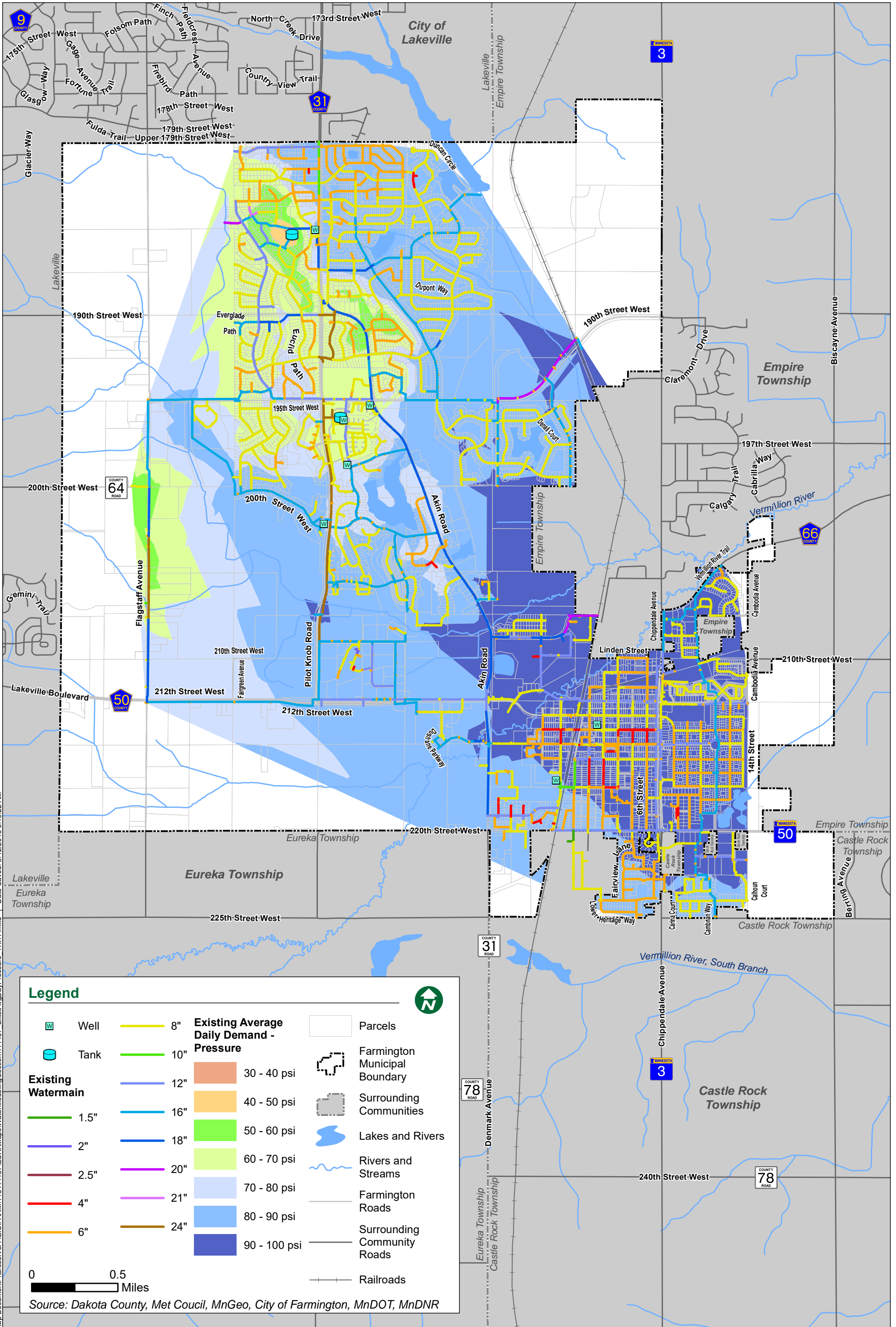
distribution systems have a standard operating pressure between 60 and 80 psi. Figure 5.2 displays the existing system's average daily pressure. The maximum daily pressures were between 30 and 93 psi; therefore, during maximum demand condition, the minimum recommended pressure is exceeded. Figure 5.3 shows the existing maximum daily pressure. Low pressures were only present around the standpipe in both the average daily and maximum daily scenarios. The available fire flow ranged from 750 gpm to over 5,000 gpm according to the model. The computer model indicates that higher flows are available in some areas; however, these higher flow rates are likely unrealistic because it is unlikely there are enough hydrants or equipment available to deliver such high rates. Figure 5.4 displays the existing available fire flows. Fire flows below 1,000 gpm were located at dead-end watermains, where a lack of looping limits the amount of fire flow. The velocities and headloss in the pipes for the maximum daily demand scenario were within acceptable ranges of less than 10 feet per second and less than 10 feet per 1000 feet of headloss, except for the watermain connected to the elevated storage tank. However, higher velocities and headloss are common around storage towers, supply wells, and water treatment plants. Figure 5.5 shows the maximum daily headloss through the system's pipes.

## 2. Future System

A model of a future system for Farmington was developed based on population projections and the projected land use map provided by the City. The future model was analyzed for the same scenarios as the existing system. The future model was modeled with the existing supply wells, but an additional storage tank was added north of Empire Township on Trunk Highway 3. Figure 5.6 shows a map of the future system's watermain sizes and major water infrastructure. Results for the future system indicates that the average daily pressure would range from 37 psi to 99 psi. Figure 5.7 displays the future system's average daily pressure. Maximum daily pressures would range from 30 psi to 94 psi. Figure 5.8 shows the future maximum daily pressure. Available fire flows range from 750 gpm to over 5,000 gpm. Figure 5.9 displays the future available fire flow. Similar to the existing system, the future system experienced headloss above the recommended standards near the elevated storage tank; however, the rest of the system was within standards for headloss and velocities. Figure 5.10 shows the maximum daily headloss through the future system's pipes.

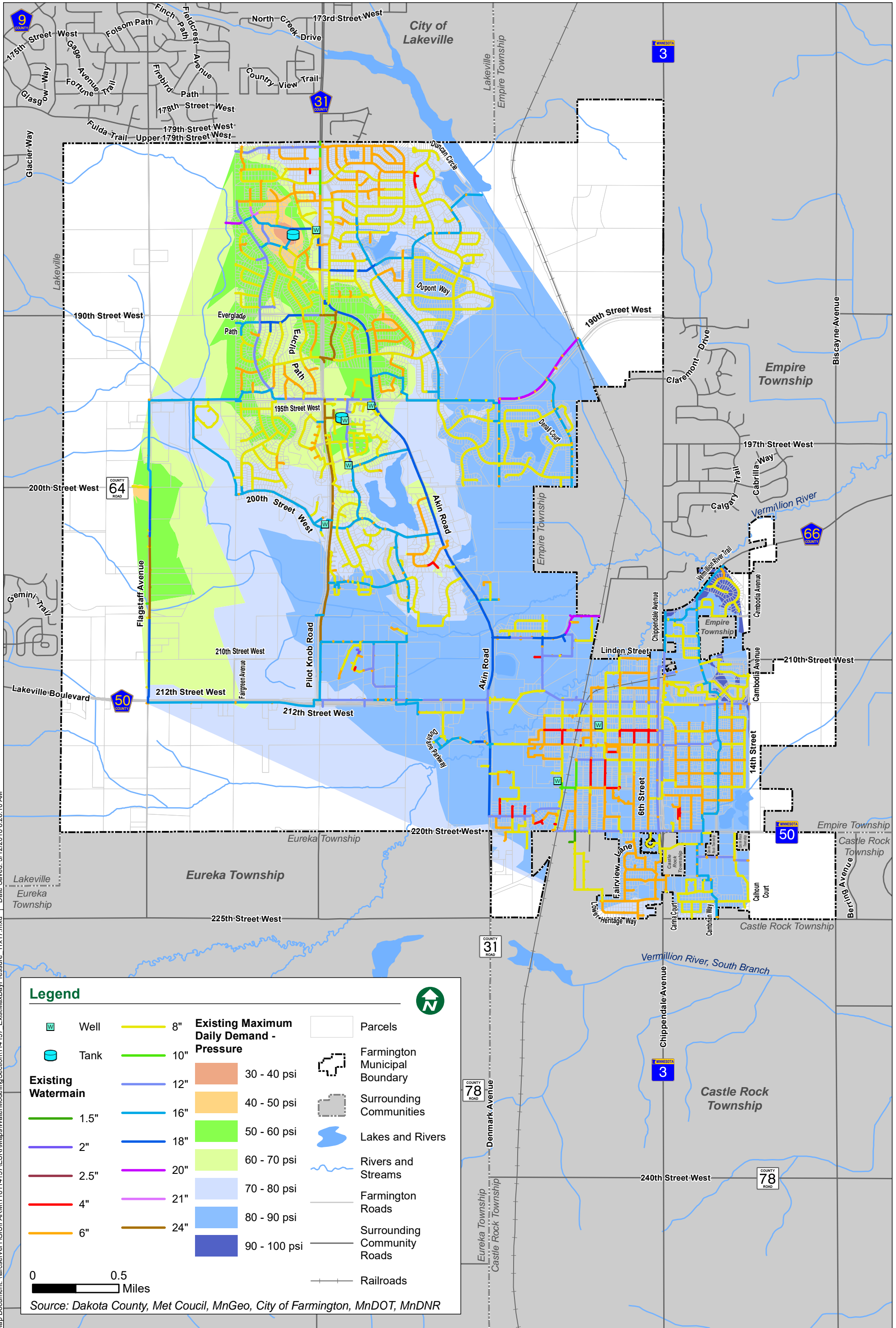
## 3. Future System Connected to Empire Township

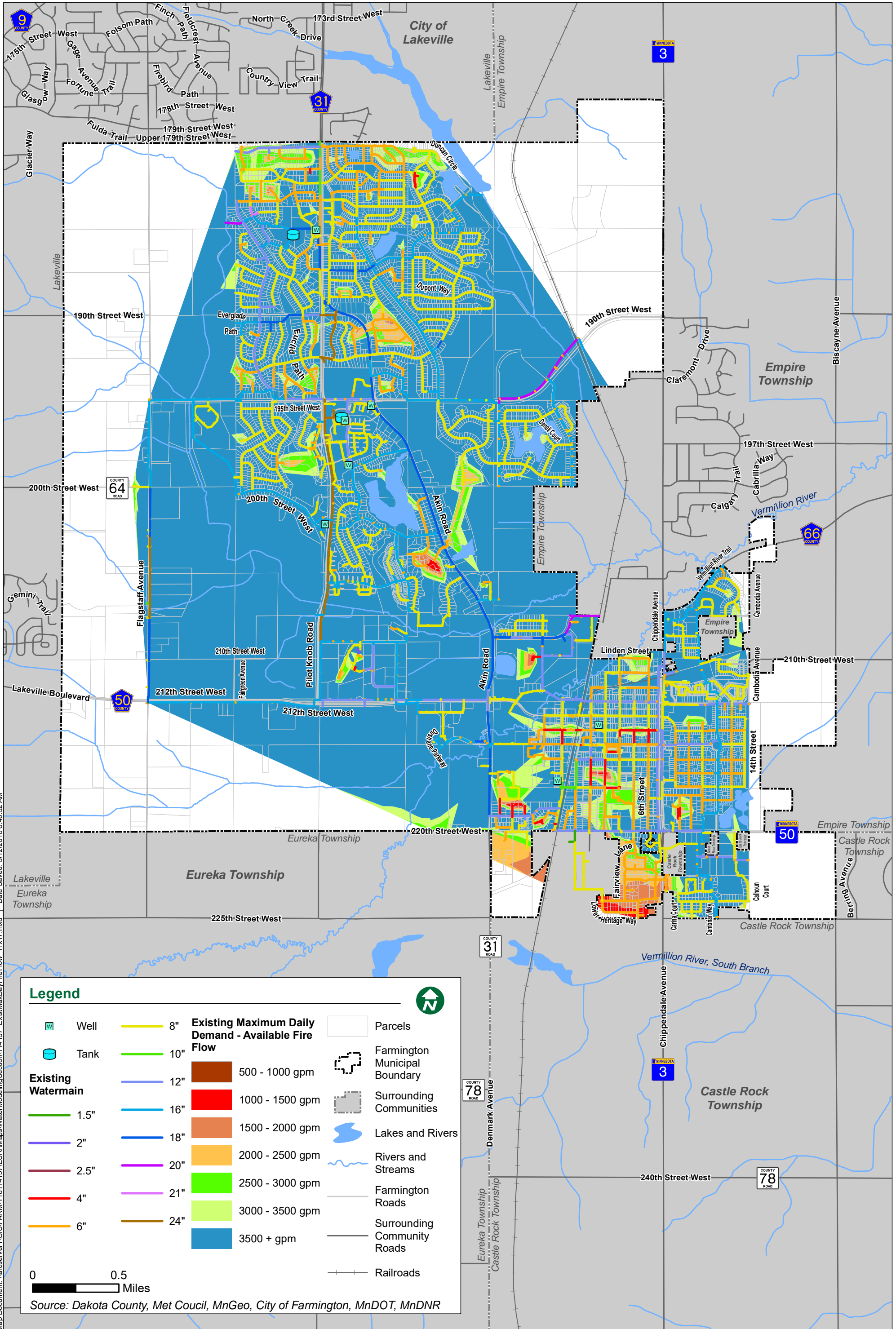
Another model of Farmington's future system includes joining with Empire Township's water system. Empire Township is connected to the Farmington's future system via four watermains in the model. Empire's existing elevated storage tank is removed from service as it's high water level is approximately 70 feet below Farmington's high water level. If the City desires to retain Empire's water tower, pressure reducing valves may be used. Figure 5.11 displays a map of the future joint systems' watermain sizes and major water infrastructure. Results for the joint systems indicates that the average daily pressure would range from 37 psi to 100 psi. Figure 5.12 displays the future system's average daily pressure. Maximum daily pressures would range from 30 psi to 96 psi. Figure 5.13 shows the future maximum daily pressure. Available fire flows range from 750 gpm to over 5,000 gpm. Figure 5.14 displays the future available fire flow. Similar to the other scenario's headloss and velocities were within the recommended standards for average daily demands, but experienced elevated headloss levels under maximum daily demands. The elevated headloss occurred near Farmington's elevated storage tank. Figure 5.15 shows the maximum daily headloss through the future joint systems' pipe network.



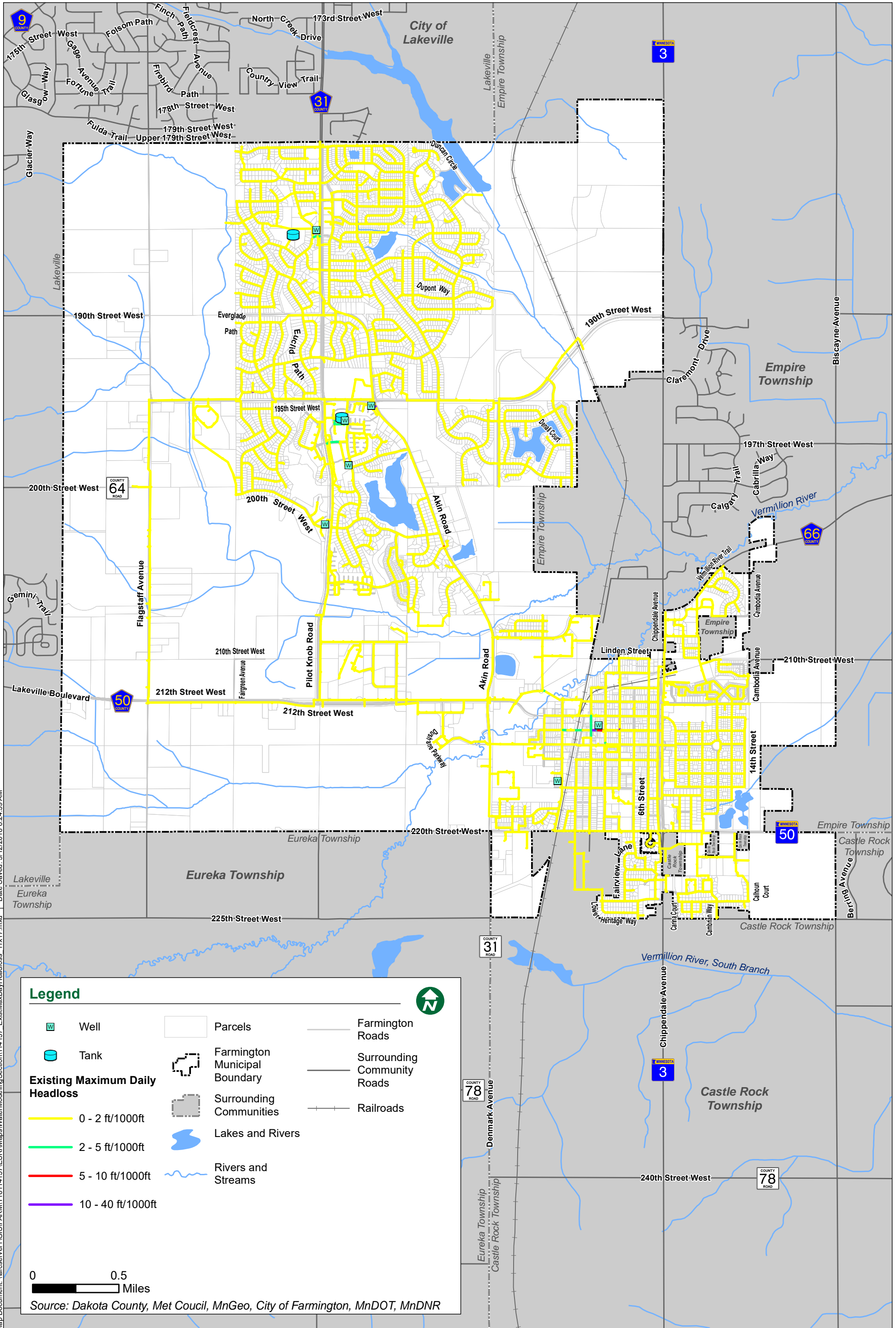
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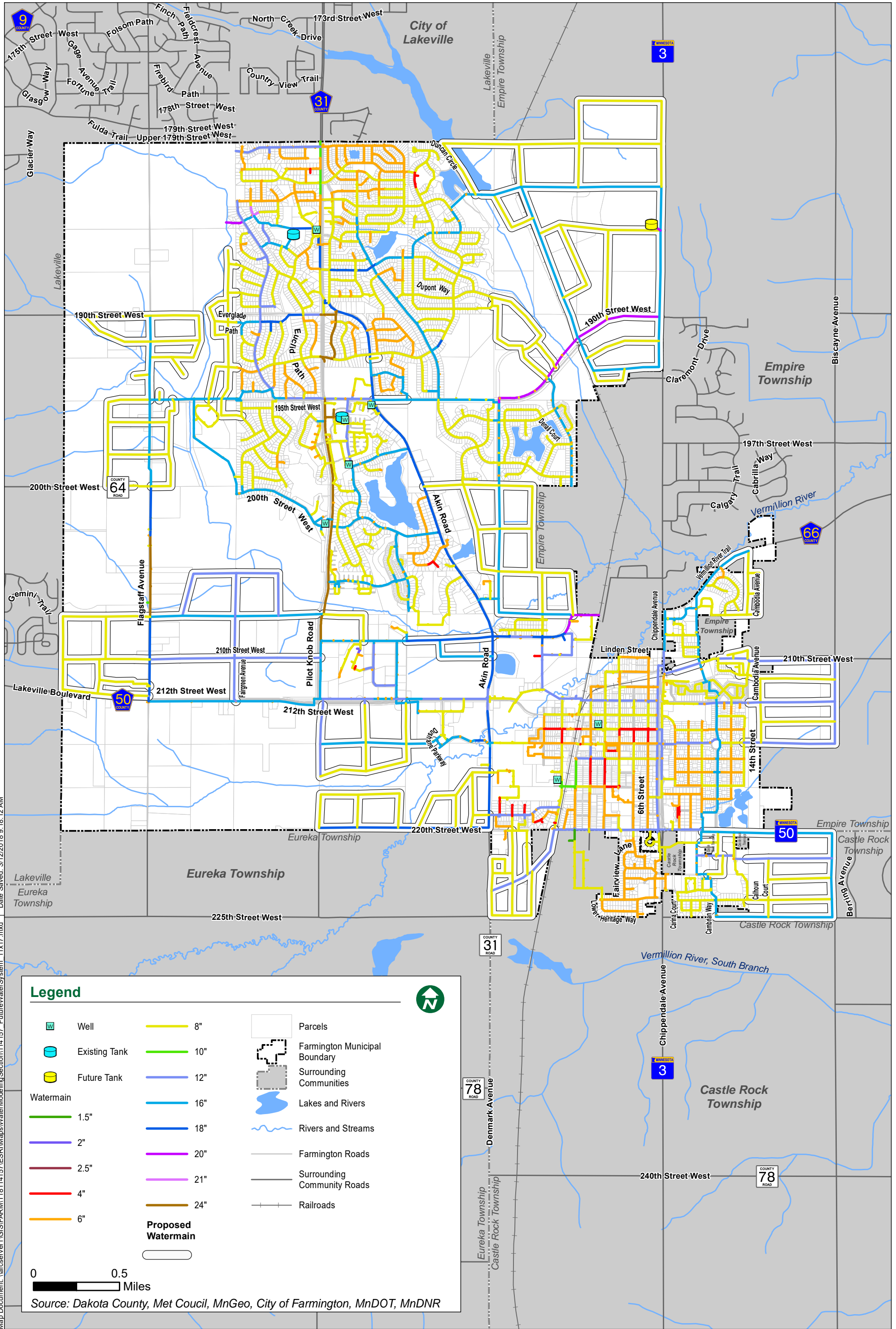




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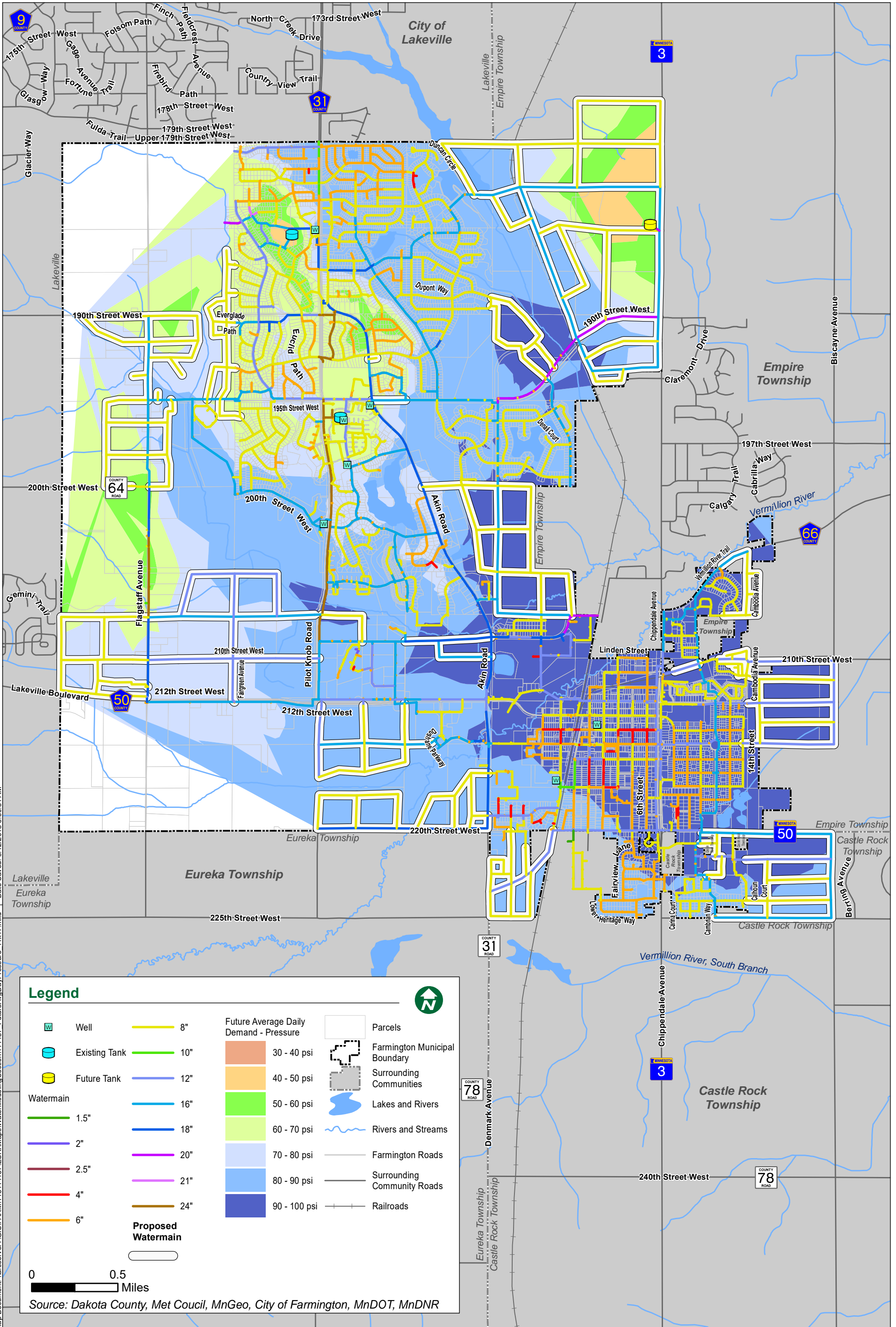
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**Legend**

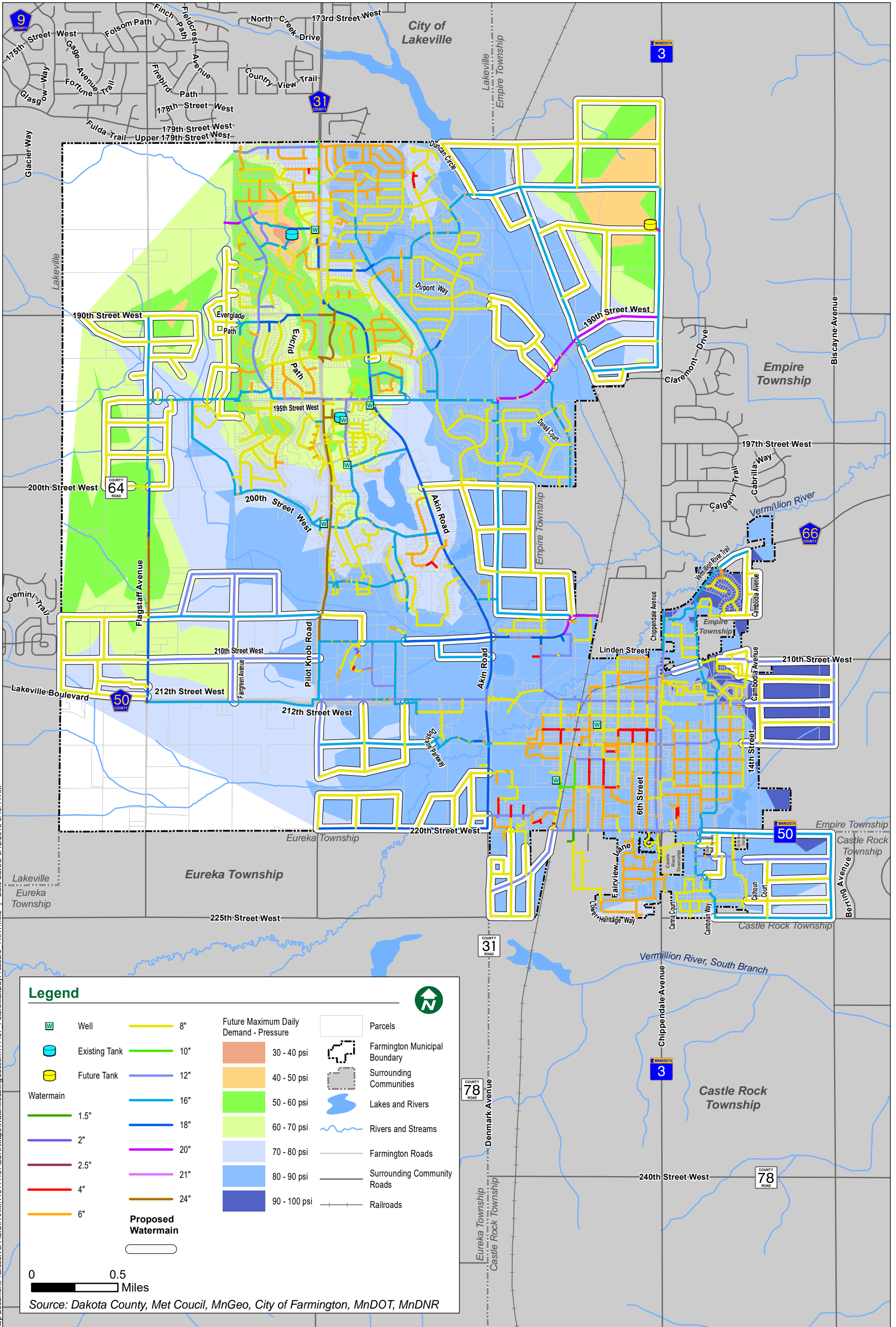
	Well		8"		Parcels
	Existing Tank		10"		Farmington Municipal Boundary
	Future Tank		12"		Surrounding Communities
<b>Watermain</b>			16"		Lakes and Rivers
	1.5"		18"		Rivers and Streams
	2"		20"		Farmington Roads
	2.5"		21"		Surrounding Community Roads
	4"		24"		Railroads
	6"	<b>Proposed Watermain</b>			

0 0.5 Miles

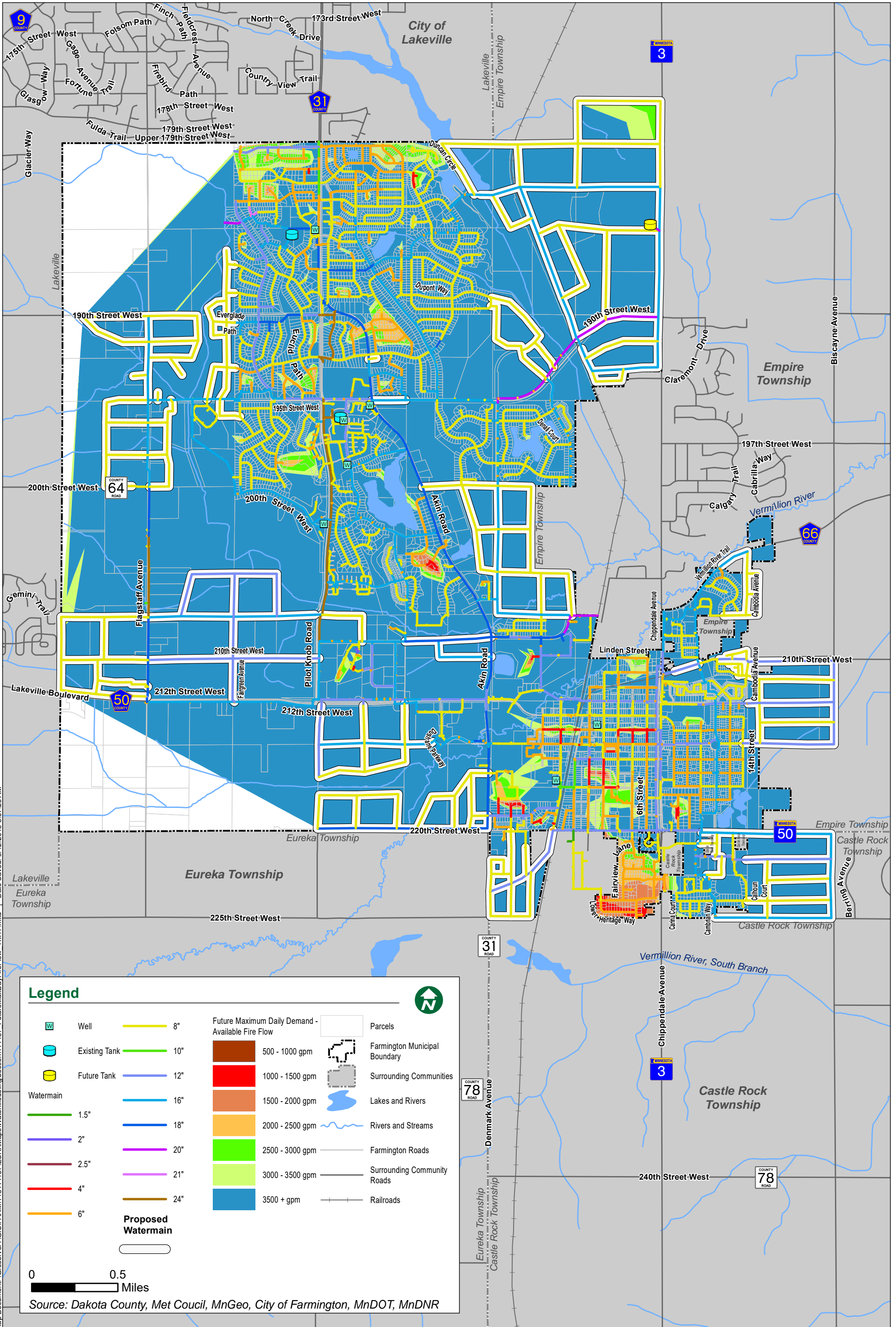
Source: Dakota County, Met Coucil, MnGeo, City of Farmington, MnDOT, MnDNR



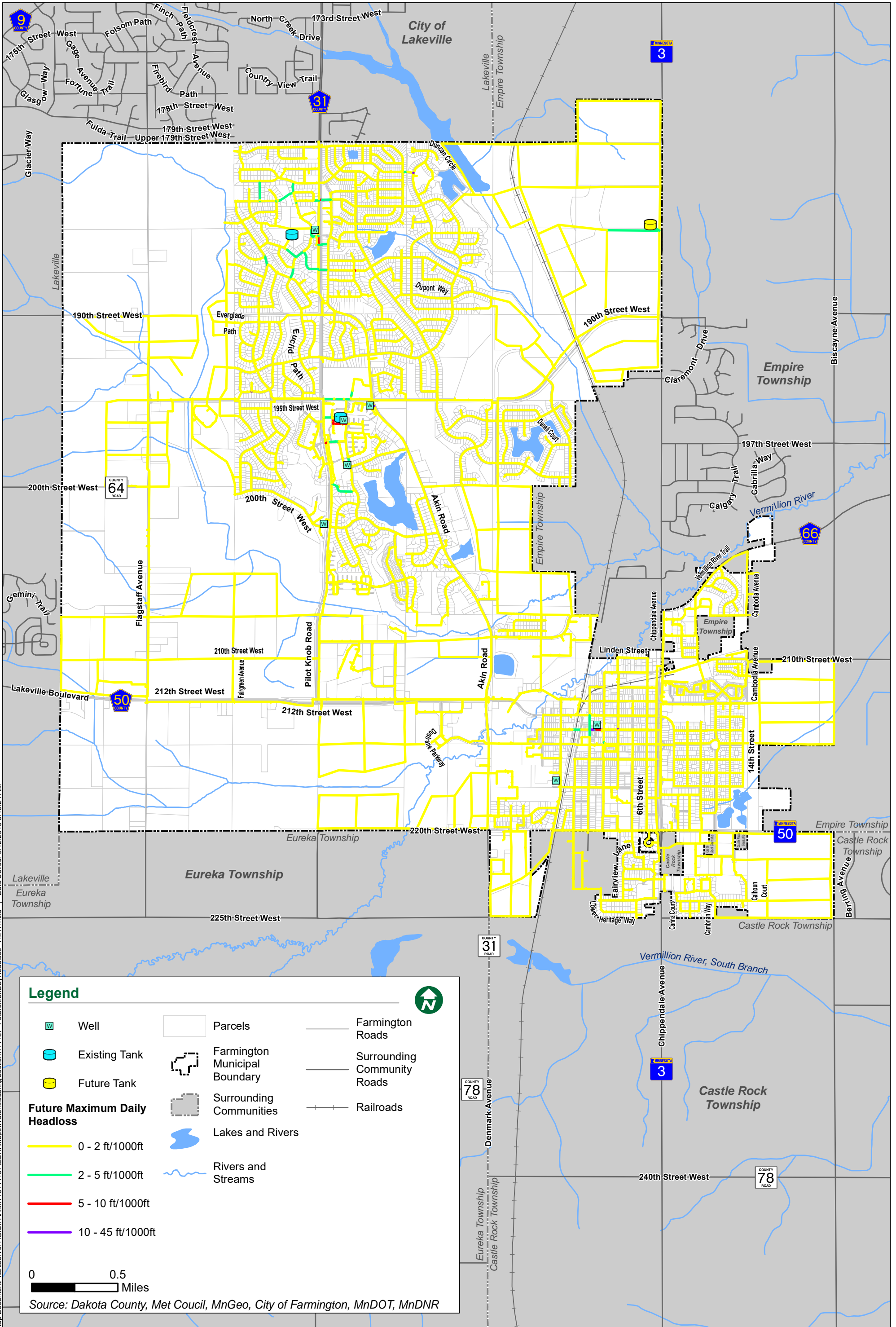
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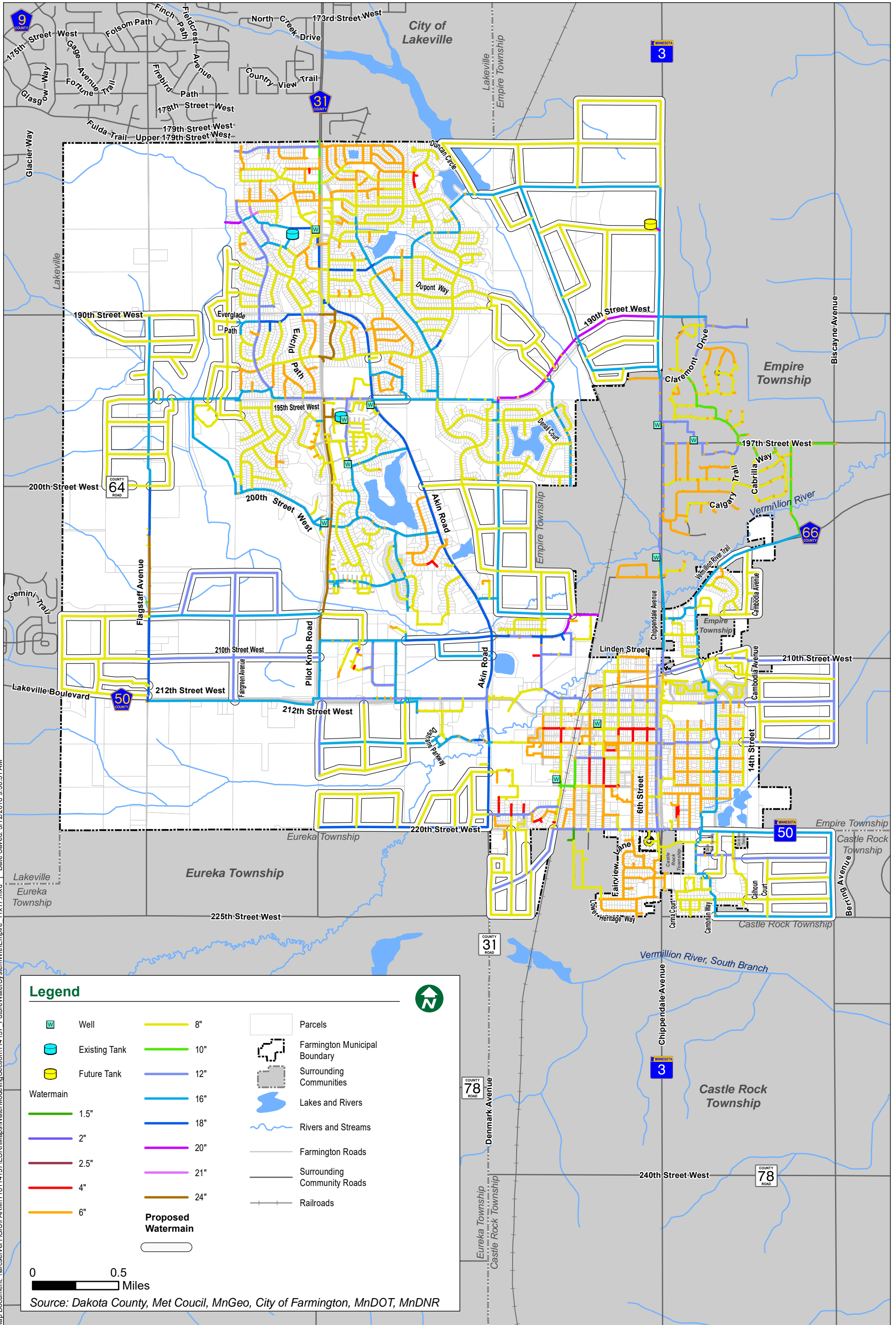


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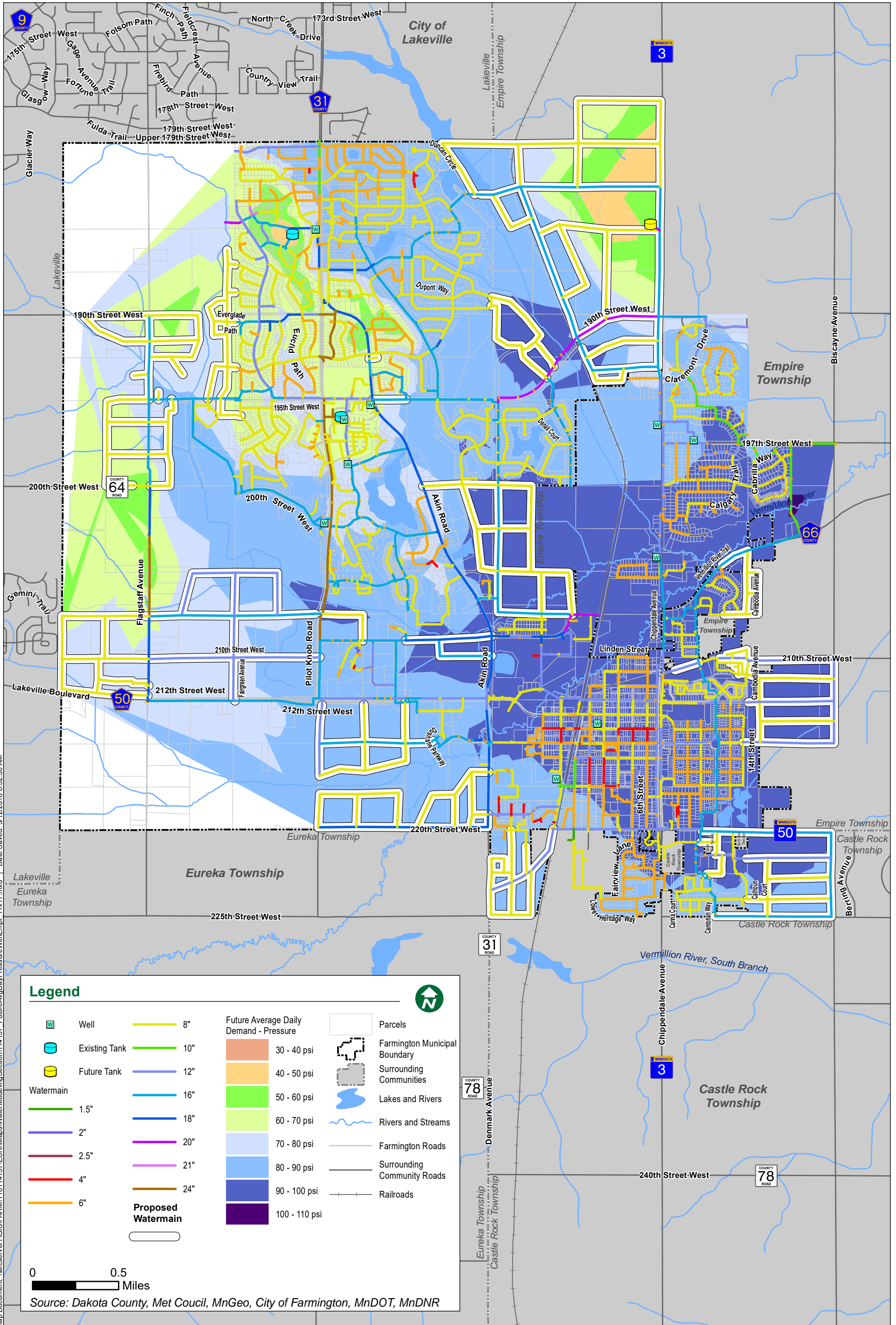




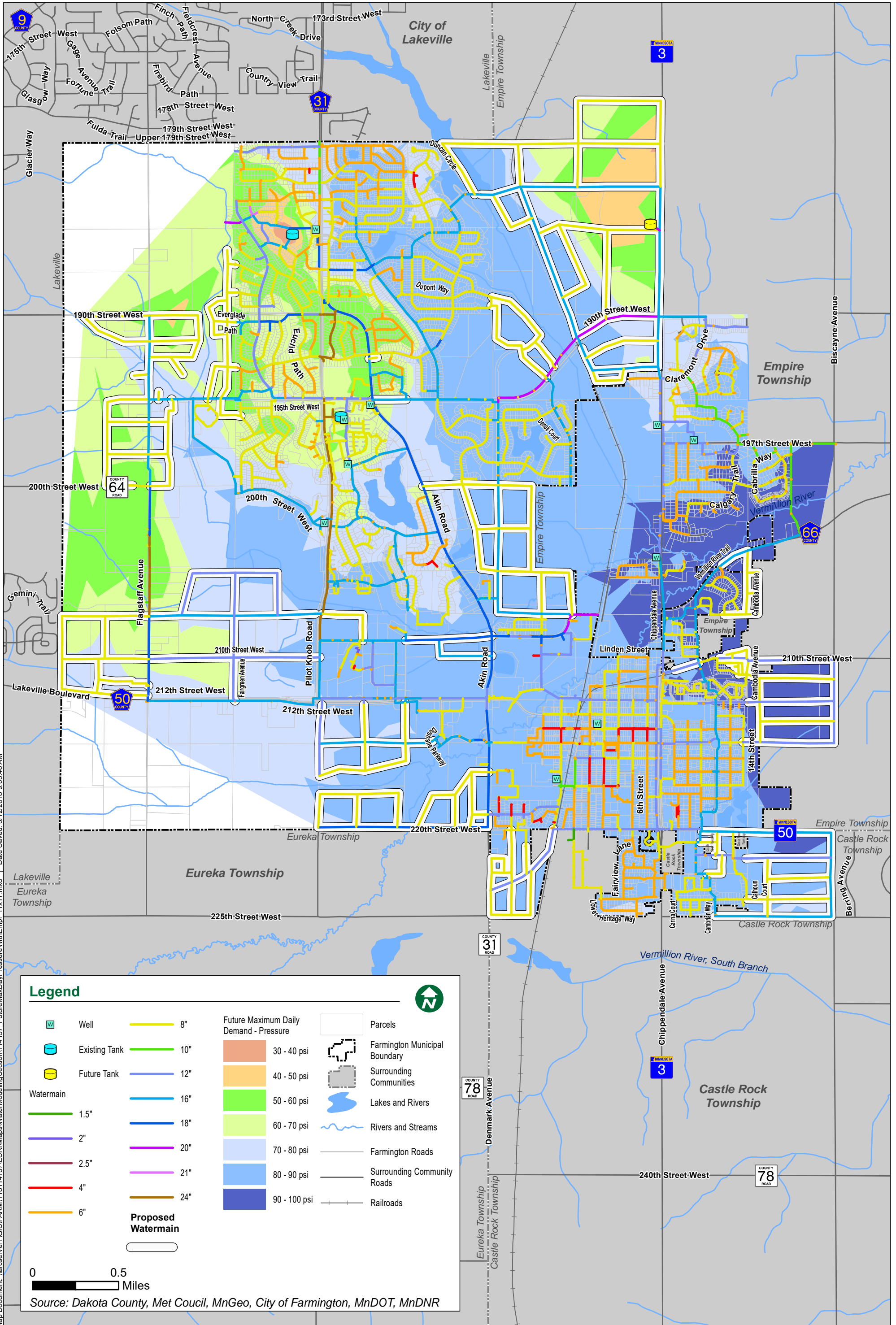
Real People. Real Solutions.



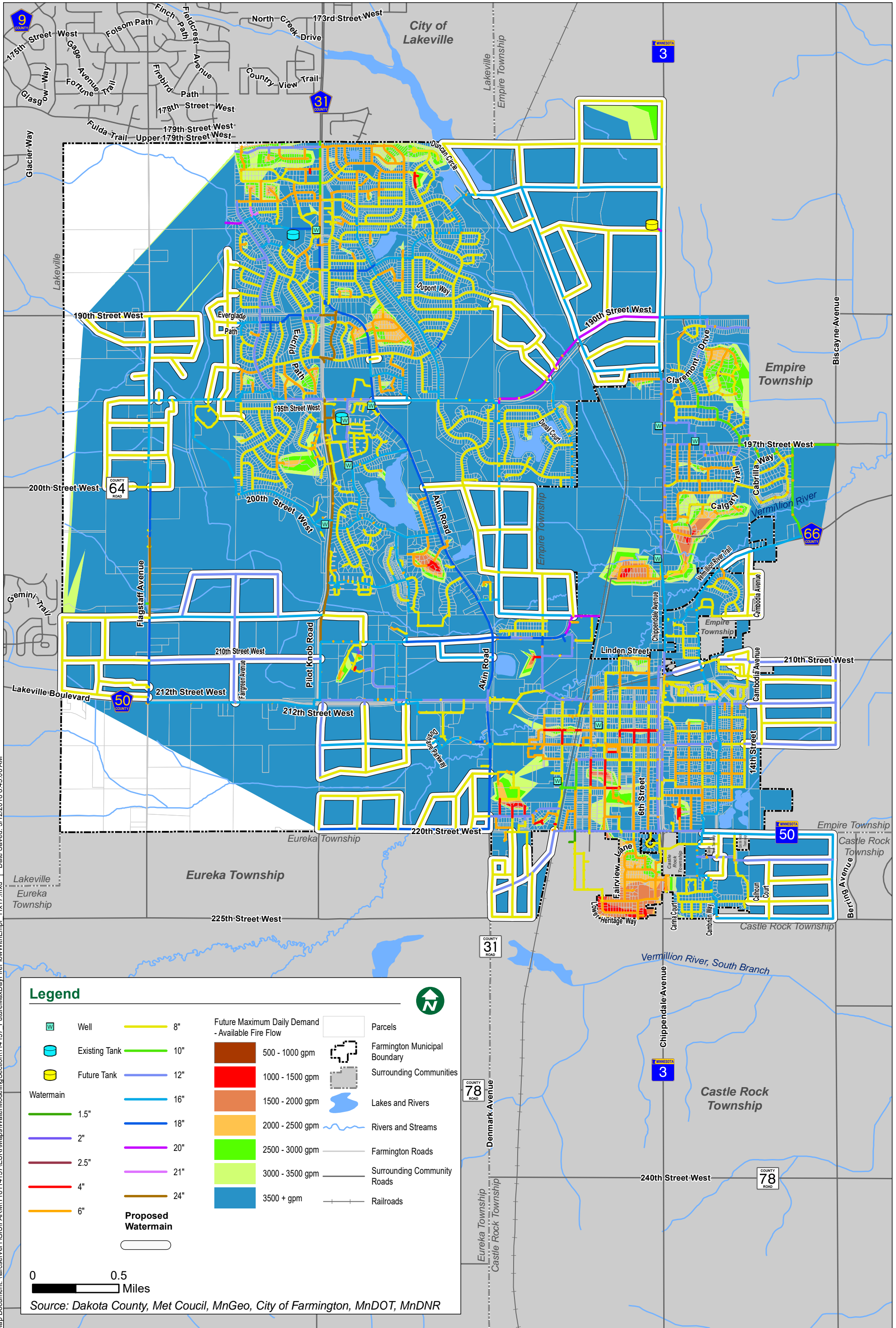
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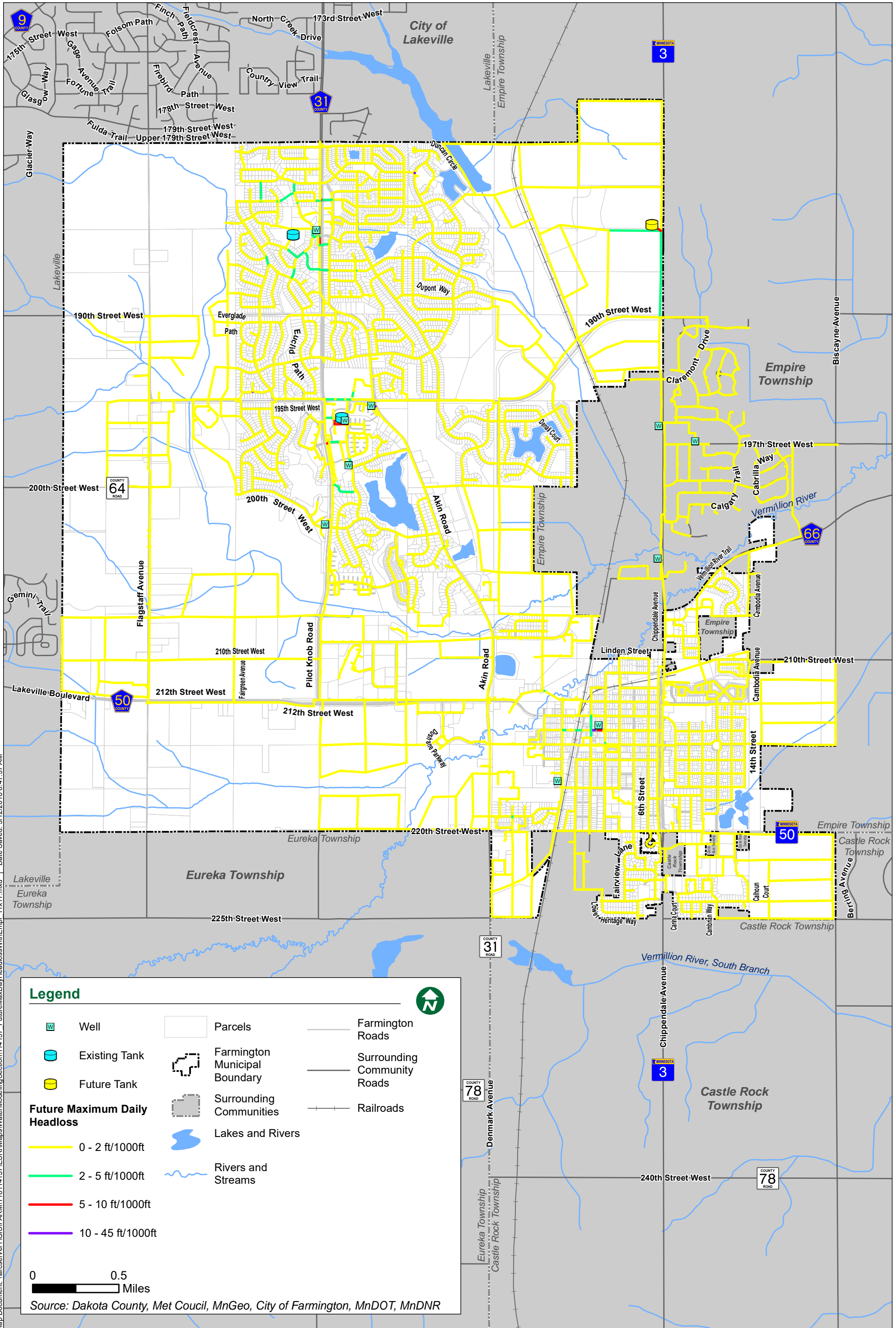
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#### 4. Recommendations

Based on the above analyses, the City of Farmington appears to have adequate available fire flows and good pressure coverage, except for some areas, particularly dead-end lines. It is recommended that the City provide watermain loops or larger watermains in these areas where possible.

It is considered good practice to increase the size of watermains that are too small. Existing four inch and smaller watermains limit fire protection to served properties. According to 10 States Standards, it states that the minimum size of watermain which provides fire protection shall be six-inch diameter. There is approximately 12,100 feet of pipe that are four inches in diameter or less; however, it is not recommended these be replaced at this time due to the high cost. The City should systematically continue to upgrade these pipes with regular street improvements.

The City may also consider setting up a leak detection schedule that examines the entire system on a cycle, such as examining one-fifth of the City every five years over a five year period. This ensures that the entire system is checked for leaks, no matter how small, and repairs leaks that may be missed by tracking the water audit only.

## VI. ECONOMIC ANALYSIS

### A. GENERAL

This section presents the general cost estimates and the Water System's Comprehensive Plan anticipated schedule. The cost estimates provided in this section are preliminary cost estimates.

### B. COMPREHENSIVE PLAN AND COST ESTIMATES

This section is forthcoming.

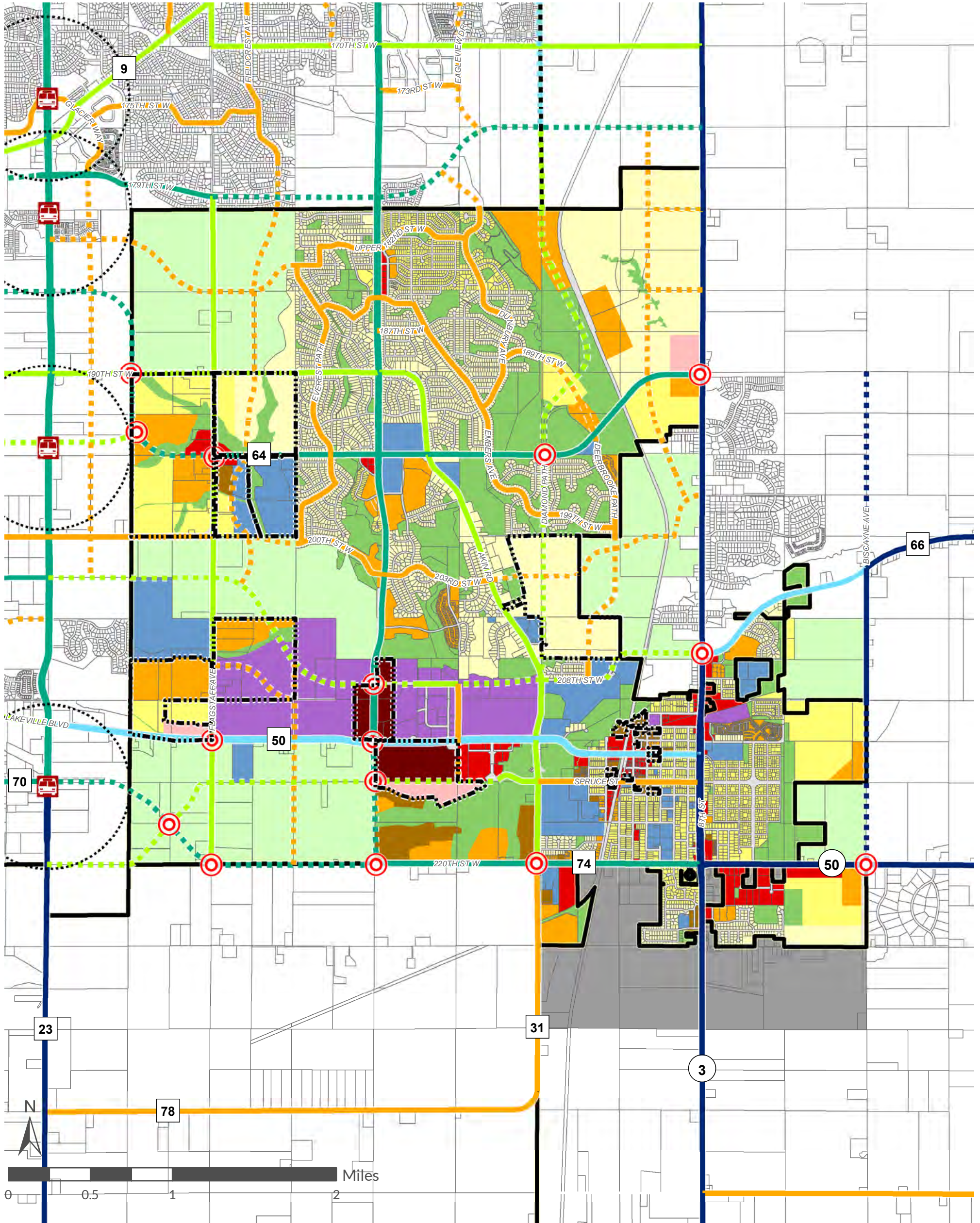
### C. FUNDING

Several sources are available for funding the above projects. The City of Farmington may also choose to fund the projects by bonding themselves or using cash reserves. It may be more beneficial to receive state funding for larger projects such as water tower installations or renovations, as these can cost significantly more than a watermain replacement project. For these projects, the state of Minnesota has the Public Facilities Authority that funds projects through the Drinking Water Revolving Fund. This requires placement on the Project Priority List to receive funding for drinking water projects. The City can also choose to try to receive different grants to fund the above projects if they are eligible.

## Appendix A: Future Land Use Map



# Proposed Changes to 2040 Future Land Use

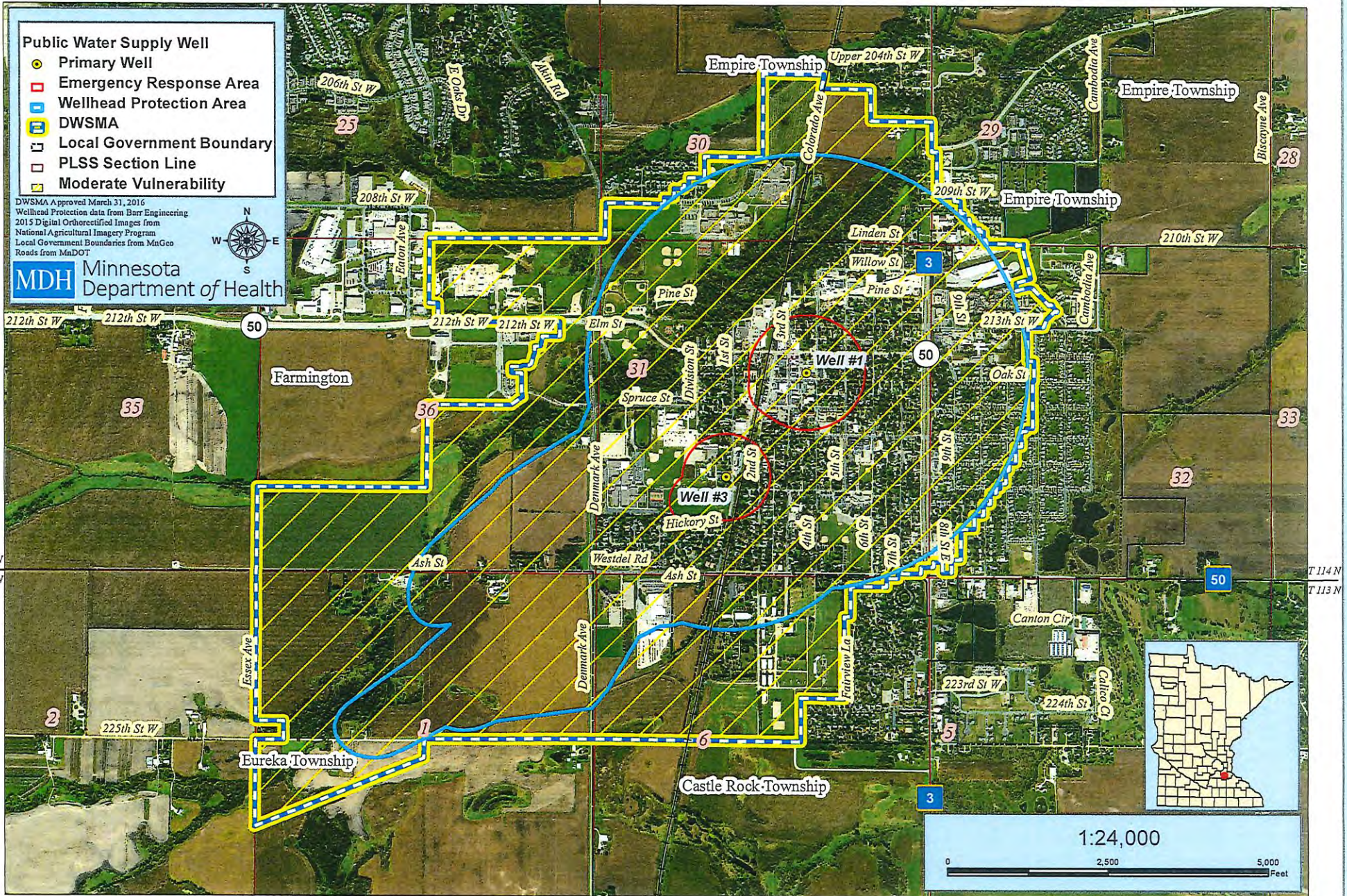


- |                           |                        |                        |                                   |
|---------------------------|------------------------|------------------------|-----------------------------------|
| Change in Future Land Use | Other Arterial         | Agriculture            | Mixed-Use (Commercial/Industrial) |
| Major Intersection        | Future Other Arterial  | Low Density            | Industrial                        |
| A Minor Expander          | Major Collector        | Low Medium             | Public/Semi-Public                |
| Future A Minor Expander   | Future Major Collector | Medium Density         | Park/Open Space                   |
| A Minor Connector         | Minor Collector        | High Density           | ROW                               |
| Future A Minor Connector  | Future Minor Collector | Mixed-Use (Comm./Res.) | Non-Designated                    |
|                           |                        | Commercial             |                                   |

## Appendix B: Drinking Water Supply Management Area (DWSMA) Figures

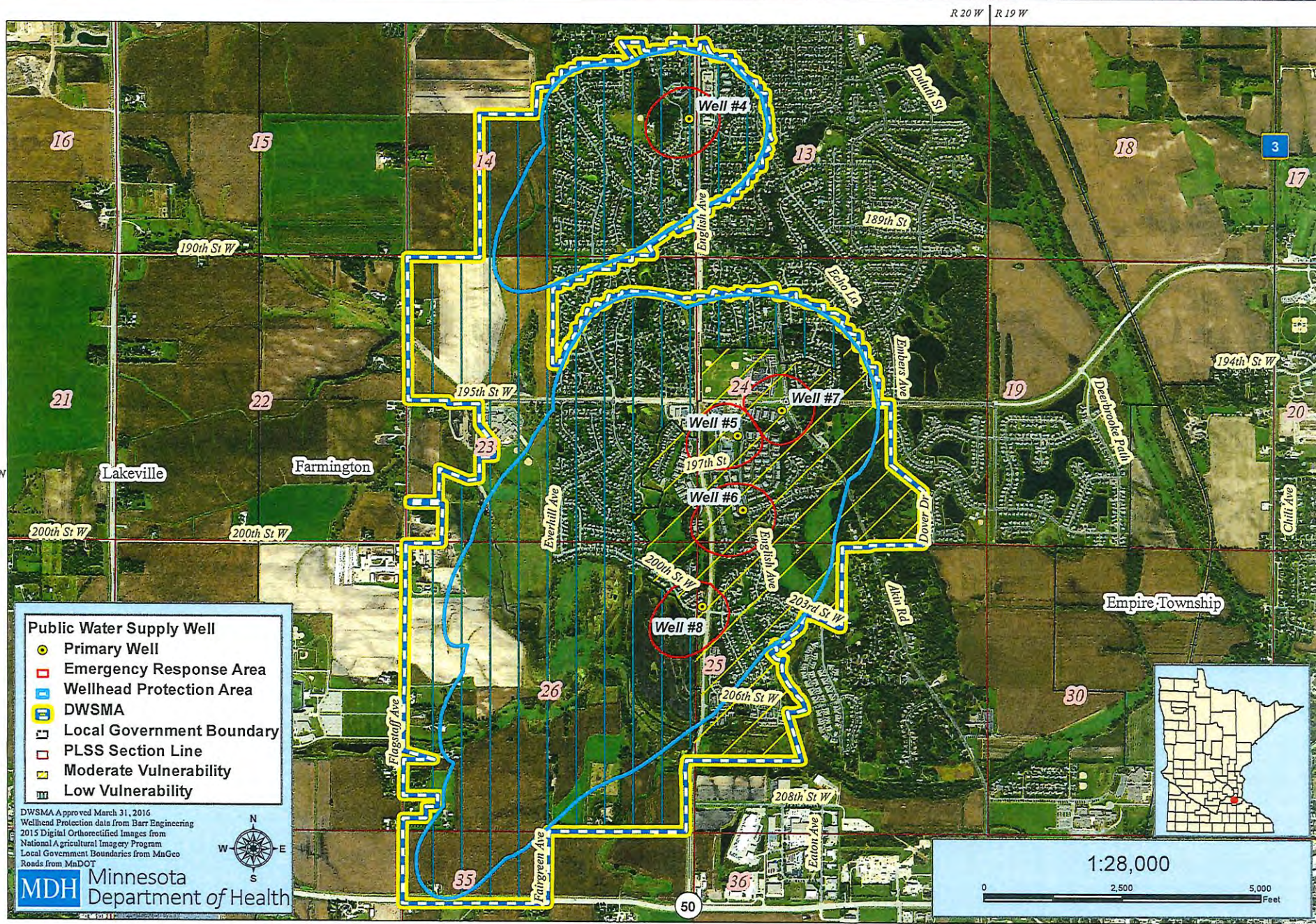
# Farmington SE Drinking Water Supply Management Area (DWSMA) MN-00873 - Moderate Vulnerability

R 20 W R 19 W



R 20 W R 19 W

# Farmington NW Drinking Water Supply Management Area (DWSMA) MN-00874 - Variable Vulnerability

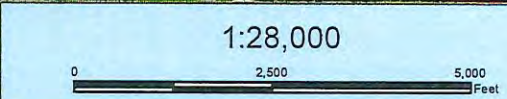


- Public Water Supply Well
- Primary Well
- Emergency Response Area
- Wellhead Protection Area
- DWSMA
- Local Government Boundary
- PLSS Section Line
- Moderate Vulnerability
- Low Vulnerability

DWSMA Approved March 31, 2016  
Wellhead Protection data from Barr Engineering  
2015 Digital Orthorectified Images from  
National Agricultural Imagery Program  
Local Government Boundaries from MnGeo  
Roads from MnDOT



**MDH** Minnesota Department of Health



## Appendix C: City of Farmington 2016 Consumer Confidence Report

# CONSUMER CONFIDENCE REPORT

## City of Farmington 2016 Drinking Water Report



Photo by Hailee Unruh

The city of Farmington is issuing the results of monitoring done on its drinking water for the period from January 1 to December 31, 2016. The purpose of this report is to advance consumers' understanding of drinking water and heighten awareness of the need to protect precious water resources.

### Source of Water

The city of Farmington provides drinking water to its residents from a groundwater source: seven wells ranging from 402 to 512 feet deep, that draw water from the Prairie Du Chien-Jordan aquifer.

The Minnesota Department of Health has made a determination as to how vulnerable our systems' source of water may be to future contamination incidents. If you wish to obtain the entire source water assessment regarding your drinking water, please call 651-201-4700 or 1-800-818-9318 (and press 5) during normal business hours. Also, you can view it on line at [www.health.state.mn.us/divs/eh/water/swp/swa](http://www.health.state.mn.us/divs/eh/water/swp/swa).

Contact [Katy Gehler](mailto:Katy.Gehler@cityoffarmington.com), 651-280-6841 if you have questions about the city of Farmington drinking water or would like information about opportunities for public participation in decisions that may affect the quality of the water.

### Results of Monitoring

No contaminants were detected at levels that violated federal drinking water standards. However, some contaminants were detected in trace amounts that were below legal limits. The table that follows shows the contaminants that were detected in trace amounts last year. (Some contaminants are sampled less frequently than once a year; as a result, not all contaminants were sampled for in 2016. If any of these contaminants were detected the last time they were sampled for, they are included in the table along with the date that the detection occurred.)

### Key to abbreviations:

- MCLG - Maximum Contaminant Level Goal: The level of a contaminant in drinking water below which there is no known or expected risk to health. MCLGs allow for a margin of safety.
- MCL - Maximum Contaminant Level: The highest level of a contaminant that is allowed in drinking water. MCLs are set as close to the MCLGs as feasible using the best available treatment technology.
- MRDL - Maximum Residual Disinfectant Level.
- MRDLG - Maximum Residual Disinfectant Level Goal.
- AL - Action Level: The concentration of a contaminant which, if exceeded, triggers treatment or other requirement which a water system must follow.
- 90th Percentile Level - This is the value obtained after disregarding 10 percent of the samples taken that had the highest levels. (For example, in a situation in which 10 samples were taken, the 90th percentile level is determined by disregarding the highest result, which represents 10 percent of the samples.) Note: In situations in which only 5 samples are taken, the average of the two with the highest levels is taken to determine the 90th percentile level.
- pCi/l - PicoCuries per liter (a measure of radioactivity).
- ppm - Parts per million, which can also be expressed as milligrams per liter (mg/l).
- ppb - Parts per billion, which can also be expressed as micrograms per liter (µg/l).
- nd - No Detection.
- N/A - Not Applicable (does not apply).
- TT - Treatment Technique: A required process intended to reduce the level of a contaminant in drinking water.

Contaminant (units)	MCLG	MCL	Level Found		Typical Source of Contaminant
			Range (2016)	Average/Result*	
Alpha Emitters (pCi/l) (04/27/2015)	0	15.4	N/A	9.7	Erosion of natural deposits.
Barium (ppm) (04/22/2015)	2	2	N/A	.11	Discharge of drilling wastes; Discharge from metal refineries; Erosion of natural deposits.
Combined Radium (pCi/l) (04/27/2015)	0	5.4	N/A	2.1	Erosion of natural deposits.
Cyanide (ppb)	200	200	N/A	60	Discharge from steel/metal factories; Discharge from plastic and fertilizer factories.
Fluoride (ppm)	4	4	.49-.92	.82	State of Minnesota requires all municipal water systems to add fluoride to the drinking water to promote strong teeth; Erosion of natural deposits; Discharge from fertilizer and aluminum factories.
Haloacetic Acids (HAA5) (ppb)	0	60	1-1.1	1.1	By-product of drinking water disinfection.
Nitrate (as Nitrogen) (ppm)	10.4	10.4	nd-.63	.63	Runoff from fertilizer use; Leaching from septic tanks, sewage; Erosion of natural deposits.
TTHM (Total trihalomethanes) (ppb)	0	80	4.9-5.6	5.6	By-product of drinking water disinfection.

\*This is the value used to determine compliance with federal standards. It sometimes is the highest value detected and sometimes is an average of all the detected values. If it is an average, it may contain sampling results from the previous year.

Contaminant (units)	MCLG	MCL	# of TT exceedances	Typical Source of Contaminant
Total Coliform Bacteria ‡	N/A	TT	1	Naturally present in the environment.

‡Beginning April 1, 2016

Coliforms are bacteria that are naturally present in the environment and are used as an indicator that other, potentially harmful, waterborne pathogens may be present or that a potential pathway exists through which contamination may enter the drinking water distribution system. We found coliforms indicating the need to look for potential problems in water treatment or distribution. When this occurs, we are required to conduct assessment(s) to identify problems and to correct any problems that were found during these assessments.

Level 1 Assessment: A Level 1 assessment is a study of the water system to identify potential problems and determine (if possible) why total coliform bacteria have been found in our water system.

During the past year we were required to conduct one Level 1 assessment. One Level 1 assessment was completed. In addition, we were required to take zero corrective actions.

Contaminant (units)	MRDLG	MRDL	****	*****	Typical Source of Contaminant
Chlorine (ppm)	4	4	nd-1.29	.24	Water additive used to control microbes.

\*\*\*\*Highest and Lowest Monthly Average.

\*\*\*\*\*Highest Quarterly Average.

Contaminant (units)	MCLG	AL	90% Level	# sites over AL	Typical Source of Contaminant
Copper (ppm)	1.3	1.3	.48	0 out of 30	Corrosion of household plumbing systems; Erosion of natural deposits.
Lead (ppb)	0	15	1.2	0 out of 30	Corrosion of household plumbing systems; Erosion of natural deposits.

If present, elevated levels of lead can cause serious health problems, especially for pregnant women and young children. Lead in drinking water is primarily from materials and components associated with service lines and home plumbing. City of Farmington is responsible for providing high quality drinking water, but cannot control the variety of materials used in plumbing components. When your water has been sitting for several hours, you can minimize the potential for lead exposure by flushing your tap for 30 seconds to 2 minutes before using water for drinking or cooking. If you are concerned about lead in your water, you may wish to have your water tested. Information on lead in drinking water, testing methods, and steps you can take to minimize exposure is available from the Safe Drinking Water Hotline or at <http://www.epa.gov/safewater/lead>.

Monitoring may have been done for additional contaminants that do not have MCLs established for them and are not required to be monitored under the Safe Drinking Water Act. Results may be available by calling 651-201-4700 or 1-800-818-9318 during normal business hours.



*Aerial photo by Bill Cuevas*

## **Aesthetic Water Quality**

**(these components are not considered harmful to health, but can affect the look and taste of the water)**

Water Hardness .....	271.51 mg/L or 15.8 grains
pH .....	7.76
Calcium.....	65.3 mg/L
Magnesium.....	26.2 mg/L
Sulfate .....	19.1 mg/L
Sodium .....	3.5 mg/L
Chloride .....	6.55 mg/L
Iron.....	.38 mg/L
Manganese.....	.06 mg/L
Alkalinity.....	254.71 mg/L

The numbers above represent average values of all samples taken, some variation may be experienced.



# Compliance with National Primary Drinking Water Regulations

The sources of drinking water (both tap water and bottled water) include rivers, lakes, streams, ponds, reservoirs, springs, and wells. As water travels over the surface of the land or through the ground, it dissolves naturally-occurring minerals and, in some cases, radioactive material, and can pick up substances resulting from the presence of animals or from human activity.

Contaminants that may be present in source water include:

*Microbial contaminants*, such as viruses and bacteria, which may come from sewage treatment plants, septic systems, agricultural livestock operations, and wildlife.

*Inorganic contaminants*, such as salts and metals, which can be naturally occurring or result from urban stormwater runoff, industrial or domestic wastewater discharges, oil and gas production, mining, or farming.

*Pesticides and herbicides*, which may come from a variety of sources such as agriculture, urban stormwater runoff, and residential uses.

*Organic chemical contaminants*, including synthetic and volatile organic chemicals, which are by-products of industrial processes and petroleum production, and can also come from gas stations, urban stormwater runoff, and septic systems.

*Radioactive contaminants*, which can be naturally-occurring or be the result of oil and gas production and mining activities.

In order to ensure that tap water is safe to drink, the U. S. Environmental Protection Agency (EPA) prescribes regulations which limit the amount of certain contaminants in water provided by public water systems. Food and Drug Administration regulations establish limits for contaminants in bottled water which must provide the same protection for public health.

Drinking water, including bottled water, may reasonably be expected to contain at least small amounts of some contaminants. The presence of contaminants does not necessarily indicate that water poses a health risk. More information about contaminants and potential health effects can be obtained by calling the Environmental Protection Agency's Safe Drinking Water Hotline at 1-800-426-4791.

***Some people may be more vulnerable to contaminants in drinking water than the general population. Immuno-compromised persons such as persons with cancer undergoing chemotherapy, persons who have undergone organ transplants, people with HIV/AIDS or other immune system disorders, some elderly, and infants can be particularly at risk from infections. These people should seek advice about drinking water from their health care providers. EPA/CDC guidelines on appropriate means to lessen the risk of infection by Cryptosporidium and other microbial contaminants are available from the Safe Drinking Water Hotline at 1-800-426-4791.***

# APPENDIX H. LOCAL SURFACE WATER MANAGEMENT PLAN, 2018-2027



Real People. Real Solutions.

**DRAFT**

March 2018

# Water System Plan

## City of Farmington, Minnesota

T18.114157

**Submitted by:**

Bolton & Menk, Inc.  
12224 Nicollet Ave  
Burnsville, MN 55337  
P: 952-890-0509  
F: 952-890-8065

# Certification

Water System Plan

for

City of Farmington, Minnesota

T18.114157

March 2018

I hereby certify that this plan, specification or report was prepared by me or under my direct supervision, and that I am a duly Licensed Professional Engineer under the laws of the State of Minnesota.

By: \_\_\_\_\_

Seth Peterson, P.E.

License No. 26468

Date: \_\_\_\_\_

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## I. EXECUTIVE SUMMARY

### A. WATER SYSTEM DESIGN CRITERIA

This section of the Plan develops the performance criteria under which the water system will be evaluated and designed. This involves an evaluation of historical population and trends, water use patterns and projections, water supply requirements, water storage requirements, required fire flows, and distribution system pressure requirements.

The City of Farmington's existing average daily demand is approximately 1.93 MGD and the maximum daily demand is approximately 5.33 MGD. The projected demands for 2040 are 2.86 MGD and 7.72 MGD for average daily and maximum daily demands respectively.

The City's recommended firm water supply capacity is 5.33 MGD for the existing system and 7.72 MGD for the future system. The recommended water storage volume for the current system is 2.49 MG and the future system has a recommended storage volume of 3.65 MG.

Watermains should have a minimum working pressure of 35 psi with normal working pressures ranging from 60–80 psi. Pipe velocities should be between 2 and 5 feet per second on average. It is also recommended that minimum pipe diameters of 6-inches be used to allow for providing fire protection and serving fire hydrants, with larger mains required if necessary.

A water model of Farmington's system was developed to aid in the evaluation of Farmington's system. This model was used to predict the City's pressure, fire flows, pipe velocities, and headloss throughout the system. The model was also used to simulate the future system, predict the impact of future growth, and the effect of future water system infrastructures.

### B. EXISTING WATER SYSTEM FACILITIES AND INFRASTRUCTURE

The City of Farmington water system consists of seven (7) active wells, one (1) elevated storage tank, one (1) standpipe, and a system of trunk and lateral watermains varying in sizes from 4-inches to 24-inches. The Farmington water system is contained within a single pressure zone.

Farmington's existing firm capacity is 10.37 MGD or 7,200 gpm; however, a municipal well's typical lifespan is approximately 40 to 60 years. Well No. 1 has exceeded 60 years of service, Well No. 3 has served the City for approximately 60 years, Well No. 4 has served the city for roughly 45 years. Without Well No. 1 and Well No. 3, the City's remaining firm capacity is 8.06 MGD or 5,600 gpm. Without Well No. 1, Well No. 3, and Well No. 4, the remaining firm well capacity is 6.62 MGD or 4,600 gpm. The City of Farmington also shares an interconnection with the City of Lakeville to be used in case of an emergency.

The City of Farmington has two storage tanks: a 1.5 MG elevated storage tank and a 0.67 MG standpipe. While the total storage capacity is 2.27 MG, the effective storage capacity is 1.79 MG, as the standpipe has an effective storage capacity of 0.29 MG.

The City of Farmington treats raw water with fluoride and chlorine at each well house prior to entering the distribution system. No other treatment is provided.

The existing distribution system consists of watermains varying from 4 to 24 inches in diameter. Most of the City's watermains are constructed of ductile iron pipe (DIP), with older parts of the City being served by cast iron pipe (CIP). Static pressure readings as reported within the system generally range from approximately 45 pounds per square inch (psi) to 100 psi.

The City's drinking water meets all primary drinking water standards, as indicated in the 2016 Consumer Confidence Report. The City also meets most secondary aesthetic water quality standards, except for iron and manganese.

#### C. WATER CONSERVATION

Water conservation can include a vast range of techniques and strategies from the addition of rain barrels to capture rainfall for lawn irrigation, to drip irrigation systems for larger gardens, to even replacing regular household appliances with energy and water efficient appliances. This section will discuss concepts for reducing water use, and peak day demands along with the current water rates, and the water lost throughout the system and how they relate to water conservation.

Farmington currently has an ordinance for odd-even day watering that has helped reduce peak day and seasonal demands. The City has also been proactive in implementing an increasing block rate structure that bills more for higher water usage. This has helped reduce water usage over the past few years.

Farmington's unaccounted for water is estimated at approximately 8.5 percent. This is within the DNR's recommendation of maintain unaccounted for water below than 10 percent. The City periodically conducts a leak survey as needed, when monthly water audits indicate a leak is occurring.

#### D. RECOMMENDED FUTURE IMPROVEMENTS

This section details recommended future improvements for Farmington's water system to improve the water supply, treatment, distribution system, and storage facilities. The recommended improvements are based on evaluation of the existing facilities.

The City currently has sufficient water supply capacity for the existing system; however, a few of the supply wells have surpassed or will surpass their typical life expectancy during the 20-year design period. With the loss of these wells, it is recommended that the City install at least one replacement well having a capacity of 1.10 MGD or a 770 gpm well prior to all three wells being removed from service.

Farmington's existing recommended storage volume is 2.49 MG and the future recommended storage volume is 3.65 MG. Farmington's existing effective storage volume is 1.79 MG, so the City is deficient in their recommended storage volumes by 0.70 MG for the existing system, and 1.86 MG for the future system. It is recommended the City install a 2.0 MG storage tank or install a 1.0 MG tank with the intent of installing another 1.0 MG tank by 2022.

Farmington's raw water quality is moderately high in iron and manganese. Secondary standards are indicative of aesthetic water quality and does not necessarily constitute a health hazard; however, the City may choose to treat iron and manganese based on consumer complaints on water color and clarity.

Based on the water model, the City of Farmington appears to have adequate available fire flows and good pressure coverage except for a few areas, particularly dead-end lines. It is recommended that the City provide watermain loops or larger watermains in these areas where possible.

#### E. ECONOMIC ANALYSIS

This section is forthcoming.



## II. WATER SYSTEM DESIGN CRITERIA

### A. GENERAL

This section of the Plan develops the performance criteria under which the water system will be evaluated and designed. This involves an evaluation of historical population and trends, water use patterns and projections, water storage requirements, required fire flows, and distribution system pressure requirements. This section will form the design basis of the Water Plan. The water model for the City of Farmington will be instrumental in identifying issues with the existing distribution system and expanding the system for future developments in the City.

### B. DESIGN PERIOD

Typically, water systems and the infrastructure are designed for a 20-year design period, as there is significant capital improvements required to improve hydraulic capacity, efficiency, or by replacing process components. Therefore, the design period for this water plan update will go through 2040.

Future projections for water usage are based on Minnesota State Demographic Center population projections and the historical water usage for the City of Farmington. The historical water usage can be used to predict demand projections. This does not mean that the current trends will be exact in future years, but the trends are considered accurate enough that any departure from projected assumptions is considered minor and will not impact the timing of any recommendations proposed throughout the design period of this report.

This plan should be revisited and updated as necessary to ensure that the system implementation is keeping pace with development, forecasted populations, and water demands. Generally, every 10 years the recommendations and capital improvements should be refined based on new data and population projections. Another tool that is useful for water use planning purposes is the Minnesota Department of Natural Resources (MN DNR) Water Supply Plan (WSP). The WSP is required every 10 years by each community serving more than 1,000 people. The WSP must be approved by both the MN DNR and the Metropolitan Council as required by law. Since the WSP is required every 10 years, it is recommended to update this Comprehensive Plan and the WSP at the same time.

### C. PLANNING AREA

The planning area for this report is identified by the City and includes current land use and future land use for Farmington through 2040. The existing land use was provided via GIS data. The future land use map can be found in Appendix A.

### D. POPULATION AND WATER USE

Population projections are based on the Minnesota State Demographic Center population projections through 2040. These projections take into account historical and emerging patterns in births, deaths, and migration to predict populations.

#### 1. Historical Population and Water Use

Water use is associated with population more than any other factor. Once a per capita demand is established, it is possible to predict future water demands. The per capita demand is typically determined based on historical data over the last 10-years omitting extremely high or low demands as they can skew the data and make future projections unrealistic. Table 2.1 shows the historical population and water demand for the City of Farmington from 2005 to 2016.

<b>Table 2.1 – Historical Water Trends</b>					
<b>Year</b>	<b>Estimated Service Population</b>	<b>Average Daily Demand (MGD)</b>	<b>Average Daily Demand per Capita (gpcpd)</b>	<b>Maximum Daily Demand (MGD)</b>	<b>Peaking Factor (Max. Day/Avg. Day)</b>
2005	18,023	1.72	95	4.96	2.9
2006	17,495	2.01	115	6.01	3.0
2007	18,589	2.21	119	6.55	3.0
2008	18,735	2.16	115	5.79	2.7
2009	18,959	2.12	112	4.70	2.2
2010	21,086	1.86	88	4.00	2.2
2011	21,369	1.94	91	5.11	2.6
2012	21,792	2.20	101	6.57	3.0
2013	22,051	1.97	89	6.04	3.1
2014	22,386	1.86	83	5.21	2.8
2015	22,451	1.75	78	4.44	2.5
2016	22,821	1.86	82	4.37	2.3
<b>10-Year Average</b>		<b>1.99</b>	<b>96</b>	<b>5.28</b>	<b>2.6</b>
<b>5-Year Average</b>		<b>1.93</b>	<b>88</b>	<b>5.33</b>	<b>2.7</b>

From 2005 to 2016, the City of Farmington saw a 25.7 percent increase in population. The population has been steadily increasing since 2006. Based on the recent population trend, it is anticipated that the projected population will follow that trend.

The per capita demand averages 96 gallons per capita per day (gpcd) when looking at the 10-year average; however, the 5-year average is 88 gpcd, this decrease in average per capita demand reflects water conservation measures the City has been implementing for the last several years. Overall, per capita demand shows a decreasing trend over the last 10 years as water conservation measures were implemented and education about water conservation becomes more public and easier to find.

Average daily demand has remained relatively consistent over the recent historical period due to population growth which counteracts the reduced per capita demand. The 5-year historical average of the average daily demand is 1.93 MGD. In 2007 and 2012, there were slight peaks in average daily demand and per capita demand due to drought conditions and reduced precipitation during the summer. Overall, there has not been any major fluctuations in average daily demand.

Maximum daily demand fluctuates over the historical period. Two peaks occurred in 2007 and again 2012 due to drought conditions and decreased precipitation. Within the past few years, maximum daily demand has continued to decrease. As the demand continues to decrease, the peaking factor also decreases, since the max daily demand is closer to the average daily demand. Maximum daily demands are most likely decreasing due to the implementation of water conservation measures and education about conserving water being more easily accessible to customers. The 5-year average maximum daily demand is 5.33 MGD and the maximum day to average day peaking factor is 2.7.

## 2. Water Use by Category

One way to analyze water consumption and historical demands is to categorize water use. Categorizing water use within a community can provide insight on where to prioritize water conservation efforts, and provides valuable information when making future water demand projections. The average water consumption by category for residential, commercial, industrial, and other uses are shown in Table 2.2.

Table 2.2 – Categorized Water Use						
Year	Water Pumped (MG)	Water Sold (MG)			Unaccounted for Water (MG)	Percent Unaccounted for Water (%)
		Residential	C/I/I <sup>1</sup>	Total Sold		
2005	628	539	86	625	3	0.5
2006	734	N/A	N/A	N/A	N/A	N/A
2007	807	N/A	N/A	N/A	N/A	N/A
2008	788	649	62	711	77	9.8
2009	772	637	59	696	76	9.8
2010	680	565	56	621	59	8.7
2011	709	586	58	644	65	9.2
2012	801	658	53	711	90	11.2
2013	718	602	55	657	61	8.5
2014	681	573	55	628	53	7.8
2015	640	546	48	594	46	7.2
2016	683	579	51	629	53	7.8
<b>5-yr Average</b>	<b>705</b>	<b>592</b>	<b>52</b>	<b>644</b>	<b>61</b>	<b>8.5%</b>

<sup>1</sup> C/I/I: Commercial, Industrial, or Institutional

The majority of Farmington’s water use is for residential purposes. For the past five years with recorded values, the residential water use has averaged approximately 592 MG, commercial/institutional/industrial (C/I/I) water use has averaged approximately 52 MG, and unaccounted water use has averaged 61 MG. Unaccounted water has averaged 8.5 percent of total water sold for the past five years with recorded values, and has been decreasing over that same time period.

## 3. Projected Population and Water Use

Historic water use (average and maximum daily demands) and population projections can be utilized to make future water projections. It is also important to consider changing trends in the amount of growth expected in the industrial and commercial sectors. Industries may use large volumes of water for processing and general operation of their industries. Expansions of this sector can greatly influence future water demands. Historically, the City of Farmington does not have a large industrial or commercial water demand. Based on Table 2.2, the C/I/I water use averaged 8.5 percent of the total annual water delivered to the distribution system. There are currently no anticipated changes to significant industrial or commercial users in the City. C/I/I water use is anticipated to follow historical trends and grow as population increases. Future water projections are shown in Table 2.3.

<b>Table 2.3 – Projected Water Demand</b>			
<b>Year</b>	<b>Projected Population</b>	<b>Average Daily Demand (MGD)<sup>1</sup></b>	<b>Maximum Daily Demand (MGD)<sup>2</sup></b>
2016	22,821	2.01	5.42
2017	23,191	2.04	5.51
2018	23,560	2.07	5.60
2019	23,930	2.11	5.69
2020	24,300	2.14	5.77
2021	24,700	2.17	5.87
2022	25,100	2.21	5.96
2023	25,500	2.24	6.06
2024	25,900	2.28	6.15
2025	26,300	2.31	6.25
2030	28,300	2.49	6.72
2040	32,500	2.86	7.72
<sup>1</sup> Assuming an average daily usage of 88 gpcpd, per the 2017 WSP total per capita demand <sup>2</sup> Assuming a peaking factor of 2.7			

Water demand projections in Table 2.3 were based on historical per capita use, the maximum daily to average daily demand ratio, and projected population growth. The Minnesota State Demographic Center was used for population projections through 2040. It is assumed that the projected service population will equal the projected total population as all future residents will be required to connect to the City’s distribution system.

The 5-year average per capita demand of 88 gallons per capita per day (gpcd) was used to make water demand projections through 2040. The 5-year average per capita demand was used to reflect the reduced per capita demand following the implementation of water conservation measures. It is important to consider these water conservation measures when making projections as they can help make accurate projections with regards to the City’s plan of conserving water and reducing per capita demands. By 2040, a projected average daily demand of 2.86 MGD is expected. The projected maximum daily demand was calculated by multiplying the average daily demand by a peaking factor of 2.7. The maximum daily demand in 2040 is projected to be 7.72 MGD.

## E. WATER SYSTEM REQUIREMENTS

### 1. Water Supply Requirements

A general engineering practice to determine the required water supply capacity is to ensure that the firm pumping capacity of the wells is sufficient to meet the maximum daily demand. Firm capacity is defined as the sum capacity of all wells, with the largest well out of service.

Therefore, it is recommended that the City’s firm water supply be 5.33 MGD or approximately 3,700 gpm for the existing system. Farmington’s recommended firm capacity for the 2040 future system is 7.72 MGD or approximately 5,400 gpm.

## 2. Storage Requirements

The principal purpose of storage is to provide the ability to equalize pumping rates during periods of variable rate demand and to provide water for emergency fire service. Adequate storage allows a reduction in the size of the pumps required to supply a community because peak demands are diminished by the reserve provided in storage. Storage is typically provided in elevated tanks for communities the size of Farmington, to provide storage and a pressure source while the wells are not pumping.

The primary reasons for providing water storage are as follows:

- To equalize pressure in the distribution system.
- Provide water for fire protection.
- Other emergency reserve requirements (pump failure, power failure, etc.).

The typical design approach is to consider the recommended minimum storage volume for each individual storage component of equalization, fire demand, and emergency reserve, then sum the equalization volume and the larger volume of fire protection or emergency volume, as it is unlikely that water would be required for multiple emergencies at any given time. Storage for equalization is recommended to be 25 percent of the maximum daily demand. Storage for fire protection depends on zoning with a standard for residential areas being 3,500 gpm for 4 hours based on the International Organization for Standardization (ISO) Public Protection Classification grading for insurance purposes. Storage for emergency use is recommended to be equal to 60 percent of average daily demand. Water storage requirements for the City of Farmington using these approaches are summarized in Table 2.4.

<b>Category</b>	<b>Existing System Volume Recommendations (MG)</b>	<b>Future System Volume Recommendations (MG)</b>
Equalization	1.33	1.93
Fire Protection	0.84	0.84
Other Emergencies	1.16	1.72
<b>Recommended Storage Volume</b>	<b>2.49</b>	<b>3.65</b>

Summing the equalization volume and the emergency volume, as it is larger than the fire protection volume, results in a recommended storage volume of 2.49 MG for the existing system. Farmington’s future system is recommended to have a storage capacity of 3.65 MG.

## 3. Watermain Sizing Requirements

Ten States Standards recommends a minimum watermain size of 6-inches for providing fire protection and serving fire hydrants, with larger mains required, if necessary. In addition, velocities in long watermain segments should be between 2 and 10 feet per second (fps) with average flows less than 5 fps, with 10 fps being acceptable during emergency withdrawals for short durations.

#### 4. Pressure Requirements

Water pressures are subject to individual preference. What some may view as adequate pressure may be viewed as too much or too little pressure. Municipalities are challenged with balancing pressure with demand and capacity of the system along with conservation of water. Typically, higher pressures equate to higher flow rates, but increases the volume of water lost through cracked and broken pipes.

Ten States Standards recommends the minimum working pressure in the distribution system should be 35 psi with normal working pressures ranging from 60–80 psi. The Minnesota Department of Health (MDH), along with Ten States Standards, requires the system to maintain a minimum pressure of at least 20 psi at ground level at all points in the distribution system under all flow conditions. This ensures that there is adequate water pressure in the event of a long-term power failure or during an emergency.

#### 5. Water Distribution Model

A water model for Farmington is being developed along with this report to identify problem areas in the existing system and to show the impacts of future improvements to the system. Possible issues with the existing system include areas with pressures above or below the recommended pressure levels, pipes with high velocities or headloss, and inadequate fire flow protection. Future improvements are discussed in Section 5 of this report. The future model is based on projected water demand and the 2040 Land Use Figure provided by the City of Farmington, as found in Appendix A. The water model is used to represent the existing and proposed 20-year design system. The models are used to create distribution system maps, average daily and maximum daily pressure maps, maximum daily fire flow maps, and maximum daily headloss maps as provided in Section 3 and Section 5. The improvements relate to improving fire flow and pressures where possible and adding new watermain into areas that are slated for future development. The water model should be used as a tool to evaluate whether additional infrastructure is required in the distribution system.

### III. EXISTING WATER SYSTEM FACILITIES AND INFRASTRUCTURE

#### A. GENERAL

The City of Farmington water system consists of seven (7) active wells, one (1) elevated storage tanks one (1) standpipe, and a system of trunk and lateral watermain varying in sizes from 4-inches to 24-inches. The Farmington water system is contained within a single pressure zone. The existing watermain distribution system and major water system infrastructure are presented in Figure 3.1.

#### B. WATER SUPPLY

The City of Farmington supplies drinking water from seven groundwater wells. Well No. 1 and Well No. 3 are in the Prairie Du Chien-Jordan aquifer, while Wells 4 through 8 are in the Jordan aquifer. The Minnesota Department of Health’s Drinking Water Supply Management Area Vulnerability Maps are provided in Appendix B. These maps show that all of Farmington’s municipal wells are moderately vulnerable to surface contaminants, except for Well No. 4 which has a low vulnerability. Well vulnerability is assessed using geologic sensitivities from boring log data and water quality data for the Farmington wells. A summary of the existing well data and pumping capacities are presented in Table 3.1.

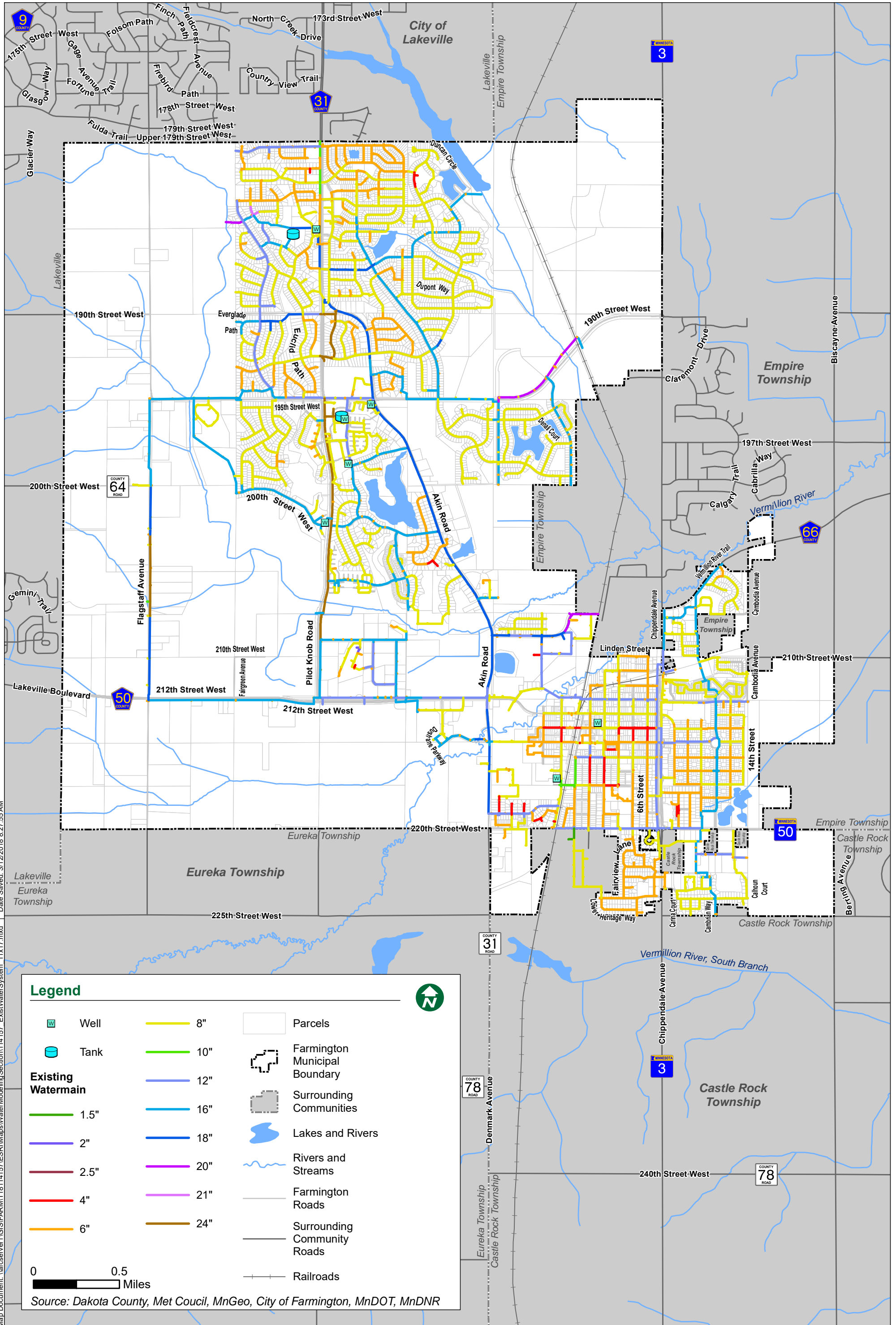
Table 3.1 – Well Construction Summary							
	Well No. 1	Well No. 3	Well No. 4	Well No. 5	Well No. 6	Well No. 7	Well No. 8
<b>Unique Well No.</b>	200932	201154	235586	603051	626785	655902	731123
<b>Year Constructed</b>	1938	1959	1973	1999	2002	2002	2006
<b>Well Pump Capacity (gpm)</b>	1,000	600	1,000	1,200	2,000	1,400	2,000
<b>Casing Diameter (inches)</b>	16	20 x 12	24 x 16	30 x 24	30 x 24	30 x 24	30 x 24
<b>Casing Depth (feet)</b>	197	132	392	417	386	408	368
<b>Overall Well Depth (feet)</b>	402	424	477	512	485	501	460

One way to evaluate the pumping capacity and the ability of the wells to meet maximum daily demands, is to evaluate the firm well capacities. The firm well capacity is the pumping capacity of all the wells without the largest producing well in service. Typically, firm well capacity is used to measure whether or not there is enough supply to meet demands. If the firm well capacity is not greater than or equal to the maximum daily demand, then there is insufficient water supply to provide enough water to meet demands.

Farmington’s existing firm capacity is 10.37 MGD or 7,200 gpm. However the typical life span for a municipal well is approximately 40 to 60 years. Well No. 1 is approaching 80 years of service, Well No. 3 is approaching 59 years of service, and Well No. 4 is approaching 45 years of service. Therefore, the City should consider replacing these wells or completing major rehabilitation of these wells.

If the City were without Well No. 1 and Well No. 3, the City’s firm capacity is 8.06 MGD or 5,600 gpm. If the City were without Well No. 1, Well No. 3, and Well No. 4, the firm well capacity is 6.62 MGD or 4,600 gpm.

The City of Farmington also shares an interconnection with the City of Lakeville to be used in case of an emergency. This interconnection has a capacity of 1 MGD.



Map Document: \\arsserver1\GIS\FAR\MT18114157\ESRI\Maps\WaterModeling\Section114157\_ExistingWaterSystem\_11x17.mxd | Date Saved: 3/12/2018 8:27:55 AM

Source: Dakota County, Met Coucil, MnGeo, City of Farmington, MnDOT, MnDNR



C. WATER STORAGE FACILITIES

The City of Farmington has two storage tanks: a 1.5 MG elevated storage tank and a 0.67 MG standpipe. While the total storage capacity is 2.27 MG, the effective storage capacity is 1.79 MG, as the standpipe has an effective storage capacity of 0.29 MG. The effective storage capacity is defined as the storage available while maintaining sufficient pressure. Therefore, as the standpipe’s water level approaches ground level, the pressure it supplies to the system is diminished and provides insufficient pressure. Table 3.2 provides a summary of the storage tanks.

<b>Table 3.2 – Existing Storage Facilities</b>			
	<b>Daisy Knoll Standpipe</b>	<b>Elevated Tower</b>	<b>Total Storage</b>
<b>Capacity (MG)</b>	0.67	1.50	2.17
<b>Effective Capacity (MG)</b>	0.29	1.50	1.79
<b>Year Constructed</b>	1973	1998	-
<b>High Water Level</b>	1117.33	1117.33	-
<b>Support Type</b>	Ground	Elevated	-

One way to evaluate the adequacy of storage capacity is to evaluate the minimum use to see if there is sufficient turnover of water during winter months to prevent freezing in the storage facilities. A good rule is to allow water to turnover every couple of days in the winter. Currently, the average daily demand is 1.93 MGD. Utilizing the effective storage capacity of 1.79 MG, the water turnover is about every 22 hours. Using the future demands, by 2040, the average day demand is anticipated to be 2.86 MGD, yielding a turnover every 15 hours (if no extra storage facility is constructed). Based on this simple analysis, there appears to be a shortage of storage capacity, as average daily demands aren’t met, but the water turnover is good and would prevent water from freezing in the storage tanks during winter months.

Water modeling can be used to evaluate available fire flows in a City. This can be beneficial for planning purposes when evaluating distribution system improvements. The guide for determining required fire flows is developed by the Insurance Service Office (ISO). When designing future improvements, it is important to account for needed fire flows. The needed fire flow differs between structures and building types such as residential, commercial, or industrial. For single-family homes, the following table should be considered for needed fire flows.

<b>Table 3.3 – Needed Fire Flows for Residential Homes</b>	
<b>Distance Between Buildings (ft)</b>	<b>Fire Flow (gpm)</b>
More than 100	500
31 - 100	750 – 1,000
11 - 30	1,001 - 1500
Less than 11	1,501 – 2,000
Continuous	2,500

Commercial and industrial needed fire flows are determined on an individual basis by evaluating the occupancy area, communication factor, exposure factor, and if a sprinkler

system is installed. Typically, most systems require only 500–1,000 gpm of needed fire flow if a sprinkler system is installed and up to 500 gpm of additional flow if a sprinkler system is not installed.

#### D. WATER TREATMENT FACILITIES

The City of Farmington treats raw water with fluoride and chlorine at each well house prior to entering the distribution system. No other treatment is provided.

#### E. WATER DISTRIBUTION SYSTEM

The existing distribution system consists of watermains varying from 4 to 24 inches in diameter. Most of the City’s watermains are constructed of ductile iron pipe (DIP), with older parts of the City being served by cast iron pipe (CIP). The distribution system receives water from individual wells. A network of larger distribution mains extend from the wells to the storage tanks and other points throughout the system.

The existing system operates under a single pressure zone. The static high water level is 1,117.33 feet above mean sea level. Static pressure readings, as reported within the system, generally range from approximately 45 pounds per square inch (psi) to 100 psi.

The watermains are looped within the City as to not have a dead end pipe, which could create water quality concerns. The watermains loop around and connect so the water flows in a path. Parts of the system do have branched systems that are not looped. Consideration should be given to looping larger diameter watermains with future expansion. Extending watermain to future developments, and providing looping can help with maintaining adequate system pressure.

Hydrant flushing is an important maintenance activity to clean out dead end watermains. The City has been proactive in performing hydrant flushes on critical watermains. The water distribution-piping network has been well maintained and will continue to serve the customers of Farmington.

#### F. WATER QUALITY

##### 1. General

The purpose of this section is to evaluate the water quality of Farmington’s water system and detail the treatment methods used. The section will also detail the current drinking water standards and how the water quality compares to these standards.

##### 2. Water Quality and Treatment

The City’s drinking water meets all primary drinking water standards, as indicated in the 2016 Consumer Confidence Report. The City also meets most secondary aesthetic water quality standards, except for iron and manganese. The 2016 Consumer Confidence Report shows that the average for all iron and manganese samples are above the secondary standard. The 2016 Consumer Confidence Report can be found in Appendix C.

Farmington’s raw water quality is moderately high in iron and manganese. Historic test results have shown that four of the wells exceed the secondary standards for both iron and manganese. Secondary standards are indicative of aesthetic water quality and does not necessarily constitute a health hazard; however, the City may choose to treat iron and manganese based on consumer complaints on water color and clarity. Excessive iron and manganese can cause red and black stains and colors when the water is used for irrigation and other household uses.

The City's current system treats raw water with fluoride and chlorine at each well house. Fluoride is added to aide in cavity protection for customers and prevents tooth decay. The City disinfects the raw water using chlorine as a primary disinfectant. This is achieved by breakpoint chlorination where chlorine is added at a specific dose, which oxidizes all of the natural or added ammonia in the water until only free chlorine is left. This type of disinfection provides a stable and powerful disinfectant that inactivates organisms in the water.

3. Current Drinking Water Standards

The City follows all of the enforcement standards set forth in the Environmental Protection Agency's National Primary Drinking Water Standards. These standards are enforceable limits that each public water supply system must adhere to and provide annual updates to the public. The City of Farmington accomplishes this in the annual drinking water report (Consumer Confidence Report).

## IV. WATER CONSERVATION

### A. GENERAL

The purpose of this section is to discuss how water conservation plays a key role in future water planning and how these concepts can be implemented by the City. Water conservation is becoming an important issue where water is viewed as an important resource. Conserving water may help with demand reduction and relaxes stress on the distribution system and wells during high usage months. Water conservation can include a vast range of techniques and strategies from the addition of rain barrels to capture rainfall for lawn irrigation, to drip irrigation systems for larger gardens, to even replacing regular household appliances with energy and water efficient appliances. This section will discuss concepts for reducing water use, and peak day demands along with the current water rates and the water lost throughout the system and how they relate to water conservation.

### B. REDUCING USE

Reducing water use is one of the largest factors for decreasing the per capita demand and how much water is lost through the system. Most of the water in a community goes towards residential use. Residential water use includes water used in all household appliances, cooking, cleaning, toilets, showers, and lawn irrigation. Seasonal usage can affect what water is used for with respect to residential demand. Typically, commercial and industrial demands can remain somewhat constant throughout the year, as the day-to-day operations of the facility do not change significantly. Reducing water use in these facilities involves discussion with the owner and what techniques may work for each industry or business.

During winter months, a baseline demand can be established because almost all of the residential water is used for normal household uses with the exception of lawn irrigation. This baseline demand can give an estimate to how much water is required for residential customers on a regular basis with no lawn irrigation; however, during summer months when lawn irrigation is at a peak, this seasonal demand can play a large role in how much water is required for customers.

Seasonal peak water demands are often the result of lawn irrigation, which may require additional supply wells and water storage to meet requirements for these peak demands. With an average of 90 percent of water sold going to residential use, lawn irrigation can play a major role in the seasonal demand for this customer category. Currently, the City has sufficient water supply to provide for the maximum daily demands and seasonal water use.

Reduction of lawn irrigation to help control demands is typically accomplished through odd-even day or even time-of-day watering restrictions. Farmington currently has an ordinance for odd-even day watering that has helped reduce peak day and seasonal demands. The City has also been proactive in implementing an increasing block rate structure that bills more for higher water usage. This has helped reduce water usage over the past few years as is evident in historical demands shown in Table 2.1.

Reducing water lost in the system is accomplished through leak detection and annual water audits. The City currently performs leak detection on a periodic as-needed basis. It is important to use the leak detection information yearly for capital improvement planning to target areas where the volume of water lost in the system is greatest. Water losses can also be targeted by installing new enhanced meters and repairing and recalibrating current meters.

Water conservation is a key factor in reducing water use. Conservation measures typically involve education along with an incentive and regulation to encourage water conservation. While some of these measures such as billing inserts on water conservation or rebates for installing a water efficient appliance, or grant programs for adding rain barrels, can help with

reducing water use, they will not completely eliminate the need for additional wells or water storage; however, they could delay the implementation of the infrastructure or reduce the total future required capacity.

#### C. REDUCING PEAK DEMANDS

Historically, the maximum daily demands for Farmington frequently exceed 5 MGD as indicated in Table 2.1. These peak day demands typically occur in the summer months when lawn irrigation is at its highest. The water used for lawn irrigation is typically what drives the maximum daily demands. The volume of water devoted to lawn irrigation can be moderated by the odd-even day watering restriction. There has been moderate success in Farmington since this restriction has been implemented. This restriction may help reduce seasonal demands due to lawn irrigation, but it does not significantly reduce overall use.

Evaluation of historical demands indicates that over the past few years, peak demands have been decreasing and are lower than the 10-year average. Contribution factors could be that Farmington has been dedicated to improving the efficiency of the distribution system and increasing efforts related to water conservation. One of the key elements that has helped reduce peak demands is the implementation of the increasing rate structure that bills more for higher water use. By continuing to manage the rate structure and make changes as necessary, this may help by controlling the peak day demands experienced during summer months when water usage is greatest.

#### D. WATER RATES

As stated above, the City of Farmington has an increasing rate structure for residential customers that bills quarterly with the volume reported in thousands of gallons of water used. This type of billing is considered conservation billing and has helped the City reduce overall water usage since its implementation. By having water bills reported in gallons, it allows customers to easily see how much water they use in a given billing period so they can manage their own water usage and how much they are willing to pay. The City currently has a three-tiered structure as follows:

- \$1.30 per 1,000 gallons for the first 20,000 gallons
- \$1.60 per 1,000 gallons for usage between 20,001 gallons and 40,000 gallons
- \$2.00 per 1,000 gallons above 40,000 gallons

An availability fee of \$12.00 is charged quarterly and is not dependent on usage.

#### E. WATER LOSS

The City of Farmington recently submitted a Water Supply Plan (WSP) to the Minnesota Department of Natural Resources (DNR). In the WSP, unaccounted for water is estimated at approximately 8.5 percent. The unaccounted for water has been fairly consistent between 8 and 10 percent. The DNR has a threshold of keeping unaccounted for water less than 10 percent. Based on the available data, Farmington is below the 10 percent threshold; however, the 8.5 percent average unaccounted for water equates to approximately 61 million gallons of water lost.

Lost water can be attributed to leaks from the system, unmetered use (i.e. firefighting, street sweeping, ice rink flooding, hydrant flushing, construction etc.), or even unauthorized use. Water losses means lost revenue to the utility if the water is not metered or if it's lost due to leaks in the system.

Adding enhanced water meters on commercial buildings and automated meters in residential homes can help reduce the amount of water that goes unmetered in the system. Maintaining a

meter change-out schedule and/or a maintenance schedule can help reduce the errors due to water meters.

As stated earlier in this report, the City conducts a leak survey periodically as needed, when monthly water audits indicate a leak is occurring. This helps find and stop leaks that are occurring in the City and to reduce the amount of water lost. The leak detection is an important part in system maintenance that should continue yearly to stop leaks and prevent large volumes of water from leaking and not being metered. Identifying and correcting leaks early enables utilities to minimize costly repairs of large watermain failures, and to avoid premature expansion to supply and treatment and storage facilities.

Another important tool that can be used to help track water losses is a water audit. This can be as simple as tracking the total volume of water pumped in a year and comparing it to the volume of water billed to customers. These two numbers should be relatively close to each other. If they are significantly different, that could indicate that water is being lost in the system somewhere, which results in lost revenue. Overall, Farmington has a lower percentage of unaccounted for water and they conduct monthly water audits to indicate whether there is a leak in the distribution system. These efforts should help track water losses to keep them at a minimum.

## V. RECOMMENDED FUTURE IMPROVEMENTS

### A. GENERAL

This section details recommended future improvements for Farmington's water system to improve the water supply, treatment, distribution system, and storage facilities. The recommended improvements are based on evaluation of the existing facilities discussed in Section 3 and the projected water demands evaluated in Section 2. This Section includes a discussion of the water system model to show how the infrastructure improvements affect average and maximum daily pressures, as well as maximum daily fire flows.

### B. WATER SUPPLY

Analysis of the water supply indicates that the City of Farmington does not require additional wells to meet existing requirements. Recall that it is desirable to maintain a firm well capacity (capacity with the largest well out of service) greater than the projected maximum daily demand. The City of Farmington's current recommended firm water supply is 5.33 MGD or approximately 3,700 gpm for the existing system. The City's recommended firm capacity for the future system is 7.72 MGD or approximately 5,400 gpm.

Currently, by operating the wells 24 hours per day, the City has a firm well capacity of 10.37 MGD or 7,200 gpm. This exceeds existing and future maximum daily demands; however Well No. 1, Well No. 3, and Well No. 4 have surpassed their typical useful life and should be considered for replacement. Due to the age of Well No. 4, it may remain in service, but should be considered for replacement by 2040. By replacing Well No. 1 and Well No. 3, the firm capacity of the remaining wells is 8.06 MGD or 5,600 gpm. This firm capacity is greater than the existing and future requirement; however, by sealing and abandoning Well No. 1, Well No. 3, and Well No. 4, the firm capacity of the remaining wells is 6.62 MGD or 4,600 gpm. This firm capacity is greater than the existing maximum daily demand, but is insufficient for the future maximum daily demand. Therefore, it is recommended the City install a 1.10 MGD or 770 gpm well prior to all three wells being replaced by the year 2040.

### C. WATER STORAGE FACILITIES

Recommended storage capacity for larger cities, such as Farmington, are determined based on the following storage requirement categories:

1. Equalization storage
2. Fire storage
3. Emergency storage

The recommended storage for the City is the equalization storage plus the larger of either the fire storage or emergency storage. The equalization storage is equal to the average daily demand or 25 percent of the maximum daily demand, provided pumping rates can achieve average daily demands or greater, as is the case for Farmington. The fire storage is a standard recommended storage volume of 3,500 gpm for 4 hours or 0.84 MG. The emergency storage is either the average daily demand, which is typically used for small towns, or 60 percent of the average daily demand for larger cities. Farmington's recommended storage volumes for each category are displayed below in Table 5.1. Following these guidelines, Farmington's recommended storage volumes for the existing and future system are the sum of the equalization storage and emergency storage volumes. Farmington's existing recommended storage volume is 2.49 MG and the future recommended storage volume is 3.65 MG. Farmington's existing effective storage volume is 1.79 MG, so the City is deficient in their

recommended storage volumes by 0.70 MG for the existing system and 1.86 MG for the future system.

<b>Table 5.1 – Storage Requirements</b>		
<b>Category</b>	<b>Existing System Volume Recommendations (MG)</b>	<b>Future System Volume Recommendations (MG)</b>
Equalization	1.33	1.93
Fire Protection	0.84	0.84
Other Emergencies	1.16	1.72
<b>Recommended Storage Volume</b>	<b>2.49</b>	<b>3.65</b>

It is recommended the City install a 2.0 MG storage tank or install a 1.0 MG tank with the intent of installing another 1.0 MG tank by 2022. It is also recommended to continue with proper maintenance and to evaluate the towers as needed to determine the adequacy of the coating system to ensure that it has several more years of useful life.

#### D. WATER TREATMENT FACILITIES

The City currently meets all primary drinking water standards, as indicated in the 2016 Consumer Confidence Report, and most of the secondary aesthetic water quality standards, except for iron and manganese. Farmington’s raw water quality is moderately high in iron and manganese. Historic test results have shown that four of the wells exceed the secondary standards for both iron and manganese. Secondary standards are indicative of aesthetic water quality and does not necessarily constitute a health hazard; however, the City may choose to treat iron and manganese based on consumer complaints on water color and clarity. Excessive iron and manganese may cause red and black stains and colors when the water is used for irrigation and other household uses. The City may want to consider an iron and manganese removal plant to minimize consumer complaints regarding water quality and help with long term maintenance and operation of the system.

#### E. WATER DISTRIBUTION SYSTEM

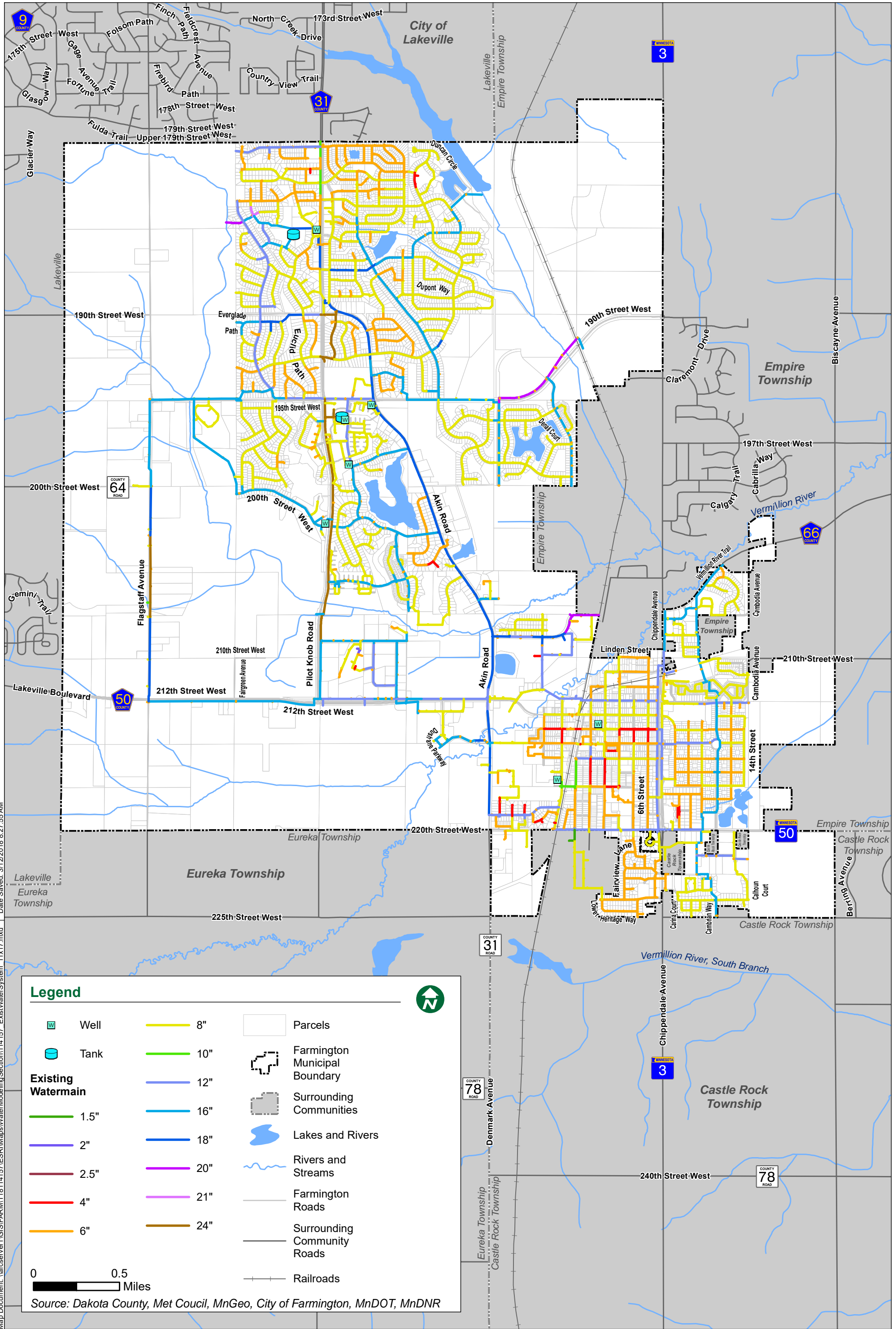
The distribution system was analyzed using Innovyze’s InfoWater Version 12.3 water modeling program. Water models were developed to simulate the existing average daily demands and maximum daily demands. The existing system was calibrated with hydrant testing data obtained from the City. Calibration results show that the model is a good approximation of the City’s water distribution system. Figure 5.1 shows a map of the existing system’s watermain sizes and major water system infrastructure. The model was used to develop Farmington’s existing water system and a future system to represent the projected 2040 system. These systems were analyzed for the following:

- Average daily and maximum daily pressure
- Maximum daily fire flows
- Maximum daily pipe flows and headloss

##### 1. Existing System

The water model calculated the existing system’s average daily pressure to be between 37 psi and 99 psi. While pressures are above the minimum recommendation of 35 psi and below the maximum recommendation of 100 psi, the pressures in the system nearly exceed both these recommendations. As stated in Section 2, it is recommended





**Legend**

	Well		8"		Parcels
	Tank		10"		Farmington Municipal Boundary
<b>Existing Watermain</b>			12"		Surrounding Communities
	1.5"		16"		Lakes and Rivers
	2"		18"		Rivers and Streams
	2.5"		20"		Farmington Roads
	4"		21"		Surrounding Community Roads
	6"		24"		Railroads

0 0.5 Miles

Source: Dakota County, Met Coucil, MnGeo, City of Farmington, MnDOT, MnDNR

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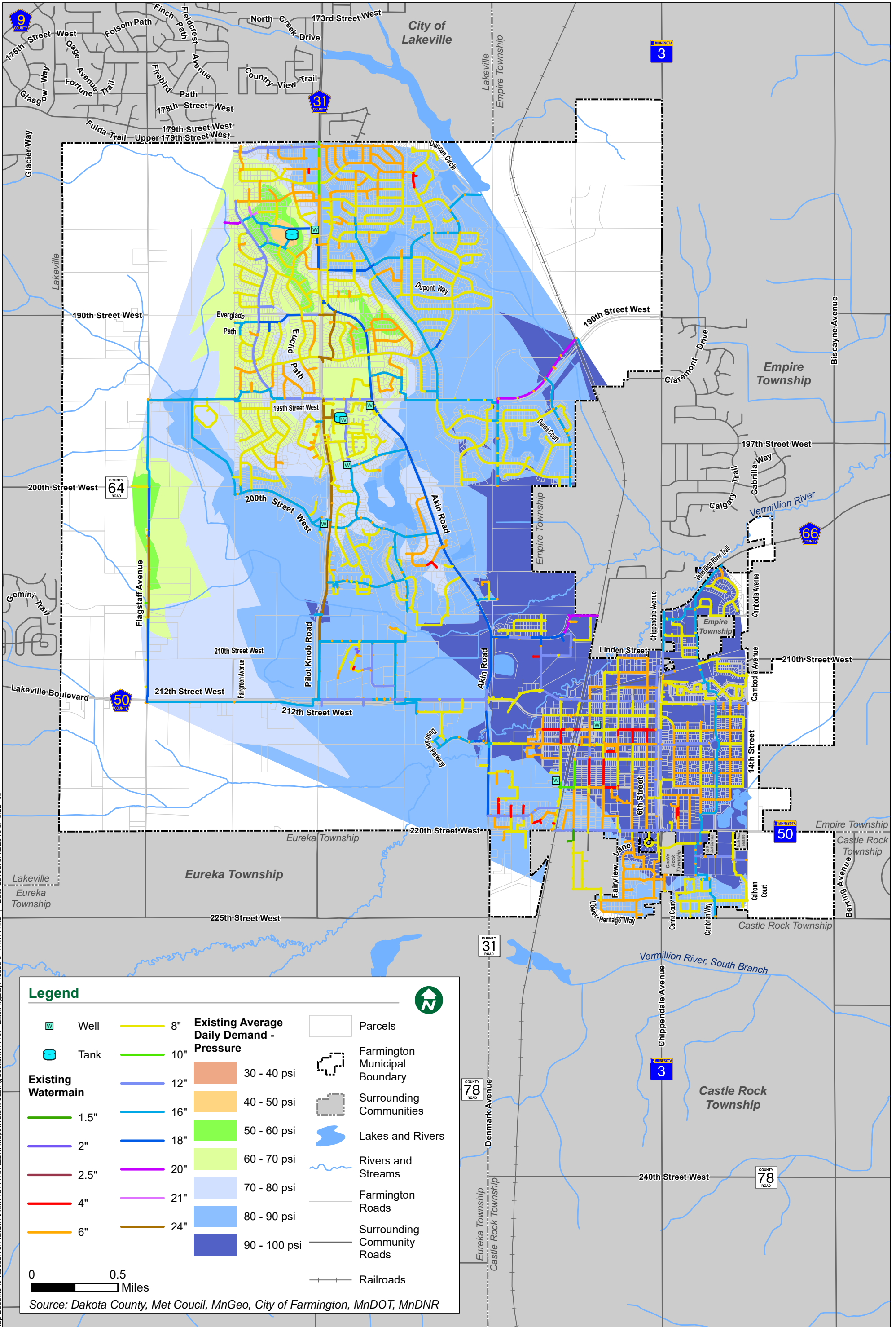
distribution systems have a standard operating pressure between 60 and 80 psi. Figure 5.2 displays the existing system's average daily pressure. The maximum daily pressures were between 30 and 93 psi; therefore, during maximum demand condition, the minimum recommended pressure is exceeded. Figure 5.3 shows the existing maximum daily pressure. Low pressures were only present around the standpipe in both the average daily and maximum daily scenarios. The available fire flow ranged from 750 gpm to over 5,000 gpm according to the model. The computer model indicates that higher flows are available in some areas; however, these higher flow rates are likely unrealistic because it is unlikely there are enough hydrants or equipment available to deliver such high rates. Figure 5.4 displays the existing available fire flows. Fire flows below 1,000 gpm were located at dead-end watermains, where a lack of looping limits the amount of fire flow. The velocities and headloss in the pipes for the maximum daily demand scenario were within acceptable ranges of less than 10 feet per second and less than 10 feet per 1000 feet of headloss, except for the watermain connected to the elevated storage tank. However, higher velocities and headloss are common around storage towers, supply wells, and water treatment plants. Figure 5.5 shows the maximum daily headloss through the system's pipes.

## 2. Future System

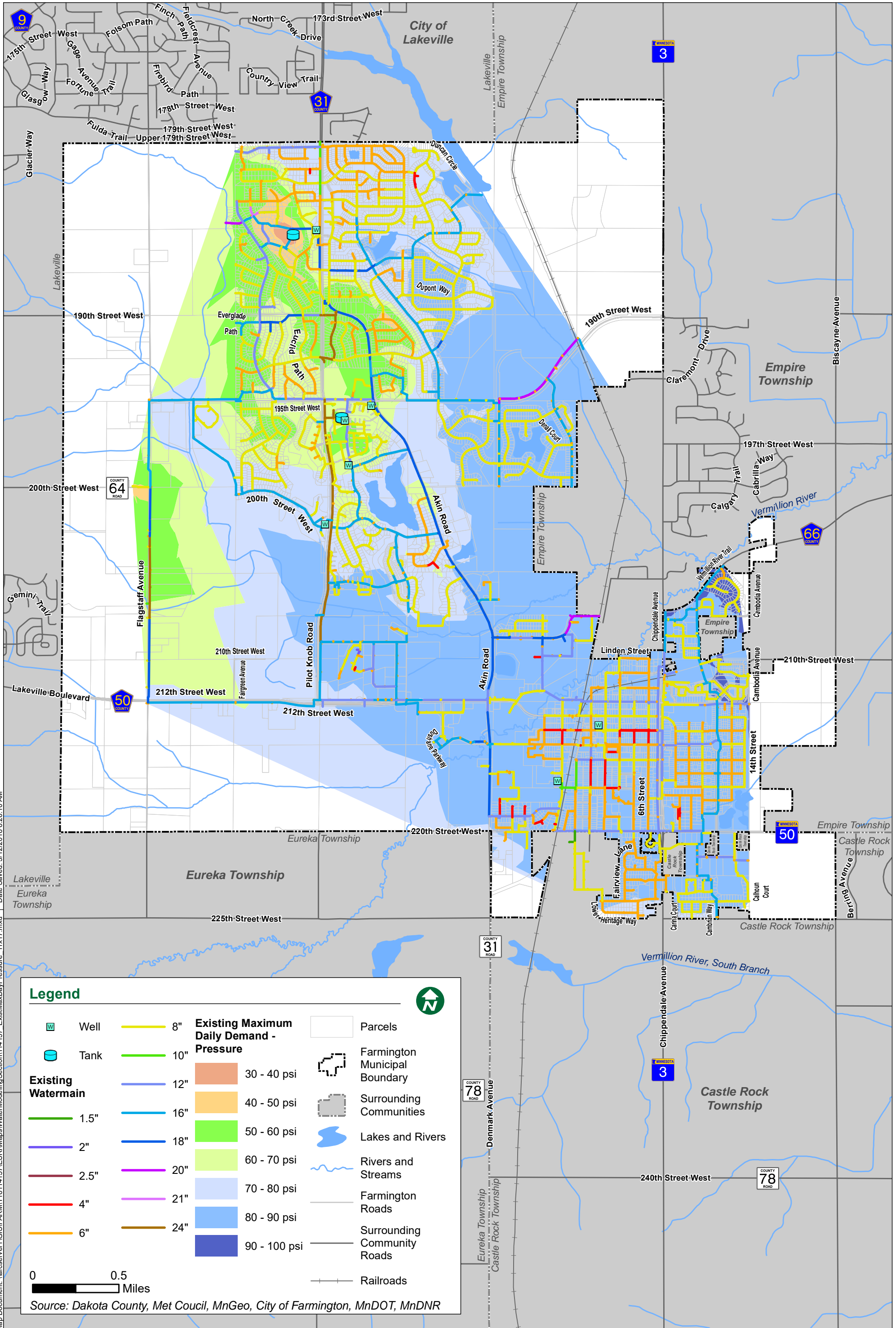
A model of a future system for Farmington was developed based on population projections and the projected land use map provided by the City. The future model was analyzed for the same scenarios as the existing system. The future model was modeled with the existing supply wells, but an additional storage tank was added north of Empire Township on Trunk Highway 3. Figure 5.6 shows a map of the future system's watermain sizes and major water infrastructure. Results for the future system indicates that the average daily pressure would range from 37 psi to 99 psi. Figure 5.7 displays the future system's average daily pressure. Maximum daily pressures would range from 30 psi to 94 psi. Figure 5.8 shows the future maximum daily pressure. Available fire flows range from 750 gpm to over 5,000 gpm. Figure 5.9 displays the future available fire flow. Similar to the existing system, the future system experienced headloss above the recommended standards near the elevated storage tank; however, the rest of the system was within standards for headloss and velocities. Figure 5.10 shows the maximum daily headloss through the future system's pipes.

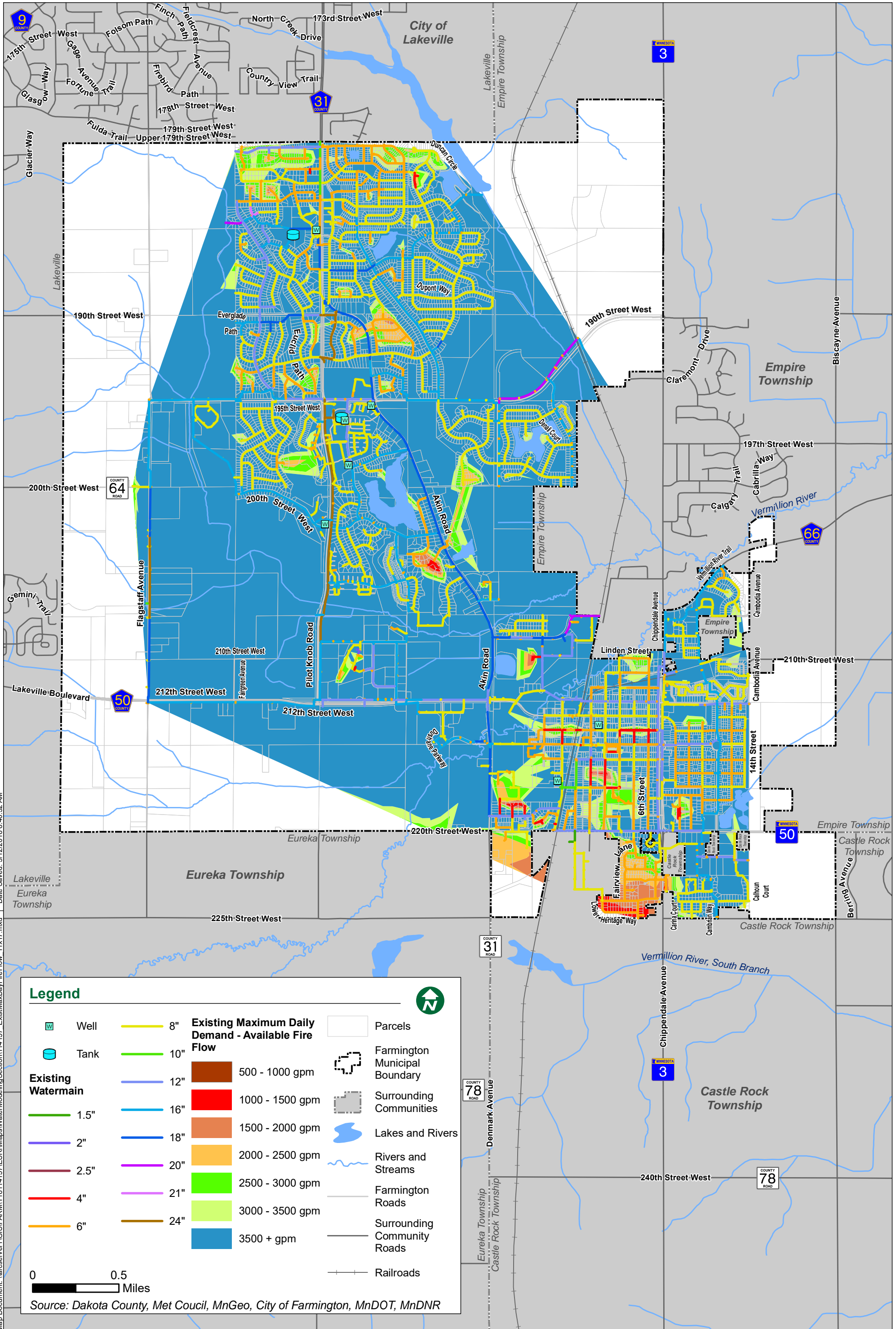
## 3. Future System Connected to Empire Township

Another model of Farmington's future system includes joining with Empire Township's water system. Empire Township is connected to the Farmington's future system via four watermains in the model. Empire's existing elevated storage tank is removed from service as it's high water level is approximately 70 feet below Farmington's high water level. If the City desires to retain Empire's water tower, pressure reducing valves may be used. Figure 5.11 displays a map of the future joint systems' watermain sizes and major water infrastructure. Results for the joint systems indicates that the average daily pressure would range from 37 psi to 100 psi. Figure 5.12 displays the future system's average daily pressure. Maximum daily pressures would range from 30 psi to 96 psi. Figure 5.13 shows the future maximum daily pressure. Available fire flows range from 750 gpm to over 5,000 gpm. Figure 5.14 displays the future available fire flow. Similar to the other scenario's headloss and velocities were within the recommended standards for average daily demands, but experienced elevated headloss levels under maximum daily demands. The elevated headloss occurred near Farmington's elevated storage tank. Figure 5.15 shows the maximum daily headloss through the future joint systems' pipe network.

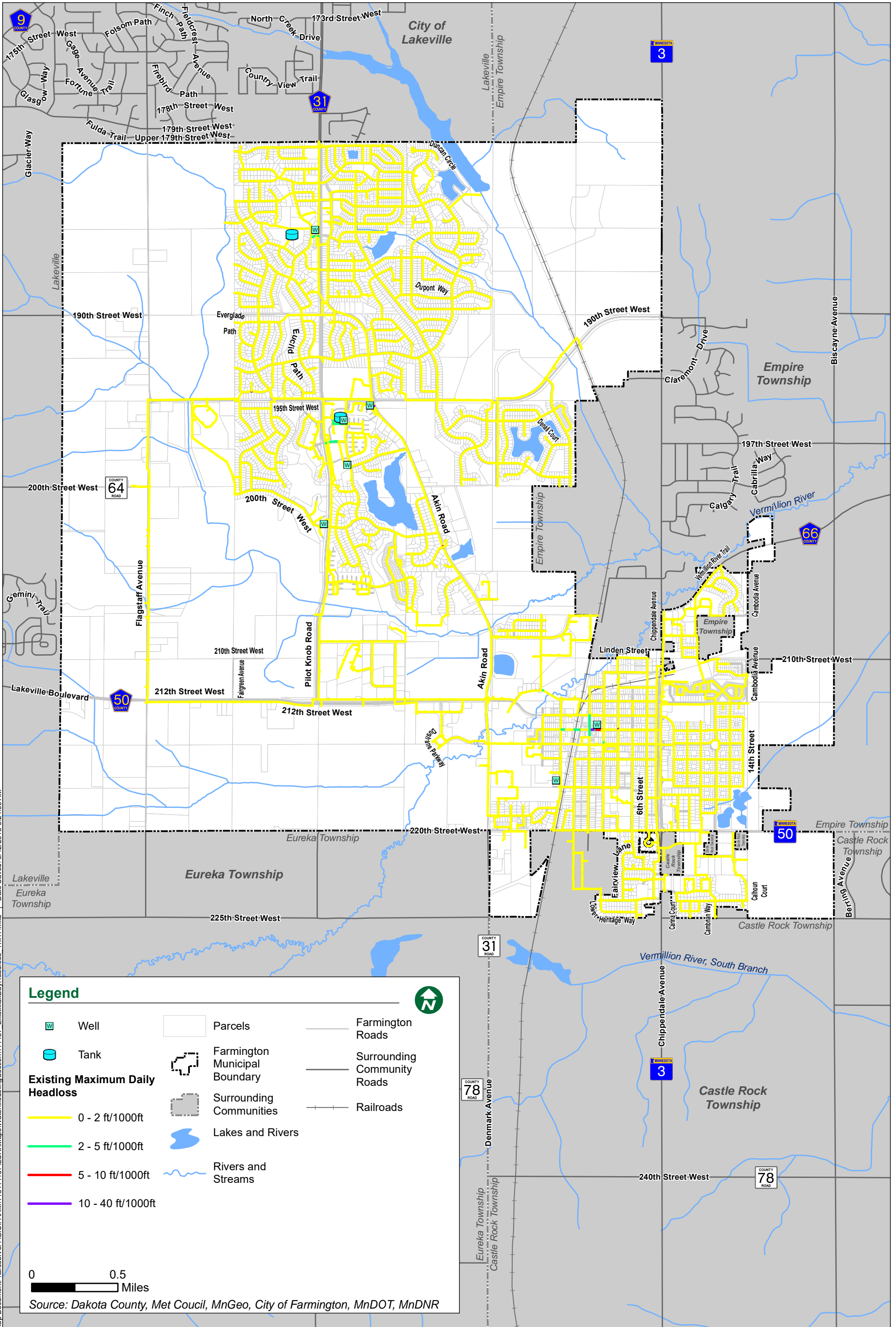


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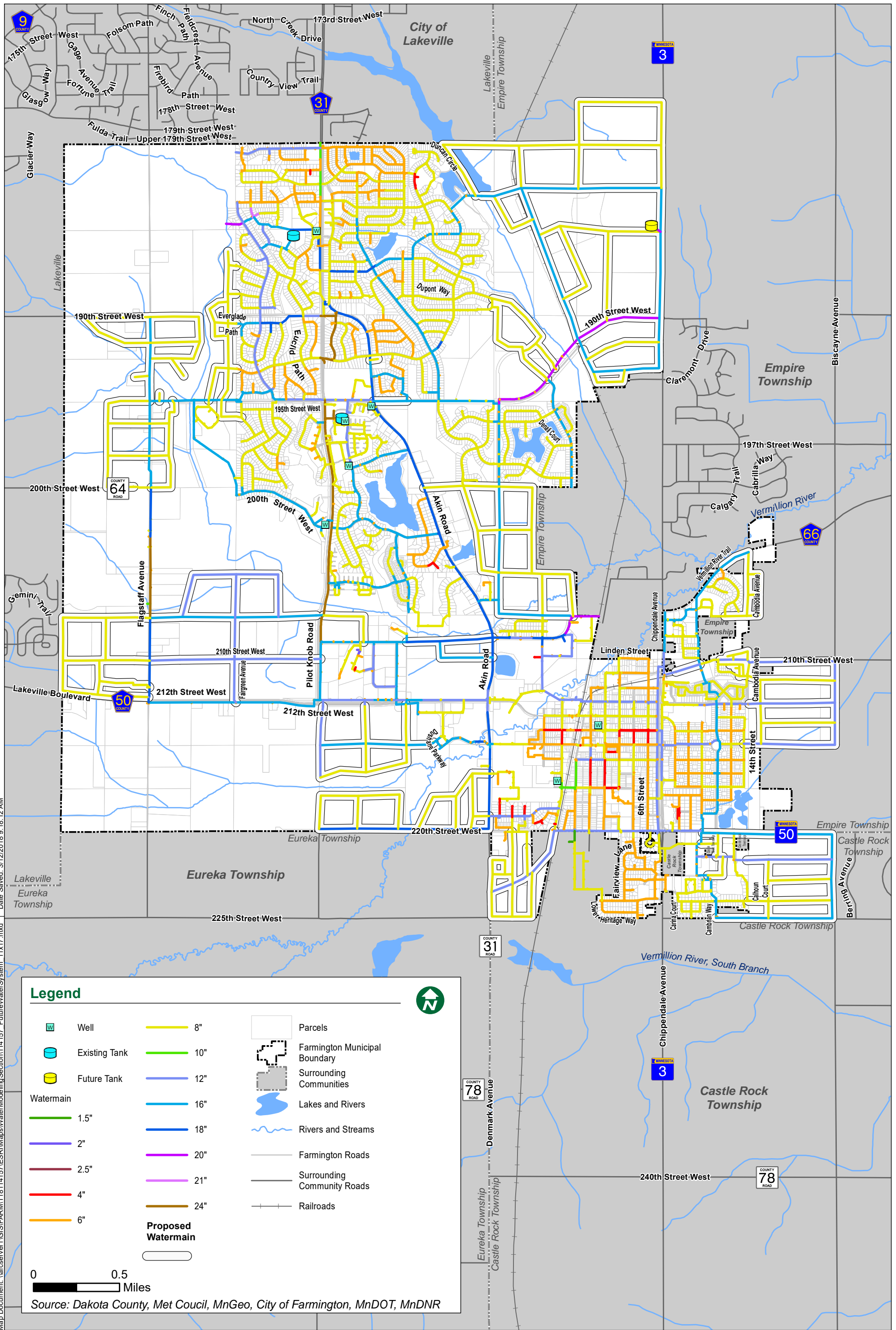




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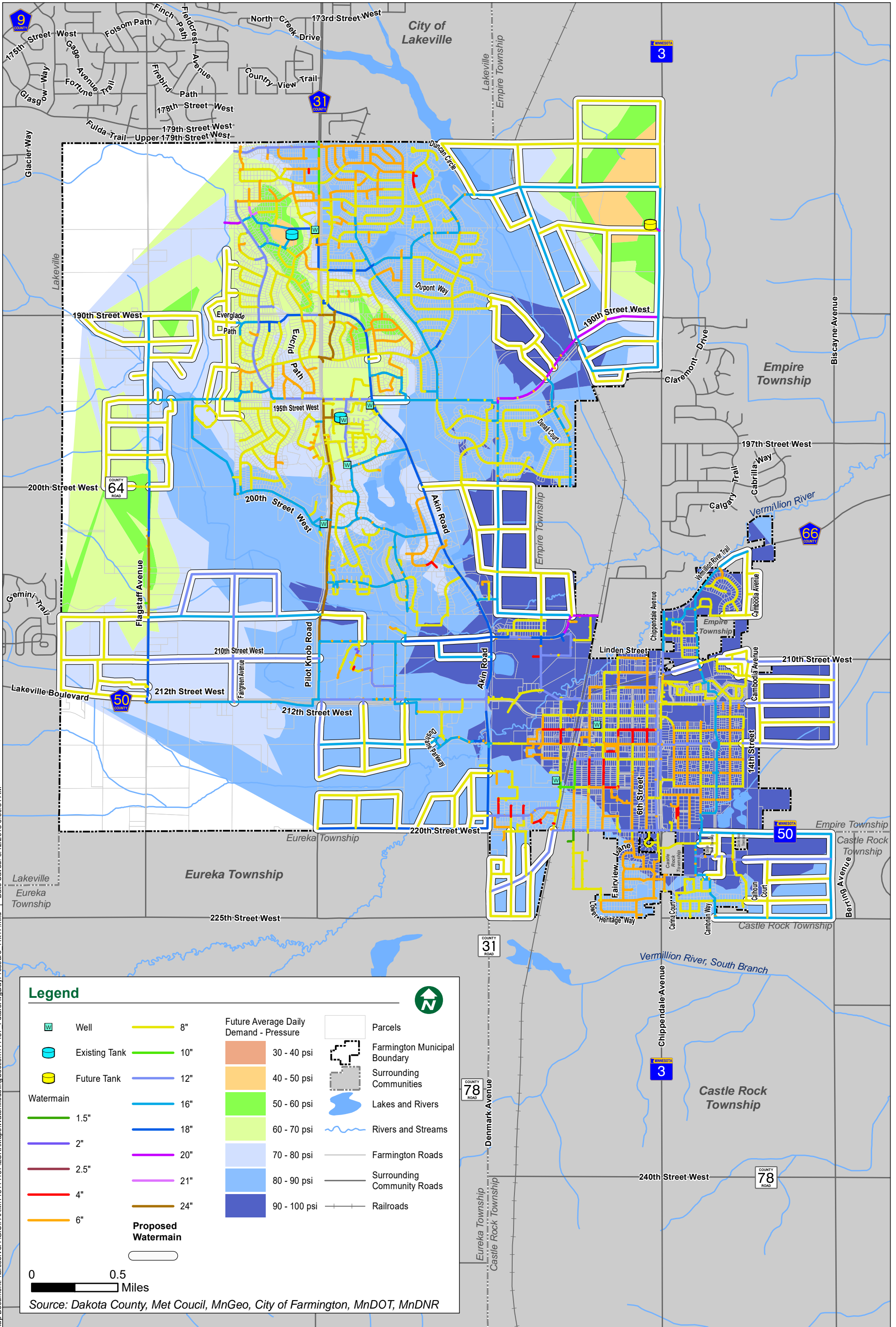
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**Legend**

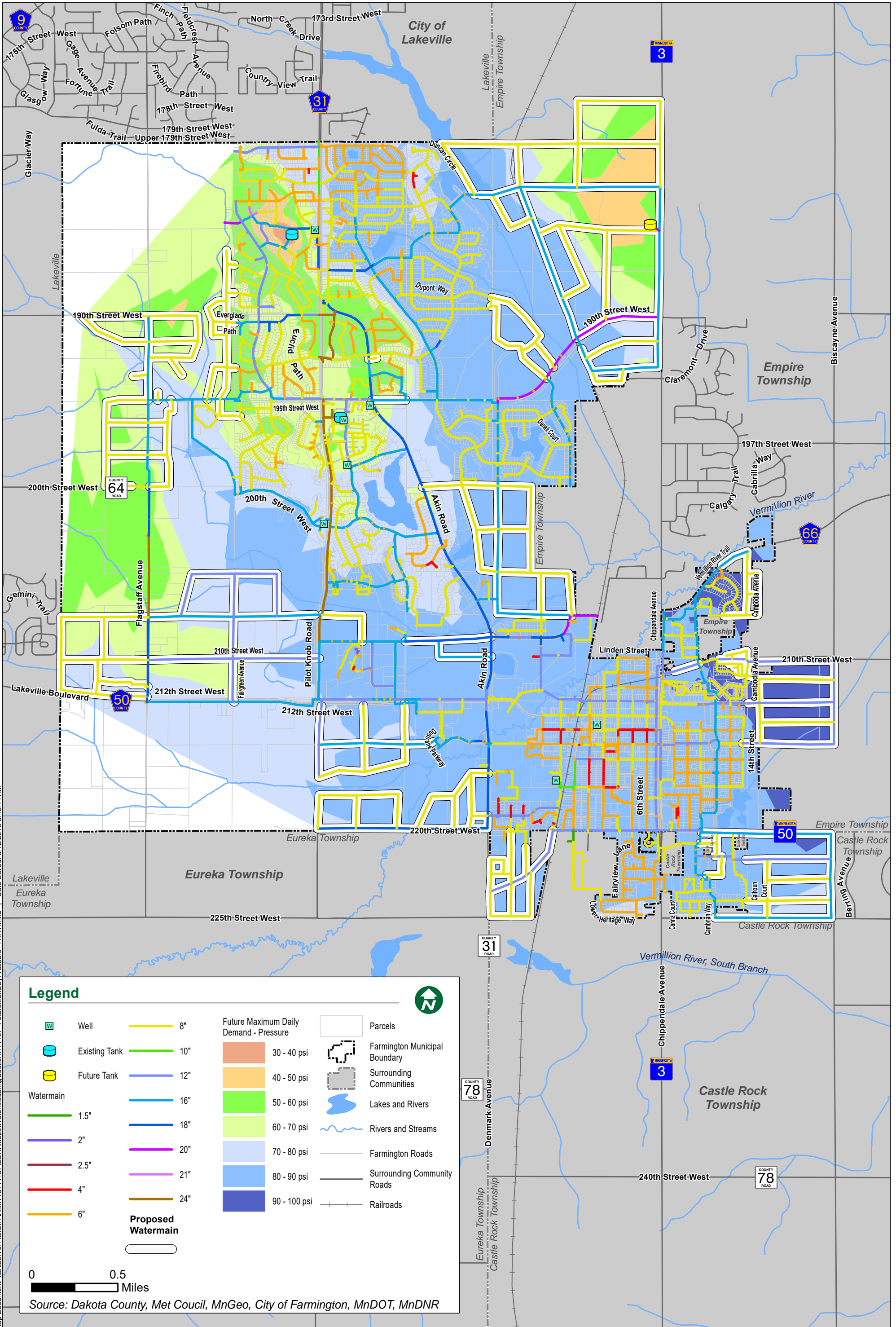
	Well		8"		Parcels
	Existing Tank		10"		Farmington Municipal Boundary
	Future Tank		12"		Surrounding Communities
<b>Watermain</b>			16"		Lakes and Rivers
	1.5"		18"		Rivers and Streams
	2"		20"		Farmington Roads
	2.5"		21"		Surrounding Community Roads
	4"		24"		Railroads
	6"				
<b>Proposed Watermain</b>					

0 0.5 Miles

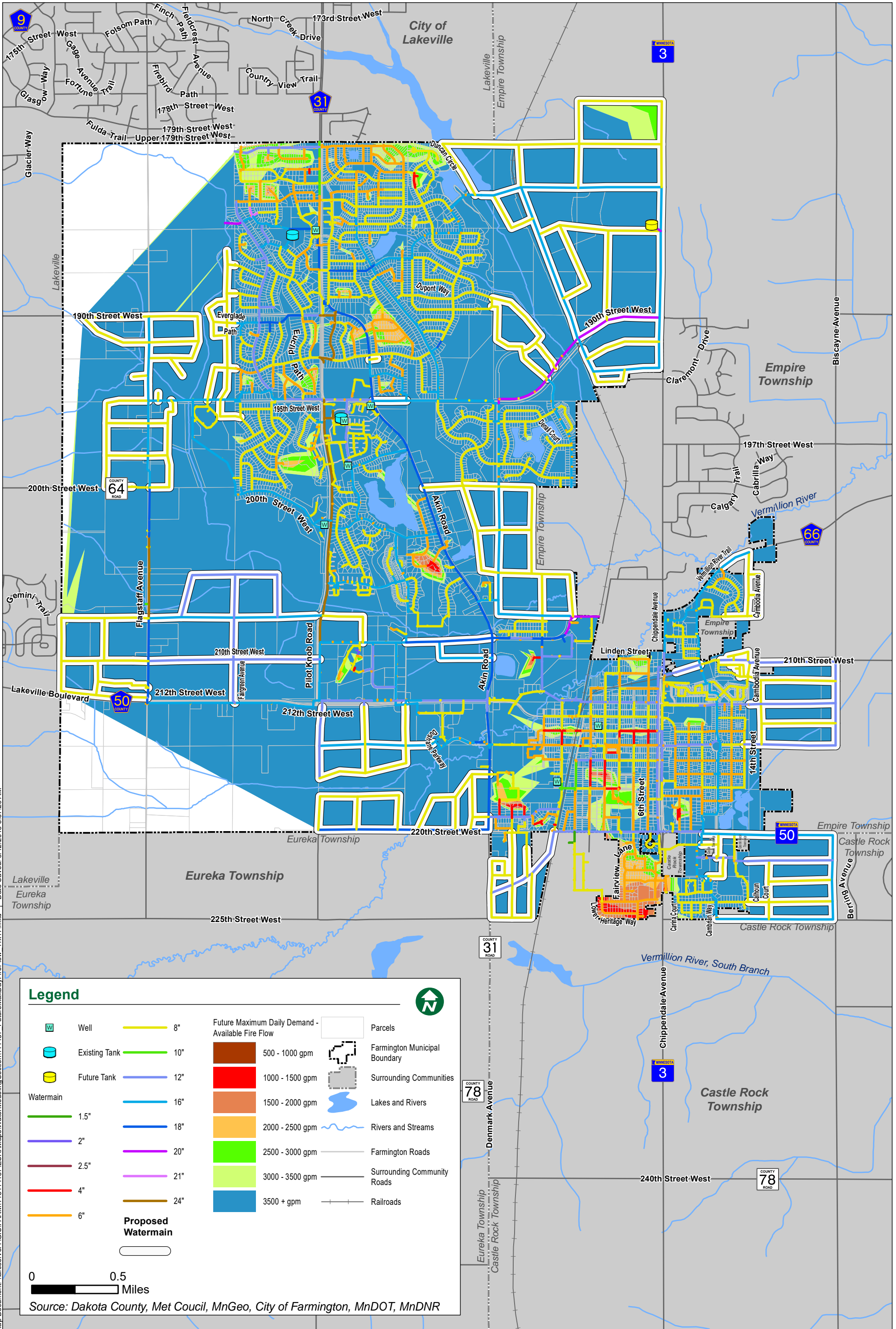
Source: Dakota County, Met Coucil, MnGeo, City of Farmington, MnDOT, MnDNR



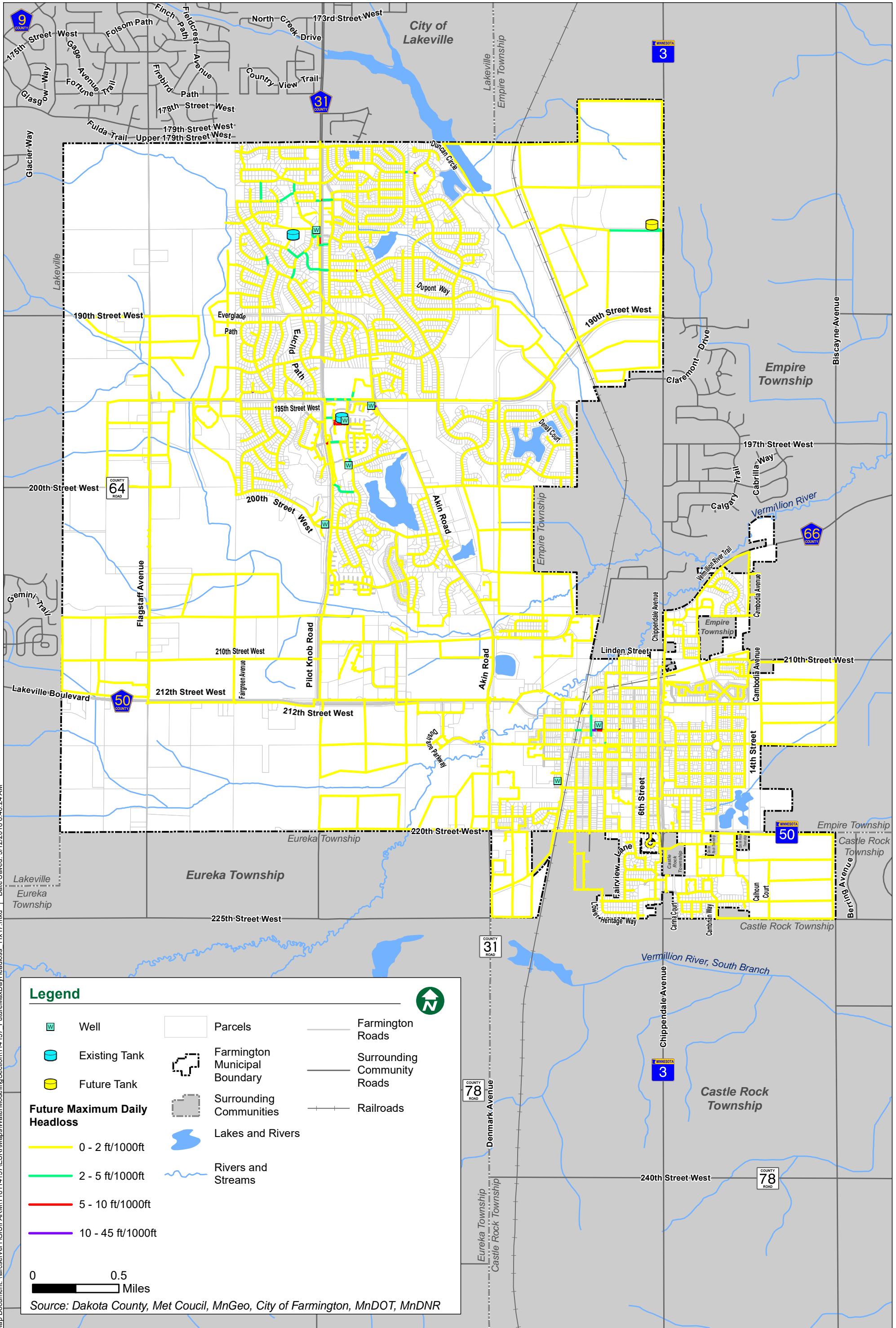




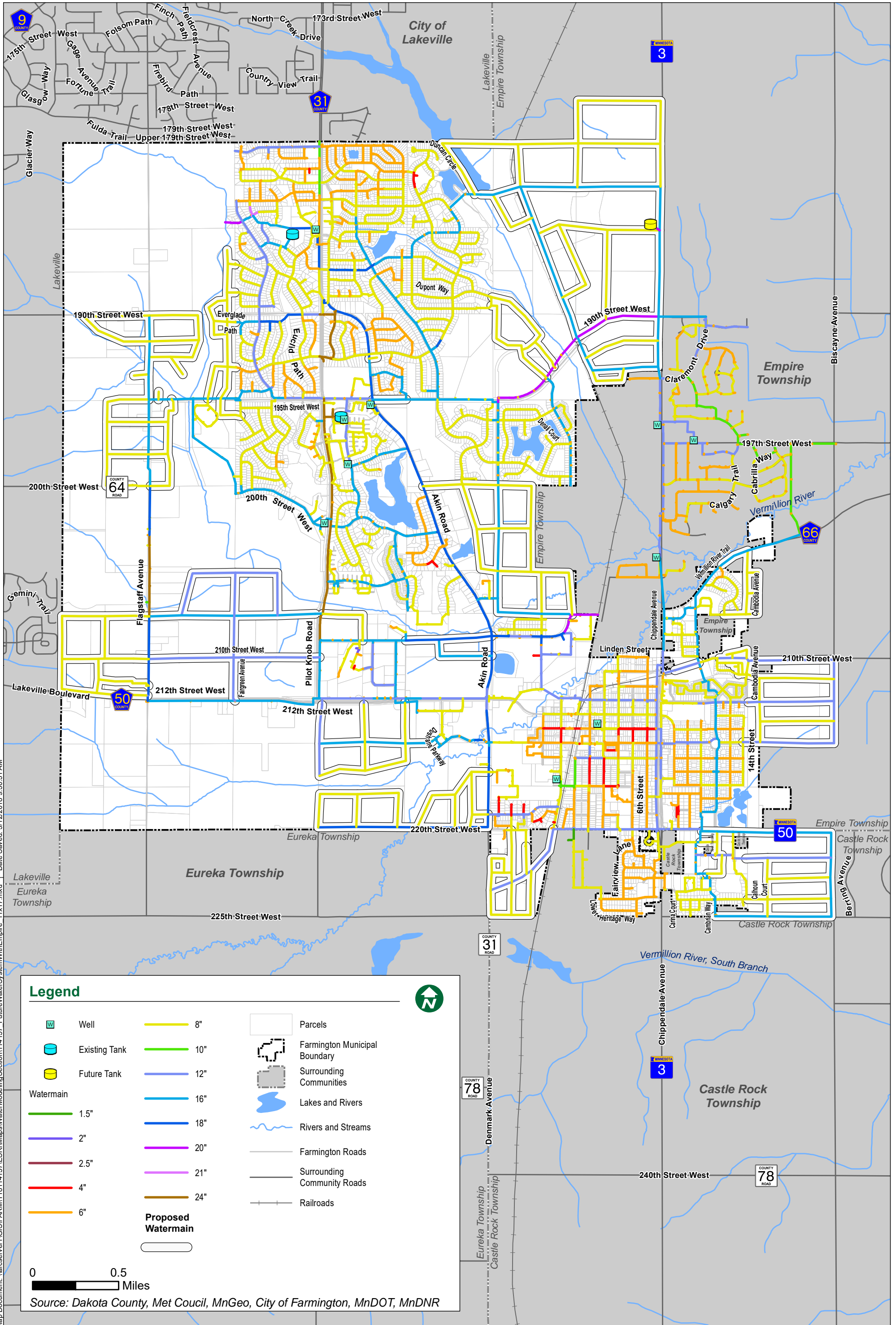
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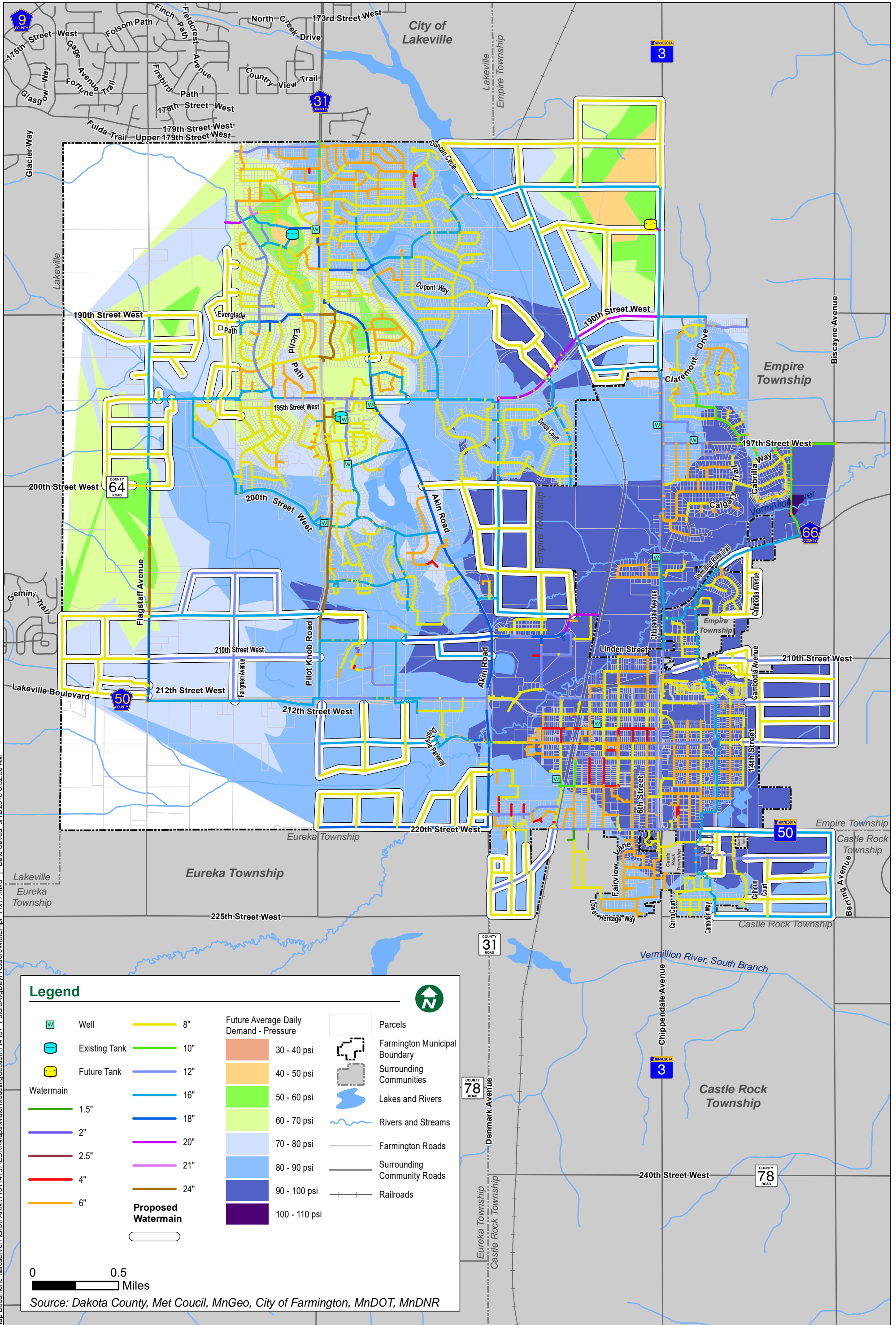
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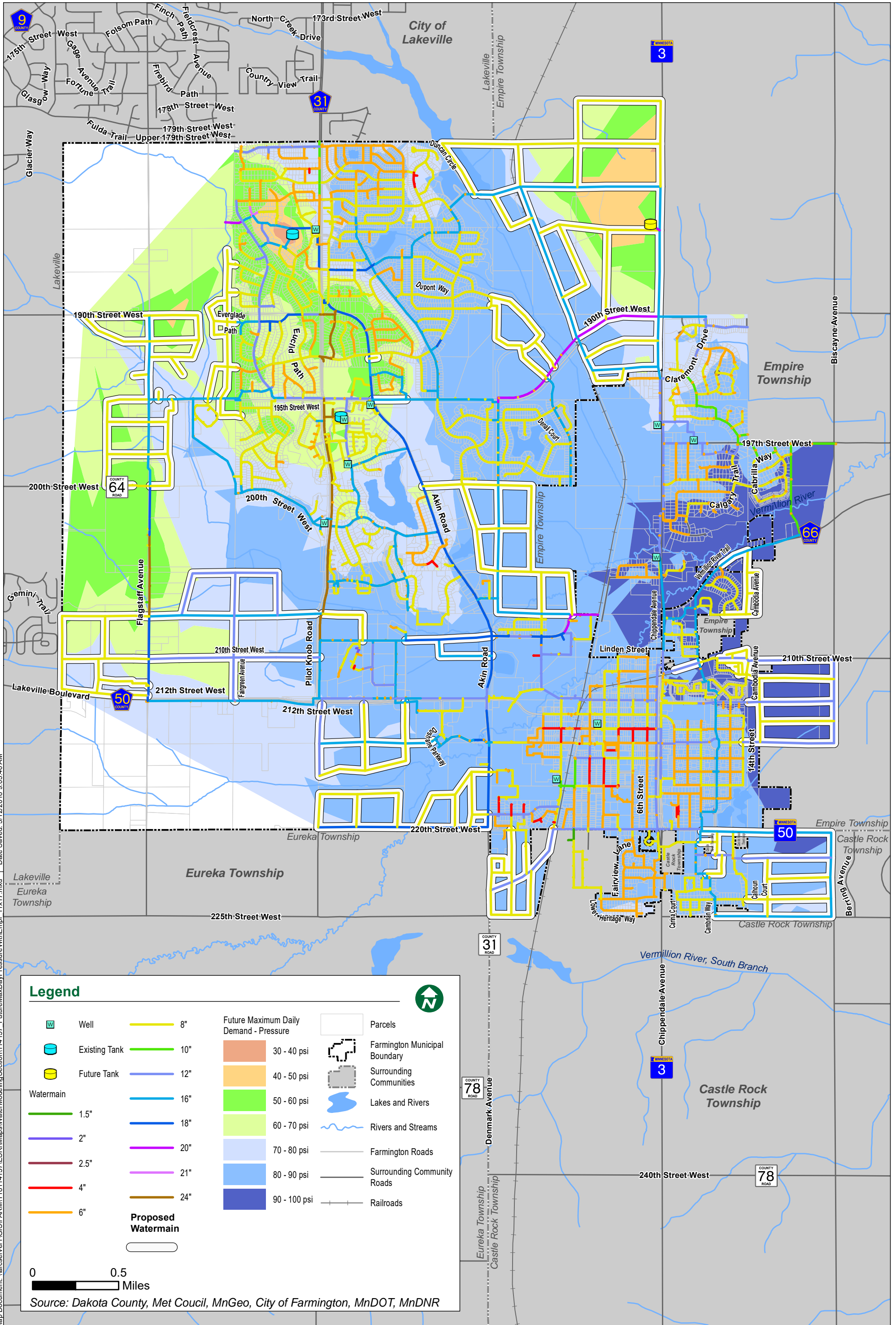
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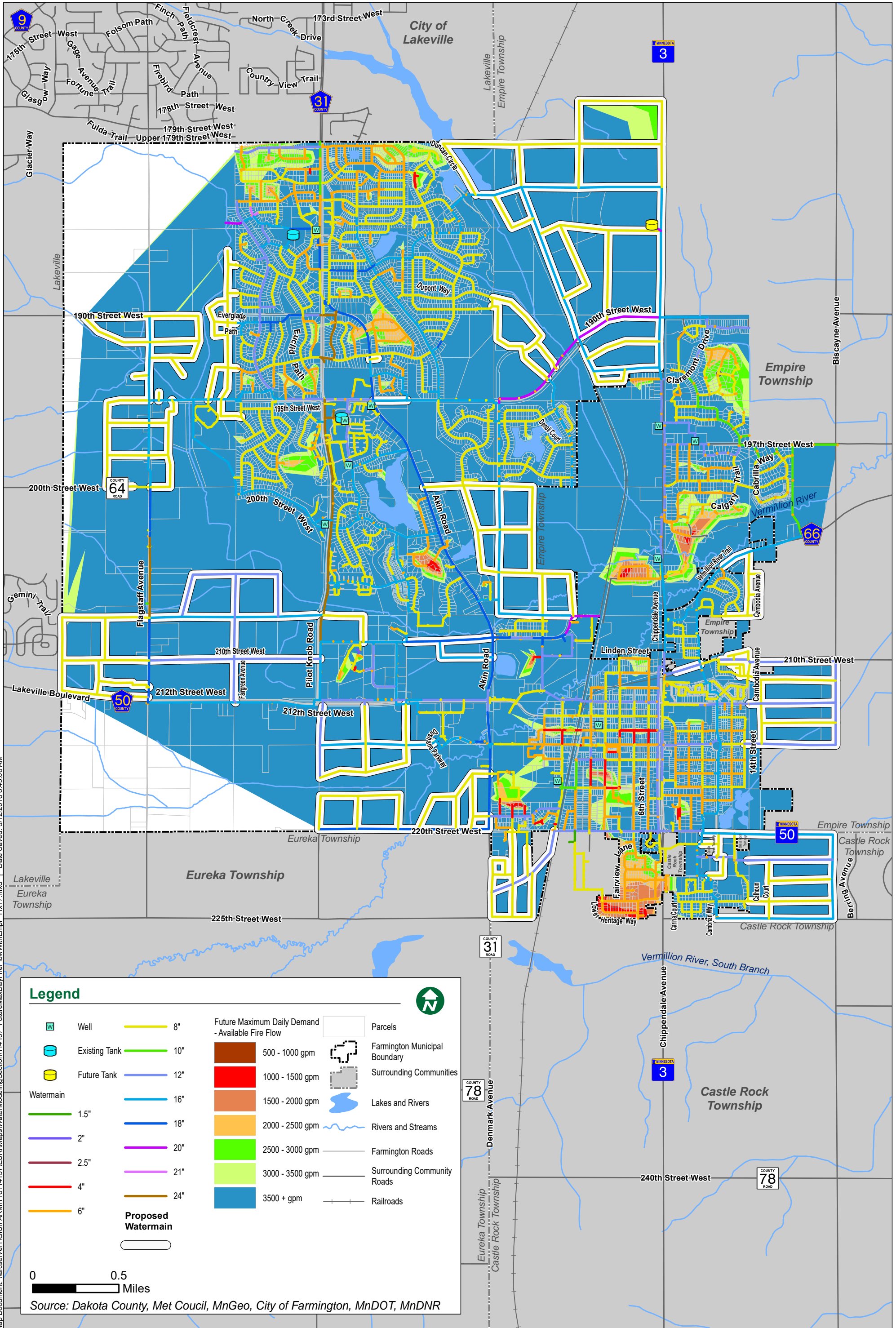
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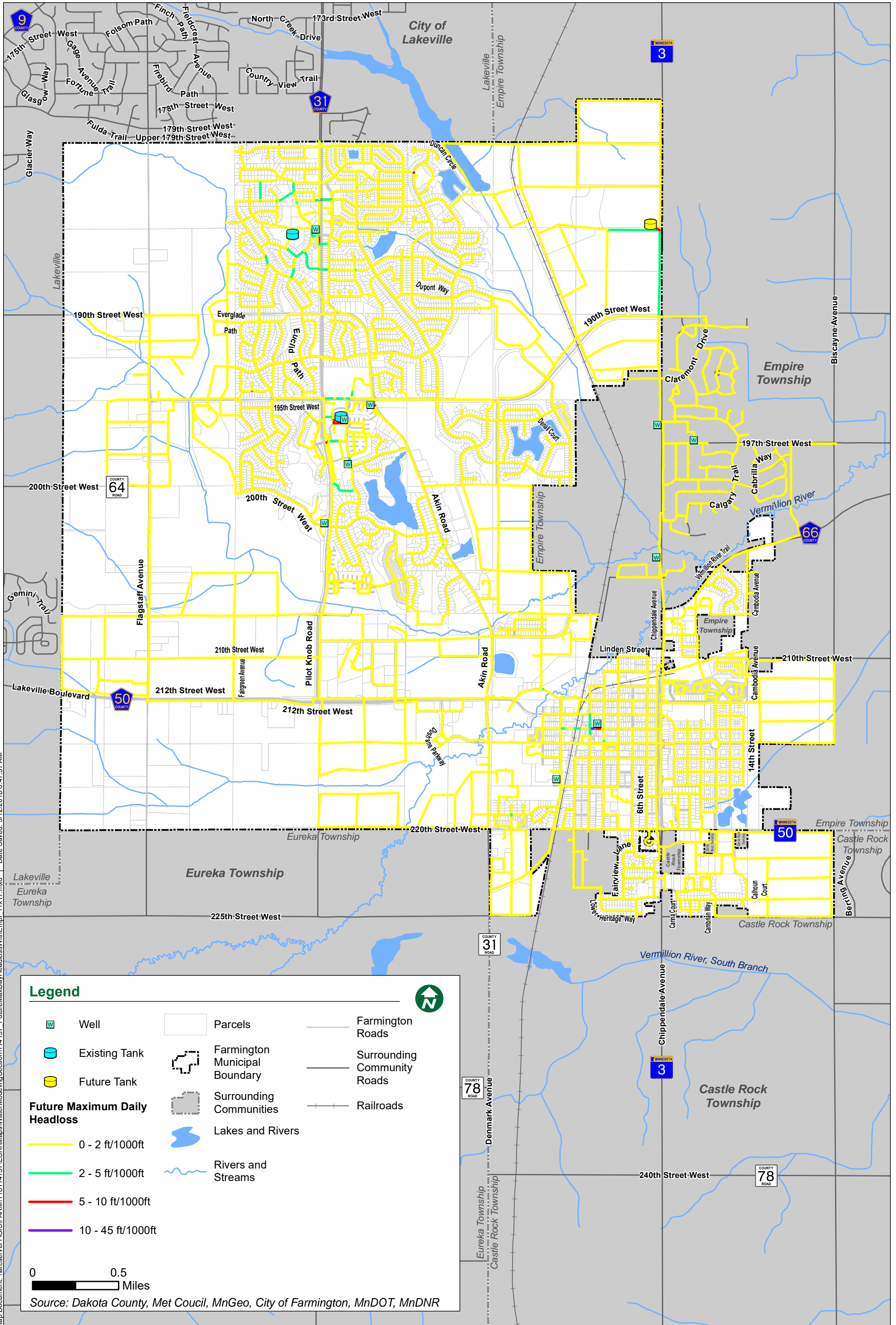
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#### 4. Recommendations

Based on the above analyses, the City of Farmington appears to have adequate available fire flows and good pressure coverage, except for some areas, particularly dead-end lines. It is recommended that the City provide watermain loops or larger watermains in these areas where possible.

It is considered good practice to increase the size of watermains that are too small. Existing four inch and smaller watermains limit fire protection to served properties. According to 10 States Standards, it states that the minimum size of watermain which provides fire protection shall be six-inch diameter. There is approximately 12,100 feet of pipe that are four inches in diameter or less; however, it is not recommended these be replaced at this time due to the high cost. The City should systematically continue to upgrade these pipes with regular street improvements.

The City may also consider setting up a leak detection schedule that examines the entire system on a cycle, such as examining one-fifth of the City every five years over a five year period. This ensures that the entire system is checked for leaks, no matter how small, and repairs leaks that may be missed by tracking the water audit only.

## VI. ECONOMIC ANALYSIS

### A. GENERAL

This section presents the general cost estimates and the Water System's Comprehensive Plan anticipated schedule. The cost estimates provided in this section are preliminary cost estimates.

### B. COMPREHENSIVE PLAN AND COST ESTIMATES

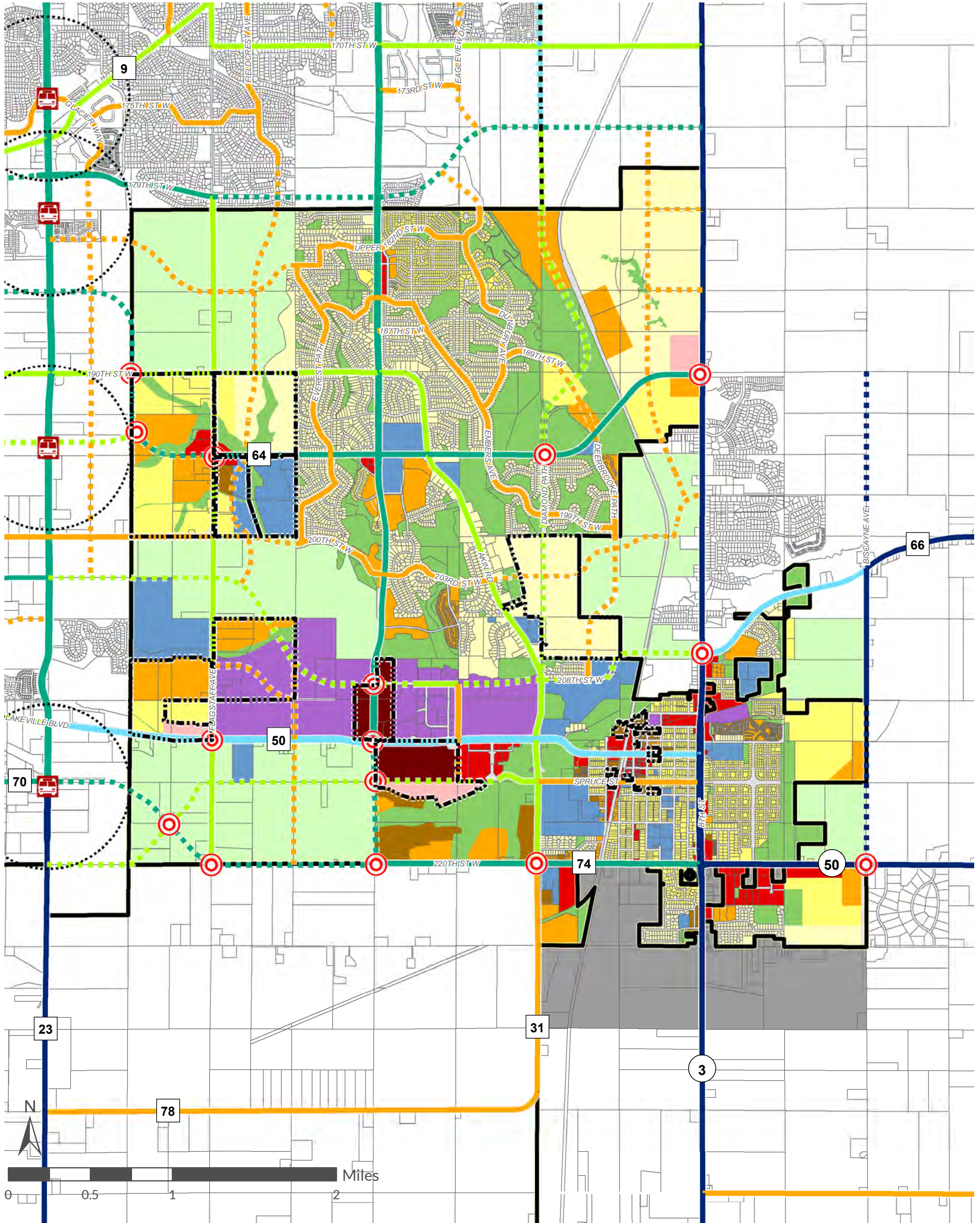
This section is forthcoming.

### C. FUNDING

Several sources are available for funding the above projects. The City of Farmington may also choose to fund the projects by bonding themselves or using cash reserves. It may be more beneficial to receive state funding for larger projects such as water tower installations or renovations, as these can cost significantly more than a watermain replacement project. For these projects, the state of Minnesota has the Public Facilities Authority that funds projects through the Drinking Water Revolving Fund. This requires placement on the Project Priority List to receive funding for drinking water projects. The City can also choose to try to receive different grants to fund the above projects if they are eligible.

## Appendix A: Future Land Use Map

# Proposed Changes to 2040 Future Land Use

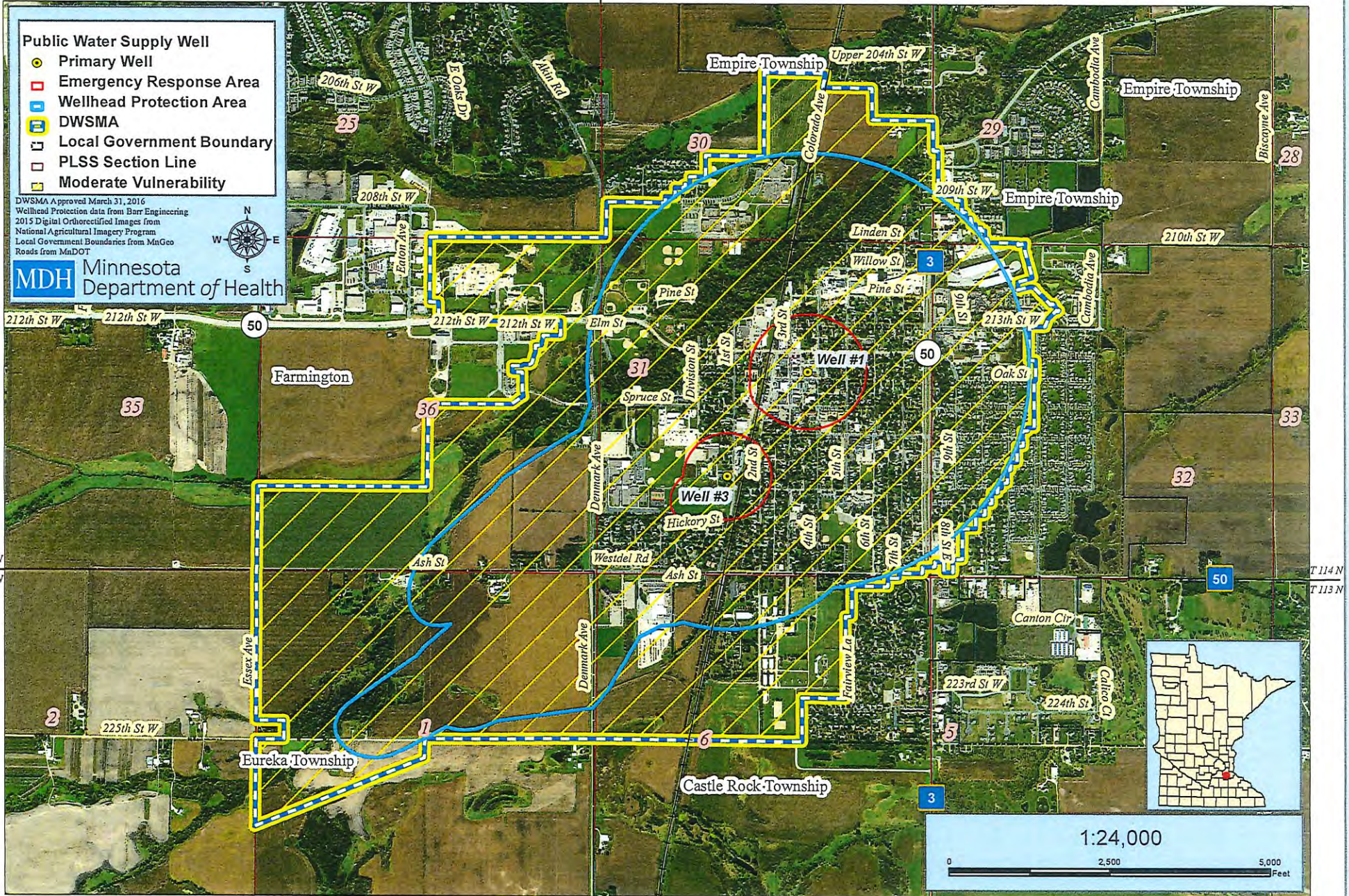


- |                           |                        |                        |                                   |
|---------------------------|------------------------|------------------------|-----------------------------------|
| Change in Future Land Use | Other Arterial         | Agriculture            | Mixed-Use (Commercial/Industrial) |
| Major Intersection        | Future Other Arterial  | Low Density            | Industrial                        |
| A Minor Expander          | Major Collector        | Low Medium             | Public/Semi-Public                |
| Future A Minor Expander   | Future Major Collector | Medium Density         | Park/Open Space                   |
| A Minor Connector         | Minor Collector        | High Density           | ROW                               |
| Future A Minor Connector  | Future Minor Collector | Mixed-Use (Comm./Res.) | Non-Designated                    |
|                           |                        | Commercial             |                                   |

## Appendix B: Drinking Water Supply Management Area (DWSMA) Figures

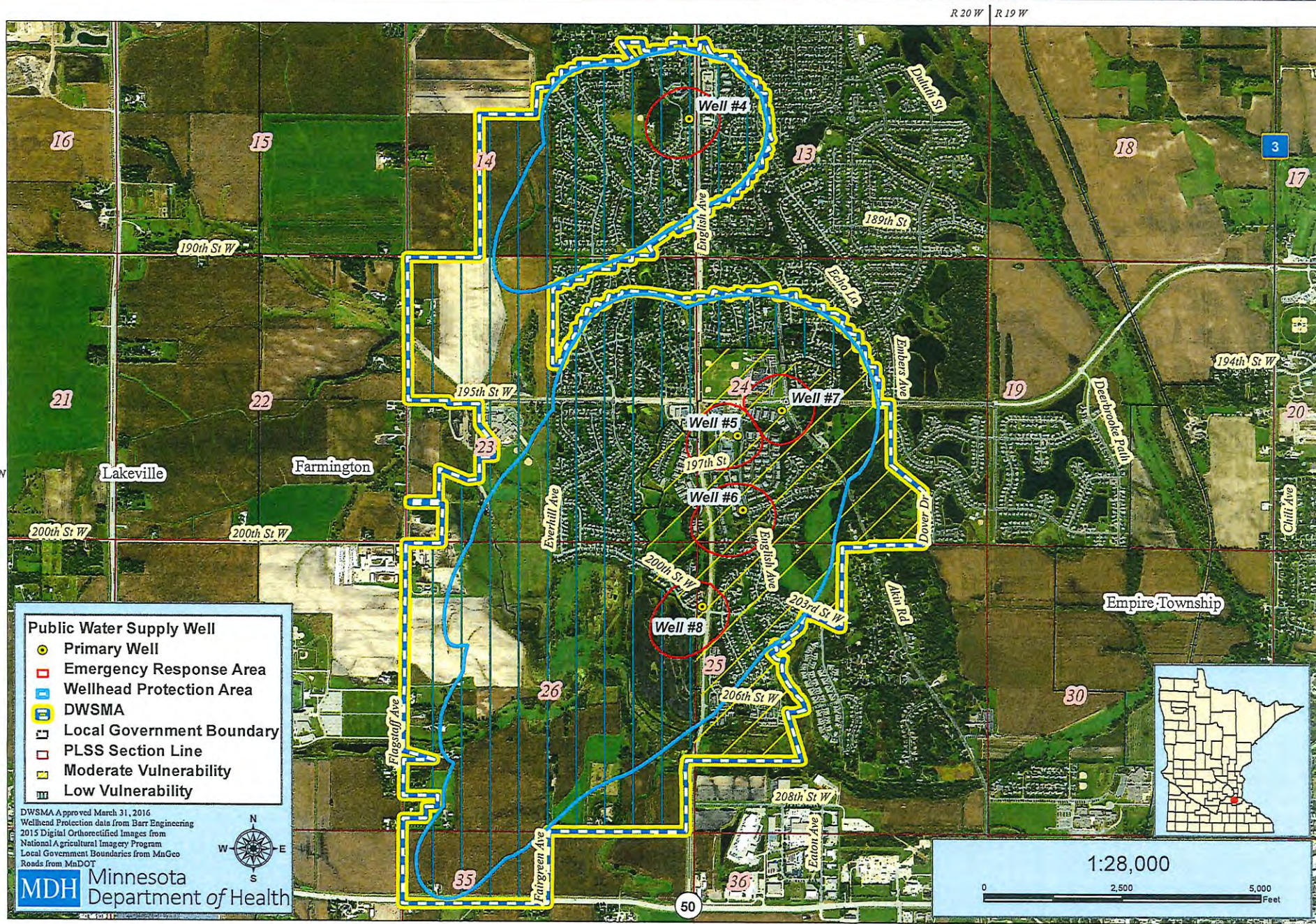
# Farmington SE Drinking Water Supply Management Area (DWSMA) MN-00873 - Moderate Vulnerability

R 20 W R 19 W



R 20 W R 19 W

# Farmington NW Drinking Water Supply Management Area (DWSMA) MN-00874 - Variable Vulnerability

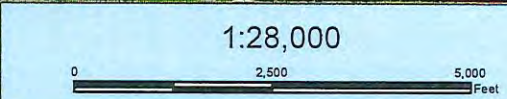


- Public Water Supply Well
- Primary Well
- Emergency Response Area
- Wellhead Protection Area
- DWSMA
- Local Government Boundary
- PLSS Section Line
- Moderate Vulnerability
- Low Vulnerability

DWSMA Approved March 31, 2016  
Wellhead Protection data from Barr Engineering  
2015 Digital Orthorectified Images from  
National Agricultural Imagery Program  
Local Government Boundaries from MnGeo  
Roads from MnDOT



**MDH** Minnesota Department of Health



R 20 W R 19 W

## Appendix C: City of Farmington 2016 Consumer Confidence Report



# CONSUMER CONFIDENCE REPORT

## City of Farmington 2016 Drinking Water Report



Photo by Hailee Unruh

The city of Farmington is issuing the results of monitoring done on its drinking water for the period from January 1 to December 31, 2016. The purpose of this report is to advance consumers' understanding of drinking water and heighten awareness of the need to protect precious water resources.

### Source of Water

The city of Farmington provides drinking water to its residents from a groundwater source: seven wells ranging from 402 to 512 feet deep, that draw water from the Prairie Du Chien-Jordan aquifer.

The Minnesota Department of Health has made a determination as to how vulnerable our systems' source of water may be to future contamination incidents. If you wish to obtain the entire source water assessment regarding your drinking water, please call 651-201-4700 or 1-800-818-9318 (and press 5) during normal business hours. Also, you can view it on line at [www.health.state.mn.us/divs/eh/water/swp/swa](http://www.health.state.mn.us/divs/eh/water/swp/swa).

Contact [Katy Gehler](mailto:Katy.Gehler@cityoffarmington.com), 651-280-6841 if you have questions about the city of Farmington drinking water or would like information about opportunities for public participation in decisions that may affect the quality of the water.

### Results of Monitoring

No contaminants were detected at levels that violated federal drinking water standards. However, some contaminants were detected in trace amounts that were below legal limits. The table that follows shows the contaminants that were detected in trace amounts last year. (Some contaminants are sampled less frequently than once a year; as a result, not all contaminants were sampled for in 2016. If any of these contaminants were detected the last time they were sampled for, they are included in the table along with the date that the detection occurred.)

### Key to abbreviations:

- MCLG - Maximum Contaminant Level Goal: The level of a contaminant in drinking water below which there is no known or expected risk to health. MCLGs allow for a margin of safety.
- MCL - Maximum Contaminant Level: The highest level of a contaminant that is allowed in drinking water. MCLs are set as close to the MCLGs as feasible using the best available treatment technology.
- MRDL - Maximum Residual Disinfectant Level.
- MRDLG - Maximum Residual Disinfectant Level Goal.
- AL - Action Level: The concentration of a contaminant which, if exceeded, triggers treatment or other requirement which a water system must follow.
- 90th Percentile Level - This is the value obtained after disregarding 10 percent of the samples taken that had the highest levels. (For example, in a situation in which 10 samples were taken, the 90th percentile level is determined by disregarding the highest result, which represents 10 percent of the samples.) Note: In situations in which only 5 samples are taken, the average of the two with the highest levels is taken to determine the 90th percentile level.
- pCi/l - PicoCuries per liter (a measure of radioactivity).
- ppm - Parts per million, which can also be expressed as milligrams per liter (mg/l).
- ppb - Parts per billion, which can also be expressed as micrograms per liter (µg/l).
- nd - No Detection.
- N/A - Not Applicable (does not apply).
- TT - Treatment Technique: A required process intended to reduce the level of a contaminant in drinking water.

Contaminant (units)	MCLG	MCL	Level Found		Typical Source of Contaminant
			Range (2016)	Average/Result*	
Alpha Emitters (pCi/l) (04/27/2015)	0	15.4	N/A	9.7	Erosion of natural deposits.
Barium (ppm) (04/22/2015)	2	2	N/A	.11	Discharge of drilling wastes; Discharge from metal refineries; Erosion of natural deposits.
Combined Radium (pCi/l) (04/27/2015)	0	5.4	N/A	2.1	Erosion of natural deposits.
Cyanide (ppb)	200	200	N/A	60	Discharge from steel/metal factories; Discharge from plastic and fertilizer factories.
Fluoride (ppm)	4	4	.49-.92	.82	State of Minnesota requires all municipal water systems to add fluoride to the drinking water to promote strong teeth; Erosion of natural deposits; Discharge from fertilizer and aluminum factories.
Haloacetic Acids (HAA5) (ppb)	0	60	1-1.1	1.1	By-product of drinking water disinfection.
Nitrate (as Nitrogen) (ppm)	10.4	10.4	nd-.63	.63	Runoff from fertilizer use; Leaching from septic tanks, sewage; Erosion of natural deposits.
TTHM (Total trihalomethanes) (ppb)	0	80	4.9-5.6	5.6	By-product of drinking water disinfection.

\*This is the value used to determine compliance with federal standards. It sometimes is the highest value detected and sometimes is an average of all the detected values. If it is an average, it may contain sampling results from the previous year.

Contaminant (units)	MCLG	MCL	# of TT exceedances	Typical Source of Contaminant
Total Coliform Bacteria ‡	N/A	TT	1	Naturally present in the environment.

‡Beginning April 1, 2016

Coliforms are bacteria that are naturally present in the environment and are used as an indicator that other, potentially harmful, waterborne pathogens may be present or that a potential pathway exists through which contamination may enter the drinking water distribution system. We found coliforms indicating the need to look for potential problems in water treatment or distribution. When this occurs, we are required to conduct assessment(s) to identify problems and to correct any problems that were found during these assessments.

Level 1 Assessment: A Level 1 assessment is a study of the water system to identify potential problems and determine (if possible) why total coliform bacteria have been found in our water system.

During the past year we were required to conduct one Level 1 assessment. One Level 1 assessment was completed. In addition, we were required to take zero corrective actions.

Contaminant (units)	MRDLG	MRDL	****	*****	Typical Source of Contaminant
Chlorine (ppm)	4	4	nd-1.29	.24	Water additive used to control microbes.

\*\*\*\*Highest and Lowest Monthly Average.

\*\*\*\*\*Highest Quarterly Average.

Contaminant (units)	MCLG	AL	90% Level	# sites over AL	Typical Source of Contaminant
Copper (ppm)	1.3	1.3	.48	0 out of 30	Corrosion of household plumbing systems; Erosion of natural deposits.
Lead (ppb)	0	15	1.2	0 out of 30	Corrosion of household plumbing systems; Erosion of natural deposits.

If present, elevated levels of lead can cause serious health problems, especially for pregnant women and young children. Lead in drinking water is primarily from materials and components associated with service lines and home plumbing. City of Farmington is responsible for providing high quality drinking water, but cannot control the variety of materials used in plumbing components. When your water has been sitting for several hours, you can minimize the potential for lead exposure by flushing your tap for 30 seconds to 2 minutes before using water for drinking or cooking. If you are concerned about lead in your water, you may wish to have your water tested. Information on lead in drinking water, testing methods, and steps you can take to minimize exposure is available from the Safe Drinking Water Hotline or at <http://www.epa.gov/safewater/lead>.

Monitoring may have been done for additional contaminants that do not have MCLs established for them and are not required to be monitored under the Safe Drinking Water Act. Results may be available by calling 651-201-4700 or 1-800-818-9318 during normal business hours.



*Aerial photo by Bill Cuevas*

## **Aesthetic Water Quality**

**(these components are not considered harmful to health, but can affect the look and taste of the water)**

Water Hardness .....	271.51 mg/L or 15.8 grains
pH .....	7.76
Calcium.....	65.3 mg/L
Magnesium.....	26.2 mg/L
Sulfate .....	19.1 mg/L
Sodium .....	3.5 mg/L
Chloride .....	6.55 mg/L
Iron.....	.38 mg/L
Manganese.....	.06 mg/L
Alkalinity.....	254.71 mg/L

The numbers above represent average values of all samples taken, some variation may be experienced.

# Compliance with National Primary Drinking Water Regulations

The sources of drinking water (both tap water and bottled water) include rivers, lakes, streams, ponds, reservoirs, springs, and wells. As water travels over the surface of the land or through the ground, it dissolves naturally-occurring minerals and, in some cases, radioactive material, and can pick up substances resulting from the presence of animals or from human activity.

Contaminants that may be present in source water include:

*Microbial contaminants*, such as viruses and bacteria, which may come from sewage treatment plants, septic systems, agricultural livestock operations, and wildlife.

*Inorganic contaminants*, such as salts and metals, which can be naturally occurring or result from urban stormwater runoff, industrial or domestic wastewater discharges, oil and gas production, mining, or farming.

*Pesticides and herbicides*, which may come from a variety of sources such as agriculture, urban stormwater runoff, and residential uses.

*Organic chemical contaminants*, including synthetic and volatile organic chemicals, which are by-products of industrial processes and petroleum production, and can also come from gas stations, urban stormwater runoff, and septic systems.

*Radioactive contaminants*, which can be naturally-occurring or be the result of oil and gas production and mining activities.

In order to ensure that tap water is safe to drink, the U. S. Environmental Protection Agency (EPA) prescribes regulations which limit the amount of certain contaminants in water provided by public water systems. Food and Drug Administration regulations establish limits for contaminants in bottled water which must provide the same protection for public health.

Drinking water, including bottled water, may reasonably be expected to contain at least small amounts of some contaminants. The presence of contaminants does not necessarily indicate that water poses a health risk. More information about contaminants and potential health effects can be obtained by calling the Environmental Protection Agency's Safe Drinking Water Hotline at 1-800-426-4791.

***Some people may be more vulnerable to contaminants in drinking water than the general population. Immuno-compromised persons such as persons with cancer undergoing chemotherapy, persons who have undergone organ transplants, people with HIV/AIDS or other immune system disorders, some elderly, and infants can be particularly at risk from infections. These people should seek advice about drinking water from their health care providers. EPA/CDC guidelines on appropriate means to lessen the risk of infection by Cryptosporidium and other microbial contaminants are available from the Safe Drinking Water Hotline at 1-800-426-4791.***

# APPENDIX I. ADJACENT & AFFECTED JURISDICTIONAL REVIEW & RESPONSES





Dakota County

Type	Comment	Page(s)	Response
Transportation	<p>The City of Farmington 2040 Comprehensive Plan Update Transportation chapter appears to be consistent with Dakota County's plans, including the 2030 Dakota County Transportation Plan (adopted in 2012) and the Transportation chapter of the Draft <i>Dakota County 2040 Comprehensive Plan</i>. Note that Dakota County intends to update its full Transportation Plan in 2019 to reflect local Comprehensive Plan updates and any studies, analysis and policy updates that have</p>		Comment noted.
Transportation	<p>Future Functional Classification System. Page S-9S, Figure S.40, Functional Classification-The map identifies County State Aid Highway (CSAH) SO (212th Street West) as a future Major Collector. The highway is currently designated as Other Arterial. Please consider providing text stating that the City will pursue this functional classification designation after the highway has been transferred from the County to the City in the future.</p>		This information had been provided under the Future Functional Classification heading of the Roadway System Plan section and has been added to Figure 5.40.
Transportation	<p>Travel Demand Forecast. After consultation with Metropolitan Council staff, Dakota County used its original 2030 travel demand model projections with updated existing volumes and appropriate adjustments as the 2040 travel demand projection for the Dakota County Comprehensive Plan. Dakota County will update the 2030 travel demand model to reflect forecast 2040 population as part of its full Transportation Plan Update after the cities complete their respective comprehensive plan updates. This allows the County model to reflect the 2040 demographic projections currently being established by each community and is consistent with the process used for the last County comprehensive plan update. Dakota County will use the Farmington 2040 Comprehensive Plan Update and travel demand modelling information as a basis for our future travel</p>		Comment noted.



	<p>When comparing the County's 2030 travel forecast with the City's 2040 travel forecast several slight differences are identified. The County's 2040 forecasts are higher than the City of Farmington's 2040 forecasts for CSAH 50 and CSAH 31 in some locations. However, both City and County plans identify the appropriate future number of lane needs in their plans. This issue will be further examined when the County conducts a full update to its Transportation Plan including the travel demand model to include local 2040 land use forecasts.</p>	
Transportation	<p>New Development Impacts to County Systems / Future Studies. Pages S-112 to S-116 identify Future Study/Coordination Issues, including the following that potentially impact the County</p> <p><i>Potential Diamond Path (County Road 33) Extension:</i> The County currently identifies future County highway jurisdiction of Diamond Path between CSAH 46 and 180th Street (also a future County highway). As the Farmington 2040 Comprehensive Plan identifies, the City and County plan to study the potential for extending future Diamond Path to Akin Road. The County will work with the City in the coming months to define a scope for</p> <p><i>CSAH 54/Flagstaff Avenue Commercial Node:</i> The City identifies this area as an important commercial area as parcels transition from agricultural use. The City identifies coordinating with the County in the implementation of the future roadway alignment identified as Corridor C in the Dakota County East-West Corridor Preservation Study, Phase II. We look forward to</p>	<p>Comment noted; the City looks forward to working with the County to study these locations.</p>
Transportation	<p><b>Transit.</b> On page 5-117, please consider revising the last sentence to refer to dial-a-ride service as Transit Link.</p>	<p>The requested wording change has been made.</p>
	<p>Landfill abatement is not required in City Comprehensive Plans, so it is commendable that the Farmington plan identified the City's role in recycling and waste reduction. Since the City has included content on solid waste in their plan, County staff has a few suggestions for increasing consistency with the County's recently adopted Solid Waste Master Plan.</p> <p>Municipalities have solid waste management responsibilities in state law and County Ordinance and are required to meet County Solid Waste Master Plan objectives, such as working to achieve the State's 75 percent recycling rate by 2030.</p> <p><b>Goal 2: Environmental impacts are reduced in Farmington</b> (page 8-154)</p>	<p>In reponse to Dakota County's comments, the city has added two policies under Goal 2, which are: Policy 2.4 Develop standards and review procedures that support adequate indoor and outdoor space for improved recycling opportunities (including organics such as food waste, as appropriate) in commercial development. Policy 2.5: Incorporate environmental impact considerations into municipal decision-making.</p>





Mn Department of Natural Resources (DNR)

Type	Comment	Page(s)	Response
Recommendation	<p><b>Wildlife.</b> In another measure to preserve the natural environment, consider adding policies that take wildlife into consideration as transportation and redevelopment projects occur. To enhance the health and diversity of wildlife populations, encourage private and public developments to retain or restore natural areas planted with native species. One larger area is better than several small “islands” or patches; and connectivity of habitat is important. Animals such as frogs and turtles need to travel between wetlands and uplands throughout their life cycle. Consult <a href="#">DNR’s Best Practices for protection of species</a> and <a href="#">Roadways and Turtles Flyer</a> for self-mitigating measures to incorporate into design and construction plans.</p>	3-23.	Added a policy to Land Use Chapter: LU P8.3
	<p>Preventing entrapment and death of small animals especially reptiles and amphibians, by specifying biodegradable erosion control netting (‘bio-netting’ or ‘natural netting’ types (category 3N or 4N)), and specifically not allow plastic mesh netting. (p. 25)</p>		
	<p>Providing wider culverts or other passageways under paths, driveways and roads while still considering impacts to the floodplain.</p>		
	<p>Including a passage bench under bridge water crossings. (p. 17) because typical bridge riprap can be a barrier to animal movement along streambanks.</p>		
	<p>Curb and stormwater inlet designs that don’t inadvertently direct small mammals and reptiles into the storm sewer. (p. 24). Installing “surmountable curbs” (Type D or S curbs) allows animals (e.g., turtles) to climb over and exit roadways. Traditional curbs/gutters tend to trap animals on the roadway. Another option is to install/create curb breaks every, say, 100 feet (especially important near wetlands).</p>		
	<p>Using smart salting practices to reduce impacts to aquatic species.</p>		
	<p>Fencing could be installed near wetlands to help keep turtles off the road (fences that have a j-hook at each end are more effective than those that don’t).</p>		

<p>Recommendation</p>	<p><a href="#">Native Species. Another policy to enhance the natural environment is to encourage private and public developments to be planted with native flowers, grasses, shrubs and tree species. Species such as monarchs rely on these plants, and it does not take many plants to attract butterflies, other beneficial pollinators as well as migrating and resident birds. Adding more native plants into landscaping, not only enhances the health and diversity of pollinators and wildlife populations, these plants can also help filter and store stormwater – other goals in your plan. For more information consult DNR’s pollinator page .</a></p> <p>Proposed landscape guidelines to improve the aesthetics in for commercial and industrial areas</p> <p>Street tree planting plans</p> <p>City gateway features</p> <p>Along ponds and waterways.</p> <p>Small nature play areas in children’s parks</p> <p>Along the edges of ballfield complexes.</p> <p>Waterways</p>	<p>3-23.</p>	<p>Added a policy to Land Use Chapter: LU P8.3</p>
<p>Recommendation</p>	<p><b>Community Forestry.</b> The loss of tree canopy due to threats such as emerald ash borer and oak wilt has negative impacts on the county’s health and environment, and a planned community forest can provide numerous community benefits. In the list of Green Team actions, you note that Farmington is a Tree City. It would also be worth highlighting if Farmington has developed a forestry management plan, along with plans for implementation, as part of a strategy to meet environmental and sustainability goals and policies.</p>		<p>Noted. The City has a robust tree preservation ordinance, tree planting requirements, as well as online resources for addressing emerald ash borer. No changes made</p>
<p>Recommendation</p>	<p><a href="#">Recreation Trails. Consider indicating snowmobile trails on park systems plans. State-supported grant-in-aid trails connect your community to an extensive network of trails throughout the state. Including the trails on inventories would raise awareness of this recreational activity. The snowmobile GIA Program webpage below also has more information on the program and funding.</a> <a href="https://www.dnr.state.mn.us/grants/recreation/gia_snowmobile">https://www.dnr.state.mn.us/grants/recreation/gia_snowmobile</a></p>		<p>Noted. The City will explore options for snow mobile recreation and funding through the Parks and Recreation department and the Parks and Recreation Commission. No changes made</p>

<p>Recommendation</p>	<p><b>Rare Features.</b> Two data layers useful for land use and conservation planning include the MBS Native Plant Communities and the MBS Sites of Biodiversity Significance. GIS shapefiles of these data layers can be downloaded from <a href="#">the Minnesota Geospatial Commons</a>. The DNR recommends avoidance of these ecologically significant areas, especially MBS Sites of Outstanding or High Biodiversity Significance and DNR Native Plant Communities with a conservation status rank of S1 (critically imperiled), S2 (imperiled), or S3 (vulnerable to extirpation). We recommend that Comprehensive plans include a map of both of these layers and a list of the types of native plant communities documented within the plan's boundaries. For further conservation planning and to ensure compliance with the Minnesota endangered species laws, the DNR encourages communities to check the NHIS Rare Features Data for known occurrences of state-listed species. The NHIS Rare Features Data contains nonpublic data and can only be accessed by submitting a License Agreement Application Form for a GIS shapefile or by submitting a NHIS Data Request Form for a database printout. Both of these forms are available at <a href="#">the NHIS webpage</a>. For more information on the biology, habitat use, and conservation measures of these rare species, please visit <a href="#">the DNR Rare Species Guide</a>. NHIS training includes rules for using/displaying nonpublic data in public documents.</p> <p>MBS Sites of Biodiversity Significance  <a href="http://www.dnr.state.mn.us/eco/mcbs/biodiversity_guidelines.h">http://www.dnr.state.mn.us/eco/mcbs/biodiversity_guidelines.h</a></p> <p>MBS Native Plant Communities  <a href="http://www.dnr.state.mn.us/npc/index.html">http://www.dnr.state.mn.us/npc/index.html</a></p>	<p>3-56.</p>	<p>Added map showing data</p>
<p>Recommendation</p>	<p>The transportation maps include stream centerlines and it would be helpful to add those to the land use and natural resource</p>	<p>3.30.</p>	<p>Added to Land Use Maps</p>
<p>Recommendation</p>	<p>Surface Water Map, Fig 3.17. -- It would be helpful to indicate which streams are designated trout streams and tributaries and to label stream names.</p>	<p>3-54.</p>	<p>Vermillion River the only named DNR stream/river, and the only trout stream - label added</p>

Please check the appropriate box:

- We have reviewed the proposed Plan Update, do not have any comments, and are therefore waiving further review.
- We have reviewed the proposed Plan Update and offer the following comments (attach additional sheets if necessary)

- The land north of Lakeville Blvd (CSAH 50) at the Farmington/Lakeville border is zoned for low/medium density residential. Please note that Lakeville has zoned the land to the west of this for commercial development. Consideration should be given to higher density residential development on the site or for sufficient buffering to future commercial uses.

Name of Reviewer Kris Jensen Date 4 Dec 2018

Signature of Reviewer -

Kris Jensen



November 30, 2018

**Physical Development Division**  
Steven C. Mielke, Director

Dakota County  
Western Service Center  
14955 Galaxie Avenue  
Apple Valley, MN 55124-8579

952.891.7000  
Fax 952.891.7031  
[www.dakotacounty.us](http://www.dakotacounty.us)

**Environmental Resources**  
*Environmental Initiatives*  
*Groundwater Protection*  
*Land Conservation*  
*Vermillion River Watershed*  
*Water Resources*  
*Waste Regulation*

**Office of Planning**

**Parks Facilities Fleet**  
*Parks*  
*Facilities Management*  
*Fleet Management*

**Transportation**  
*Highway*  
*Surveyor's Office*  
*Transit Office*

Tony Wippler  
Planning Manager  
City of Farmington  
430 Third Street  
Farmington, MN 55024

Dear Mr. Wippler:

Thank you for the opportunity to review the draft City of Farmington 2040 Comprehensive Plan Update. Dakota County staff reviewed the Plan for consistency with the County's Comprehensive Plan and policies. Dakota County staff comments on the plan are on the following page.

Please contact Kurt Chatfield (952-891-7022, [kurt.chatfield@co.dakota.mn.us](mailto:kurt.chatfield@co.dakota.mn.us)) if you would like to discuss the County review. We look forward to working with the City of Farmington to achieve our shared objectives.

Sincerely,

A handwritten signature in blue ink, appearing to read "Erin Stwora".

Erin Stwora, Deputy Director  
Physical Development Division

Cc: Commissioner Mike Slavik, District 1  
Matt Smith, County Manager  
Patrick Boylan, Metropolitan Council Sector Representative



## CHAPTER 5: TRANSPORTATION

The City of Farmington 2040 Comprehensive Plan Update Transportation chapter appears to be consistent with Dakota County's plans, including the 2030 Dakota County Transportation Plan (adopted in 2012) and the Transportation chapter of the Draft *Dakota County 2040 Comprehensive Plan*. Note that Dakota County intends to update its full Transportation Plan in 2019 to reflect local Comprehensive Plan updates and any studies, analysis and policy updates that have occurred since 2012.

### Future Functional Classification System

Page 5-95, Figure 5.40, Functional Classification – The map identifies County State Aid Highway (CSAH) 50 (212th Street West) as a future Major Collector. The highway is currently designated as Other Arterial. Please consider providing text stating that the City will pursue this functional classification designation after the highway has been transferred from the County to the City in the future.

### Travel Demand Forecast

After consultation with Metropolitan Council staff, Dakota County used its original 2030 travel demand model projections with updated existing volumes and appropriate adjustments as the 2040 travel demand projection for the Dakota County Comprehensive Plan. Dakota County will update the 2030 travel demand model to reflect forecast 2040 population as part of its full Transportation Plan Update after the cities complete their respective comprehensive plan updates. This allows the County model to reflect the 2040 demographic projections currently being established by each community and is consistent with the process used for the last County comprehensive plan update. Dakota County will use the Farmington 2040 Comprehensive Plan Update and travel demand modelling information as a basis for our future travel demand model update.

When comparing the County's 2030 travel forecast with the City's 2040 travel forecast several slight differences are identified. The County's 2040 forecasts are higher than the City of Farmington's 2040 forecasts for CSAH 50 and CSAH 31 in some locations. However, both City and County plans identify the appropriate future number of lane needs in their plans. This issue will be further examined when the County conducts a full update to its Transportation Plan including the travel demand model to include local 2040 land use forecasts.

### New Development Impacts to County Systems / Future Studies

Pages 5-112 to 5-116 identify Future Study/Coordination Issues, including the following that potentially impact the County system:

- *Potential Diamond Path (County Road 33) Extension:* The County currently identifies future County highway jurisdiction of Diamond Path between CSAH 46 and 180th Street (also a future County highway). As the Farmington 2040 Comprehensive Plan identifies, the City and County plan to study the potential for extending future Diamond Path to Akin Road. The County will work with the City in the coming months to define a scope for the study.
- *CSAH 64/Flagstaff Avenue Commercial Node:* The City identifies this area as an important commercial area as parcels transition from agricultural use. The City identifies coordinating with the County in the implementation of the future roadway alignment identified as Corridor C in the Dakota County East-West Corridor Preservation Study, Phase II. We look forward to working with the City.

## Transit

On page 5-117, please consider revising the last sentence to refer to dial-a-ride service as Transit Link.

## CHAPTER 8: SUSTAINABILITY

Landfill abatement is not required in City Comprehensive Plans, so it is commendable that the Farmington plan identified the City's role in recycling and waste reduction. Since the City has included content on solid waste in their plan, County staff has a few suggestions for increasing consistency with the County's recently adopted Solid Waste Master Plan.

Municipalities have solid waste management responsibilities in state law and County Ordinance and are required to meet County Solid Waste Master Plan objectives, such as working to achieve the State's 75 percent recycling rate by 2030.

### Goal 2: Environmental impacts are reduced in Farmington (page 8-154)

1. Please consider adding a policy to encourage standards that support adequate indoor and outdoor space for improved recycling opportunities (including organics such as food waste, as appropriate) in commercial development.

A documented local land use barrier to commercial recycling is inadequate waste/recycling collection space (indoor areas and exterior waste enclosure space). The above proposed policy supports the County's draft 2018-2038 Solid Waste Master Plan (Master Plan) which includes strategies to increase landfill abatement throughout Dakota County that focus on collaborating with partners in areas that they have influence, such as municipalities on development issues, to remove recycling barriers.

2. Please consider adding a policy to incorporate environmental impact considerations in municipal decision-making.

## CHAPTER 10: IMPLEMENTATION, Page 10-182

Paragraph 1, page 10-182) states: *All sewage generated in unsewered areas shall be treated and dispersed by an approved SSTS that is sited, designed, installed, operated, and maintained in accordance with the provisions of this ordinance or by a system that has been permitted by the Minnesota Pollution Control Agency (MPCA).*

Please consider noting that this refers to Dakota County Ordinance 113.

June 26, 2018

Tony Wippler  
City of Farmington  
430 Third Street  
Farmington, MN 55024-1374

SUBJECT: Farmington 2040 Comprehensive Plan  
MnDOT Review # CPA18-041  
Farmington City Limits

Dear Mr. Wippler,

Thank you for the opportunity to review the Farmington 2040 Comprehensive Plan Draft. MnDOT has reviewed the document and has the following comments:

***Planning:***

The Dakota County Principal Arterial Study Report (March 2018) recommended that MN 3 be designated as a future principal arterial, but not for near-term designation.

For questions regarding this comment please contact Michael Corbett at (651) 234-7793 or [michael.j.corbett@state.mn.us](mailto:michael.j.corbett@state.mn.us).

***Review Submittal Options:***

MnDOT's goal is to complete the review of plans within 30 days. Submittals sent in electronically can usually be turned around faster. There are four submittal options. Please submit either:

1. An electronic .pdf version of the plans. MnDOT can accept the plans via e-mail at [metrodevreviews.dot@state.mn.us](mailto:metrodevreviews.dot@state.mn.us) provided that each separate e-mail is less than 20 megabytes.
2. A compact disc with the plans in .pdf format. The disc can be sent to:

MnDOT – Metro District Planning Section  
Development Reviews Coordinator  
1500 West County Road B-2  
Roseville, MN 55113

3. A .pdf version of the plans sent to MnDOT's external shared workspace site located at: <https://mft.dot.state.mn.us>. Please contact MnDOT development review staff gain access to the shared workspace site. Also, please send a note to [metrodevreviews.dot@state.mn.us](mailto:metrodevreviews.dot@state.mn.us) indicating the file name and stating that the plans have been submitted on the shared workspace site.
4. If you are unable to send the plans electronically, please submit a set of full size plans to the above address.

If you have any questions concerning this review, please contact me at (651) 234-7788.

An equal opportunity employer

Sincerely,

Jennifer Wiltgen  
Principal Planner

**Copy sent via E-Mail:**

Nancy Jacobson, Design  
Nick Olson, Water Resources  
Almin Ramic, Traffic  
Rebecca Parzyck, Right-of-Way  
Buck Craig, Permits  
Molly Kline, Area Engineer  
Michael Corbett, Planning  
Rylan Juran, Aviation  
John Tompkins, Freight  
Cameron Muhic, Bike-Ped  
Mackenzie Turner-Bargen, Bike-Ped  
Carl Jensen, Transit  
Russell Owen, Metropolitan Council

**Memo:**

**To:** SEE MAIL MERGE LIST OF ADJACENT COMMUNITIES AND AGENCIES

**From:** Tony Wippler, Planning Manager, City of Farmington; Jeff Miller, City Planning Consultant

**Re:** Distribution of Farmington Draft 2040 Comprehensive Plan Update

**Date:** June 4, 2018

This memo is to serve as the City of Farmington's official distribution of its DRAFT 2040 Comprehensive Plan Update per Minnesota Statute [473.858 Subd. 2](#) and the Metropolitan Council guidance. The DRAFT 2040 Comprehensive Plan Update can be downloaded from this link: [http://www.hkgi.com/projects/FarmingtonCompPlan/project\\_documents.php](http://www.hkgi.com/projects/FarmingtonCompPlan/project_documents.php)

The draft plan is also available via the City's website: [www.ci.farmington.mn.us](http://www.ci.farmington.mn.us)

Please know that this is a DRAFT document and that it is subject to change as we work through the review process. In the event there are substantive changes to the draft plan that have the potential to impact your jurisdiction or agency we will promptly notify you via email of such changes.

The Farmington City Council authorized the finalization and distribution of the draft plan at its April 16<sup>th</sup> City Council meeting. It is respectfully requested that you review the proposed 2040 Comprehensive Plan Update and send any comments or indication of no comment to Tony Wippler ([twippler@farmingtonmn.gov](mailto:twippler@farmingtonmn.gov)) and/or Jeff Miller ([jeff.miller@hkgi.com](mailto:jeff.miller@hkgi.com)) by December 5<sup>th</sup>, 2018.

With regard to review of the Comprehensive Plan Update, we ask that you provide feedback as timely as possible within the requested 6-month comment period. Please be advised that email response is the preferred method of comment. Written responses are also acceptable and can be submitted to my attention at Farmington City Hall, 430 Third Street, Farmington, MN 55024. The attached form is available to facilitate your response should you choose to use it.

If there is anything further we can do to facilitate your review, answer questions or be of further assistance in your review, please feel free to contact Tony via email or phone at 651.280.6822 or Jeff via email or phone at 612.252.7123.

On behalf of the City of Farmington, we would like to thank you in advance for your assistance and prompt response.

Please check the appropriate box:

- We have reviewed the proposed Plan Update, do not have any comments, and are therefore waiving further review.
- We have reviewed the proposed Plan Update and offer the following comments (attach additional sheets if necessary)

The mission of the Minnesota Department of Natural Resources is to work with citizens to conserve and manage the state's natural resources, to provide outdoor recreation opportunities and to provide for commercial uses of natural resources in a way that creates a sustainable quality of life. With these things in mind, we appreciate the opportunity to provide comments on Farmington's draft 2040 comprehensive plan. We support the city's commitment to "protect and conserve natural resources" and the policy to "Ensure that the community's significant natural resources are preserved, protected and enhanced as part of the community's growth, creating connected open space corridors where feasible."

The following comments outline other ways to further this goal and policy:

**Trout Streams.** We appreciate that you have included maps of the designated trout streams and tributaries in your community. Trout streams are classified as 2A waters under Minnesota Rules, Chapter 7050, Subpart 2. Trout streams are dependent on a supply of clean groundwater to provide the quality, quantity and temperature required for a healthy trout habitat. The DNR is responsible to protect and manage the state's surface waters, including cold water trout streams. In issuing permits for groundwater use, and reviewing Environmental Impact Statements, the impacts on trout streams will be considered. The DNR's Near Surface Pollution Sensitivity GIS layer would be a helpful tool to include in your comprehensive plan's natural resource inventory. The plan could also include policies to avoid changes to the local hydrology, support infiltration of storm water from impervious surfaces, and reduce crossings that would negatively impact trout stream health. For example, several proposed minor collectors are shown crossing over South Creek and a Regional Trail is also proposed along the edge.

**Wildlife.** In another measure to preserve the natural environment, consider adding policies that take wildlife into consideration as transportation and redevelopment projects occur. To enhance the health and diversity of wildlife populations, encourage private and public developments to retain or restore natural areas planted with native species. One larger area is better than several small "islands" or patches; and connectivity of habitat is important. Animals such as frogs and turtles need to travel between wetlands and uplands throughout their life cycle. Consult [DNR's Best Practices for protection of species](#) and [Roadways and Turtles Flyer](#) for self-mitigating measures to incorporate into design and construction plans.

Examples of more specific measures include:

- Preventing entrapment and death of small animals especially reptiles and amphibians, by specifying biodegradable erosion control netting ('bio-netting' or 'natural netting' types (category 3N or 4N)), and specifically not allow plastic mesh netting. (p. 25)
- Providing wider culverts or other passageways under paths, driveways and roads while still considering impacts to the floodplain.
- Including a passage bench under bridge water crossings. (p. 17) because typical bridge riprap can be a barrier to animal movement along streambanks.

- Curb and stormwater inlet designs that don't inadvertently direct small mammals and reptiles into the storm sewer. (p. 24). Installing "surmountable curbs" (Type D or S curbs) allows animals (e.g., turtles) to climb over and exit roadways. Traditional curbs/gutters tend to trap animals on the roadway. Another option is to install/create curb breaks every, say, 100 feet (especially important near wetlands).
- Using smart salting practices to reduce impacts to downstream aquatic species.
- Fencing could be installed near wetlands to help keep turtles off the road (fences that have a j-hook at each end are more effective than those that don't).

**Native Species.** Another policy to enhance the natural environment is to encourage private and public developments to be planted with native flowers, grasses, shrubs and tree species. Species such as monarchs rely on these plants, and it does not take many plants to attract butterflies, other beneficial pollinators as well as migrating and resident birds. Adding more native plants into landscaping, not only enhances the health and diversity of pollinators and wildlife populations, these plants can also help filter and store stormwater – other goals in your plan. For more information consult DNR's [pollinator page](#)

Plant lists and suggestions for native plants can be incorporated into:

- Proposed landscape guidelines to improve the aesthetics in for commercial and industrial areas
- Street tree planting plans
- City gateway features
- Along ponds and waterways.
- Small nature play areas in children's parks
- Along the edges of ballfield complexes.
- Waterways

**Community Forestry.** The loss of tree canopy due to threats such as emerald ash borer and oak wilt has negative impacts on the county's health and environment, and a planned community forest can provide numerous community benefits. In the list of Green Team actions, you note that Farmington is a Tree City. It would also be worth highlighting if Farmington has developed a forestry management plan, along with plans for implementation, as part of a strategy to meet environmental and sustainability goals and policies.

**Recreation Trails.** Consider indicating snowmobile trails on park systems plans. State-supported grant-in-aid trails connect your community to an extensive network of trails throughout the state. Including the trails on inventories would raise awareness of this recreational activity. The snowmobile GIA Program webpage below also has more information on the program and funding. [https://www.dnr.state.mn.us/grants/recreation/gia\\_snowmobile.html](https://www.dnr.state.mn.us/grants/recreation/gia_snowmobile.html)

**Rare Features.** Two data layers useful for land use and conservation planning include the MBS Native Plant Communities and the MBS Sites of Biodiversity Significance. GIS shapefiles of these data layers can be downloaded from [the Minnesota Geospatial Commons](#). The DNR recommends avoidance of these ecologically significant areas, especially MBS Sites of Outstanding or High Biodiversity Significance and DNR Native Plant Communities with a conservation status rank of S1 (critically imperiled), S2 (imperiled), or S3 (vulnerable to extirpation). We recommend that Comprehensive plans include a map of both of these layers and a list of the types of native plant communities documented within the plan's boundaries.

For further conservation planning and to ensure compliance with the Minnesota endangered

species laws, the DNR encourages communities to check the NHIS Rare Features Data for known occurrences of state-listed species. The NHIS Rare Features Data contains nonpublic data and can only be accessed by submitting a License Agreement Application Form for a GIS shapefile or by submitting a NHIS Data Request Form for a database printout. Both of these forms are available at [the NHIS webpage](#). For more information on the biology, habitat use, and conservation measures of these rare species, please visit [the DNR Rare Species Guide](#). NHIS training includes rules for using/displaying nonpublic data in public documents.

Links: MBS Sites of Biodiversity Significance  
[http://www.dnr.state.mn.us/eco/mcbs/biodiversity\\_guidelines.html](http://www.dnr.state.mn.us/eco/mcbs/biodiversity_guidelines.html)  
MBS Native Plant Communities  
<http://www.dnr.state.mn.us/npc/index.html>

### **Specific Comments/Clarifications**

- The transportation maps include stream centerlines and it would be helpful to add those to the land use and natural resource maps.
- Surface Water Map, Fig 3.17. -- It would be helpful to indicate which streams are designated trout streams and tributaries and to label stream names.

**Reviewer:** Martha Vickery, regional coordinator, DNR Lands and Minerals Central Region

**Date:** 12/5/18

**Signature:** \_\_\_\_\_



# **APPENDIX J. METROPOLITAN COUNCIL PRELIMINARY REVIEW & RESPONSES**

December 11, 2018

Mr. Tony Wippler, City Planner  
City of Farmington  
325 Oak Street  
Farmington, MN 55024

**RE: Preliminary Review of the City of Farmington 2040 Comprehensive Plan**  
Metropolitan Council District 16  
Metropolitan Council Review File No. 22057-0

Dear Mr. Wippler,

Metropolitan Council staff have reviewed the preliminary draft of the City of Farmington's 2040 Comprehensive Plan (Plan), received on September 18, 2018. In the preliminary review, staff focused on whether the draft Update appeared to be complete and contained any major system issues or policy conflicts. Time did not permit as thorough of a review as will occur when the Plan is officially submitted for Council review. A more detailed review may reveal other important matters that were not identified during this preliminary review.

When addressing the matters in this letter, City staff are advised to refer to the City's Checklist of Minimum Requirements in the Community pages of the online Local Planning Handbook and the City's System Statement:

City of Farmington's Checklist of Minimum Requirements:

[https://metro council.org/Handbook/Files/Checklist/02394747\\_Farmington\\_Checklist.aspx](https://metro council.org/Handbook/Files/Checklist/02394747_Farmington_Checklist.aspx)

City of Farmington's Community Page:

<https://lphonline.metro council.state.mn.us/CommPage?ctu=2394747&applicant=Farmington>

City of Farmington System Statement:

[https://metro council.org/Communities/Planning/Local-Planning-Assistance/System-Statements/System-Statements/02394747\\_Farmington\\_2015SS.aspx](https://metro council.org/Communities/Planning/Local-Planning-Assistance/System-Statements/System-Statements/02394747_Farmington_2015SS.aspx)

The preliminary review process found the following sections complete for review and did not identify any major system issues or policy conflicts: Aggregate Resources, Implementation, Regional Parks and Trails, Solar, Surface Water Management, Transit, and Water Supply.

**Solar Access Protection & Development** (Cameran Bailey, 651-602-1212)

The Plan is **complete** and consistent with statutory requirements (Minn. Stat. 473.859. Subd. 2; Section 103B.235) and Council policy regarding planning for the protection and development of access to direct sunlight for solar energy systems as required by the Metropolitan Land Planning Act (MLPA).

*Advisory Comments*

Staff recommend enrolling in the following cost-free programs, which are designed to provide planning, technical, and policy assistance to local Minnesota governments, as additional "solar implementation strategies" in your Plan. These programs are very likely to effectively complement your participation in the MN GreenStep Program:

- U.S. Dept. of Energy's SolSmart Program - Solar Permitting, Zoning, and Development
- Xcel Energy's Partners in Energy Program – Energy Action Plan Development

Please feel free to follow up with Council staff for any additional assistance.

**Surface Water Management** (*Jim Larsen, 651-602-1159*)

The City lies within the oversight boundaries of the Vermillion River Watershed Joint Powers Organization (Watershed). Farmington submitted a draft Local Water Management Plan (LWMP) update in August 2018. Council staff reviewed and commented on the draft LWMP to the City and Watershed in a letter dated September 21, 2018.

*Advisory Comments*

If available at the time the City submits its formal Update, we request the City provide the complete final LWMP in an Appendix in the Update and a summary of the LWMP in the body of the Update, incorporating any recommended revisions from the Council and Watershed's review of the draft LWMP. If available at the time the formal Update is submitted, we also request that the City provide to the Council the date the Watershed approved the LWMP, and the date the City adopted the final LWMP

**Water Supply** (*Lanya Ross, 651-602-1803*)

The Plan is consistent with WRPP policies related to water supply, including the policy on sustainable water supplies, the policy on assessing and protecting regional water resources, and the policy on water conservation and reuse.

The community has prepared a Local Water Supply Plan in 2018 that was submitted to both the MN Department of Natural Resources (DNR) and Metropolitan Council and reviewed under separate cover in a letter to DNR dated 6/7/2018.

*Advisory Comments*

As the community finalizes its Plan, a map of designated drinking water supply management areas (DWSMA) or wellhead protection areas may be included to support the discussion of land use best practices on page 8-156. Data are available on the MN Department of Health website at <http://www.health.state.mn.us/divs/eh/water/swp/maps/index.htm>. Useful files may include: 'Drinking Water Supply Management Areas – Groundwater' and 'Wellhead Protection Areas'.

The following sections of the draft Plan are considered **incomplete**. Changes in the draft Plan are definitely needed before the Plan is submitted to the Council for formal review.

**Land Use** (*Patrick Boylan, 651-602-1438*)

The Plan is **incomplete** for future land use. To be complete, the final document must provide density ranges on Figure 3.3 and Table 3.4

*Advisory comments*

Consider increasing the minimum density ranges for medium density residential land use categories in the City and or in the future land uses. Recent residential development and re-development are perhaps greater than the minimums for future residential land use areas.

**Sanitary Sewer** (*Roger Janzig, 651-60-1119*)

The Plan is **incomplete** for sanitary sewer review. To be complete, the Plan needs to address the following issues.

- Include a table that details adopted community sewer forecasts 10-year increments to 2040 for households and employment; this should be broken down by each Metropolitan Disposal System Interceptor; and Subsurface sewage treatment systems.
- The Plan shows an expanded MUSA; the final document needs to state how many acres are being added to the 2030 MUSA and what are the forecasts for that area
- The Plan needs to include an electronic map or maps (GIS shape files or equivalent) showing the following information:
  - Existing sanitary sewer system,
  - Lift stations.
  - Existing connections points to the metropolitan disposal system.
  - Future connection points for new growth if needed.
  - Local sewer service districts by connection point.
  - Intercommunity connections.
- The Plan needs to include a copy of intercommunity service agreements entered into with an adjoining community, including a map of areas covered by the agreement and tables that provide the following local system information:
  - Capacity and design flows for existing trunk sewers and lift stations.
  - Assignment of 2040 growth forecasts by Metropolitan interceptor facility.

#### Inflow and Infiltration (I/I)

To be complete, the Plan must define City's goals, policies, and strategies for preventing and reducing excessive inflow and infiltration (I/I) in the local municipal (city) and private (private property) sanitary sewer systems.

- Include a summary of activities or programs intended to mitigate I/I from both public and private property sources.
- The final Plan must describe the requirements and standards in Farmington for minimizing inflow and infiltration.
- Include a copy of the local ordinance or resolution that prohibits discharge from sump pumps, foundation drains, and/or rain leaders to the sanitary sewer system.
- Include a copy of the local ordinance or resolution requiring the disconnection of existing foundation drains, sump pumps, and roof leaders from the sanitary sewer system.
- Describe the sources, extent, and significance of existing inflow and infiltration in both the municipal and private sewer systems.
- Include a description of the existing sources of I/I in the municipal and private sewer infrastructure.
- Include a summary of the extent of the systems that contributes to I/I such as locations, quantities of piping or manholes, quantity of service laterals, or other measures. If an analysis has not been completed, include a schedule and scope of future system analysis.
- Include a breakdown of residential housing stock age within the community into pre- and post-1970 era, and what percentage of pre-1970 era private services have been evaluated for I/I susceptibility and repair.
- Include the measured or estimated amount of clearwater flow generated from the public municipal and private sewer systems.
- For quantifying I/I, some communities have used the EPA guidance to determine the annual I/I and peak month I/I  
<https://www3.epa.gov/region1/sso/pdfs/Guide4EstimatingInfiltrationInflow.pdf>
- Include a cost summary for remediating the I/I sources identified in the community. If previous I/I mitigation work has occurred in the community, include a summary of flow reductions and investments completed. If costs for mitigating I/I have not been analyzed,

include the anticipated wastewater service rates or other costs attributed to inflow and infiltration.

For new trunk sewer systems that require connection to the Metropolitan Disposal System, the Plan must include:

- A table that details the proposed time schedule for the construction of the new trunk sewer system.
- Type and capacity of the treatment facilities, whether municipally or privately owned.
- Copies of the associated National Pollutant Discharge Elimination System (NPDES) or State Disposal System (SDS) permits.

### **Community Wastewater Treatment and individual Subsurface Sewage Treatment Systems (SSTS)** (*Jim Larsen, 651-602-1159*)

A number of SSTS remain in operation in the City. City Code adopts Dakota County On-Site Sewage Treatment System Ordinance 113, as amended, by reference. To be complete for review, the Plan will need to address the following items.

The Plan will need to incorporate additional information to render this element of the plan complete for review. Council staff requests that the City confirm (either in their response to our preliminary Plan review or in their formal Plan submission) that there are no public or privately-owned Community Wastewater Treatment Systems (other than as yet unspecified number of individual SSTS remaining in operation in the City) or incorporate a short discussion of any existing operating facilities and a map depicting their location.

Specifically needed to be included in the final Plan for it to be found complete for review is the number of households and businesses that continue to be served by operating individual SSTS in the City, a 'dot' map depicting their locations in the City including highlighting of any areas known to have nonconforming systems or systems with known problems, and a description of the City's SSTS maintenance management program for compliance with MPCA Rule 7080-7083 regulations. (For reference, the City's 2030 Update indicated there were 85 systems in operation in the City at that time.) If the City or their planning consultant needs any assistance or guidance in preparing the SSTS location map, please contact Steve Hack, MCES GIS System Administrator at 651-602-1469 or [Steven.Hack@metc.state.mn.us](mailto:Steven.Hack@metc.state.mn.us).

### **Transportation** (*Russ Owen, 651-602-1724*)

The Plan is **incomplete** for transportation. To be complete, the Plan needs to include:

- Identify any specific future rights-of-way that need to be preserved.
- Identify changes to Farmington's major/minor collector system and include in a table or highlighted on a map.

#### *Advisory Comments*

- Figure 5.1: this map should show functional classification as well as existing ADT/HCAADT. This would ensure that volumes for all principal and A-minor arterials are included in the Plan.

#### Bicycling and Walking

The Plan is **incomplete** for bike/ped required elements. To be complete, the final document must include:

- A map depicting all Tier 1 and Tier 2 RBTN corridors and alignments within the City.

- The final plan must show the relationship of the RBTN to the local bicycle network of off-road trails and on-street bikeways, including all existing and planned connections.
- The map should also include locations of regional employment clusters, activity center nodes, and other local activity centers.

#### Freight

The Plan is **incomplete** for freight. To be complete, the Plan needs to identify any local roadway issues or problem areas for goods movement.

#### *Additional Advisory Transit Comments*

- On page 5-119, the final plan document should change the reference to the Red Line service extension to a "*proposed* extension of Red Line service to a future station....."
- On page 5-119, please consider changing the dial-a-ride service provider from DARTS Transportation Services to "Transit Link, a service of the Metropolitan Council."

#### **Forecasts** (Paul Hanson, 651-602-1642)

The Plan is **incomplete** for sewer-serviced forecast. To be complete, the City needs to provide a table with sewer-serviced numbers for population, households, and employment, for 2020, 2030, and 2040. Although the Plan describes development during various staging periods in districts throughout the City, no table was found that delineates population.

#### **Transportation Analysis Zones (TAZ):**

The Plan is incomplete for TAZ required information. To be complete, the final plan needs to include a map and table depicting TAZ information.

#### **Housing** (Hilary Lovelace, 651-602-1555)

The Plan is **incomplete** for housing review. To be complete, the final Plan must include the following items in the final document.

#### Existing Housing Needs

- The list on page 4-80 is a good summary of needs, but more detail is needed for the Plan to be considered complete. Discussion of each table before and after this page does not explore why the items in the list on page 4-80 are needs. An inclusion of a narrative paragraph or two that describes why the needs listed were chosen in response to data presented earlier in the section would likely resolve the incompleteness.

#### Projected Housing Needs

Land guided to address the City's allocation of affordable housing need for 2021-2030 is not consistently described in the document. Specifically:

- Mixed-Use has a listed minimum density of 9 units/acre on page 4-83 but lists a minimum units/acre of 6 on page 3-33.
- Land use tables on p. 3-37 and 3-39 show 44.67 and 40.68 (81.36 x 50%) for Medium Density and Mixed-Use acres available to develop between 2021-2030, respectively. But the Development Potential table on page 4-83 shows 41.21 and 37.24 acres in these categories. To be complete, the final submission needs to clarify this issue.

#### Implementation Required Elements

All tools need to be linked to a circumstance in which they will be used, whether that be a specific time in the future (i.e. by 2022) or after certain conditions are met (after passage or a formal City policy or community workgroup.) Other tools are not linked to a circumstance in which they will be *considered*, such as to support housing affordable at 30% AMI or below.

To be considered complete, each tool must include what circumstances and when applicable, a sequence of implementation:

- Zoning and subdivision ordinances – please define “ongoing basis.”
- TIF – what types of affordable housing (i.e. AMI% band, large unit affordable) and circumstances (i.e. in mixed-use projects) would the City consider supporting TIF use?
- Housing Bonds – indicating bonds would be considered on a case by case basis is not specific enough to meet the requirements of the Metropolitan Land Planning Act. What types of housing (i.e. AMI% band, senior affordable) and circumstances (i.e. high density, mixed incomes) would compel the City to consider issuing conduit bonds?
- TBRA – please provide some detail as to what criteria would be used to determine if a project is “qualified.”

All housing tools described must be linked clearly and consistently to stated housing needs, including needs connected to the three bands of affordability. Some tools do not specify which AMI band will be prioritized in the City’s consideration of the tool, including the following tools specifically:

- Municipal Housing Bonds can be issued by the City directly (and not only through the Dakota County CDA). Please indicate if the City would consider issuing bonds directly and if so, for what types of housing needs.
- Tax Increment Financing (TIF), include which AMI bands would be prioritized with this tool
- Use of LCA LCDA or LCA LCDA-TOD funding, include which AMI bands would be prioritized when considering this tool
- Dakota County HOPE
- Some circumstances and sequence of use include description of “low- and moderate-income” households. Defining those categories with AMI bands elsewhere in the Plan will make these descriptions consistent.

In the Plan, some widely used tools to address housing needs aren’t included. To be consistent with regional policy, tools must be acknowledged, and to be complete, the plan should state if, and if so when and why, it would consider using them to address housing needs:

- City support or direct application to specific resources within the Consolidated RFP put out by Minnesota Housing, include circumstances in which it would be used and which AMI bands would be served with this tool  
(<https://metro council.org/Handbook/Files/Resources/Fact-Sheet/HOUSING/The-Consolidated-RFP.aspx>)
- Effective referrals to partner organizations – in addition to the many services noted that are provided by the CDA -that address housing needs  
(<https://metro council.org/Handbook/Files/Resources/Fact-Sheet/HOUSING/Effective-Housing-Referrals.aspx>)
- Participation in housing-related organizations, partnerships, and initiatives  
(<https://metro council.org/Handbook/Files/Resources/Fact-Sheet/HOUSING/Collaborating-on-Housing-Strategies.aspx>)
- Preservation of expiring low-income housing tax credit properties.
- Advocating for a Community Land Trust model to create and preserve affordable homeownership opportunities, including which % AMI would be the target audience for this tool.
- Specific tools that preserve naturally occurring affordable housing, including partnerships with sources of preservation financing (MN Housing, Greater Minnesota Housing Fund’s

NOAH Impact Fund), and 4(d) tax incentives.

(<https://metro council.org/Handbook/Files/Resources/Fact-Sheet/HOUSING/Housing-Preservation.aspx>)

#### *Advisory Comments*

- With respect to a Fair Housing policy, local fair housing policies do not mean that cities should or can manage or administer Fair Housing complaints. A local fair housing policy rather ensures the City is aware of fair housing requirements with regard to housing decisions and provides sufficient resources to educate and refer residents who feel their fair housing rights have been violated (this can be as simple as having links to resources on the City's website). The Metropolitan Council will require a local Fair Housing policy as a requirement to draw upon Livable Communities Act (LCA) awards beginning in 2019. To learn more, and review a template local fair housing policy, please refer to the following resources:
  - Creating a Local Fair Housing Policy webinar: <https://www.youtube.com/watch?v=38JY4pNGnZ8&feature=youtu.be>
  - Best Practices: <https://metro council.org/Handbook/PlanIt/Files/Webinar-Fair-Housing-Handout2.aspx>
  - Policy Template: <https://metro council.org/Handbook/Training/Webinars.aspx> - click on Handout 1 under the Implementing A Local Fair Housing Policy at the bottom of the screen.
- Council staff encourages the City to consider an Accessory Dwelling Unit (ADU) policy or allow them as a permitted use. This is a unique way to diversify housing choices within existing single-family neighborhoods.
- For Dakota County CDA's Family Housing Partnership, Family Townhome, LIHTC and HOPE programs, the Plan notes that the City will refer people to those programs. For the Senior Housing and Workforce Housing program, the Plan notes that the City will work with the CDA to find appropriate sites for (presumably) new housing. It is not clear if the former programs no longer exist, and so the City can only refer people to existing units under those programs, or if the City is stating an explicit priority for the latter two programs when the CDA is considering new development.
- All the existing housing data (including the number of low-income households that are housing cost burdened) sourced from the Metropolitan Council has been updated with 2016 data. The City can find updated Existing Housing Assessment on Farmington's community page in the Local Planning Handbook and updating any relevant data.

#### Implementation Plan

- Supporting or sponsoring an LCA grant is not accurate. For LCA grants, the City must be the applicant and must be a participant in the program. Farmington is currently a participating city in the Livable Community Act program.
- Related to LIHTC properties, it may be prudent for the City to track the affordability expiration of properties to respond to the needs of those that may be evicted if rents are raised in addition to the included language on the support of new LIHTC properties.
- The "Scattered Site Housing Program" is not described thoroughly. Is the City's role to point out opportunity sites for the program to the County? How often/by what means does this happen? Is there an annual assessment of potential sites?

In summary, the submitted draft Update is missing a number of items and may require revision. If you



have any questions or need further information regarding the comments in this letter, please contact Patrick Boylan, Principal Reviewer at 651-602-1438.

Sincerely,

A handwritten signature in blue ink, appearing to read "LisaBeth Barajas". The signature is fluid and cursive, with a large loop at the end.

LisaBeth Barajas, Manager  
Local Planning Assistance

CC: Wendy Wulff, Metropolitan Council District 16  
Patrick Boylan, Principal Reviewer  
Raya Esmaeili, Reviews Coordinator

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City of Farmington Comprehensive Plan Incomplete Comment Tracker  
December 11, 2018 Letter

Requested edits by HKGi are highlighted

<b>Solar Access Protection &amp; Development</b>			
<b>Number</b>	<b>Comment</b>	<b>Proposed Response</b>	<b>Edit Location in the Plan (Document pg #, paragraph, etc.)</b>
<b>Advisory Comment</b>			
1	<p>Staff recommend enrolling in the following cost-free programs, which are designed to provide planning, technical, and policy assistance to local Minnesota governments, as additional "solar implementation strategies" in your Plan. These programs are very likely to effectively complement your participation in the MN GreenStep Program:</p> <ul style="list-style-type: none"> <li>– U.S. Dept. of Energy's SolSmart Program – Solar Permitting, Zoning, and Development</li> <li>– Xcel Energy's Partners in Energy Program – Energy Action Plan Development</li> </ul> <p>Please feel free to follow up with Council staff for any additional assistance.</p>	Comment acknowledged.	Not a required element, no revision necessary.

<b>Surface Water Management</b>			
<b>Number</b>	<b>Comment</b>	<b>Proposed Response</b>	<b>Edit Location in the Plan (Document pg #, paragraph, etc.)</b>
<b>Advisory Comment</b>			
1	<p>If available at the time the City submits its formal Update, we request the City provide the complete final LWMP in an Appendix in the Update and a summary of the LWMP in the body of the Update, incorporating any recommended revisions from the Council and Watershed's review of the draft LWMP. If available at the time the formal Update is submitted, we also request that the City provide to the Council the date the Watershed approved the LWMP, and the date the City adopted the final LWMP</p>	Comment acknowledged.	Not a required element, no revision necessary.

<b>Water Supply</b>			
<b>Number</b>	<b>Comment</b>	<b>Proposed Response</b>	<b>Edit Location in the Plan (Document pg #, paragraph, etc.)</b>
<b>Advisory Comment</b>			
1	As the community finalizes its Plan, a map of designated drinking water supply management areas (DWSMA) or wellhead protection areas may be included to support the discussion of land use best practices on page 8-156. Data are available on the MN Department of Health website at <a href="http://www.health.state.mn.us/divs/eh/water/swp/maps/index.htm">http://www.health.state.mn.us/divs/eh/water/swp/maps/index.htm</a> . Useful files may include: 'Drinking Water Supply Management Areas — Groundwater' and 'Wellhead Protection Areas'.	Comment acknowledged.	Not a required element, no revision necessary.

<b>Land Use</b>			
<b>Number</b>	<b>Comment</b>	<b>Proposed Response</b>	<b>Edit Location in the Plan (Document pg #, paragraph, etc.)</b>
<b>Incomplete Comments</b>			
1	The Plan is incomplete for future land use. To be complete, the final document must provide density ranges on Figure 3.3 and Table 3.4	Density Ranges to Figure 3.3 and Table 3.4	Added to Figure 3.3 on page 3-31 and Table 3.3 on page 3-33
<b>Advisory Comment</b>			
1	Consider increasing the minimum density ranges for medium density residential land use categories in the City and or in the future land uses. Recent residential development and redevelopment are perhaps greater than the minimums for future residential land use areas.	Comment acknowledged.	Not a required element, no revision necessary.

<b>Sanitary Sewer</b>			
<b>Number</b>	<b>Comment</b>	<b>Proposed Response</b>	<b>Edit Location in the Plan (Document pg #, paragraph, etc.)</b>
<b>Incomplete Comments</b>			
1	Include a table that details adopted community sewer forecasts 10-year increments to 2040 for households and employment; this should be broken down by each Metropolitan Disposal System Interceptor; and Subsurface sewage treatment systems.	Table is in Comprehensive Sewer Plan (CSP)	Location in CSP: Page 6, Table 2
2	The Plan shows an expanded MUSA; the final document needs to state how many acres are being added to the 2030 MUSA and what are the forecasts for that area	Added to CSP Executive summary	Location in CSP Page 1, Table 1  Added to page 6-131, Table 6.1
3	The Plan needs to include an electronic map or maps (GIS shape files or equivalent) showing the following information: <ul style="list-style-type: none"> <li>Existing sanitary sewer system.</li> <li>Lift stations. Existing connections points to the metropolitan disposal system.</li> <li>Future connection points for new growth if needed.</li> <li>Local sewer service districts by connection point.</li> <li>Intercommunity connections.</li> </ul>	Maps located in Appendix F of CSP	CSP location: Appendix F
4	The Plan needs to include a copy of intercommunity service agreements entered into with an adjoining community, including a map of areas covered by the agreement and tables that provide the following local system information: <ul style="list-style-type: none"> <li>Capacity and design flows for existing trunk sewers and lift stations.</li> <li>Assignment of 2040 growth forecasts by Metropolitan interceptor facility.</li> </ul>	Comment Acknowledged	Located in Section 4.2 of the CSP, Page 12

<b>Sanitary Sewer</b>			
<b>Number</b>	<b>Comment</b>	<b>Proposed Response</b>	<b>Edit Location in the Plan (Document pg #, paragraph, etc.)</b>
<b>Inflow and Infiltration (I/I)</b>			
5	Include a summary of activities of programs intended to mitigate I/I from both public and private property sources.	Comment acknowledged	I/I Reduction plan has been included as Appendix H of the CSP and summarized in CSP Executive summary; Summary added to pages 6-133 through 6-135 of Comprehensive Plan
6	The final Plan must describe the requirements and standards in Farmington for minimizing inflow and infiltration.	Comment acknowledged	I/I reduction plan included in Appendix H of CSP Summary added to pages 6-133 through 6-135 of Comprehensive Plan
7	The final Plan must describe the requirements and standards in Farmington for minimizing inflow and infiltration.	Comment acknowledged	I/I reduction plan included in Appendix H of CSP Summary added to pages 6-133 through 6-135 of Comprehensive Plan
8	Include a copy of the local ordinance or resolution requiring the disconnection of existing foundation drains, sump pumps, and roof leaders from the sanitary sewer system.	Comment acknowledged	Appendix A of CSP  Summary added to pages 6-133 through 6-135 of Comprehensive Plan
9	Describe the sources, extent, and significance of existing inflow and infiltration in both the municipal and private sewer systems.	Comment acknowledged	Section 5 of CSP Summary added to pages 6-133 through 6-135 of Comprehensive Plan
10	Include a description of the existing sources of I/I in the municipal and private sewer infrastructure.	Comment acknowledged	Map in Appendix F of CSP Summary added to pages 6-133 through 6-135 of Comprehensive Plan

<b>Sanitary Sewer</b>			
<b>Number</b>	<b>Comment</b>	<b>Proposed Response</b>	<b>Edit Location in the Plan (Document pg #, paragraph, etc.)</b>
11	Include a summary of the extent of the systems that contributes to I/I such as locations, quantities of piping or manholes, quantity of service laterals, or other measures. If an analysis has not been completed, include a schedule and scope of future system analysis.	Comment acknowledged	Section 5 of CSP Summary added to pages 6-133 through 6-135 of Comprehensive Plan
12	Include a breakdown of residential housing stock age within the community into pre- and post-1970 era, and what percentage of pre-1970 era private services have been evaluated for I/I susceptibility and repair.	Comment acknowledged	Map in appendix F, table in Section 5 of CSP Summary added to pages 6-133 through 6-135 of Comprehensive Plan
13	Include the measured or estimated amount of clearwater flow generated from the public municipal and private sewer systems.	Comment acknowledged	Section 5 of CSP, Table 16 Summary added to pages 6-133 through 6-135 of Comprehensive Plan
14	For quantifying I/I, some communities have used the EPA guidance to determine the annual I/I and peak month I/I  <a href="https://www3.epa.gov/region1/sso/pdfs/Guide4Estimatinginfiltrationinflow.pdf">https://www3.epa.gov/region1/sso/pdfs/Guide4Estimatinginfiltrationinflow.pdf</a>	Comment acknowledged	No Change Required Summary added to pages 6-133 through 6-135 of Comprehensive Plan
15	Include a cost summary for remediating the I/I sources identified in the community. If previous I/I mitigation work has occurred in the community, include a summary of flow reductions and investments completed. If costs for mitigating I/I have not been analyzed, include the anticipated wastewater service rates or other costs attributed to inflow and infiltration.	Comment acknowledged	Addressed in I/I reduction plan (Appendix H of CSP) Summary added to pages 6-133 through 6-135 of Comprehensive Plan

<b>Sanitary Sewer</b>			
<b>Number</b>	<b>Comment</b>	<b>Proposed Response</b>	<b>Edit Location in the Plan (Document pg #, paragraph, etc.)</b>
16	<p>For new trunk sewer systems that require connection to the Metropolitan Disposal System, the Plan must include:</p> <ul style="list-style-type: none"> <li>• A table that details the proposed time schedule for the construction of the new trunk sewer system.</li> <li>• Type and capacity of the treatment facilities, whether municipally or privately owned.</li> </ul> <p>Copies of the associated National Pollutant Discharge Elimination System (NPDES) or State Disposal System (SDS) permits.</p>	Comment Acknowledged	Section 4.5.6 of CSP
<b>Community Wastewater Treatment and Individual Subsurface Sewage Treatment Systems (SSTS)</b>			
17	<p>The Plan will need to incorporate additional information to render this element of the plan complete for review. Council staff requests that the City confirm (either in their response to our preliminary Plan review or in their formal Plan submission) that there are no public or privately- owned Community Wastewater Treatment Systems (other than as yet unspecified number of individual SSTS remaining in operation in the City) or incorporate a short discussion of any existing operating facilities and a map depicting their location.</p>	Comment Acknowledged	Refer to Section 4.3 of the CSP. City ordinances for ISTS included in Appendix G
18	<p>Specifically needed to be included in the final Plan for it to be found complete for review is the number of households and businesses that continue to be served by operating individual SSTS in the City, a 'dot' map depicting their locations in the City including highlighting of any areas known to have nonconforming systems or systems with known problems, and a description of the City's SSTS maintenance management program for compliance with MPCA Rule 7080-7083 regulations. (For reference, the City's 2030 Update indicated there were 85 systems in operation in the City at that time.) If the City or their planning consultant needs any assistance or guidance in preparing the SSTS location map, please contact Steve Hack, MCES GIS System Administrator at 651-602-1469 or Steven.Hack@metc.state.mn.us.</p>	Comment acknowledged	Map of permitted ISTS located in Appendix F of CSP

<b>Transportation</b>			
<b>Number</b>	<b>Comment</b>	<b>Proposed Response</b>	<b>Edit Location in the Plan (Document pg #, paragraph, etc.)</b>
<b>Incomplete Comments</b>			
1	Identify any specific future rights-of-way that need to be preserved.	Per the MC 2040 Local Planning Handbook, the need to identify future rights-of-way applies to A-minor arterial roadways. Future A-minor arterial roadway alignments within Farmington are/will be under the jurisdiction of others (Dakota County or MnDOT) and these alignments are not specifically known at this time without more detailed study and coordination. Therefore specific R/W acquisition boundaries cannot be depicted. This is true for City collectors as well.	Page 5-99 Figure 5.7 added note: "In most cases, new alignments will require right-of-way acquisition by the road authority. However, specific right-of-way needs are not known without further study and agency coordination"
2	Identify changes to Farmington's major/minor collector system and include in a table or highlighted on a map.	Add the following language:  "No changes in existing City collector roadways are anticipated other than the extensions identified in Figure 5.7. The specific alignments of these extensions may change pending further study, stakeholder outreach, and agency coordination. As identified in Figure 5.7, if CSAH 50 (212 <sup>th</sup> St/Elm St) through town is turned back to the City, it would likely become a major collector roadway."	Add noted text to Page 5-100 of June 2019 Draft, at end of paragraph under Major and Minor Collectors Heading.
<b>Bicycling and Walking</b>			
4	A map depicting all Tier 1 and Tier 2 RBTN corridors and alignments within the City.	This map was already in the map which is Figure 5.15 of the June 2019 draft document.	No change required.
5	The final plan must show the relationship of the RBTN to the local bicycle network of off- road trails and on-street bikeways, including all existing and planned connections.	RBTN corridors have been added to Figure 5.14 of the June 2019 draft.  Add text: "RBTN Corridors are conceptual, and actual connections between local facilities and potential future RBTN facilities are not known at this time."	Text added to page 5-125 in the first paragraph



<b>Transportation</b>			
<b>Number</b>	<b>Comment</b>	<b>Proposed Response</b>	<b>Edit Location in the Plan (Document pg #, paragraph, etc.)</b>
6	The map should also include locations of regional employment clusters, activity center nodes, and other local activity centers.	There are no regional employment centers in Farmington. Other activity centers such as parks, schools, and community facilities are depicted on Figure 5.14.	Revised Figure 5.14 on page 5-123 shows trails and RBTN relationship
<b>Freight</b>			
7	The Plan needs to identify any local roadway issues or problem areas for goods movement.	Add text: “, and there are no notable local roadway issues or problem areas for goods movement.”	Text added to Page 5-127 of the June 2019 Draft at the end of the second to last sentence of the material under the Freight heading.
<b>Forecasts</b>			
8	The City needs to provide a table with sewer-serviced numbers for population, households, and employment, for 2020, 2030, and 2040. Although the Plan describes development during various staging periods in districts throughout the City, no table was found that delineates population.	This is a Sanitary Sewer comment that does not apply to the Transportation Chapter. The current Comprehensive Plan includes Transportation Analysis Zone (TAZ) information consistent with requirements identified in the MC 2040 Local Planning Handbook.	No change required.
<b>Transportation Analysis Zones (TAZ)</b>			
9	The final plan needs to include a map and table depicting TAZ information.	This information is already in the Comprehensive Plan: Table 5.3, Figure 5.10 of the June 2019 Draft.	No change required.
<b>Advisory Comments</b>			
1	Figure 5.1: this map should show functional classification as well as existing ADT/HCAADT. This would ensure that volumes for all principal and A-minor arterials are included in the Plan.	Comment acknowledged.	No change required.
2	On page 5-119, the final plan document should change the reference to the Red Line service extension to a “proposed extension of Red Line service to a future station.....”	Comment acknowledged.	Language updated on Page 5-120 of the June 2019 Draft.
3	On page 5-119, please consider changing the dial-a-ride service provider from DARTS Transportation Services to “Transit Link, a service of the Metropolitan Council.”	Comment acknowledged.	Language updated on Page 5-120 of the June 2019 Draft.

<b>Housing</b>			
<b>Number</b>	<b>Comment</b>	<b>Proposed Response</b>	<b>Edit Location in the Plan (Document pg #, paragraph, etc.)</b>
<b>Incomplete Comments</b>			
<b>Existing Housing Needs</b>			
1	The list on page 4-80 is a good summary of needs, but more detail is needed for the Plan to be considered complete. Discussion of each table before and after this page does not explore why the items in the list on page 4-80 are needs. An inclusion of a narrative paragraph or two that describes why the needs listed were chosen in response to data presented earlier in the section would likely resolve the incompleteness.	A housing assessment has been added before the Community Housing Needs Section	Housing Assessment section added to pages 4-75 & 4-76 of June 2019 text
<b>Projected Housing Needs</b>			
2	Land guided to address the City's allocation of affordable housing need for 2021-2030 is not consistently described in the document. Specifically: <ul style="list-style-type: none"> <li>Mixed-Use has a listed minimum density of 9 units/acre on page 4-83 but lists a minimum units/acre of 6 on page 3-33.</li> <li>Land use tables on p. 3-37 and 3-39 show 44.67 and 40.68 (81.36 x 50%) for Medium Density and Mixed-Use acres available to develop between 2021-2030, respectively. But the Development Potential table on page 4-83 shows 41.21 and 37.24 acres in these categories. To be complete, the final submission needs to clarify this issue.</li> </ul>	Tables have been updated to have consistent acreage and densities between Chapters	Updates to Table 4.10 and Table 4-11 on page 4-79 of June 2019 draft
<b>Implementation Required Elements</b>			
3	All tools need to be linked to a circumstance in which they will be used, whether that be a specific time in the future (i.e. by 2022) or after certain conditions are met (after passage or a formal City policy or community workgroup.) Other tools are not linked to a circumstance in which they will be considered, such as to support housing affordable at 30% AMI or below.	Circumstances and Sequence of use column added to table, with descriptions of timing or income level	Table 4.13 updated on pages 4-81 through 4-85

<b>Housing</b>			
<b>Number</b>	<b>Comment</b>	<b>Proposed Response</b>	<b>Edit Location in the Plan (Document pg #, paragraph, etc.)</b>
4	<p>To be considered complete, each tool must include what circumstances and when applicable, a sequence of implementation:</p> <ul style="list-style-type: none"> <li>• Zoning and subdivision ordinances – please define "ongoing basis."</li> <li>• TIF – what types of affordable housing (i.e. AMI% band, large unit affordable) and circumstances (i.e. in mixed-use projects) would the City consider supporting TIF use?</li> <li>• Housing Bonds – indicating bonds would be considered on a case by case basis is not specific enough to meet the requirements of the Metropolitan Land Planning Act. What types of housing (i.e. AMI% band, senior affordable) and circumstances (i.e. high density, mixed incomes) would compel the City to consider issuing conduit bonds?</li> <li>• TBRA – please provide some detail as to what criteria would be used to determine if a project is "qualified."</li> </ul>	<p>Clarification language has been added to the entries in question to give a better idea of circumstances and sequence of use</p>	<p>Items updated within Table 4.13 on pages 4-81 through 4-85</p>
5	<p>All housing tools described must be linked clearly and consistently to stated housing needs, including needs connected to the three bands of affordability. Some tools do not specify which AMI band will be prioritized in the City's consideration of the tool, including the following tools specifically:</p> <ul style="list-style-type: none"> <li>• Municipal Housing Bonds can be issued by the City directly (and not only through the Dakota County CDA). Please indicate if the City would consider issuing bonds directly and if so, for what types of housing needs.</li> <li>• Tax Increment Financing (TIF), include which AMI bands would be prioritized with this tool</li> <li>• Use of LCA LCDA or LCA LCDA-TOD funding, include which AMI bands would be prioritized when considering this tool</li> <li>• Dakota County HOPE</li> <li>• Some circumstances and sequence of use include description of "low- and moderate income" households. Defining those categories with AMI bands elsewhere in the Plan will make these descriptions consistent.</li> </ul>	<p>Clarification language has been added to the entries in question to give a better idea of circumstances and sequence of use.</p> <p>Description of AMI bands has been added to page 4-80</p>	<p>Items updated within Table 4.13 on pages 4-81 through 4-85</p> <p>Description of AMI bands has been added to page 4-80</p>

<b>Housing</b>			
<b>Number</b>	<b>Comment</b>	<b>Proposed Response</b>	<b>Edit Location in the Plan (Document pg #, paragraph, etc.)</b>
6	<p>In the Plan, some widely used tools to address housing needs aren't included. To be consistent with regional policy, tools must be acknowledged, and to be complete, the plan should state if, and if so when and why, it would consider using them to address housing needs:</p> <ul style="list-style-type: none"> <li>• City support or direct application to specific resources within the Consolidated RFP put out by Minnesota Housing, include circumstances in which it would be used and which AMI bands would be served with this tool (<a href="https://metro council.org/Handbook/Files/Resources/Fact-Sheet/HOUSING/TheConsolidated-RFP.aspx">https://metro council.org/Handbook/Files/Resources/Fact-Sheet/HOUSING/TheConsolidated-RFP.aspx</a>)</li> <li>• Effective referrals to partner organizations - in addition to the many services noted that are provided by the CDA -that address housing needs (<a href="https://metro council.org/Handbook/Files/Resources/Fact-Sheet/HOUSING/Effective-Housing-Referrals.aspx">https://metro council.org/Handbook/Files/Resources/Fact-Sheet/HOUSING/Effective-Housing-Referrals.aspx</a>)</li> <li>• Participation in housing-related organizations, partnerships, and initiatives (<a href="https://metro council.org/Handbook/Files/Resources/Fact-Sheet/HOUS/NG/Collaborating-on-Housing-Strategies.aspx">https://metro council.org/Handbook/Files/Resources/Fact-Sheet/HOUS/NG/Collaborating-on-Housing-Strategies.aspx</a>)</li> <li>• Preservation of expiring low-income housing tax credit properties.</li> <li>• Advocating for a Community Land Trust model to create and preserve affordable homeownership opportunities, including which % AMI would be the target audience for this tool.</li> <li>• Specific tools that preserve naturally occurring affordable housing, including partnerships with sources of preservation financing (MN Housing, Greater Minnesota Housing Fund's NOAH Impact Fund), and 4(d) tax incentives. (<a href="https://metro council.org/Handbook/Files/Resources/Fact-Sheet/HOUSING/Housing-Preservation.aspx">https://metro council.org/Handbook/Files/Resources/Fact-Sheet/HOUSING/Housing-Preservation.aspx</a>)</li> </ul>	Tools added to Houing Implementation table	Items added to Table 4.13 on pages 4-81 through 4-85

<b>Housing</b>			
<b>Number</b>	<b>Comment</b>	<b>Proposed Response</b>	<b>Edit Location in the Plan (Document pg #, paragraph, etc.)</b>
<b>Advisory Comments</b>			
1	<p>With respect to a Fair Housing policy, local fair housing policies do not mean that cities should or can manage or administer Fair Housing complaints. A local fair housing policy rather ensures the City is aware of fair housing requirements with regard to housing decisions and provides sufficient resources to educate and refer residents who feel their fair housing rights have been violated (this can be as simple as having links to resources on the City's website). The Metropolitan Council will require a local Fair Housing policy as a requirement to draw upon Livable Communities Act (LCA) awards beginning in 2019. To learn more, and review a template local fair housing policy, please refer to the following resources:</p> <ul style="list-style-type: none"> <li>• Creating a Local Fair Housing Policy webinar: <a href="https://www.youtube.com/watch?v=38JY4pNGnZ8&amp;feature=youtu.be">https://www.youtube.com/watch?v=38JY4pNGnZ8&amp;feature=youtu.be</a></li> <li>• Best Practices: <a href="https://metro council.org/Handbook/PlanIt/Files/Webinar-Fair-Housing-Handout2.aspx">https://metro council.org/Handbook/PlanIt/Files/Webinar-Fair-Housing-Handout2.aspx</a></li> <li>• Policy Template: <a href="https://metro council.org/Handbook/Training/Webinars.aspx">https://metro council.org/Handbook/Training/Webinars.aspx</a> - click on Handout 1 under the Implementing A Local Fair Housing Policy at the bottom of the screen.</li> </ul>	City will be adopting a Fair Housing policy in 2019 – tool updated	Item updated within Table 4.13 on pages 4-81 through 4-85
2	Council staff encourages the City to consider an Accessory Dwelling Unit (ADU) policy or allow them as a permitted use. This is a unique way to diversify housing choices within existing single-family neighborhoods.	Comment Noted – the city will consider looking into the feasibility of ADUs in the future	No changes to plan text
3	For Dakota County CDA's Family Housing Partnership, Family Townhome, LIHTC and HOPE programs, the Plan notes that the City will refer people to those programs. For the Senior Housing and Workforce Housing program, the Plan notes that the City will work with the CDA to find appropriate sites for (presumably) new housing. It is not clear if the former programs no longer exist, and so the City can only refer people to existing units under those programs, or if the City is stating an explicit priority for the latter two programs when the CDA is considering new development.	Comment Noted – the City will continue its close work with Dakota County CDA to link available existing units to those in need as well as identifying potential places for future development programs	No changes to plan text

<b>Housing</b>			
<b>Number</b>	<b>Comment</b>	<b>Proposed Response</b>	<b>Edit Location in the Plan (Document pg #, paragraph, etc.)</b>
4	All the existing housing data (including the number of low-income households that are housing cost burdened) sourced from the Metropolitan Council has been updated with 2016 data. The City can find updated Existing Housing Assessment on Farmington's community page in the Local Planning Handbook and updating any relevant data.	Data updated to reflect 2016 housing data	Changes throughout chapter
<b>Implementation Plan</b>			
5	Supporting or sponsoring an LCA grant is not accurate. For LCA grants, the City must be the applicant and must be a participant in the program. Farmington is currently a participating city in the Livable Community Act program.	Language updated	Language updated in Table 4.13 on pages 4-81 through 4-85
6	Related to LIHTC properties, it may be prudent for the City to track the affordability expiration of properties to respond to the needs of those that may be evicted if rents are raised in addition to the included language on the support of new LIHTC properties.	Comment Noted	No changes to plan
7	The "Scattered Site Housing Program" is not described thoroughly. Is the City's role to point out opportunity sites for the program to the County? How often/by what means does this happen? Is there an annual assessment of potential sites?	Program is through Dakota County CDA – clarification language added to table	Language updated in Table 4.13 on pages 4-81 through 4-85

**APPENDIX K. PLANNING  
COMMISSION STAFF REPORT & MINUTES,  
DECEMBER 11, 2018**

City of Farmington  
430 Third Street  
Farmington, MN 55024

*A Proud Past - A Promising  
Future  
Committed to Providing High  
Quality, Timely and Responsive  
Service to All of Our Customers*

**AGENDA**  
**PLANNING COMMISSION**  
December 11, 2018  
7:00 PM  
City Hall Council Chambers

- 1. CALL TO ORDER**
- 2. APPROVAL OF MINUTES**
  - (a) Approve Planning Commission Minutes
- 3. PUBLIC HEARINGS**
  - (a) 2040 Comprehensive Plan
- 4. ADJOURN**





# City of Farmington

430 Third Street  
Farmington, Minnesota  
651.280.6800 - Fax 651.280.6899  
www.ci.farmington.mn.us

**TO:** Planning Commission  
**FROM:** Tony Wippler, Planning Manager  
**SUBJECT:** 2040 Comprehensive Plan  
**DATE:** December 11, 2018

## INTRODUCTION

City staff and consultant will present the Final Draft of the Farmington 2040 Comprehensive Plan Update at the public hearing. The plan also includes the Final Draft of the Water Supply and Distribution Plan, Comprehensive Sanitary Sewer Plan, and the Surface Water Management Plan.

## DISCUSSION

Below, please find a synopsis of the various chapters and plans that make up the 2040 Comprehensive Plan Update.

### **Plan Purpose & Vision Chapter**

#### VISION

*"Farmington will continue to grow as a community in ways that are high quality, balanced, and enhance our hometown feel. Farmington will be a desirable community for its friendly, safe, and well-maintained neighborhoods for residents of all ages. Farmington's hometown feel is also based on the community's natural open space character which entails strategic preservation of the community's natural and rural character. The community's continued growth will bring opportunities for adding and locating schools, recreational facilities, retail businesses, job opportunities, and other community assets convenient for neighborhoods. Balancing the community's residential growth with business growth will improve residents' access to desired retail, employment opportunities, and the residential/business tax ratio."*

#### GUIDING PRINCIPLES

- Balance the Mix of Land Uses for Economic Vitality and Growth
- Provide a Variety of Well Maintained Housing Choices
- Protect and Conserve Natural Resources
- Promote an Interconnected Community
- Ensure Quality and Controlled Growth

### **Land Use Plan Chapter**

Below shows the projections for 2020, 2030 and 2040 population, households, and employment, which are the foundation for the proposed 2040 Future Land Use Plan Map's growth and land use designation changes.

	<b>2010 Census</b>	<b>2014 (Est.)</b>	<b>2020</b>	<b>2030</b>	<b>2040</b>	<b>Change 2014-2040</b>
Population	21,086	22,386	24,300	28,300	32,500	10,114 (45.18%)
Households	7,066	7,557	8,500	10,100	11,800	4,243 (56.15%)
Employment	4,438	4,595	5,600	6,200	6,800	2,205 (47.99%)

Since the current 2030 Plan defines the city's zoning districts rather than land use plan categories, draft land use plan categories have been added to the 2040 Plan. In addition, a new land use category has been added, Mixed Use (Commercial/Industrial), to address the city's desire for increasing flexibility of the types of future commercial and industrial uses allowed in the Spruce Street Master Plan/Pilot Knob Road area.

The key factors driving the proposed updates shown on the 2040 Future Land Use Plan Map include the following:

- 2040 population, households, and employment projections
- Quantity of vacant developable land within the city
- Significant quantity and location of land (approximately 800 acres) that will expire in 2019 and 2020 from the Agricultural Preserve Program, which means the property owners may be interested in developing this land
- Planned future roadways network
- Planned sanitary sewer system expansion (MUSA)
- Location of sensitive water resources, e.g. creeks, floodplains, wetlands
- Community's interest in adding commercial areas near existing and new neighborhoods
- Guiding land to accommodate the city's portion of the metro region's affordable housing needs

Significant changes to land use designations on the 2040 Future Land include the following:

1. Recommended changes from the 2016 Downtown Redevelopment Plan, primarily Commercial to Residential land uses in areas on the edge of downtown and near the river
2. Spruce Street Master Plan Area, Commercial to Mixed Use (Commercial/Residential) and Mixed Use (Commercial/Industrial)
3. North side of Hwy 50/Flagstaff, Agricultural to Residential, Mixed Use (Commercial/Residential) and Industrial
4. 195<sup>th</sup> St/Flagstaff, Agricultural to Residential (Low, Low/Medium, Medium and High Density Residential, and Commercial)

An Anticipated Development Phasing map was developed to show phases in 10-year increments. This is included in the plan as the 2040 Anticipated Development Phases map.

The nine draft land use goals are:

1. Efficient, well-planned land use expansion and development that meets the needs of the city’s projected population, household and employment growth.
2. Balance of residential, commercial, employment, and public land uses that promotes the city’s long-term economic stability.
3. Farmington’s existing hometown character is maintained and strengthened through its future growth.
4. The diversity of housing options available is expanded as part of the community’s growth and redevelopment.
5. A mix of convenient and attractive commercial areas are distributed around the city.
6. Employment centers are expanded in the community to increase job opportunities as well as increase and diversify the tax base.
7. Downtown is reinvigorated as the community’s commercial, cultural, and recreational center as well as a great place to live.
8. Natural resources are protected for the benefit of the overall health of the community’s natural and human environment.
9. Farmington’s significant, scarce, and non-renewable heritage resources are preserved, protected and used in appropriate ways to reflect the community’s shared values (public and private sectors) for its unique heritage.

### Housing Plan Chapter

The current 2030 Housing Plan chapter identifies a number of housing issues in the city and focuses on the Livable Communities Act programs as ways to address affordability. The draft 2040 Housing Plan chapter keeps many of those items in place, but has shifted focus towards a variety of housing tools that can be used to meet the identified housing needs of the city. Many of the tools are through the Dakota County Community Development Agency (CDA), which the city will continue to support. In addition to housing tools, the chapter also analyzes the affordable allocation need, which is a new requirement of the Metropolitan Council. In coordination with the draft 2040 Land Use Plan, we found that in the decade between 2021-2030, Farmington will have development of land uses in high enough densities to meet the affordable allocation need for the city. The tables below show the analysis:

Future Land Use	Acres (NET) 2021-2030	Minimum Units per Acre	Minimum %	Res Units	Affordability Level
Medium Density	41.21	6	100%	247	51%-80% AMI
High Density	28.1	12	100%	337	50% AMI and Below
Mixed-Use (Comm/Res)	37.24	9	50%	168	51%-80% AMI
<b>TOTAL</b>	<b>106.56</b>			<b>752</b>	

Household Income Level	Units Required	Units Allocated
At or below 30% AMI	317	337
31 to 50% AMI		
51 to 80% AMI	124	415
<b>TOTAL UNITS</b>	<b>441</b>	<b>752</b>

The five draft housing goals are:

1. Maintain high-quality housing options
2. Provide a wide variety of housing types for people in all stages of life
3. Have housing that is affordable to all residents at all stages of life
4. Ensure that housing is located within livable, well-connected neighborhoods
5. Encourage measured residential growth that meets pent-up regional demand for housing while also recognizing the regional constraints for unchecked growth

### Parks & Recreation Chapter

The draft 2040 Parks & Recreation Chapter has been updated to reflect the following:

- The Existing and Proposed Park, Trail and Open Space Plan Map further refines and adds new neighborhood park locations so that future neighborhood parks are no more than one mile apart and provides to future residents no more than a half-mile walking distance to future neighborhood parks, which is a standard created by the National Recreation Park Association.
- The Existing and Proposed Park, Trail and Open Space Plan Map was refined to show future trail corridors aligning with future

minor arterial and collector streets, which normally trails and/or sidewalks are constructed within the rights of way in these types of streets.

- The goals have been updated to reflect addressing the community's population aging in the next 20 years. The city's current population has a relatively young median age, but this will change in the next 20 years.
- The demographic information has been updated to reflect the current profile of the residents who live in Farmington.
- A section on trails has been added, which was not included in the 2030 Comprehensive Plan.

### **Sustainability Plan Chapter**

The current 2030 Sustainability Plan chapter simply consists of a brief history of the city's sustainability efforts and an extensive description of the Minnesota GreenStep Cities program. The draft 2040 Sustainability Plan chapter focuses on Farmington's participation in the GreenStep Cities program since 2011, when the city joined this program. The chapter identifies the sustainability best practices that have been achieved by the city up to now as a Step 2 GreenStep City as well as the city's goal to adopt additional sustainability best practices to achieve a Step 3 designation. The city's existing sustainability conditions are described, generally related to energy use and generation: building energy use, transportation energy use, greenhouse gas emissions, energy efficiency options, solar resources, and wind resources. Sustainability goals and policies have been added to this chapter, which are missing from the current Sustainability Plan chapter.

The five draft sustainability goals are:

1. Achieve recognition as a Step 3 Minnesota GreenStep City
2. Reduction of environmental impacts in Farmington
3. Increased conservation of non-renewable energy
4. Increased use of renewable energy
5. Reduction of greenhouse gas emissions

### **Economic Development Plan Chapter**

The current 2030 Economic Development Plan chapter consists of a lengthy history and descriptions of the Farmington's past economic development efforts. The draft 2040 Economic Development Plan chapter provides an overview of the purpose of municipal economic development planning, the role and powers of the Economic Development Authority (EDA), a brief history of Farmington's past economic development planning, the city's existing economic conditions, the Spruce Street Area Master Plan, the Downtown Redevelopment Plan, the city's three-year strategic planning process, and the city's key economic development partnerships. Economic development goals and policies have been added to this chapter, which are missing from the current Economic Development Plan chapter.

The eight draft economic development goals are:

1. Healthy and diversified growth of existing and new businesses to achieve the community's 2030 and 2040 employment projections
2. A desirable commercial environment for residents is created through growth from existing and new businesses
3. Redevelopment of vacant and underutilized properties in older areas to revitalize these vital community areas
4. A well-trained and adaptable workforce is maintained within the community to support the projected business and job growth
5. Diverse housing options and quality of life amenities that support the needs and preferences of the community's workforce into the future
6. A three-year Strategic Plan for Economic Development that provides a dynamic and actionable tool for achieving the community's economic development vision
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The City of Farmington's existing and proposed sanitary sewer system for the 2040 development of the city was modeled and is shown on the maps included in the plan. The city has eight major sewer districts, named Districts 1 through 8, which each define the limits of service for a separate trunk system. Modeling of the sanitary sewer system was based on a variety of parameters, such as: land use, population density, standard wastewater generation rates, topography, and future land use plans. Based on development patterns, two of the trunk lines were given more detailed capacity consideration. This includes deploying meters in key manholes to calibrate the design assumptions against actual flows. Design assumptions in the model were updated based on the metering results and typical factors of safety.

### **Water Supply and Distribution Plan**

The Water Supply and Distribution Plan develops the performance criteria under which the water system will be evaluated and designed. This involves an evaluation of historical population and trends, water use patterns and projections, water supply requirements, water storage requirements, required fire flows, and distribution system pressure requirements.

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these wells, it is recommended that the City install at least one replacement well having a capacity of 1.10 MGD or a 170 gpm well prior to all three wells being removed from service. This well is currently under contract and will occur over the next few months. It should be noted that Farmington also shares an interconnection with the City of Lakeville, but this interconnect is limited to emergency use only due to pressure and water compatibility issues.

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The City of Farmington has two storage tanks: a 1.5 MG elevated storage tank at the municipal campus and a 0.67 MG standpipe in Daisy Knoll Park. While the total storage capacity is 2.27 MG, the effective storage capacity is 1.79 MG, as the standpipe has an effective storage capacity of 0.29 MG. Farmington's existing recommended storage volume is 2.49 MG and the future recommended storage volume is 3.65 MG. It is recommended the City install a 2.0 MG storage tank which is currently planned starting in 2020.

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The distribution system exists on a single pressure zone with static pressure readings ranging from approximately 45 pounds per square inch (psi) to 100 psi. Pressures are dictated on the system primarily by elevation. Considering the developing areas, the system will continue to operate on a single zone in the future.

As part of the water system evaluation, there was discussion with Empire Township regarding potential water sharing. The township water system operates at a lower pressure than the city's. That being said, there is an area in the township, adjacent to the city, that will require a new pressure zone on their system. This area could be served from the Farmington system through a water sharing agreement in the future when it is ready to be developed.

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The Surface Water Management Plan serves as a comprehensive planning document to guide the conservation, protection and management of surface waters within Farmington. As a growing community, development and changes in land use will have the potential to decrease water quality, increase flooding, impact water resources and increase public expenditures on surface water management.

The goals identified in this LSWM are to:

- Effectively and responsibly manage local water resources.
- Protect and enhance surface water quality in the city.
- Provide flood risk reduction measures for persons and property, and manage the rate and volume of runoff entering rivers, streams, lakes, and wetlands within the city.
- Protect groundwater quality and quantity to preserve it for sustainable and beneficial purposes.
- Maintain and enhance the functions and values of wetlands within the city.
- Preserve floodplains and manage adjacent uses to minimize flood risks and associated damages.
- Develop or improve recreational open space areas, fish and wildlife habitat, and public accessibility in conjunction with water quality improvement projects.
- Protect and conserve water and natural resources by promoting sustainable growth and integrated land use planning.
- Increase public awareness of the function and value of surface water resources and the impacts associated human activities.
- Maintain adequate funding for surface water management.

The more significant updates to the 2018 SWMP include the following topics:

#### Updated Hydrologic/Hydraulic Modeling Using Atlas 14 Precipitation

- Precipitation data used to complete hydrologic analysis was updated in 2014. The new standard rain events increased across the board.
- This increase not only has implications as it relates to stormwater facilities in newly developing areas, but also areas where development has occurred. For new ponding facilities, sizing will be determined using the new data. For existing areas, the city will consider increasing capacity with typical pond maintenance projects.
- The City is reviewing areas of potential flooding concern and considering working with FEMA to accelerate updates to the official floodplain maps

#### Change in the City's approach to Regional Ponding

- The 2008 SWMP anticipated the use of a number of regional stormwater ponds with property acquisition and construction costs contemplated and set with the Surface Water Management development fee.
- Since the last plan, there are new regulatory requirements for volume control in addition to rate control. Volume control is currently accomplished on a site/development basis.
- The SWMP update shifts to development-level ponds/BMPs to address both rate and volume control requirements. This approach allows for ease of phasing and property acquisition in line with the pace of development.

- Costs for the construction of surface water management facilities is borne directly by the developer, therefore the City's development fee will be reduced.
- This approach gives developers more control over placement of BMPs as an amenity to their developments, however the city will still seek to limit the overall number of ponds/BMPs that are implemented.

MS4 General Permit

To meet federal requirements, the city develops a local Stormwater Pollution Prevention Plan (SWPPP) meeting MPCA requirements under the State's MS4 general permit. This permit is on a five year cycle and is in the process of being renewed. The first round of the permit focused on program development meeting the six control measures. The second round shifted focus from program development to measuring program implementation. The MPCA is in the process of issuing a new MS4 General Permit. The 2018 update is expected to include additional requirements tracking performance of water quality ponds and other stormwater management BMPs.

**Transportation Plan**

The current 2030 Transportation chapter was last updated in 2011 and incorporated topic specific transportation studies completed in collaboration with Dakota County and MnDOT. The draft 2040 Transportation Plan builds off of the last update identifying a number of considerations to continue to build the transportation network. This chapter updates traffic forecasts and modeling based on the most current metro wide traffic analysis and changes to the overall land use.

The overarching goals that will guide further development of the City's transportation system are to:

- Provide a transportation system that is integrated with City land use and development plans, that preserves City historical resources, and conserves and, where possible, enhances environmental features and resources.
- Provide a system which supports the efficient and effective movement of people and goods in a comprehensive yet cost-effective manner.

To realize these goals, the City will address more focused objectives as summarized below:

- Work with MnDOT and Dakota County on implementing access management principals.
- In collaboration with Dakota County, review the role Diamond Path plays in the overall transportation network.
- Further coordination and study with the City of Lakeville regarding timing and design considerations of 202<sup>nd</sup>/208<sup>th</sup> Street as it extends from CR 50 in Lakeville to the Industrial Park.
- Further coordination and study is warranted regarding the connection of 208<sup>th</sup> Street from its current terminus at Riverview Elementary to CR66.
- Further consideration of the travel/connectivity value of the 200<sup>th</sup>/203<sup>rd</sup> Street to 197<sup>th</sup> Street connection.
- A commercial node adjacent to the CSAH 64/Flagstaff Ave intersection has been identified in the Land Use chapter. The City will continue to coordinate with the County regarding roadway timing and design considerations.

Work has been initiated on a study in collaboration with Dakota County and Empire Township to review segments of Diamond Path, 208th Street and 197th Street as they relate to the overall transportation network in the northeast Farmington area.

**Overall Document Link**

The 2040 Comprehensive Plan and related plans are not included in the agenda packet due to their overall size. The 2040 Comprehensive Plan can be found in its entirety on the city's website and by utilizing the following link:

[http://www.hkgi.com/projects/FarmingtonCompPlan/project\\_documents.php](http://www.hkgi.com/projects/FarmingtonCompPlan/project_documents.php)

**ACTION REQUESTED**

Recommend adoption of the attached resolution approving the Final Draft of the Farmington 2040 Comprehensive Plan Update and related plans as well as authorizing their distribution to the Metropolitan Council and forward that recommendation to the City Council on December 17, 2018.

**ATTACHMENTS:**

Type	Description
□ Resolution	Comp Plan Resolution

**Planning Commission  
Minutes  
Regular Meeting  
December 11, 2018**

**1. Call to Order**

Chair Rotty called the meeting to order at 7:00 p.m.

Members Present: Rotty, Bjorge, Franceschelli, Kuyper

Members Absent: Tesky

Also Present: Tony Wippler, Planning Manager

**2. Approval of Minutes**

**a. Approve Planning Commission Minutes**

**MOTION** by Franceschelli, second by Rotty to approve the minutes of November 13, 2018. Voting for: Rotty, Franceschelli. Abstain: Bjorge, Kuyper. **MOTION CARRIED.**

**3. Public Hearings – Chair Rotty opened the public hearings**

**a. 2040 Comprehensive Plan**

Mr. Jeff Miller of Hoisington Koegler Group presented the 2040 Comprehensive Plan. Mr. Miller reviewed the various chapters highlighting the guiding principles and the major updates. By 2040 the population is predicted to be 32,500. A new land use category has been added, Mixed Use (Commercial/Industrial). This will increase the flexibility for future commercial and industrial uses allowed in the Spruce Street Master Plan / Pilot Knob Road area. The area along I95<sup>th</sup> Street between Pilot Knob Road and Flagstaff, and the area south of the high school has been designated as agricultural. That has changed to urban development. The land along Pilot Knob near CSAH 50 and south has been guided to the new mixed use of commercial / industrial.

Chair Rotty spoke about the work session on the Highway 3 corridor. It is anticipated there will be some type of zoning changes along Highway 3. Whatever those changes are, that will be an amendment to this comprehensive plan.

Regarding the ag land, previously 940 acres had no expiration date. Now 815 acres of that will expire in 2020. Within the past year, 125 acres were taken out of ag preserve which will be available in 2026.

The Met Council has a requirement for all cities to meet a threshold for affordable housing. The 2040 plan meets that need with 752 units allocated to affordable housing.

The Parks and Recreation Chapter shows new neighborhood park locations, future trail corridors aligning with future streets. A section on trails has been added, which was not included in the 2030 Comprehensive Plan.

The economic development chapter has been streamlined to contain the purpose of municipal economic development, roles and powers of the EDA, history of planning and economic development, existing economic conditions, existing economic development plans such as the Downtown Redevelopment Plan and the city's three-year strategic planning process.

Planning Manager Wippler gave highlights of the comprehensive sanitary sewer plan and surface water management plan. There were two significant updates to the surface water management plan. There is an updated hydrologic/hydraulic model using atlas 14 precipitation. It is used to determine storm water ponding for development. This will impact new development and existing development as far as maintenance. The other change is the city's approach to regional ponding. Currently, this is regulated through a surface water management fee which would go towards the acquisition and development of regional ponds. With the new requirements, there would be more site development level ponds to address both rate and volume control. There will be more small ponds rather than large ponds.

The transportation plan includes working with neighboring cities and townships on various connections.

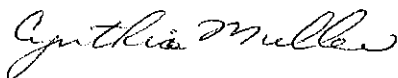
Commission members asked various questions on the plan. Comments were received from residents, the city of Lakeville and MnDOT. Upon City Council approval, the plan will be sent to the Met Council. Commission members were very much in favor of this plan and thanked all entities for their comments.

**MOTION** by Bjorge, second by Kuyper to close the public hearing. **APIF, MOTION CARRIED.** **MOTION** by Franceschelli, second by Kuyper to recommend approval of the 2040 Comprehensive Plan to the City Council. **APIF, MOTION CARRIED.**

**4. Adjourn**

**MOTION** by Bjorge second by Kuyper to adjourn at 8:00 p.m. **APIF, MOTION CARRIED.**

Respectfully submitted,



Cynthia Muller  
Administrative Assistant

**APPENDIX L. CITY COUNCIL  
RESOLUTION & PUBLIC HEARING STAFF REPORT  
& DRAFT MINUTES, JUNE 17, 2019**



**CITY COUNCIL REGULAR MEETING AGENDA**

June 17, 2019

7:00 PM

- 1. CALL TO ORDER**
- 2. PLEDGE OF ALLEGIANCE**
- 3. ROLL CALL**
- 4. APPROVE AGENDA**
- 5. ANNOUNCEMENTS / COMMENDATIONS**

(a) 2018 Police Department Annual Report

- 6. CITIZEN COMMENTS / RESPONSES TO COMMENTS**

(This time is reserved for citizen comments regarding non-agenda items. No official action can be taken on these items. Speakers are limited to five minutes to address the city council during citizen comment time.)

- 7. CONSENT AGENDA**

- (a) Approve Minutes of the June 3, 2019 City Council Meeting-Administration
- (b) Approve Minutes of the June 10, 2019 City Council Work Session-Administration
- (c) Approve Dismissal-Administration
- (d) Approve Changes to the Bylaws of the Farmington Firefighters Relief Association-City Council
- (e) Approve Development Contract and Planned Unit Development Agreement for Fairhill Estate at North Creek-Community Development
- (f) Adopt Resolution Accepting a Donation to the Rambling River Center-Parks
- (g) Appointment Recommendation Fire Department-Human Resources
- (h) Appointment Recommendation Public Works - Human Resources
- (i) Approve Interchange Agreement with Dakota Broadband Board-Human Resources
- (j) Approve Appointment Recommendation for the Executive Director of the Dakota Broadband Board-Human Resources
- (k) Approve Seasonal Hiring-Human Resources
- (l) Approve Bills-Finance

**REGULAR AGENDA**

- 8. PUBLIC HEARINGS**

**9. AWARD OF CONTRACT**

**10. PETITIONS, REQUESTS AND COMMUNICATIONS**

- (a) Submittal of the Final Draft of the Farmington 2040 Comprehensive Plan Update and Related Plans to the Metropolitan Council
- (b) Farmington Bike Pedestrian Plan

**11. UNFINISHED BUSINESS**

**12. NEW BUSINESS**

- (a) 2018 Investment Review

**13. CITY COUNCIL ROUNDTABLE**

**14. ADJOURN**

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# City of Farmington

430 Third Street  
Farmington, Minnesota  
651.280.6800 - Fax 651.280.6899  
www.ci.farmington.mn.us

**TO:** Mayor, Councilmembers and City Administrator  
**FROM:** Tony Wippler, Planning Manager  
**SUBJECT:** Submittal of the Final Draft of the Farmington 2040 Comprehensive Plan Update and Related Plans to the Metropolitan Council  
**DATE:** June 17, 2019

## **INTRODUCTION**

City staff will present the Final Draft of the Farmington 2040 Comprehensive Plan Update at the meeting. The plan also includes the Final Drafts of the Water Supply and Distribution Plan, Comprehensive Sanitary Sewer Plan, and the Surface Water Management Plan.

## **DISCUSSION**

Below, please find a synopsis of the various chapters and plans that make up the 2040 Comprehensive Plan Update.

### **Plan Purpose & Vision Chapter**

#### **VISION**

*"Farmington will continue to grow as a community in ways that are high quality, balanced, and enhance our hometown feel. Farmington will be a desirable community for its friendly, safe, and well-maintained neighborhoods for residents of all ages. Farmington's hometown feel is also based on the community's natural open space character which entails strategic preservation of the community's natural and rural character. The community's continued growth will bring opportunities for adding and locating schools, recreational facilities, retail businesses, job opportunities, and other community assets convenient for neighborhoods. Balancing the community's residential growth with business growth will improve residents' access to desired retail, employment opportunities, and the residential/business tax ratio."*

#### **GUIDING PRINCIPLES**

- Balance the Mix of Land Uses for Economic Vitality and Growth
- Provide a Variety of Well Maintained Housing Choices
- Protect and Conserve Natural Resources
- Promote an Interconnected Community
- Ensure Quality and Controlled Growth

### **Land Use Plan Chapter**

The following table shows projections for 2020, 2030 and 2040 population, households, and employment, which are the foundation for the proposed 2040 Future Land Use Plan Map's growth and land use designation changes.

	2010 Census	2014 (Est.)	2020	2030	2040	Change 2014-2040
Population	21,086	22,386	24,300	28,300	32,500	10,114 (45.18%)
Households	7,066	7,557	8,500	10,100	11,800	4,243 (56.15%)
Employment	4,438	4,595	5,600	6,200	6,800	2,205 (47.99%)

Since the current 2030 Plan defines the city's zoning districts rather than land use plan categories, draft land use plan categories have been added to the 2040 Plan. In addition, a new land use category has been added, Mixed Use (Commercial/Industrial), to address the city's desire for increasing flexibility of the types of future commercial and industrial uses allowed in the Spruce Street Master Plan/Pilot Knob Road area.

The key factors driving the proposed updates shown on the attached 2040 Future Land Use Plan Map include the following:

- 2040 population, households, and employment projections
- Quantity of vacant developable land within the city
- Significant quantity and location of land (approximately 800 acres) that will expire in 2019 and 2020 from the Agricultural Preserve Program, which means the property owners may be interested in developing this land
- Planned future roadways network
- Planned sanitary sewer system expansion (MUSA)
- Location of sensitive water resources, e.g. creeks, floodplains, wetlands
- Community's interest in adding commercial areas near existing and new neighborhoods
- Guiding land to accommodate the city's portion of the metro region's affordable housing needs

Significant changes to land use designations on the 2040 Future Land include the following:

1. Recommended changes from the 2016 Downtown Redevelopment Plan, primarily Commercial to Residential land uses in areas on the edge of downtown and near the river
2. Spruce Street Master Plan Area, Commercial to Mixed Use (Commercial/Residential) and Mixed Use (Commercial/Industrial)

3. North side of Hwy 50/Flagstaff, Agricultural to Residential, Mixed Use (Commercial/Residential) and Industrial
4. 195<sup>th</sup> St/Flagstaff, Agricultural to Residential (Low, Low/Medium, Medium and High Density Residential, and Commercial)

It should be noted that the land use changes contemplated in the recently approved Trunk Highway 3 Corridor Plan are not included in this draft plan. Being a public hearing was already held and adjacent jurisdiction review completed for the 2040 draft plan, staff felt it was not appropriate to include the suggested Trunk Highway 3 Corridor Plan land use changes without going through the necessary public hearing process and adjacent jurisdiction review. These changes can be incorporated later with an amendment to the 2040 plan.

Anticipated Development Phasing map developed to show phases in 10-year increments on the attached 2040 Anticipated Development Phases map.

The nine draft land use goals are:

1. Efficient, well-planned land use expansion and development that meets the needs of the city's projected population, household and employment growth.
2. Balance of residential, commercial, employment, and public land uses that promotes the city's long-term economic stability.
3. Farmington's existing hometown character is maintained and strengthened through its future growth.
4. The diversity of housing options available is expanded as part of the community's growth and redevelopment.
5. A mix of convenient and attractive commercial areas are distributed around the city.
6. Employment centers are expanded in the community to increase job opportunities as well as increase and diversify the tax base.
7. Downtown is reinvigorated as the community's commercial, cultural, and recreational center as well as a great place to live.
8. Natural resources are protected for the benefit of the overall health of the community's natural and human environment.
9. Farmington's significant, scarce, and non-renewable heritage resources are preserved, protected and used in appropriate ways to reflect the community's shared values (public and private sectors) for its unique heritage.

### **Housing Plan Chapter**

The current 2030 Housing Plan chapter identifies a number of housing issues in the city and focuses on the Livable Communities Act programs as ways to address affordability. The draft 2040 Housing Plan chapter keeps many of those items in place, but has shifted focus towards a variety of housing tools that can be used to meet the identified housing needs of the city. Many of the tools are through the Dakota County Community Development Agency (CDA), which the

city will continue to support. In addition to housing tools, the chapter also analyzes the affordable allocation need, which is a new requirement of the Metropolitan Council. In coordination with the draft 2040 Land Use Plan, we found that in the decade between 2021-2030, Farmington will have development of land uses in high enough densities to meet the affordable allocation need for the city. The tables below show the analysis:

The five draft housing goals are:

1. Maintain high-quality housing options
2. Provide a wide variety of housing types for people in all stages of life
3. Have housing that is affordable to all residents at all stages of life
4. Ensure that housing is located within livable, well-connected neighborhoods
5. Encourage measured residential growth that meets pent-up regional demand for housing while also recognizing the regional constraints for unchecked growth

### **Parks & Recreation Chapter**

The draft 2040 Parks & Recreation Chapter has been updated to reflect the following:

- The Existing and Proposed Park, Trail and Open Space Plan Map further refines and adds new neighborhood park locations so that future neighborhood parks are no more than one mile apart and provides to future residents no more than a half-mile walking distance to future neighborhood parks, which is a standard created by the National Recreation Park Association.
- The Existing and Proposed Park, Trail and Open Space Plan Map was refined to show future trail corridors aligning with future minor arterial and collector streets, which normally trails and/or sidewalks are constructed within the rights of way in these types of streets.
- The goals have been updated to reflect addressing the community's population aging in the next 20 years. The city's current population has a relatively young median age, but this will change in the next 20 years.
- The demographic information has been updated to reflect the current profile of the residents who live in Farmington.
- A section on trails has been added, which was not included in the 2030 Comprehensive Plan.

### **Sustainability Plan Chapter**

The current 2030 Sustainability Plan chapter simply consists of a brief history of the city's sustainability efforts and an extensive description of the Minnesota GreenStep Cities program. The draft 2040 Sustainability Plan chapter focuses on Farmington's participation in the GreenStep Cities program since 2011, when the city joined this program. The chapter identifies the sustainability best practices that have been achieved by the city up to now as a Step 2 GreenStep City as well as the city's goal to adopt additional sustainability best practices to achieve a Step 3 designation. The city's existing sustainability conditions are described, generally related to energy use and generation: building energy use, transportation energy use, greenhouse gas emissions, energy efficiency options, solar resources, and wind resources. Sustainability goals and policies have been added to this chapter, which are missing from the current Sustainability Plan chapter.

The five draft sustainability goals are:

1. Achieve recognition as a Step 3 Minnesota GreenStep City
2. Reduction of environmental impacts in Farmington
3. Increased conservation of non-renewable energy
4. Increased use of renewable energy
5. Reduction of greenhouse gas emissions

### **Economic Development Plan Chapter**

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The overarching goals that will guide further development of the City's transportation system are to:

- Provide a transportation system that is integrated with City land use and development plans, that preserves City historical resources, and conserves and, where possible, enhances environmental features and resources.
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To realize these goals, the City will address more focused objectives as summarized below:

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- In collaboration with Dakota County, review the role Diamond Path plays in the overall transportation network.
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Work has been initiated on a study in collaboration with Dakota County and Empire Township to review segments of Diamond Path, 208th Street and 197th Street as they relate to the overall transportation network in the northeast Farmington area.

#### **Overall Document Link**

The 2040 Comprehensive Plan and related plans are not included in the agenda packet due to their overall size. The 2040 Comprehensive Plan can be found in its entirety on the city's website and by utilizing the following link:

[http://www.hkgi.com/projects/FarmingtonCompPlan/project\\_documents.php](http://www.hkgi.com/projects/FarmingtonCompPlan/project_documents.php)

**BUDGET IMPACT**

NA

**ACTION REQUESTED**

Adopt the attached resolution authorizing the submittal of the Final Draft of the Farmington 2040 Comprehensive Plan Update and related plans to the Metropolitan Council.

**ATTACHMENTS:**

Type	Description
□ Resolution	Authorization Resolution

RESOLUTION NO. R29-19

**AUTHORIZING THE SUBMITTAL OF THE FINAL  
DRAFT OF THE FARMINGTON 2040  
COMPREHENSIVE PLAN UPDATE AND RELATED PLANS TO THE  
METROPOLITAN COUNCIL**

Pursuant to due call and notice thereof, a regular meeting of the City Council of the City of Farmington, Minnesota, was held in the Council Chambers of said City on the 17<sup>th</sup> day of June, 2019 at 7:00 P.M.

Members Present: Larson, Bernhjelm, Craig, Donnelly, Hoyt  
Members Absent: None

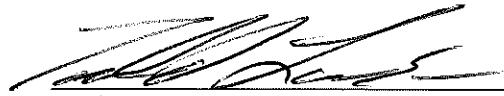
Member Hoyt  
and  
Member Bernhjelm  
introduced and seconded the following:

**WHEREAS**, a public hearing to review the Final Draft of the Farmington 2040 Comprehensive Plan Update and related plans was held on the 11<sup>th</sup> day of December, 2018, after notice of the same was published in the official newspaper of the City, and;

**WHEREAS**, the Planning Commission has recommended a favorable action by the City Council to accept the Farmington 2040 Comprehensive Plan Update and related plans and authorize distribution of copies to the Metropolitan Council for a one hundred and twenty-day review.

**NOW, THEREFORE, BE IT RESOLVED** that the Farmington City Council hereby approves the Final Draft of the Farmington 2040 Comprehensive Plan Update and related plans and authorizes its distribution of copies to the Metropolitan Council for a one hundred and twenty-day review.

This resolution adopted by recorded vote of the Farmington City Council in open session on the 17<sup>th</sup> day of June, 2019.

  
\_\_\_\_\_  
Todd Larson, Mayor

Attest to the 17<sup>th</sup> day of June, 2019

  
\_\_\_\_\_  
David McKnight, City Administrator

SEAL



**CITY OF FARMINGTON  
CITY COUNCIL MINUTES  
REGULAR MEETING  
JUNE 17, 2019**

**1. Call to Order**

Mayor Larson called the meeting to order at 7:00 p.m.

**2. Pledge of Allegiance**

Mayor Larson led those in attendance in the Pledge of Allegiance.

**3. Roll Call**

Present-Larson, Bernhjelm, Craig, Donnelly and Hoyt  
Absent-None

Staff Present-Administrator McKnight, Community Development Director Kienberger, Parks and Recreation Director Distad, Public Works Director Gehler, Planning Manager Wippler, Police Chief Rutherford, Fire Chief Elvestad, Finance Director Malecha and Attorney Jamnik.

**4. Agenda**

Motion by Bernhjelm, second by Hoyt, to approve the agenda as presented. APIF, motion carried.

**5. Announcements/Commendations**

**a) 2018 Police Department Annual Report**

Police Chief Rutherford presented the 2018 Police Department Annual Report. Some of the topics reviewed included a review of the divisions, public outreach, 2018 activities, K9 program, South Metro SWAT, training, SRO, JPA involvement, National Night Out, citizens academy, Toys for Town, employee milestones, calls for service, criminal prosecutions and more.

Councilmembers thanked the chief and the department for their work over the past year. Comments were also made about the specific efforts with public outreach.

**6. Citizen Comments**

None.

## **7. Consent Agenda**

Motion by Hoyt, second by Bernhjelm, to approve the consent agenda:

- a) Approve Minutes of the June 3, 2019 City Council Meeting-Administration
  - b) Approve Minutes of the June 10, 2019 City Council Work Session-Administration
  - c) Approve Dismissal-Administration
  - d) Approve Change to the Bylaws of the Farmington Firefighters Relief Association-City Council
  - e) Approve Development Contract and Planned Unit Development Agreement for Fairhill Estates at North Creek-Community Development
  - f) Adoption Resolution R28-2019 Accepting a Donation to the Rambling River Center-Parks
  - g) Appointment Recommendation Fire Department-Human Resources
  - h) Appointment Recommendation Public Works-Human Resources
  - i) Approve Interchange Agreement with Dakota Broadband Board-Human Resources
  - j) Approve Appointment Recommendation for the Executive Director of the Dakota Broadband Board-Human Resources
  - k) Approve Seasonal Hiring-Human Resources
  - l) Approve Bills-Finance
- APIF, motion carried.

## **8. Public Hearings**

None

## **9. Award of Contract**

None

## **10. Petitions, Requests and Communications**

- a) Submittal of the Final Draft of the Farmington 2040 Comprehensive Plan Update and Related Plans to the Metropolitan Council**

Planning Manager Wippler presented the final draft of the Farmington 2040 Comprehensive Plan Update and related plans.

### **DISCUSSION**

Below, please find a synopsis of the various chapters and plans that make up the 2040 Comprehensive Plan Update.

#### **Plan Purpose & Vision Chapter**

## VISION

*"Farmington will continue to grow as a community in ways that are high quality, balanced, and enhance our hometown feel. Farmington will be a desirable community for its friendly, safe, and well-maintained neighborhoods for residents of all ages. Farmington's hometown feel is also based on the community's natural open space character which entails strategic preservation of the community's natural and rural character. The community's continued growth will bring opportunities for adding and locating schools, recreational facilities, retail businesses, job opportunities, and other community assets convenient for neighborhoods. Balancing the community's residential growth with business growth will improve residents' access to desired retail, employment opportunities, and the residential/business tax ratio."*

## GUIDING PRINCIPLES

- Balance the Mix of Land Uses for Economic Vitality and Growth
- Provide a Variety of Well Maintained Housing Choices
- Protect and Conserve Natural Resources
- Promote an Interconnected Community
- Ensure Quality and Controlled Growth

### Land Use Plan Chapter

The following table shows projections for 2020, 2030 and 2040 population, households, and employment, which are the foundation for the proposed 2040 Future Land Use Plan Map's growth and land use designation changes.

	2010 Census	2014 (Est.)	2020	2030	2040
Population	21,086	22,386	24,300	28,300	32,300
Households	7,066	7,557	8,500	10,100	11,100
Employment	4,438	4,595	5,600	6,200	6,800

Since the current 2030 Plan defines the city's zoning districts rather than land use plan categories, draft land use plan categories have been added to the 2040 Plan. In addition, a new land use category has been added, Mixed Use (Commercial/Industrial), to address the city's desire for increasing flexibility of the types of future commercial and industrial uses allowed in the Spruce Street Master Plan/Pilot Knob Road area.

The key factors driving the proposed updates shown on the attached 2040 Future Land Use Plan Map include the following:

- 2040 population, households, and employment projections
- Quantity of vacant developable land within the city
- Significant quantity and location of land (approximately 800 acres) that will expire in 2019 and 2020 from the Agricultural Preserve Program, which means the property owners may be interested in developing this land
- Planned future roadways network
- Planned sanitary sewer system expansion (MUSA)
- Location of sensitive water resources, e.g. creeks, floodplains, wetlands
- Community's interest in adding commercial areas near existing and new neighborhoods
- Guiding land to accommodate the city's portion of the metro region's affordable housing needs

Significant changes to land use designations on the 2040 Future Land include the following:

1. Recommended changes from the 2016 Downtown Redevelopment Plan, primarily Commercial to Residential land uses in areas on the edge of downtown and near the river
2. Spruce Street Master Plan Area, Commercial to Mixed Use (Commercial/Residential) and Mixed Use (Commercial/Industrial)
3. North side of Hwy 50/Flagstaff, Agricultural to Residential, Mixed Use (Commercial/Residential) and Industrial
4. 195<sup>th</sup> St/Flagstaff, Agricultural to Residential (Low, Low/Medium, Medium and High Density Residential, and Commercial)

It should be noted that the land use changes contemplated in the recently approved Trunk Highway 3 Corridor Plan are not included in this draft plan. Being a public hearing was already held and adjacent jurisdiction review completed for the 2040 draft plan, staff felt it was not appropriate to include the suggested Trunk Highway 3 Corridor Plan land use changes without going through the necessary public hearing process and adjacent jurisdiction review. These changes can be incorporated later with an amendment to the 2040 plan.

Anticipated Development Phasing map developed to show phases in 10-year increments on the attached 2040 Anticipated Development Phases map.

The nine draft land use goals are:

1. Efficient, well-planned land use expansion and development that meets the needs of the city's projected population, household and employment growth.
2. Balance of residential, commercial, employment, and public land uses that promotes the city's long-term economic stability.
3. Farmington's existing hometown character is maintained and strengthened through its future growth.
4. The diversity of housing options available is expanded as part of the community's growth and redevelopment.

5. A mix of convenient and attractive commercial areas are distributed around the city.
6. Employment centers are expanded in the community to increase job opportunities as well as increase and diversify the tax base.
7. Downtown is reinvigorated as the community's commercial, cultural, and recreational center as well as a great place to live.
8. Natural resources are protected for the benefit of the overall health of the community's natural and human environment.
9. Farmington's significant, scarce, and non-renewable heritage resources are preserved, protected and used in appropriate ways to reflect the community's shared values (public and private sectors) for its unique heritage.

### **Housing Plan Chapter**

The current 2030 Housing Plan chapter identifies a number of housing issues in the city and focuses on the Livable Communities Act programs as ways to address affordability. The draft 2040 Housing Plan chapter keeps many of those items in place, but has shifted focus towards a variety of housing tools that can be used to meet the identified housing needs of the city. Many of the tools are through the Dakota County Community Development Agency (CDA), which the city will continue to support. In addition to housing tools, the chapter also analyzes the affordable allocation need, which is a new requirement of the Metropolitan Council. In coordination with the draft 2040 Land Use Plan, we found that in the decade between 2021-2030, Farmington will have development of land uses in high enough densities to meet the affordable allocation need for the city. The tables below show the analysis:

The five draft housing goals are:

1. Maintain high-quality housing options
2. Provide a wide variety of housing types for people in all stages of life
3. Have housing that is affordable to all residents at all stages of life
4. Ensure that housing is located within livable, well-connected neighborhoods
5. Encourage measured residential growth that meets pent-up regional demand for housing while also recognizing the regional constraints for unchecked growth

### **Parks & Recreation Chapter**

The draft 2040 Parks & Recreation Chapter has been updated to reflect the following:

- The Existing and Proposed Park, Trail and Open Space Plan Map further refines and adds new neighborhood park locations so that future neighborhood parks are no more than one mile apart and provides to future residents no more than

a half-mile walking distance to future neighborhood parks, which is a standard created by the National Recreation Park Association.

- The Existing and Proposed Park, Trail and Open Space Plan Map was refined to show future trail corridors aligning with future minor arterial and collector streets, which normally trails and/or sidewalks are constructed within the rights of way in these types of streets.
- The goals have been updated to reflect addressing the community's population aging in the next 20 years. The city's current population has a relatively young median age, but this will change in the next 20 years.
- The demographic information has been updated to reflect the current profile of the residents who live in Farmington.
- A section on trails has been added, which was not included in the 2030 Comprehensive Plan.

### **Sustainability Plan Chapter**

The current 2030 Sustainability Plan chapter simply consists of a brief history of the city's sustainability efforts and an extensive description of the Minnesota GreenStep Cities program. The draft 2040 Sustainability Plan chapter focuses on Farmington's participation in the Green Step Cities program since 2011, when the city joined this program. The chapter identifies the sustainability best practices that have been achieved by the city up to now as a Step 2 Green Step City as well as the city's goal to adopt additional sustainability best practices to achieve a Step 3 designation. The city's existing sustainability conditions are described, generally related to energy use and generation: building energy use, transportation energy use, greenhouse gas emissions, energy efficiency options, solar resources, and wind resources. Sustainability goals and policies have been added to this chapter, which are missing from the current Sustainability Plan chapter.

The five draft sustainability goals are:

1. Achieve recognition as a Step 3 Minnesota Green Step City
2. Reduction of environmental impacts in Farmington
3. Increased conservation of non-renewable energy
4. Increased use of renewable energy
5. Reduction of greenhouse gas emissions

## **Economic Development Plan Chapter**

The current 2030 Economic Development Plan chapter consists of a lengthy history and descriptions of the Farmington's past economic development efforts. The draft 2040 Economic Development Plan chapter provides an overview of the purpose of municipal economic development planning, the role and powers of the Economic Development Authority (EDA), a brief history of Farmington's past economic development planning, the city's existing economic conditions, the Spruce Street Area Master Plan, the Downtown Redevelopment Plan, the city's three-year strategic planning process, and the city's key economic development partnerships. Economic development goals and policies have been added to this chapter, which are missing from the current Economic Development Plan chapter.

The eight draft economic development goals are:

1. Healthy and diversified growth of existing and new businesses to achieve the community's 2030 and 2040 employment projections
2. A desirable commercial environment for residents is created through growth from existing and new businesses
3. Redevelopment of vacant and underutilized properties in older areas to revitalize these vital community areas
4. A well-trained and adaptable workforce is maintained within the community to support the projected business and job growth
5. Diverse housing options and quality of life amenities that support the needs and preferences of the community's workforce into the future
6. A three-year Strategic Plan for Economic Development that provides a dynamic and actionable tool for achieving the community's economic development vision
7. Public and private sector reinvestment in downtown to revitalize it as the community's commercial, cultural, and recreational center
8. Cultivation of strong relationships between existing businesses and the city to increase business retention

## **Comprehensive Sanitary Sewer Plan**

The 2040 Comprehensive Plan Update is to include a sanitary sewer element covering the collection and disposal of wastewater generated by the community. Similarly, the Metropolitan Sewer Act requires local governments to submit a Comprehensive Sewer Plan (CSP) which describes the current and future service needs required from MCES.

The City of Farmington's existing and proposed sanitary sewer system for the 2040 development of the city is shown on the attached maps. The city has eight major sewer districts, named Districts 1 through 8, which each define the limits of service for a separate trunk system. Modeling of the sanitary sewer system was based on a variety of parameters, such as: land use, population density, standard wastewater generation rates, topography, and future land use plans. Based on development patterns, two of the trunk lines were given more

detailed capacity consideration. This includes deploying meters in key manholes to calibrate the design assumptions against actual flows. Initial findings indicate actual available capacity in these lines could be greater than previous assumptions.

## **Water Supply and Distribution Plan**

This section of the Plan develops the performance criteria under which the water system will be evaluated and designed. This involves an evaluation of historical population and trends, water use patterns and projections, water supply requirements, water storage requirements, required fire flows, and distribution system pressure requirements.

### Supply (Wells)

Farmington's existing water supply consists of seven (7) active wells. There is currently sufficient water supply capacity for the existing system; however, a few of the supply wells have surpassed or will surpass their typical life expectancy during the 20-year design period. With the loss of these wells, it is recommended that the City install at least one replacement well having a capacity of 1.10 MGD or a 770 gpm well prior to all three wells being removed from service. This well is planned for replacement over the next few years. It should be noted that Farmington also shares an interconnection with the City of Lakeville, but this interconnect is limited to emergency use only due to pressure and water compatibility issues.

### Storage

The City of Farmington has two storage tanks: a 1.5 MG elevated storage tank at the municipal campus and a 0.67 MG standpipe in Daisy Knoll Park. While the total storage capacity is 2.27 MG, the effective storage capacity is 1.79 MG, as the standpipe has an effective storage capacity of 0.29 MG. Farmington's existing recommended storage volume is 2.49 MG and the future recommended storage volume is 3.65 MG. It is recommended the City install a 2.0 MG storage tank which is currently planned starting in 2019.

### Water Treatment

The City's drinking water meets all primary drinking water standards, as indicated in historical Consumer Confidence Reports. The City also meets most secondary aesthetic water quality standards, except for iron and manganese. Treatment of raw water is currently limited to the addition of fluoride and chlorine at each well house prior to entering the distribution system. At this time, feedback on the aesthetics of the water due to iron and manganese do not support the significant expense to add a water treatment plant to filter the water.

### Water Distribution

The existing distribution system consists of watermains varying from 4 to 24 inches in diameter. Most of the City's watermains are constructed of ductile iron pipe (DIP), with older parts of the



city being served by cast iron pipe (CIP). The city should consider replacement of 4-inch diameter pipes as part of overall street reconstruction projects.

The distribution system exists on a single pressure zone with static pressure readings ranging from approximately 45 pounds per square inch (psi) to 100 psi. Pressures are dictated on the system primarily by elevation. Considering the developing areas, the system will continue to operate on a single zone in the future.

As part of the water system evaluation, there was discussion with Empire Township regarding potential water sharing. The township water system operates at a lower pressure than the city's. That being said, there is an area in the township, adjacent to the city, that will require a new pressure zone on their system. This area could be served from the Farmington system through a water sharing agreement in the future when it is ready to be developed.

### **Surface Water Management Plan**

The Surface Water Management Plan serves as a comprehensive planning document to guide the conservation, protection and management of surface waters within Farmington. As a growing community, development and changes in land use will have the potential to decrease water quality, increase flooding, impact water resources and increase public expenditures on surface water management.

The goals identified in this LSWMP are to:

- Effectively and responsibly manage local water resources.
- Protect and enhance surface water quality in the city.
- Provide flood risk reduction measures for persons and property, and manage the rate and volume of runoff entering rivers, streams, lakes, and wetlands within the city.
- Protect groundwater quality and quantity to preserve it for sustainable and beneficial purposes.
- Maintain and enhance the functions and values of wetlands within the city.
- Preserve floodplains and manage adjacent uses to minimize flood risks and associated damages.
- Develop or improve recreational open space areas, fish and wildlife habitat, and public accessibility in conjunction with water quality improvement projects.
- Protect and conserve water and natural resources by promoting sustainable growth and integrated land use planning.

- Increase public awareness of the function and value of surface water resources and the impacts associated human activities.
- Maintain adequate funding for surface water management.

The more significant updates to the 2018 SWMP include the following topics:

*Updated Hydrologic/Hydraulic Modeling Using Atlas 14 Precipitation*

- Precipitation data used to complete hydrologic analysis was updated in 2014. The new standard rain events increased across the board.
- This increase not only has implications as it relates to stormwater facilities in newly developing areas, but also areas where development has occurred. For new ponding facilities, sizing will be determined using the new data. For existing areas, the city will consider increasing capacity with typical pond maintenance projects.
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- A commercial node adjacent to the CSAH 64/Flagstaff Ave intersection has been identified in the Land Use chapter. The City will continue to coordinate with the County regarding roadway timing and design considerations.

Work has been initiated on a study in collaboration with Dakota County and Empire Township to review segments of Diamond Path, 208th Street and 197th Street as they relate to the overall transportation network in the northeast Farmington area.

Councilmember Donnelly stated it was a concise plan and thanked staff for all of their hard work. He asked at what point is the plan considered approved by the Met Council and the city. Wippler shared the timelines for the process from here forward which should be completed by the end of the year.

Councilmembers Craig and Hoyt thanked staff for their work and are excited to see where the city is headed.

Motion by Bernhjelm, second by Hoyt, to adopt Resolution R29-2019 authorizing the submittal of the final draft of the Farmington 2040 Comprehensive Plan Update and related plans to the Metropolitan Council. APIF, motion carried.

#### **b) Farmington Bike/Pedestrian Plan**

Parks and Recreation Director Distad reviewed the history of the Bike/Ped Plan. Distad explained the public input process and thanked the members of the committee who helped develop the plan.

Jody Rader of HKGI reviewed the plan with the city council. The areas discussed included the plan purpose, public engagement involved in the plan process, issues and opportunities, committee role, open house input, draft network plan, system recommendations, implementation recommendations, priority projects review, operations and maintenance and more.

Councilmember Donnelly stated it was a thorough plan with the implementation being the difficult portion for the city.

Councilmember Hoyt thanked all of those involved in putting the plan together.

Motion by Donnelly, second by Hoyt, to adopt the Farmington Bike/Ped Plan. APIF, motion carried.

#### **11. Unfinished Business**

None

## **12. New Business**

### **a) 2018 Investment Review**

Finance Director Malecha presented the 2018 investment review. Pursuant to the city investment policy, staff should annually review the cash and investment portfolio with the city council.

Malecha reviewed cash and investment status, balance review at the end of 2018, how money is invested, where dollars are invested, types of investments, length of investments, investment income and more.

Councilmember Hoyt stated keep doing what we are doing.

Councilmember Bernhjelm stated that as the city's financial health continues to improve we can hopefully move to more long-term, higher yield investments.

## **13. City Council Roundtable**

Bernhjelm-Thanked those involved in putting on Dew Days and wished everyone a happy July 4<sup>th</sup>.

Craig-Thanked everyone involved in putting on Dew Days.

Hoyt-Thanked everyone involved in putting on Dew Days and was happy to help raise money for the Rambling River Center.

McKnight-Reminded the city council that the July 1<sup>st</sup> city council is cancelled and the July 15<sup>th</sup> city council meeting will be a joint meeting with the school board.

Larson-Thanked everyone involved in putting on Dew Days and encouraged residents to shop local.

## **Adjourn**

Motion by Hoyt, second by Bernhjelm, to adjourn the meeting at 8:28 p.m. APIF, motion carried.

Respectfully Submitted

*David J. McKnight*

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David McKnight, City Administrator