

2040 COMPREHENSIVE PLAN

CITY OF LONG LAKE, MINNESOTA



SUNRISE AT NELSON LAKESIDE PARK

PHOTO COURTESY OF ALICIA LARSON, SHOOT FIRST PHOTOGRAPHY

APPROVED BY THE CITY COUNCIL

APRIL 20, 2021

DEDICATION

This document is a culmination of input by many citizen volunteers, elected officials, appointed committees, staff and our consultants.

Thank you.

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CHAPTER 1: COMMUNITY PROFILE

COMMUNITY HISTORY

The City of Long Lake is located in central Hennepin County and was incorporated in 1906.

The first settlers arrived in Long Lake in early spring 1855. This early contact in Long Lake did not result in settlement but rather this group of Nova Scotians came down Watertown Road, walked to the lake, looked across the lake and settled on the north side of the lake in what is now Orono. The first permanent settlement was established in May of 1855 with the arrival of the Flemings and the George Knettles family from Cumberland County, Pennsylvania. This first settlement was called Cumberland Town and consisted of a sawmill, general store and schoolhouse. The platted area Cumberland Addition can trace its roots to this early period. The Kettle's house became a favorite stop for travelers between 1855 and 1860 and is the location of the first public religious service in the community. The first post office was established in 1856, which was named Tamarack in recognition of the Tamarack swamps in the western part of the County.

A significant aspect of the early settlement of Long Lake was the relationship between the Dakota, the Chippewa and the settlers. The origin of the Union Cemetery is found in this tripartite relationship. The area where the cemetery is located was called Teepee Hill in these early years. It served as an encampment for the Chippewa in 1859-1860. The Dakota were informed of the location of the Chippewa through two settlers in the area. This information prompted many of the Dakota to be in and around Long Lake. Although there was no fighting and the actual intentions of the Dakota are not clear, their presence in the area forced the Chippewa to vacate Teepee Hill. This area was acquired by Bradford Wakefield, most probably through squatter's rights, and purchased by Union Cemetery Association in 1861. There was concern among the settlers that the Chippewa would return, so by establishing a cemetery (hallowed ground) it was unlikely that any Native American people would choose that site as an encampment, thus assuring the safety of the surrounding area.

During the middle to late 19th century, Long Lake developed like many other towns. A sawmill was erected (1866), the railroad reached Long Lake (1868), a school district was organized (1869), a general store was started (1870), the Freethinkers Hall was organized (1874), a flourmill was established (1875), and a hotel was added (1875). These institutions were all-important elements to early town development in the upper Midwest.

The late 1890's - early 1900's became known as the berry years in Long Lake. The Minnesota Fruit Growers Association was established in Long Lake in 1898 to focus on promoting strawberry and raspberry production. These products became a regional specialty with shipments going as far as Fargo and Grand Forks.

As the 19th century turned into the 20th, Long Lake continued to grow and change. A public library was started (1905), a canning factory was established (1906), and Long Lake was incorporated (1906) specifically to prevent the Great Northern Railway from moving the depot west and out of town. The Long Lake Fire Department was officially established in 1915.

During the period from 1916-1919, the first World War consumed Long Lake, like the rest of the country. In the 1920's, Long Lake saw construction of the Buckhorn Cafe which became a well-known community meeting place. It was during this time that the reduction of the role of agriculture in the Long Lake economy was evident by the transition from agriculturally oriented establishments (agriculture production facilities) to more consumer-oriented services (Buckhorn Cafe, car repair). In addition, Long Lake was serving as a summer destination for people in Minneapolis and St Paul who wanted to get away from the summer's heat. At that time, the City was accessible. It had a number of lakeside cabins and was a relaxing place to fish or swim.

It was not until the 1950's that Long Lake expanded to its current City limits. Up until the 1950's, the City limits were about the same as in 1898. The catalyst for the expansion of the City limits was a desire by Long Lake's neighbors to take advantage of the City's decision to install a sewer system. Those areas that wanted to be connected to City sewer were annexed by the City.

In 2000 MnDOT began construction of the TH 12 bypass which resulted in the loss of about 70 houses and the need to replace or relocate Long Lake's City Hall, Fire Station and Public Works facility. The TH 12 bypass project also resulted in the full reconstruction, beginning in 2017, of old Highway 12, now the CSAH 112/Wayzata Boulevard W corridor going through Long Lake.

Additional detailed information on Long Lake's heritage can be found at the Western Hennepin County Pioneer Association Pioneer Museum (www.whcpa-museum.org).

FORECASTS AND COMMUNITY DESIGNATION

The Metropolitan Council designates the City of Long Lake as a Suburban community and provides population, households, and employment estimates for planning purposes. Forecasts assist the City in planning for when, where and how much population, household and job growth the community can anticipate. The overall density expectations for new growth, development, and redevelopment for suburban communities is a minimum average net density of 5 units per acre.

As of the 2010 United States Census, the City of Long Lake had a population of 1,768 and 732 households.

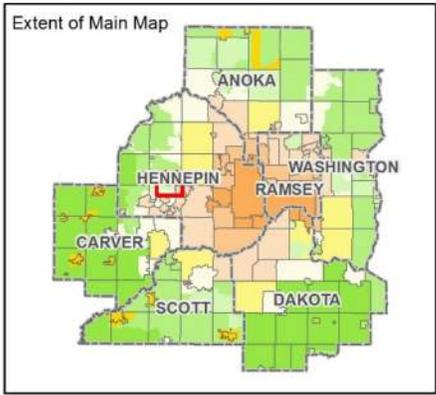
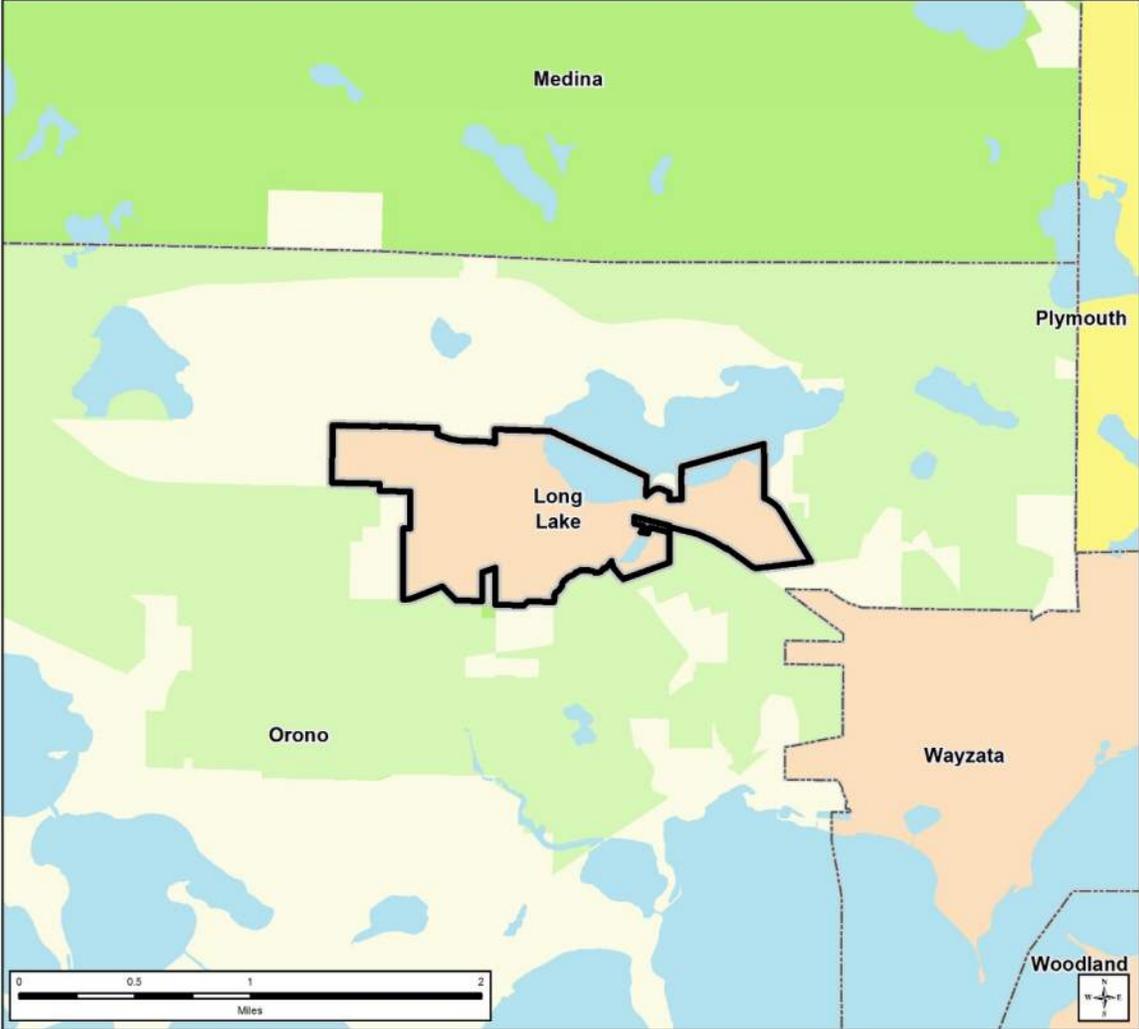
In the next 20 years, the Metropolitan Council anticipates population in Long Lake to grow by approximately 12.5% and that households will increase by approximately 22%. These growth estimates show that the City of Long Lake should be planning for a larger number of one to two person households. Employment within the City is forecasted to grow by approximately 28%.

Table 1-1: Metropolitan Council Community Forecast for the City of Long Lake

Source: Metropolitan Council

Forecast Year	Population	Households	Employment
2010	1,768	732	1,093
2020	1,810	790	1,190
2030	1,960	870	1,310
2040	1,990	900	1,400

Community Designations City of Long Lake, Hennepin County



Community Designations

Outside Council planning authority	Emerging Suburban Edge
Agricultural	Suburban Edge
Rural Residential	Suburban
Diversified Rural	Urban
Rural Center	Urban Center

County Boundaries
 City and Township Boundaries
 Lakes and Major Rivers

COMMUNITY GOALS

The mission of the 2040 Comprehensive Plan Update Task Force was to build on and refine the 2008 Comprehensive Plan by retaining items that remain relevant and to add issues that have emerged over the past ten years.

This document provides a description of desired land uses for the ongoing evolution of Long Lake defined by public attitudes about concerns and preferences for future growth. The target horizon for the vision and goals is 2040. Amendments to this Comprehensive Plan may occur as new ideas emerge over the next ten-year Comprehensive Plan cycle.

2018 Community Survey

In May of 2018 the City mailed a survey to approximately 750 businesses and households to further understand patterns and concerns. 193 survey responses were submitted to the City. From this survey and the work of the taskforce, the following goals were established.

Provide a mix of housing options for all stages of life.

- As families age, alternative housing styles should be considered allowing residents to remain in Long Lake throughout their lives.
- Provide opportunities for all our generations to stay in Long Lake.
- Provide housing opportunities, which meets the needs of all generations and income levels, particularly varying type of independent and accessible senior housing.
- Long Lake supports the development of well-designed and appropriately located multi-family and mixed-use housing projects when these developments improve access to affordable housing and transit, creative positive community impacts, and preserve natural resources.
- As housing preferences change, Long Lake supports taking actions that improve the quality of the existing housing stock and supports the development of housing that meets the needs of the population today.

Take an active role in maintaining and growing a strong local economy for today and tomorrow.

- Foster a strong and diverse business base with planned and organized growth, timely allocation of resources and investment of public dollars.
- Redevelopment will be encouraged and supported for areas that are obsolete or blighted, and where such redevelopment is to foster job growth and increase property values as well as create a more positive community image.
- Business and organizations start, stay, and grow here.
- Our business environment inspires private investment and job growth.

Continue to provide high quality public services through good governance and practice.

- Utilize best planning and management practices to provide the most efficient public services.
- Long Lake provides quality services at a reasonable cost.
- City information is clear, accessible, and delivered in ways that meet the community's needs.
- Long Lake values its public safety staff and its ability to provide a safe and secure community through its excellent training and engagement with residents
- Plan for a balance of desired community amenities with goal of maintaining a low tax rate.

Protect the environment.

- Promote preservation of Long Lake's high value natural resource areas for public enjoyment through passive and active recreational opportunities.
- Promote and protect natural resources areas in the review and approval of new development
- Embrace public and private actions to preserve and enhance our lakes, wetlands, and trees as a significant aesthetic, recreational and economic value to be preserved for all generations.

Connect people and places.

- Maintain and provide a quality public realm that creates a safe living environment for all residents.
- Develop better walking and biking connections between where residents live and where they desire to travel, including commercial areas, schools, parks, neighborhoods, regional facilities, and employment centers.
- Long Lake provides quality recreation and park amenities inspire activity for all ages and interests.
- Long Lake will work to enhance and expand the parks, trails and open space system when possible to ensure that all have access to quality community facilities.
- Long Lake will seek opportunities to enhance the character of the downtown as a distinctive place that embodies the heritage of the community.

CHAPTER 2: LAND USE

INTRODUCTION

The City of Long Lake is proud of its village-like character that is centered around a historic downtown located along Wayzata Boulevard and strong residential neighborhoods of varying densities and housing types. As a fully developed community, residential uses will continue to be the dominant land use, while acknowledging that there are plentiful redevelopment opportunities that will provide change for the city.

The purpose of this land use plan is to provide public policy to guide that change, to serve the needs of all sectors of the community and to build a safe, healthy, sustainable, secure and prosperous environment in the city. The Long Lake comprehensive land use plan seeks to identify both opportunities and constraints, to identify and take into consideration the land use preferences of residents and landowners, and to establish community planning and design priorities for private development and public facilities for the next twenty years.

GENERAL LAND USE

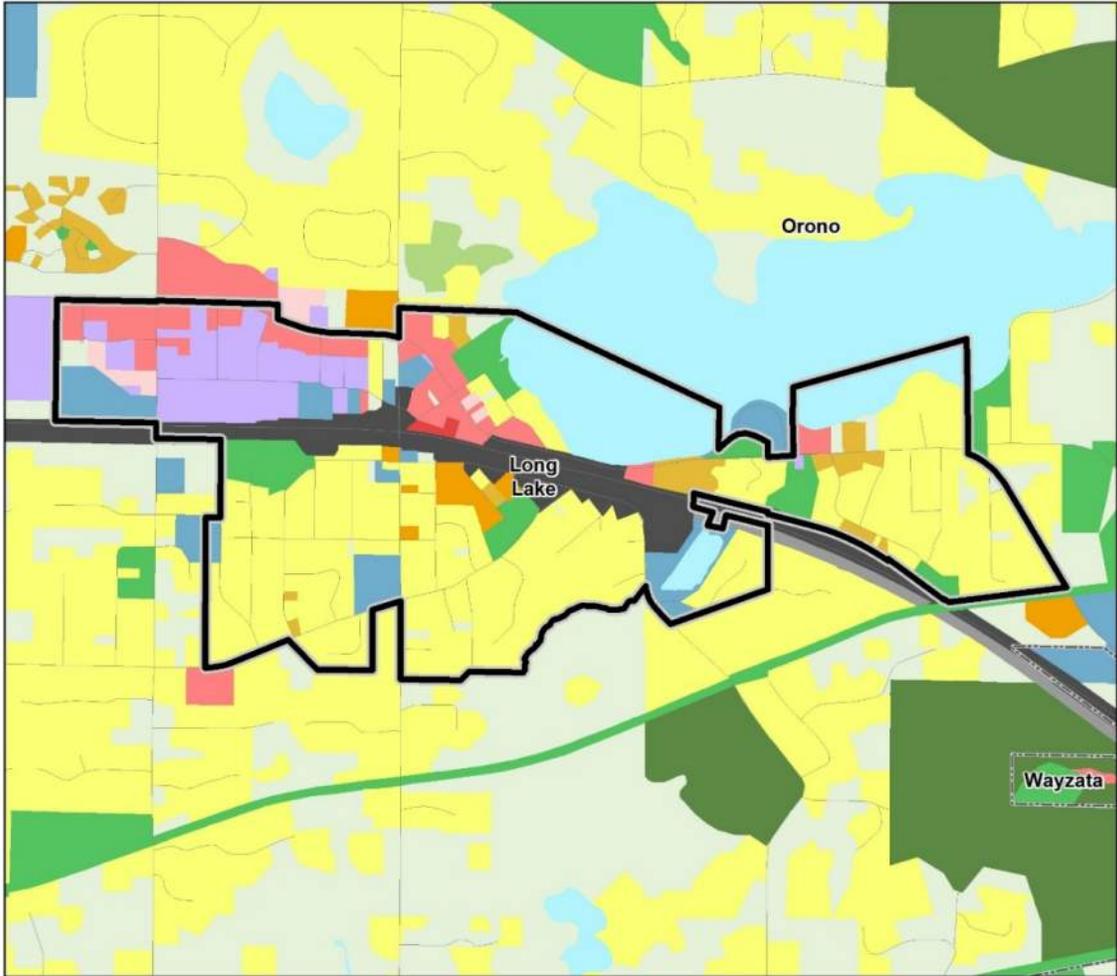
Long Lake is a fully developed, suburban community where nearly half of the land is dedicated to residential land uses. The realignment of CSAH 112 in 2018 bisects the town and offers the businesses along Wayzata Boulevard West a clearly defined commercial area with a village-like feel.

- With very little developable land, redevelopment projects are anticipated in several areas throughout the City. These areas are expected to provide new housing stock and commercial uses.
- The business area occupying the western portion of Long Lake is important to the economic vitality of the City and new development/redevelopment activities should focus upon upgrading the appearance of properties.
- The City's major water feature, Long Lake, is a resource that is protected by low intensity land uses.

EXISTING LAND USE

Figure 2-1: 2016 Generalized Land Use (Source: Metropolitan Council)

2016 Generalized Land Use
City of Long Lake, Hennepin County



2016 Generalized Land Use

- | | | |
|-----------------------------|--------------------------------|------------------------------|
| Farmstead | Mixed Use Residential | Major Highway |
| Seasonal/Vacation | Mixed Use Industrial | Railway |
| Single Family Detached | Mixed Use Commercial and Other | Airport |
| Manufactured Housing Park | Industrial and Utility | Agricultural |
| Single Family Attached | Extractive | Undeveloped |
| Multifamily | Institutional | Water |
| Retail and Other Commercial | Park, Recreational or Preserve | County Boundaries |
| Office | Golf Course | City and Township Boundaries |
| | | NCompass Street Centerlines |

Table 2-1 Current Generalized Land Use by Acre.

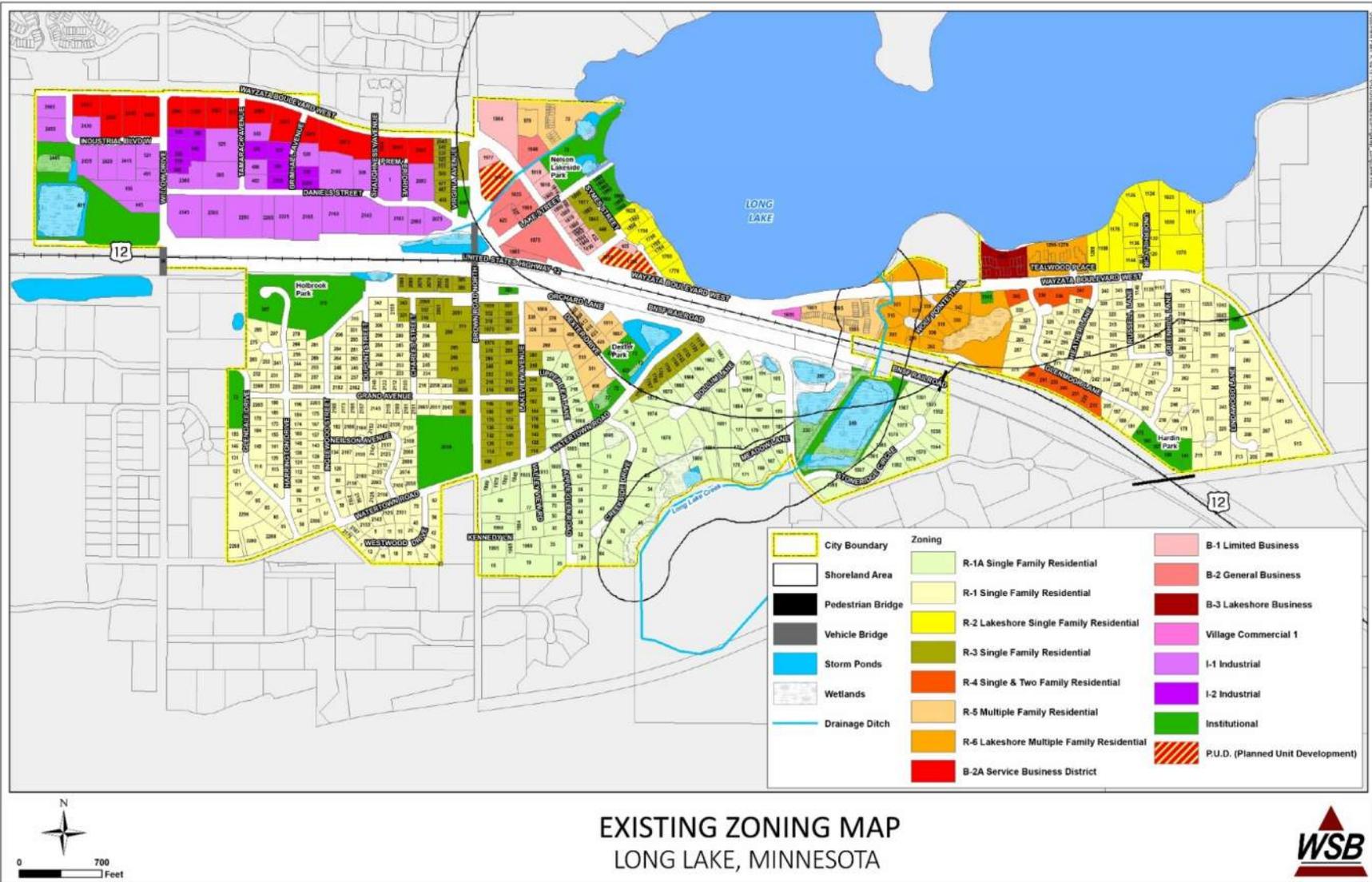
Source: Metropolitan Council.

Land Use Categories	2016 Total (acres)	Percent of Total
Residential Total	300	49.0%
Single Family Detached	276	45.0%
Multifamily	26	4.2%
Commercial Total	52	8.4%
Retail and Other Commercial	47	7.6%
Office	5	0.8%
Industrial Total	48	8.0%
Industrial and Utility	46	7.5%
Railway	2	0.5%
Institutional Total	37	6.0%
Park and Recreation Total	34	5.5%
Mixed Use Total	2	0.5%
Mixed Use Commercial and Other	2	0.5%
Major Roadways	52	8.4%
Agricultural and Undeveloped Land Total	14	2.2%
Open Water	73	12%
Total	612	100%

Table 2-2: Existing Zoning Designations in Long Lake

Zoning District	Description
R-1 & R-1A	Single Family Residential District
R-2	Lakeshore Single Family Residential District
R-3	Single Family Residential District
R-4	Single- and Two-Family Residential District
R-5	Multiple Family Residential District
R-6	Lakeshore Multiple Family Residential District
B-1	Limited Business District
B-2	General Business District
B-2A	Service Business District
B-3	Lakeshore Business District
VC-1	Village Commercial District
I-1 & I-2	Industrial District

Figure 2-2 Existing Zoning Map



FUTURE LAND USE

Future Land Use Categories

Low Density Residential

Low density residential is designed to accommodate residential developments consisting of single family and double family dwellings that range between three and seven units per acre. Most existing single-family residential neighborhoods that are zoned R-1A, R-1, R-2, R-3 and R-4 (that allows two family units) fall within this land use category.

Multiple Family Residential

Two multiple family residential density categories are planned for medium and high-density residential developments. In addition to the regulations for density and building type described below, building height is regulated to preserve views from and to the lake, and maintain a small-town character. Building height of multiple family dwellings should not exceed three stories on properties north of Wayzata Boulevard and four stories on the south side.

Medium Density: The medium density designation accommodates existing and planned residential developments at densities from 8 to 14 dwelling units per acre. Existing medium density multiple family developments include the Brown Road Court and Dexter Drive four, six and eight-plexes, and other townhome developments within the City.

High Density: The high-density residential properties are those that can accommodate developments that are 14 to 20 units per acre and are typically mid-rise apartments and condominiums. Existing developments within this category include the Lakeview Terrace, Hillside Terrace, Midfield Terrace and Grandview Apartments. Additionally, the Long Lake Assisted Living Facility falls within this category. New high-density multiple family residential development is planned in the Downtown Village area.

Downtown Village Mixed Use

The designated Downtown Village area comprises approximately 37 acres (excluding right of way and the lake). Outward expansion is limited by the lake, Wayzata Boulevard, Brown Road and surrounding development. Although the lake prohibits northern expansion, it provides a unique amenity that links various components of the community and provides a focal point for redevelopment efforts in the downtown. Current uses comprise small businesses and shops that cater to local residents of the Long Lake area; public uses such as the library, Pioneer Museum, and City Hall; a park; and low-density residential homes along the lakeshore.

Wayzata Boulevard is the primary roadway serving the existing business area. With the completion of the TH 12 realignment, peak hour access to businesses by vehicles and pedestrians has improved with the removal of through and truck traffic from Wayzata Boulevard. Lake Street and Mill Street also serve as minor business-oriented roadways that provide secondary access for several businesses. Lake Street

provides direct access to the lake and Nelson Lakeside Park. Symes Street and Martha Lane currently serve both residential and business developments.

The Downtown Village area is now seeing the redevelopment activities that were anticipated in the 2030 plan following the completion of the TH 12 realignment. A primary planning objective for the Downtown Village area is to encourage redevelopment opportunities that support the small-town values and yet, expand retail shopping and housing options that are currently unavailable within the community. District-wide we anticipate that approximately half of the share of land uses will be housing and the other half will be commercial. The Metropolitan Council indicates that Long Lake is close to “peak employment” and therefore it is not anticipated that any new office uses will be located within the downtown area.

Housing built in the Downtown Village Mixed-Use District should be developed at 14 to 60 units per acre. Acceptable housing types would be townhomes, midrise apartments and condominiums.

To accomplish this objective, the City encourages development that:

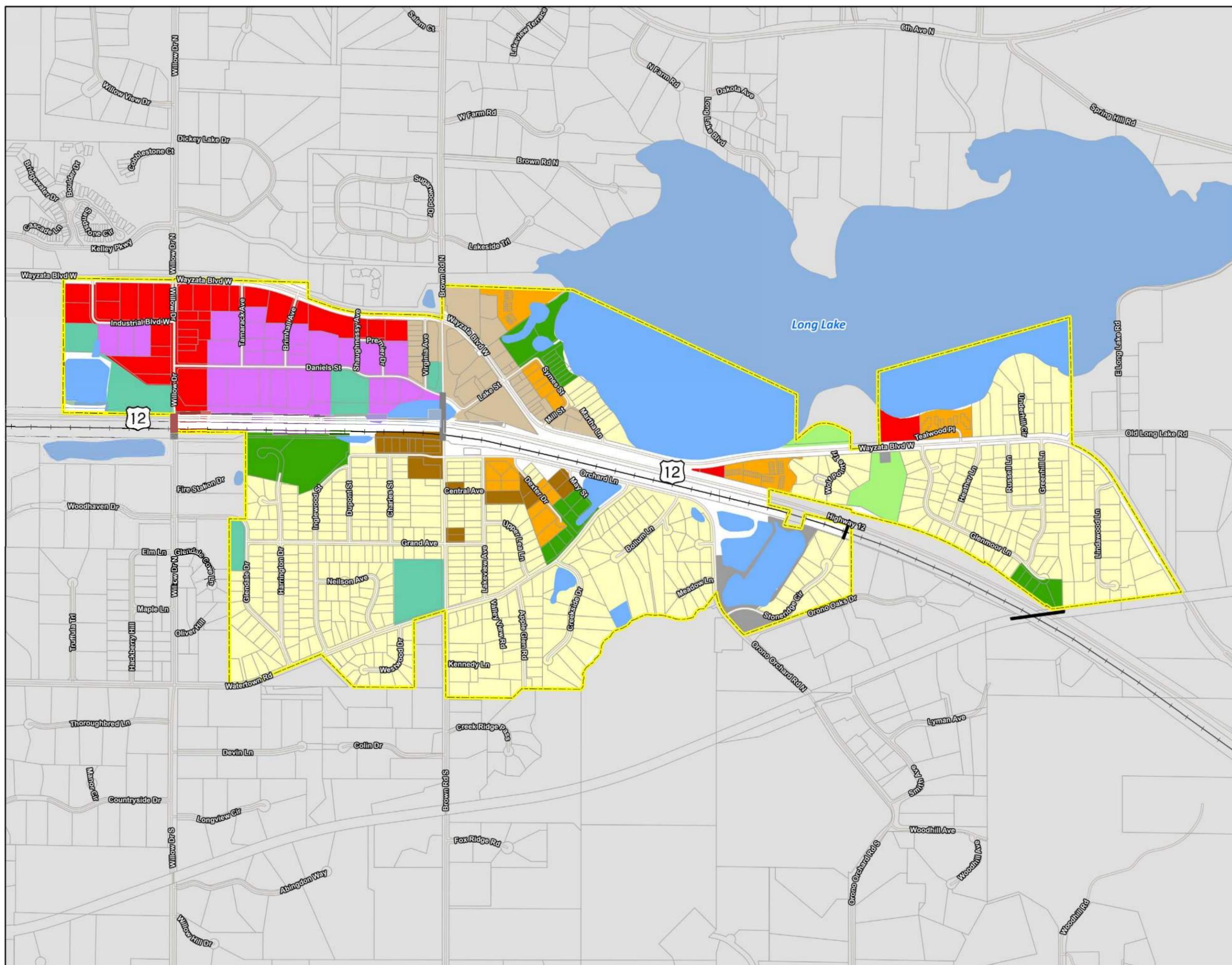
- Provides opportunities to encourage the utilization of non-traditional development techniques in providing mixed uses;
- Implements the commitments of the Livable Community Act agreement;
- Expands shopping, living and employment opportunities for existing and future Long Lake residents; and
- Encourages further diversification and balance in land uses within the City.



CITY OF
LONG LAKE

Figure 2-3

Long Lake, Minnesota
2040 Comprehensive Plan
Proposed Land Use Map



- City Boundary
- Parcels
Lakes/Ponds
- Pedestrian Bridge
- Vehicle Bridge
- 2040 Land Use Plan**
- Business/Light Industrial
- Commercial
- Downtown Village Mixed Use
- Institutional
- Low Density Residential
- Multiple Family Residential (High Density)
- Multiple Family Residential (Medium Density)
- Open Space - Private
- Park
- Utility



0 1,000
Feet



Commercial

The commercial designation includes a wide variety of retail, office, and service uses that vary in intensity and off-site impacts but occur within an enclosed building. These uses are auto-oriented, often located in larger buildings and have the potential to create off-site impacts. Due to these characteristics, **higher intensity commercial uses** are not appropriate in the downtown area where significant parking areas are not available and there is the potential to impact residential uses.

The majority of the commercial land uses are located along the south frontage of Wayzata Boulevard in the western business area of Long Lake. Several properties located along Willow Drive are currently utilized for industrial purposes and are located on small lots. The City encourages redevelopment activities to include the assemblage and consolidation of the small lots to provide larger development parcels. The large parcels will attract a variety of commercial uses and allow for drainage, parking, landscaping and other site improvements that will improve the appearance of the Willow Drive area.

The zoning districts that have been established to regulate the intensity and characteristics of development include the B-1 and B-2 zoning districts.

The development strategies and criteria applicable to this land use category include:

- High quality site and architectural design, and building materials are proposed to be utilized within this land use category to promote pleasing off-site views of the development;
- Significant traffic generation during the weekday and weekends is associated with certain retail developments therefore; traffic studies of large developments that have the potential to impact the integrity of the existing and planned roadway system may be required before development approvals are reviewed. Additionally, developments that potentially lower the level of service on adjacent roadways or intersections may be required to install traffic improvements to improve the level of service to its pre-development condition if City approval is granted.
- Landscaping of loading dock and delivery areas from adjacent land uses should be provided to screen noise and activity within these areas;
- Landscaping shall also consist of boulevard treatment, to enhance building design and soften parking lot areas;
- Driveway access points to developments shall be from local streets.
- Individual developments shall not access directly onto Wayzata Boulevard and cross easements between parking lots should be provided; and
- Lighting shall be limited to downcast parking lot and building illumination designed for employee and customer safety.

Business / Light Industrial

The Business/Light Industrial category allows offices, assembly, warehouse, manufacturing and other similar activities within an enclosed building to limit the amount of dust, noise, odor and other adverse impacts. This area is located in the western Long Lake area and is served by Daniels Street and local north-south streets.

The current zoning district categories that regulate industrial uses include I-1 and I-2. A limited percentage of floor space (10% of gross floor area) is permitted for retail activities associated with industrial uses. Use of the I-2 zoning district will be limited as redevelopment opportunities arise to comply with the industrial land use policies of this plan.

The development strategies and criteria applicable to this land use category include:

- Quality site design and building materials are expected to be utilized within this land use category to promote pleasing off-site views of the development;
- Loading and delivery areas shall be screened from off-site views.
- Landscaping shall consist of aesthetic treatment to provide interruption of long building walls, provide boulevard plantings along Daniels Street and other roadways and to soften parking lot areas;
- Exterior storage of materials and equipment shall be completely enclosed, or screened from all property lines by a fence or wall;
- Traffic generation from development is not expected to be significant compared to commercial land use categories; however, heavy vehicles such as trucks, etc. are characteristic of uses in this land use category. Space for truck and vehicle maneuvering needs to be planned for these uses. Weekend trip generation from the site should be minimal;
- Driveway access to new development shall be from local streets or those designed for primarily non-residential traffic. No new direct access to Wayzata Boulevard shall be allowed; and
- Lighting is limited to downcast parking lot and building illumination designed for security and safety

Park / Open Space - Private

The park land use designation is applied to all public parks and playfields. These include Holbrook Park, Nelson Lakeside Park, Dexter Park and Hardin Park. No additional park areas are planned due to the status of full development within the City. All funds obtained from future development that is subject to the park dedication provisions of the Subdivision Ordinance will be applied to redevelopment and enhancement of existing parks. The Park and Trails map is shown in Figure 2-6.

There are four private open space areas within the City, and all are associated with adjacent planned residential developments. The open space areas serve as recreational or natural areas that offset the density of each respective development. Generally, all are privately maintained by a homeowner's association and are regulated by the zoning districts associated with the development.

Institutional

Institutional uses include all municipal facilities (excluding parks), religious institutions, the West Hennepin County Pioneers Museum and other similar non-profit uses. The zoning provisions that control the characteristics of these land uses are the I - Institutional District and the conditional use permit provisions of the ordinance. There are no areas where this land use designation is substantially expanded.

Utility

These areas include the public and quasi-public facilities needed for typical urban levels of development. These land uses include the stormwater ponding areas for the City, the Minnehaha Creek Watershed District and Mn/DOT, a Metropolitan Council lift station and a cellular tower. The use of these properties is regulated by the I-Infrastructure zoning district and governmental agency requirements.

Table 2-3 Future Land Use by Land Area

2040 Land Use Category	Total (acres)	Percent of Total Land Area (%)
Business /Light Industrial	40	6.5
Commercial	37	6.0
Downtown Village Mixed Use	25	4.1
Institutional	21	3.5
Low Density Residential	271	44.3
Multiple Family Residential – Medium Density	20	3.2
Multiple Family Residential – High Density	10	1.6
Parks / Open Space - Private	33	5.3
Utility	8	1.4

FUTURE REDEVELOPMENT

Because Long Lake is fully developed, the City's growth will come from redevelopment opportunities, which have less of an impact on the local infrastructure compared to new development. Redevelopment in the City will be primarily focused on residential growth on some key sites, indicated in Figure 2-4. The biggest sites for redevelopment will be along Virginia Avenue and along Wayzata Boulevard. The goal for these areas is either medium or high-density residential developments, and in areas adjacent to the Downtown Village area, that a retail use is integrated when available.

Residential Growth Potential Based on Future Land Use Designations and Redevelopment Areas

Table 2-4: Potential Residential Redevelopment by Decade – Acres as Percentage

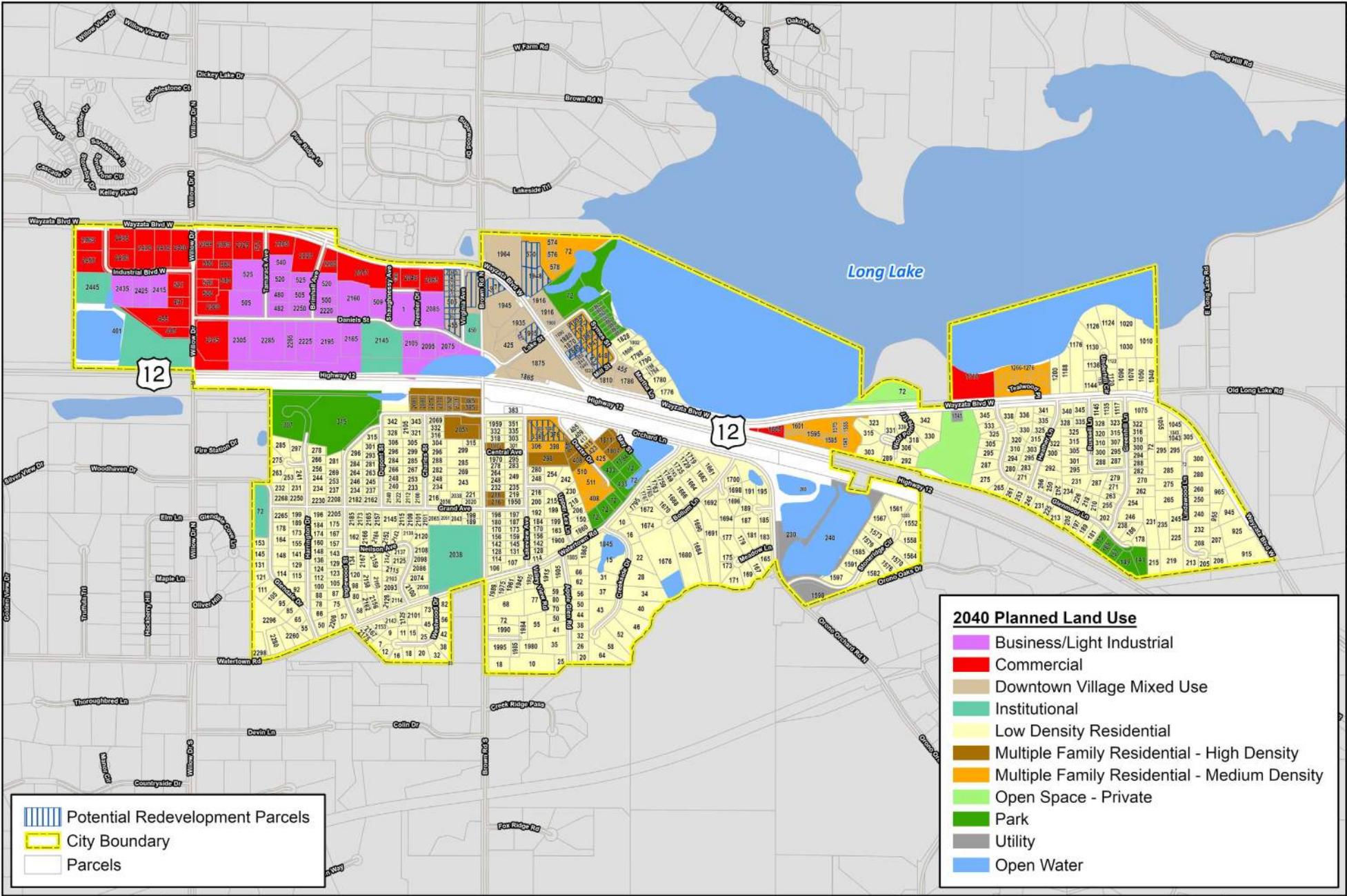
	Now – 2020		2021-2030		2031-2040		Total	
	Acres	Acres Percentage	Acres	Acres Percentage	Acres	Acres Percentage	Acres	Acres Percentage
Multiple Family Medium Density	0	0.0%	2.99	54.8%	0	0.0%	2.99	31.2%
Multiple Family High Density	0	0.0%	0	0%	0	0.0%	0	0%
Downtown Village Mixed Use	0	0.0%	2.47	45.2%	4.11	100.0%	6.58	68.8%
Total	0	0.0%	5.46	100.0%	4.11	100.0%	9.57	100.0%

Table 2-5: Potential Residential Redevelopment by Decade – Minimum Units Generated

	Land Use Type	TOTAL Dev. Acres	Acres 2019-2020	Acres 2021-2030	Acres 2031-2040	Density Range			Yield %	Min. 2019-2020	Min. 2021-2030	Min. 2031-2040	TOTAL Minimum Units	Midpoint 2019-2020	Midpoint 2021-2030	Midpoint 2031-2040	TOTAL Midpoint Units
						Min	Mid	Max									
2040 Future Land Use	Multiple-Family Medium Density	2.99	0	2.99	0.00	8	11	14	100%	0	24	0	24	0	33	0	33
	Multiple-Family High Density	0.00	0	0	0.00	14	17	20	100%	0	0	0	0	0	0	0	0
	Downtown Village Mixed-	6.58	0	2.47	4.11	14	37	60	50%	0	17	29	46	0	46	76	122
Guided Total		6.28								0	41	29	70		79	76	155

Community Designation Density	11.14
Total expected housing units	155

The Metropolitan Council identifies Long Lake as a suburban community and is expected to redevelop at a minimum average net density of 5 units per acre. Table 2-5 shows the potential redevelopment broken down by decade, and the subsequent minimum units produced as a result. Overall, there is the potential for 9.57 acres to redevelop, adding a total minimum of 70 units between 2021 and 2040. Based on these estimations, Long Lake will redevelop at a net density of approximately 11.14 units per acre, which is beyond the minimum expectation of 5 units per acre. Based on this residential growth, the City anticipates being able to accommodate the growth without significant changes or upgrades to its services and facilities.



 Potential Redevelopment Parcels
 City Boundary
 Parcels

2040 Planned Land Use

-  Business/Light Industrial
-  Commercial
-  Downtown Village Mixed Use
-  Institutional
-  Low Density Residential
-  Multiple Family Residential - High Density
-  Multiple Family Residential - Medium Density
-  Open Space - Private
-  Park
-  Utility
-  Open Water



Future Redevelopment
City of Long Lake, MN

N



0 1,200 Feet
1 inch = 1,200 feet



SPECIAL RESOURCE PROTECTION

The Metropolitan Land Planning Act requires communities in the seven-county metro area to include provisions in local comprehensive plans for historic preservation, solar access protection, and protection of aggregate resources. The following section describes the methods for planning and protecting these resources in Long Lake.

Historic Sites

There are no properties or structures in Long Lake that are on the Register of National Historic Places. Additionally, there are no properties that the Minnesota Historical Society has identified as eligible to be on the National Historic Preservation list. However, the City is committed to preservation of its history and supports the efforts of the West Hennepin County Pioneer Museum since it serves to reinforce the quality of life in Hennepin County. The City will work with the State and the Hennepin County Historical Society to identify and publicize any potential historic resources and to expand efforts to protect and preserve them.

Aggregate Resources

According to the Aggregate Resources Inventory of the Seven County Metropolitan Area, Minnesota, 2000, there are no significant aggregate resources in the Long Lake area.

Solar Access

Minnesota Statutes require an element for the protection and development of access to direct sunlight for solar energy systems. The purpose of this legislation is to prevent solar collectors from being shaded by adjacent structures or vegetation and to ensure that development decisions do not preclude the possible future development and use of solar energy systems. To ensure the availability of solar access, the City of Long Lake will, whenever possible, protect access to direct sunlight for solar energy systems from the principle structures. Currently, the structure setback and height standards within the Zoning Ordinance are sufficient to prevent potential interference to solar collectors from adjacent structures and vegetation.

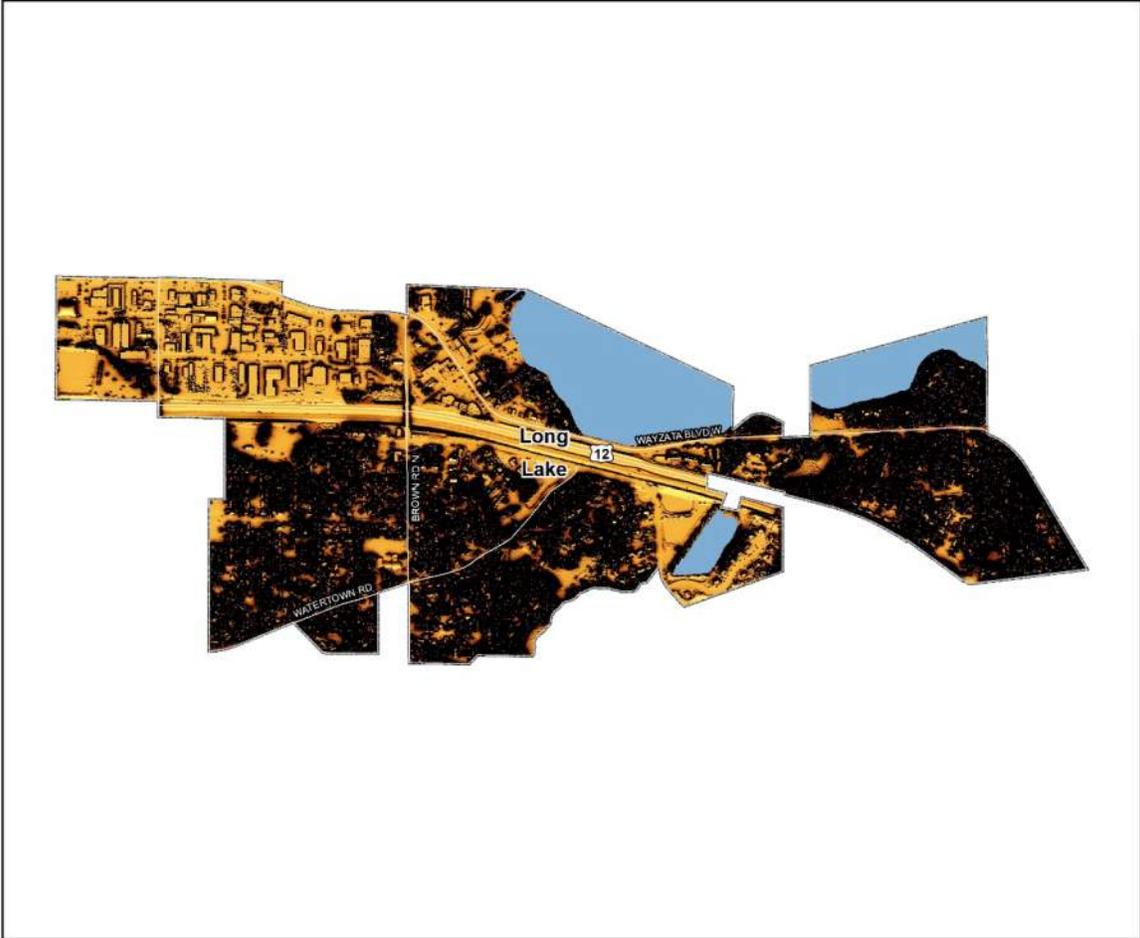
The gross solar potential and gross rooftop potential are expressed in megawatt hours per year (Mwh/yr.). The calculations below Table 2-6 reveal potential solar resources before removing areas unsuitable for solar development or factors related to solar energy efficiency.

Table 2-6: Solar Resources *Source: Metropolitan Council*

Gross Potential (Mwh.yr)	Rooftop Potential (Mwh/yr)	Gross Generation Potential (mwh.yr) ²	Rooftop Generation Potential (Mwh/yr) ²
972,682	122,818	97,268	12,281

Figure 2-5 Gross Solar Potential
Source: Metropolitan Council

Gross Solar Potential City of Long Lake, Hennepin County



12/21/2016



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

- High : 1275596
- 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.

NATURAL RESOURCES

The City is committed to protecting other natural resources including water quantity and quality, wetlands, floodplains, shoreland areas and significant vegetation. Policies and programs to protect, enhance and mitigate impacts to these resources are documented in the *Water Supply Plan* and elsewhere in this plan.

CHAPTER 3: HOUSING

BACKGROUND

Housing Tenure, Type, and Age

Based on 2019 U.S. Census data, Long Lake has a total of 822 housing units, and 798 total households with an average household size of 2.41 people. Of the housing units, approximately 65 percent are detached single-family residences, 12 percent are attached single family residences, 22 percent are multi-family residences, and 0.5 percent are manufactured homes. Of the 797 occupied housing units in Long Lake, 67.6 percent are owner-occupied. The population share living in renter-occupied housing units is 29.3 percent, and it is estimated that 2.9 percent of housing units are vacant. Housing tenure and type is summarized in Table 3.1 below.

Table 3-1 Housing Units by Occupancy Status and Tenure

	Census 2010		2019	
	Number	Percent	Number	Percent
Total Units	768	100%	822	100%
Occupied	735	95.7%	797	97.0%
Owner	515	67.1%	556	67.6%
Renter	220	28.6%	241	29.3%
Vacant	33	4.3%	24	2.9%

Table 3-2 Housing Type

Single-family units	Multi-family units	Manufactured homes	Other housings units
610	156	0	0

Approximately 65 percent of Long Lake's housing stock was built in the three-decade span between 1960 and 1989, and the median year that a home was built is 1972. Residential building has slowed in recent years but can be attributed to the fact that Long Lake is nearly fully developed. The housing stock in Long Lake is aging, with a 45 percent being 50 years or older.

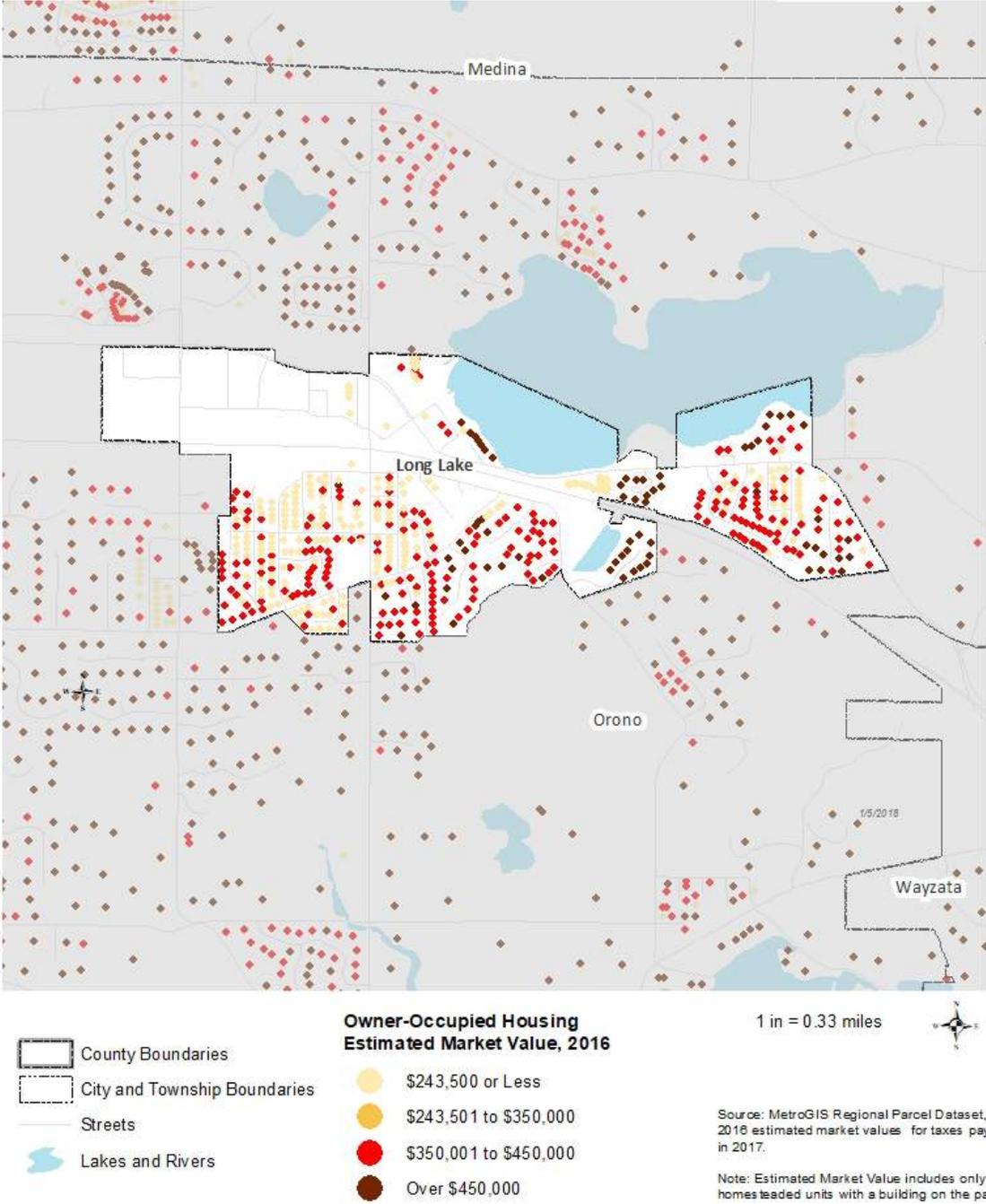
Table 3-3 Housing Units by Year Structure Built

Year Built	Number of Housing Units
1939 or earlier	60
1940 to 1949	24
1950 to 1959	113
1960 to 1969	150
1970 to 1979	193
1980 to 1989	160
1990 to 1999	28
2000 to 2009	49
2010 to 2013	2
2014 or later	2
Median Year Structure Built	1972

Median Home Value

According to the 2017 American Community Survey the median gross rent in Long Lake was \$952 and the median home value was \$274,100. Figure 3-1 shows owner-occupied housing units by their estimated market value.

Figure 3-1: Owner Occupied Housing by Estimated Market Value



EXISTING HOUSING AFFORDABILITY

Of the 822 total housing units in Long Lake, nearly half (48.5 percent) are affordable to households that are at or below 80% of AMI, or households making less than \$65,700 annually. For those households with yearly incomes of less than \$25,740, or below 30% of AMI, a much smaller percentage (6.5 percent of Long Lake’s housing units) are considered affordable.

Table 3-4 Percent of Affordable Housing Units

Units affordable to households with income at or below 30% of AMI	Units affordable to households with income 31% to 50% of AMI	Units affordable to households with income 51% to 80% of AMI	Total Units affordable to households with income at or below 80% of AMI	Percent of units affordable to households with income at or below 80% AMI
54 (6.5%)	70 (9.1%)	275 (35.9%)	399	48.5%

There are 39 publicly subsidized housing units in Long Lake, all specifically identified as senior housing. All 39 units are located within the Hillside Terrace apartments.

Table 3-5 Public Subsidy Units

Senior Units	Units for people with disabilities	All others	Total publicly subsidized units
39	0	0	39

While the price of housing units relative to area median income is one measure of housing affordability in a community, another way to examine the impact of housing costs is by looking at cost-burdened households. Households are “cost-burdened” if their housing costs are at or over 30 percent of their income. This is an indicator of households that are spending a disproportionate share of their income on housing. The implications of a housing cost burden are most severe for households in the lowest income tier.

Table 3-5 illustrates the number of households that are cost-burdened in Long Lake, by AMI income level. About 17 percent of Long Lake’s total households are cost-burdened, and the cost-burdened households are spread evenly between the income tiers.

Table 3-6 Cost Burdened Households

Income at or below 30% of AMI	Income 31% to 50% of AMI	Income 51% to 80% of AMI	Total Cost Burdened Households	Percent of Cost-Burdened Households
43	50	38	131	16.4%

EXISTING HOUSING NEED

One in six households in Long Lake are cost-burdened

One in six households meets the definition of cost-burdened, meaning they are paying more than 30 percent of their income toward housing. With housing costs outpacing many wages, it is becoming increasingly important to focus on affordable housing. According to the Metropolitan Council, housing is considered affordable if it is priced at or below 30 percent of the gross income of a household earning 50 percent of the Twin Cities median family income. In 2017, the area median income (AMI) for the seven-county Minneapolis-St. Paul area adjusted by the Department of Housing and Urban Development for a family of four was \$90,400. Therefore, in 2017, housing was considered affordable if annual housing costs for a family of four did not exceed 30 percent of \$45,200, which translates to \$13,560 per year, or \$1,130 per month, for housing.

As market challenges the production of housing that is affordable, Long Lake must prioritize support for affordable housing development by using the tools available at the City's discretion and strengthening partnerships with agencies to promote affordable housing production. Programs and fiscal devices to assist with this are listed in the Housing Tools section.

The housing stock in Long Lake is aging, and residents will have increasing maintenance and upkeep requirements in the coming decades.

Long Lake's affordable housing stock is predominantly located in single-family areas that are at or older than 50 years of ages and may not be as attractive or suitable for today's households as they once were. Developing strategies to maintain and support Long Lake's housing stock, particularly for those households with fewer resources will remain a significant challenge in the years to come and will be important to continue to attract newcomers to the City.

Diversify housing options to allow residents to age in place.

Three-quarters of the housing stock in Long Lake are single-family residences, with limited availability of options for multi-family living, particularly for an older population looking for options other than a traditional single-family home. Demographic data indicates that the population is aging, and diversifying housing options to allow residents to "age in place" provide opportunities to stay in Long Lake throughout all life stages. These diversified housing options may include appropriately sized and equipped single-family homes, independent living facilities, or more advanced care facilities with medical staff.

PROJECTED HOUSING NEED

Between 2020 and 2040, Long Lake is expected to grow to a population of 1,990, which is an increase of 180 people. It is also forecasted that the total households in Long Lake will increase from 790 to 900 households, an increase of 110 households. Because Long Lake is fully built out, there is little undeveloped land available, so housing development will happen through redevelopment.

Based on Long Lake's Land Use Plan, several parcels have been re-guided for 2040 to high-density residential to help accommodate the expected growth. Before 2040, the City expects that 4.66 acres will redevelop, all consisting of residential development in the Downtown Village Mixed Use District, the

Multiple Family Residential High Density, and Multiple Family Residential Medium Density. These parcels planned for redevelopment will accommodate the growth expected within the City.

PLANNING FOR AFFORDABLE HOUSING

Given the growth forecasted for the 2021-2030 decade, the Metropolitan Council has allocated the following share of the region’s affordable housing need for that decade to the City: 15 units at 30% AMI or less, 8 units at 31-50% AMI, and 5 units at 51-80% AMI; or 28 units total.

Table 3-7 Long Lake’s Affordable Housing Need

Affordable Housing Need Allocation	
At or Below 30 % AMI	15 units
From 31 to 50% AMI	8 units
From 51 to 80% AMI	5 units
Total Units	28 units

As demonstrated in the Land Use chapter of this Plan, Long Lake has guided sufficient land areas to meet its affordable housing allocation of 28 units.

HOUSING TOOLS

Programs

Numerous programs are available to help cities meet their existing and future housing needs. Cities can consider utilizing certain programs such as fee waivers and/or adjustments to facilitate affordability. In addition, cities may also consider encouraging and working with potential developers who plan to use federal low-income housing tax credits to construct affordable rental housing. Other options include affordable housing assistance or development and preservation programs available through the local, county, state, and federal government. Cities may consider the following programs in order to meet its housing goals:

Minnesota Housing Consolidated Request for Proposals: The Minnesota Housing Finance Agency provides a once annually request for proposal (RFP) where affordable housing developers can apply for funding to construct affordable housing. Long Lake will encourage developers to apply to the Consolidated RFP to provide affordable housing for those residents in need. The City will consider giving priority to proposals that include rental units affordable at 30% AMI or below and owner-occupied units. The RFP is a useful tool to support the development of rental housing units affordable at 50% AMI or below.

Community Development Block Grants (CDBG): The U.S. Department of Housing and Urban Development (HUD) provides CDBG funds to communities with over 45,000 residents for the use of providing and maintaining affordable housing. Hennepin County administers these CDBG funds for the City of Long Lake. Long Lake encourages the Hennepin County to use CDBG funds to provide affordable housing for those residents in need whenever the CDBG funds are available. Long Lake will consider

applying for CBDG funding on behalf of the developer when a housing project qualifies for CDBG funds and the project complies with the other objectives of the Comprehensive Plan. CDBG is a useful tool to preserve both rental and ownership units affordable at 80% AMI and below.

HOME Funds: The HOME Investment Partnerships Program (HOME) is a flexible federal grant program that allows Hennepin County to fund affordable housing activities for very low and low-income families or individuals, homeless families, and persons with special needs. Long Lake encourages the Hennepin County to use HOME funds to provide affordable housing for those residents in need whenever the HOME funds are available. Long Lake will consider applying for HOME funding on behalf of the developer when a housing project qualifies for HOME funds and the project complies with the other objectives of the Comprehensive Plan. HOME funds are a useful tool for both the preservation and development of both rental and ownership units affordable at 50% AMI and below.

Neighborhood Stabilization Program (NSP) Grants: The NSP was established by HUD for the purpose of stabilizing communities that have suffered from foreclosures and abandonment. The focus of this program is the purchase, rehabilitation and resale of foreclosed and abandoned properties. NSP is currently not funded, but Long Lake supports the continuation of the NSP program should funding become available again in the future. NSP funds were a useful tool to preserve ownership units affordable at 80% AMI and below.

Affordable Housing Incentive Funds (AHIF): The AHIF operates under the Hennepin County HRA. This loan program funds the development of affordable housing units for very low-income households. Long Lake encourages the Hennepin County HRA to use AHIF funds to provide affordable housing for those residents in need whenever the AHIF funds are available. Long Lake will consider applying for AHIF funding on behalf of the developer when a housing project qualifies for AHIF funds and the project complies with the other objectives of the Comprehensive Plan. AHIF is a useful tool to develop rental units affordable at 30% AMI and below.

Repair and Rehabilitation Support: Many programs support housing repair and rehabilitation assistance for homeowners and rental housing properties. These sources of assistance can be accessed through the County HRA, Greater Minnesota Housing Corporation, Minnesota Housing, and other non-profit organizations. Repair and rehabilitation support are useful tools to preserve ownership units affordable at 80% AMI and below.

First time homebuyer, down payment assistance, and foreclosure prevention programs: The City encourages residents to access existing programs available through Hennepin County, the Minnesota Homeownership Center, Minnesota Housing, and other nonprofits. Long Lake aspires to create strong partnerships with external organizations who offer these programs and seek to provide referral information wherever possible. These programs will be especially valuable to households at or below 80% AMI who would otherwise face extreme hardships in purchasing or maintaining a home.

Rental Assistance: Hennepin County and local nonprofits offer some emergency funds to households or individuals in crisis, and who qualify financially. Metro HRA offers portable Section 8 vouchers on a limited basis that can be used on rental properties throughout the metro. The City aspires to connect

income-qualifying residents to these resources when they are available if it helps them stay in their homes and in the community while managing a crisis. This strategy will be implemented in conjunction with the effective referrals activities. The City will encourage applicants to use rental assistance to support the development of both rental and ownership housing units that are affordable at or below 50% of the AMI, if the project complies with the other objectives of the Comprehensive Plan. Assistance is also available for projects that work to retain the quality of existing affordable housing that is primarily available for those at or below 50% AMI.

Livable Communities Grants: Long Lake is a participating community in the Metropolitan Council's Livable Community Act (LCA) programs. Long Lake will consider applying for livable communities grants on behalf of developers who propose projects that meet the City's existing and/or future housing needs, including housing affordable at 80% AMI and below.

Local Fair Housing Policy: The Metropolitan Council requires a local Fair Housing policy to draw down LCA awards for affordable housing. The City will consider adopting a local Fair Housing policy if and when it applies for and is awarded LCA funds for affordable housing.

Land Trusts: Long Lake has access to the West Hennepin Affordable Housing Land Trust, also known as Homes Within Reach (HWR). This program uses the Community Land Trust practice to create and preserve affordable homeownership for families in suburban Hennepin County. Currently, Long Lake does not have an active Homes Within Reach program, but joining this program is something the City will consider.

Effective Housing Referrals: The City supports providing appropriate resources and education to existing and prospective residents about housing support programs serving the area. Many of these programs are housed under Hennepin County, Minnesota Housing, the Metropolitan Council, or other local organizations such as Habitat for Humanity, the Greater Minnesota Housing Fund, and the Greater Metropolitan Housing Corporation. Effective housing referrals will increase opportunities for residents to enter the community who would otherwise have barriers and improve the likelihood of existing housing maintenance. This strategy will be used consistently to assist with housing needs. The City will use effective referrals to support the development of both rental and ownership housing units that are affordable at or below 50% of the AMI, if the project contributes to a wide spectrum of housing (including types and price points) in the City. The City will also use effective referrals for projects targeting 80% AMI or below which would attract younger residents.

Rental Licensing and Inspection: Cities can implement rental licenses and inspections to protect the health, safety, and welfare of residents living in rental property, as well as to provide a mechanism for a city to maintain property values and ensure the quality of the community's housing supply. Long Lake has 246 rental units representing only 32% of the total housing units within the community. Long Lake currently requires registration of rental units. This City will not implement an inspection program at this time because of staffing implications associated with such a program. Long Lake will re-evaluate the rental licensing and inspection program should the number of rental units within the community increase.

Low Income Housing Tax Credit (LIHTC): With LIHTC, developers apply for tax credits to offset costs at the time of development. The City does not fund this type of assistance. Long Lake will consider stating its intent of support for developers who pursue LIHTC. The City will consider working in partnership with Hennepin County and Minnesota Housing to preserve existing affordable units funded by LIHTC that may expire during the lifetime of the plan.

Participation in Housing-Related Partnerships and Organizations: City staff or elected officials will consider increased involvement in events, collaborations, or programs that support furthering fair and affordable housing. Staying proactively involved in affordable housing discussions with other jurisdictions and agencies will allow Long Lake to stay apprised of current programs, opportunities, and best practices.

Partnerships with sources of preservation financing: Affordable housing preservation funding is available through MN Housing, Greater Minnesota Housing's NOAH Impact fund and others. The City will consider funding opportunities as they become available that could help incentivize owners to preserve existing affordable housing units and maintain/improve their properties.

Housing Improvement Areas: A housing improvement area (HIA) is a defined area in a city in which housing improvements in condominium or townhome complexes may be financed with the assistance of the City, or the City's economic development authority (EDA) or housing and redevelopment authority (HRA). The City would consider an HIA if approached by a homeowner's association to maintain the existing affordability at the condominium or townhome complex.

Site Assembly and/or Acquisition: Cities have the authority to acquire properties for housing through a number of mechanisms including through transfer of tax-forfeit properties from Hennepin County or through outright purchase. Long Lake will monitor and consider acquisition of properties that can be assembled and developed into a public good project, including the production of affordable housing or maintenance of existing affordable housing. Such a strategy could be used to allow the City to put out specific RFP requirements to developers in order to achieve a project that includes housing affordability, specifically that meet thresholds for 50 percent AMI and below for rental housing and 80 percent AMI and below for ownership.

Fiscal Devices

Fiscal devices, such as revenue bonds, tax increment, financing, or tax abatement can be used to help ease the construction and availability of affordable housing in the City of Long Lake.

Development Authorities: Long Lake does not have its own Housing and Redevelopment Authority (HRA) and depends on Hennepin County Coordinate HRA for affordable housing and redevelopment services. Hennepin County can construct, finance and/or partner with private developers to provide affordable housing for those Long Lake residents in need. Long Lake will not create its own development authority. Development authorities are a useful tool to support the development of both rental and ownership housing units affordable at 50% AMI or below.

Housing Bonds: Minnesota State Statute allows HRAs the ability to issue housing bonds to provide affordable housing. Long Lake encourages the Hennepin County HRA to issue housing bonds to provide

affordable housing for those residents in need. Long Lake will not issue bonds for housing separate from the tax increment financing process described below. Housing bonds are a useful tool to support the development of both rental and ownership housing units affordable at 50% AMI or below.

Tax Abatement: Cities may issue bonds to be used to support the construction of affordable housing and use a portion of the property tax received (tax abatement) from the development to finance these bonds. Long Lake will not use Tax Abatement. This removes this property taxes revenue from paying for the services needed for this property, its residents and the community in general. The City would rather use TIF as an affordable housing finance tool because of its use of the increment from all of the taxing authorities and therefore Long Lake will not use tax abatement to finance housing. Tax abatement is a useful tool to support the development of both rental and ownership housing units affordable at 80% AMI or below.

Tax Increment Financing: Long Lake will consider creating housing districts to create a tax increment financing (TIF) district. The TIF bonds issued on this district are to be used to support the construction of affordable housing and entire property taxes received above the original tax value (increment) from the development to finance these bonds. This removes this property taxes revenue from paying for the services needed for this property, its residents and the community in general. The City will consider developing a TIF policy within 18 months of the approval of the Comprehensive Plan by the Metropolitan Council to determine when the level of affordable housing and the guaranteed length of affordability to provide a public benefit great enough to justify the use of TIF. TIF is a useful tool to support the development of both rental and ownership housing units affordable at 50% AMI or below.

Official Controls

Official controls and land use regulation can be used to assist in the construction of affordable housing units. Controls and regulations can also be used to simplify the process of expanding local housing options.

Fee Waivers or Adjustments: Cities may waive or reduce fee to reduce the cost of construction of affordable housing. Conversely, State rules require that the fee that a city charges be related to the cost of providing the services for which the fee are collected. This waiver or reduction could create a deficiency in the funding for services which would be required the use of general funds to resolve. Cities can develop a fee waiver or reduction policy to determine when the level of affordable housing and the guaranteed length of affordability provide a public benefit great enough to justify the reduction or waiver of development fees. Long Lake will consider the use of fee waivers or adjustments for long-term, high-quality affordable housing during the period of 2021-2030. Fee waivers or adjustments are a useful tool to support the development of both rental and ownership housing units affordable at 80% AMI or below.

Zoning and Subdivision Policies: The City has the ability to adjust its zoning and subdivision regulations through a planned unit development (PUD). Zoning and subdivision regulation are created in part to mitigate the impacts that a development may have on adjoining properties. When considering a PUD for affordable housing, cities should determine when the level of affordable housing and the guaranteed length of affordability provide a public benefit great enough to justify the potential impacts that would result from a deviation in the zoning or subdivision regulations. The City of Long Lake will consider the

use of zoning and subdivision ordinance deviations through the use of PUD for long-term, high-quality affordable housing during the lifetime of this plan. PUD is a useful tool to support the development of both rental and ownership housing units affordable at 80% AMI or below.

4(d) Tax Program: Rental properties may receive a property tax break provided that the property has income and rent restricted units serving households at 60% AMI and below. The City of Long Lake will consider using 4d tax incentives to further promote the preservation of affordable multifamily housing during the lifetime of this plan. 4(d) tax bond funds are a useful tool to support the development of rental housing units affordable at 50% AMI or below.

HOUSING GOALS

Goal 1: The City supports the development of subdivisions with a variety of housing types.

Variation in housing types, sizes, and styles will help to better achieve an intergenerational community that supports households and individuals at various stages of life.

Goal 2: The City will support helping people stay in the homes they have in order to remain in the community they enjoy.

There are established programs that help households manage the financial burden of homeownership and maintain a high quality of housing through grants and loans.

Goal 3: The City supports housing for people during all stages of their lives.

Long Lake is predominately developed with single-family housing. Trends indicate that extended families desire to live near each other, but not necessarily in the same home. The City supports development of a variety of housing options so that young adults can afford to move out of their parent's home and stay in Long Lake; empty nesters should have ample smaller ownership opportunities to free up the single-family housing for new families; and allow housing opportunities for grandparents to live near their children and grandchildren.

CHAPTER 4: TRANSPORTATION

The transportation system in the Long Lake area includes the City, Hennepin County and State roadway network as well as bicycle/pedestrian infrastructure, public transit services and proximity to aviation facilities.

Transportation Analysis Zones (TAZ)

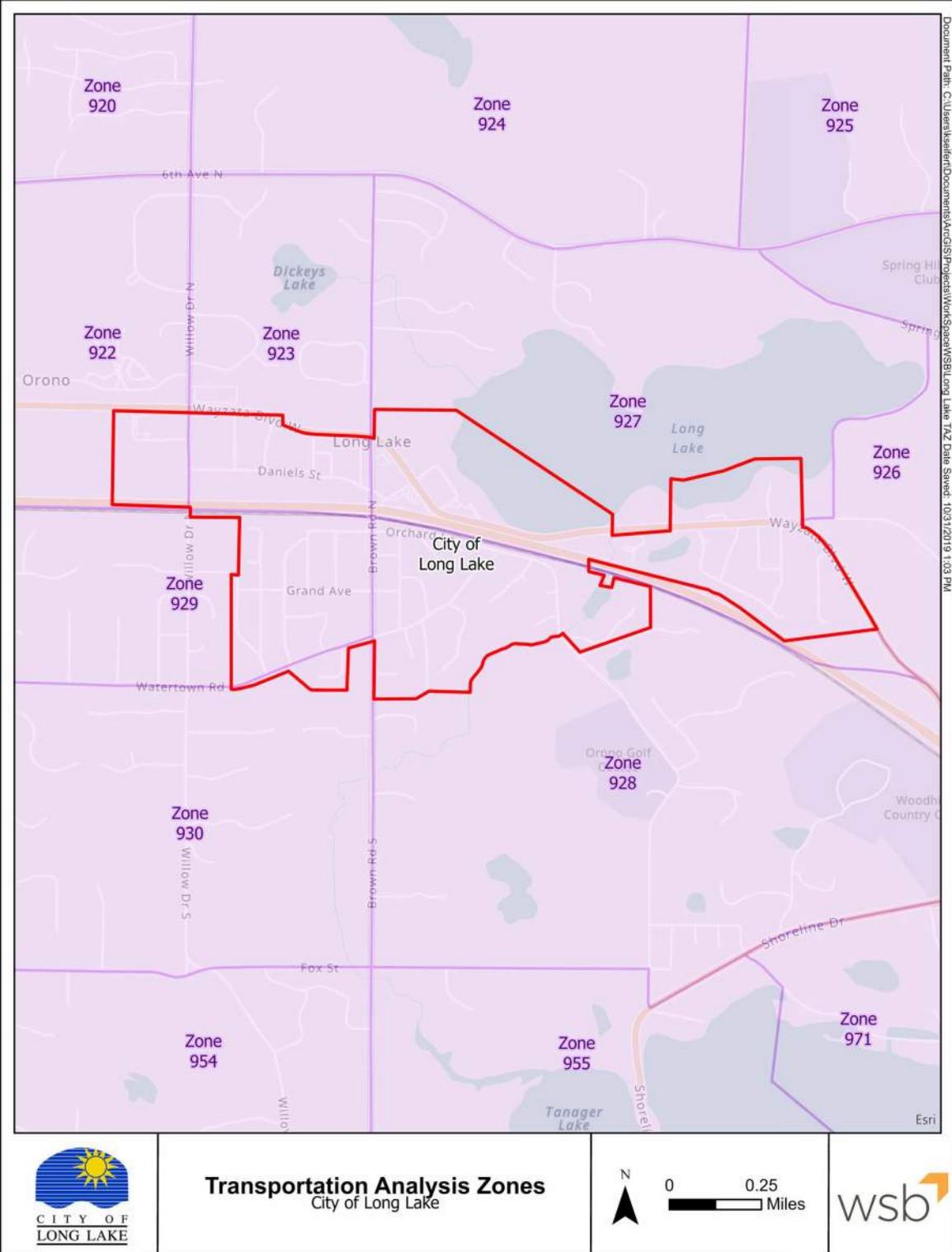
The Metropolitan Council utilizes the population, household and employment forecasts within each Transportation Analysis Zone (TAZ) to anticipate future traffic volumes and characteristics on the regional roadway system. The City of Long Lake is within TAZ 922, 923, 927, 928, 929 and 930 as shown in Figure 4 -1. All of the TAZs are bisected by the City boundary, meaning that there is not a single TAZ that is wholly within Long Lake.

The forecasted population, household and employment growth planned within Long Lake according to the 2040 Land Use Plan is depicted on Table 4-1 below.

Table 4-1 Transportation Analysis Zones 2010- 2040

TAZ	2010 Census			2020 Estimate			2030 Forecast			2040 Forecast		
	POP	HH	EMP	POP	HH	EMP	POP	HH	EMP	POP	HH	EMP
922	0	0	275	0	0	300	0	0	375	0	0	400
923	19	7	475	19	7	510	130	55	540	130	55	550
927	555	231	308	576	246	345	606	250	360	620	260	400
928	560	229	10	575	256	10	580	268	10	586	280	20
929	580	243	25	586	259	25	590	275	25	600	283	30
930	54	22	0	54	22	0	54	22	0	54	22	0
2040 Land Use Plan Totals	1768	732	1093	1810	790	1190	1960	870	1310	1990	900	1400

Figure 4-1: Transportation Analysis Zones



As shown in TAZ Table 4-1, Long Lake is expected to grow in population, households, and employment between now and 2040, but growth will not occur evenly between each of the TAZs. The TAZs that will experience the most population and household growth coincide with the zones where land use changes are planned for additional residential capacity and uses. The TAZs with the most residential growth include 923, 927, 928 and 929. The TAZs that will experience the most significant employment growth coincide with commercial, industrial, and mixed uses and include TAZs 922, 923, and 927.

Because Long Lake is considered fully developed and much of the growth will come in the form of redevelopment, the guided future land uses are strategic to allow increased densities in locations with better access to highways and transit, and to allow a mix of uses in the “downtown village” area where there may be increased non-vehicular transportation opportunities to access nearby amenities. The TAZ table reflects these assumptions.

2040 FUNCTIONAL CLASSIFICATION

Figure 4-2 identifies roadways in the Long Lake area, including their jurisdiction and existing “functional classification.” These roadways are under the jurisdiction of various levels of government, including MnDOT, Hennepin County, and the City. Limited access roadways that carry larger volumes of traffic at higher speeds tend to be under the jurisdiction of MnDOT (e.g., Interstates, U.S. and State Trunk Highways).

Roads that carry local traffic are under the jurisdiction and the responsibility of the City. Hennepin County has jurisdiction over roads that carry intermediate levels of traffic and which provide connections among communities in the County. County roadways include those that receive direct aid from MnDOT, County State Aid Highways (CSAH's), and general County Roads.

- The functional classification of a roadway is based upon:
- The volume and speed of traffic that the road can carry,
- The amount and kind of access to the road, and
- The distance one can travel on the road.

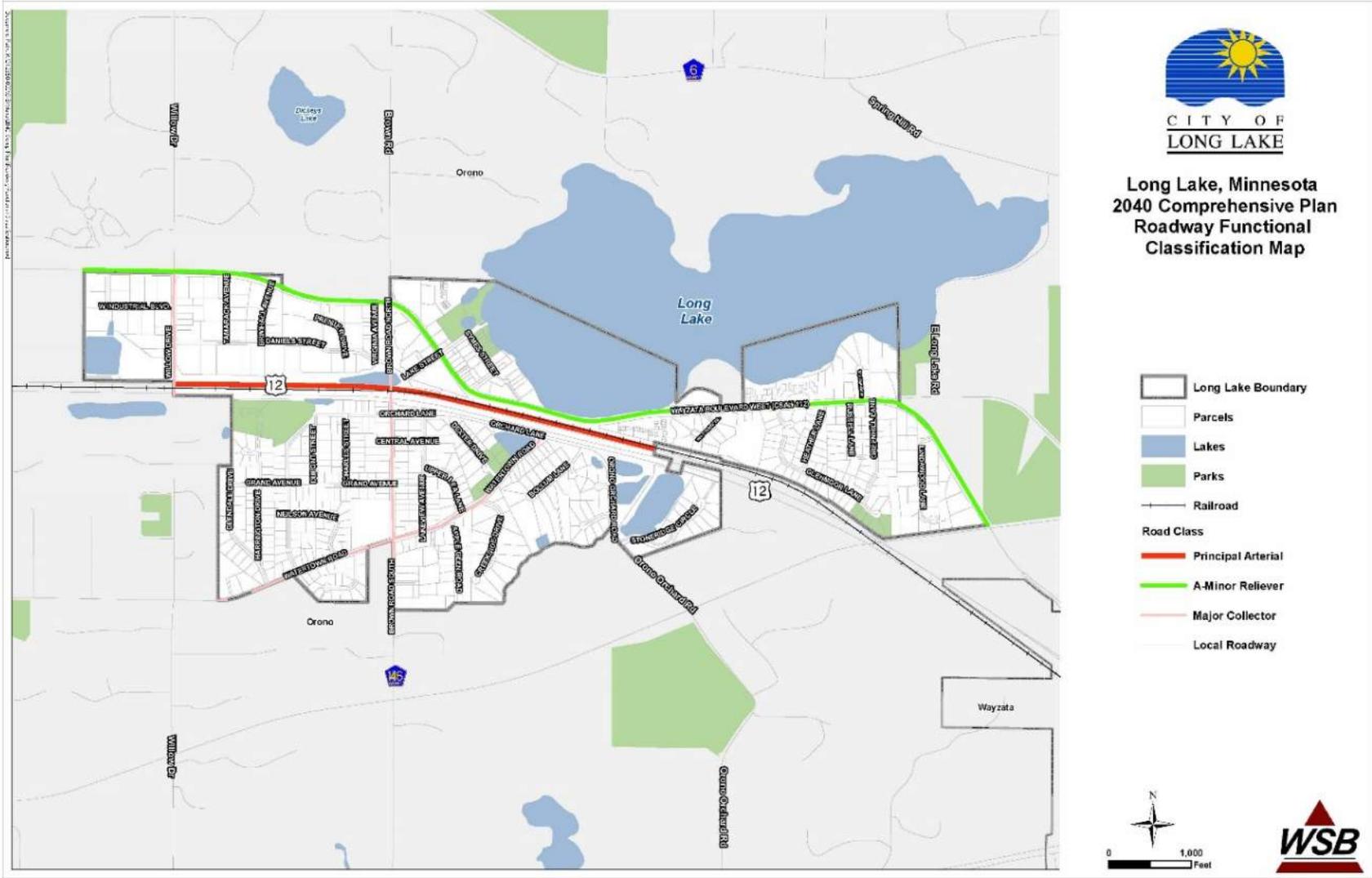
A description of the functional classification of roads in general as developed by the Metropolitan Council, and the existing classification of roads in the Long Lake area is presented in Table 4-2 and are also illustrated in Figure 4-2.

Table 4-2: Functional Classification

Functional Classification	Description of Classification	Existing Classifications
Principal Arterial	<ul style="list-style-type: none"> Roads that compose the metropolitan highway system Includes all interstate freeways and other major roadways. Provide long distance connections within the metro area. Connections with other roadways are limited to other principal arterials and a minimum number of other roads. Intersections are generally spaced between 3 - 6 miles in developing areas and between 6 - 12 miles in rural areas. 	TH12
A-Minor Reliever	<ul style="list-style-type: none"> Generally, provide mobility for shorter distances than principal arterials. Provide interconnection between other arterial roadways and between regional business concentrations, often supplementing principal arterials. Connect developed metro area with cities and towns outside Twin Cities area. Spacing of interconnections generally occurs as needed. 	Wayzata Boulevard West (CSAH 112)
Collector	<ul style="list-style-type: none"> Provide supplemental interconnection among rural growth centers. Connect to minor arterials, other collectors and local streets 	Willow Drive Brown Road (CSAH 146) Watertown Road
Local	<ul style="list-style-type: none"> Created as needed to access properties. Connect to a few minor arterials. 	All City streets

Source: Metropolitan Council

Figure 4-2: Roadway Functional Classification Map



Principal Arterials

The City's only principal arterial is TH12 which bisects the City traveling East-West. This roadway has four lanes and is not planned to add or remove any lanes. There are no proposed improvements for this roadway at this time.

A-Minor Arterials

The City's only A-Minor Reliever is Wayzata Boulevard West (CSAH 112). This roadway is two lanes entering and exiting Long Lake and is two lanes with a shared turn lane in the center through the downtown. This roadway was reconstructed in 2019 and there are no proposed improvements for the roadway at this time.

Access Management

The City understands that access management for state and county roadways is under their respective jurisdictions. Both MnDOT and Hennepin County have their own access management policies applicable to each of their roadway systems, respectively. The City maintains its own policies on access to its local roadway network. These policies are similar to those of the Hennepin County and the State of Minnesota but are more appropriately formed for a local municipal roadway system.

Preservation of Future Rights-of-Way

The City has not identified any future rights-of-way that need to be preserved.

EXISTING AND FORECASTED TRAFFIC

Figure 4-3 shows existing traffic volumes for the major roadways in Long Lake. Currently, the highest volumes of daily traffic (10,000 – 15,000 AADT) occur on Wayzata Boulevard/CSAH 112 east of Willow Drive N. Traffic volumes decrease to 5,000 to 10,000 AADT on Wayzata Boulevard west of Willow Drive N. Brown Road N see less than 5,000 AADT for the entire roadway within Long Lake.

Figure 4-4 shows the forecasted traffic for 2040 in Long Lake. The roads that have forecast data available are Wayzata Boulevard/CSAH 112 and Brown Road S/CR 146. The highest volume of forecasted traffic is anticipated to occur along Wayzata Boulevard between Willow Drive and Lake Street, with an estimated 15,000 – 50,000 AADT. The other parts of Wayzata Boulevard, and CR 146 is not expected to see significant traffic increases.

Figure 4-3: Current Traffic Volumes

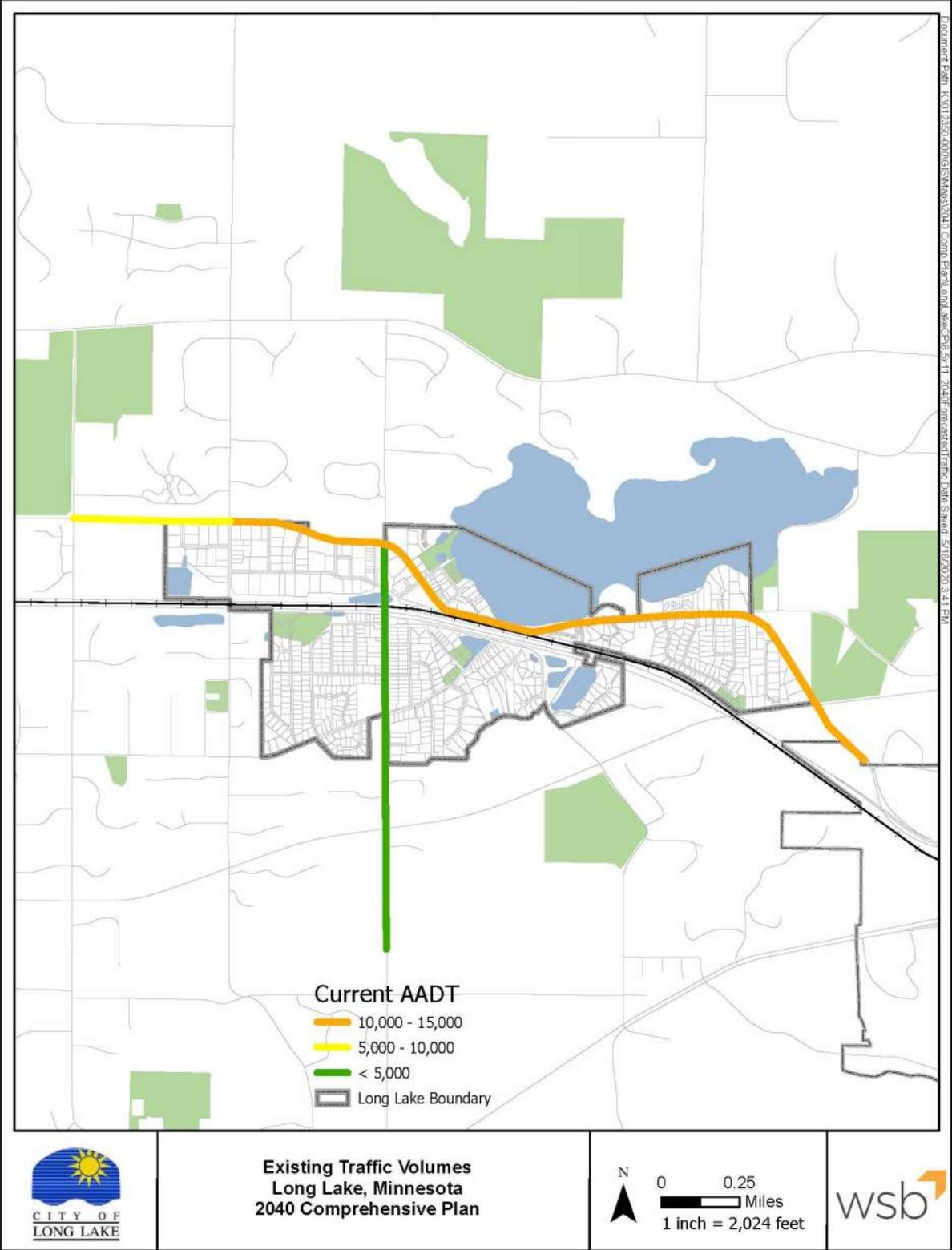
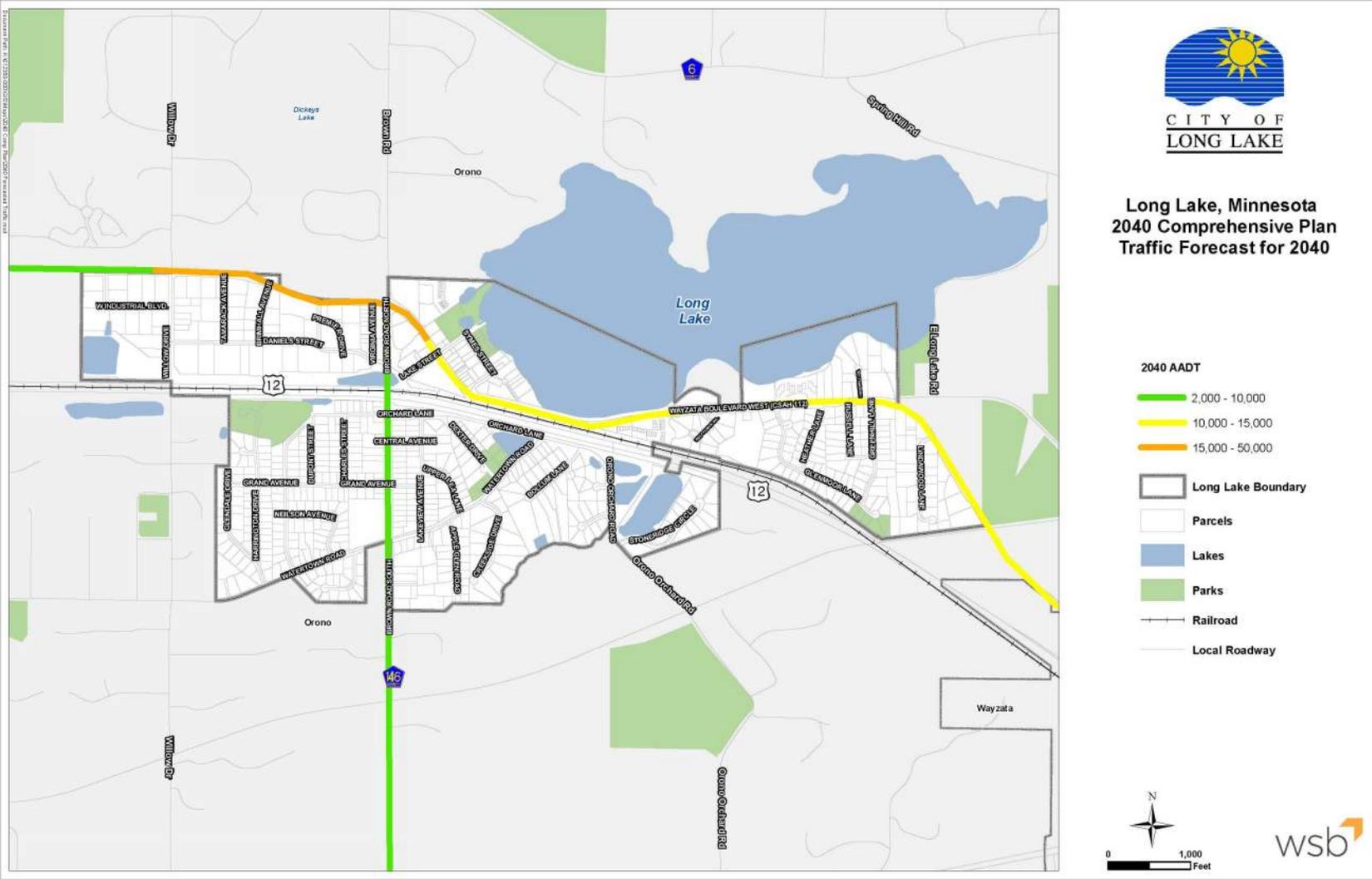


Figure 4-4: 2040 Traffic Forecast Map



TRANSIT

The Metropolitan Council oversees the planning and service of the region's transit system, which currently includes regular bus service, dial-a-ride services including Metro Mobility and Transit Link, high occupancy vehicle lanes and ramp meter bypasses, bus-only shoulder lanes, park-and-ride lots and Light Rail Transit service. The Council determines policies for transit based on the need for different types of service as well as the potential demand for service. The 2040 Transportation Policy Plan identifies the City of Long Lake as within Transit Market Area V. The characteristics of this area are defined by the plan as having very low population and employment densities and tends to be primarily Rural communities and Agricultural uses. General public dial-a-ride service may be appropriate here, but due to the very low-intensity land uses these areas are not well-suited for fixed-route transit service.

The following regional transit services are available in Long Lake to qualifying residents:

- Fixed-route bus service: The City is served by bus route 674 which offer peak hours service into and from Downtown Minneapolis. A map of the existing bus service is shown in Figure 4-5.
- Metro Mobility is a door-to-door service for certified riders who are unable to use regular fixed-route bus service due to a disability or health condition. This service is offered in Long Lake on weekdays from 5:15 AM – 6:45 PM; Saturday 8 AM – 4 PM; Sunday 8 AM – 4 PM.
- Transit Link is a shared-ride public transportation service where regular route transit service is infrequent or unavailable. Standard service hours are weekdays, Monday through Friday from 6 AM to 7 PM.
- Metro Vanpool provides financial assistance for vanpools of five or more people, including a volunteer driver, commuting to and from work destinations throughout the region not well served by the regular-route transit network.

The City does not have any park-and-ride facilities, transit stations, or transit centers. No changes are planned to transit service in the Long Lake area. The City will continue to explore the potential for park-and-ride services as appropriate, as part of redevelopment activities. Additionally, the City will encourage discussion of feasible transit opportunities with MnDOT and Metro Transit as redevelopment continues in the downtown area.

Figure 4-5: Transit Routes



AVIATION

No metropolitan airports pose any potential impacts on the City of Long Lake, nor are there any airspace restrictions affecting development in the City. The City will notify the Metropolitan Airports Commission and MnDOT if any new structures are proposed in excess of 200 feet above ground level.

FREIGHT

Railroads

One Class I Major Railroad operated by Union Pacific is located along Highway 12, which bisects Long Lake. The railway line is shown in Figure 4-6, Metropolitan Freight System. There are no barge facilities, truck or intermodal freight terminals within the community.

Goods Movement

The City has a large industrial park area north of Highway 12 from Brown Road out towards the City's limits. The uses within this area are predominantly auto-oriented uses such as repair shops or boat storage, however the City has seen an increase in warehousing and production facilities in this area. Figure 4-7 provides current heavy commercial average annual daily traffic (HCAADT) estimates. At this time, the City does not feel as though there are any roadway issues which present a problem for goods movement.

Figure 4-6: Freight System

Metropolitan Freight System City of Long Lake, Hennepin County

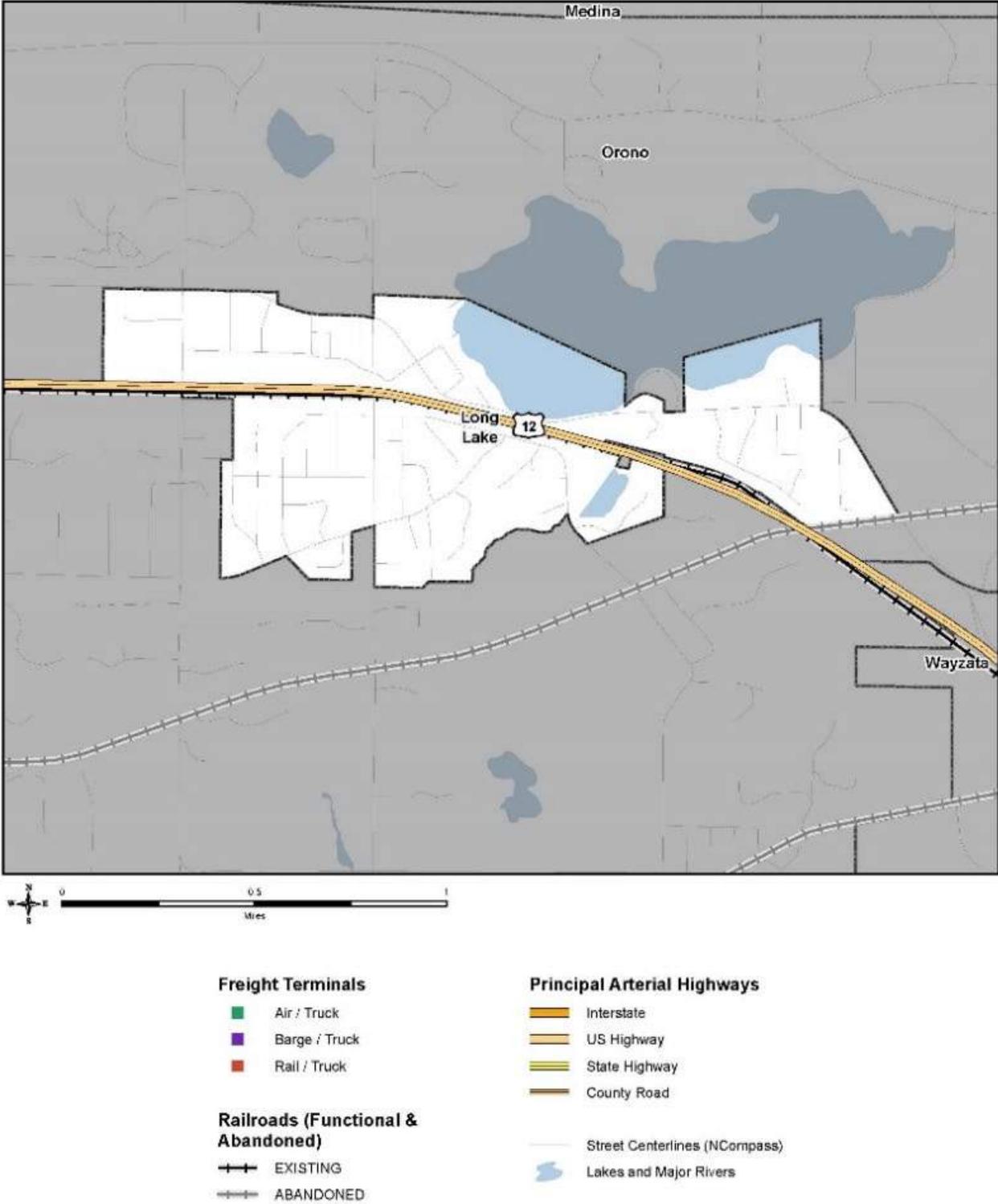


Figure 4-7: Heavy Commercial Annual Average Daily Traffic Count



BICYCLING AND WALKING

The Metropolitan Council 2040 TPP encourages the use of bicycles as a mode of transportation and establishes a Regional Bicycle Transportation Network (RBTN) to establish an integrated network of on street bikeways and off-road trails that complement each other to improve conditions for bicycle transportation at the regional level.

The RBTN identifies Tier 1 and Tier 2 alignments where existing regional or other trails exist or where a specific alignment has been identified. The RBTN also identifies Tier 1 and Tier 2 corridors where specific alignments have not yet been defined.

The City of Long Lake does not have any Tier 1 or Tier 2 alignments within the City's boundary, however the Luce Line Trail which is a Tier 1 alignment borders the City. Figure 4-8 shows the RBTN near Long Lake.

Local bicycle and pedestrian infrastructure are highlighted in the Parks and Recreation chapter of this Plan, including existing and planned trails and sidewalks. Most recently, with the realignment of Highway 12, several new pedestrian amenities were installed as part of the project including:

- New trails connecting Luce Line Trail and Wayzata Boulevard.
- New sidewalks and trails with a boulevard buffer.
- A new safer trail crossing at Heather Lane.
- Improved accessibility for people with disabilities, including ADA-compliant pedestrian curb ramps.
- New street lighting for increased visibility.

The most significant physical barrier within Long Lake is TH12 which divides the City into a northern and southern part. Pedestrians and bicyclists have several opportunities to safely cross this barrier:

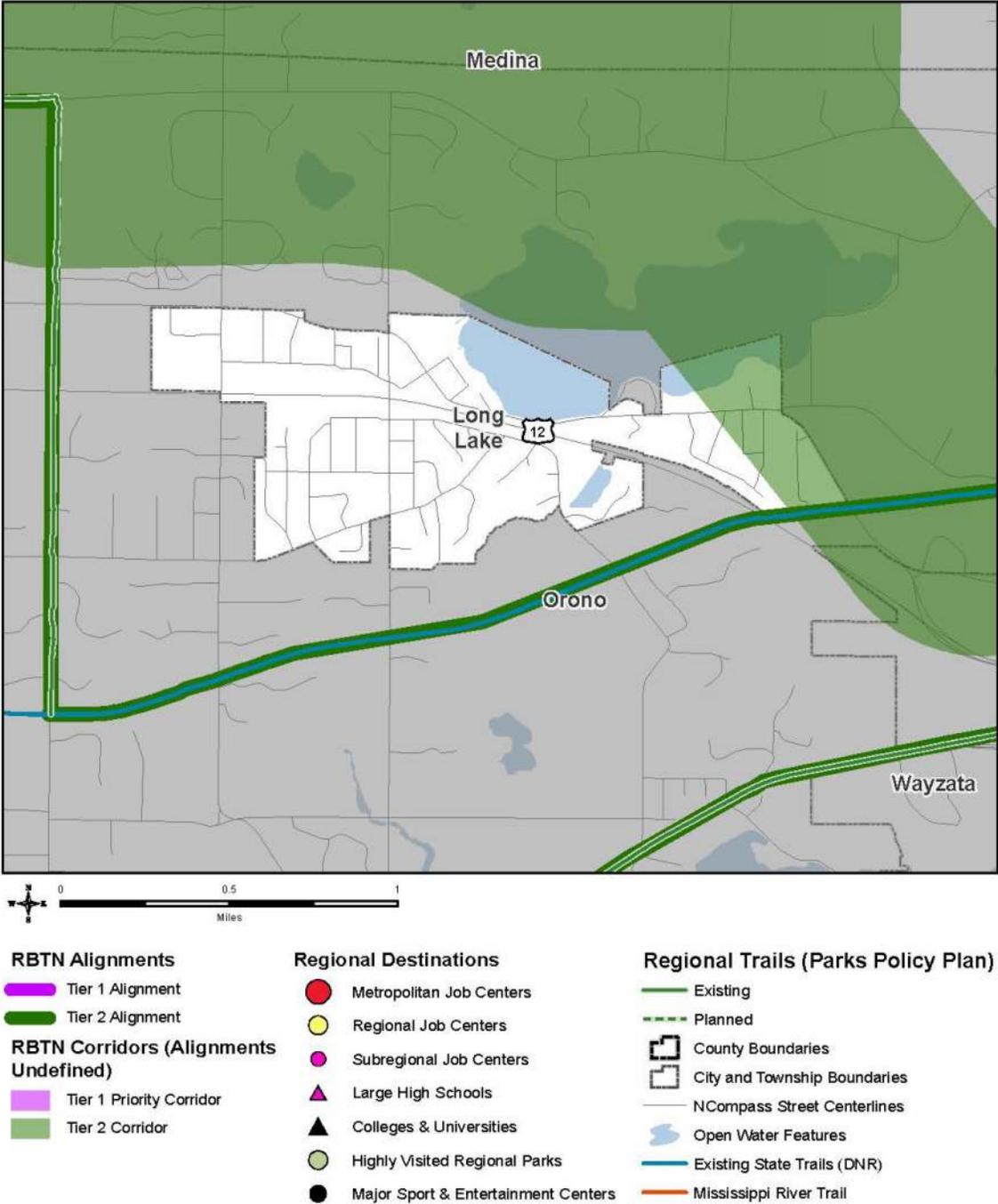
- Willow Drive North. This vehicular bridge has sidewalks and is the most western-located place to cross over TH12. The bridge straddles Long Lake and Orono.
- Brown Road North is a vehicular bridge with sidewalks and a significant connection between the north and south parts of the city.
- A cycling/pedestrian overpass above TH12 connects the Long Lake City Trail to the north and Stoneridge Circle to the south, giving residents south of TH12 on foot or bike a more direct route to amenities north of TH12.
- Luce Line State Trail lies just outside city limits, but it provides another opportunity for non-vehicular traffic to safely cross over TH12.

In the Thrive MSP Plan, the Metropolitan Council outlines the following as a suburban community's role in advancing biking and walking infrastructure. Long Lake will seek these opportunities to improve its local connections that enhance pedestrian and bicycle-related trips within the City.

- Adopt development standards that improve the user experience, circulation, and access for bicyclists and pedestrians.
- Adopt Complete Streets policies that improve the safety and mobility for all road users.

Figure 4-8: Regional Bicycle Transportation Network

Regional Bicycle Transportation Network (RBTN) City of Long Lake, Hennepin County



CHAPTER 5: PARKS AND TRAILS

LOCAL PARKS AND TRAILS

Parks

The City of Long Lake has a total of four public parks, with the following amenities offered at each. A map of the local park and trail system is shown in Figure 5-1.

- **Dexter Park** offers a basketball court, playground equipment, picnic tables and benches for public use. The City may consider an upgraded playground for this park in the future.
- **Hardin Park** offers tennis courts, a pickleball court, a basketball court, playground equipment, picnic tables and benches, and walking trails. Recent park upgrades include new shelters and benches.
- **Holbrook Park** features a ballfield and bleachers; hockey and pleasure skating rinks and a warming house open seasonally during the winter months; a seasonal dog park in the hockey rink area during spring, summer and fall; a half-basketball court, playground equipment, picnic tables and grills.
- **Nelson Lakeside Park** is located in the heart of downtown on Long Lake and features a public boat launch, fishing pier, rack for canoe storage a swimming beach, a picnic shelter with tables, grills and picnic tables around the park, playground equipment, and is home to the Long Lake Veterans Memorial. Recent improvements include the replacement of the playground equipment and the benches.

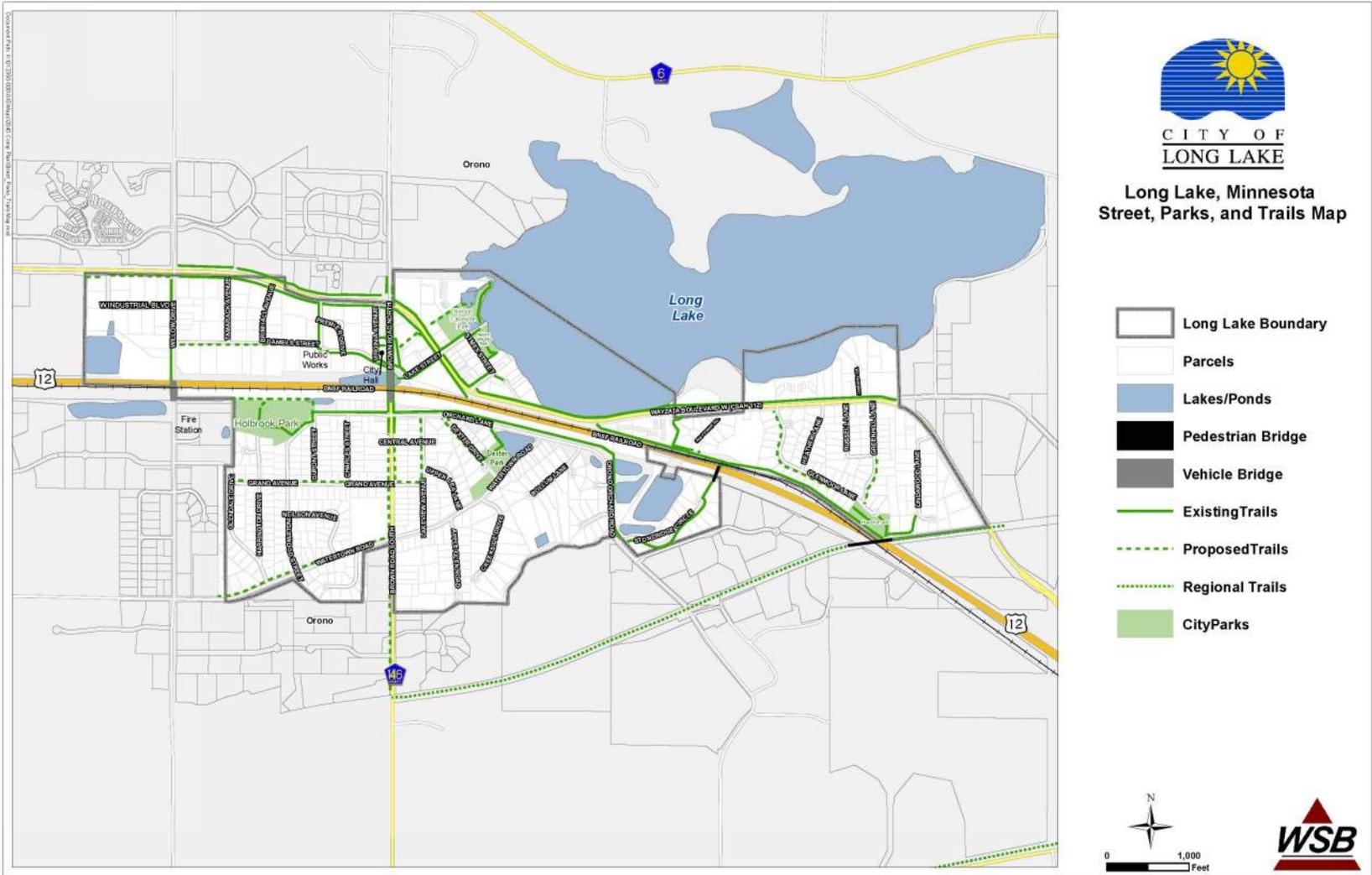
Trails

Long Lake has a growing system of trails and offers a cycle and pedestrian-only overpass between the Long Lake City Trail on the north and the residential Stoneridge Circle on the south of TH12. Additionally, with the reconstruction of County Road 112/Wayzata Boulevard an improved pedestrian crossing was installed at Wurzer Trail and Heather Lane, connecting Wurzer Trail to the Luce Line. Figure 5-1 depicts the existing and proposed trail systems.

Capital Improvements

The City of Long Lake does not have a Capital Improvement Program for local parks, open spaces, or trails at this time, however, maintenance and improvements are made on an as-needed basis and funded by the City's General Fund.

Figure 5-1: Local Park and Trail System



REGIONAL PARKS AND TRAILS

Parks

There are no existing or proposed regional or state parks within Long Lake, but there are several amenities for residents to enjoy that are within close proximity. As shown in a snippet of the Twin Cities Regional Parks System Map (Figure 5-2), the closest regional parks are Baker Park Reserve, located approximately 6 miles northwest of Long Lake in Maple Plain, and Noerenberg Memorial Gardens, located approximately 3.5 miles southwest of Long Lake in Wayzata. Both the Wolsfeld Woods and Wood-Rill Scientific Natural Areas are within one to two miles for local residents to visit.

Trails

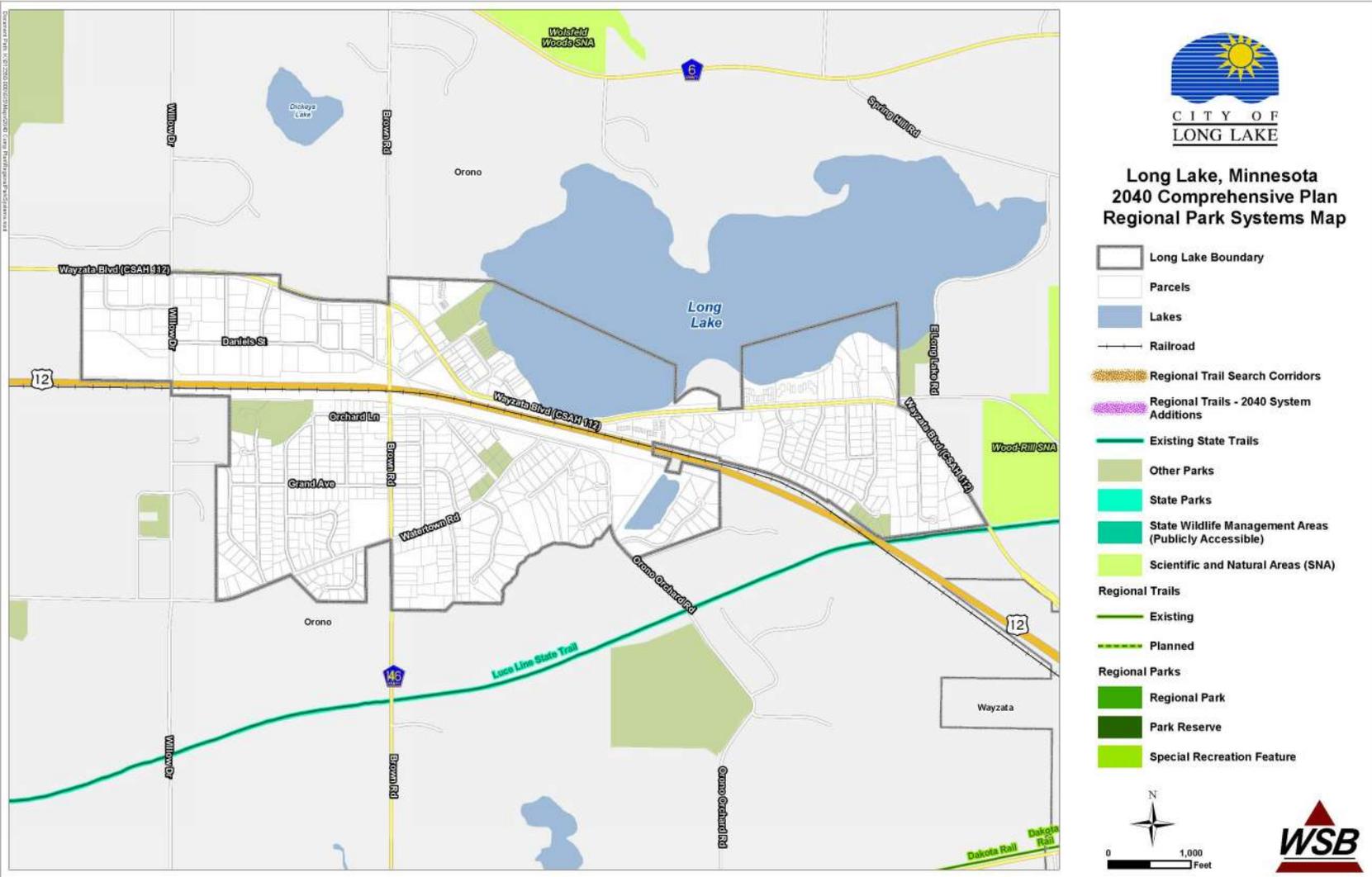
There is one regional trail and one state trail, both located just outside Long Lake. The Luce Line State Trail runs east west and is located just south of Long Lake. The trail is depicted in Figure 5-2 in brown and in Figure 5-3. This state trail is a 63-mile long former railroad grade which was developed for biking, hiking, horseback riding, and mountain biking. The Long Lake City Trail which starts at Long Lake and runs beside TH12 connects to the Luce Line State Trail near Hardin Park. The Baker Regional Trail runs north-south to the west of Long Lake and connects to Baker Park Reserve. This trail is depicted in green on the map below.

Figure 5-3 depicts the regional park system in more detail, highlighting the close proximity of the Luce Line State Trail that runs along Long Lake's southeastern boarder.

Figure 5-2: Regional Parks System Map



Figure 5-3: Regional Parks and Trails System Map



CHAPTER 6: SANITARY SEWER PLAN

INTRODUCTION

The City of Long Lake is required to prepare a Comprehensive Plan that aligns with the Metropolitan Council's Metropolitan System Plan every ten years per Minnesota Rule 473.858. One component of the Comprehensive Plan is the Sanitary Sewer Plan, which evaluates the adequacy of the existing sanitary sewer system, projects sanitary sewer flows from future development, and recommends improvements to accommodate future flows. Ultimately, this plan is used by both the City, on a local basis, and the Metropolitan Council, on a regional basis, for long-term planning of sanitary sewer infrastructure.

The City of Long Lake's Sanitary Sewer Plan was developed to conform to the Metropolitan Council's Thrive MSP 2040 Water Resources Policy Plan. The Thrive MSP 2040 Plan was approved in May 2014 and outlines regional goals for the wastewater system, including environmental sustainability, water reuse, and water conservation. Additionally, the Thrive MSP 2040 Plan includes population, household, and employment projections, and projected wastewater flows.

The Metropolitan Council estimates that sanitary sewer flows will remain constant between now and 2040 for the City of Long Lake. However, redevelopment of certain areas within the City may cause increased flows in those areas and the sewer system that serves them. This Sanitary Sewer Plan outlines the locations in which the Metropolitan Council can expect to see increased wastewater flows, allowing the Council to determine if capacity upgrades will be required at regional wastewater treatment plants, lift stations, forcemains, and interceptors. This plan also serves as a guiding document for the City's capital improvement planning efforts.

BACKGROUND

The City of Long Lake is located in Hennepin County, in the west portion of the Twin Cities metropolitan area, and it is completely contained by the City of Orono. The bulk of Long Lake is residential, with some commercial and institutional properties in the northwest corner of the City along Wayzata Boulevard West (CSAH 112). Approximately 12 percent of the area of the City is occupied by lakes, principally Long Lake.

Long Lake has been designated entirely as a suburban community. According to the Thrive MSP 2040, suburban communities within the Twin Cities metropolitan area experienced continued growth and expansion during the 1980s and 1990s and typically have lower population densities. The Metropolitan Council expects Long Lake to, "plan for forecasted population and household growth at average densities of at least 5 units per acre for new development and redevelopment and to target opportunities for more intensive development near regional transit investments." The City of Long Lake has the following goals and objectives for its sanitary sewer system:

Goal 1: To economically provide municipal sanitary sewer facilities to the residents of Long Lake which will provide a high-quality level of service and low maintenance and operation costs.

Objective 1.1: Require all habitable structures to be connected to the City's sanitary system.

Objective 1.2: Continue to monitor the sewer system eliminating any infiltration and/or inflow problems that may exist or develop in the sanitary sewer system and meet or exceed standards set by the Metropolitan Council.

Objective 1.3: Establish design and construction standards for sanitary sewer installation and maintenance to minimize potential sources of inflow/infiltration in the sewer collection system.

EXISTING SANITARY SEWER SYSTEM

Sanitary sewer systems typically consist of three elements: collection, conveyance and treatment. The Metropolitan Council Environmental Services (MCES) provides treatment for majority of the municipalities in the metropolitan area, including the City of Long Lake. Therefore, the City's sanitary sewer system is a collection and conveyance system only.

Sanitary Sewer Service Area and Intercommunity Flows

The City's sanitary sewer service area was divided into twelve districts. Sanitary sewer districts were delineated based on the connection points between the City's system and the MCES interceptor. It is common practice to divide sewer districts into sub-districts to better allocate wastewater flow to trunk sanitary sewer mains. However, since Long Lake's sewer districts were considered to be small, they were not further divided.

The City receives intercommunity sanitary sewer flows through several interconnections from the City of Orono. The properties in the City of Orono that flow into Long Lake's sanitary sewer system are summarized in **Table 6-1**. The City of Long Lake and the City of Orono have agreements in place to regulate the properties shown in **Table 1** that flow into Long Lake's sanitary sewer system from Orono (agreements can be found in the **Appendix A** of the Sanitary Sewer Plan). The City's sanitary sewer service area, sewer districts, and areas of intercommunity flows with neighboring communities are shown in **Figure 6-1**.

Table 6-1. Intercommunity Flows

Neighboring Community	Flow INTO Long Lake	Flow OUT OF Long Lake
City of Orono	82 residential properties (15 vacant) 4 commercial properties	N/A

MCES flow meters M430 and M431 measure the entire wastewater flow generated within the City of Long Lake's sanitary sewer service area, which includes several interconnections with the City of Orono, and portions of the City of Orono located north of Long Lake that flow directly into the MCES system. All the wastewater flow collected within the City of Long Lake is conveyed by MCES Interceptor 8352A to MCES Regional Lift Station No. 60. Wastewater pumped by Regional Lift Station No. 60 is conveyed through a series of forcemains and gravity interceptors to the Blue Lake Wastewater Treatment Plant (WWTP), in Shakopee, MN. The Blue Lake WWTP is owned and operated by MCES and has a design capacity of 32 million gallons per day (MGD). MCES infrastructure located within the City of Long Lake is shown in **Figure 6-2**.

Gravity Sewer

The City of Long Lake's gravity sewer includes 6-inch through 15-inch diameter pipe. Much of the system is vitrified clay pipe (VCP), although other pipe materials include cast iron pipe (CIP), ductile iron pipe (DIP), high density polyethylene (HDPE) pipe, polyvinyl chloride (PVC) pipe, and reinforced concrete pipe (RCP). The City's gravity sanitary sewer system, including its lift stations and their service areas, is shown in **Figure 6-3**. **Figure 6-3** also identifies the trunk sewers that were included in the capacity analysis of this Sanitary Sewer Plan.

FIGURE 6-1 – SANITARY SEWER DISTRICTS

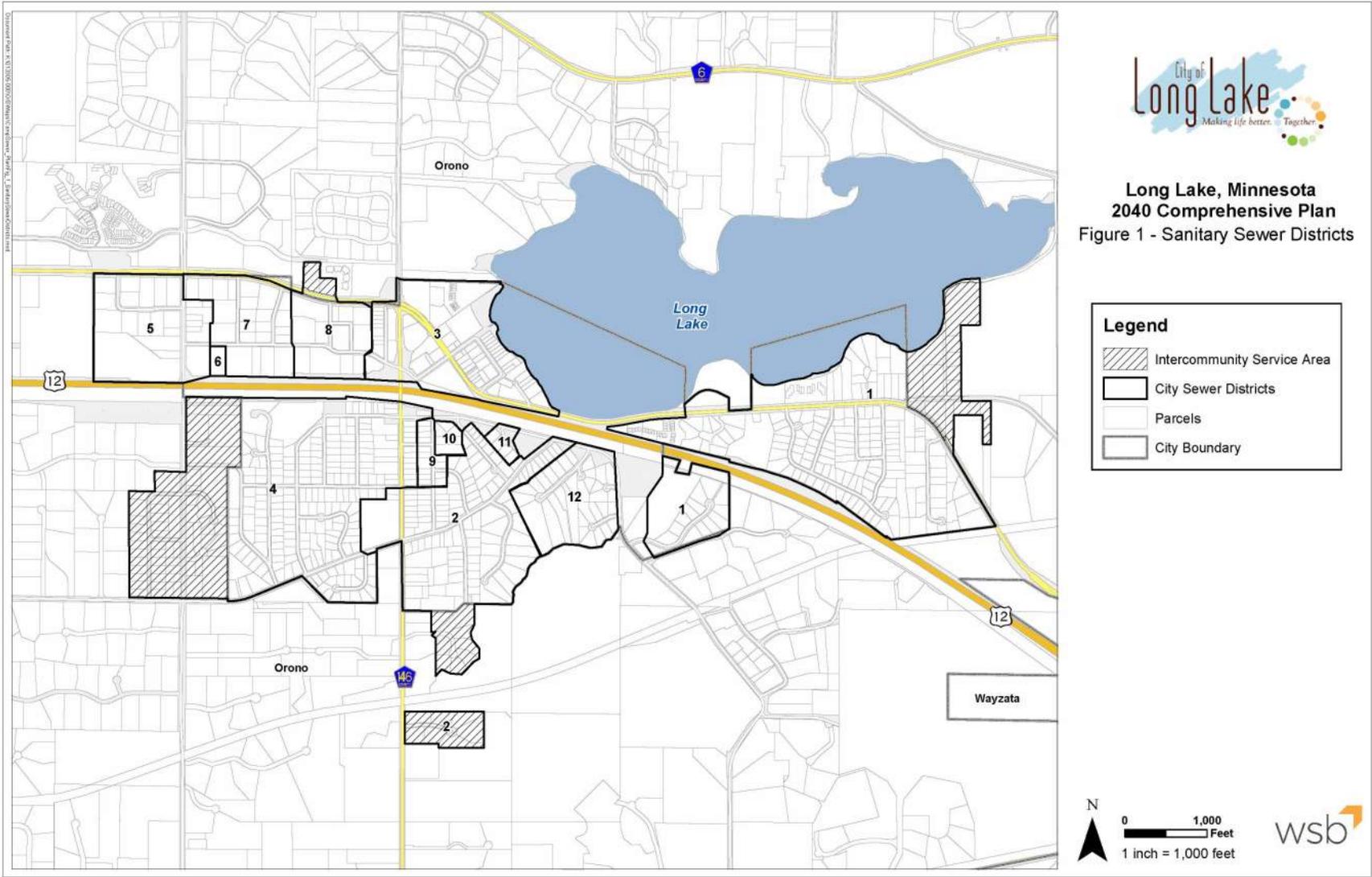


FIGURE 6-2 - MCES INFRASTRUCTURE

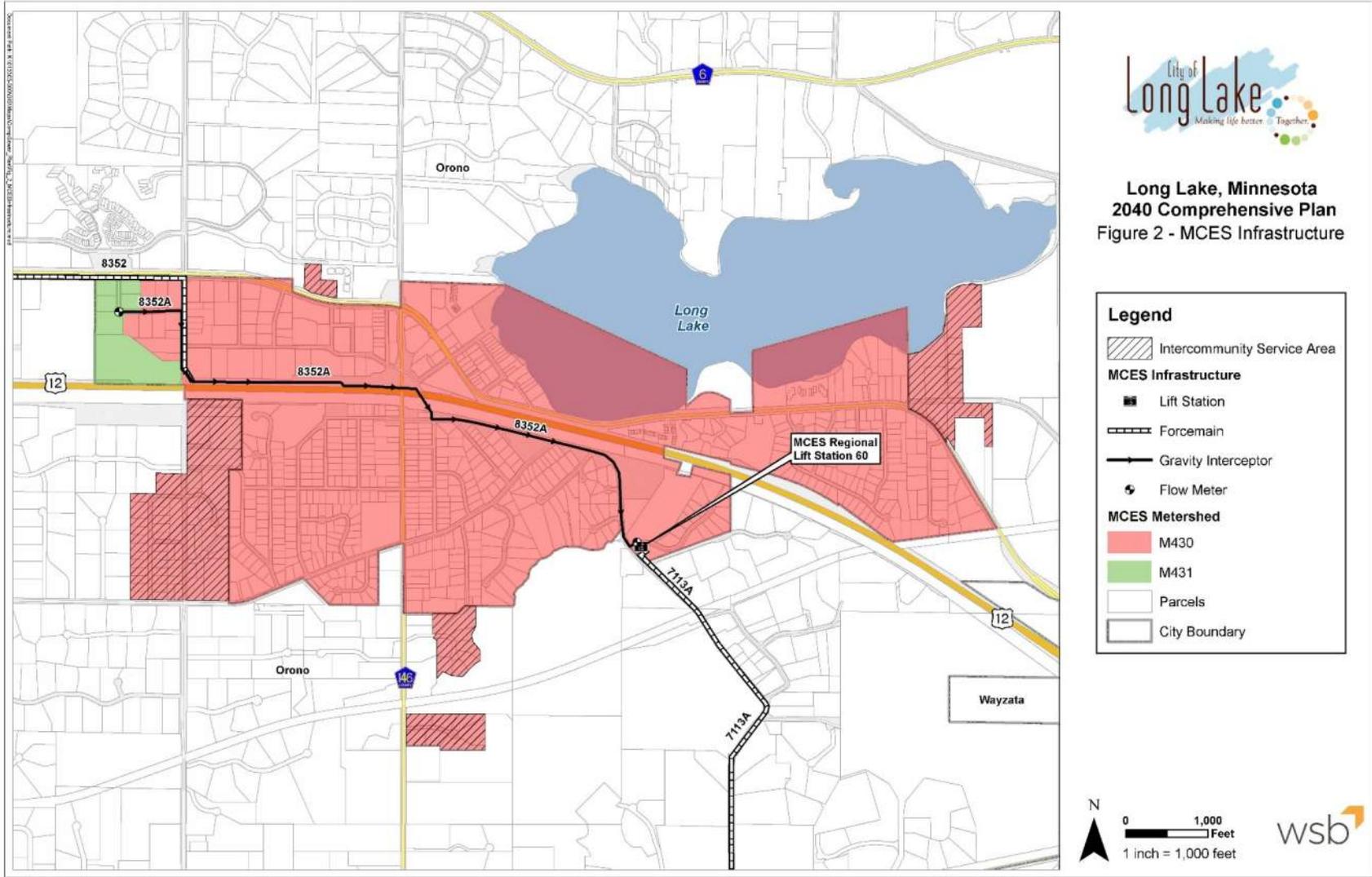
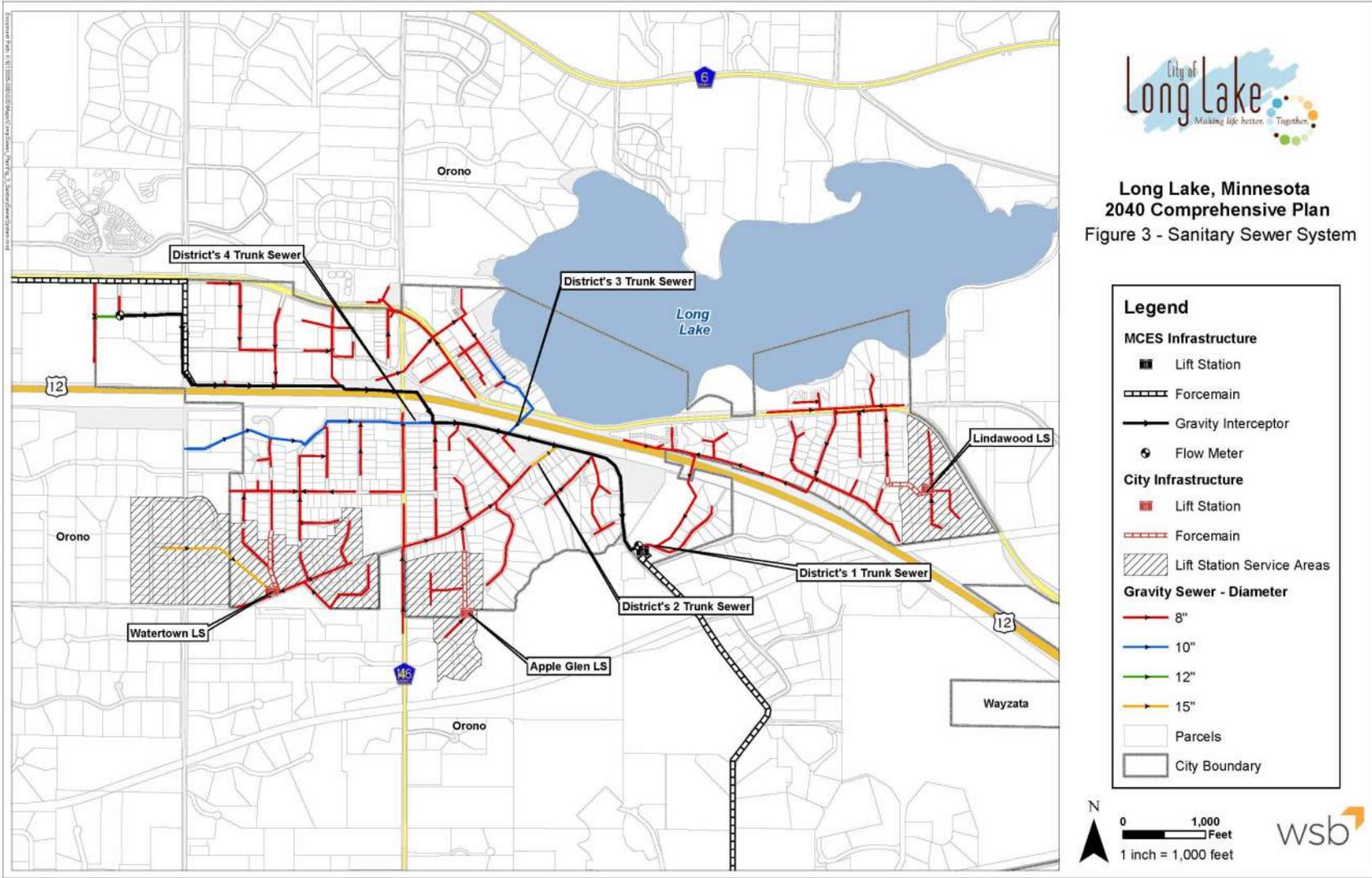


FIGURE 6-3 - EXISTING SANITARY SEWER SYSTEM



Existing Wastewater Flows

MCES meter flow data was used to estimate existing and historical wastewater flows for the City of Long Lake. The entire flow generated within the City of Long Lake is measured by MCES meter M430. In addition to the wastewater generated within Long Lake, meter M430 also measures wastewater already metered by upstream MCES meters M431 and M434. Because of that, the flows measured by the upstream meters were subtracted from the readings collected at meter M430 to single out the wastewater generated within Long Lake's sanitary sewer service area. The historical wastewater flow calculated for the City of Long Lake is shown in **Table 6-2**. Long Lake's 2014-2018 average wastewater flow was approximately 0.305 MGD.

Table 6-2. Long Lake Historical Wastewater Flow

Year	Average Daily Flow (MGD)	Peaking Factor	Peak Flow (MGD)
2014	0.303	6.2	1.878
2015	0.251	3.9	0.979
2016	0.309	4.4	1.360
2017	0.323	8.2	2.649
2018	0.338	9.0	3.042
5-Year Average	0.305	6.3	1.922

Wastewater Generation Rates

Table 6-3 shows the assumed sanitary sewer generation rates used in this Sanitary Sewer Plan. These generation rates are based on the existing land use densities of the City of Long Lake. Historical flow meter data obtained from the MCES was used in conjunction with the assumed sewer generation rates listed in **Table 6-3** to allocate existing wastewater flows to each sanitary district within the City of Long Lake. The calculated flows were used to evaluate existing residual capacities of lift stations and trunk sewers.

Table 6-3. Assumed Sanitary Sewer Flows by Land Use Type

Land Use	Average Flow	Unit
Single Family Detached	180	gal/day/unit
Single Family Attached	180	gal/day/unit
Multifamily	2,520	gal/day/acre
Mixed Use	2,520	gal/day/acre
Office	800	gal/day/acre
Retail and Commercial	800	gal/day/acre
Institutional	800	gal/day/acre
Industrial and Utility	800	gal/day/acre
Parks and Undeveloped	0	gal/day/acre

Peak Flow Factors

To ensure that the sanitary sewer system is capable of conveying flow fluctuations throughout the day and during rainfall events, peak hourly flow factors were applied to the existing average flows to obtain peak hourly wastewater flows. Pipes that serve smaller areas are more likely to experience larger fluctuations in flow. Therefore, peaking factors typically increase as average flow decreases.

The MCES has a list of standard flow variation peaking factors for sewer design which range from 1.7 to 4.0 depending on average wastewater flows. The historical wastewater flows for the City of Long Lake shown in **Table 6-2** suggest that the peak hourly factors for the City are larger than those standardized by the MCES. Thus, a peak hourly factor of 6.3, which corresponds to the average of the peaking factors calculated for the last 5 years, was used in this Sanitary Sewer Plan.

Existing Lift Stations

The City's sanitary sewer system includes three (3) lift stations. The year of installation, pumping capacity, peak hourly flow, and existing residual capacity of each lift station is provided in **Table 6-4**. The firm pumping capacity, which should equal or exceed the peak hourly sanitary flow, is the capacity of the lift station with its largest pump out of service. The location of each lift station is indicated in **Figure 6-3**. In 2002, Long Lake had four (4) lift stations. However, due to the 2002 Sanitary Sewer and Watermain Utility Improvements project, a deeper sanitary trunk sewer was installed along Symes Street which allowed the City to remove Lift Station B and flow wastewater by gravity.

Table 6-4. Existing Lift Station Summary

Lift Station	Year of Installation	Number of Pumps	Firm Pumping Capacity (gpm)	Forcemain Diameter (inches)	Existing Flow (gpm)		Residual Capacity (%)
					Average	Peak Hourly	
Watertown ⁽¹⁾	1962	2	189	4.0	18.9	118.8	37
Apple Glen	1972	2	190	4.0	5.0	31.5	83
Lindawood	1980	2	120	4.0	4.5	28.4	76

(1) The City of Long Lake conducted a 4-week flow monitoring study between July 16 and August 16, 2019 to assess sources of I/I within the sanitary sewer service area of the Watertown lift station. This study revealed that average wastewater flows in this lift station are 15.0 gpm, which align with the average flow calculated using current land use data and MCES flow meter data.

The City of Long Lake has rehabilitated their lift stations in several occasions. The Watertown lift station was rehabilitated in 1989 and in 2016, and minor pump maintenance was conducted in 2018. The Apple Glen lift station was only rehabilitated in 1993. However, the pumps were replaced in 2016. Lastly, the Lindawood lift station was rehabilitated in 2006.

The wastewater velocity through each forcemain was calculated using the pumping capacities listed in **Table 6-4** to ensure recommended flow velocities were achieved based on Ten State Standards. Minimum flow velocity should be maintained at a minimum of 2 feet per second (fps) through the forcemain to prevent settling of solids, whereas maximum flow velocity should be maintained below 8 fps to prevent scouring of

the pipe walls and potential damage to valves and fittings. **Table 6-5** shows the calculated velocities for the forcemains. As shown in **Table 6-5**, all the calculated velocities are within the recommended range.

Table 6-5. Existing Forcemain Summary

Lift Station	Forcemain Inner Diameter (inches)	Forcemain Material	Flow Velocity (fps)
Watertown	4.10	Cast Iron	4.6
Apple Glen	4.10	Cast Iron	4.6
Lindawood	4.22	Ductile Iron	2.8

Existing Trunk Sewers

A trunk main is a sewer pipe having a diameter greater than eight (8) inches. It is important to ensure that trunk mains are sized properly since they convey large volumes of wastewater during peak flow events. A trunk main was identified for each sewer district within the City's service area and their capacities were analyzed. The size, capacity, and sewer district served by each trunk main, existing peak hourly flows, and existing residual capacities are listed in **Table 6-6**. As shown in **Table 6-6**, all trunk sewers are sized adequately for existing conditions.

Table 6-6. Existing Trunk Sewer Summary

Sewer District	Diameter (in)	Pipe Material	Year of Installation	Trunk Slope (%)	Trunk Capacity (gpm) ⁽¹⁾	Peak Flow (gpm) ⁽²⁾	Residual Capacity (%)
1	8	PVC	2003-2004	0.34	317	240	24
2	15	RCP	Unknown	0.16	1,008	117	82
3	10	PVC	2003-2004	0.20	441	120	73
4	10	PVC	2003-2004	0.27	512	309	40

(1) Trunk capacity corresponds to the capacity of the pipe flowing full at the capacity limiting section (shallowest pipe slope) of the trunk.

(2) Peak hourly flow in trunk mains includes all wastewater flow collected in upstream service area/sewer district.

Sanitary sewer trunk mains were not analyzed for Districts 5 through 12 as the wastewater collected in these areas enters the MCES interceptor through multiple 8-inch pipe locations. Additionally, given that those sewer districts are small, it is very likely that the 8-inch connections to the MCES system are adequately sized. Although an 8-inch pipe is not considered a trunk main, it was decided to analyze the pipe section in District 1 as if it were a trunk sewer since all the wastewater collected in sanitary sewer District 1 flows into the MCES interceptor at a single location. Additionally, District 1 is the second largest district in Long Lake.

Community Treatment Systems

There are no public or private community treatment systems within the City of Long Lake. All properties within the City are served by the municipal collection system.

Individual Sewage Treatment Systems

The City requires that all residences and businesses within proximity to the sanitary sewer system connect to the municipal sewer system. Consequently, there are no homes or businesses that utilize private individual sewage systems (ISTS) within the current sanitary sewer service area. Excerpts from Long Lake's City Code regarding ISTS, Chapter 36 - Utilities, are cited below:

Chapter 36 – Utilities, Article III. – Sewer Service, Division 2 – Prohibitions, Section 36-211. – Connection with public sewer, (c): Sewage disposal facilities. Except as otherwise provided, it is unlawful to construct or maintain any privy, vault, septic tank, cesspool or other facility intended or used for the disposal of sewage.

Chapter 36 – Utilities, Article III. – Sewer Service, Division 5 – Treatment, Section 36-301. – Individual and Alternative discharging sewage treatment systems: The improper location, design, installation, use and maintenance of individual sewage treatment systems adversely affects the public health, safety and general welfare by discharge of inadequately treated sewage to the ground surface, surface waters, and groundwaters; therefore, to protect surface water and groundwater and promote public health, safety and general welfare, the city shall regulate all individual and alternative discharging sewage treatment systems in compliance with Minn. Stats. §§ 115.55–115.58 and Minn. Rules ch. 7080, which the city adopts and incorporates by reference.

PROJECTED POPULATION AND SANITARY SEWER FLOW

Population

The Metropolitan Council publishes population and sewer usage forecasts for each city in the Metropolitan Area. These forecasts serve to help cities prepare infrastructure for growth and to promote continued maintenance of municipal infrastructure. The forecast data in **Table 6-7** is from the Metropolitan Council's Local Planning Handbook Community Page for Long Lake and includes both total and sewered population, households, and employment through 2040.

Table 6-7. Population Projections

Year	Total			Sewered		
	Population	Households	Employment	Population	Households	Employment
2010	1,768	732	1,093	1,768	732	1,093
2019 ⁽¹⁾	1,806	784	1,142	1,806	784	1,142
2020	1,810	790	1,190	1,810	790	1,190
2025 ⁽¹⁾	1,885	830	1,250	1,885	830	1,250
2030	1,960	870	1,310	1,960	870	1,310
2035 ⁽¹⁾	1,975	885	1,355	1,975	885	1,355
2040	1,990	900	1,400	1,990	900	1,400

(1) Interpolated values.

As shown in **Table 6-7**, the number of households in the City of Long Lake is expected to increase by approximately twenty-three percent (23%) by the year 2040. Similarly, the population is projected to grow by approximately thirteen percent (13%) by 2040. All of the existing and projected population will be served by the City's sanitary sewer system and since there is only one MCES interceptor in Long Lake, MCES interceptor 8352-A will convey all of the wastewater associated with the population growth shown in **Table 6-7**.

Land Use

The City's existing and 2040 land-use maps were used to develop the Comprehensive Sanitary Sewer Plan. Detailed information and figures regarding Long Lakes' land use are included in the City's 2040 Comprehensive Land Use Plan. 2040 wastewater flows were estimated using historical MCES metered flow data, as well as existing and future land use data using the methodology explained below.

Estimating 2040 Average Flows

Once the existing average flows were estimated using MCES historical meter data and existing land use conditions, future flows were projected based on the planned 2040 land use from the Land Use Plan. Parcels that are planned to be developed or redeveloped were assigned wastewater flow rates in accordance to their future land use type. **Table 6-8** lists the assigned flows, which include design considerations for anticipated inflow and infiltration (I/I).

Table 6-8. Assumed Future Sanitary Sewer Flows by Land Use Type

Land Use	Average Flow ⁽¹⁾	Unit
Low Density Residential	900	gal/day/acre
Medium Density Residential	1,890	gal/day/acre
High Density Residential	2,520	gal/day/acre
Downtown Villa Mixed Use	2,520	gal/day/acre
Office	800	gal/day/acre
Retail and Commercial	800	gal/day/acre
Institutional	800	gal/day/acre
Industrial and Utility	800	gal/day/acre
Parks and Undeveloped	0	gal/day/acre

(1) Average wastewater flows for residential land uses were calculated based on a unit flow of 180 gpd/unit and the projected residential densities shown in the 2040 Comprehensive Land Use Plan.

2040 Intercommunity Flows

The City of Long Lake has intercommunity sanitary sewer connections with the City of Orono in various locations. The areas from the City of Orono that flow into Long Lake are highlighted in **Figures 6-1** and **6-2**. Wastewater flows for these areas were estimated using historical MCES meter data and existing land use data. To project 2040 flows, it was assumed that all existing vacant parcels would be developed by 2040 based on the zoning designations indicated in the 2040 Land Use Plans for Long Lake and Orono, respectively. **Table 6-9** shows the number of properties contributing to intercommunity flows broken down by receiving sewer district. The City of Long Lake has several agreements with City of Orono to regulate the properties shown in **Table 6-9** that are allowed to flow into Long Lake’s sanitary sewer system from Orono (agreements can be found in **Appendix A** of the Sanitary Sewer Plan). The City of Long Lake is considering revising and updating the agreements in the near future.

Table 6-9. Intercommunity Flows

Receiving Sewer District	Existing		2040	
	Properties	Avg Wastewater Flows (GPD)	Properties	Avg Wastewater Flows (GPD)
1	10 Single Family 1 Undeveloped	2,299	11 Single Family	2,479
2	14 Single Family 1 Undeveloped	3,219	15 Single Family	3,399
4	43 Single Family 2 Commercial 13 Undeveloped	14,434	56 Single Family 2 Commercial	17,314
8	2 Commercial	2,535	2 Commercial	2,535
Total	71 Developed 15 Undeveloped	22,487	86 Developed	25,727

Projected Average Wastewater Flows

All of the wastewater flow from the City of Long Lake is treated at the MCES Blue Lake WWTP, and any increase in wastewater flow will be treated at that facility. **Table 6-10** lists the projected total average wastewater flow for Long Lake from MCES and from this Sanitary Sewer Plan. Note that the projections used in this report are greater than the MCES projections. The projections used in this report rely on historical flow data and flow estimates for each parcel of developable land.

Table 6-10. Total Average Wastewater Projections

Projection Source	2020 Projected Flow (MGD)	2030 Projected Flow (MGD)	2040 Projected Flow (MGD)
MCES ⁽¹⁾	0.240	0.240	0.240
Sanitary Sewer Plan	0.308	0.334	0.361

(1) MCES flow data obtained from the 2015 System Statement for the City of Long Lake

Future flow projections were also divided by sewer district. Average flow projections by sewer district are shown in **Table 6-11**.

Table 6-11. Average Wastewater Projections by Sewer District

Sewer District	2020 Projected Flow (MGD)	2030 Projected Flow (MGD)	2040 Projected Flow (MGD)
1 ⁽¹⁾	0.055	0.060	0.066
2 ⁽¹⁾	0.040	0.040	0.040
3	0.030	0.048	0.066
4 ⁽¹⁾	0.071	0.072	0.074
5	0.033	0.034	0.035
6	0.002	0.002	0.002
7	0.024	0.024	0.024
8 ⁽¹⁾	0.019	0.019	0.019
9	0.003	0.003	0.003
10	0.021	0.021	0.021
11	0.003	0.003	0.003
12	0.008	0.008	0.008
Total	0.308	0.334	0.361

(1) Sanitary sewer districts receiving intercommunity flows from the City of Orono.

It is projected that only four sewer districts will experience an increase in average wastewater flow by 2040. These districts are 1, 3, 4, and 5. Out of those four sewer districts, District 3 is projected to experience the highest wastewater flow increase due to future redevelopment of the City's downtown. **Figure 6-4** shows the projected average wastewater flow increase (existing through 2040) for each sanitary sewer district within Long Lake's service area.

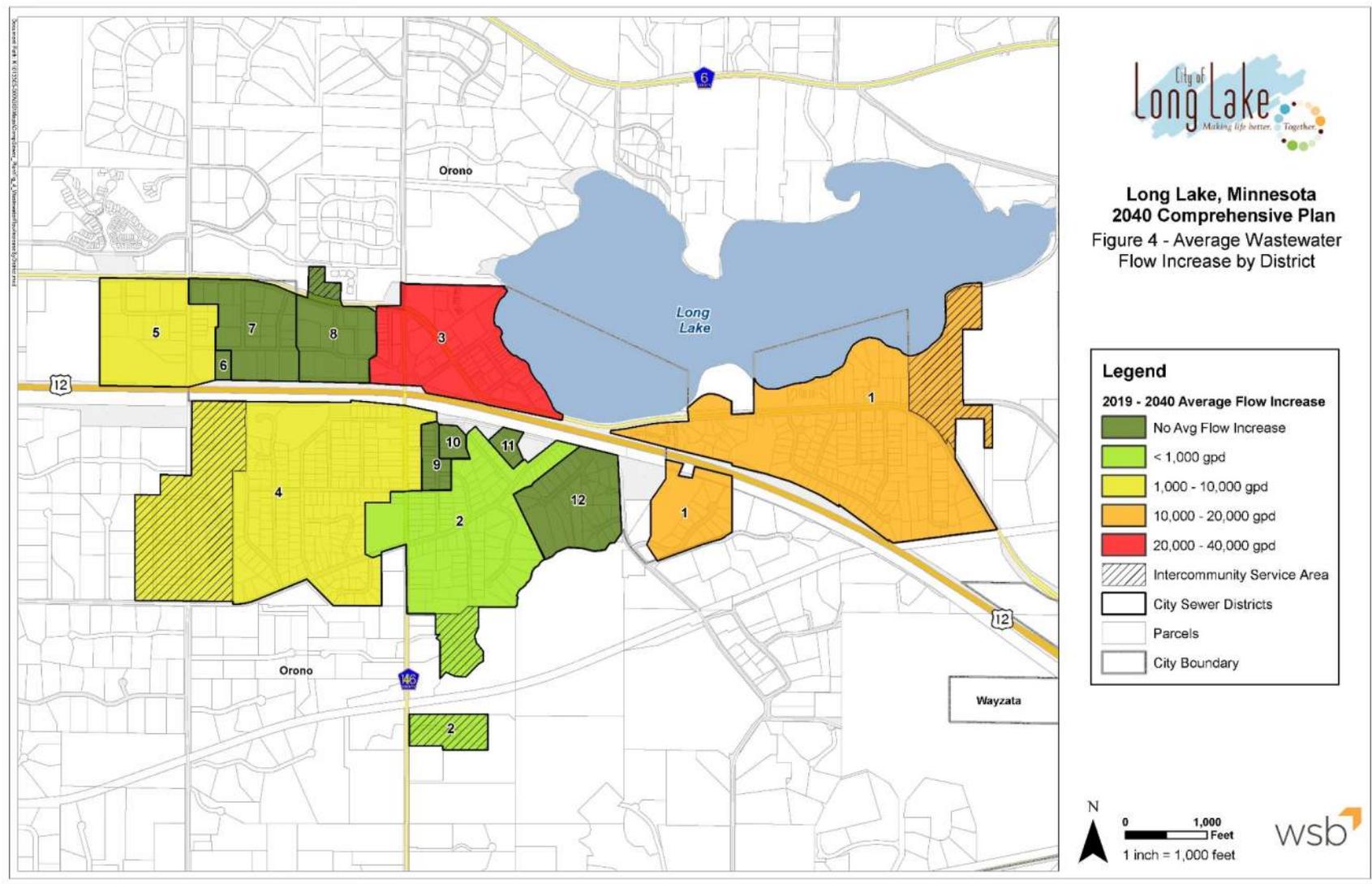
2040 Growth Forecasts by Sewer District

Sewer District	2010		2020		2030		2040	
	Households	Employment	Households	Employment	Households	Employment	Households	Employment
1	210	30	210	32	210	45	210	46
2	180	0	180	0	180	0	180	0
3	23	264	81	327	161	376	191	415
4	245	25	245	25	245	25	245	25
5	0	211	0	220	0	245	0	267
6	0	6	0	6	0	6	0	6
7	0	308	0	319	0	327	0	351
8	0	249	0	261	0	286	0	290
9	15	0	15	0	15	0	15	0
10	17	0	17	0	17	0	17	0
11	5	0	5	0	5	0	5	0
12	37	0	37	0	37	0	37	0
Total	732	1093	790	1190	870	1310	900	1400

Peak Flow Factors

Historical wastewater flows for the City of Long Lake (shown in **Table 6-2**) suggest that the City's peak hourly factors are larger than those standardized by the MCES. Thus, a peak hourly factor of 6.3, which corresponds to the average of the peaking factors calculated for the last 5 years, was used in this Sanitary Sewer Plan.

FIGURE 6-4 - Average Wastewater Flow Increase by District



PROPOSED SANITARY SEWER SYSTEM

The existing sanitary sewer system for the City of Long Lake, including gravity mains, forcemains and lift stations, was studied to determine if its current sizing is adequate to convey the projected 2040 peak hourly flows. The generation rates from **Table 6-8** in conjunction with the 2040 Comprehensive Land Use Plan were used to estimate the future sewer flows. Two separate analyses were completed and are shown in the sections below. These include a lift station analysis and a trunk gravity sewer analysis.

Lift Station Analysis

An analysis of the projected 2040 remaining capacity for each of the City's lift stations is shown in **Table 6-12**. As shown in **Table 6-12**, the peak hourly flow projected for the lift station's service areas is not expected to exceed their existing firm pumping capacity.

Table 6-12. Projected 2040 Peak Flows by Lift Station

Lift Station	Firm Pumping Capacity (gpm)	2040 Flow (gpm)		Residual Capacity (%)
		Average	Peak Hourly	
Watertown ⁽¹⁾	189	20.2	128	32
Apple Glen	190	5.4	34	82
Lindawood	120	5.0	32	73

The City's forcemains were not re-evaluated with the 2040 peak hourly flows since the pump capacity of the existing lift stations and the forcemain sizes are not expected to change.

Trunk Sewer Analysis

The estimated 2040 peak hourly flows and subsequent remaining capacity in the City's trunk sewer lines are shown in **Table 6-13**. The trunk sections used to analyze 2040 peak hourly flows are the same used to analyze existing peak hourly flows.

Table 6-13. Projected 2040 Trunk Sewer Capacity Analysis

Sewer District	Diameter (in)	Year of Installation	Trunk Slope (%)	Trunk Capacity (gpm)	Peak Flow (gpm)	Residual Capacity (%)
1	8	2003-2004	0.34	317	290	9
2	15	Unknown	0.16	1,008	177	82
3	10	2003-2004	0.20	441	290	34
4	10	2003-2004	0.27	512	328	36

Given the residual capacities shown in **Table 6-13**, it is recommended that the City reviews future wastewater flows and capacities within District 1 as development and/or re-development takes place in the district. The remaining City trunks evaluated in this Sanitary Sewer Plan are adequately sized to convey the projected 2040 peak hourly flows.

MCES Interceptor Facility Forecasts

The 2040 projected average daily and peak hourly flows from Long Lake’s service area to MCES Interceptor 8352A are listed in **Table 6-14**. The flows listed are the total, cumulative flows at the final stretch of the interceptor immediately upstream of MCES Lift Station No. 60.

Table 6-14. Projected 2040 MCES Interceptor Use

MCES Interceptor	Sewer District(s)	2040 Average Daily Flow (MGD) ⁽¹⁾	2040 Peak Hourly Flow (MGD) ⁽¹⁾
8352A	1 through 12	0.361	2.273

(1) 2040 flows exclude any wastewater flow generated upstream of Long Lake.

Future Individual Sewage Treatment Systems

The City requires that all residences and businesses within proximity to the sanitary sewer system connect to the municipal sewer system. Consequently, all future developments within Long Lake’s sanitary sewer service area will be connected to the City’s sanitary sewer system and ISTS installation will not be allowed.

INFLOW AND INFILTRATION

General

Inflow is water that enters the sewer system directly through broken manhole covers, sewer cleanouts, sump pumps, foundation drains, and rain leaders during storm events and snow melt. *Infiltration* is water, typically groundwater, that leaks into the sewer system through cracks in sewer mains, laterals, joints, and manholes.

Water from inflow and infiltration (I/I) can consume available capacity in the wastewater collection system and increase the flow to treatment facilities. In extreme cases, I/I flow can cause bypasses or overflows of raw wastewater. The additional flow also requires a larger capacity in the city’s collection and treatment components, which results in increased capital, operation and maintenance, and replacement costs. As a sewer system ages and deteriorates, I/I can become an increasing burden on a City’s system. Therefore, it is imperative that I/I be reduced whenever it is cost effective to do so.

In 2006, the MCES began an Ongoing I/I Program which requires communities within their service area to eliminate excessive I/I. The MCES establishes annual I/I goals for each community discharging wastewater into the Metropolitan Disposal System (MDS) based on average daily flows, adjustments for community growth, and I/I mitigation peaking factors.

Flow metering data is available for MCES Metersheds M430, M431 and M434, and an analysis of this data as it relates to I/I is presented on the following section. The City’s strategies, programs, investments, and goals for reducing I/I are also listed in the following sections.

I/I Analysis

Long Lake's sanitary sewer system currently consists of approximately 12 miles of gravity main, 3 lift stations, and 2,250 feet of forcemain. The lift stations were constructed from the 1960s onward. Approximately 50 percent of the residential housing in the City was constructed before 1970 and only a handful of the pre-1970 private services have been evaluated for I/I as failures have been encountered during public sewer repairs. The pre-1970s era public and private sewers are more susceptible to I/I due to their material and age. The City is in the process of identifying and diagnosing sources of I/I within the system, and it is recommended that any pre-1970s era facilities be prioritized for inspection and rehabilitation.

The amount of I/I flow generated within Long Lake's service area, which includes portions of the City of Orono, was estimated by calculating the average annual and peak month I/I rates, which are equal to the wastewater flow (average annual and peak month) minus the base wastewater flow, using MCES meter data from 2012-2017. The base sanitary flow was approximated as the lowest monthly average flow within each year. Based on the data shown in **Table 6-15**, the average annual I/I rate is 21 percent and the peak month I/I rate is 45 percent. This data indicates the presence of I/I, particularly in peak months.

I/I Reduction

The City's strategy for preventing excess I/I include requiring all new development to conform to City standards. Long Lake's City Code prohibiting the discharge of stormwater to the sanitary sewer system is cited below.

Chapter 36 – Utilities, Article III. – Sewer Service, Division 3 – Connections, Section 36-231. – Permit Required: No unauthorized person shall uncover, make any connections with or opening into, use, alter or disturb the municipal sewer system or appurtenance without first obtaining a written permit from the clerk.

Chapter 36 – Utilities, Article III. – Sewer Service, Division 3 – Connections, Section 36-235. – Old Sewer Service Connection: Old sewer service connections may be used for new buildings only when they are found on examination and test by the superintendent to meet all the requirements of this article.

Chapter 36 – Utilities, Article III. – Sewer Service, Division 3 – Connections, Section 36-242. – Inspection by Superintendent: The applicant for sewer connection permit shall notify the superintendent when the service connection is ready for inspection and connection to the public sewer. The connection shall be made under the supervision of the superintendent or his representative.

Chapter 36 – Utilities, Article IV. – Stormwater Drainage and Wastewater, Division 3 – Prohibitions, Section 36-391. – Discharge of Waters: No person shall discharge or cause to be discharged any stormwater, surface water, groundwater, roof runoff, subsurface drainage, cooling water or unpolluted industrial process waters to any sanitary sewer.

The City will consider adopting an ordinance requiring the disconnection of existing foundation drains, sump pumps, and roof leaders from the sanitary sewer system within six (6) months of the adoption of this plan.

In addition to enforcing City standards, the City conducted several activities in recent years directed at recognizing and correcting I/I. The I/I reduction work recently completed is shown in **Table 6-15**. These I/I mitigation activities have not had a significant impact on I/I reduction in Long Lake.

Table 6-15. I/I Mitigation Activities

Year	Project Description	Cost
2008	District 4 – Sanitary Sewer Cleaning and Televising	Unknown
2009	District 4 – Placing 60 feet of CIP short liner	Unknown
2010	District 4 – Repairing and Sealing four service connections District 4 – Repairing two leaking manholes District 4 – Chemical grouting and sealing 67 joints of 8" VCP	Unknown
2013	Sanitary Sewer Rehabilitation (1,400 feet of sewer lining and manhole sealing)	\$47,000
2016	Watertown Road Forcemain and gravity sewer replacement	\$54,000
2016	CSAH 112 – Phase 1 Sanitary Sewer Rehabilitation (950 feet of sewer removal and new installation)	\$230,000
2017	CSAH 112 – Phase 2 Sanitary Sewer Rehabilitation (616 feet of sewer removal, new installation and spot repair)	
2019	2019 Inflow and Infiltration Monitoring Study	\$6,000

District 4 was cleaned and televised in 2008 and two I/I mitigation projects were completed in 2009 and 2010 to correct the deficiencies found during the 2008 televising efforts. The bulk of the I/I mitigation work over the past years has been completed along CSAH 112 (Wayzata Boulevard) where the City of Long Lake rehabilitated/replaced over 1,500 feet of gravity sewer main. Data quantifying the reduction in clearwater flow from past I/I mitigation projects is not currently available. The City will explore options for I/I reduction measurement in the future, such as pre-and post-mitigation flow metering.

CAPITAL IMPROVEMENTS

The City of Long Lake does not currently have an existing CIP that highlights future sanitary sewer infrastructure projects. The City is in the process of reviewing its existing sanitary sewer system with the City Engineer to develop a CIP. The parts of the system that will require repair or replacement will be identified and finalized by staff and submitted to the Metropolitan Council when completed. The City's CIP sections that pertain to sanitary sewer improvements will be attached as an appendix to this report when it becomes available.

SUMMARY AND OUTCOMES

The analysis shown in this Sanitary Sewer Plan is aimed to provide the City of Long Lake and the Metropolitan Council assistance in planning for wastewater collection, conveyance and treatment. The lift station, forcemain, and trunk sewer analysis completed in this Sanitary Sewer Plan revealed that the City's existing sanitary sewer system is adequately sized to pump and convey the existing and 2040 projected peak hourly flows. However, due to the 2040 remaining capacity projected for the sanitary sewer trunk located in District 1, it is recommended that the City reviews future wastewater flows and capacities within this district as development and/or re-development takes place to ensure the trunk can convey future peak flows.

It is anticipated that the design flows and criteria outlined in this Sanitary Sewer Plan will be used for utility planning as development continues within the City. Tables and figures can be utilized to create budget-level estimates and schematic representations of infrastructure improvements, with specific sizing and routing to be determined during the design phase.

CHAPTER 7: SURFACE WATER

INTRODUCTION

This Water Resources Management Plan (WRMP, Plan, the plan) will serve as a comprehensive planning document to guide the City of Long Lake in conserving, protecting, and managing its surface water resources. This plan has been created to meet the requirements detailed in Minnesota Statutes 103B and Minnesota Rules 8410, administered by the Minnesota Board of Water and Soil Resources. This plan is also consistent with the goals and policies of the Metropolitan Council's *Water Resources Management Policy Plan*, and Minnehaha Creek Watershed District. This plan may be periodically amended to remain current with local practices and policies. The purposes of the water management programs are to:

1. Protect, preserve, and use natural surface and groundwater storage and retention systems;
2. Minimize public capital expenditures needed to correct flooding and water quality problems;
3. Identify and plan for means to effectively protect and improve surface and groundwater quality;
4. Establish more uniform local policies and official controls and strive for regional uniformity in surface and groundwater management;
5. Prevent erosion of soil into surface water systems;
6. Identify the unique connection between surface water and groundwater and look for opportunities to promote groundwater recharge, where beneficial;
7. Protect and enhance fish and wildlife habitat and water recreational facilities; and
8. Secure the other benefits associated with the proper management of surface and groundwater.

The Long Lake Water Resources Management Plan addresses these purposes.

LAND USE

Location

The City is located within Hennepin County on the south shore of Long Lake. The City contains 613 acres of land and water resources within its corporate boundaries and is surrounded by the City of Orono. The City is located in the west portion of the Twin Cities Metropolitan area.

The entire watershed is within the Metropolitan Urban Service Area (MUSA). The Metropolitan Urban Service Area, or "MUSA," is the area in the seven counties in which the Metropolitan Council ensures that regional services and facilities, such as sewers and major highways, are provided or planned.

Existing Land Use

The existing land use in the City consists of a mix of industrial, commercial, residential, open space, and transportation corridors (**Figure 1**¹). Approximately 40 percent of the City is currently residential land use. In addition, public land uses comprise a large amount of developed acreage due to the current right-of-way requirements for TH 12 and other road corridors in the City. Less than 1% of the City is currently undeveloped.

The City has a natural surface water conveyance system that generally drains the western portion of the City north into Long Lake and then into Long Lake Creek. Long Lake Creek ultimately flows south into Lake Minnetonka. The majority of the City was developed prior to 1980 along these natural drainage systems.

Future Land Use

Future planned land uses and zoning within the City are described in the 2040 Comprehensive Plan: Chapter 4 Land Use. The Plan describes the 2040 land use goals as maintaining and supporting the pattern of the established residential neighborhoods and existing businesses while having a village-oriented downtown. However, it is also recognized that older areas of the City need investment and revitalization to maintain thriving businesses and residential neighborhoods. Figure 8 in Appendix A shows the City's proposed land uses.

Recent land use planning studies for the downtown redevelopment area include the Downtown Master Plan and Design Guidelines prepared by Hoisington Koegler Group, Inc. in 2001, and the Downtown Parking Study prepared by the Hoisington Koegler Group and WSB in 2006. Future development and redevelopment will be required to meet the City's Design Standards, Zoning Ordinances (Wetland Systems, Water Management, and Floodplain Management Sections), Comprehensive Plan and this LWMP. Redevelopment activities and in-fill development within the City should complement existing land use and density and are expected to continue as the population of the surrounding area continues to grow.

Recreation

The City of Long Lake offers a variety of recreational opportunities through its network of parks and trails. Below is a list of municipal parks:

1. Nelson Lakeside Park
2. Holbrook Park
3. Hardin Park
4. Dexter Park

¹ Please note that Figures are not included in this Chapter and are found in Appendix A of the Water Resources Management Plan.

Additionally, the Minnesota DNR maintains a trail which runs adjacent to the City. The Luce Line State Trail is a 63- mile-long former railroad grade which was developed for biking, hiking, horseback riding, and mountain biking.

Fish and Wildlife Habitat

The City provides habitat for a variety of small mammals, reptiles, birds, amphibians, and insects. Maintenance of habitat for wildlife species is important to ecological stability of the City's natural areas. **Figure 2** shows the map of habitat and land cover as classified by the Minnesota Land Cover Classification System (MLCCS). The majority of the land cover is developed, with some areas of forest and herbaceous covering.

Information from the DNR indicates there is a variety of moderately unique fish and wildlife habitat within the City, much of which is located near or in Long Lake. Long Lake is often stocked by the DNR to supplement natural reproduction. A Lake Survey Report for Long Lake can be found at the DNR Website.

Shoreland Management Ordinance

Long Lake has adopted a shoreland management ordinance in accordance with DNR criteria. The City's shoreland ordinance (in Section 17A) is part of the City's overall zoning ordinance. The City has also adopted a wetland ordinance entitled "W" Wetlands Systems District (Section 17). Sections 17 and 17A of the City's zoning ordinance are provided in **Appendix B** of the Water Resources Management Plan (WRMP).

Floodplain Zoning

The City participates in the National Flood Insurance Program (NFIP) and in 2004 the Federal Emergency Management Agency (FEMA) issued the initial Flood Insurance Rate Map (FIRM) for the City. The FIRM maps were then updated in 2016 by FEMA. FIRM panels numbered 27053C0302E and 27053C0306E were adopted by reference into the City's Ordinance Section 17B as the official Flood Plain Zoning District Map. Section 17B of the City's zoning ordinance is also provided in **Appendix B** of the WRMP. **Figure 3** illustrates the FEMA mapped flood hazard zones in Long Lake.

Additional Land Use Control

City code requires project owners to obtain a Building Permit (Section 4) for the construction or alteration of any structure. In addition, Section 17A of City Code (Water Management) requires all grading or filling activities to obtain a building permit prior to commencing construction. The ordinance requires preparation of storm water management components for all projects for the purposes of erosion and sediment control and water quality treatment. The code refers to the Minnehaha Creek permit program.

For development and redevelopment within the downtown area of the Long Lake, the City requires projects to be implemented in a manner consistent with the *Downtown Master Plan and Design Guidelines*. These guidelines include several items that help to reduce development impacts on water resources including:

1. Promoting the preservation and siting of business establishments in a compact configuration and a scale that accommodates pedestrian travel within the downtown area and surrounding neighborhoods.
2. Preservation and enhancement of desirable environmental features on property such as mature trees, vegetative buffer areas, stabilizing significant slopes, and installing water management features.

Section 33 of City Code addresses Tree Preservation and Landscape Standards in an effort to recognize and preserve existing natural resources of the community, and to encourage the greening of the City.

A description of the City's Design Standards and Administrative Processes are included in **Appendix D** of the WRMP. The City's policy is to refer all project proposers to the MCWD standards in the early stages of a development planning process for a larger project or following an application for a building permit for any land disturbing activity.

At this time, the City is deferring erosion and sediment control regulation (MCWD Rule B) to the MCWD along with MCWD Rules C, D, E, F, G and N.

1. Rule B Erosion Control
2. Rule C Floodplain Alteration
3. Rule D Wetland Protection
4. Rule E Dredging
5. Rule F Shoreline Improvements
6. Rule G Waterbody Crossing
7. Rule N Stormwater Management

The City entered into an agreement with the MCWD for maintenance on some of the storm water treatment ponds located in the City. This and other agreements as executed (e.g., with MnDOT for the TH12 storm water ponds) they are incorporated into **Appendix C** of the WRMP.

Private Development Stormwater Maintenance

Stormwater management ponds constructed on private developments are required to be covered by drainage and utility easements that are dedicated to the City. Developers are required to submit an operations and maintenance plan as well as a maintenance agreement for proposed stormwater BMPs. Current and future landowners are required to maintain the stormwater BMPs including but not limited to removing trash and debris, inspecting inlets and outlets, removing sediment buildup, and stabilizing and restoring eroded areas. In the event the landowner fails to maintain the stormwater BMP in good working condition acceptable to the City, the City may enter the property and correct any deficiencies.

NPDES Phase II

The MPCA implemented the NPDES Phase II Stormwater Program in March 2003. Phase II requires municipal separate storm sewer systems (MS4s) in urban areas with populations over 10,000 and under 100,000 to obtain an NPDES permit. Permits for construction sites greater than one acre will also be required as part of the Phase II. The City has submitted its Stormwater Pollution Prevention Plan and Notice of Intent in conformance with the MPCA guidelines. The application that was sent to the MPCA is included in **Appendix E** of the WRMP.

WATER RESOURCE INVENTORY

This section of the WRMP describes the regional climate of Minnesota, includes a general overview of the major surface water resources (lakes, wetlands, ditches, drainage patterns, and storm water ponds/facilities) within the City, and provides a discussion of the hydrologic modeling completed for the City and for the TH12 realignment project. This section also discusses how the detailed hydrologic data and modeling will be used by the City to guide and evaluate future development projects.

Climate and Precipitation

The climate within the Minneapolis/St. Paul metropolitan area is described as a humid continental climate with moderate precipitation, wide daily temperature variations, warm humid summers, and cold winters. The total average annual precipitation is approximately 31 inches, of which approximately one-third occurs in the months of June, July, and August. The annual snowfall average is about 54 inches, which is equivalent to approximately 5.4 inches of water.

In 2013, the National Oceanic Atmospheric Administration (NOAA) published the Atlas 14 Precipitation-Frequency document which showed an increase in rainfall intensity from the previously referenced Technical Paper 40 precipitation values. The City uses the Atlas 14 precipitation data for design purposes. A rainfall event having a 99% chance of occurrence in a given year over a 24-hour period is approximately 2.9 inches. A rainfall event having a 1% chance of occurrence in a given year over a 24-hour period is approximately 7.83 inches. The 1%, 10-day snowmelt runoff is 7.2 inches.

Additional rainfall information for the area can be obtained from the [National Weather Service website](#) or from the [State Climatologist website](#).

Table 7-1: Atlas 14 Rainfall Depths for 24-hr Event

Return Period	Rainfall Depth (inches)
1-yr	2.5
2-yr	2.9
5-yr	3.6
10-yr	4.3
50-yr	6.3
100-yr	7.3

Additional information on the climate of the area is provided in the MCWD Water Resources Management Plan or online at <http://climate.umn.edu/>.

Geology and Topographic Information

Soils

The surficial geology of the Long Lake area consists of unconsolidated sediments of glacial deposits, derived from the Grantsburg Sublobe of the Superior Lobe. The glacial sediments were deposited during the most recent glacial event, the Late Wisconsinian, which ended about ten thousand years ago. These deposits consist of till, outwash, and lacustrine (lake derived) deposits composed of mixed sands, silts, clays, and gravels. The hydraulic soil group and textural classification of soils are important indicators of the runoff potential and infiltration capacity of the soil; thus they should be considered when implementing BMPs.

The hydraulic soil group classifications for the soils in the City are shown in **Figure 4**.

The four soil classifications are defined as follows:

Group A – These soils have high infiltration rates even when thoroughly wetted. The infiltration rates range from 0.3 to 0.5 inches per hour. These soils consist chiefly of deep, well drained to excessively drained sands and gravel. Group A soils have a high rate of water transmission, therefore resulting in a low runoff potential.

Group B – These soils have moderate infiltration rates ranging from 0.15 to 0.30 inches per hour when thoroughly wetted. Group B soils consist of deep moderately well to well drained soils with moderately fine to moderately coarse textures.

Group C – These soils have slow infiltration rates ranging from 0.05 to 0.15 inches per hour when thoroughly wetted. Group C soils have moderately fine to fine texture.

Group D – These soils have very slow infiltration rates ranging from 0 to 0.05 inches per hour when thoroughly wetted. Group D soils are typically clay soils with high swelling potential, soils with high permanent water table, soils with a clay layer at or near the surface, or shallow soils over nearly impervious material.

Surficial Hydrogeology

The unconsolidated glacial deposits range in thickness from 150 to 300 feet within the boundaries of the City. Due to its lower permeability, the clay-rich till generally yields less ground water than the sandy and gravelly outwash deposits. In fact, the till can act as a confining layer if thick enough and broad enough. Groundwater flow in the unconsolidated glacial deposits is generally from north to south. The water table is approximately 950 feet above mean sea level.

Bedrock Geology

The depth to bedrock ranges from 50 to 400 feet within the boundaries of the City. Long Lake sits on the western edge of the Twin City Basin, a bowl-like structure in the bedrock. At this location the bedrock strata dips gently toward the east. The youngest and stratigraphically highest bedrock underlying the City

is the St. Peter Sandstone. Underlying the St. Peter Sandstone is the Prairie Du Chien Dolostone that is the only other uppermost bedrock in Long Lake.

Bedrock Hydrogeology

The City water supply comes from two municipal wells in bedrock aquifers. Four bedrock aquifers underlie the City of Long Lake. They are the St. Peter Sandstone, Prairie du Chien- Jordan, the Franconia-Ironton-Galesville, and the Mount Simon-Hinckley. These aquifers are separated by lower permeability confining layers. The first encountered bedrock aquifer is the St. Peter Sandstone that is relatively thin in the Long Lake area, the second aquifer is the Prairie du Chien- Jordan Aquifer. The St. Lawrence Confining Layer separates the Prairie du Chien-Jordan Aquifer from the underlying Franconia-Ironton-Galesville Aquifer. The Eau Claire Confining Layer separates the Franconia-Ironton-Galesville Aquifer from the deepest aquifer, the Mt. Simon- Hinckley Aquifer. The groundwater flow direction in the bedrock aquifers is generally southeast in the Long Lake area.

The lower part of the St. Peter Sandstone that is found in Long Lake contains multicolored beds of mudstone, siltstone and shale with interbedded very coarse sandstone. Many sand grains in the lower part are dark gray in color.

The Prairie du Chien-Jordan Aquifer is made up of the Prairie du Chien Group and the Jordan Sandstone. The Prairie du Chien Group consists of a sandy dolostone with minor amounts of shale. The Jordan Sandstone is a fine to coarse grained quartzose sandstone with minor amounts of shale. The Prairie du Chien-Jordan is the most heavily used aquifer in Hennepin County, with potential yields in excess of 2,000 gallons per minute. Underlying the Prairie du Chien-Jordan is the St. Lawrence Confining Layer. The St. Lawrence is comprised of lower permeability siltstone and dolostone and acts to hydrologically separate the overlying Prairie du Chien-Jordan from the underlying Franconia-Ironton-Galesville.

The Franconia-Ironton-Galesville Aquifer is made up of the Franconia Formation, comprised of glauconitic sandstone with some shale and dolomite; the Ironton Sandstone, and the Galesville Sandstone. This aquifer is commonly used for domestic water supply wells in the north and northwestern portions of Hennepin County. Underlying the Franconia-Ironton- Galesville is the Eau Claire Confining Layer. The Eau Claire consists of siltstone, shale, and silty sandstone and serves to hydrologically separate the overlying Franconia-Ironton- Galesville from the underlying Mount Simon-Hinckley.

The Mount Simon-Hinckley Aquifer is made up of the Mount Simon and Hinckley Formations. The Mount Simon Formation is a silty, fine- to coarse-grained sandstone with thin beds of very fine- to fine-grained sandstone and minor shale beds. The Hinckley is absent in most places, but where it occurs it is in remnants on the order of tens of feet thick.

Recharge Zones

Recharge to the bedrock aquifers beneath the City of Long Lake occurs in two ways, vertically and laterally. Vertical recharge occurs through overlying glacial sediments and other bedrock aquifers. This is accomplished because even low permeability units allow some leakage of ground water through them. Lateral recharge occurs as ground water moves laterally from outside the City or County, through the aquifer. The lateral recharge to the bedrock aquifers in Long Lake comes from the north-northwest.

Recharge to the water table aquifer occurs primarily from precipitation and surface water groundwater interactions as well as laterally from outside the City.

Local Groundwater Models

The Hennepin County Conservation District (HCD) in cooperation with the Minnesota Department of Health has developed a County wide multi-layer groundwater model. This model may be a valuable tool in dealing with many of Long Lake's groundwater issues. This model could be useful with issues such as; wellhead protection, storm water infiltration ponds, wetland issues, well siting, dewatering, etc.

The Minnesota Pollution Control Agency (MPCA) developed a Metropolitan Groundwater Model in 2000. This model is a regional model focusing on the seven County metropolitan area including Hennepin County. The model is simple and coarse discretized, including only known major hydrogeologic features. The focus of the MPCA model is more for evaluating groundwater contamination and remediation of the Quaternary aquifer and the Prairie Du Chien aquifer. The MPCA model and the HCD model utilize the Multi-Layer Analytical Element Model (MLAEM). The HCD model however is characterized as a single layer.

The City completed its Wellhead Protection Plan Part I in 2003 and Part II in 2004. **Figure 5** shows the boundaries of the City's drinking water supply management area (DWSMA) and the wellhead protection area. Additional information relating to wellhead management and groundwater sensitivity analyses are provided in **Appendix G** of the WRMP.

Surface Water Resource Data

Several surface water features are present in the City that provide water-based recreation opportunities and wildlife habitat. The primary water-based recreation areas are Long Lake and Long Lake Creek. Long Lake Creek and ravines within the City also serve as wildlife corridors, as do the parks and golf courses. Because the City is almost fully developed, preservation of the existing corridors and development of buffer areas will be encouraged through the City's land use planning and administration activities. Additional information on each of these surface water features follows.

Wetlands

The MCWD in 2001-2003 completed a wetland function and value assessment for wetlands larger than one-quarter acre in size in the City using a variant of the Minnesota Routine Assessment Method (MnRAM). Currently the MCWD acts on behalf of the City as the LGU responsible for administering the Wetland Conservation Act (WCA). MCWD's wetland regulatory program (Rule D) is based on the aforementioned functional management classification.

The National Wetland Inventory Map shown in **Figure 6**, shows the location and type of wetlands within the City of Long Lake. In addition to these wetlands, there are several storm water detention basins within the City that provide some of the benefits of a natural wetland system. MnDOT also has detailed wetland delineation information along the TH12 realignment corridor.

There are currently two areas within the City that contain wetlands over five acres. Both are currently subject to long-term, site-specific regulations which prohibit development in these areas. These

requirements are in addition to the wetland regulations in Section 17A of the Zoning Ordinance. The first area is a 5.9-acre Outlot B in the Wolf Pointe Woods subdivision which is encumbered by a permanent drainage and utility easement. The second area is Outlot A of the Fleming Trail Addition. Item 11 of the Fleming Trail Addition Declaration of Covenants prohibits development of Outlot A, and Item 4 requires that impacts on existing natural vegetation must be minimized.

Major Bodies of Water

Long Lake (DNR Inventory No. 27-0160P) is a 320-acre basin located on the northern limits of the City of Long Lake. The DNR has classified Long Lake as a Recreational Development Lake. Information is available from the DNR and the MCWD regarding basin morphology, water quality, fisheries, lake levels, and a bathometric map on DNR's Lake Finder webpage and MCWD's web pages.

The lake outlet is a concrete weir within an 8-foot wide box culvert located on the south side of the lake just west of Union Cemetery. The runout elevation is listed by the DNR as 944.25 (NGVD 1929). There was a historical discussion regarding the appropriate runout elevation of the lake at the time of the outlet's reconstruction. The end result was a Mn/DNR Commissioner's Order to set the present outlet elevation of the lake.

The lake is used for fishing, water skiing, swimming, and other water-resources based activities. Water quality is commonly judged by the water clarity. The water clarity is dependent upon the amount of algae present, which is generally controlled by the amount of available phosphorus. Reducing the phosphorus available will generally improve water clarity.

The MCWD has established an in-lake target phosphorus concentration of 40 µg/l. The 2009 average in-lake total phosphorus (TP) concentration of 83.9 µg/l exceeds the MCWD target concentration and the MPCA's standard. Long Lake is included on the 2018 MPCA's 303(d) list of impaired waters for excessive nutrients and Long Lake is also listed as impaired for mercury fish consumption advisory. For mercury, a state-wide TMDL has been completed and received final approval by the EPA in March 2007. A TMDL was completed in 2014 for excessive nutrients.

The portion of the City that drains directly to Long Lake is, for the most part, entirely developed. Additional improvements may include retrofitting the existing storm drainage system with water quality treatment devices and/or the diversion of storm water away from Long Lake. In an effort to improve the water quality of Long Lake, the MCWD has sponsored the introduction of alum and constructed storm water treatment ponds within the City Park near Symes Street. The City recently restored the ravine draining into Long Lake and constructed a water quality treatment BMP along the ravine within the Nelson Lakeside Park.

Streams and Ditches

Long Lake Creek is a DNR regulated watercourse that flows from Long Lake south into Lake Minnetonka. A drainage ditch system that originates in Orono discharges into Long Lake in the northwest portion of the City. This system discharges to a ravine near Daniel Street and outlets into Long Lake Park west of Symes Street and Lake Street.

A system of natural drainage swales, a natural drainage ravine and Long Lake Creek are located within the boundaries of the City. No public ditches exist within the City of Long Lake.

Land-locked Basins

MCWD has identified landlocked subwatershed units in the eastern part of the city located south of Highway 12. These locations are shown in Appendix C of the MCWD Comprehensive Watershed Management Plan. Stormwater abstraction within the drainage area of the land-locked basin will be used to address any stormwater quality and quantity issues. Outletting of land-locked basins is a last resort, not to increase downstream flow or flooding/erosion potential.

General Drainage Patterns

The City is located entirely within the MCWD and is part of the Long Lake Creek Watershed as illustrated in **Figure 7**. The general direction of surface water flow within the subwatershed is towards the south into Lake Minnetonka.

The western portion of the City drains generally to Long Lake and the eastern portion of the City drains to Long Lake Creek and south to Lake Minnetonka. The City has numerous points of drainage originating from the City of Orono and many points of drainage into the City of Orono.

Hydrologic Modeling

1997 Modeling

The Long Lake Ravine subwatershed was modeled in 1997, by the MCWD for use in the design of regional pond(s) using the TR-20 computer model developed by the National Resource Conservation Service (NRCS). At that time, the MCWD had proposed to expand an existing wetland complex west of Industrial Boulevard to serve as a storm water detention and treatment basin.

1998 Modeling

Several hydrologic modeling efforts have been completed for the Long Lake area starting in about 1998 as part of this WRMP and preliminary design stages of the TH 12 realignment. In 1998, the City was divided into seven distinct subwatersheds for the original DRAFT WRMP. Four of the subwatersheds were included in the detailed model.

The 1998 modeling was based upon from City staff regarding historical observations (City Public Works Superintendent Marv Wurzer has worked for the City for over 20 years which have included several large rainfall events), field observation, consideration of existing and future land use conditions, and examination of drainage patterns. Based upon these considerations, the 1998 hydrologic model developed for the City was developed only for the Long Lake Ravine (LLR), East Brown Road (EBR), Long Lake Watertown (LLW), and the Long Lake Creek (LLC) subwatersheds.

The existing subwatershed drainage patterns were evaluated for the Long Lake WRMP using the HydroCADTM version 4.522 computer model, which uses the TR-20 methodology.

Contour, topographic, culvert size, and invert information obtained from Mn/DOT and MCWD was used for the development of the hydrologic model for the four subwatersheds. Land use information from the

other models, the City of Long Lake zoning map, and the City of Orono Draft Storm Water Management Plan was also used to develop the 1998 model.

2001 Modeling

This section summarizes the hydrologic modeling completed since 1998 for the purposes of completing of this WRMP and for the TH 12 realignment. In 2001, it was obvious that the proposed realignment of TH 12 (generally along the former Burlington Northern railroad) would result in several alterations to the drainage patterns. As of 2001, MnDOT had completed modeling of approximately 60 percent of the City using XP-SWMM computer model to assist in the design of storm sewer and storm water retention and detention areas for the proposed TH 12 realignment. A summary of the hydrologic data for the drainage areas modeled is provided in **Appendix F** of the WRMP.

The MCWD, Mn/DOT, and the City models were developed to guide different management decisions. A meeting was held on June 15, 1998, between the MCWD, Mn/DOT, and the City of Long Lake technical representatives to discuss the various modeling assumptions and results. The modeling assumptions and approaches vary somewhat, but the results are generally consistent.

A second meeting was held on July 25, 2001, again with representatives of MnDOT, MCWD, and the City of Long Lake. The main focus of the meeting was to discuss the status of the City's WRMP and the coordination of hydrologic modeling efforts between MnDOT and the City. At this meeting, the group agreed that incorporating the most recent MnDOT modeling information into the City WRMP was the most efficient approach to completion of the plan. The group also concluded that using the MnDOT modeling information to guide future water management decisions in the City would be beneficial for two reasons. First, the thought was that following approval of MnDOT modeling for TH 12, the permit application review process for MCWD could be streamlined and become more efficient for projects in the areas covered by the model. This remains true today, although the focus has shifted much more towards water quality and volume control in the past 10 years.

The second benefit was that development projects in areas covered by the MnDOT model would have been eligible to take advantage of the regional ponds constructed as part of the TH 12 project provided the development was consistent with the future land use (hydrologic) conditions that MnDOT used to develop the model. While this may still have some merit, projects using the MnDOT regional ponds may be eligible, but would require approval of a regional stormwater plan in accordance with Section 7 of the MCWD Stormwater Management Rule.

2003 Modeling

The 2003 MCWD Hydrologic, Hydraulic, and Pollutant Loading Study (HHPLS) subdivided the Long Lake subwatershed into 53 subwatershed units and included detailed modeling of the current and 2020 hydraulic and hydrologic conditions in the subwatershed. As part of this study effort, the entire watershed was modeled for both existing and future water resource management problem identification and prioritization. The modeling efforts included hydrologic and hydraulic, lake analysis, pollutant loading, and groundwater modeling. Rates and volumes for the City can be requested from MCWD.

Some of the existing and future outcomes for modeled locations (lakes, ponds, channels, and crossings) within the subwatershed are scour potential, normal and high water levels, peak discharge, and peak velocity for the 1.5 year, 24-hour and 100-year, 24-hour events, and the 100-year, 10-day snowmelt event.

Trunk Highway 12 Reconstruction

Several regional storm water ponds were created in Long Lake and Orono as part of the TH 12 project. As stated earlier in the plan, these regional ponds were designed based on future land use assumptions (in 2001) to meet water quality and water quantity control requirements.

PROBLEMS AND CORRECTIVE ACTIONS

Outlined below is an assessment of known existing and potential water resource-related problems. These problems have been identified based on an analysis of the land and water resource data collected as part of this Plan preparation and through information from the City. A description of any existing or potential problems within the topic area has been listed and future corrective actions have been incorporated into an implementation plan.

Lake and Stream Water Quality Problems

Problem 1.A Impaired waters to which the City discharges to are listed in **Table 7-2**.

Table 7-2

Waterbody/Watercourse (AUID)	Year Added to List	Affected Use	Pollutant/Stressor	TMDL Status
Long Lake (ID - 27-0160-00)	1998	Aquatic Consumption	Mercury in fish tissue	Complete
Long Lake (ID - 27-0160-00)	2010	Aquatic Recreation	Excess nutrients	Complete
Tanager Lake (ID - 27-0141-00)	2010	Aquatic Recreation	Excess nutrients	Complete

Corrective Action 1.A The Environmental Protection Agency (EPA) has approved the statewide TMDL mercury study. No action by the City is needed.

The Upper Minnehaha Creek Watershed Nutrient and Bacteria TMDL Study and Restoration Strategy Report were completed in 2014. A total phosphorus (TP) load reduction was assigned to the City for Long Lake and Tanager Lake. Annual load TP load reduction for Long Lake is 135 lbs/year and for Tanager Lake is 37 lbs/year.

The City will continue to implement BMPs as part of street reconstruction projects as feasible. The City will also continue with their street sweeping program to remove leaves and other organics prior to discharging into waterbodies.

If additional TMDLs are identified that affect the City, the City shall participate in the stakeholder process to develop the TMDL and implementation plan. The City is committed to protecting water quality and would consider partnering with MCWD and/or adjacent communities for specific projects.

Problem 1.B The possibility of contamination exists when there are connections between groundwater and surface water.

Corrective Action 1.B The Hennepin County Groundwater Plan has not been formally adopted; however, the county is implementing many aspects of the plan. The City completed a Part 1 Wellhead Protection Plan in 2003 and a Part 2 Wellhead Protection Plan in 2004 (**Appendix G**). The WHPA and DWSMAs in the City of Long Lake are illustrated in **Figure 5**. The water supply system has no evidence of contamination from human origin or naturally occurring contaminants. The aquifer used for the City water supply is considered non-vulnerable to contamination because it is covered by fine-grained geologic materials that hydraulically separate it from the surface waters. In fact, the water quality meets or exceeds the Federal Safe Drinking Water Act.

Potential sources of aquifer contamination are other wells that reach the aquifer. Water quantity in the system meets needs and the only concern would be the pumping effects of high-capacity wells that may alter the boundaries of the delineated WHPAs, reduce the hydraulic head in the aquifer, or cause the movement of contamination toward public water supply wells.

Flooding and Stormwater Rate Control Concerns

Problem 2.A The outlet for the Nelson Lakeside Park system frequently gets clogged and needs regular maintenance to prevent water backup through the system.

Corrective Action 2.A The City will look into an outlet improvement project to provide an overflow structure with an improved skimmer that would prevent clogging from debris.

Impacts of Water Quantity or Quality Management Practices on Recreational Opportunities

Problem 3.A The City has not experienced any impacts to recreational opportunities as the result of water quantity or quality impacts.

Corrective Action 3.A No corrective action needed. However, if areas develop or redevelop, the project will be subject to the policies of the MCWD. The City will look to partner with MCWD and adjacent communities if any issues arise.

Impacts of Stormwater Quality on Fish and Wildlife Resources

Problem 4.A The City has not experienced any impacts on fish and wildlife resources.

Corrective Action 4.A No corrective action needed. However, if areas develop or redevelop, the project will be subject to the policies of the MCWD. The City will look to partner with MCWD and adjacent communities if any issues arise.

Impacts of Erosion and Sedimentation on Water Resources

Problem 5.A Soil erosion and sediment transportation associated with re-development may impact the quality of water and storage volume available within City lakes, streams, and ditches.

Corrective Action 5.A The City has updated the erosion control requirements in the stormwater ordinance. New develop and redevelopment will also be subject to the policies of the MCWD.

Problem 5.B Long Lake has natural ravines and drainage ways that are prone to bank erosion. Care must be taken to ensure that the introduction of stormwater into these systems and flow within the ravines does not cause bank erosion. Soil erosion also can create pond and drainage way performance and maintenance issues.

Corrective Action 5.B Land disturbing activities in the City will comply with the erosion and sediment control and permitting requirements of MCWD. The City will conduct feasibility studies at the any specific locations identified as issues to determine the best energy dissipation and permanent stabilization techniques for these areas to resolve the erosion problem.

Impact of Land Use Practices and Development on Water Resource Issues

Problem 6.A Selected areas of the City have been exposed to increased rates and volumes of stormwater runoff as a result of an increase in impervious surface area. Other land development and land use practices have negatively impacted both water quality and quantity outside the City limits. The City will look into partnering with MCWD on future projects to reduce impacts from development and improve water quality.

Corrective Action 6.A The City will implement policies and projects in this SWMP. Additionally, areas that develop or redevelop will be subject to the policies of the MCWD. The City places high priority on maintaining local parks and open spaces. The use of natural landscaping in these areas will help minimize runoff and erosion concerns. When maintenance or upgrading to local parks, trails, or open spaces is required, the City will look for opportunities to install additional BMPs to help further reduce erosion and runoff concerns.

Problem 6.B The MCWD has identified several Key Conservation Areas within the City. These areas are generally located over the Long Lake Creek drainage area located just south of Long Lake.

Corrective Action 6.B The City will work with MCWD to appropriately protect these areas where possible.

Adequacy of Existing Regulations to Address Adverse Impacts on Water Resources

Problem 7.A The City generally has adequate regulatory controls in place to manage and mitigate adverse impacts on public waters and wetlands. However, additional ordinances or ordinance updates are necessary to continue to successfully manage water resources.

Corrective Action 7.A The MCWD will retain permitting authority within the City. The City will continue to implement the City's NPDES SWPPP as well as implement the policies with this SWMP. The City will review and revise existing ordinances, as necessary. Also, the City will update the erosion control requirements in the stormwater ordinance. Ordinances will be

updated to include submission of preliminary plats to the MCWD. Ordinances will be updated within 180 days of MCWD plan approval.

Information regarding the standards and review logistics for projects within the City of Long Lake will be conveyed with existing permitting and preliminary plat review processes.

Education Program

Problem 8.A The City recognizes the need for community education programs to increase public awareness of water resource management and improve the quality of stormwater runoff.

Corrective Action 8.A The City will continue to provide educational content and opportunities to residents, businesses, developers, and others. These efforts may include postings on the City website and publishing a newsletter to spread awareness of stormwater related issues. The City will work with MCWD on educational efforts when possible to avoid duplicating efforts. Information from the MCWD Communication's Committee and other entities could be included in the City newsletter, which is published quarterly.

Identification of Potential Problems Anticipated to Occur in the Next 20 Years

Problem 9.A The City is generally fully developed, with little opportunity to construct stormwater management projects.

Corrective Action 9.A Upon new development and redevelopment, the stormwater management policies of the MCWD will apply. By applying these policies, previously untreated areas will have treatment and implementation of BMPs.

The City will also pursue alternative funding through local, state, and/or federal grants for a regional stormwater treatment and reuse system to treat stormwater in the downtown area. The City does not currently have funding for this project but will explore options and opportunities to complete such a project.

Problem 9.B Determining the performance of existing stormwater infrastructure throughout the City.

Corrective Action 9.B Included in the City's SWPPP are established BMPs aimed at storm sewer inspection and maintenance training programs. The City is to annually inspect 20 percent of completed City owned BMPs and 100 percent of pollution control devices. The City will also evaluate inspection records to determine if inspection frequency should be increased or decreased. More information on the City's stormwater maintenance and inspection program can be found in the SWPPP located in **Appendix E**.

Below are the maintenance and inspection activities the City intends to undertake to ensure that their drainage system is performing efficiently and effectively:

1. Visually inspect stormwater ponds every year to determine if the ponds are performing adequately.

2. When a pond has reached half of its design life expectancy it should be surveyed to determine its remaining dead storage volume. Once the pond has lost half of its dead storage volume, the accumulated sediment should be removed from the pond.
3. Inspect storm sewer outfalls once in the spring and once in the fall for evidence of scouring or the presence of significant deposition of silt. Scouring problem areas will be noted and stabilized. In areas where silt deposition is evident, which is indicative of significant erosion upstream, an inspection of the upstream watershed will be made to identify the source of erosion. Once this erosion problem is determined suitable, corrective measure will then be undertaken to correct the problem.

Problem 9.C Locate potential flooding areas in the downtown area.

Corrective Action 9.C The City will complete a feasibility study to analyze flooding areas as well as strategies to minimize flooding and create water quality improvements.

Problem 9.D Increasing prevalence of polycyclic aromatic hydrocarbons (PAHs) in stormwater ponds from runoff of roadways and other surfaces.

Corrective Action 9.D Identify stormwater ponds that are contaminated and follow protocol on the MPCA website for disposal of dredged material. The City also bans the use of materials that contain PAHs for paved surfaces for future development and redevelopment.

Problem 9.E Increasing prevalence of chloride in surface and groundwater in the Twin Cities from road salt runoff from roadways and other impervious surfaces.

Corrective Action 9.E The City will work to implement preventative measures to reduce the chloride runoff used in deicing before it reaches surface and/or groundwater. The City currently uses a sand-salt mix consisting of 15% salt and 85% sand. The City conducts street sweeping efforts at least twice annually including in the spring, fall and on an as-needed basis in higher priority areas or where street maintenance work has been completed. Additional preventative measures will include education and outreach for salt applicators (commercial or private), promote winter best practices, partnering with MCWD for training, and other initiatives noted in the Twin Cities Metropolitan Area Chloride Management Plan.

Availability and Adequacy of Existing Information to Manager Water Resources

Problem 10.A The City will need to maintain and update information developed within this SWMP.

Corrective Action 10.A The City will continue to update the hydrologic/hydraulic model and Geographic Information System (GIS) database as new development and redevelopment occur.

Problem 10.B Locate all drainage easements within the City and enforce requirement for drainage easements with redevelopment projects.

Corrective Action 10.B The City will conduct a project to identify and log all drainage easements. When redevelopment happens in the City, drainage easements will be required.

Problem 10.C The City recognizes that there is currently not enough water quality monitoring data available to determine the effects of stormwater quality on area lakes.

Corrective Action 10.C The City defers to and supports the water quality monitoring activities of the MCWD.

GOALS AND POLICIES

Summary

The primary goal of Long Lake's WRMP is to provide a framework for effective surface water management and to bring the City into statutory compliance. This includes guiding redevelopment activities and identifying and implementing retrofits to the existing system. These retrofits consist of both projects and programs. Additionally, the plan provides clear guidance on how Long Lake intends to manage surface water in terms of both quantity and quality.

The goals and policies described in this section are intended to incorporate the foundation of several regional, state, and federally mandated programs. They are not meant to replace or alter the regional, state, and federally mandated programs, rules, and regulations, but to serve as an enhancement and provide some general policy guidelines. The goals address the management strategies of Minnehaha Creek Watershed District (MCWD) and are consistent with the objectives set forth in the State Wetland Conservation Act (WCA) and the Federal Nationwide Urban Runoff Program (NURP). Cooperation, collaboration, and partnering results in projects that are less likely to conflict with the goals of the affected entities, are better able to meet long-term goals, and are generally more cost-effective.

This section outlines the goals and policies specific to surface water management in Long Lake. Goals and policies are grouped by their relationship to the key issues listed below:

1. Section 5.2 – Water Quantity
2. Section 5.3 – Water Quality
3. Section 5.4 – Erosion Control
4. Section 5.5 - Wetlands
5. Section 5.6 – Public Participation, Information, and Education
6. Section 5.7 – Maintenance and Inspection
7. Section 5.8 – Recreation, Fish and Wildlife
8. Section 5.9 – Groundwater
9. Section 5.10 – Finance

Water Quantity

Goal: Control flooding and minimize related public capital and maintenance expenditure necessary to control excessive volumes and rates of runoff.

Policies

1. Permanent stormwater management shall meet the requirements of Minnehaha Creek Watershed District and the City's Ordinance.
2. The City will require corrective maintenance and the use of appropriate best management practices (BMPs) to preserve the hydraulic capacity of water bodies. This includes the cooperative agreement between the City and MCWD for the construction and maintenance of sedimentation basins, wet detention basins and related facilities in Long Lake Park and the retention and treatment of stormwater runoff before its discharged into Long Lake.
3. The City will continue using regional detention areas whenever practical; however, for new construction stormwater abstraction using on-site facilities will be used where practical and effective.
4. For development or redevelopment projects outside the drainage area covered by the MnDOT drainage system, the runoff rates shall not increase for the 1, 10, and 100-year Atlas 14 rainfall events.
5. Emergency overflows, outlets to drainage systems or other provisions shall be provided if the available storm water storage capacity is inadequate to prevent flooding of adjacent structures.
6. The minimum building elevation (lowest floor elevation) for all structures must be 2 feet above the established 100-year peak levels.
7. Increased volumes of runoff due to development should be minimized by abstraction, limiting impervious cover and encouraging infiltration of stormwater where soil conditions are appropriate.
8. The City encourages the use of alternative landscape techniques and low impact development to reduce rates and volumes of runoff.
9. The City encourages the use of stormwater abstraction BMPs to control stormwater on-site for areas draining to land-locked basins.
10. The City will require no net loss of floodplain storage from development or redevelopment projects.
11. The design storm for the future local collection system evaluation and design will be a 10-year return period event. Local storm sewer systems will generally be designed using the Rational Formula.

Water Quality

Goal: Minimize impact of future development activities on water quality of Long Lake, Long Lake Creek, and wetlands. Achieve water quality standards in Long Lake, Long Lake Creek, and wetlands consistent with intended use and classification.

Policies

1. Proposed developments will identify all reasonable steps to avoid water quality impacts and mitigate with appropriate BMPs (stormwater abstraction preferred), to minimize the water quality impacts of receiving waters. The City encourages the use of low-impact development integrated management practices.
2. The City will require corrective maintenance and the use of appropriate best management practices (BMPs) to preserve water quality. This includes the cooperative agreement between the City and MCWD for the construction and maintenance of sedimentation basins, wet detention basins, and related facilities in Long Lake Park and the retention and treatment of stormwater runoff before it is discharged into Long Lake.
3. The City shall use BMPs to reduce phosphorus nutrient loading to Long Lake Creek downstream of Long Lake to meet MCWD phosphorus reduction goal.
4. The City shall maintain a response plan to minimize impacts of hazardous spills.
5. The City will support MCWD efforts in developing regional water quality ponds and other stormwater BMPs whenever practical.
6. The City will support Phosphorus Turf Fertilizer Use Restrictions and MCWD information and education efforts to reduce nutrient loading to lakes, creeks, and wetlands.
7. The City shall promote the reduction or minimization of hard-surfaced areas through the implementation of City ordinances and standards.
8. The City will balance protection of wetlands, utilization of wetlands to protect the water quality of other water resources (i.e., wetland, lake, stream), and use of wetlands to provide flood control.
9. The City encourages the use of alternative landscape techniques and materials to reduce water quality impacts as described in the Minnesota Stormwater Manual.
10. The City will manage City properties in accordance with the appropriate best management practices.
11. The City will coordinate and cooperate with MCWD on the management of all dredging projects.

Erosion Control

Overall Goal: Minimize soil erosion through enforcement and education.

Policies

1. Erosion control plans meeting the requirements of MCWD rules shall be required for grading activities.
2. All construction sites that are required to obtain a NPDES permit must comply with the erosion and sediment control conditions of that permit. Erosion and sediment control BMPs are to be installed before land disturbing activities begin and shall be maintained until the site is re- stabilized.
3. The City shall support MCWD erosion control education efforts and encourages use of construction and erosion control practices in Metropolitan Council's Urban Small Site BMP Manual and the Minnesota Stormwater Manual.

Wetlands

Overall Goal: Increase the wetland values within the City, where feasible.

Policies

1. The City shall support the administration of the Minnesota Wetland Conservation Act (WCA) by the MCWD. In accordance with MCWD requirements, the City will require 1:1 mitigation for wetland excavation impacts not covered under the WCA.
2. The City will encourage treatment of storm water runoff prior to discharge to wetlands.
3. The City shall encourage the maintenance of a natural buffer around natural wetlands.
4. The City shall support the restoration of disturbed wetlands within the City.
5. The City will support existing wetland regulation activities and has established a Wetland Systems Ordinance that is included in Appendix B. The Minnesota Wetland Conservation Act will be administered by the MCWD. The MCWD has completed a Wetland Function and Value Assessment for wetlands throughout the watershed district and is available in Appendix E.

Public Participation, Information, and Education

Goal: Increase public participation and knowledge in management of the water resources.

Policies:

1. The City support the MCWD and other water resource management organizations in their public information efforts.

Maintenance and Inspection

Goal: Preserve the function of water resource facilities through routine inspection and regular maintenance activities.

Policies:

1. As part of their NPDES permit, the City will develop and implement an annual inspection and maintenance plan for water resource facilities (see listed activities 1-3 above).
2. The City shall require maintenance of privately constructed treatment ponds.
3. The City shall require adequate maintenance-related access for public and private water resources facilities (i.e., ponds, etc.).
4. The City will require corrective maintenance and the use of appropriate best management practices (BMPs) to preserve water quality and hydraulic capacity of water bodies. This includes the cooperative agreement between the City and MCWD for the construction and maintenance of sedimentation basins, wet detention basins, and related facilities in Long Lake Park and the retention and treatment of stormwater runoff before its discharged into Long Lake.
5. The City will complete the required pond inventory and maintenance requirements as required in the NPDES MS4 Permit.

Recreation, Fish, and Wildlife

Goal: Improve fish and wildlife habitat and water resource-based recreational opportunities where feasible.

Policies:

1. Natural areas and wildlife habitat intended for preservation shall be protected during construction by appropriate BMPs.
2. Encourage the preservation of vegetative buffers around ponds and wetlands to provide habitat for wildlife.
3. The City shall support programs for controlling exotic and invasive species of plants and animals.
4. The City will support new opportunities to integrate water resources based recreation activities and wildlife interests within wildlife corridors.

Groundwater

Goal: Prevent contamination of the aquifers and promote groundwater recharge.

Policies:

1. The City shall develop and implement controls to protect wellhead areas identified in their Wellhead Protection Plans, Parts I and II.
2. The City shall promote proper well abandonment.
3. The City will consider alternatives to conventional storm water detention to enhance groundwater recharge through infiltration.
4. The City will implement and enforce the existing Water Conservation Plan. The City shall encourage the use of alternative landscape techniques and materials to reduce dependency on groundwater supplies.

Finance

Goal: Establish funding sources to finance water resources management activities.

Policies:

1. The City shall identify and implement possible funding sources for water resources management.
2. The City will actively pursue grants, donations, and in-kind contributions to help fund water resources management.
3. The City shall assist citizens and businesses in their efforts to improve water quality, improve water quantity controls, and/or upgrade wetlands when feasible.

IMPLEMENTATION PROGRAM

Introduction

The Implementation Section is intended to provide guidance in carrying out the plan objectives. The implementation program summarizes the schedule for and cost of recommended actions. Lastly, procedures for amending the plan are discussed. Table 6 summarizes the Implementation Priorities of this WRMP.

Official Controls

The City currently does not have official controls in place that will provide for protection of water resources to the same degree as the MCWD Rules. However, the Plan will ensure protection of water resources in the City to the same degree as MCWD Rules by authorizing the MCWD to continue to require permits for the use and development of land, otherwise exercise its regulatory authority, within the meaning of Minnesota Statutes Section 103B.211, subd. 1(a)(3)(I).

City code requires project owners to obtain a Building Permit (Section 4) for the construction or alteration of any structure. In addition, Section 17A of City Code (Water Management) requires all grading or filling activities to obtain a building permit prior to commencing construction. The ordinance requires preparation of stormwater management components for all projects for the purposes of erosion and sediment control and water quality treatment. The code refers to the Minnehaha Creek permit program and City staff conducting either a planning review or building permit review informs project owners of the MCWD Rules and Permit Program.

Implementation Priorities

The implementation plan includes identification and prioritization of capital improvements, administration, inspections, permitting, plan amendments, financing alternatives, public involvement, and monitoring programs. Prioritization of improvements is based on a review of all recommended actions. Table 6 provides a schedule and approximate funding for those projects listed.

Street Sweeping

The City has operated a semi-annual street sweeping program of all streets in the City. The City has determined that the current street sweeping program as a BMP will partially meet the requirements for both the subwatershed from Long Lake to Tanager Lake and the subwatershed area upstream of Long Lake.

Based on samples taken from street sweepings by the nearby City of Plymouth and tested by the University of Minnesota, the samples were found to have a concentration of 235.5 mg/kg of phosphorus. These findings are more conservative than the report "Deriving Reliable Pollutant Removal Rates for Municipal Street Sweeping and Storm Drain Cleanout Programs in the Chesapeake Bay Basin" prepared by the Center for Watershed Protection. It was determined the enhanced street sweeping program (vacuum sweepers) removed 1.0 lbs. of phosphorus per street mile.

The City of Long Lake uses a high efficiency broom street sweeper compared to the vacuum- assist sweeper for the City of Plymouth. The overall reduction due to street sweeping can be expressed as a percentage change for the two types of street sweepers. The street dirt yield for the vacuum-assist sweeper is 63% whereas the high efficiency broom yields a 20% removal efficiency based on the report "Evaluation of Street Sweeping as a Stormwater- Quality-Management Tool in Three Residential Basins in Madison, Wisconsin" prepared by the United States Geological Survey. A high efficiency broom is used to sweep all streets within Long Lake twice a year.

This information was used to generate the City's estimated annual phosphorus load reduction. The estimated annual total phosphorus load reduction within the MCWD is 7.7 lbs/year, 2.5 lbs/year in the Long Lake to Tanager Lake subwatershed, and 5.2 lbs/year in the subwatershed tributary to Long Lake. This is a conservative estimate of 0.31lbs of TP/street mile/sweep compared with the City of Plymouth's findings of 1.0 lbs of TP/street mile/sweep. This difference is due to the type of street sweeper used. To ensure an accurate analysis of the phosphorus removal, the City will record the total amount of sediment removed and sample the sediment to determine the concentration of phosphorus.

The City has identified street sweeping as a significant BMP towards reducing the overall phosphorus load to Minnehaha Creek. Based on the removal efficiencies for a vacuum-assist sweeper compared to the high efficiency broom sweeper, the City will look to upgrade to a vacuum-assist sweeper to achieve a higher removal rate. The City will also consider an increase in the frequency of sweeping to achieve an even higher removal rate.

Bioretention / Infiltration

The area downstream of Long Lake (within the City limits from Long Lake to Tanager Lake) will have phosphorus load reductions through a combination of bioretention / infiltration system(s) and street sweeping. This area is very residential with several existing stormwater ponds and wetlands limiting the availability of space to construct bioretention / infiltration system(s).

One site was identified on institutional property in subwatershed LLC 47 for construction of a bioretention / infiltration system that would result in an annual phosphorus load reduction of 5.7 pounds/year from a drainage area of 14 acres. The current phosphorus load was calculated using the Simple Method for Estimating Phosphorus Export, in the Minnesota Stormwater Manual. Bioretention / infiltration BMPs have a 100% phosphorus removal rate for the portion of the area draining to the BMP.

Additionally, the City completed a surface water improvement project in Nelson Lakeside Park. Improvements were made to stabilize the ravine which flows through the park to the MCWD maintained stormwater detention ponds and a riparian subsurface gravel filter was constructed to provide water quality treatment for the contributing downtown redevelopment area. The total load reduction as a result of this project is estimated to be 9.5 lbs. TP/yr.

Implementation Plan

Planning level estimates of capital expenditures have been made. Future anticipated projects are also listed. The activities have been distributed throughout a 10-year implementation plan extending through 2028 (Table 6). This table also includes miscellaneous maintenance/public works issues.

Table 6 provides an estimated annual cost of the implementation plan. Table 6 also provides a time frame in which to complete each identified activity. This table will assist in accomplishing the major goals of this plan; to accommodate development projects in the City while protecting the water resources within and surrounding the City.

The Implementation Plan will be reviewed on an annual basis, along with the City's CIP, and will be summarized and reported to the City Council in an annual report. At that time, each proposed improvement is to be reconsidered, City budgets adjusted, and additional improvements added to the program. Any changes to the Implementation Plan will be submitted to MCWD.

Amendments to the Plan

The Long Lake Water Resources Management Plan is intended to extend through at least the year 2028. For the plan to remain dynamic, an avenue must be available to implement new information, ideas, methods, standards, and management practices. Amendment proposals can be requested any time by any person or persons either residing or having business within the City.

Request for Amendments

Written requests for plan amendment are submitted to the City staff. The request shall outline the need for the amendment as well as additional materials that the City will need to consider before making its decision.

Staff Review

A decision is made as to the validity of the request. Three options exist: 1) reject the amendment; 2) accept the amendment as a minor issue, with minor issues collectively added to the plan at a later date; or 3) accept the amendment as a major issue, with major issues requiring an immediate amendment. In acting on an amendment request, staff shall recommend to the City Council whether or not a public hearing is warranted.

Council Consideration

The amendment and the need for a public hearing shall be considered at a regular or special Council meeting. Staff recommendations should also be considered before decisions on appropriate action(s) are made.

Public Hearing, Council, MCWD and Met Council Review

This step allows the public input based on the public sentiment. Council shall determine when the public hearing should occur in the process. Based on the Public hearing, Council could approve of the amendments, and, if necessary, refer the amendments to the MCWD Board for comment and approval. If the proposed amendments are considered major changes, the Plan will be sent to the Metropolitan Council for review.

Council Adoption

Final action on an amendment following approval by the MCWD, is Council adoption. However, prior to the adoption, an additional public hearing could be held to review the plan changes and notify the appropriate stakeholders.

Annual Report to Council

A brief annual report will be prepared by City staff summarizing development changes, capital improvements, and other water resources management related issues that have occurred over the past year.

The annual report should include an update on available funding sources for water resource issues. Grant programs are especially important to review since they may change annually. These changes do not necessarily require individual amendments. The reports can, however, be considered when the plan is brought up to date. The report should be completed by June 30th to allow implementation items to be considered in the normal budget process. Copies of the report should be submitted annually to the MCWD in a format approved by the MPCA and the MCWD. The annual update can also serve as an important public information tool. A summary could be published in the City's newsletter.

FINANCE

The City of Long Lake funds its stormwater management activities primarily through the fees collected through its Stormwater Utility Fund. The balance is used roughly once every three years during street reconstruction projects to improve storm sewer systems and provide new water quality treatment systems in those areas.

The City will continue to use the Stormwater Utility Fund as the primary source of funding for the needed projects and activities relating to surface water management. The City will continue to explore grant funding programs to supplement these funds and review the utility fee rates on a regular basis. A summary of major categories of funding sources is provided below.

Ad Valorem Tax

General taxation is the most common revenue source used to finance government services, including minor maintenance measures for drainage and water quality facilities. Using property tax has the effect of spreading the cost over the entire tax base of a community.

A special tax district can also be used to raise revenue. The special tax district is similar to the administrative structure under general taxation except that all or part of the community may be placed in the tax district. The principle is to better correlate improvement costs to benefited or contributing properties.

Special Assessments

Municipalities are familiar with the use of special assessments to finance special services from maintenance to construction of capital improvements. The assessments are levied against properties benefiting from the special services. The philosophy of this method is that the benefited properties pay in relation to benefits received. The benefit is the increase in the market value of the properties.

Development Charges

Fees charged to new development which generate runoff can be charged to finance infrastructure needed to serve the development. This is a useful tool in communities that are rapidly developing.

User Charges

User charges, which support surface water utilities, are mechanisms by which a City can generate funds through billings similar to water and sewer billings. The principle is to charge for services rendered to properties generating runoff, as well as the service to properties being protected from the effects of runoff, without consideration to an increase in market value of the property.

During implementation, action plans for each component of the utility implementation are developed. The action plans identify tasks, resources, responsibilities, schedules, and measurements. A link between the recommended rate structure and the data base is developed during Implementation.

Grants

State grants are available for surface water management and nonpoint source pollution. However, it is generally not a good financial practice to rely on grants for a service program. This source of revenue is not dependable and requires constant speculation as to its availability. Grants are useful but should only be used to supplement a planned local revenue source.

Funding Method	Advantages	Disadvantages
Ad Valorem Tax	<ol style="list-style-type: none"> 1. Administrative structure in place. 2. Simple and accepted source of revenue. 3. Allows for a larger revenue base. 4. Through tax districts contributors pay. 	<ol style="list-style-type: none"> 1. No incentive to reduce runoff or pollution. 2. No relationship to level of benefits received. 3. Discontinuous source of revenue. 4. Limitations on amount due to budget constraints. 5.
Special Assessments	<ol style="list-style-type: none"> 1. Only benefited properties pay. 2. No competition with general services. 3. Benefits directly related to cost for service. 4. Assessment can be deferred in hardship cases. 	<ol style="list-style-type: none"> 1. Rigid procedural requirements. 2. Runoff contributions cannot be assessed. 3. Difficult to determine and prove benefit. 4. May place an unfair burden on some.
Development Charges	<ol style="list-style-type: none"> 1. New development generating runoff pays for runoff management. 2. Administrative structure for reviewing plans and collecting fees is in place. 3. Systems can be tailored to the specific needs through regulatory changes. 4. No competition with general services. 	<ol style="list-style-type: none"> 1. Only address problems within the vicinity of the new development, not usually existing developments. 2. Only address prevention not correction of major problems. 3. Limited usefulness as a financing mechanism. 4. Limited new development pressure within existing City limits.
User Charges	<ol style="list-style-type: none"> 1. Properties pay relative to their contribution. 2. Not in competition with general funds. 3. Existing and new developments both pay. 4. Continuous, dedicated, source of revenue. 	<ol style="list-style-type: none"> 1. Some initial costs in development of rate formula and philosophy. 2. May require an expanded administrative structure.
Grants	<ol style="list-style-type: none"> 1. Reduce cost burden to residents in the community. 	<ol style="list-style-type: none"> 1. Undependable source of revenue, irregular schedule. 2. Increase administrative costs and matching funds generally required. 3. Considerable lead time from application to receiving.

MINNEHAHA CREEK WATERSHED COORDINATION PLAN

Background

The Minnehaha Creek Watershed District (MCWD/District) Watershed Management Plan (WMP/Plan) focuses on partnership with the land use community and incorporates a subwatershed focus to address areas of significant resources needs with a level of complexity that requires sustained effort and coordination across multiple partners. While operating on a subwatershed scale, focused within the priority areas indicated in its WMP, the MCWD is remaining responsive to its communities District-wide by providing technical resources, regulatory coordination, and in some cases, funding. MCWD partnership and level of response is driven by early coordination of land use planning.

As part of the development of the District's Plan, communities provided information as to local goals, plans, and priorities. This information was used to broadly characterize opportunities and to inform the development of District implementation plans. The City of Long Lake, partially within the Long Lake Creek Subwatershed and the Lake Minnetonka Subwatershed, understands the importance of protecting Long Lake and downstream Lake Minnetonka. Within the City of Long Lake, the WMP has identified water resource issues of excess nutrients, degraded aquatic plant communities, and degraded, disconnected corridors caused by altered wetlands, common carp, stormwater runoff, internal phosphorus loading and water quality from upstream water bodies. Strategies identified to address these issues and drivers include wetland restoration, carp management, restoration of upstream water bodies and others. The City of Long Lake recognizes that implementation of these strategies may expand outside City boundaries and will require a partnership-driven approach with the MCWD, Long Lake Waters Association, and neighboring Cities. It is the intent of this Coordination Plan to provide a systematic approach to early coordination between the City of Long Lake and the MCWD to facilitate and maximize water resources implementation priorities together.

Purpose

The Minnehaha Creek Watershed District's (MCWD) approach to water resource planning recognizes the environmental, social, and economic value created when built and natural systems work in harmony. Through its WMP the MCWD emphasizes early coordination of land use and water resources planning with Cities to integrate water resources goals with other public and private goals to add this broader value and quality of life to the community. To maintain awareness of needs and opportunities to implement programs and projects that reflect the cooperation of other public and private partners, align investments, and secure a combined set of District, City, and partner goals, the MCWD requests that cities establish a coordination plan as part of the Local Water Management Plan that the City and MCWD can implement at a staff level. Improving coordination between land use planning at the City and watershed planning at the MCWD at the conceptual level planning phase will result in better projects that meet agency goals and are a more efficient use of public funds. Early coordination and collaboration between entities is the key to maximizing shared water resource goals and community goals for private redevelopment and public capital improvements. Through this coordination, it is the intent of the City to efficiently manage water quality concerns and maximize the asset value of the City's natural resources in the future.

Coordination

The following is a coordination plan, which will be adjusted and expanded as deemed appropriate by the City and MCWD during project implementation. It is anticipated that the City Administrator and Public Works Director will be the primary contacts for the coordination plan.

1. Annual meeting – City and MCWD staff will meet during the first quarter of each year to review the National Pollutant Discharge Elimination System (NPDES) Municipal Separate Storm Sewer Systems (MS4) reports and activity from the previous year. Staff will also discuss draft Capital Improvement Plans (CIP) for each organization for the upcoming year. Opportunities for early

coordination and review of land use change applications and regulatory coordination will also be reviewed to identify areas for collaboration.

2. Land Use Planning – The City will continue to join with its partners in the Long Lake Creek Subwatershed Partnership in order to implement water resource priorities identified in the MCWD Watershed Management Plan, align local plans, and provide capital investment to identify opportunities where local investments intersect with natural resource goals. Through on-going coordination of land use planning and changes the City and MCWD will adaptively evaluate project opportunities and assess them against the established goals the partnership. Because there is little land left for development, the City expects changes in land use to be driven by redevelopment and infill development. The City will include the MCWD early on in potential land use changes and redevelopment projects so the MCWD can be value added to projects. Specific land use changes can be found in the Land Use Chapter of the 2040 Comprehensive Plan. **Figure 9** shows the City-owned parcels, which could provide an opportunity to partner with MCWD for water resource related projects.
3. Regulatory coordination – The City of Long Lake staff and consultants will endeavor to continue to route request for land use approvals including but not limited to, subdivisions, site plan approvals, WCA applications, infrastructure improvements, and park improvements to the District at concept plan phase in effort to maximize water resources benefits and streamline regulatory processes. Specific areas of regulatory coordination include the following:
 - a. Pre-application meetings and permit reviews coordinated with MCWD early in the planning process.
 - b. City assistance to support MCWD in construction site inspections and compliance
 - c. MCWD will keep the City apprised of water resource violations and expectations for compliance.
 - d. The City will require documentation of required MCWD permits in advance of issuing applicable City permits. Approved MCWD permits will be stored with other project documentation for future reference.
 - e. City road, infrastructure, facilities and land improvements that require MCWD permits will be coordinated as part of the annual meeting and otherwise early in the CIP process so that the regulatory process may be efficient and integrated water and natural resource improvements may be explored.
 - f. The primary person responsible for regulatory coordination at the City of Long Lake is the City Administrator and the Public Works Director and the Permitting Program Manager at MCWD.
4. Public Outreach and Education – The City will continue to distribute a newsletter and post on the City website to spread awareness of stormwater related issues. The City will help promote the MCWD's educational workshop and events to private homeowners and developers. The

MCWD's educational workshops cover topics such as winter maintenance training, installing turf alternatives, and informational sessions on the Master Water Steward program. The City will coordinate with the MCWD on other educational efforts when possible to avoid duplicating efforts.

5. **Aligning Planning and Investments:** The MCWD can provide technical resources and planning assistance to assist the City and its partners in the Long Lake Creek Subwatershed in aligning public and private investments providing value to its residents and the environment. In addition to leveraging District technical and financial assistance, the City will support the District as it may pursue external funding resources to support capital project implementation within the Long Lake Creek Subwatershed. Identified capital projects will be reviewed and updated annually.
6. The City understands that the process to align investments begins at the concept stage of project development and recognizes that in addition to a future competitive grant program, the MCWD may offer technical resources and planning assistance to assist the City in aligning public and private investments providing value to its residents and the environment.
7. **Funding** – The City seeks support from the MCWD in terms of grant funding for water quality projects. The City requests that MCWD staff continue to provide information about upcoming grants and other funding opportunities internal and external to the MCWD.
8. **Communication** – The primary contacts responsible for implementation of the coordination plan are the **City Administrator and Public Works Director** at the City of Long Lake, and the **Policy Planning Manager** at the MCWD.
9. **Data Sharing** – City staff will coordinate with MCWD staff to share any new or relevant data on an annual basis to ensure consistency. This data could be related to any newly completed studies water quality monitoring, or Best Management Practice (BMP) performance monitoring, among other things.
10. **Public Improvement Projects** – City staff members will provide yearly updates on plans for public improvement projects. This will be coordinated as part of the annual meeting while discussing the draft CIP. Maintenance activities for stormwater infrastructure will be provided to MCWD as part of the MS4 recording process and as part of City inspection reports. The CIP will be updated annually.
Street reconstruction projects are planned for most upcoming years in the City. Some street reconstruction projects include storm sewer replacement. The City will send the MCWD where future street reconstruction projects are planned when they are added to the CIP, so the MCWD can provide recommendations and technical planning assistance for how water quality improvements could be incorporated into larger City projects.
11. **Long Lake Creek Subwatershed Partnership** – The City will continue to coordinate and collaborate with the Cities of Medina and Orono, the Long Lake Water Association (LLWA) and

MCWD to address water quality issues as part of the Long Lake Creek Subwatershed Partnership. The goal of the partnership is to combine collected data, align local plans and coordinate capital improvement projects to improve water quality and ecological health throughout the subwatershed. The City looks to MCWD, as the regional agency, to facilitate the coordination and provide technical expertise to the group. The group members will meet regularly to discuss these efforts. The Long Lake Creek Subwatershed Assessment is currently being developed and once complete, will identify action items and roadmap for the continued partnership.

CHAPTER 8: IMPLEMENTATION

The implementation of the Comprehensive Plan does not end with adoption. The City's official controls, the zoning ordinance and subdivision regulations, will ensure day to day monitoring and enforcement of the policy plan. The regulatory provisions of both ordinances, as revised, will provide a means of managing development in the City in a manner consistent with the Comprehensive Plan. The City's Capital Improvements Program will enable needed improvements identified in the plan to be programmed and implemented in a timely and cost-effective manner.

Plan Amendment Process

The Comprehensive Plan is intended to be general and flexible; however, formal amendments to the Plan will be required when land use elements, development staging or growth policies are revised. Periodically, the City should undertake a formal review of the plan to determine if amendments are needed to address changing factors or events in the community. While a plan amendment can be initiated at any time, the City should carefully consider the implications of the proposed changes before their adoption.

When considering amendments to this plan, the City will use the following procedure:

1. Amendments may be initiated by landowners, land developers, the Planning and Zoning Commission or the City Council.
2. The Planning and Zoning Commission will direct the City staff to prepare a thorough analysis of the proposed amendment.
3. The City staff will present to the Planning and Zoning Commission a report analyzing the proposed changes, including their findings and recommendations regarding the proposed plan amendment.
4. The Planning and Zoning Commission will decide whether or not to proceed with the proposed amendment. If a decision to proceed is made, a formal public hearing will be held on the proposed amendment.
5. Following the public hearing the Planning and Zoning Commission will make a recommendation to the City Council.
6. The City Council will receive the recommendation from the Planning and Zoning Commission and make a final decision on whether to adopt the amendment.
7. All amendments to the plan must be submitted to the Metropolitan Council for review prior to implementation.

Official Controls

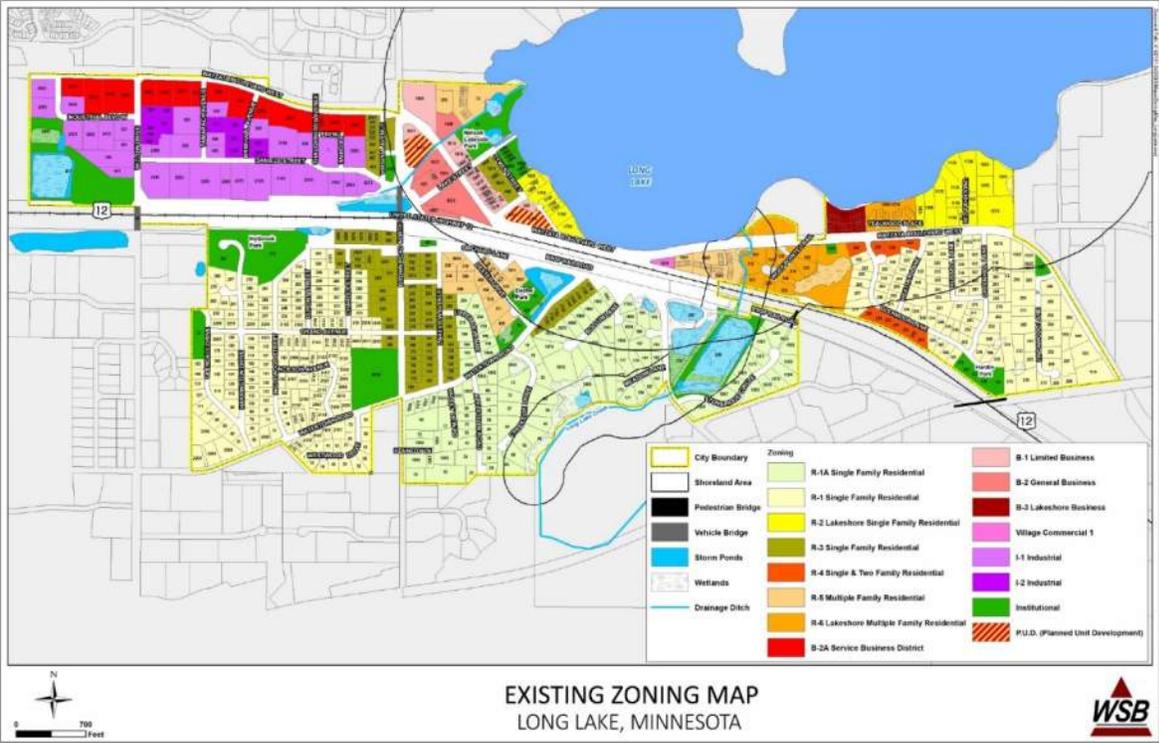
As part of the planning process, the City will evaluate its land use controls and consider amendments to existing ordinances which eliminate inconsistencies with the Comprehensive Plan, enhance performance standards, protect public and private investments, conform to mandatory State and Federal regulations and make it an understandable document.

The plan identifies a number of specific changes to the zoning ordinance and subdivision regulations which need to be considered by the City which are outlined in Table 42.

Table 9-1: Zoning Category Descriptions

Zoning District	Description
R-1 & R-1A	Single Family Residential
R-2	Lakeshore Single Family Residential
R-3	Single Family Residential
R-4	Single- and Two-Family Residential
R-5	Multiple Family Residential
R-6	Lakeshore Multiple Family Residential
B-1	Limited Business
B-2	General Business
B-2A	Service Business
B-3	Lakeshore Business
VC-1	Village Commercial
I-1 & I-2	Industrial

Figure 9-1: Zoning Map



Implementation Matrix

The implementation work plan outlined in the tables in the following pages expands upon the strategies and action items presented in all preceding chapters of this plan by assigning a responsible body or actor (who), a timeframe for action (when), and a suggestion of where the funding that will enable the action will come from (how).

While the following lays out a work plan covering the entire planning horizon, it is to be expected that the task list will change from year to year. As time goes on, some tasks will take longer than expected and will shift into the next year’s list. Priorities will change and tasks will be moved up to be accomplished earlier. New ideas will be presented to accomplish the goals and vision cited here and will be added to the task list. This is all part of the cyclical process of implementation.

Implementation actions and strategies are arranged in the Implementation Matrix by plan chapter, which has the following color scheme:

	Land Use
	Housing
	Transportation
	Parks and Recreation
	Sewer
	Surface Water
	Water Supply
	Economic Competitiveness
	Resiliency

In the “When” column, timeframes are organized into four classifications:

- Ongoing (an action that occurs as needed or on a continual basis)
- Short-term (starting now, completed within the next five years)
- Medium-term (5-10-year completion)
- Long-term (10-20-year completion)

Note that in the “Who” column, it is assumed that the City Council bears the ultimate responsibility for all actions undertaken by City Staff. It is also assumed that the appropriate advisory commission will be involved in approving or recommending actions undertaken by the associated City department (for example, the Parks and Recreation Commission will review and make recommendations on actions for which the Parks staff is responsible).

	Action or Strategy	Who	When	How (\$)
Land Use	Reconcile zoning designations with land use designations	Staff, Planning Commission	Short-term	City funds
	Begin updates to City Zoning Code, with an emphasis to start on the Planned Unit Development (PUD) zoning section. Review the B-2A Service Business District zoning section to determine where updates may be warranted. Consider other thorough updates to Zoning Code to be reflective of current best practices.	Staff, Planning Commission	Short-term	City funds
	Update Residential Zoning Code densities for conformance with the Comprehensive Plan	Staff, Planning Commission	Short-term	City funds
	Initiate update of City Code of Ordinances, a separate document from City Zoning Code, to be reflective of ordinances adopted since codification.	Staff, Planning Commission	Short-term	City funds
	Consider engaging WSB more frequently for code enforcement activities, recognizing that code enforcement is conducted on a complaint basis currently to assure enforcement is conducted in an equitable manner.	Staff, Planning Commission	Ongoing	City funds
	Review Village Design Guidelines	Staff, Planning Commission	Short-term	City funds
	Consider amending the City's subdivision regulations to better protect natural resources and amenities and provide for appropriate land dedication and funding for improvement of the City's park system.	Staff, Planning Commission	Short-term	City funds

	<p>EDA to work towards selecting a developer for the City-owned Virginia Avenue property, giving consideration to the concerns of the Virginia Avenue residential neighbors throughout the process. Pursue sale of Virginia Avenue property to qualified developer. Development of the Virginia Avenue property will require land use applications be made by the developer. Land use applications will necessitate review by the Planning Commission and action by the City Council.</p>	<p>Staff, Planning Commission</p>	<p>Short-term</p>	<p>City funds</p>
	<p>Consider opportunities for acquisition of other MnDOT or privately-owned sites for redevelopment.</p>	<p>EDA</p>	<p>Ongoing</p>	<p>City funds</p>
	<p>Submit an application for a second Business District Initiative (BDI) grant in support of helping the business district thrive during continued construction, with a focus on applying for grant funds for enhancements to a business district. This category could include items such as banners, flowers, signage, and items for downtown beautification.</p>	<p>Staff</p>	<p>Short-term</p>	<p>City funds</p>
	<p>Work towards resolution of utilizing/selling a portion of the property behind the City's Public Works building, addressing the 'public use' requirement imposed by MnDOT upon the purchase of the site. If the public use requirement can be resolved, a private party continues to be interested in purchasing the portion of the property behind his building from the City, and funds from said purchase would be allocated back to the EDA.</p>	<p>Staff, Planning Commission</p>	<p>Short-term</p>	<p>City funds</p>
	<p>With the purchase of the former BP station (1905 W Wayzata Boulevard) now complete, take action to remove structures from and level the site to immediately improve the appearance of the property, and consider posting "no boat and/or trailer parking" signage. Explore best options for the site while considering what soil remediation may be necessary. Recognize that grant opportunities are available to potentially assist in funding a soil remediation project.</p>	<p>Staff, Planning Commission</p>	<p>Short-term</p>	<p>City funds</p>
	<p>Overall, work to be responsive to a growing number of land use applications anticipated to be received for action in the future.</p>	<p>Staff, Planning Commission</p>	<p>Ongoing</p>	<p>City funds</p>

	Housing Goal/Need	Action or Strategy	Who	When	How (\$)
Housing					
	Development and/or Preservation of Affordable Housing	Support use of Minnesota Housing Consolidated Request for Proposals	Staff	Ongoing	TIF, tax abatement, housing bonds, development authorities, MHFA funding, LCDA grants, 4(d) tax program, HOME funds, City funds, MN Consolidated RFP
		Support use of Community Development Block Grants	Staff	Ongoing	
		Support use of HOME Funds	Staff	Ongoing	
		Support use of Affordable Housing Incentive Fund	Staff	Ongoing	
		Support use of first-time homebuyer, down payment assistance, and foreclosure prevention programs	Staff	Ongoing	
		Support use of Rental Assistance	Staff	Ongoing	
		Support use of Livable Communities Grants	Staff	Ongoing	
		Support use of Land Trusts	Staff	Ongoing	
		Explore local fair housing policy options.	Staff	Ongoing	
		Consider fee waivers or adjustments.	Staff	Ongoing	
		Review zoning and subdivision policies.	Staff	Ongoing	
		Support developer use of LIHTC.	Staff	Ongoing	
	Support applications for public housing and project-based assistance.	Staff	Ongoing		
	Administer policies regarding financial or procedural incentives for developers.	Staff	Ongoing		
	Maintenance of Existing Housing	Support use of Neighborhood Stabilization Program Grants	Staff	Ongoing	
Encourage repair and rehab programs, including Housing Replacement programs.		Staff	Ongoing		
Support homebuyer assistance and foreclosure prevention programs.		Staff	Ongoing		
Make effective referrals to available programs.		Staff	Ongoing		
Support energy assistance programs		Staff	Ongoing		

	Opportunities for Multi-Generational Community Living	Support homebuyer assistance and foreclosure prevention programs.	Staff	Ongoing
		Support use of Rental Assistance	Staff	Ongoing
		Support use of Livable Communities Grants	Staff	Ongoing
		Make effective referrals to available programs.	Staff	Ongoing
		Explore local fair housing policy options.	Staff	Ongoing
		Consider fee waivers or adjustments.	Staff	Ongoing
		Review zoning and subdivision policies.	Staff	Ongoing
		Support developer use of LIHTC.	Staff	Ongoing
		Support applications for public housing and project-based assistance.	Staff	Ongoing
		Administer policies regarding financial or procedural incentives for developers.	Staff	Ongoing

	Action or Strategy	Who	When	How (\$)
Transportation				
	Implement 'reduce speed' signage along Grand Avenue. Consider incorporating speed reduction signage and measures as part of a Grand Avenue street reconstruction project.	Staff / City Council	Short-term	City funds
	Complete installation of pedestrian crossing signals at Wurzer Trail and at Heather Lane.	Staff / City Council	Short-term	City funds
	Respond to resident concerns and consider measures available to address use of Glenmoor Lane street parking by Birch's on the Lake restaurant patrons. Birch's patrons continue to park on Glenmoor Lane even as parking spaces are open and available in Birch's parking lot.	Staff / City Council	Short-term	City funds

	Revise and resume a City Pavement Management Plan, taking into account condition of streets as well as the condition of utility infrastructure below the surface as the Pavement Management Plan is updated. Consider seal coating newer streets as needed rather than undertaking seal coating projects to a set budget amount annually. Evaluate funding sources for street and infrastructure improvements, recognizing that the earliest a street reconstruction project could likely take place would be 2020.	Staff / City Council	Short-term	City funds
	Facilitate traffic speed enforcement as the County Road 112/Wayzata Boulevard W reconstruction project work continues and the speed limit at the east end of the corridor is reduced.	Staff / City Council	Ongoing	City funds
Parks and Recreation				
	Work to achieve funding, labor and/or volunteers, and agency permissions as needed for repairs to the Nelson Lakeside Park fishing pier and to the split rail fencing throughout the park. Consider upgrading Nelson Lakeside Park lights to LED lighting, with light fixtures to match new light poles as installed throughout the City's downtown area.	Staff	Short-term	City funds, volunteers,
	Continue ongoing implementation of the Goose Management Plan for Nelson Lakeside Park.	Staff	Ongoing	City funds
	Complete the installation of a drinking water fountain at Dexter Park. Consider utilizing extra mixed dirt material left over from the County Road 112 reconstruction project to grade an area in the park for use as a soccer field.	Staff	Short-term	City funds
	Explore options and funding sources for replacing Dexter Park playground equipment and investigate whether a mobile rhino-style operation could be an option for equipment refinishing for playground equipment in the City's parks.	Staff	Short-term	City funds, grants
	Complete construction of a shelter in Dexter Park once Eureka Construction has met their contractual obligation to install a concrete pad	Staff	Short-term	City funds

	in the park. The shelter would be similar to the structure constructed by Public Works in Hardin Park.			
	Explore addition of an archery range amenity at Holbrook Park.	Staff	Short-term	City funds
	Consider upgrading the gravel trail at Holbrook Park and installing a paved asphalt trail to connect to Willow Drive.	Staff	Short-term	City funds
	Work to establish wage compensation and attract rink attendant staff for the Holbrook Park warming house to assure the facility is staffed during the next winter skating season. Explore opportunity to partner with Orono Youth Hockey for rink usage, potentially including an exchange of rink use for staffing assistance.	Staff	Short-term	City funds
	Research and consider alternatives to improve upon current flooding system for Holbrook Park rink facilities.	Staff	Short-term	City funds
	Consider adding a seasonal temporary skating rink on Long Lake adjacent to Nelson Lakeside Park.	Staff	Short-term	City funds
	Complete cleanup and grading of Wurzer Trail drainage ditch and consider implementing sustainable/prairie or butterfly sanctuary plantings.	Staff	Short-term	City funds
	Install benches where safe to do so along the lakeside trail.	Staff	Short-term	City funds
	Consider using boulders excavated by Wayzata Boulevard W/CR 112 reconstruction project contractors for placement along the hillside from Hardin Park down to the trail, and in other City parks, to add a natural play amenity.	Staff	Short-term	City funds
	Consider installing more GaGa Pits in City parks.	Staff	Short-term	City funds
	Recruit volunteers to establish a gardening club to help maintain landscaping and flower baskets along the Wayzata Boulevard W corridor as well as in City parks.	Staff	Ongoing	City funds

	Consider the addition of a fourth full-time Public Works employee to allow for bringing park and trail lawn mowing and maintenance in-house.	Staff	Short-term	City funds
	Complete installation of park benches provided by Eureka Construction in varying park/trail locations.	Staff	Short-term	City funds
	Continue to advocate Memorial Park Bench Donation Program as established by the Park Board in 2016.	Staff	Ongoing	City funds
	Recognizing that development of new park and trail facilities is difficult for a fully developed community with limited funds available for park improvements, revisit and redevelop purpose for the City's Park Board. Anticipated development/redevelopment projects may help contribute to funding available for park projects and enhancements.	Staff	Short-term	City funds
	Action or Strategy	Who	When	How (\$)
Sewer				
	System Repair and Replacement Study	Staff	Short-term	City funds
	Storm Sewer Improvements	Staff	Short-term	City funds
Surface Water				
	Nelson Lakeside Park Outlet Improvements	Staff	Short-term	City funds
	Water Quality Projects Downstream of Long Lake	Staff	Ongoing	City funds
	Assess and identify any identified localized flooding area by the MCWD Subwatershed models	Staff	Ongoing	City funds
	Undertake projects to restore potential wetlands outlined in the MCWD Functional Assessment Report	Staff	Ongoing	City funds
Water Supply				
	Repair and/or replace water storage facilities	Staff	Ongoing / As needed	City funds

	Repair and/or replace distribution systems (pipes, valves, etc.)	Staff	Ongoing / As needed	City funds
Economic Competitiveness				
	Review Tax Increment Financing Policy	EDA / City Council	Short-term	City funds
	Continue pursuing sale of City owned properties for redevelopment.	EDA / City Council	Short-term	City funds
	Consider that the EDA has taxing authority to bring in revenue from the City's tax base in order to implement a revolving loan fund and offer short term grants to help businesses that may need gap financing for projects such as facade upgrades.	EDA	Short-term	City funds
Resiliency				
	Prepare and adopt solar ordinance	Planning Commission	Short-term	City funds