

Chapter 6 - Water Resources and Wastewater



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Water Resources and Wastewater

Wastewater

Many of the land use themes build on the previous 2030 land use plan. That plan incorporated a strategic land use policy approach that has served the city well over the past decade. The 2040 land use plan recognizes the city will continue to mature providing additional opportunities for mixed use and redevelopment in regional areas, corridors and light rail transit station areas. The water resources plan is an important component of the comprehensive plan as it serves to guide how land is used in the city and served by sanitary sewer system.

Generally, the sanitary sewer system within the city follows a topographic-based approach to the trunk sewers similar to stormwater management. The topographic divisions allow for a gravity-based sewer system which reduces overall costs and energy consumption. Lift stations are utilized in instances to serve isolated neighborhoods that are characterized by unique topographic conditions.

The installation of the city sanitary sewer system occurred in the late 1960s and 1970s. Wastewater that is collected within the municipal system flows into regional interceptor sewers, owned and operated by Metropolitan Council Environmental Services (MCES). Treatment of Minnetonka's wastewater occurs at the Blue Lake Treatment facility near Shakopee.

Metropolitan Facilities

The city collection system flows in a southerly direction and accesses three separate MCES interceptor sewers where the flow is measured at MCES metering stations located along the southern boundary of the city. The flows are metered to determine the allocation of annual operations and maintenance costs of the metropolitan system per community. The MCES interceptors that carry Minnetonka wastewater eventually merge with the Chaska interceptor in the central portion of Eden Prairie which carries effluent to the Blue Lake wastewater treatment facility in Shakopee. The MCES sewer system within the city of Minnetonka and surrounding area, including existing MCES interceptors and flow meters that carry Minnetonka wastewater are identified on 0.

Interceptor No. 7018 accommodates the north Lake Minnetonka communities and enters Minnetonka at the northwest corner of the city at



the TH 101 bridge over Grays Bay and merges with another interceptor at the west central portion of Minnetonka near the intersection of Woodlawn Avenue and Minnetonka Boulevard. The western portion of Interceptor No. 7073 serves the western Lake Minnetonka communities and accommodates municipal trunk connections in the western portion of the city. Interceptor No. 7016 enters Minnetonka at its southwest corner and accepts wastewater from the south shore Lake Minnetonka communities and a small area of southwest Minnetonka. It merges with Interceptor No. 7073 near Creek Ridge Trail and Scenic Heights Drive. Wastewater flows from the Minnetonka trunk sewers in the Riley-Purgatory watershed exit the city via this interceptor along the Purgatory Creek floodplain immediately east of the Scenic Heights Drive intersection with CR 62.



Wastewater from the south central area of Minnetonka enters Interceptor No. 7118 in Eden Prairie near the entrance to the Glen Lake Home School on TH 62. This area represents the western portion of the Nine Mile Creek watershed in Minnetonka.

Wastewater from municipal trunk lines in the remaining portion of the city enters MCES Interceptor No. 6801 in Eden Prairie near the Rowland Road/TH 62 underpass. The service area for this intersection is large and represents approximately three-fourths of the area of the city. The MCES interceptor service area accommodates wastewater in the Bassett Creek, Minnehaha Creek and eastern Nine Mile Creek watersheds in the city.

Municipal System

Nearly all land within the city is developed and is served by the municipal sanitary sewer system. The sanitary sewer system is comprised of gravity sewer mains ranging in size from 6 inch laterals that serve smaller neighborhood areas and flow into the trunk sewer mains, to 24-inch trunks that flow to the MCES interceptors sewers. Whenever possible, gravity is utilized to convey wastewater in collection pipes. When terrain does not allow this movement, lift stations are installed to pump wastewater to higher elevation trunk gravity mains.

The city operates and maintains 36 wastewater lift stations throughout the city. The largest station is located at the Public Works building on Minnetonka Boulevard and is capable of pumping 10,000 gallons per minute. The city also maintains 43 home lift pumps to provide sewer service to homes that lack elevation for gravity flow. For planning purposes, the city has established 18 local sewer service districts (sewer sheds). The city sewer system including city lift stations and existing connection points to MCES interceptors is identified on Figure 6-2.

Maintenance tasks are performed throughout the year to assure that operational problems are minimized. On-going maintenance activities include the following:

- » “Jetting” is an operation that sprays the pipe with high-pressure water to remove any blockages that may exist. Failure to remove these blockages may result in basement backups.
- » Televising of sewer lines are performed with improvement projects or used to determine the condition of the pipe and identify structural defects for repair before a pipe breaks or creates a blockage.
- » The lift stations are inspected annually and maintained to assure trouble-free operation. Maintenance includes cleaning the pumps and wet wells, checking the motors, checking the pumps, and inspecting the control panels.
- » Home lift pumps are inspected and repaired in October of each year to assure reliable operation.

Private Treatment Systems

There are 10 properties that are not served by the city system and rely upon individual subsurface sewage treatment systems (SSTS). These properties generally do not have direct access to the municipal sewer system, but could connect at such time that they redevelop or city improvement projects address the lack of direct access. The location of known private waste water treatment plans and SSTS within the city are identified on Figure 6-3.

Minnnetonka city code of ordinances address zoning and building regulations with these systems, connection requirements when sewer is available, and requirements of system owners in protecting public health. SSTS must also be compliant with state standard, specifically MPCA 7080. A copy of city code of ordinances relating to these systems are also included in the appendix of this report.



Inter-community Connections

The city of Minnetonka also provides municipal sewer transmission for adjacent communities where adjacent topography lends itself to directly connecting to the city’s system. There are 8 communities outside of the city that are served by the city of Minnetonka system. Table 6-1 shows communities outside of the City of Minnetonka served by the city’s municipal system. Properties served directly by the MCES interceptors passing through the city are not included. The location of known inter-communities connections are identified on Figure 6-4.

Table 6-1 Adjacent Communities Served by Minnetonka

Community
Deephaven
Eden Prairie
Hopkins
Shorewood
St. Louis Park
Plymouth
Wayzata
Woodland

Inter-community agreements exist for most of these properties, but not all of them. A copy of all inter-community agreements for sewer services are included in the appendix of this report.

Existing and Future Sewer Flows

Existing Sewer Flows

The 2010 MCES sewer allocation forecasts estimated the population of Minnetonka at 49,734 with approximately 21,901 households (single family and multiple family) and an approximately 44,228 employment population. Based on current city data this includes approximately 16,056 household connections (single family and multiple family) and 600 non-residential connections.

A capacity analysis for the existing municipal system was completed using a computer model as part of the 2018 *Comprehensive Sanitary Sewer System Plan*. The existing flow rates for the city sewer districts (established for I/I investigation) were determined by measuring trunk mains flows and MCES flow data, where available and calibrated based on existing land use data.

Table 6-2 shows the estimated wastewater flow generation rates (obtained through data calibration) for the existing land uses in the city.

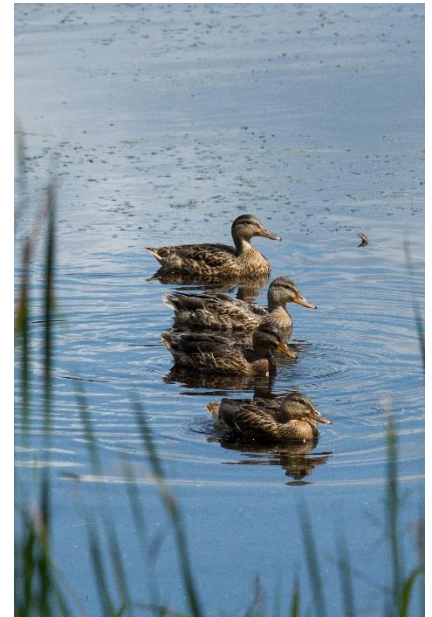


Table 6-2 Calibrated Estimated Wastewater Flow Generation Rates

Land Use Category	Flow (gallons per acre per day)
Commercial	528
High density residential	1808
Industrial	528
Institutional	528
Low density residential	543
Medium density residential	1085
Office	528
Open Space	0
Park & Recreation	66
Railway	0
Right-of-Way	0
Vacant	0
Mixed Use	528
Utility	0
Water	0

Results from the computer model indicate the existing trunk sewer system has adequate capacity for conveying existing peak flows.

Future Sewer Flows

Metropolitan Council population estimates indicates limited increases in population, household and employment growth to 2040 as shown in Table 6-3 .

Table 6-3 Metropolitan Council Forecasts

	1990	2000	2010	Revised Development Framework		
				2020	2030	2040
Population	48,370	51,102	49,734	53,200	58,000	61,500
Households	18,687	21,267	21,901	24,200	26,600	28,300
Employment	35,536	50,471	44,228	54,360	58,860	63,160

The estimated unit wastewater flows were modeled to determine the 2040 average day wastewater flows for each sewer district based upon future land uses. Table 6-4 shows the future sanitary sewer flows by sewer shed for each time frame.

Table 6-4 ¹Future Wastewater Flows by Local Sewer Shed

District	Existing Avg. Flow (MGD)	2020 Avg. Flow (MGD)	2025 Avg. Flow (MGD)	2030 Avg. Flow (MGD)	2035 Avg. Flow (MGD)	2040 Avg. Flow (MGD)
1	0.269	0.277	0.283	0.290	0.296	0.303
2	0.135	0.137	0.138	0.140	0.141	0.143
3	0.460	0.561	0.645	0.729	0.813	0.897
4	0.260	0.269	0.277	0.285	0.293	0.300
5	0.349	0.357	0.364	0.371	0.378	0.385
6	0.363	0.372	0.380	0.387	0.395	0.402
7	0.167	0.170	0.173	0.175	0.178	0.181
8	0.304	0.356	0.399	0.442	0.486	0.529
9	0.143	0.149	0.155	0.161	0.167	0.172
10	0.367	0.404	0.435	0.466	0.497	0.529
11	0.115	0.116	0.116	0.117	0.117	0.117
12	0.378	0.388	0.396	0.405	0.413	0.421
13	0.130	0.130	0.131	0.131	0.131	0.132
14	0.085	0.086	0.086	0.086	0.086	0.086
15	0.261	0.263	0.265	0.266	0.267	0.269
16	0.207	0.208	0.209	0.210	0.212	0.213
17	0.170	0.171	0.171	0.171	0.172	0.172
18	0.118	0.122	0.125	0.128	0.132	0.135
Total	4.279	4.534	4.748	4.959	5.173	5.386

MCES interceptor 6801 collects discharge from the largest portion of the city of Minnetonka and encompasses local sewer shed 1-11 and 13. These districts are anticipated to see the largest increase in flow related to redevelopment and intensification. Interceptor 7018 represents the second largest discharge point for the city of Minnetonka and encompasses flow from local sewer shed 14-18. Interceptor 7118 transports effluent from local sewer shed 12. A summary of anticipated flow assigned by interceptor facility is listed below in Table 6-5 .

Table 6-5 Future Wastewater Flows by MCES Interceptor Discharge Point

Interceptor District	Existing Avg. Flow (MGD)	2020 Avg. Flow (MGD)	2025 Avg. Flow (MGD)	2030 Avg. Flow (MGD)	2035 Avg. Flow (MGD)	2040 Avg. Flow (MGD)
6801	2.931	3.167	3.366	3.562	3.760	3.958
7018	0.971	0.979	0.986	0.993	1.000	1.007
7118	0.378	0.388	0.396	0.405	0.413	0.421

The capacity of the existing sewer system to serve the potential redevelopment and new development areas was evaluated in the event that wastewater flows increase per the Metropolitan Council 2040 forecasts outlined in the Land Use chapter of the comprehensive plan. The wastewater system and recommendations listed within this plan support the MCES forecasted flows through 2040.

The computer model utilized projected peak flows, based on the increase in average flows, to determine the remaining capacity of the existing trunk sewer system. The impact of increased future flows on the city’s existing trunk sewer system is minimal. Projected 2040 average flows would increase by 1,106,670 gallons per day (gpd) based on anticipated redevelopment, thus the city of Minnetonka’s MCES 2040 average day flow allocation should be increased to this amount.

The majority of redevelopment and intensification of land use are found in the Opus area (Sewer Shed 3) in the southeast corner of the city and Ridgedale area (Sewer Shed 5 & Sewer Shed 8). Although increased development intensity has been accounted for in the 2040 model, future flows in these areas should be reviewed as each new development scenario occurs to determine any future impacts to the system.

A summary of the available capacity of the municipal trunk sewer pipes discharging to the MCES interceptors are listed in Table 6-6 . Capacity is outlined in the table on the following page.

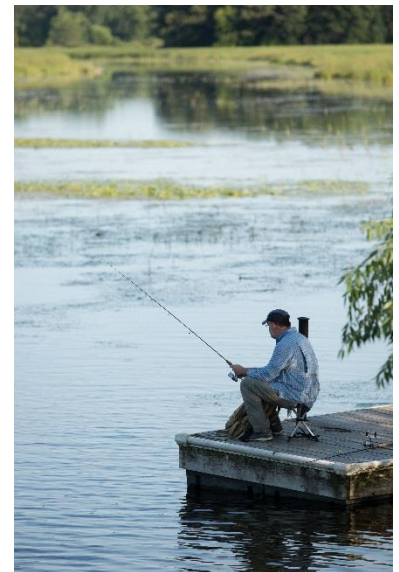


Table 6-6 Capacity and Design Flows for Trunk Sewers Discharging to MCES Interceptors

Pipe Connected to MCES Interceptor (Facility ID)	Pipe Measured (Facility ID)	Location	Nominal Diameter (in)	Material	Slope (%)	10 SS Minimum Slope (%)	Average Flow (MGD)	5-year Peak Flow (MGD)	Capacity @ Min. Grade (MGD)	Full Pipe Capacity (MGD)	Current Remaining Capacity (%)
GS5262	GS5261	The Strand	10	RPP	0.243	0.280	0.067	0.492	0.864	0.804	39%
GS8915	GS5947	Bell Cir	10	DIP	0.276	0.280	0.016	0.119	0.946	0.938	87%
GS6828A	GS6828	End Ln	10	PVC	1.760	0.280	0.154	1.130	0.950	2.383	53%
GS5672	GS5672	Mtka Target	15	UKN	0.601	0.150	0.104	0.763	1.621	3.243	76%
GS8780	GS8780	Vine Hill	21	RCP	0.100*	0.100	0.148	1.089	3.246	3.246	66%
GS6177	GS6176	Creekside	24	RCP	0.084	0.080	0.292	2.144	4.145	4.240	49%
GS8073	GS8073	Saddlewood	24	RCP	0.068	0.080	0.244	1.793	4.145	3.835	53%
GS5464	GS5463	Trail Ridge	10	DIP	0.280*	0.280	0.101	0.741	0.946	0.946	22%
GS8109	GS8109	Meter 6801	54	RCP	0.081	0.060	3.489	12.920	31.201	36.254	64%
GS8102	GS8102	Meter 7118	24	RCP	1.596	0.080	0.343	2.100	4.145	18.510	89%

*No as-built data, 10-State Standards recommended minimum grade used for calculations

Infiltration and Inflow

Infiltration and inflow (I/I) is “clear water” that enters the sanitary sewer collection system. Infiltration is typically groundwater entering the system through defective pipes, laterals, joints, manholes and other appurtenances. Inflow results from direct or cross connections with storm sewers, sump pumps and roof drains or seepage through manhole covers. I/I reduction is critical to eliminate, due to unnecessary capacity restrictions within the collection system and costly treatment of clear water.

For planning purposes, the city is divided into 18 sewer sheds to monitor I/I based on the location of MCES interceptors, trunk sewers, location of lift stations, ability to monitor flows, etc.

The City of Minnetonka, like the majority of the communities in the Metropolitan Twin Cities area, has spent considerable time and energy managing I/I within their sanitary sewer collection system. The city has been working over the past decade on reduction of I/I throughout the system by focusing efforts in areas where monitoring has indicated that I/I is the most significant. Generally speaking this is in the northeast quadrant of the city, city districts 5 – 8. Efforts have uncovered numerous locations of inflow that have been mitigated to decrease I/I into the

system. Currently, the city is mandated to reduce the amount of I/I that flows into the sanitary sewer system during rainstorms.

Goals, Policies, and Strategies

The city recognizes the importance of reducing the volume of I/I entering the sanitary sewer system and that increased flow generated by I/I requires additional investment by city and regional agencies. To prevent the unnecessary treatment and transportation of this clean water the city operates and plans system improvements based on the following goals related to I/I:

- » The city will continue to monitor the sanitary sewer system to identify points of I/I.
- » The city will continue the I/I program to eliminate points of I/I into the sanitary sewer system on public property, and require the elimination of inflow and infiltration on private property.
- » The city will continue to administer and enforce Chapter 12, Section 1200 of the city code of ordinances prohibiting clear water connections to the sanitary sewer system.
- » The city will reduce I/I to below the MCES allowable peak hourly flow rate goal for Minnetonka.

Formal policies have been adopted by the city to control and eliminate private inflow. This includes specific language prohibiting the flows of “storm water; natural precipitation; melting snow; ground water; water flow from a roof, ground surface, subsurface drainage, down spout, eave trough, rainspout, yard drain, sump pump, foundation drain, yard fountain, pondrain water from roofs, yards, lawns, streets, ground water,” into any public sanitary sewer. Staff will continue to enforce these policies throughout the city. A full copy of city code of ordinances section 1200.095 “Discharge of Prohibited Substances; Sump Pumps” is included in the appendix of this report.

In addition to formal council policies the city has adopted a 5-year capital improvement program (CIP) with dedicated funds to supporting I/I reduction in the city. These funds are used systematically prioritized and used in areas that are believed to have the highest amounts of I/I.

The city has also completed an initial education, inspection, and repair program to reduce the quantity of I/I. The program included:

- » Investigations including manhole inspections, roof and yard drain inspections on commercial properties, private property sump pump/foundation drain inspections, sanitary sewer pipe cleaning, and closed circuit television inspection (CCTV).
- » The completion of a sewer rehabilitation program that includes manhole lid replacement, manhole grouting, and sewer pipe lining.



- » Currently, home inspections are being conducted in all areas of the city. If an illegal discharge is found, the city offers a matching grant program to help homeowners pay for improvements necessary to disconnect roof leaders, foundation drains, and sump pumps from the sanitary sewer system.

Existing System and Estimated I/I

In 2006, the Metropolitan Council Environmental Services (MCES) implemented a surcharge program designed to encourage metropolitan communities to reduce I/I entering their portion of the sanitary collection system. During a number of significant rainfall events in 2001 and 2005, Minnetonka's I/I flows reached levels that triggered the MCES surcharge.

In February 2006, MCES adopted an I/I Surcharge Program which requires communities within their service area to eliminate excessive I/I over a period of time. All communities exceeding their wastewater flow goal for the period of June 1, 2004 through June 30, 2006 were levied a surcharge fee at the beginning of 2007, spread over five year period through 2011. The surcharge is based on rates established as part of the MCES program. The city has implemented a program and improvements to reduce I/I resulting in elimination of the city's surcharge fee.

Based on the base flow rate and surcharge rates monitored and assigned by the MCES there are anticipated to be several locations and sources of I/I in the city of Minnetonka system and private services connected to the municipal system. These sources could consist of inflow (unknown direct connections to the surface drainage and private sump pumps/roof drains illegally connected to the system) and infiltration (leaking manholes, sanitary sewer mains, and private sanitary sewer service lines).

The extent of I/I in the system is unknown due to the size and complexity of the city system, but the city's I/I monitoring efforts and lift station pump run logs have helped identify areas where the largest discrepancies exist between assumed base flow conditions during winter months and peak I/I season flows. Table 6-7 below page 6-13 includes the estimated annual I/I in the city based on available data.

The city also recently completed a 12-year I/I reduction program which included televising the sewers to identify issues, flow monitoring to prioritize areas of investigation, the sealing of over 180 manholes, and private property connection inspections. It is estimated that this program has reduced the amount of clearwater entering the city system by over 3.1 million gallons per day.

In 2008 and 2009, all residential properties were inspected for sources of inflow and in 2010 all commercial property inspections were completed. Based on these inspection and correction efforts it is anticipated that the majority of the city's single family homes do not contain illegal roof drain

or sump pump connections to the sanitary sewer system. Table 6-8 includes the estimate age of the housing stock within the city.

Table 6-7 Estimated Annual Infiltration and Inflow

Year	Population	Average Annual Flow [AA] (MGD)	Average Dry Weather Flow [AD] (MGD)	Peak Month Flow [PM] (MGD)	Base I/I AA - AD (MGD)	Average Wet Weather I/I PM - AA (MGD)	Peak Month to Annual Average Ratio
2007	50,595	3.54	3.52	4.47	0.02	0.93	1.26
2008	51,499	5.65	5.64	6.65	0.01	1.01	1.18
2009	51,756	5.32	5.23	5.58	0.09	0.35	1.05
2010	51,451	5.55	5.33	5.84	0.22	0.51	1.05
2011	50,046	5.66	5.51	7.00	0.15	1.49	1.24
2012	51,451	5.04	4.95	5.49	0.09	0.54	1.09
2013	50,747	5.11	4.83	5.98	0.29	1.15	1.17
2014	50,841	5.33	4.89	7.24	0.44	2.35	1.36
2015	51,144	4.79	4.63	5.30	0.16	0.67	1.11
2016	51,647	4.97	4.65	5.48	0.32	0.83	1.10
2017	53,394	5.03	4.70	5.63	0.34	0.93	1.12
Average I/I Flow (MGD)						0.98	
Average I/I Per Capita (GPCD)						19.12	
Average I/I % over Average Day						14.6%	
Average I/I % over Base Sanitary Flow (Avg. Dry Weather Flow)						19.6%	

Table 6-8 Housing Stock Inspected for Illegal Connections

Housing Age	No. of Units	Percent Inspected
<1950s	5,208	100%
1960s	3,181	100%
1970s	4,336	100%
1980s	6,415	100%
1990s	3,356	100%
2000s	1,221	100%
>2010	108	100%

The city pays the MCES based on the current rate to treat all effluent that is discharged into the MCES interceptors. City utility rates are adjusted based on the MCES rates and cost to operate and maintain the municipal system, including capital investment in infrastructure.

System Priorities and I/I Implementation Plan

As discussed in the previous section the city recently completed a rigorous 12-year I/I reduction program which included improvements to the public municipal system and reduction of I/I from private property. The city of Minnetonka is currently working on developing another 10+ year I/I reduction plan that leverages already allocated CIP dollars into system improvements which will reduce the amount of clear water in the system. Although this program is still under development the city anticipates this will include continued monitoring and modeling efforts, inspections and repairs, and education to the public.

The city's CIP currently identified \$1,250,000 over the next 5-years to the city's I/I reduction program. As the new program is developed, all identified projects and reduction efforts will be prioritized with available funding, I/I reduction amount, and coordinating with adjacent project in mind.

Over the past 12-years the city has also received three \$50,000 state grants administered by the MCES. As the new program develops it is anticipated that the city will pursue state funding to assist in these efforts.

Sanitary Sewer System Strategies, Goals and Implementation Tools

The city has established strategies, goals, and implementation tools that are crucial to the future performance and vitality of the sanitary sewer system. The strategies govern the capacity and operation of the municipal sanitary sewer system, the goals adopted establish the relationship of the city's system to various city activities, and the implementation tools provide the framework to achieving these strategies and goals.

The two primary goals of the city related to the sanitary sewer component of the water resources program are:

- » To provide high quality sanitary sewer service to the residents and businesses of the city in the most economical manner possible.
- » To provide sanitary sewer service that meets the requirements of the 2040 population and employment forecasts of the city.

This section of the plan describes how the city will manage the sanitary sewer system in relationship to metropolitan facilities, planning and development activities, municipal investments, municipal operations and maintenance, and environmental conditions. Goals and tools related to the reduction of I/I are included in as a standalone section of this report.

Relationship to Metropolitan System

The city recognizes the importance of a coordinated regional collection and treatment system. The continued investment and maintenance of the system is of prime importance to the city as well as the region. Likewise, anticipating growth and redevelopment to ensure future interceptor and treatment plant capacity is a major goal of the city. Related to the city's sanitary sewer system related to the metropolitan system the city operates based upon the following goals:

- » The city will protect the capacity of the interceptor sewers that serve Minnetonka.
- » The city will work with the Metropolitan Council staff to monitor the metered flows from the Minnetonka system.

The city's I/I efforts outlined in this report support the regional effort to preserve the capacity of the MCES interceptor system and treatment plant.

Relationship to Land Use Activities

Ideally, the size and capability of a municipality's sanitary sewer system should accommodate planned future growth and development. It is equally important to ensure that land uses and development intensity do not threaten the long term viability of the system. The following goals will be applied by the city:

- » Design trunk sewer expansions in relation to the planned land use intensities established in the Land Use chapter of the 2040 Comprehensive Guide Plan.
- » Provide municipal sanitary sewer service to the few remaining uses that rely on individual sewage treatment systems and future development and redevelopment.
- » Determine whether sufficient sewer system capacity is available to serve the intensity of new development and redevelopment before final development approvals are granted by the city.
- » Periodically review and evaluate the sewer collection system, metropolitan treatment plant capacity, and the accuracy of metered flow data provided by the Metropolitan Council.
- » Determine funding responsibility for increased capacity and reconstruction of sewer facilities needed to serve the intensity of new development or redevelopment.

Tools in implementing these goals and strategies are primarily located in the city's code of ordinances, although some are proactively completed before and during the planning process. The zoning regulations determine the specific use and development intensity of individual parcels in the community. The use and development intensity result in typical sewer flow calculations that are utilized to "size" the utility systems.

Development and use assumptions based upon reasonable application of the zoning regulations are critical for future utility planning purposes. As part of specific project review, a provision of the zoning ordinance requires that utilities be adequate to accommodate the use and development intensity of the proposed project.

The subdivision ordinance requires that property to be developed must be served by the municipal sanitary sewer system. Further, all new sanitary sewer required for development, repair or replacement must be constructed according to city requirements and specifications.

Lastly, city modeling efforts are completed in advance of redevelopment to ensure that the sewer capacity is available for development before city council approval and ideally before project conception.

Municipal Investments

The installation, maintenance and operation of a public utility is a major municipal investment and on-going service that is provided by the city. It is imperative that the municipal investments be preserved over the long term and that major changes to the system provide a positive benefit that is commensurate with the associated cost. Goals associated with managing these investments include:

- » Funding priorities will be placed on maintaining the existing municipal sanitary sewer system.
- » A financial analysis will be prepared prior to the reconstruction of any portion of the sanitary sewer system.
- » Funding of future sewer facility improvements will continue to be identified in the Capital Improvements Plan.

The construction of the municipal and metropolitan sanitary sewer systems and their on-going operations are financed in several ways. First, a service availability charge (SAC) is allocated to each use by the Metropolitan Council for connection to the regional treatment facilities and interceptor sewers. The SAC revenue is utilized for debt service and reserved capacity for future expansion of the regional system. The city collects the SAC charges at the time of building permit issuance for the Metropolitan Council.

The construction of the municipal system is paid by developers or through assessments to properties benefitted by the provision of sanitary sewer service and by connection charges for availability and access to the municipal system. On-going operations and maintenance costs of the municipal and regional system are financed by customer charges that are paid on a monthly or quarterly basis. Sewer charges are based upon the total community flow calculated by MCES and the customer category, i.e. residential. A “strength charge” set by MCES is also applied to industrial users dependent upon effluent characteristics. Sewer charges also

include local fees, based on the estimates of costs for monitoring, repair and replacement of existing sewer infrastructure.

Municipal Operations and Maintenance

The overall maintenance of the municipal sewer system is an integral activity that is directed towards the long-term preservation of the system. Further, management practices are aimed at responding to customer complaints, system upkeep and continual monitoring.

- » Maintain operating efficiency, minimize sewage blockages, and reduce the potential for infiltration/inflow.
- » Continue to improve the city's maintenance and inspection program.

The Public Works Department is responsible for all maintenance activities associated with the city portion of the sanitary sewer system. Preventative maintenance is conducted by the department on a regular basis and consists of pipeline cleaning and cutting to control tree root intrusion; lift station maintenance monitoring and inspection; manhole repairs and rehabilitation; sewer television, and customer service on a 24 hour, seven day per week basis. The maintenance frequency is based upon inspection and historical data.

Environmental

A goal of the city is to reduce point and non-point pollution sources within the city to the extent possible. The construction of the municipal sanitary sewer system and eventual elimination of private on-site systems is one of the major strategies the city has utilized to achieve this goal.

- » All individual sewage treatment systems shall comply with requirements of the Minnesota Pollution Control Agency and the Minnesota State Department of Health.
- » Individual sewage treatment systems shall be discontinued according to city policy when municipal sanitary sewer is available to serve the property.

The public utility ordinance requires that “properties where cesspools or septic tanks have been in existence prior to construction of a sanitary sewer shall connect with the public sanitary sewer when ... repairs are needed or within two years of service availability, whichever occurs first.” Further, the ordinance prescribes the design and manner in which individual connections and use of public sewers are to be made. Generally, uses that threaten the integrity of the sewer system or the capabilities of the Blue Lake treatment facilities, as prescribed by state and federal laws, are prohibited.

The existing regulations for individual sewage treatment systems (ISTS) relate to connections to the sanitary sewer collection system and the installation of ISTS. The existing ISTS's must remain in compliance with the city ISTS provisions of the water and sewer utilities ordinance (Section 1000) and the State Division of Health regulations. The Community Development Department is responsible for coordination and enforcement of these ordinances.

Section 1000.15 of the utilities ordinance provides regulatory procedures for connections to the public sanitary sewer system and regulatory standards for existing ISTS. MPCA requires inspections of ISTS every three years. The city relies on Hennepin County to do these inspections.

Capital Improvements Program (CIP)

The programming of major sewer capital expenditures is planned and provided for in the utility portion of the city's CIP. While no new trunk sewer or additional facilities are required in the city because the overall system is basically complete, there is a need for lateral sewer pipe extensions, on-going system maintenance and replacement of system components due to age or proposed redevelopment. Lateral sewer service needs to be provided to the few remaining properties that will undergo development and existing residences where service is not

currently available. The lateral service extensions are annually programmed in the CIP by developer or resident petition the year preceding proposed construction. Additionally, on-going maintenance of the sewer system and facilities is programmed in the CIP. The maintenance improvements range from lift pump replacements and lift station improvements to the removal of inadequate sewer pipe, reconstruction of forcemain pipe, and sewer pipe replacement when street reconstruction occurs. Table 6-9 shows the long term planned capital improvements for the lift stations.

Table 6-9 Lift Station Replacement Program

Lift Station Number	Lift Station Name	Estimated Rehabilitation Year	Est. Total Replacement Cost
LS01	Acorn Ridge	2006/2025	\$160,000
LS02	Bantas Point Road	2017/2036	\$240,000
LS03	Brightwood Drive	2010/2029	\$225,000
LS04	Burchlane	1998/2021	\$400,000
LS05	Caribou Drive	2009/2028	\$180,000
LS06	Crosby Road	2017/2037	\$280,000
LS07	Day Place	2013/2032	\$210,000
LS08	Dickson Road	2013/2033	\$220,000
LS09	Fairchild Avenue	2007/2025	\$160,000
LS10	Fetterly Road	2014/2030	\$240,000
LS11	Ford Road	2003/2023	\$130,000
LS12	Gaywood Drive	2009/2028	\$180,000
LS13	Glen Lake	2008/2026	\$270,000
LS14	Lakeshore Avenue	2014/2033	\$220,000
LS15	MacKenzie Point Road	2015/2034	\$230,000
LS16	Main	1997/2019	\$1,600,000
LS17	Minnetoga	2015/2035	\$240,000
LS18	Minnetonka Boulevard	2004/2024	\$160,000
LS19	Moorland Road	2007/2026	\$170,000
LS20	North Street	2010/2030	\$200,000
LS21	Opus	2002/2022	\$270,000
LS22	Pine Lane	2008/2027	\$210,000

LS23	Powderhorn Terrace	2012/2035	\$240,000
LS24	Ringer Road	2017/2037	\$240,000
LS25	Sherwood Forest	2016/2029	\$230,000
LS26	Sparrow Road	2008/2027	\$210,000
LS27	Tonkawood Court	2016/2036	\$280,000
LS28	Waymouth	2011/2030	\$200,000
LS29	West 34th Street	1993/2020	\$135,000
LS30	Westwood	2012/2032	\$210,000
LS31	Whitegate Lane	2011/2031	\$210,000
LS32	Williston Road	2019	\$1,150,000
LS33	Windridge Circle	2002/2023	\$250,000
LS34	Woodgate	1999/2020	\$220,000
LS35	Clarion Hills	2001/2022	\$150,000
LS36	494/394	2035	\$240,000

APPENDIX A

Figure 6-1 - MCES Sanitary Sewer System and Service Areas

Figure 6-2 - City of Minnetonka Sanitary Sewer System

Figure 6-3 - City of Minnetonka Private Sanitary Sewer System Map

Figure 6-4 - City of Minnetonka Intercommunity Connections

Minnetonka City Code of Ordinances 1200

Copy of Intercommunity Utility Agreements

Figure 6-1. MCES Sanitary Sewer System and Service Areas

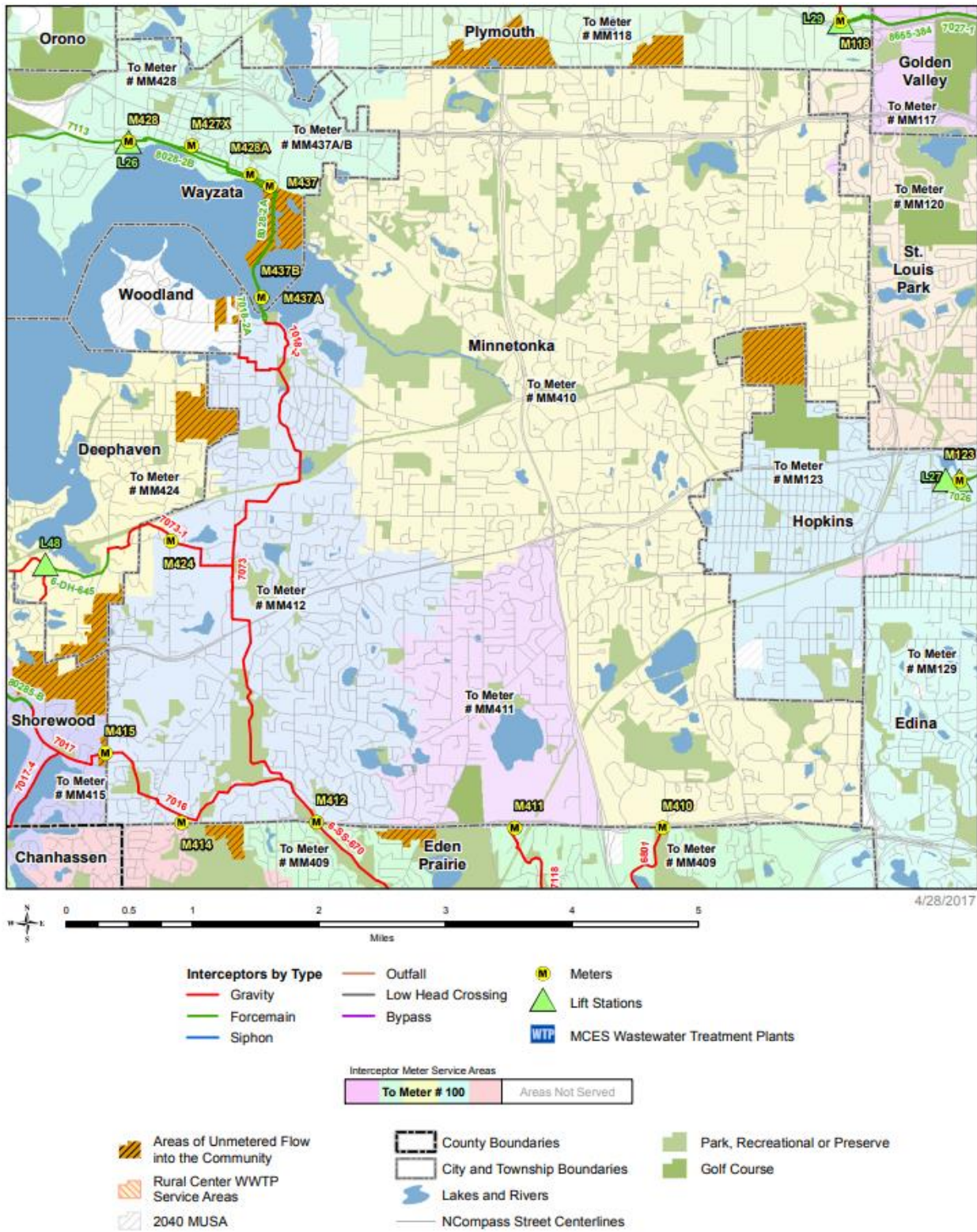


Figure 6-2. City of Minnetonka Sanitary Sewer System

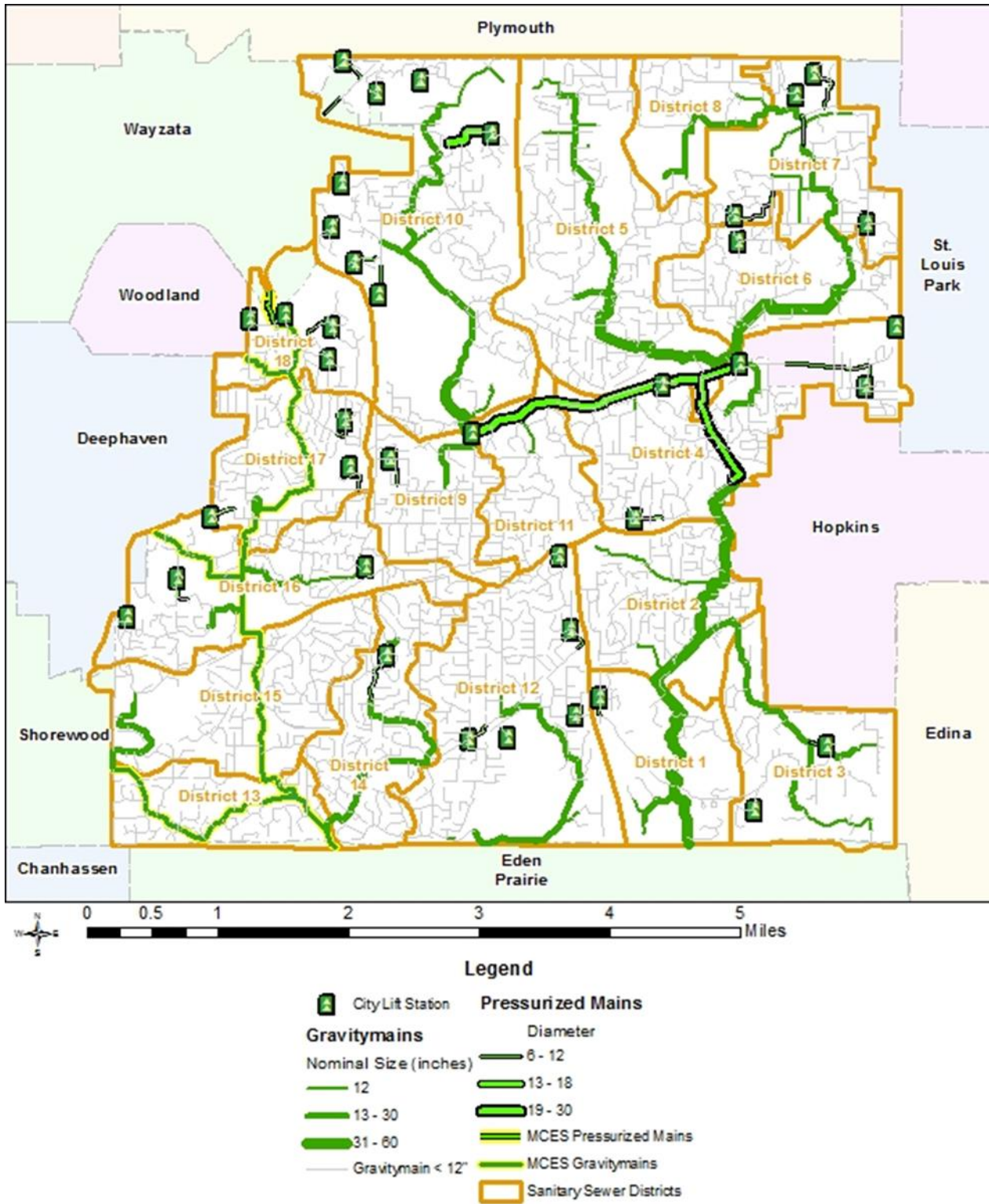


Figure 6-3. City of Minnetonka Private Sanitary Sewer System Map

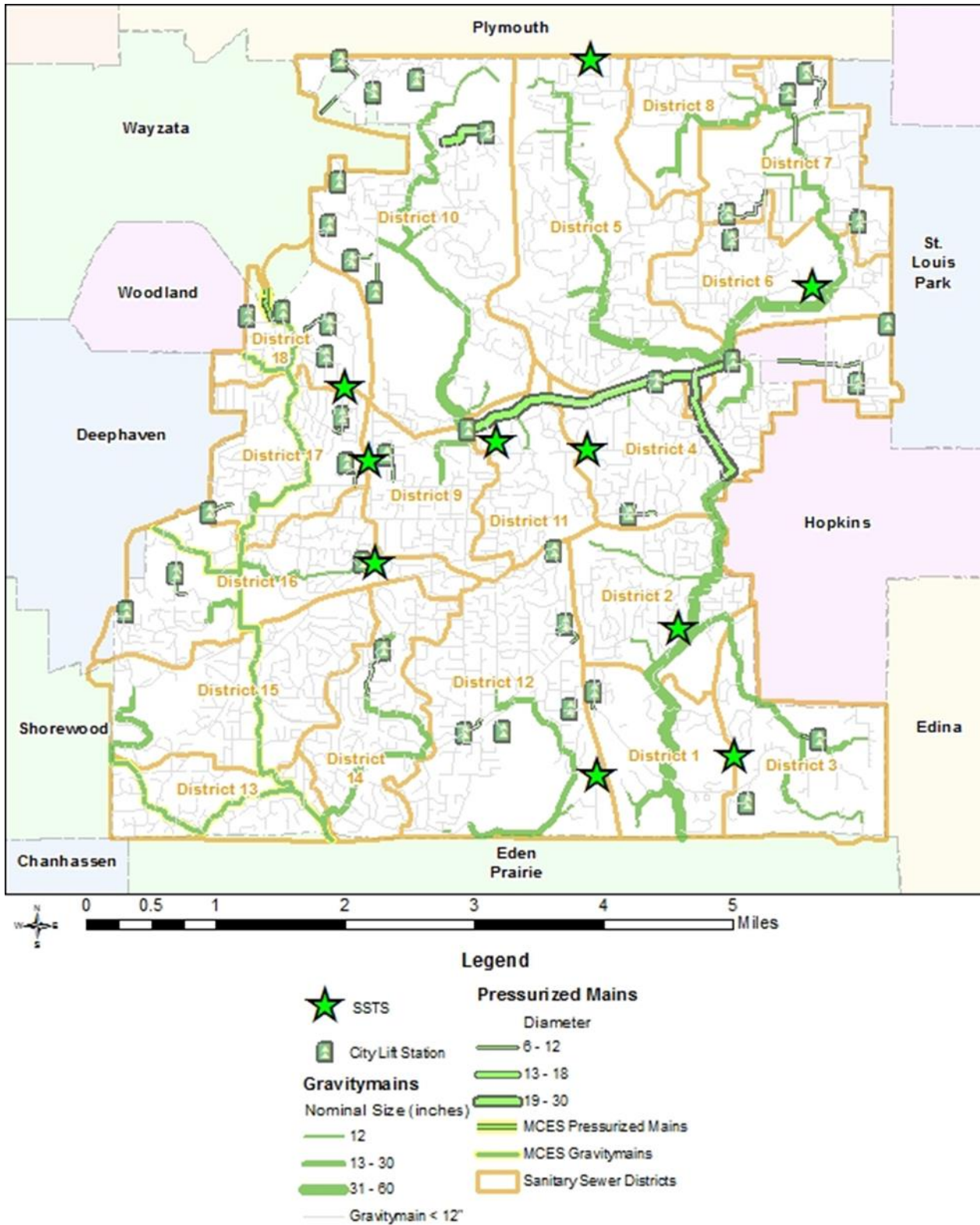


Figure 6-4. City of Minnetonka Intercommunity Connections

