Sanitary Sewer

Sanitary Sewer management is an important aspect of our urban environment. Citizens in today's cities generate significant amounts of waste. The proper disposal and management of these wastes is critical for the maintenance of public health, the protection and preservation of our water resources, and the area's future growth.

The Metropolitan Council Environmental Services (MCES) operates the metropolitan-wide sewer system and requires that the city submit a Sanitary Sewer Plan as part of the comprehensive plan update every ten years. The plan is reviewed to ensure conformance with MCES's 2040 Water Resources Policy Plan and the Metropolitan Council's Thrive MSP 2040 to ensure that the Council's regional wastewater system has adequate capacity to serve the future needs of the region. Conformance for wastewater means that, within the Metropolitan Urban Service Area, communities are meeting the overall density expectations identified in Thrive MSP 2040.

This section of the Comprehensive Plan demonstrates the city's conformance to the regional plan. The Sanitary Sewer Plan serves as an inventory of the city's sanitary trunk facilities and a guide for completing any future trunk upgrades.

Where We Have Been

In St. Louis Park, sanitary sewer management encompasses both local and regional systems which together transport, treat and dispose of waste water.

Regional System

The largest sewer lines serving the city are called metropolitan interceptors and are operated and maintained by the MCES. The city's system collects liquid waste from homes and businesses and delivers it to the MCES system interceptors. Waste treatment occurs at the treatment plant in St. Paul, and the city is assessed for its share of the treatment costs based on sewage flows. Since it is difficult and costly to increase system capacity, the present sanitary waste control system must be closely managed to operate efficiently. Careful projections of future demands on the system based on growth and changes in land use are essential for planning increases in system capacity.

City Sanitary Sewer System

The sanitary sewer system provides sanitary waste collection for every home and business within the city. The local sewer system, owned and managed by the city, includes sewer connections, sewer main lines, lift stations, and manholes which collect and transport liquid wastes to the regional system as well as treatment facilities (Figure 4-17).

Where We Are Today

Sanitary Sewer Facilities

St. Louis Park uses a conventional system in which gravity serves as the driving force to move the wastewater through a network of downward sloping pipes. The sanitary sewer system follows the normal contour of the land, but some areas do not provide the elevation required for a gravity system to work. In these cases lift stations collect and pump the wastewater to a higher level where the gravity system can work.

St. Louis Park's sanitary sewer system transports wastewater to three MCES interceptors. The MCES interceptors transport the sanitary sewage to the Metro treatment facility in St. Paul where it is treated and discharged into the Mississippi River. St. Louis Park's sanitary sewer utility is presented in Figure 4-17, Table 4-19, and Table 4-20. The city does not have any intercommunity service agreements.

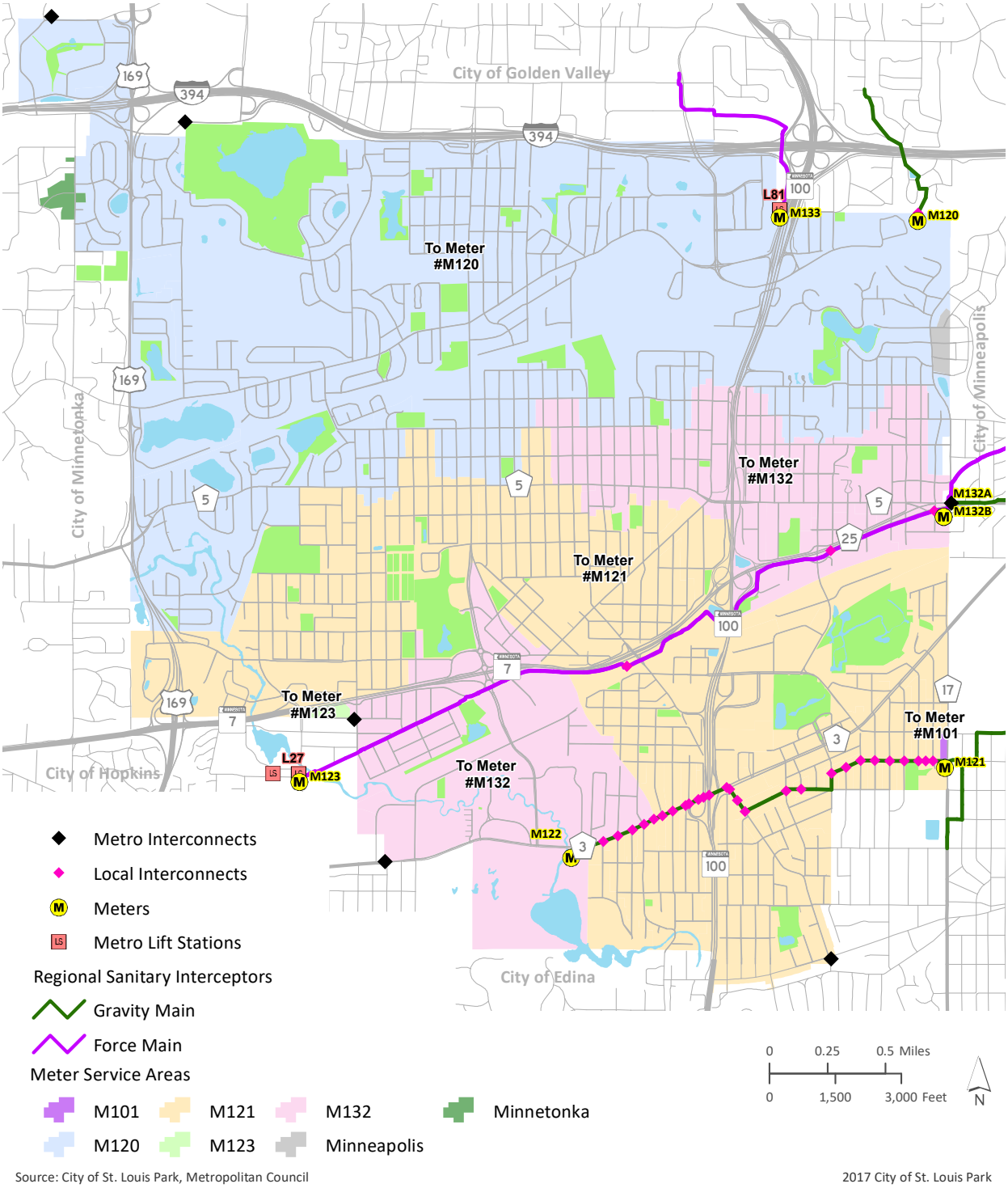
Table 4-19. St. Louis Park Sanitary Sewer System By-the-Numbers

SEWER CONNECTIONS	SEWER MAIN LINES
13,579	758,468 ft.
LIFT STATIONS	**MANHOLES**
23	3,276

Table 4-20. St. Louis Park Sanitary Sewer System Connections

	CONNECTIONS
Residential	11,606
Multi-Family	1,200
Institutional	108
Commercial	592
Industrial	73
Total	13,579

Figure 4-17. Regional Sanitary Sewer System



Source: City of St. Louis Park, Metropolitan Council

2017 City of St. Louis Park

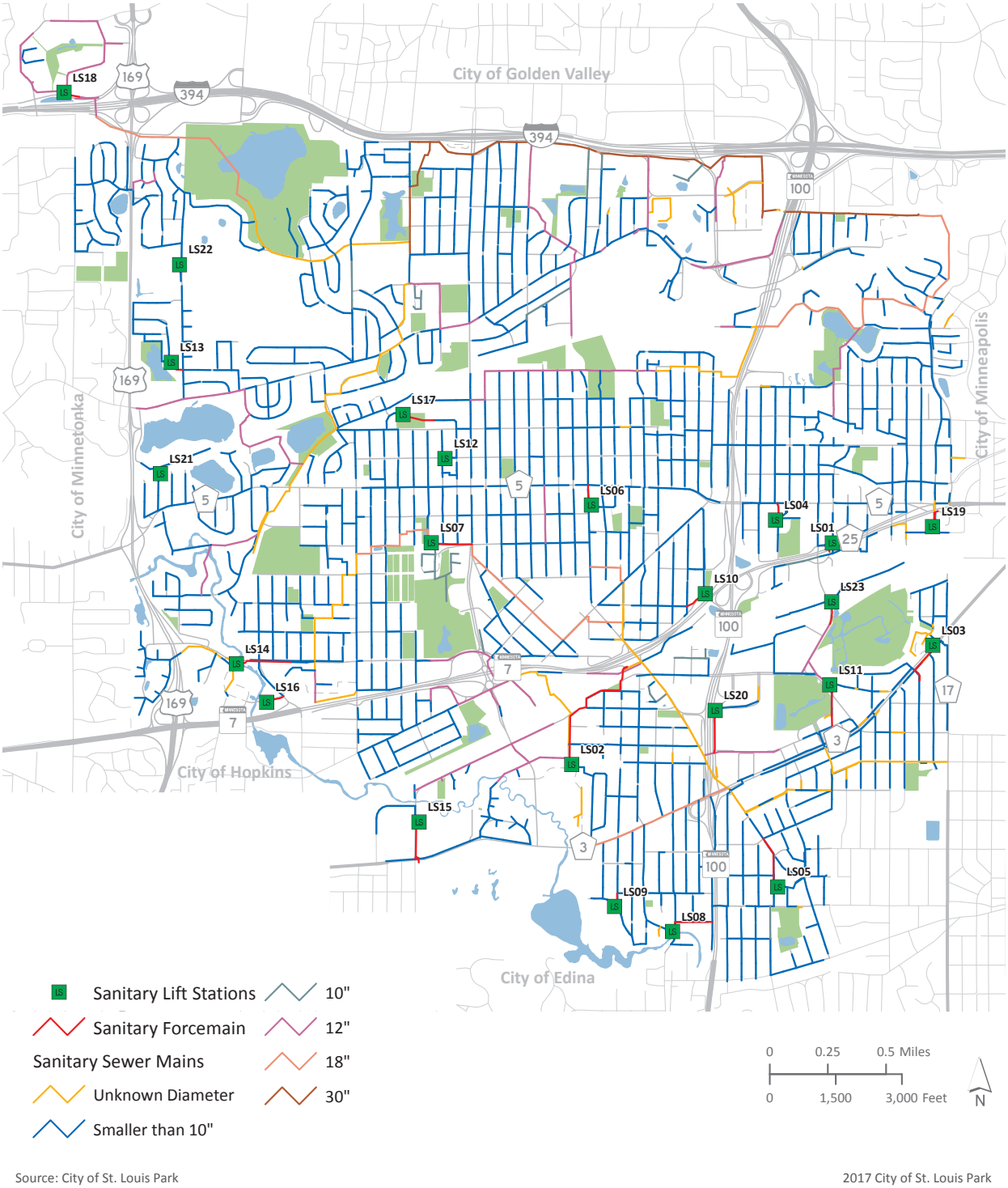
Lift Stations

The city's sanitary sewer system consists of 23 lift stations ranging in size from a 100 gallon per minute (gpm) to a 4600 gpm lift station. The lift stations have been sized to handle buildout of their respective service areas. Table 4-21 summarizes the capacity information for each of the lift stations. The locations of the lift stations are shown in Figure 4-18.

Table 4-21. Lift Station Capacities

LIFT STATION NO.	NUMBER OF PUMPS	PRESENT CAPACITY (MGD)	ULTIMATE CAPACITY (MGD)	FORCE MAIN SIZE (INCHES)	CAPACITY IN GPM
LS 1	2	0.94	0.94	8	650
LS 2	3	13.25	13.25	16	4600
LS 3	2	0.50	0.50	6	350
LS 4	2	0.22	0.22	4	150
LS 5	2	0.94	0.94	8	650
LS 6	2	0.14	0.14	4	100
LS 7	3	1.87	1.87	12	1300
LS 8	2	0.58	0.58	6	400
LS 9	2	0.29	0.29	4	100
LS 10	2	0.32	0.32	4	220
LS 11	3	0.55	0.55	8	380
LS 12	2	0.22	0.22	4	150
LS 13	2	0.43	0.43	4	150
LS 14	2	0.43	0.43	6	300
LS 15	2	0.86	0.86	6	600
LS 16	2	0.14	0.14	6	100
LS 17	2	0.14	0.14	4	100
LS 18	2	1.44	1.44	10	1000
LS 19	3	1.87	1.87	12	1300
LS 20	2	0.71	0.71	6	495
LS 21	2	0.81	0.81	4	280
LS 22	2	0.29	0.29	4	200
LS 23	2	0.29	0.29	6	200

Figure 4-18. City Sanitary Sewer System



Source: City of St. Louis Park

2017 City of St. Louis Park

Trunk Sewer Mains Connected to MCES System

The design flow and maximum capacity of trunk sewer mains that flow to the MCES system are summarized below.

Table 4-22. Trunk Sewer Mains Connected to MCES System

LOCATION	FORCEMAIN DIAMETER (IN.)	INLET DIAMETER (IN.)	DESIGN FLOW (GPM)	MAX CAPACITY (GPM)	COMMENTS
Lift Sta. No. 1 (4602 S. HWY 7)	8	9	650	650	Pumps into MCES FM to M132
Lift Station No. 2 (6504 Excelsior Blvd.)	16	18	4600	4600	Pumps into MCES FM to M132
Lift station No. 19 (3036 Glenhurst Rd.)	12	15	1300	1300	Pumps into MCES FM to M132
NE area of 4330 Cedar Lake Rd.	N/A	30	887	6279	Flows into MCES LS at M120 from West
NE area of 4330 Cedar Lake Rd.	N/A	18	592	1608	Flows into MCES LS at M120 from East
W. 39th St. & France Ave.	N/A	33	1180	8096	Flows into MCES at M121
Emergency MCES LS West End 18" FM	N/A	30	887	6279	Flows to & through MCES emergency LS, then to 4330 Cedar Lake Rd. (M120)

Existing Wastewater Flows

The total flows are measured by MCES at meter locations leaving the city. Annual and monthly flow data from MCES indicates that the ten-year average flow is 4.97 MGD and the average annual per capita wastewater flow is approximately 107 gallons per day (GPD). The average dry weather (winter) flow is 4.89 MGD and corresponding per capita amount is 105 gpdc.

Where We Are Headed

Population, Employment, and Wastewater Forecasts

The comprehensive wastewater plan is developed in part to portray the condition of the St. Louis Park wastewater collection system under future flow conditions, assuming that the population and employment forecasts are achieved. The purpose in developing the future plan is to anticipate future changes to the system that may be required and to allow for the development of a sustainable capital improvements program for the wastewater collection system. The Thrive MSP 2040 population, household and employment forecasts in ten-year increments through 2040 were used in generating wastewater flow projections and in maintaining the required consistency with all parts of the comprehensive planning effort.

Table 4-23. Metropolitan Council Projections for St. Louis Park

YEAR	POPULATION	HOUSEHOLDS	EMPLOYMENT
2010	45,250	21,743	40,485
2020	49,600	23,600	43,400
2030	52,350	25,220	45,300
2040	54,520	26,230	46,850

Since 100% of St. Louis Park is considered sewered by MCES, the projections in Table 4-23 represent sewered and total components. In addition, the above projections apply to the Metro Wastewater Treatment Plant (WWTP) since sanitary sewer flow from St. Louis Park is treated at the Metro WWTP.

The 2040 land use map, growth and redevelopment projections, and MCES historical metershed data were used to determine forecasts by MCES metersheds, as seen in Table 4-24.

Table 4-24. 2040 Projections by MCES Metershed

Metershed	Population	Households	Employment
M120	19,273	9,147	17,858
M121	22,896	10,934	15,193
M132	12,351	6,149	13,799

Table 4-25. Projected Total Average Annual Flow Projections (MGD) by Metershed

Year	M120	M121	M132
2020	2.13	1.70	0.95
2030	2.16	1.74	0.99
2040	2.17	1.74	0.99

Infiltration and Inflow

General

The Metropolitan Council appointed a task force that met in 2003/2004 to address the impacts of excess inflow and infiltration (I/I) on the regional system. I/I describes clear water that enters wastewater collection systems and consumes capacity of the conveyance and treatment systems. Inflow is typically stormwater that increases peak flow in the wastewater system during and after rainfall events from point sources such as broken manhole covers, sewer cleanouts, sump pumps, foundation drains, and rain leaders. Infiltration is typically groundwater that gradually enters the wastewater system through cracks and openings in sewer mains, service laterals, joints, and deteriorated manholes. It was determined that the cost for source removal of I/I was much more cost effective than the cost to store, convey and treat excess I/I. Therefore, the current program focuses on source removal within the communities and regional system.

In 2009/2010 the Metropolitan Council Demand Charge Task Force reviewed goals of the current program including a possible demand charge. The recommendation was to implement an on-going program similar to the existing I/I program. However, instead of a mandatory demand charge, discretion was left with MCES to institute a demand charge if a community is not working towards meeting its I/I Goal.

Included within the MCES 2040 Water Resources Policy, adopted in May of 2015 and more recently amended, is the establishment of I/I goals for all communities discharging wastewater to the regional system. The I/I Goal is the maximum allowable discharge to the regional wastewater system expressed as a peak hourly flow rate measured in million gallons per day (MGD). The I/I Goal is equal to the adjusted average dry weather flow (ADF) multiplied by the respective peak hourly factor. The ADF is based upon a ten-year rolling average of meter flow data and is adjusted upward by population growth for future forecasting. As part of the ongoing I/I efforts a procedure manual is updated by the Metropolitan Council for the subsequent program year.

The city's Sanitary Sewer Plan addresses the MCES specific requirements. Communities with excessive I/I will still be required to eliminate it within a reasonable time period.

The Council has also established I/I goals for each metershed, and the City of St. Louis Park is currently meeting its metershed goals (Table 4-26). In the past St. Louis Park was on MCES's excessive I/I list. However, the city implemented an extensive I/I mitigation program that included flow monitoring and analysis, as well as other measures, to identify and correct high I/I areas.

Table 4-26. Current MCES Metershed Goals for St. Louis Park

METERSHED	ADJUSTED TOTAL DAILY FLOW (MGD)	PEAK HOURLY FLOW FACTOR	I/I GOAL (MGD)
M120	2.46	3.30	8.13
M121	1.84	3.40	6.26
M132	1.06	3.60	3.83

Table 4-27. I/I Averages for St. Louis Park since 2007

YEAR	POPULATION	AVERAGE ANNUAL (AA) FLOW (MGD)	AVERAGE DRY (AD) WEATHER FLOW (MGD)	PEAK MONTH (PM) FLOW (MGD)	BASE I/I AA - AD (MGD)	AVERAGE WET WEATHER I/I PM - AD (MGD)	PM TO AA RATIO
2007	44,896	5.48	5.27	5.80	0.21	0.53	1.06
2008	45,216	5.18	5.10	5.53	0.08	0.42	1.07
2009	47,221	4.96	4.81	5.32	0.16	0.51	1.07
2010	47,221	4.88	4.85	5.17	0.03	0.32	1.06
2011	45,250	5.37	4.98	6.05	0.38	1.07	1.13
2012	45,505	4.78	4.73	5.19	0.04	0.45	1.09
2013	47,221	4.67	4.41	5.28	0.27	0.87	1.13
2014	47,411	5.09	4.48	6.59	0.61	2.11	1.29
2015	47,502	4.70	4.63	4.95	0.07	0.31	1.05
2016	47,502	4.64	4.58	4.88	0.06	0.31	1.05
Average Flow (MGD)		**4.97**	**4.78**	**5.48**	**0.19**	**0.69**	**1.10**
Average I/I Per Capita (GPCD)						**14.87**	
Average I/I % over Avg. Day						**10.00%**	
Average I/I % over Base Sanitary Flow (Avg. Dry)						**14.70%**	

Existing I/I

Sources of I/I in the sanitary sewer system include cracks and openings in sewer mains, service laterals, joints, and deteriorated manholes and sewer clean outs, as well as possible sump pump foundation drain or rain leader connections.

Older areas consisting of clay pipe and pre-1970 era homes have been identified as higher sources of potential I/I. Pre-1970 era residential housing areas account for 63% of the total residential homes. The City has inspected approximately 75% of the private sewer connections and watch for a constant flow of clear water. There are no private sewer systems in the city beyond sewer connections being inspected by City staff.

The EPA guide for estimating infiltration and inflow compares average dry weather (winter) flows to annual average and peak month flows to determine the average amount of I/I entering the system. The table below summarizes average annual, average dry weather and peak month flows for the last ten years. It also compares the various flows to help quantify the amount of I/I entering the system on an average basis.

Comparing annual average (AA) to average dry weather (AD) the average flow attributable to I/I is approximately 0.19 mgd or 4.10 gallons per capita per day, which could be considered the base I/I. The average peak month (PM) to annual average ratio is 1.1. This equates to an average I/I contribution of approximately 0.69 mgd during wet weather periods.

By looking at flows over the course of a year it is possible to quantify I/I on an average basis. However, it is much more difficult to determine peak instantaneous or peak hour events that are mostly associated with inflow. A one (1) inch rainfall event could have a large impact on the system or minimal impact depending upon the duration and intensity as well as other factors for each particular event. Typically, no two events are the same, and at best patterns can be determined for general rainfall amounts.

The city conducted an initial I/I study in 2007, and monitoring results pointed to four areas of the city's collection system (NW, Central, and two East Central areas) that had high potential I/I during rainfall events. Flow monitoring continued through 2015 to further isolate I/I within the four areas. The results of the flow monitoring have been used to guide the city's on-going mitigation plan.

A sanitary sewer televising/inspection program started in late 2014 and a sewer lining program began in 2015. Approximate city costs (not including staff time) for I/I remediation is summarized in Table 4-28.

Table 4-28. I/I Remediation Costs Since 2009

YEAR	APPROXIMATE COST OF I/I REMEDIATION
2009	$10,900
2010	$19,300
2011	$16,100
2012	$16,100
2013	$20,700
2014	$6,900
2015	$400,600
2016	$400,000

On-going Mitigation Plan

The city has a proactive program consisting of policies, ordinances and strategies with the goal of identifying and correcting I/I.

A summary of on-going and future activities and programs & costs intended to mitigate I/I include:

- Four-year cleaning and maintenance program on the main sewer lines and bi-annual maintenance program on the sanitary sewer lift stations.
- Provide current information on the Sanitary Sewer System infrastructure through video inspection.
- Continue to evaluate the main lines for structural integrity, inflow and infiltration, using the process to establish a proactive CIP to correct any deficiencies through the most effective methods. Televise every four years.
- Sewer Lining (Approx. 3 miles/yr)- $400,000/year
- Manhole inspection & repair (lining)- $25,000/year
- Manhole Cover Replacement- $25,000/year
- Employee education – NPDES annual training
- City Code that promotes reduced I/I – The current code prohibits owners, occupants or users of any premises to direct into or allow any storm water, surface water, water from air conditioner systems, oil or other material to drain into the sanitary sewer system

Requirements & Standards for Mitigating I/I

In addition to the strategies and programs described above, the city has established local ordinances that prohibit clear water discharges from sump pumps, foundation drains, rain leaders into the sewer system and requiring the disconnection of such connections. City Code Sec. 32-96 is listed below. The Minnesota State Plumbing Code 714.2 covers prohibited water discharge.

» St. Louis Park City Code Sec. 32-96 Adoption of certain regulations by reference.

A. Metropolitan Council Environmental Services Regulations. The waste discharge rules for the metropolitan disposal system are adopted and incorporated in this article by reference.

B. State Plumbing Code. The Minnesota State Plumbing Code is incorporated in this article by reference. Such code shall apply to all public sewer connections required by this article.

Subsurface Sewage Treatment Systems (SSTS)

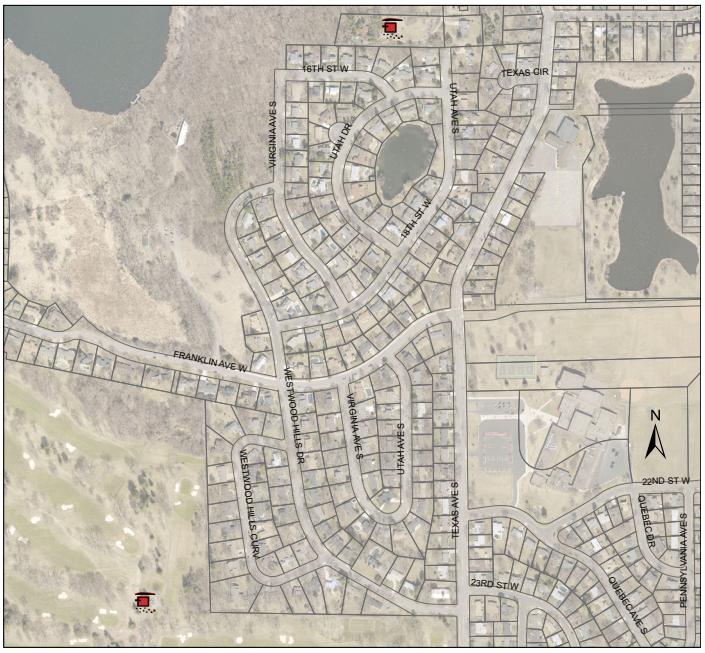
MCES projections do not include any unsewered areas in St. Louis Park. St. Louis Park City Code Sec. 32-91 requires all properties to connect to the public sewer. The city currently has two subsurface sewage treatment systems (SSTS). The locations are shown in Figure 4-19.

The city's management program for subsurface sewage treatment systems (SSTS) is covered by the Minnesota State Statutes 115.55 and 115.56, Minnesota Rules applying to the Minnesota Pollution Control Agency Chapters 7080, 7081, 7082 and 7083 and Hennepin County Ordinance 19. The City ordinance that applies to SSTS is Sec. 6-211 and is attached in the appendix.

Capital Improvement Plan & Preventative Maintenance

The city is committed to capital reinvestment of the Sanitary Sewer Utility to achieve the goals and policies set forth and maintain the long-term sustainability of the utility. A Capital Improvement Plan (CIP) is in place to cover expansion (if needed) and repair of the sanitary sewer system and is updated annually. No new trunk sewers are planned that require connection to the Metropolitan Disposal System.

Figure 4-19. Subsurface Sewage Treatment System (SSTS) Locations in St. Louis Park



LEGEND

Existing SSTS

ARTICLE VII. INDIVIDUAL SEWAGE TREATMENT SYSTEMS CODE

- Sec. 6-211. Code adopted. The city adopts and incorporates by reference Hennepin County Ordinance Number 19, Individual Sewage Treatment System Standards for Hennepin County. One copy of such ordinance shall be marked "City of St. Louis Park Official Copy," and such copy shall be kept on file in the office of the city clerk, and shall be open to inspection and use by the public.
- Sec. 6-212. Permit required. A permit from the city is required for all work as specified in the individual sewage treatment system standards. The applicant must submit a permit application, complete plans and evidence of state licensing.
- Sec. 6-213. Fees. Permit fees shall be set from time to time by the city and a schedule of such fees is listed in appendix A to this Code. Such fees must be submitted to the city before a permit will be issued.

Sanitary Sewer Goals and Strategies

1. **Provide the community a municipal sanitary sewer collection system that will enable optimum transportation of sewage with minimum interruption**

   Strategies

   A. Continue the four-year cleaning and maintenance program on the main sewer lines and bi-annual maintenance program on the sanitary sewer lift stations.

   B. Continue to evaluate the basic maintenance and operational guidelines to provide responsive and cost-effective maintenance of the Sanitary Sewer System.

2. **Provide current information on the Sanitary Sewer System infrastructure through video inspection**

   Strategies

   A. Continue to evaluate the sanitary sewer lines for structural integrity, inflow and infiltration, using the process to establish a proactive CIP to correct any deficiencies through the most effective methods. Televise every 4 years.

   B. Incorporate the inspection process with an efficient maintenance program.

3. **Continue to Mitigate Inflow and Infiltration in the Sanitary Sewer System**

   Strategies

   A. Implement on-going I/I Mitigation Plan included in this plan.

   B. Continue to systematically investigate areas of concern identified through flow monitoring.