Chapter 14

SANITARY SEWER

The Sanitary Sewer portion of the Maplewood Comprehensive Plan was previously updated as a component of the overall 2020 and 2030 plans. Under separate cover, the 2003 Comprehensive Sanitary Sewer Plan Update (2003 update), was completed to address some inconsistencies in the 2020 Comprehensive Plan. The 2003 update was completed to consider development/ redevelopment that was being planned within the City, and to address sewage flow issues for the Legacy Village development as required by the Alternative Urban Areawide Review (AUAR) for the development. The 2003 update was updated in 2010, like this 2018 Plan update, as part of the City's 2030 Comprehensive Plan.

Overview

This section has been prepared to be consistent with the requirements of the Metropolitan Council's Local Planning Handbook. The Local Planning Handbook describes the content requirements for the sewer element of comprehensive plans. This report serves as both the sewer element of the City's Comprehensive Plan (Tier I) as well as the City's local sewer extension plan (Tier II). The information included in this update allows the Metropolitan Council to plan and manage their regional sewage collection and treatment systems.

The current major population characteristics of Maplewood are summarized in Table 14-1 based upon the current Comprehensive Plan update:

Table 14-1. Maplewood Population Characteristics

Forecast Year	Estimated Population	Estimated Households	Estimated Employment
2010	38,018	14,882	27,635
2020	42,200	17,000	32,700
2030	45,600	18,900	34,800
2040	48,600	20,300	36,600

1. Data from Met Council Community Page for Maplewood

Sanitary Sewer Service Districts

The City is divided into seventy-four (74) separate sewer districts. The district boundaries are identical to the boundaries identified in the 2020 and 2030 Comp Plans. A map illustrating the current sewer district boundaries is shown below as Figure 14-1.

Some of the sewer districts discharge Maplewood sewage directly into adjacent communities without any metering of outflow. The Maplewood sanitary sewer system also receives some direct inflow from adjacent communities. In cases where no metering information is available for inflow or outflow, flows are estimated based on land uses in the areas discharging flow. Figure 14-1 illustrates the locations of inflows from and outflows to the adjacent communities. Table 14-2 provides a summary of the discharge connections and metering locations for each of the sewer districts.

Figure 14-1. City of Maplewood Sanitary Sewer Districts

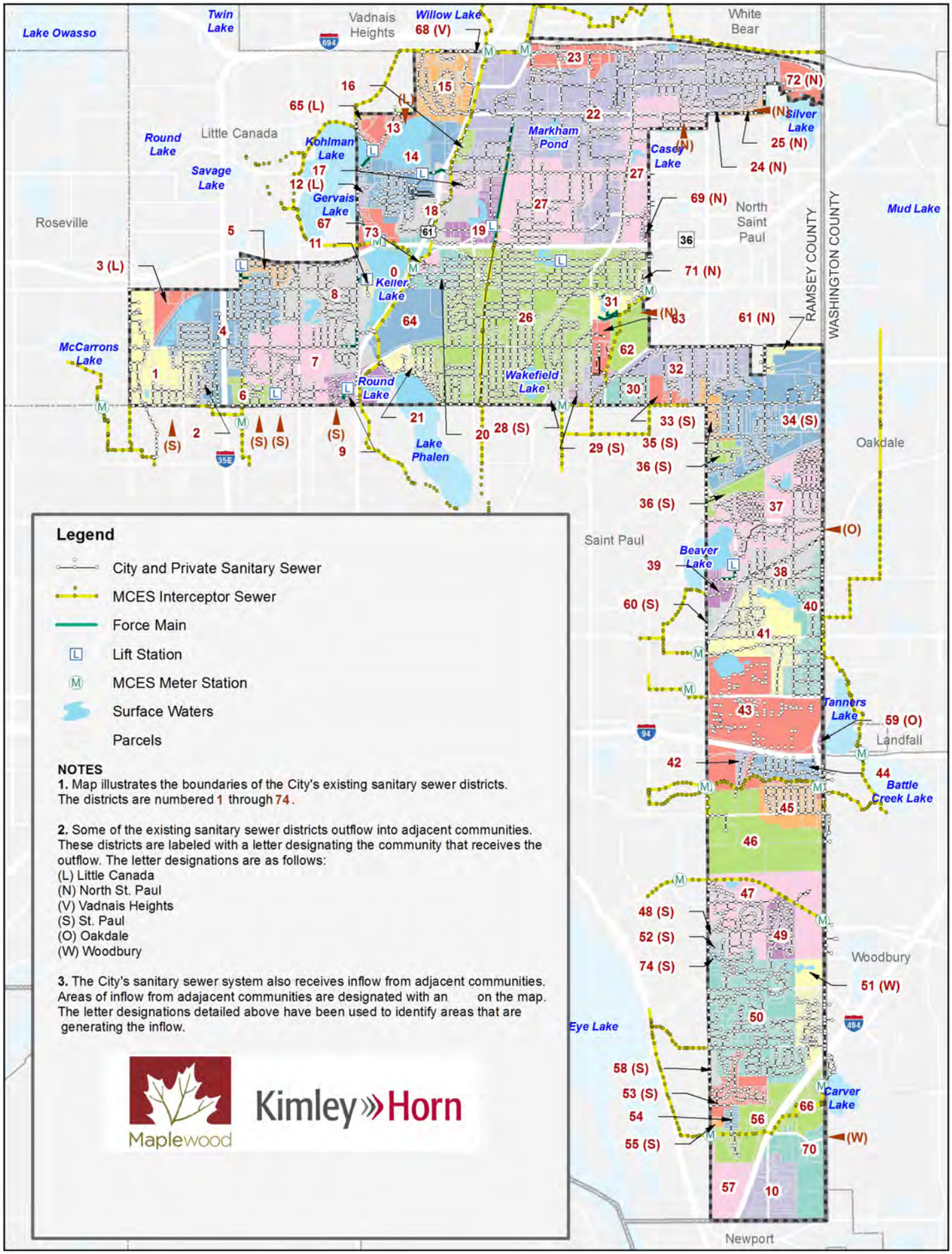

Table 14-2. Sewer Service District Discharge Connections

Sewer District #	Outflow to:	Meter:
3(L), 12(L), 65(L)	Little Canada Sewer	None
5	Maplewood Lift Station 10 to Maplewood Sewer District 4	None
19	Maplewood Lift Station 12 to Maplewood Sewer District 22	#M025A
14	Maplewood Lift Station 14 to Maplewood Sewer District 22	#M025A
13	Maplewood Lift Station 17 to Maplewood Sewer District 14	#M025A
11	Maplewood Lift Station 18 to Maplewood Sewer District 8	None
73	Maplewood Lift Station 20 to MCES Little Canada Interceptor (I-8151)	None
37	Maplewood Lift Station 6 to Maplewood Sewer District 39	#M008
7	Maplewood Lift Station 8 to Maplewood Sewer District 6	#M016
27	Maplewood Sewer District 26	#M011
62	Maplewood Sewer District 32	None
34(S)	Maplewood Sewer District 36	None
57	Maplewood Sewer District 56	None (#M002 not in Service)
42, 43, 44, 45, 46	MCES Battle Creek Interceptor (I-MW-411)	#M005
8, 9, 21, 64	MCES Beltline Interceptor (I-7122)	None
15, 16, 17, 18, 20, 22, 23, 67	MCES Beltline Interceptor (I-7122)	#M025A
10, 54, 56, 66, 70	MCES Carver Lake Interceptor (I-7402)	None (#M002 not in Service)
50	MCES Highwood Interceptor (I-SP-202)	None
39	MCES Interceptor I-8566-371	#M008
38, 41	MCES Interceptor I-SP-211	#M007
30, 32	MCES Interceptor I-SP-215	None
26	MCES Interceptor I-SP-217	#M011
2, 4	MCES Interceptor I-SP-221	None
6	MCES Interceptor I-SP-221	#M016
31, 63	MCES North St. Paul Interceptor (I-MW-413)	None
40	MCES Oakdale Interceptor (I-WO-501) (to be Conveyed to Oakdale)	#M021
1	MCES Trout Brook Interceptor (I-SP-222)	#M015A
47, 49	MCES Woodbury Interceptor (I-MW-410)	#M004
24(N), 25(N), 61(N), 69(N), 71(N), 72(N)	North St. Paul Sewer	None
59(O)	Oakdale Sewer	None
28(S), 29(S), 36(S), 48(S), 52(S), 53(S), 55(S), 58(S), 60(S), 74(S)	St. Paul Sewer	None
33 (S), 35 (S)	St. Paul Sewer (I-SP-214 to be Conveyed to St. Paul)	None
68 (V)	Vadnais Heights Sewer	None
51 (W)	Woodbury Sewer	None

Projected Sewage Flows

This update has been prepared considering the City of Maplewood's future land use maps. For the purposes of estimating sewage flows, we have assumed the following:

- The existing land use map illustrates 2018 development within the City. Land currently identified as vacant was assigned a flow representative of the zoning classification for each vacant parcel.
- The future land use map illustrates projected 2040 development within the City

Projected sewage flows have been determined for each of the seventy-four (74) sewer districts in the City. Projected sewage flows are based on the land use specific flows listed in Table 14-3. Flows for 2018 and 2040 listed in Table 14-4 are based on the land use categories for existing and future land uses, respectively. Flows for 2030 have been estimated by interpolating the mid-point between the calculated 2018 and 2040 flows.

Table 14-3. Predicted Flows for Existing and Future Land Uses

Existing Land Use	Future Land Use	Units		Predicted Flow Rate	
		Per Parcel	Per Acre	(Gal./Unit/ Day)	(Gal./Acre/ Day)
Single Family Residential	Rural/Low Density Residential	1		275	
	Low Density Residential				
Multi-Family Residential	Medium Density Residential		8	275	2,200
Manufactured Housing Park					
	High Density Residential		12	275	3,300
Planned Unit Development (PUD)	Mixed Use Neighborhood				2,300
	Mixed Use Neighborhood HD				
	Mixed Use Community				
Commercial	Commercial				800
Industrial	Employment				
Public/Institutional	Public/Institutional				
Utility	Utility				0
Open Space	Open Space				
Park	Park				
ROW	ROW				
Water	Water				

The projected flow rate for residential properties of 275 gallons/unit/day and the projected flow rate for non-residential properties of 800 gallons per acre have been estimated based upon communications with Metropolitan Council Environmental Services (MCES) staff during previous updates. Previous estimates have also considered some calibration of the projected flow rates with actual metering records. The number of units per acre for multiple dwelling residential properties is based on the average density of each category consistent with the City's land use plan. The estimated flow rate for mixed use and PUD properties of 2,300 gallons/acre/day has been estimated assuming a mix of high density residential use and commercial use.

Table 14-4. Estimated Flow by District and Year

Sewer District	Average Daily Flow (Gallons/Day)		
	2018	2030	2040
1	171,289	223,659	276,030
2	13,968	13,968	13,968
3 (L)	30,352	30,352	30,352
4	227,635	234,170	240,705
5	24,200	24,200	24,200
6	33,408	36,794	40,180
7	182,156	184,575	186,993
8	153,494	159,326	165,159
9	58,153	73,615	89,077
10	12,375	12,375	12,375
11	4,400	4,400	4,400
12 (L)	5,500	5,500	5,500
13	14,025	14,025	14,025
14	88,473	99,041	109,609
15	111,910	120,147	128,384
16	11,644	11,681	11,718
17	26,735	24,074	21,413
18	72,381	85,316	98,250
19	31,690	52,479	73,267
20	43,059	53,410	63,761
21	45,590	51,144	56,698
22	752,931	905,432	1,057,932
23	150,719	176,483	202,247
24 (N)	1,375	1,375	1,375
25 (N)	9,075	9,075	9,075
26	742,604	793,113	843,623
27	297,531	320,035	342,540
28 (N)	9,928	9,928	9,928
29 (N)	10,175	10,383	10,592
30	42,881	55,595	68,309
31	37,621	37,621	37,621
32	155,229	198,214	241,198
33 (S)	23,685	28,790	33,895

Sewer District	Average Daily Flow (Gallons/Day)		
	2018	2030	2040
34 (S)	249,373	259,630	269,887
35 (S)	24,473	30,402	36,330
36 (S)	43,616	84,695	125,774
37	437,659	459,431	481,203
38	112,768	120,581	128,394
39	26,300	29,356	32,411
40	83,788	93,570	103,352
41	128,502	134,645	140,788
42	4,950	4,950	4,950
43	302,835	303,121	303,406
44	40,520	46,601	52,681
45	74,396	78,254	82,112
46	62,173	62,173	62,173
47	249,010	287,017	325,024
48 (S)	10,732	10,775	10,818
49	65,194	83,125	101,057
50	247,561	250,796	254,030
51 (W)	60,489	86,233	111,976
52 (S)	1,925	1,925	1,925
53 (S)	46,829	46,829	46,829
54	5,225	5,225	5,225
55 (S)	1,650	1,650	1,650
56	14,850	14,850	14,850
57	0	0	0
58 (S)	2,475	2,475	2,475
59 (O)	3,216	6,231	9,246
60 (S)	2,750	2,655	2,561
61 (N)	8,250	8,250	8,250
62	275	275	275
63	34,917	34,917	34,917
64	0	0	0
65 (L)	1,925	1,925	1,925
66	7,425	7,425	7,425
67	10,925	20,394	29,863
68 (V)	2,267	2,267	2,267
69 (N)	3,472	3,472	3,472
70	5,225	93,450	181,675
71 (N)	5,225	5,225	5,225
72 (N)	0	0	0
73	2,475	2,475	2,475
74 (S)	2,475	2,475	2,475
0	62	62	62
Totals	**5,984,364**	**6,750,099**	**7,515,833**

Subsurface Sewage Treatment Systems (SSTS)

There are approximately 102 subsurface sewage treatment systems (SSTS) in the City of Maplewood as of 2016. The City previously had 135 SSTS in 2003 and 112 in 2010. The vast-majority of these systems are located south of Linwood Avenue. The City's goal is to phase out the use of SSTS within Maplewood as practical and feasible. Additional information on the SSTS in the southern portion of Maplewood south is provided in the South Maplewood Sewer Study, prepared by SEH, Inc. dated May 19, 2003.

Each year, the City prepares an Annual SSTS Report summarizing the status of the SSTS sites. This report states which sites have sewer available and which sites are required to connect to the City sewer. SSTS owners are required to have their system inspected every 3 years and complete any required maintenance. The owner must submit the required MPCA Septic Tank Maintenance Reporting Form to the City. On January 28, 2002, the City of Maplewood approved City Ordinance Section 9-950 regulating the location, design, installation, use and maintenance of SSTS within Maplewood. The ordinance became effective on June 1, 2002. The City's current SSTS Ordinance is found in Chapter 40, Article II, Division 5.

Infiltration/Inflow

In 1998, the City of Maplewood initiated a program to identify and address infiltration and inflow (I & I) issues in the City's sanitary sewer system. This program includes a quarterly review of flow reports to identify critical I & I areas. The City is making annual investments to address I & I problems. These investments have included sewer main lining, sealing manholes, and the replacement of sections of sanitary sewer main. A majority of the I & I program has been focused on the portion of Maplewood north of Minnehaha Avenue.

The City's I & I program initially focused on addressing illegal sump pump connections under an annual program that started in 2004. Currently, the City funds and annual sewer main lining program that is linked to its annual street reconstruction program. The City lines sanitary sewer mains that have been identified as contributing to I & I and also offers landowners the opportunity to have the system in their area televised at no cost. If improvements or repairs are needed, the City covers the cost of improvements within the right-of-way (ROW) and the landowner is responsible for the cost of improvements outside the ROW.

Actions/Capital Improvement Plan

A number of trunk sanitary sewer improvements have been identified that should be considered as a part of the City's future Capital Improvement Plan (CIP) to meet future needs of growth areas, address public health issues or to eliminate the need for existing lift stations. A summary of these improvements and a proposed schedule for their completion is provided in Table 14-5 below and the location of these potential improvements is illustrated in Figure 14-2. The schedule for a number of these improvements will be directly related to development activity in the area. Prior to capital improvements in the districts listed in Table 14-5, and in preparation for development and redevelopment in areas of change discussed in the Land Use chapter of this plan, the City will complete more detailed analyses of the sanitary sewer system in those areas. The City will initiate improvements in specific areas noted only in response to development activity or to protect public health.

Table 14-5. Capital Improvement Plan

Sewer District	Date	Description
7	TBD	Construction of gravity sewer connection to eliminate Lift Station #8.
10	Development or Public Health Driven	Construction of sewer extension and two lift stations along Sterling Street to connect to MCES Carver Lake Interceptor.
19	TBD	Construction of gravity sewer connection to MCES Beltline Interceptor to eliminate Lift Station #12.
51	Development or Public Health Driven	Construction of sewer extensions along Linwood Avenue and Highwood Avenue west of Century Avenue to connect to existing City sanitary sewer.
56	Development or Public Health Driven	Construction of sewer extension along Henry Lane and Sterling Street to connect to MCES Carver Lake Interceptor.
66	Development or Public Health Driven	Construction of sewer extension along Century Avenue south of I-494 to connect to MCES Carver Lake Interceptor.
70	Development or Public Health Driven	Construction of sewer extension along Carver Avenue to connect to MCES Carver Lake Interceptor.

Figure 14-2. Capital Improvement Plan