





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 |

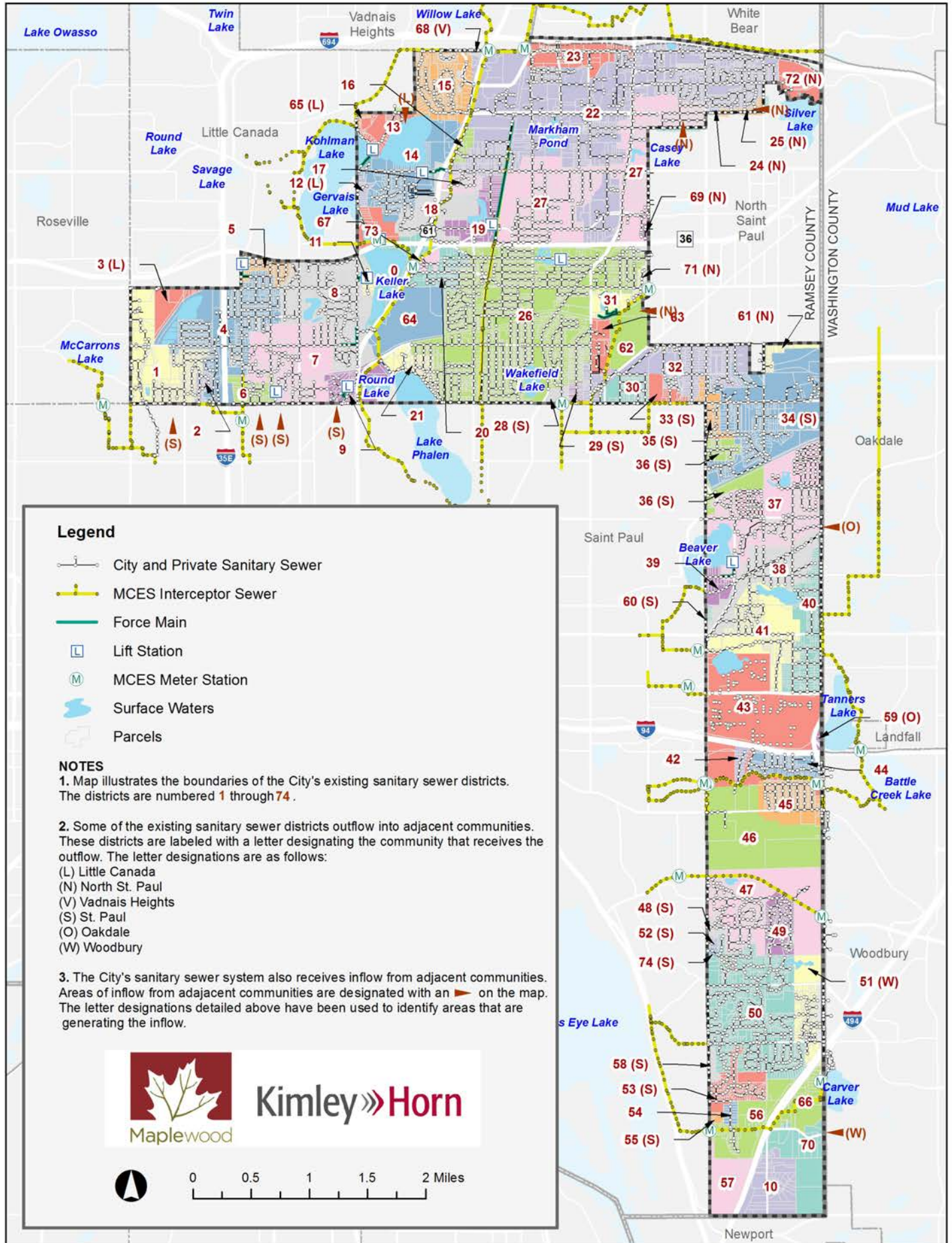
1. Data from Met Council Community Page for Maplewood

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. The City has agreements with Oakdale (2003) and Little Canada (2008) to accept flow from these cities into Maplewood's sanitary sewer system. 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. **Table 14-3** provides a summary of the estimated population, households and employment by MCEC Interceptor contribution for the years 2020, 2030 and 2040.

Figure 14-1. City of Maplewood Sanitary Sewer Districts



Legend

- City and Private Sanitary Sewer
- MCES Interceptor Sewer
- Force Main
- Lift Station
- MCES Meter Station
- Surface Waters
- Parcels

NOTES

1. Map illustrates the boundaries of the City's existing sanitary sewer districts. The districts are numbered 1 through 74.
2. Some of the existing sanitary sewer districts outflow into adjacent communities. These districts are labeled with a letter designating the community that receives the outflow. The letter designations are as follows:
 (L) Little Canada
 (N) North St. Paul
 (V) Vadnais Heights
 (S) St. Paul
 (O) Oakdale
 (W) Woodbury
3. The City's sanitary sewer system also receives inflow from adjacent communities. Areas of inflow from adjacent communities are designated with an on the map. The letter designations detailed above have been used to identify areas that are generating the inflow.



SANITARY SEWER

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 |

Table 14-3. Projected Population, Households and Employment by MCEs Interceptor

| MCEs Interceptor or Outflow Location | Estimated Population | | | Estimated Households | | | Estimated Employment | | |
|--|----------------------|---------------|---------------|----------------------|---------------|---------------|----------------------|---------------|---------------|
| | 2020 | 2030 | 2040 | 2020 | 2030 | 2040 | 2020 | 2030 | 2040 |
| MCEs Battle Creek Interceptor (I-MW-411) | 1,720 | 1,820 | 3,272 | 627 | 680 | 1,392 | 9,897 | 9,734 | 9,435 |
| MCEs Beltline Interceptor (I-7122) | 9,192 | 10,183 | 12,657 | 3,971 | 4,340 | 5,071 | 7,622 | 8,719 | 9,763 |
| MCEs Carver Lake Interceptor (I-7402) | 1,613 | 2,012 | 1,241 | 468 | 916 | 1,240 | 36 | 44 | 54 |
| MCEs Highwood Interceptor (I-SP-202) | 2,094 | 2,078 | 2,069 | 1,027 | 1,123 | 996 | 69 | 80 | 89 |
| MCEs Interceptor I-8566-371 | 353 | 361 | 371 | 1,356 | 1,424 | 1,133 | 254 | 293 | 297 |
| MCEs Interceptor I-SP-211 | 4,494 | 4,553 | 5,742 | 878 | 915 | 1,238 | 5,473 | 5,369 | 5,148 |
| MCEs Interceptor I-SP-215 | 1,933 | 2,244 | 1,742 | 754 | 944 | 725 | 718 | 889 | 1,063 |
| MCEs Interceptor I-SP-217 | 7,682 | 8,122 | 8,159 | 3,104 | 3,410 | 3,476 | 3,359 | 4,111 | 4,882 |
| MCEs Interceptor I-SP-221 | 4,148 | 4,227 | 3,937 | 1,705 | 1,808 | 1,513 | 1,079 | 1,244 | 1,405 |
| MCEs Little Canada Interceptor (I-8151) | 148 | 158 | 171 | 64 | 68 | 71 | 28 | 33 | 39 |
| MCEs North St. Paul Interceptor (I-MW-413) | 68 | 69 | 70 | 17 | 17 | 47 | 300 | 321 | 338 |
| MCEs Oakdale Interceptor (I-WO-501) | 475 | 477 | 481 | 147 | 154 | 308 | 2,291 | 2,241 | 2,157 |
| MCEs Trout Brook Interceptor (I-SP-222) | 372 | 381 | 447 | 262 | 285 | 529 | 450 | 504 | 554 |
| MCEs Woodbury Interceptor (I-MW-410) | 2,193 | 2,212 | 1,833 | 777 | 782 | 785 | 171 | 193 | 214 |
| Little Canada Sewer | 642 | 826 | 960 | 55 | 59 | 89 | 172 | 181 | 189 |
| North St. Paul Sewer | 694 | 1,085 | 1,602 | 159 | 169 | 169 | 76 | 84 | 92 |
| Oakdale Sewer | 86 | 111 | 65 | 5 | 6 | 30 | 353 | 345 | 331 |
| St. Paul Sewer | 2,718 | 2,808 | 2,384 | 1,256 | 1,385 | 1,151 | 253 | 283 | 302 |
| St. Paul Sewer (I-SP-214) | 218 | 233 | 225 | 176 | 214 | 155 | 82 | 112 | 144 |
| Vadnais Heights Sewer | 88 | 108 | 119 | 5 | 5 | 5 | 7 | 7 | 7 |
| Woodbury Sewer | 1,276 | 1,531 | 1,060 | 183 | 199 | 189 | 13 | 15 | 17 |
| TOTALS | 42,206 | 45,600 | 48,607 | 16,998 | 18,902 | 20,312 | 32,702 | 34,801 | 36,519 |

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 14-4**. Flows for 2018 and 2040 listed in **Table 14-5** 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 14-4. 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 | | | |
| 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 14-5. 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 |

| Sewer District | Average Daily Flow | | (Gallons/Day) |
|----------------|--------------------|------------------|------------------|
| | 2018 | 2030 | 2040 |
| 33 (S) | 23,685 | 28,790 | 33,895 |
| 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 |

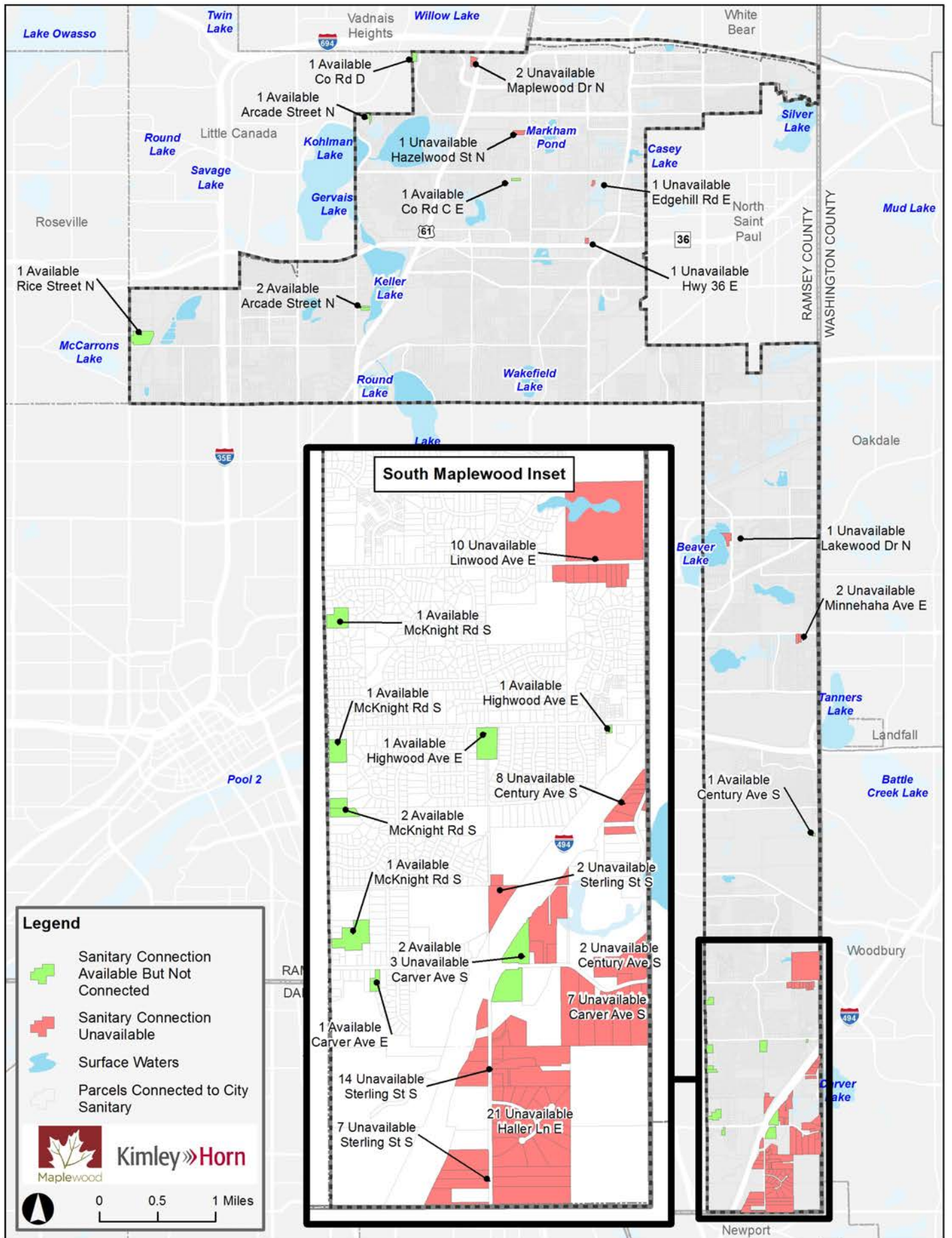
Subsurface Sewage Treatment Systems (SSTS)

There are approximately 100 subsurface sewage treatment systems (SSTS) in the City of Maplewood as of 2018. The City previously had 135 SSTS in 2003, 112 in 2010 and 102 in 2016. The vast-majority of these systems are located south of Linwood Avenue as shown in **Figure 14-2**. 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. **Figure 14-2** identifies which current SSTS locations have a potential connection to the sanitary sewer system available.

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.

There are no public or privately owned Community Wastewater Treatment Systems in operation within the City.

Figure 14-2. Subsurface Sewage Treatment Systems in Maplewood



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.

City code, Division 4 discharges into sewer system, prohibits discharges of certain hazardous and harmful waters, wastes and substances into the sanitary sewer system. The code also prohibits clear water discharges from foundation drains, sump pumps and other clear water drainage sources.

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 an 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. A summary of the recently completed and planned sewer lining projects is provided below. The method used to line pipes is a cured in place pipe (CIPP) liner.

Completed Projects

- » **2014** - 4,109 feet of 8-inch CIPP
- » **2015** - 2,772 feet of 8-inch CIPP
- » **2016** - 5,552 feet of 8-inch CIPP
- » **2017** - 2,809 feet of 8-inch CIPP

Planned Projects

- » **2018** - 2,942 feet of 8-inch CIPP
- » **2019** - 3,405 feet of 8-inch CIPP
- » **2020** - 3,357 feet of 8-inch CIPP
- » **2021** - 3,446 feet of 8-inch CIPP

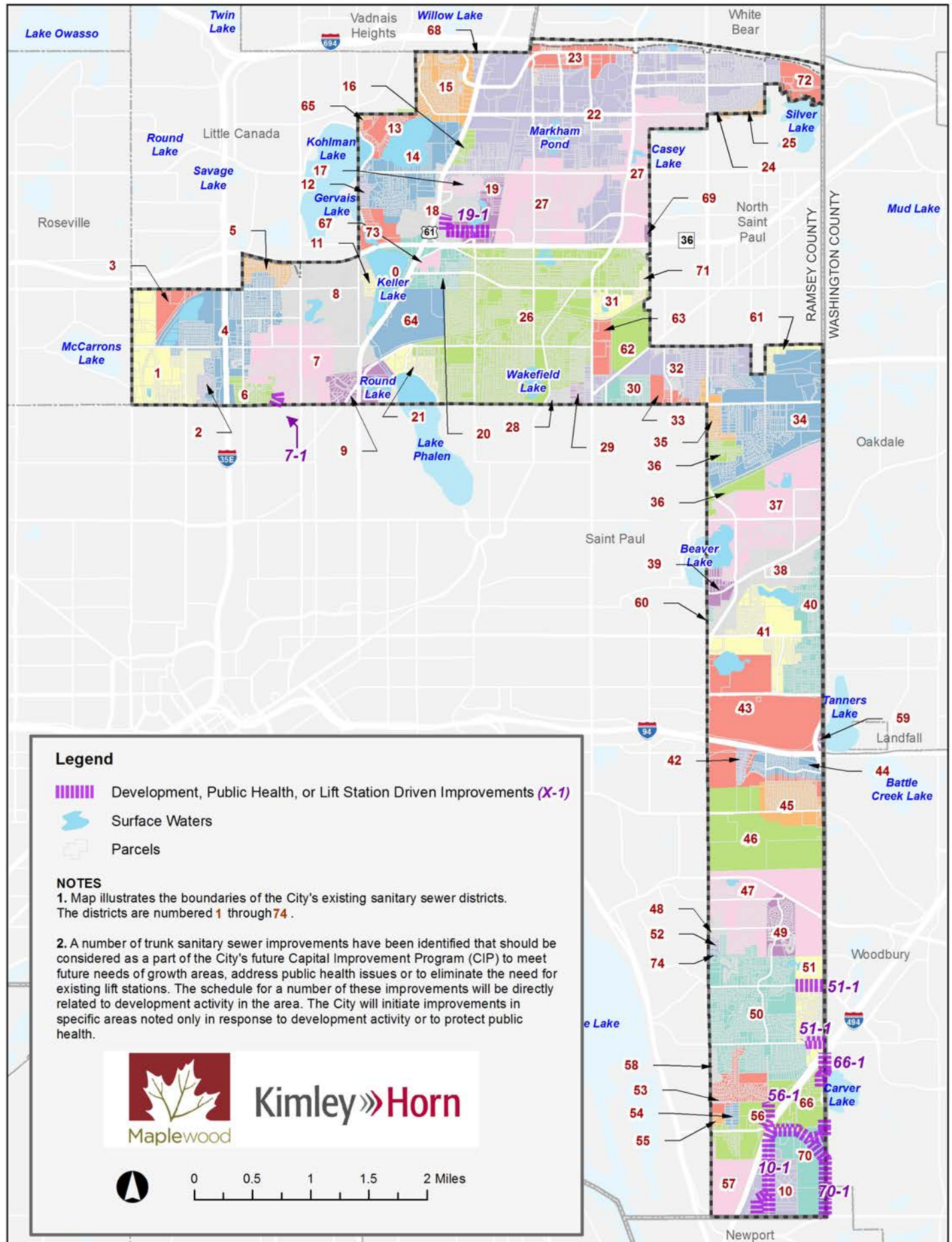
Actions/Capital Improvement Plan

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 14-6** below and the location of these potential improvements is illustrated in **Figure 14-3**. 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 14-6**, 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 14-6. 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 14-3. Capital Improvement Plan



SANITARY SEWER