Sanitary Sewer Master Plan

Hillsboro
OREGON

2024

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Executive Summary

The City of Hillsboro (City or Hillsboro) has a strong commitment to protecting public health, natural resources, and the environment. The health of the city and its local waterways depend on the sanitary sewer system, which collects wastewater from the City's residential, business, and commercial users and conveys it regional wastewater treatment plants, operated and managed by Clean Water Services. The sanitary sewer system was built separate from the stormwater systems.

The 2024 Sanitary Sewer Master Plan (SSMP) is a critical element of the City continuing to provide reliable and effective sanitary services to the community by planning fiscally responsible investments. It is intended to provide guidance for collection system improvements over the next 10–15 years, and inform capital planning and utility rate studies. A summary of the SSMP is provided below. For a more detailed discussion of the information presented in this Executive Summary, please refer to the individual chapters of this SSMP.

ES.1 Introduction

The City's existing wastewater system dates to 1911 and will require repairs and upgrades to provide for significant population growth and maintain resiliency in the face of natural hazards. The City recognized the need to comprehensively understand the system's characteristics in order to prioritize investments and staffing. The City is dealing with a number of challenges related to the sanitary sewer system:

- Aging infrastructure needing to serve a growing community,
- Increasing operations and maintenance needs,
- The need to prioritize capital projects and investments to manage rate increases.

The goals of this planning effort were to identify major capital projects and O&M program needs based on existing available information in order to build a 10-year capital implementation plan. Figure ES-1 summarizes the SSMP planning process.

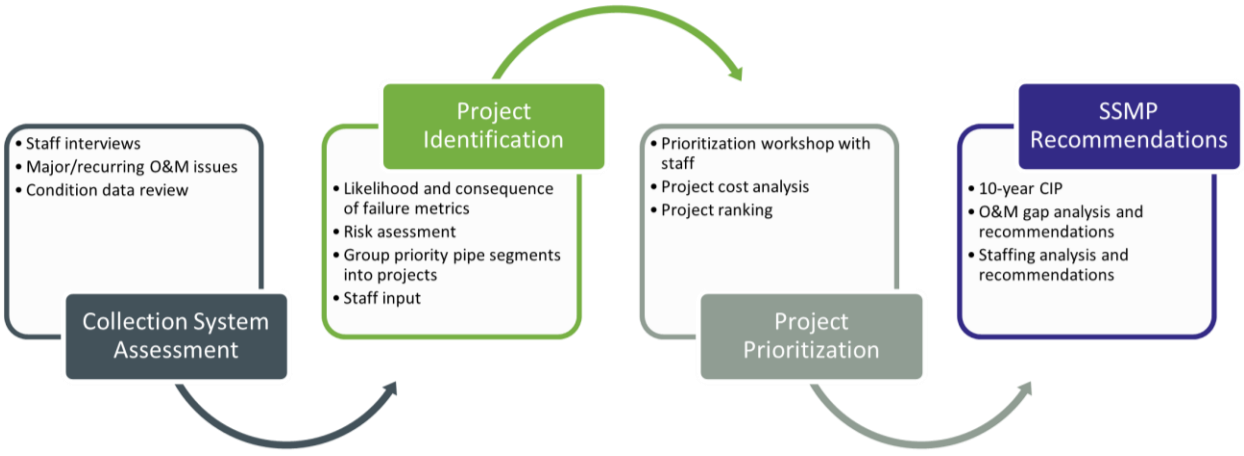

Figure ES-1. SSMP development process

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ES.2 Study Area Characteristics

The City of Hillsboro is located approximately 10 miles west of Portland, Oregon and is known as the "high-tech hub of Oregon". Several major waterways flow through the city and ultimately reach the Tualatin River south of the city. The study area for the SSMP, as defined by the sanitary sewer basin boundaries, encompasses the City-operated portion of the sanitary sewer system, spanning 26 square miles within the city as shown on Figure 2-1. The City has 13 sewer basins defined by gravity and topography (Figure ES-2).

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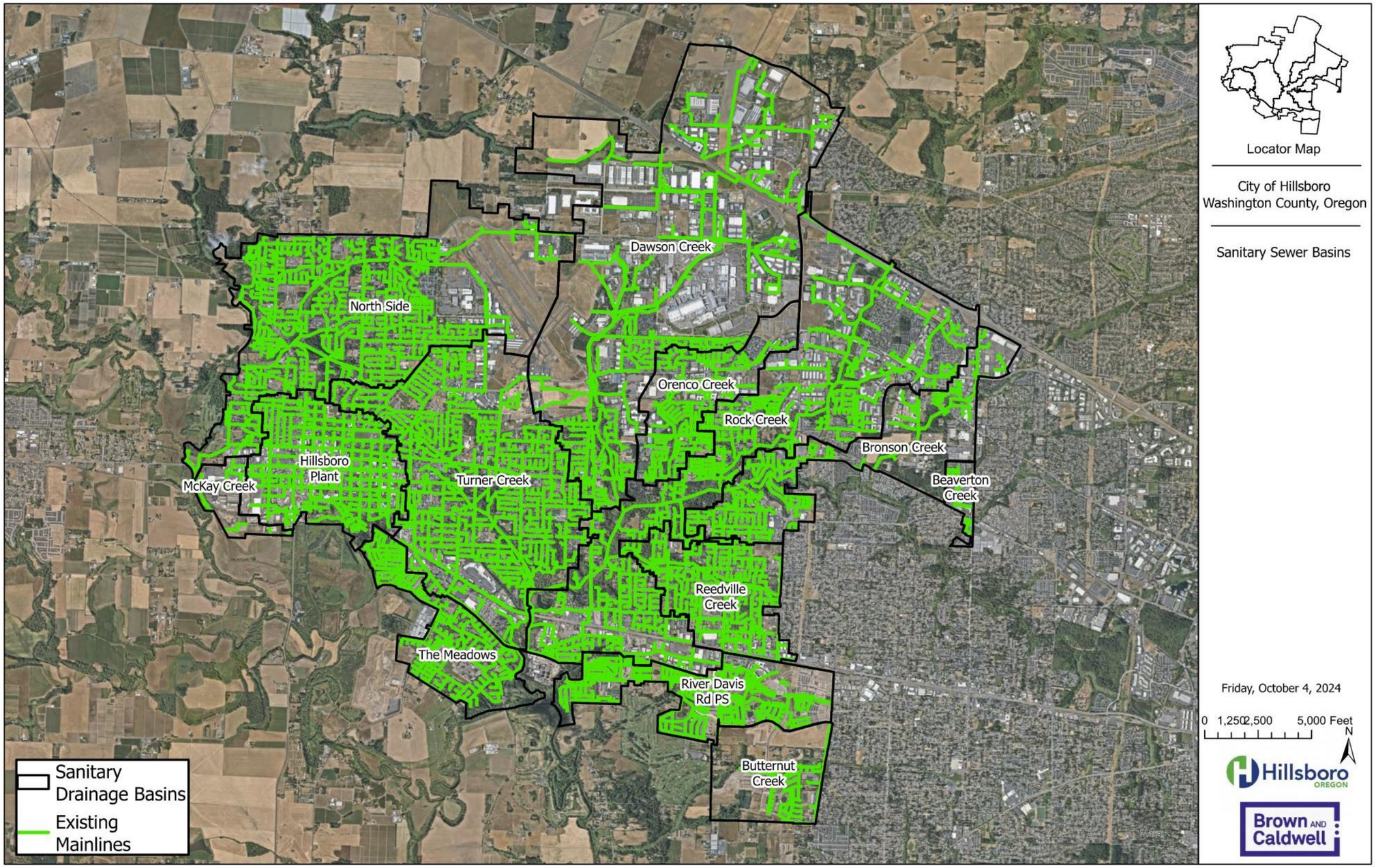

Figure ES-2. Sanitary sewer basins

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As of 2022, the city of Hillsboro has a population of about 110,000[1]. Since 2010, the population has grown by 16 percent. Population growth has been projected to continue for several areas within the city as noted in the Hillsboro Comprehensive Plan (2017).

ES.3 Sanitary Sewer System

The City's sanitary sewer collection system services approximately 110,000 people spread across an area of approximately 26 square miles. The City owns and maintains over 300 miles of gravity pipeline ranging in size from 4 to 24 inches in diameter, and 8,300 manholes. CWS owns and maintains pipelines larger than 24 inches in diameter and all force mains and pump stations.

With portions of the collection system built as early as the 1910s, some of the City's gravity sewer mains are nearing the end of useful life. The pipes constructed prior to 1940, approximately 5 percent of the City's system, are due for rehabilitation or replacement. Though currently within the anticipated useful life, pipes constructed prior to 1950, approximately 7 percent of the system, will be nearing the window for replacement within the next 20-year planning period. The majority of the older pipes are located in the downtown Hillsboro area.

Overall, the City's collection system is relatively young with more than 50 percent of the pipes constructed since 1990. Newer pipe becomes more prevalent as one moves farther away from the downtown area. These pipes will not need replacement for several more decades. Figure ES-3 show the distribution of pipes by year of installation.

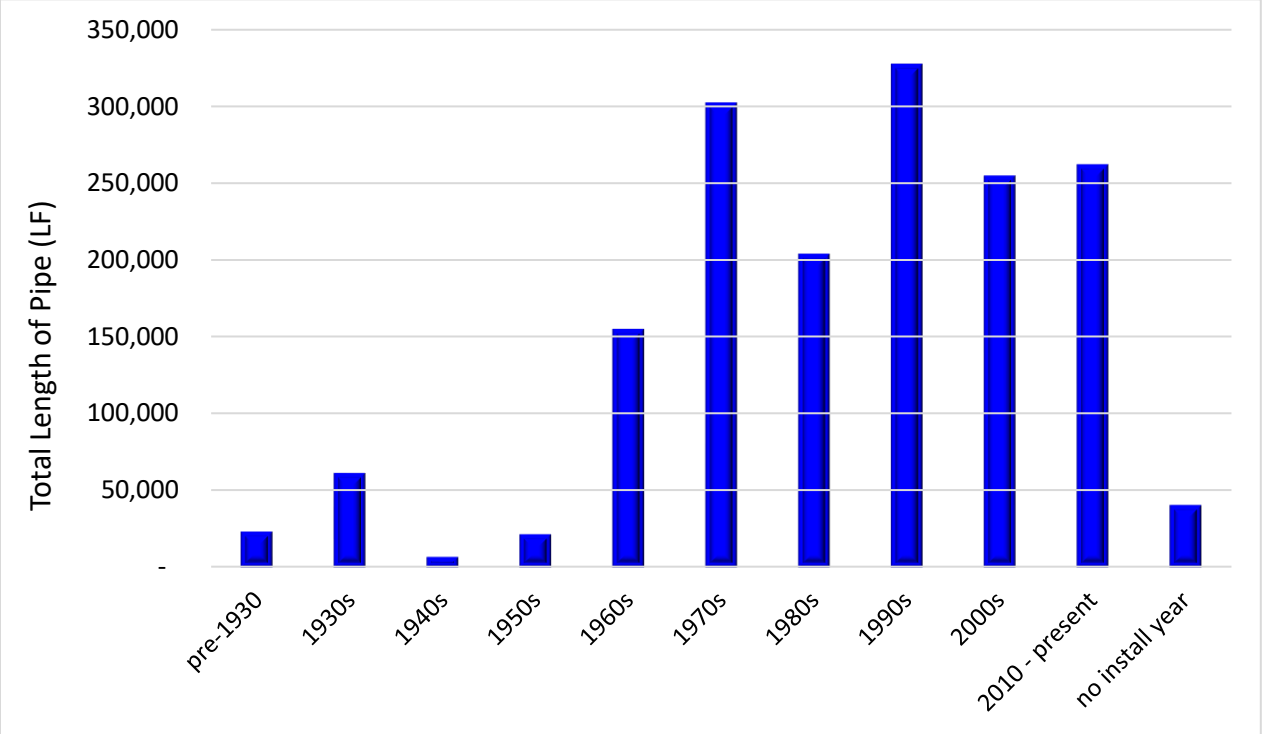

Figure ES-3. Pipe distribution by installation year

[1] City of Hillsboro Data Mosaic, 2022.

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The City has a mix of residential and industrial sources of flows. The quality and quantity of wastewater can significantly vary based on source. Residential wastewater typically has organic matter, some fats, oils, and greases, and substances from household activities. Industrial wastewater may have higher volumes and can contain byproducts from manufacturing processes or other industrial activities that result higher concentrations of pollutants. Industrial wastewater can be more corrosive to pipes than residential wastewater. However, this varies widely depending on the type of industry.

Although not yet served by the sewer system, it is the City's long-term goal to reduce the number of residents on septic systems within the City's service area. The City is working to gather information on the location and number of septic systems in order to prioritize those areas for connection.

ES.4 Capital Planning Process

The City has an immediate need to more comprehensively understand the sewer system's characteristics in order to prioritize investments and staffing for the next budgeting cycle. The capital projects and recommendations developed for this plan are based on existing conditions and known issues in the sanitary sewer system. The capacity analysis currently underway by CWS was not available to the City during preparation of this SSMP. Findings related to the City's capacity needs will be incorporated into future SSMPs as appropriate.

For this SSMP, BC performed a risk-based assessment of existing assets and conducted workshops with City staff to vet the pipeline condition assessment results and incorporate other known system issues. First, BC conducted interviews to establish staff priorities. Trained and certified PACP staff reviewed and assessed the City's geodata and historic inspection PACP scoring data to identify the pipe segments with pipeline defects eligible for rehabilitation or replacement.

An assessment of the risk associated with each pipe segment was used to identify priority pipe segments. These priority pipe segments were grouped based on location to form capital projects. The projects were vetted and prioritized with operations and maintenance staff, culminating in a 10-year CIP developed with the support and collaboration of City staff. Table ES-1 summarizes the prioritization of CIP projects and programs based on the City's prioritization considerations.

Table ES 1. CIP Priority Summary

Priority Ranking	Project Title	Priority Considerations					
		Replacement of aging or failing pipes	Equity: Improves conditions in high vulnerability community [a]	I/I reduction	SSO risk reduction	Protection of sensitive areas	Replacement of concrete pipes with industrial flows
1	Inflow and Infiltration (1911/1936)		✓	✓	✓		
2	Manhole Rehabilitation Program			✓	✓		
3	Turner Creek Feasibility Study	✓		✓	✓	✓	
4	Main Street	✓	✓	✓	✓	✓	
5	NE Harewood Street				✓		
6	TV HWY		✓	✓	✓	✓	
7	Emma Jones	✓				✓	
8	SE Walnut and SE 14th	✓	✓	✓			

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Table ES 1. CIP Priority Summary

Priority Ranking	Project Title	Priority Considerations					
		Replacement of aging or failing pipes	Equity: Improves conditions in high vulnerability community [a]	I/I reduction	SSO risk reduction	Protection of sensitive areas	Replacement of concrete pipes with industrial flows
9	Sunrise Lane				✓		✓
10	NW Garibaldi Street	✓	✓	✓	✓		
11	Arrington Court I/I	✓		✓			
12	NE 25th Avenue	✓		✓			
13	Rock Creek	✓					
14	Lincoln Elementary	✓		✓			
15	Walnut Street		✓		✓		
16	HDPE Weld Bead Removal				✓		
17	Replace Aging Concrete Pipes	✓	✓	✓			
18	Sanitary Sewer Master Plan Update						
19	Seismic Preparation Planning						

a. Determined using the Environmental Justice Screening and Mapping tool developed by the EPA. https://ejscreen.epa.gov/mapper/

ES.5 Sanitary System Operations and Maintenance Programs

The City has a comprehensive sanitary sewer O&M program which includes regular pipeline inspections, routine cleaning, specialty hotspot fats, oil, grease (FOG) cleaning, root removal, warranty inspections, repairs and upgrades, and trouble call response.

BC conducted a "gap analysis" to identify O&M program requirements and develop program updates to meet current and projected level of service expectations. The gap analysis showed the City is currently meeting the frequency and metric-based O&M program requirements and as-needed and on-going O&M program requirements established in the 2008 IGA[2] and 2018 CWS performance standards. However, while the City currently meets these minimum performance standards, it faces significant challenges in doing so related to staffing limitations, use of overtime, and availability of equipment. Staff have also identified additional program needs to meet service expectations.

The gap analysis resulted in recommendations for four new programs including manhole rehabilitation, flow monitoring and sampling, lateral pre/post inspection program, and lateral accuracy program and upgrades to the existing FOG program. By implementing these programs, the City will be able to provide better levels of service to its customers.

[2] Note that because the final 2023 IGA was not available during development of this analysis, the 2008 IGA was used as the basis for evaluating O&M requirements. These requirements were then confirmed once the 2023 IGA was finalized.

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ES.6 Implementation

The capital improvement program (CIP) is detailed in the SSMP, providing a list of improvements to meet identified needs. Table ES-2 provides a summary of the CIP costs by project in order of priority. The projects will be spread out over the next 10–15 years. This CIP will increase the City's annual capital spending from approximately $1M to $5M. CIP project details can be found in the Fact Sheets in Appendix A.

Table ES 2. 10 year CIP Summary

Project No.	Project Title	Total Project Cost [a]
1	Inflow and Infiltration (1911/1936) [a]	$6,721,000
2	Manhole Rehabilitation Program	$1,000,000/biennium ($5,000,000 over 10 years)
3	Turner Creek Feasibility Study	$250,000
4	Main Street	$2,764,000
5	NE Harewood Street	$3,156,000
6	TV HWY	$925,000
7	Emma Jones	$634,000
8	SE Walnut and SE 14th	$2,615,000
9	Sunrise Lane	$12,365,000
10	NW Garibaldi Street	$7,248,000
11	Arrington Court I/I	$11,713,000
12	NE 25th Avenue	$2,172,000
13	Rock Creek	$4,580,000
14	Lincoln Elementary	$973,000
15	Walnut Street	$1,174,000
16	HDPE Weld Bead Removal	$743,000
17	Replace Aging Concrete Pipes	$250,000/ biennium ($1,250,000 over 10 years)
18	Sanitary Sewer Master Plan Update	$350,000
19	Seismic Preparation Planning	$100,000
	TOTAL 10-YEAR CIP COST	**$64,733,000**

Note: Project costs rounded to nearest $1,000.

a. Project is currently in progress. Dollar value shown is for anticipated construction cost prepared and provided by City engineering staff.

BC developed staffing need recommendations to support the SSMP implementation by evaluating current O&M program gaps, new O&M programs, and capital project delivery. The analysis integrated the information from the O&M Gap Analysis (Section 5.2) and CIP prioritization with City compensation plans, data on time it takes to complete activities, and interviews with City staff. The staffing needs evaluation aligns with the 10–15-year planning period of this SSMP.

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The results and assumptions of the staffing evaluation are presented in Appendix C. In summary, the analysis found that the City will need to increase Operations staff to meet LOS and planned capital project delivery over the next 10 years.

The City reviewed these recommendations and developed a hiring plan. Table ES-3 summarizes the planned staffing changes by fiscal year. This staffing plan is phased over time and is based on City positions typically being full or halftime.

Table ES 3. City of Hillsboro Sanitary Sewer Staffing Plan

Planned Hires	FY25	FY26	FY27	FY28
O&M (6 FTE Total)		Senior M&O Techs (1.5 FTE)	Senior M&O Techs (3.0 FTE)	
E&ES (4.5 FTE total)	Engineering Coordinator (1.0 FTE)		Sr. Engineering Tech (1.0 FTE)	Project Manager (1.0 FTE)

The SSMP is comprised of approximately $60M in capital projects and $5M in O&M programs, plus staffing increases to support new O&M programs and CIP project delivery.

The proposed LOS as represented by this SSMP will meet minimum IGA requirements without reliance on overtime, while accounting for system growth, including additional O&M programs, and implement high-priority CIPs over the next 10–15 years. Table ES-4 summarizes current and recommended LOS by service area.

Table ES 4. Current and Recommended Levels of Service

Area	Current LOS	Recommended LOS
O&M	• Reactive system maintenance • Meets minimum requirements for existing system with reliance on overtime and borrowed equipment • Insufficient staffing for system growth	• More proactive maintenance • Meets minimum IGA requirements without reliance on overtime • Addresses anticipated increase of system assets • Implements four new programs and expands FOG program • Augments staff based on identified needs
Capital Project Implementation	• Approximately $800,000 per year • No comprehensive prioritized project list • Capital projects backlog due to staffing limitations	• ~$5M/year in project delivery • Prioritized CIP with project list based on highest needs in system • Sufficient staffing to support 10-year CIP
Benefits	• Meets permit/IGA requirements	• Proactive maintenance to help minimize future issues • Addresses known system needs and deficiencies • Provides sufficient staff resources to minimize need for overtime and borrowing resources • Provides for system growth

The City is currently working with the FCS Group to develop a sanitary sewer system financial plan including an update to the sewer local service fee based on this SSMP. The financial plan will account for the current revenue streams such as rates, connection charges, and capital cash reserves. The plan will also account for potential revenue streams such as system reinvestment funding from rates and revenue bonds to support implementation of the SSMP recommendations.

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