

Council Business Meeting

September 6, 2022

Agenda Item	Comprehensive Sanitary Sewer Collection System Master Plan Adoption	
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SUMMARY

Before the Council is the 2022 Comprehensive Sanitary Sewer Collection System Master Plan prepared by RH2 Engineering. Staff is requesting Council adopt the Comprehensive Sanitary Sewer Collection System Master Plan as the current planning document for the City’s wastewater collection system. The Sanitary Sewer Collection System Master Plan provides a useful planning tool associated with the City’s wastewater collection system through 2042 planning period.

POLICIES, PLANS & GOALS SUPPORTED

City Council Goals:

- Essential Service- Wastewater System
- Address Climate Change
- Continue to leverage resources to develop and/or enhance Value Services

CEAP Goals:

- “Consumption and Materials Management”: Reduce wastewater greenhouse gas emissions.

Department Goals:

- Maintain existing infrastructure to meet regulatory requirements and minimize life-cycle costs
- Deliver timely life cycle capital improvement projects
- Maintain and improve infrastructure that enhances the economic vitality of the community
- Evaluate all city infrastructure regarding planning management and financial resources

PREVIOUS COUNCIL ACTION

Council previously approved a personal services contract with RH2 Engineering to provide a Comprehensive Sanitary Sewer Collection System Master Plan at the February 18, 2020 Business Meeting ([Minutes](#), [Staff Report](#)).

BACKGROUND AND ADDITIONAL INFORMATION

The City of Ashland (City) contracted with RH2 Engineering, Inc., (RH2) in 2020 to prepare an updated Comprehensive Sanitary Sewer Collection System Master Plan (CSSCSMP). The previous plan was prepared in 2012 by Keller Associates. The CSSCSMP includes an evaluation of the sanitary sewer collection system and recommendations for maintenance and capital improvements.

The executive summary provides a brief overview of the CSSCSMP findings and results. The City owns and operates its sanitary sewer collection and treatment system and complies with all regulatory standards for managing a public sanitary system in the state of Oregon. The City’s population is approximately 21,554 (certified estimate from Portland State University Population Research Center as of July 1, 2021). The City provides sanitary sewer services through approximately 8,549 customer connections as of 2020.

The City of Ashland Comprehensive Sanitary Sewer Collection System Master Plan evaluated the City's wastewater collection system and made recommendations for improvements and upgrades throughout the City's facilities. Recommendations were based on the ultimate build out in the City and included near-term and long-term projects as part of the recommended Capital Improvement Program to provide adequate system capacity. Recommendations for improvements also included an operations and maintenance plan. The Comprehensive Sanitary Sewer Collection System Master Plan included the following primary work elements:

1. Basis of Planning
2. Flow Projections
3. Description and Condition of Existing System
4. Collection System Analysis and Prioritization of Future Recommendations
5. System Optimization
6. Capital Project Development Plan
7. Financial Strategy; Rate and System Development Charge (SDC) Update
8. System Operation, Maintenance and Rehabilitation Assessment
9. Policy Recommendations

EXISTING COLLECTION SYSTEM

The collection system consists of approximately 113 miles of gravity sewer mains. The gravity sewer mains are mostly 6-inch or 8-inch diameter and are constructed of various materials. The remaining gravity sewer mains range in size from 4-inch to 24-inch diameter. Most of the gravity mains, where the material is known, are made of concrete. The second most common material for gravity mains is PVC followed by clay. Approximately 35 percent of the gravity sewer mains were installed in 1970 or later and approximately 28 percent were installed before 1970. The oldest known mains in the system are from the early 1900s. Seven lift stations pump and convey wastewater in portions of the collection system where gravity flow is not feasible. The sewer service area is made up of 12 major drainage basins. The entirety of the sewer service laterals, called side sewers, are privately owned starting from the connection to the main. Since the side sewers are not City property, information is largely unknown regarding condition, age and material of the side sewers.

REGULATIONS, POLICIES, AND DESIGN CRITERIA

The Oregon Department of Environmental Quality (DEQ) is the main regulatory agency for the collection system. The City follows all federal, state, and DEQ policies and design criteria and has also adopted its own policies which meet or exceed the requirements of all governing agencies. Chapter 2 of the Master Plan presents the regulations, policies, and design criteria for the collection system. Chapter 2 is a working document that will be updated by City staff as necessary to adapt to the City's needs and goals.

FLOW PROJECTIONS

Data was collected to assess the current flows through the collection system and to develop 20-year flow rates (for year 2042). Five years of WWTP influent flow and rainfall data were initially provided by the City (2014 through 2019) and later 2020 and 2021 to RH2 for flow projection analysis.

In addition to historic data analysis, approximately five months of flow monitoring data was collected by V&A Consulting Engineers (V&A) from November 2020 through March 2021 as part of the CSSCSMP development process. The intent was to identify the average flow and system response to storm events. V&A used eight in-stream flow monitors (4 City-owned and 4 V&A flow monitors) and the City's sanitary sewer supervisory control and data acquisition (SCADA) system to collect data. Rainfall data was also collected within the same timeframe. V&A summarized the data in a report which informs the collection system evaluation in this CSSCSMP. Growth projections from the City's 2019 *Water Master Plan* were used to estimate future sanitary sewer flows. Some adjustments were made such as excluding irrigation usage from the collection system since irrigation water typically does not drain into the sewer.

CONDITION ASSESSMENT

Gravity Sewer Mains and Manholes

The City performs routine inspections of the collection system including video inspection of gravity sewer mains and photographs of manholes. This data was not in a GIS-ready format during the preparation of this CSSCSMP but the City is working towards entering all of the collected data into its Cartegraph Asset Management System in the future. The collection system condition assessment is presented in Chapter 4 of the Master Plan.

Side Sewers

Approximately 50 side sewers were evaluated in this CSSCSMP. City crews performed side sewer video inspections and collected customer surveys in areas of the City identified by RH2 to be potential sources of inflow and infiltration (I/I) based on the age of nearby sewer mains. Many of the side sewers inspected were made of a combination of polyvinyl chloride (PVC) and acrylonitrile butadiene styrene (ABS) and older materials. Several of the side sewers inspected were constructed of Orangeburg pipe. The side sewer condition assessment is presented in Chapter 4 and a summary of the side sewer inspections is in Appendix B.

Lift Stations and Force Mains

RH2 staff visited each of the lift stations (LS) on June 16, 2020 to observe the layout and general condition. Of the seven lift stations, the oldest is Shamrock LS which was built in 1972 and is approximately 50 years old. The other 6 lift stations were constructed or updated within the past 30 years. Creek Drive LS, Shamrock LS, and Kestrel LS all have operation and maintenance (O&M) issues based on discussion with City staff. A summary of the lift station site visit observations is included in Chapter 4 and the field notes are presented in Appendix C.

I/I REDUCTION PLAN

Inflow and infiltration (I/I) are common issues in wastewater collection systems. Inflow is stormwater runoff that flows directly into the collection system. Infiltration is typically groundwater that reaches the collection system through cracks and breaks in pipes and manholes. Analysis of the flow monitoring performed for the CSSCSMP indicated significant I/I in most of the City's collection system drainage basins. The majority of I/I detected appears to be rainfall dependent based on the flow monitoring program and report prepared by V&A (Appendix A). A reduction in I/I will mean less capacity is utilized and could potentially eliminate the need for future capacity related projects. Chapter 5 of the Master Plan presents multiple techniques for identifying sources of I/I, such as in-stream flow monitoring, smoke testing, dye testing, video inspection and analysis, and flow isolations. There are a number of rehabilitation methods that can be implemented to reduce I/I once its source is located. Chapter 5 describes re-routing of stormwater cross-connections as well as sewer main, manhole, and side sewer rehabilitation/replacement. Chapter 5 also presents the results of the I/I evaluation and *prioritizes addressing I/I* in the collection system drainage basins.

Environmental Impacts and Conservation

Recommended maintenance and capital improvement projects should consider the strategies identified by the City's Climate and Energy Action Plan (CEAP), which aims to reduce greenhouse gases (GHG) and promote conservation, during design for incorporation into construction. The design phase for capital improvements and maintenance projects should consider appropriate measures and focus on minimizing embedded GHG within materials required for construction improvements.

SYSTEM CAPACITY EVALUATION

A system capacity evaluation was performed with a hydraulic model of the collection system in SewerGEMS® software using a built-in dynamic wave solver. A hydraulic model was built and updated for this CSSCSMP as described in Appendix D – Model Update and Calibration. System capacity was assessed under existing and future (2042) loading scenarios using the City's criteria presented in Chapter 2.

Eight sewer main capacity related projects (CIP SM-2 through SM-9) and two lift station projects (CIP LS-1 and LS-2) were identified based on the system capacity evaluation.

If I/I reduction is successful, then some of the capacity projects may no longer be necessary. An iterative approach to addressing I/I and system capacity projects is therefore recommended. The system capacity evaluation is presented in Chapter 6 of the Master Plan.

FISCAL IMPACTS

The Comprehensive Sanitary Sewer Collection System Master Plan contract awarded to RH2 Engineering in February of 2020 was for \$298,452 and to date the City has spent a total \$298,452 on the project.

Chapter 8 of the Master Plan presents a financial plan to support completion of the collection system CIP. The financial plan addresses impacts to the City’s wastewater system development charges (SDCs) and impacts on sewer rates paid by existing customers. Chapter 8 also provides potential funding opportunities to finance the CIP. The recommended collection system CIP projects total approximately \$12.74 million to be spent over the next 20 years. The costs are inflated to approximately \$26.35 million to reflect estimated costs at the time of construction.

Projects in the CIP includes I/I evaluation, I/I reduction and gravity collection system improvement, lift station, and miscellaneous projects (such as future planning studies).

Planning level estimates of total project costs were developed and presented in Chapter 7 of the Master Plan. The recommended schedule of improvements is broken down by year for the first ten years (2022 to 2032) and then estimated as a lump sum for the following ten years (2033 to 2042). The CIP schedule proposes expenditures of approximately \$500,000 to \$600,000 annually. The proposed CIP annual schedule is similar to previous years expenditures for the collection system.

A few of the I/I evaluation projects are recommended first to inform the I/I reduction projects which could potentially eliminate the need for some of the developed capacity-related projects. A summary table and map of the proposed CIP projects are presented in Chapter 7 (Table 7-3 and Figure 7-1).

**Table 8-1
Summary of Sanitary Sewer Capital Costs**

Improvement Project	Years			Estimated Total Cost
	0-5	6-10	11-20	
Estimates in Current Dollars				
I&I Evaluation Projects	\$359,000	\$118,000	\$523,000	\$1,000,000
I&I Reduction and Gravity Collection Projects	\$2,600,000	\$1,416,000	\$3,933,000	\$7,949,000
Lift Station Projects	\$0	\$1,400,000	\$1,790,000	\$3,190,000
CSSCSMP Update	\$0	\$0	\$600,000	\$600,000
Total Projects Current Dollars	\$2,959,000	\$2,934,000	\$6,846,000	\$12,739,000
Estimates in Future Inflated Dollars				
I&I Evaluation Projects	\$459,000	\$243,000	\$1,279,000	\$1,981,000
I&I Reduction and Gravity Collection Projects	\$3,683,000	\$2,748,000	\$9,621,000	\$16,052,000
Lift Station Projects	\$0	\$2,471,000	\$4,379,000	\$6,850,000
CSSCSMP Update	\$0	\$0	\$1,468,000	\$1,468,000
Total Projects Inflated Dollars	\$4,142,000	\$5,462,000	\$16,747,000	\$26,351,000

Source: RH2 Engineering and HEC, March 2022.

Financial recommendations include forecasted rate increases as shown below. Recommendations also include pursuing grants and no or low interest loans that can include principal forgiveness, for all wastewater system

improvements to minimize rate impacts on the City’s customer base. The City should also continue to include maintenance of a reserve monies in the wastewater fund that meet policy requirements. Chapter 8 provides full details of the financial analysis and recommendations.

**Table 8-6
Calculated Sewer Rates**

Customer Type	Current Rate	Projected Rates						
		1-Jul-22	1-Jul-23	1-Jul-24	1-Jul-25	1-Jul-26	1-Jul-27	1-Jul-28
		Biennium 1			Biennium 2		Biennium 3	
Residential		0.00%	8.00%	6.00%	4.50%	4.50%	4.00%	4.00%
Monthly Service Charge, per unit	\$33.94	\$33.94	\$36.66	\$38.85	\$40.60	\$42.43	\$44.13	\$45.89
Quantity Charge, per cf	\$0.05064	\$0.05064	\$0.05469	\$0.05797	\$0.06058	\$0.06331	\$0.06584	\$0.06847
Commercial, Industrial, Governmental								
Monthly Service Charge	\$35.41	\$35.41	\$38.24	\$40.54	\$42.36	\$44.27	\$46.04	\$47.88
Quantity Charge, per cf	\$0.05621	\$0.05621	\$0.06071	\$0.06435	\$0.06724	\$0.07027	\$0.07308	\$0.07601
Greenhouses, Churches, Schools (K-12) operating 9 months/yr								
Monthly Service Charge	\$35.41	\$35.41	\$38.24	\$40.54	\$42.36	\$44.27	\$46.04	\$47.88
Quantity Charge, per cf	\$0.05621	\$0.05621	\$0.06071	\$0.06435	\$0.06724	\$0.07027	\$0.07308	\$0.07601
Bed & Breakfasts & Ashland Parks Bathrooms								
Monthly Service Charge	\$35.41	\$35.41	\$38.24	\$40.54	\$42.36	\$44.27	\$46.04	\$47.88
Quantity Charge, per cf	\$0.05621	\$0.05621	\$0.06071	\$0.06435	\$0.06724	\$0.07027	\$0.07308	\$0.07601

Source: City of Ashland and HEC 2021 rates analysis.

[1] avg. winter water use >400 cf.

STAFF RECOMMENDATION

Staff recommends adoption of the Comprehensive Sanitary Sewer Collection System Master Plan

ACTIONS, OPTIONS & POTENTIAL MOTIONS

I move to adopt the Comprehensive Sanitary Sewer Collection System Master Plan as the current planning document.

REFERENCES & ATTACHMENTS

Attachment #1: [Comprehensive Sanitary Sewer Collection System Master plan](#) (Link)