



Utility Board Agenda

For Meeting of January 16, 2018
7:00 PM to 9:00 PM
City Council Chambers, City Hall

Board Members:

Kwan Wong, Chairman, Tim O'Connell, Vice Chairman, Tom DeBoer, Mary Grady, Stephen Milton, William Pokorny and Brian Thomas

Council Liaison:

Council Member David Wisenteiner

Staff:

Jason Kintner, Public Works Director

Chip Corder, Finance Director

Francie Lake, Deputy Finance Director

Patrick Yamashita, City Engineer

Anne Tonella-Howe, Assistant City Engineer

Brian McDaniel, Utilities Operations Manager

Asea Sandine, Recording Secretary

Agenda topics

7:00 PM

Approve Minutes of November 14, 2017

All

General Sewer Plan Update

Anne Tonella-Howe

Work Plan

All

Transmitted via Email:

Agenda

Meeting Minutes

Work Plan

Next Meeting:

February 13, 2018



UTILITY BOARD REGULAR MEETING MINUTES NOVEMBER 14, 2017

CALL TO ORDER:

Chairman Kwan Wong called the regular meeting of the Utility Board to order at 7:03 p.m. in the Council Chambers Room at City Hall, 9611 SE 36th Street, Mercer Island, WA.

ROLL CALL:

Chair Kwan Wong, Vice Chair Tim O'Connell, Mary Grady, Stephen Milton, Tom DeBoer, William Pokorny, were present. Council Member Dave Wisenteiner was absent

City Staff: Jason Kintner, Public Works Director, Asea Sandine, Recording Secretary were present.

REGULAR BUSINESS:

Motion: Board Member DeBoer moved to approve the minutes from the October 10, 2017 meeting. Board Member Milton seconded the motion. The Board unanimously approved the minutes.

Enterprise Asset Management (EAM) IMPLEMENTATION UPDATE

Kintner reviewed and highlighted the department's planned and unplanned projects for 2017. He stated the department continues to work towards EAM project implementation. The EAM is scheduled to go live in the first quarter or early second quarter of 2018. He shared that currently staff are reviewing workflows, standardizing work, and implementing business processes. He advised the next steps that will include: technical configuration, user testing, and performance metrics. Kintner also presented other projects scheduled for 2018 such as: closing out the Water Advisory Action Plan, completing the SCADA master plan, finalizing the General Sewer Plan, completing Lakeline Access feasibility, Sewer Pump Station access evaluation and the Glennhome water main replacement project.

OPEN PUBLIC MEETINGS ACT

The Board reviewed the 16-minute video and signatures were obtained.

2018 DRAFT WORK PLAN

Kintner outlined the proposed 2018 Draft Work Plan with the Board. In addition to the scheduled topics, there was Board consensus to add a work plan item regarding rate methodology. Kintner also shared that the General fund discussion with the Citizen Advisory Group (CAG) is set to kick off in January 2018. He concluded by sharing that there are proposed changes to the King County Solid Waste Plan and that he would update the Board as information becomes available.

ADJOURNMENT: 8:23 PM

Asea Sandine
Recording Secretary



Memorandum

CITY OF MERCER ISLAND, PUBLIC WORKS DEPARTMENT

9611 S.E. 36th St. • Mercer Island, WA 98040-3732

(206) 275-7608 • FAX: (206) 275-7814

www.mercergov.org

To: Utility Board

Date: January 16, 2018

From: Anne Tonella-Howe, Assistant City Engineer
Lara Kammereck, Carollo Engineers
Dan Reisinger, Carollo Engineers

Re: General Sewer Plan Update

At the March 14, 2017 Utility Board meeting, the project team, comprised of City staff and Carollo Engineers, presented an update to the General Sewer Plan (Plan). The update included general information on the progress of the Plan, including highlights of each chapter completed to date. At that time, updates to the Capital Improvement Program (CIP) and the Finance chapters were not available for discussion as they were still being drafted.

At the January 16, 2018 Utility Board meeting, the project team will present the drafted chapters pertaining to the Capital Improvement Program (CIP) and the Financial Program.

Background

In accordance with WAC 173-240, governmental agencies (Cities) providing sewer service are required to have a general sewer plan with information sufficient to demonstrate the ability to provide service consistent with the requirements of the State. Updates to these plans are necessary when conditions within the City have changed.

The current General Sewer Plan was completed in 2003. Since that time, the City has experienced growth through redevelopment in the Town Center and the City has completed a significant undertaking in the replacement of Reach 4 of the Lake Line sewer (completed in 2011), including installation of a new pump station (Pump Station 4).

In late 2015, an update to the General Sewer Plan began. The City hired Carollo Engineers, an engineering firm specializing in water and wastewater services, to assist staff with the update to our plan.

At the March 14th Utility Board meeting and the April 3rd City Council meeting, the project team presented the chapters completed to date: Existing System, Policies & Criteria, Capacity, Operations & Maintenance (O&M) and Repair & Replacement (R&R). Copies of the Utility Board presentation and City Council Agenda Bill 5276 are attached.

Capital Improvement Program & Financial Chapters

These two chapters provide framework and will help guide our financial policies around future capital reinvestment in the sewer utility. The capital improvement program chapter was prepared to be adaptive over a 20-year planning horizon; it has been developed to be flexible and malleable as conditions change and new information is available. The financial chapter summarizes the financial strength of the utility and provides funding strategy to support the recommended capital reinvestment. This work will be used to develop the sewer utility's capital budget, which is updated and adopted every two years.

Next Steps

Following the January 16th Utility Board meeting, staff will incorporate feedback and comments received and will present the Capital Improvement Program and the Financial Program chapters to the City Council (scheduled for February 6, 2018). Following the presentation to Council, the draft Plan will then be submitted for State Environmental Policy Act (SEPA) review and will be available on the City's website for public review and comment. It is anticipated the public comment period will be open for 30 days. Once comments have been received and incorporated, the final draft Plan will be submitted to Department of Ecology for their review and approval. Upon receiving approval from the Department of Ecology, the Plan will return to Council for adoption (expected in 2018).

City of Mercer Island General Sewer Plan Update

Utility Board
March 14, 2017



carollo
Engineers...Working Wonders With Water®

Agenda

- System Background
- Policies and Criteria Review
- Capacity Improvements
- Operation and Maintenance (O&M) Recommendations
- Repair and Replacement (R&R) Projects
- Next Steps

General Sewer Plan documents the City's Vision for the Future

- What
- When
- Where



What is in a General Sewer Plan?

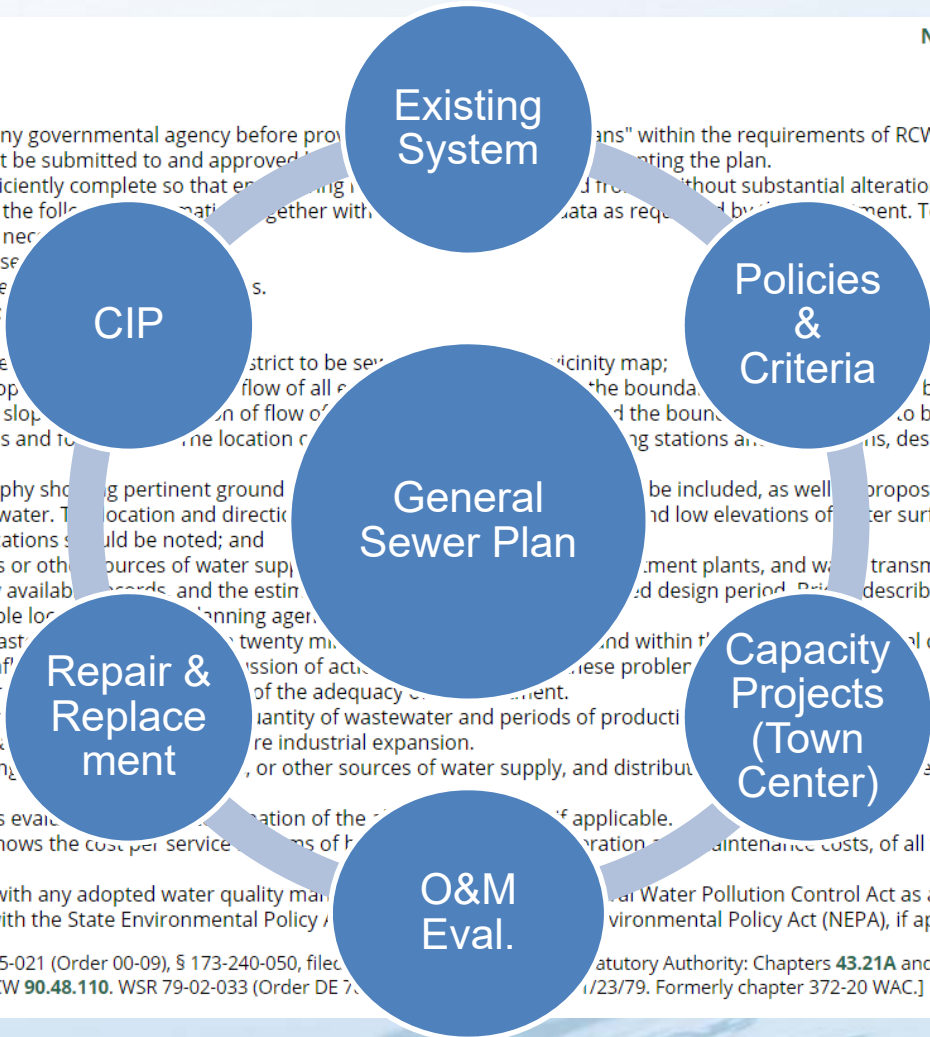
WAC 173-240-050

No agency filings affecting this section since 2003

General sewer plan.

- (1) All general sewer plans required of any governmental agency before proposing a general sewer plan and each amendment to it must be submitted to and approved by the Department of Ecology within the requirements of RCW 90.48.110. Three copies of the proposed general sewer plan must be submitted to the Department of Ecology, one copy to the local government, and one copy to the Department of Ecology. The plan must be submitted to the Department of Ecology without substantial alterations of concept and basic considerations.
- (2) The general sewer plan must be sufficiently complete so that engineering and construction can proceed without substantial alterations of concept and basic considerations.
- (3) The general sewer plan shall include the following information, together with any other information that the local government may require. To satisfy the requirements of the local government, additional information may be necessary. The general sewer plan shall include the following information:
- (a) The purpose and need for the proposed sewer system.
 - (b) A discussion of who will own, operate, and maintain the sewer system.
 - (c) The existing and proposed service boundaries.
 - (d) Layout map including the following:
 - (i) Boundaries. The boundary lines of the sewer service district to be served by the sewer system; a vicinity map; and the boundaries of the sewer service district to be served by each;
 - (ii) Existing sewers. The location, size, slope, and flow of all existing sewers within the boundaries of the sewer service district to be served by each;
 - (iii) Proposed sewers. The location, size, slope, and flow of all proposed sewers within the boundaries of the sewer service district to be served by each;
 - (iv) Existing and proposed pump stations and treatment plants. The location, size, and capacity of existing and proposed pump stations and treatment plants, designated to distinguish between those existing and proposed;
 - (v) Topography and elevations. Topography showing pertinent ground elevations, as well as proposed and existing streets; and low elevations of water surfaces at sewer outlets, and controlled overflows, if any. All existing and potential discharge locations should be noted; and
 - (vi) Streams, lakes, and other bodies of water. The location and direction of flow of all streams, lakes, and other bodies of water within the sewer service district to be served by each;
 - (vii) Water systems. The location of wells or other sources of water supply, treatment plants, and water transmission facilities.
 - (e) The population trend as indicated by available records, and the estimated population for the design period. Describe the method used to determine future population trends and the concurrence of any applicable local government planning agency.
 - (f) Any existing domestic or industrial wastewater treatment plants and within the sewer service district to be served by each.
 - (g) A discussion of any infiltration and inflow problems, and the proposed solutions.
 - (h) A statement regarding provisions for future industrial expansion.
 - (i) List of all establishments producing industrial wastewater and periods of production, and the quantity of wastewater and periods of production. Consider the industrial wastewater insofar as it may affect the sewer system or treatment plant. Consider the industrial expansion.
 - (j) Discussion of the location of all existing and proposed domestic wastewater treatment facilities, or other sources of water supply, and distribution systems.
 - (k) Discussion of the various alternatives evaluated, and the selection of the preferred alternative, if applicable.
 - (l) A discussion, including a table, that shows the cost per service connection, operation and maintenance costs, of all facilities (existing and proposed) during the planning period.
 - (m) A statement regarding compliance with any adopted water quality management plan, or other applicable regulatory requirements, including the Clean Water Act as amended.
 - (n) A statement regarding compliance with the State Environmental Policy Act, or other applicable regulatory requirements, including the National Environmental Policy Act (NEPA), if applicable.

[Statutory Authority: RCW 90.48.110. WSR 00-15-021 (Order 00-09), § 173-240-050, filed 11/16/83. Statutory Authority: RCW 90.48.110. WSR 79-02-033 (Order DE 79-02-033), filed 11/23/79. Formerly chapter 372-20 WAC.]



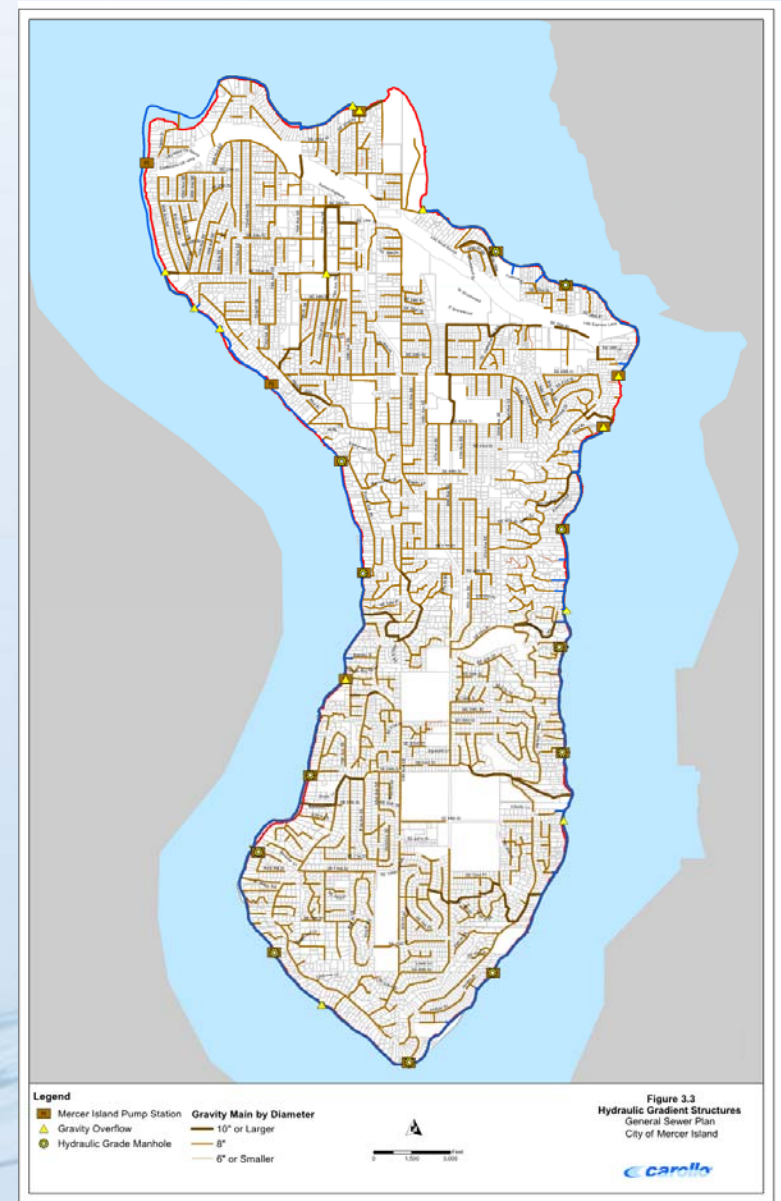
- Minimum Requirements set by Department of Ecology in WAC Chapter 173-240-050

Agenda

- **System Background**
- Policies and Criteria Review
- Capacity Improvements
- Operation and Maintenance (O&M) Recommendations
- Repair and Replacement (R&R) Projects
- Next Steps

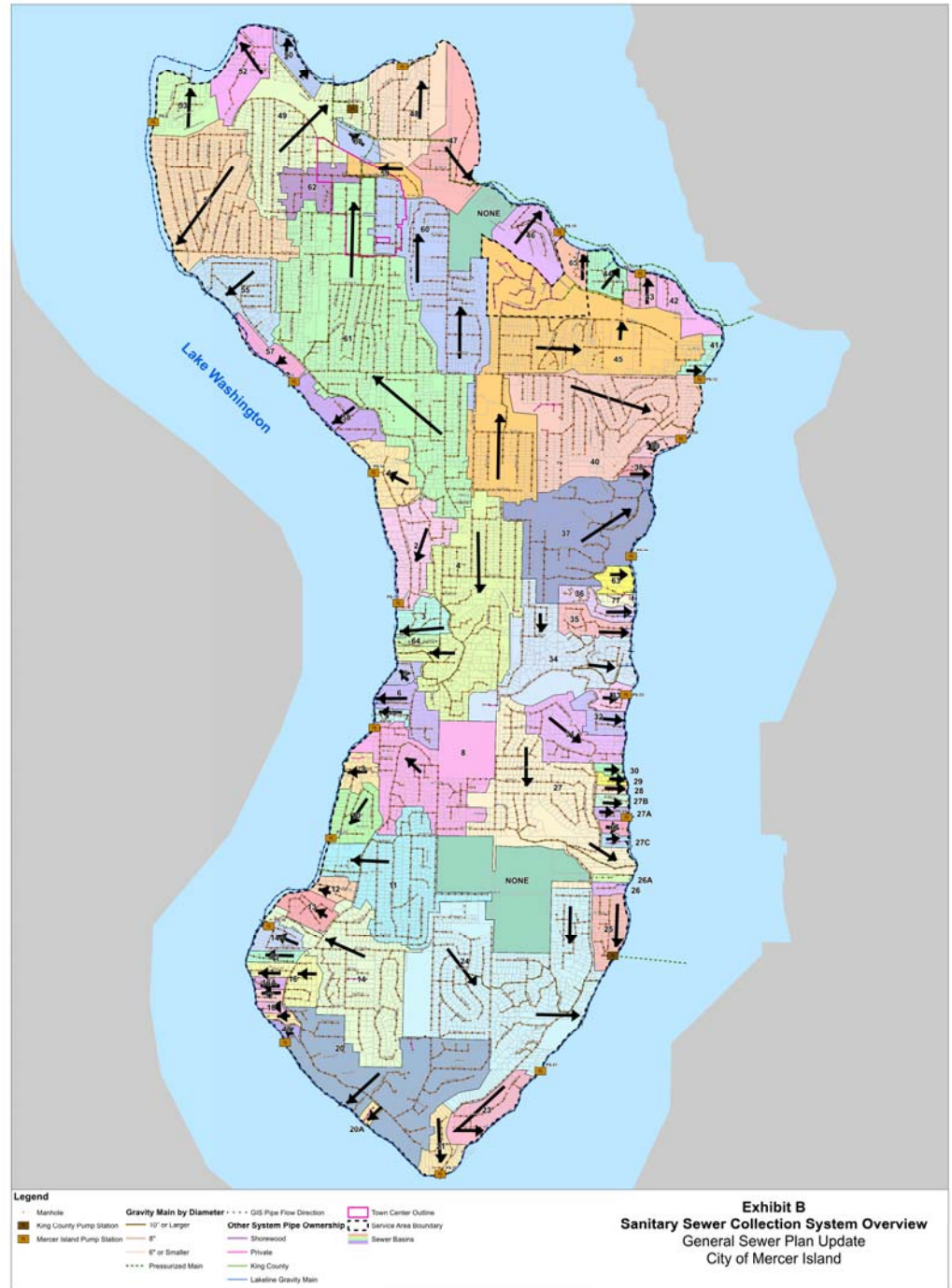
Substantial Sewer System delivers a high level of service

- Serves City except Shorewood Collection System
- 115 miles of collection system
- 2,446 manholes
- 17 Pump Stations
- 16.7 miles of Lakeline
- Discharged to King County for treatment



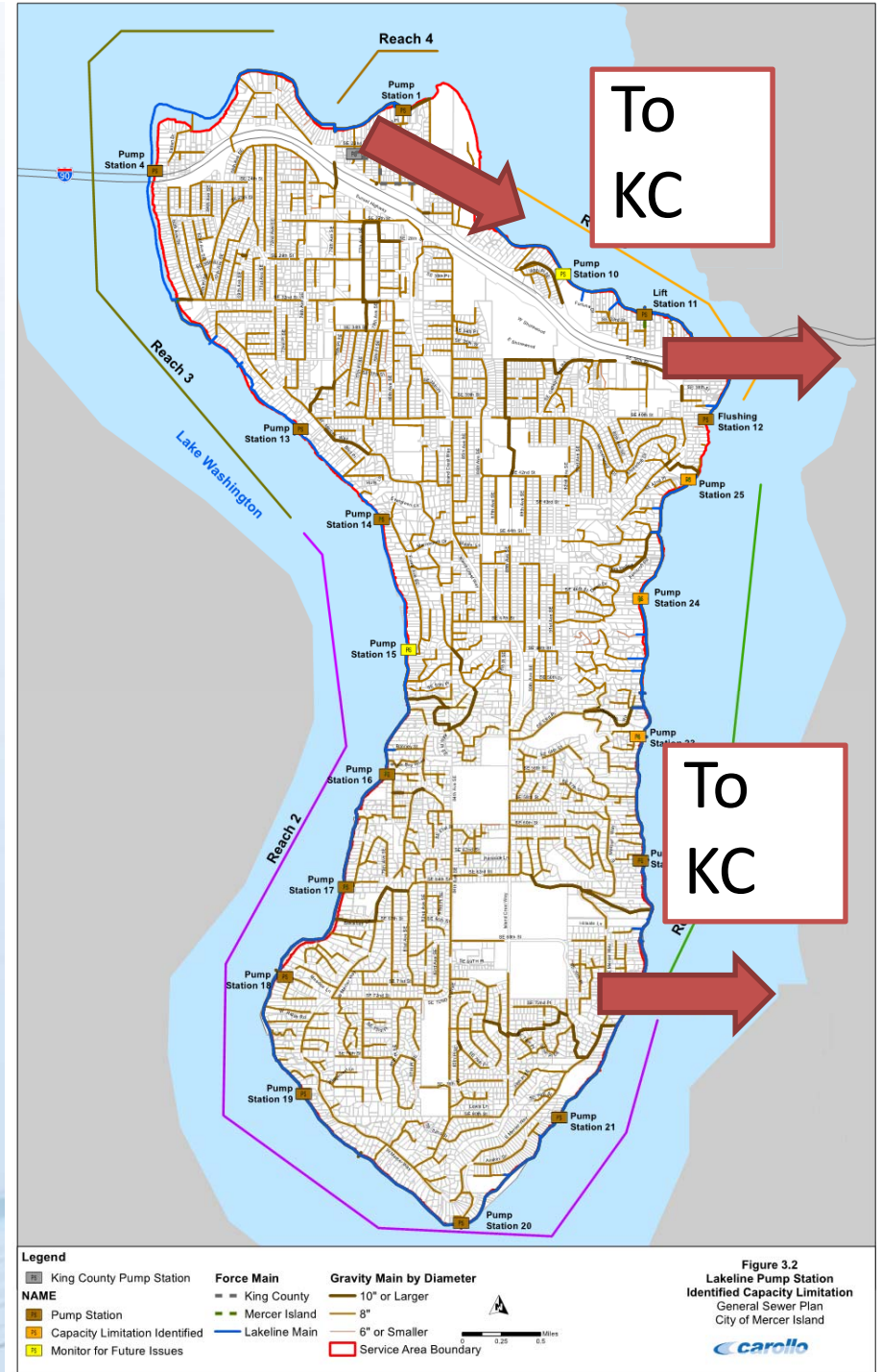
City Flow enters the Lakeline at many connection points

CarolloTemplateWaterWave.pptx



Most flows are collected in the Lakeline

- The Lakeline is located in Lake Washington.
- Flow enters the Lakeline at many connection points
- A series of pump stations moves water through the Lakeline to KC WTD facilities.



Agenda

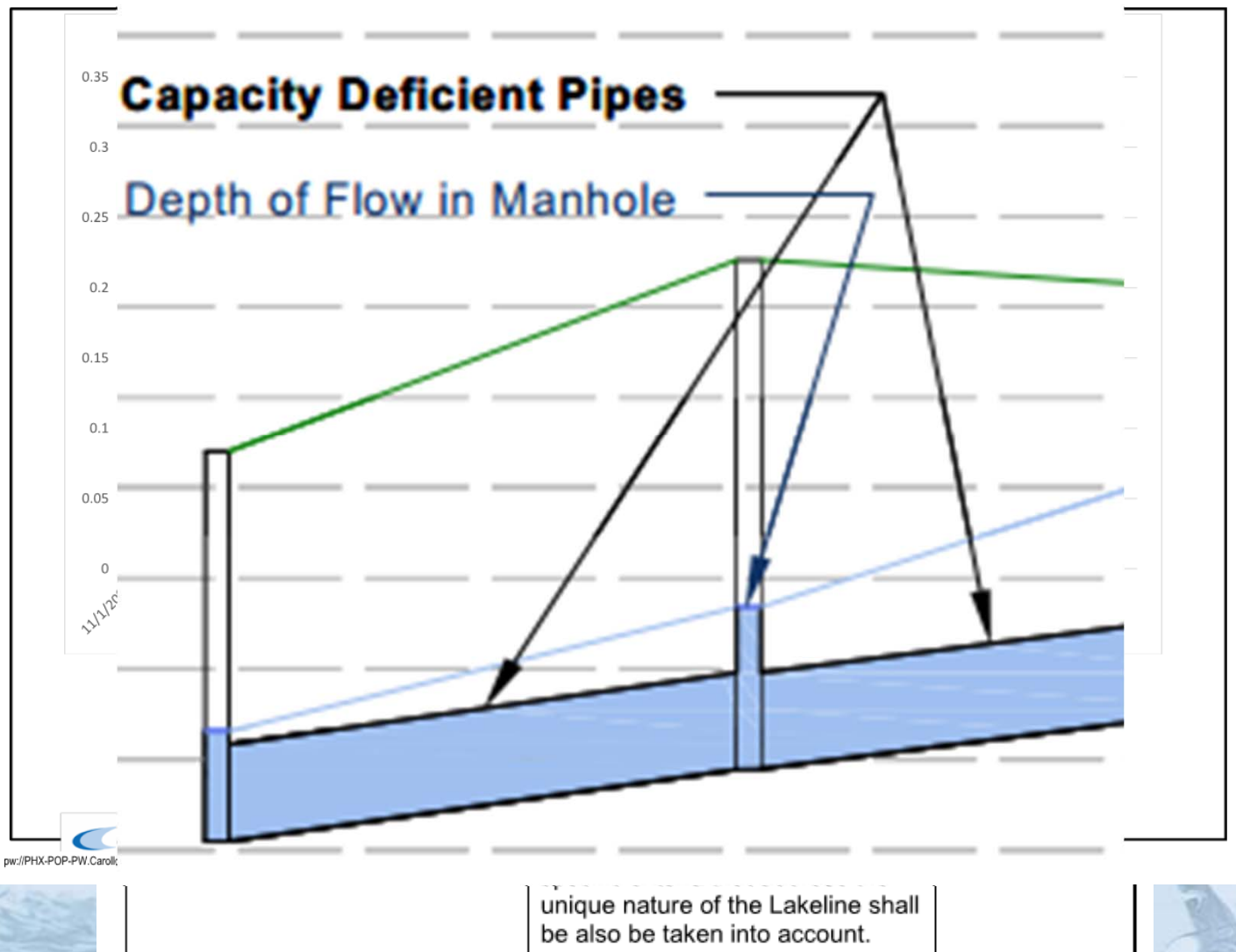
- System Background
- **Policies and Criteria Review**
- Capacity Improvements
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Assembled and summarized key policies and criteria in one place

- Considered multiple sources:
 - Mercer Island Code (MICC)
 - Comprehensive Plan Policies
 - State Agency Guidance

Table 2.2 General Service Policies General Sewer Plan City of Mercer Island		
Policy Type	Policy	Source
Service Statement	The city of Mercer island desires to protect, promote and preserve the public health, safety and welfare of its citizens	MICC 15.06.010
Ownership	City Ownership of Sewer Facilities. The sewer system is owned and operated by the city, except to the extent that private ownership is otherwise indicated as a matter of record. Such public facilities typically include mains, pump stations, or manholes.	MICC 15.06.050.A
Required Connections	All structures which contain facilities for the disposal of sewage shall be connected to the public sewer system (Ord. 14C-03 § 2).	MICC 15.06.060
Septic Tanks	The City shall require that all new development be connected to the sewer system.	Com Plan 3.1
Septic Tanks	Existing single-family homes with septic systems shall be allowed to continue using these systems so long as there are no health or environmental problems. If health or environmental problems occur with these systems, the homeowners shall be required to connect to the public sewer system.	Com Plan 3.2

Proposed new technical criteria for serving existing and new customers



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Slide 12

AT10 in an attempt to shorten the presentation maybe get rid of the Town Center Growth needs.

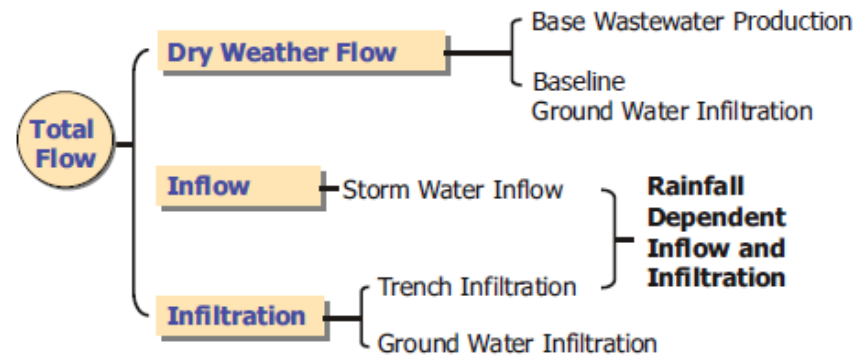
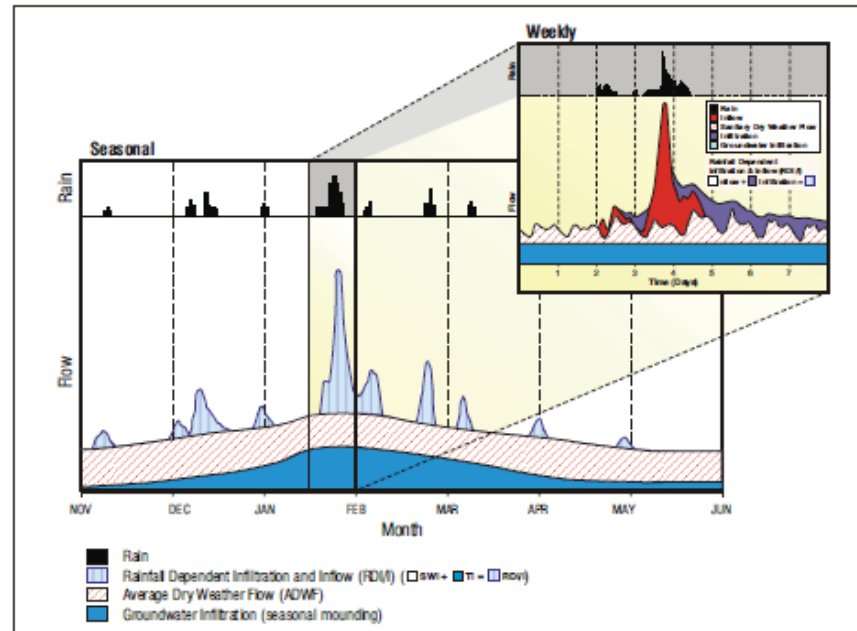
Anne Tonella-Howe, 3/13/2017

AT11 Still use the slides 15, 17 and 19 that talk about I/I and delete slides 13, 14 and 16 that talk about TC

Anne Tonella-Howe, 3/13/2017

Typical Wastewater Flow Components

- **Dry Weather Flow** = Baseline condition
- **Wet Weather Flow** = Inflow and Infiltration (=increase in flow during a rainfall event)



Note: This figure is not based on flow data specific to the City or this Master Plan

Inflow and Infiltration assumed to increase as the system ages

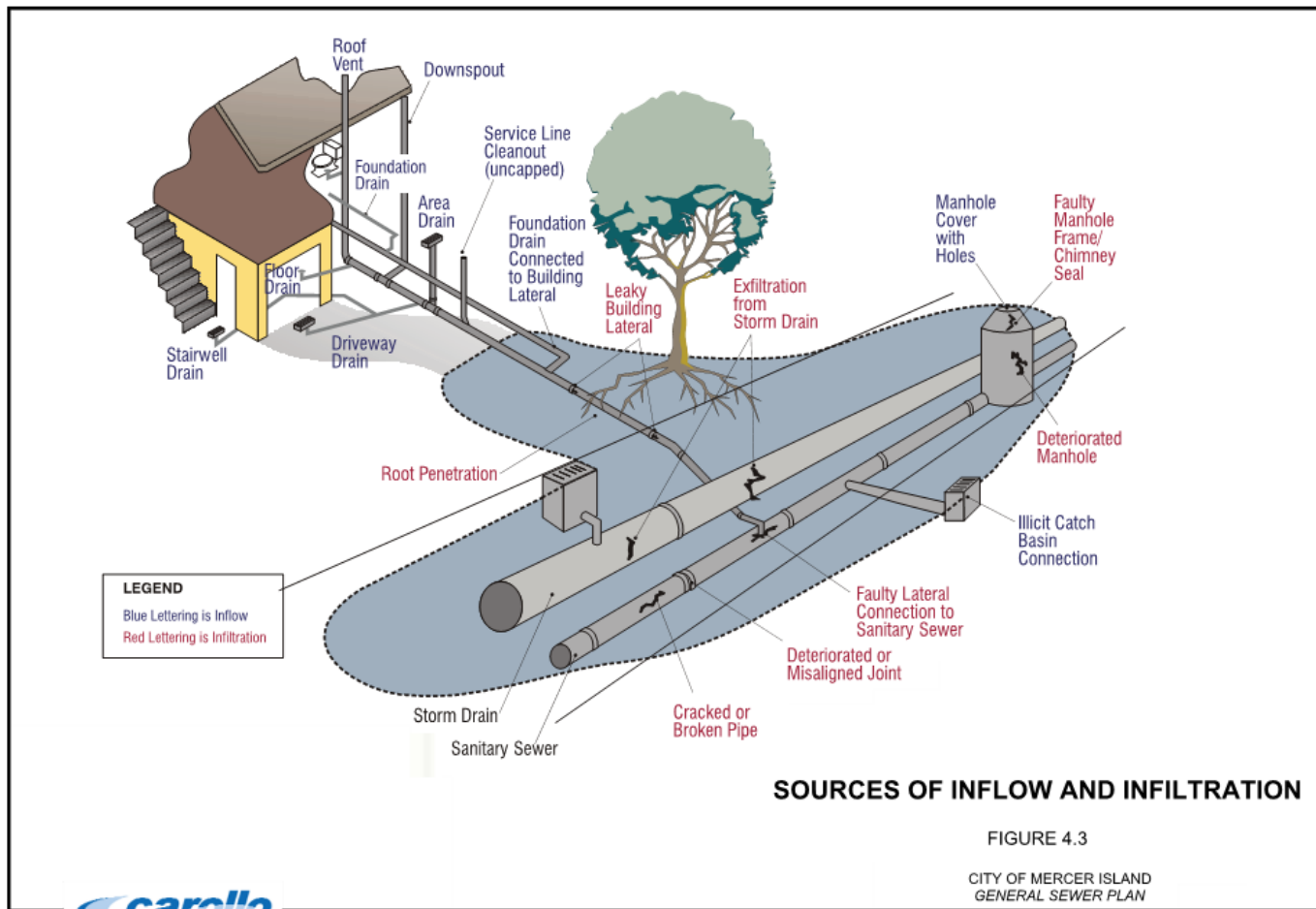


FIGURE 4.3

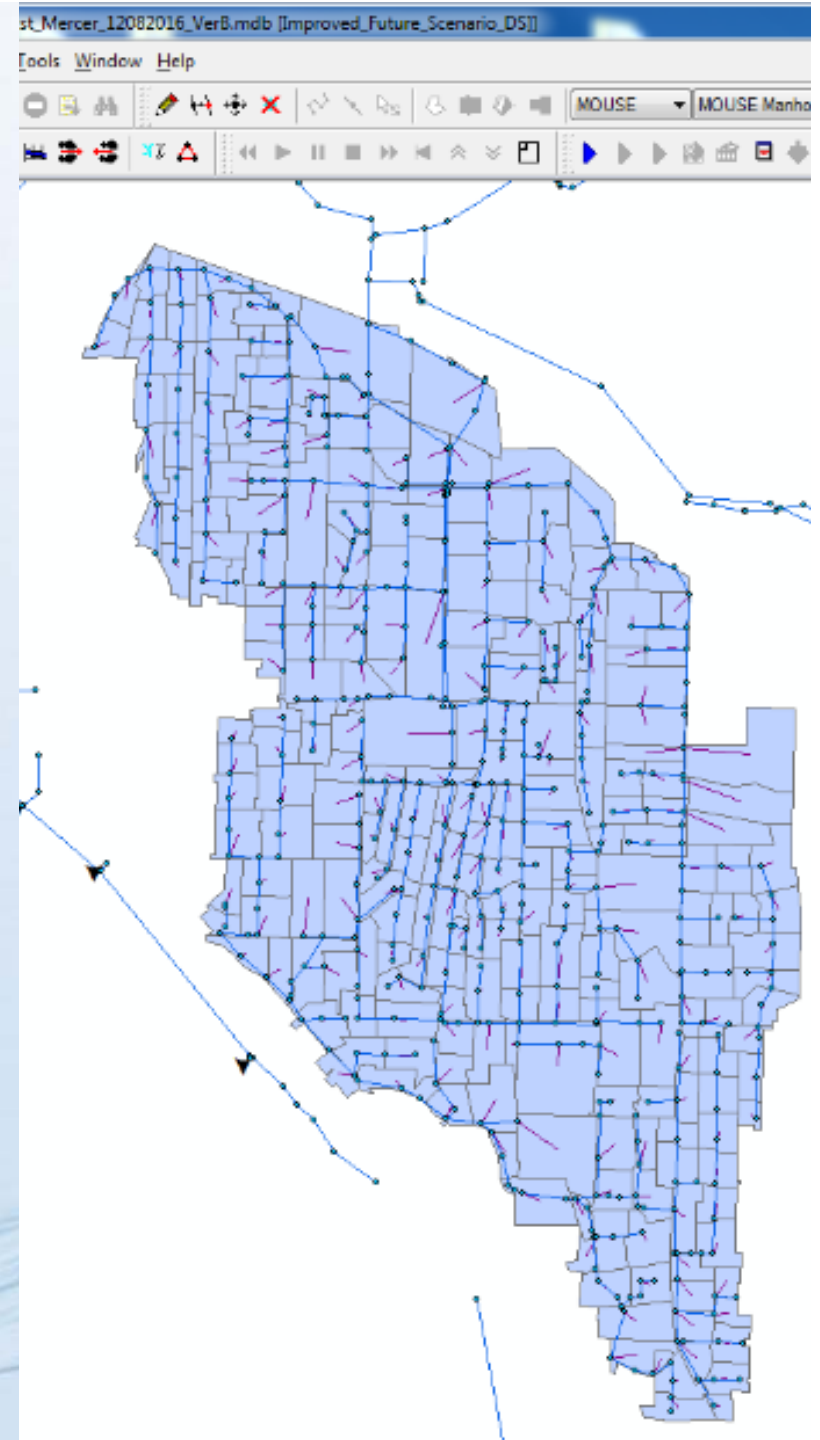
CITY OF MERCER ISLAND
GENERAL SEWER PLAN



pw://Carollo/Documents/Client/WA/Mercer Island/9925A00/Deliverables/_Figure_4.03.pdf

Hydraulic Model used to evaluate capacity of sewer system

- Based on build-out (future) zoning
- Simulates flows from a large “design” storm
 - Actual storm in November 2001



Proposed Improvements to reduce potential issues in large storms



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Summarized what and how often O&M activities should be performed

- Identified criteria for performing activities.
- Established goals to provide a high level of service.
- Define activity frequency.

Activity	Criteria	Goal	Activity Frequency	Comments
Collection System O&M				
Jet Cleaning	Routinely clean sewer system. Clean known problem areas more frequently to back-up.	Clean Island-wide every 5 years. <i>Clean problem areas</i>	Continuous	Primarily in-house work; some contracted work as needed.
Root Control	Perform as-			
Grease Removal	Perform rou cleaning act as-needed i problem are	Manhole repairs	Perform as-need to confirm condition of MH, repair functional integrity of MH.	Inspect routinely with cleaning/CCTV activity. Repair as-needed when
CCTV inspection	Routinely cc confirm con pipes, suspi blockages, l other issues			Periodic
Smoke Testing	Perform as-areas where problems			Predominantly contracted work. Minor repairs by Citv.
Sewer repairs	Perform as-			

Activity	Criteria	Goal	Activity Frequency	Comments
Manhole repairs	Perform as-need to confirm condition of MH, repair functional integrity of MH.	Inspect routinely with cleaning/CCTV activity. Repair as-needed when	Periodic	Predominantly contracted work. Minor repairs by Citv.

Activity	Criteria	Goal	Activity Frequency	Comments
Easement & Right-of-Way access maintenance	Maintain well defined access to pump stations through written/recorded agreement with property owners. Routinely clean at station sites depe on location and n	Well defined access or easement agreements. Annual maintenance including vegetation	Annual	Reference Easements/Access for Pump Station Rehabilitation Project

Pump station inspection	Proper functioni pumps and back power			
Pump station cleaning and maintenance	Cleanstation and well and perform preventative rep replacement			
Telemetry maintenance	Routine calibrati including alarm verification. Con needed system i to replace outda hardware/softwa			
Odor Control facility maintenance	Routinely mainte control/reduce o complaints			

Activity	Criteria	Goal	Activity Frequency	Comments
Administrative Tasks				
Administrative duties and staff meetings		Weekly team staff meetings; every other month department safety meetings; every other month all-department staff meetings	Continuous	
Tool and equipment cleaning/ maintenance	Perform preventative maintenance to ensure compliance with safety standards	Jet truck preventative maintenance once per year and cleaned after each use; confined space entry equipment	Continuous	

City is taking a Programmatic approach to implementing O&M and R&R efforts

- Annual programs are cost-effective and allow the City to continue a high level of service
 - Reduces costly emergency repairs
 - Matches effort with resources
 - Improves over time with experience

Asset Management Program (EAMS) is being implemented

- Updated user interface,
- Enhanced work order management,
- Ability to manage maintenance assets
- Ability to incorporate NASSCO PACP/MACP compliant CCTV inspection data
- Will help to track and manage programs

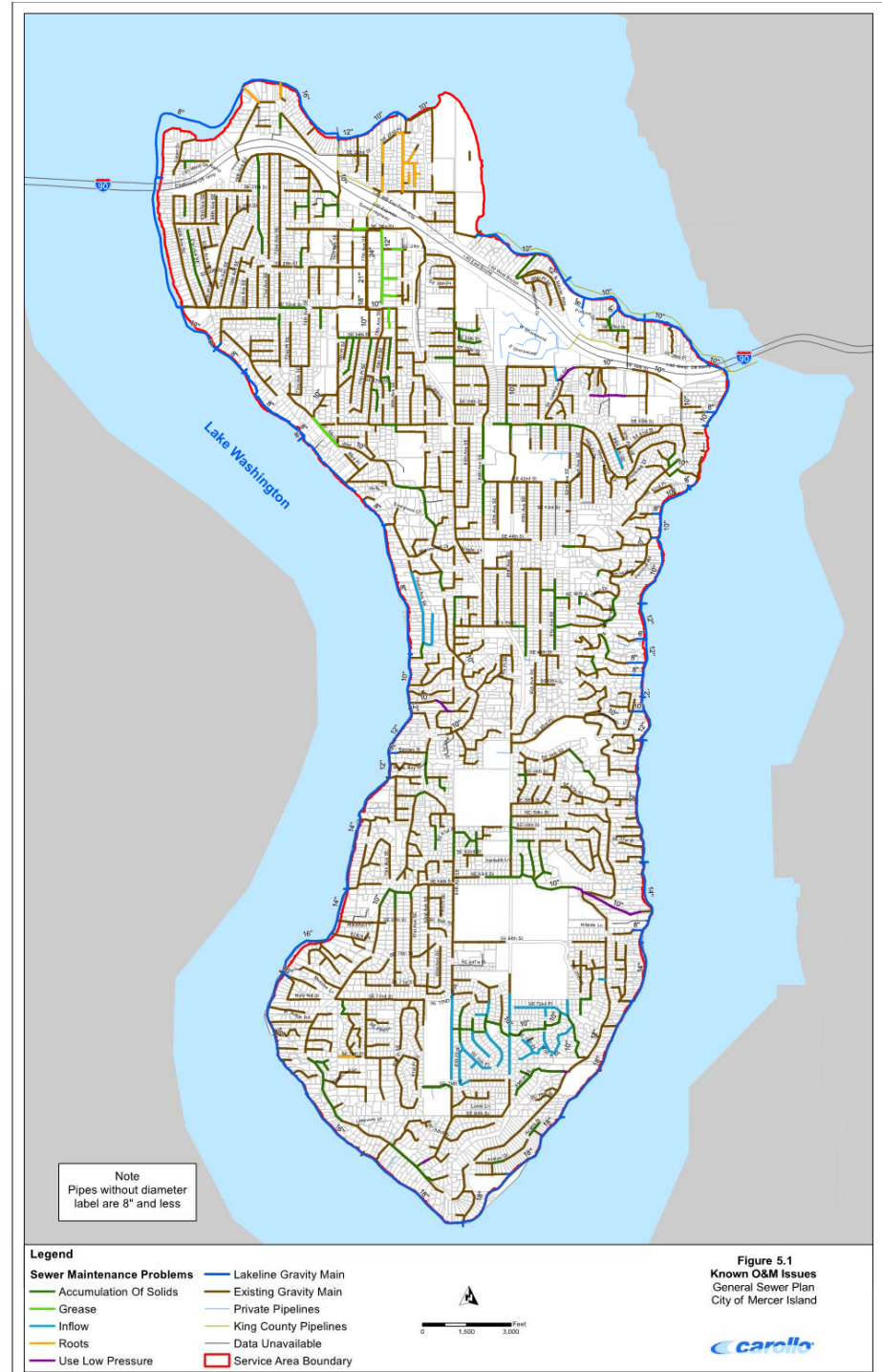
CCTV is the best way to determine the condition of the Collection System

- Goal of Island-wide inspection every 5 years.
- Use industry standard NASSCO PACP protocol.
- Currently 100% contracted
 - Staff are looking into the economics of bringing in-house.



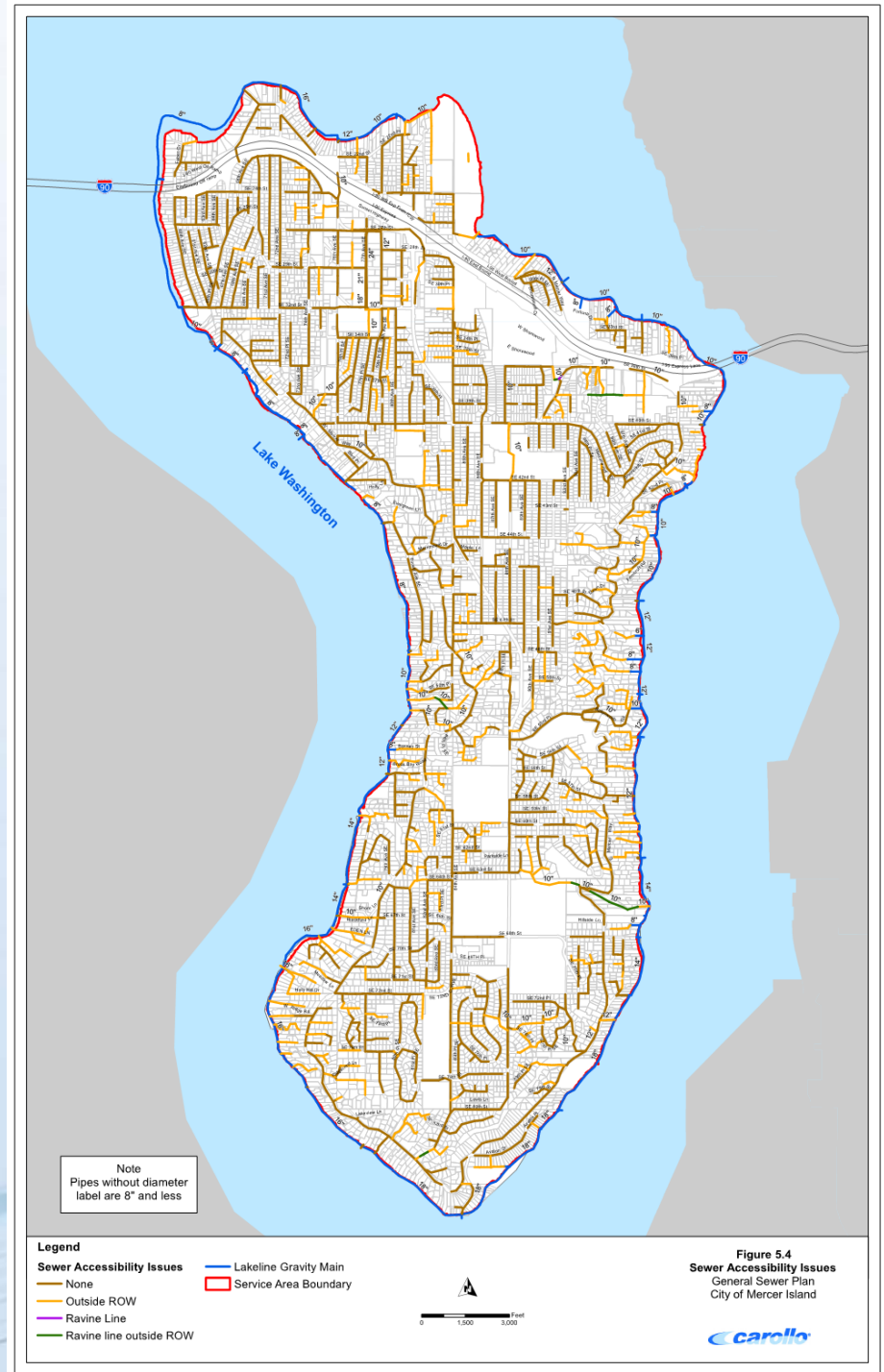
Known operational issues are well documented

- Accumulation of solids (flat pipes)
- Fats, Oils, and grease (FOG)



Limited access and steep slopes hinder O&M

- Reduces staff's efficiency
- Limits solutions
- Adds costs to restore disturbed areas



Expand Backyard Main and Sewer/Manhole Replacement Programs

- Address O&M problem areas
- Increases staff efficiency
- Reduces risks of claims against City



Like a Car, pump stations require regular maintenance to run at a high level



- “Oil changes”
 - Frequent minor maintenance
- “New tires”
 - Durable parts replaced or rebuilt every 1 to 5 years.
- “Breakdowns”
 - Wet Well Lining failures

City Staff conducted a thorough pump station condition assessment

- Detailed inspections by City Staff
- Contracted Seahurst Electrical to analyze electrical system

**City of Mercer Island
Pump Station Condition Assessment**

Pump Station #11								
Pump 1	Assessor	Date	Make/Model	HP	Hours	Life Expectancy	Overall Rating	Comments
	D Baker	10/28/2015	Vaughn	10		2 to 5 years.	4	This Vaughn chopper pump was installed in 2009. This pump is the primary pump in a two pump station.
			Components	Rating	Observations		Yes No N/A	
			Corrosion	3	Running at Inspection		yes	
			Packing Gland/Seal	3	Oil OK at Inspection		yes	
			Bearing	3	All Safety Guards Present		yes	
			Oil Seal	3	Unusual Smell or Heat		no	
			Pump Shaft	3	Pump Cavitation		no	
			Couplings	3	Excessive Noise		no	
			Structural Integrity	3	Excessive Vibration		no	
			Pipe Alignment	3	Missing Components		no	
			Isolation Valves	4	Leaks		no	
			Belt/Chain					
Valve	Assessor	Date	Make/Type	Size	Year Made	Life Expectancy	Overall Rating	Comments
Intake	D Baker	10/28/2015	Knife			2 to 5 years.	4	Knife valve needs to be exercised every three months.
			Components	Rating	Observations		Yes No N/A	
			Corrosion	4	Operating at Inspection		yes	
			Packing Gland	4	Lubrication Oil OK at Inspect.		no	
			Support	3	All Safe Guards Present		yes	
			Functional	4	Unusual Smell of Heat		no	
			Manual Operator	4	Valve Isolates (Holds)		yes	
			Actuator		Excessive Noise		no	
			Structural Integrity	3	Excessive Vibration		no	
			Pipe Alignment	3	Missing Components		no	
					Cavitation		no	

Findings were summarized by major component

Name (1)	Criticality (2)	Structure Replacement	Pump 1 Replacement	Pump 2 Replacement	Pump 3 Replacement	Immediate Repair Needs (3)
Pump Station #1	Low	Medium- to Long-term	Medium-term	Short-term	NA	PS Interior, Wetwell, and Structural
Pump Station #4	Very high	Medium- to Long-term	Medium-term	Medium-term	Medium- to Long-term	
Pump Station #10	Medium	Medium- to Long-term	Medium-term	Short-term	NA	PS Interior
Pump Station #11	High	Medium- to Long-term	Short-term	Short-term	NA	PS Interior
Flush Station #12	Very Low	Medium- to Long-term	Short-term	Short-term	NA	PS Interior

Priority pump stations were identified to aid implementing a renewal program

Pump Station	Criticality	Maintenance Needed
#11	High	Short-term
#13	High	Short-term
#15	High	Short-term
#16	Very high	Short-term
#17	Very high	Short-term
#18	Very high	Short-term
#19	High	Short-term
#20	Very high	Short-term
#23	Very high	Short-term

- Recommend continued programmatic funding, rather than individual CIP projects

City staff are identifying improvements to pump stations with known access limitations to facilitate future projects

Land Access

Water Access

Pump Station	Land Easement	Private/ Public/ Shared	Known Limitations	Dock	Private/ Public/ Shared	Known Limitations	Follow-up Actions
#13	No easements— 60' public ROW	Public	Access via public ROW is steep and unusable. Alternative access across private property road and shoreline is typical	Yes, Freeman Ave dock	Public		
#14	No easement— 30' public ROW	Public	None. Ability to access via Forest Ave street end.	AF6011026 allows sewer service boat mooring space.	Private	Access to dock is fenced off from pump station and road	

Summary of Recommended Improvements to O&M Programs

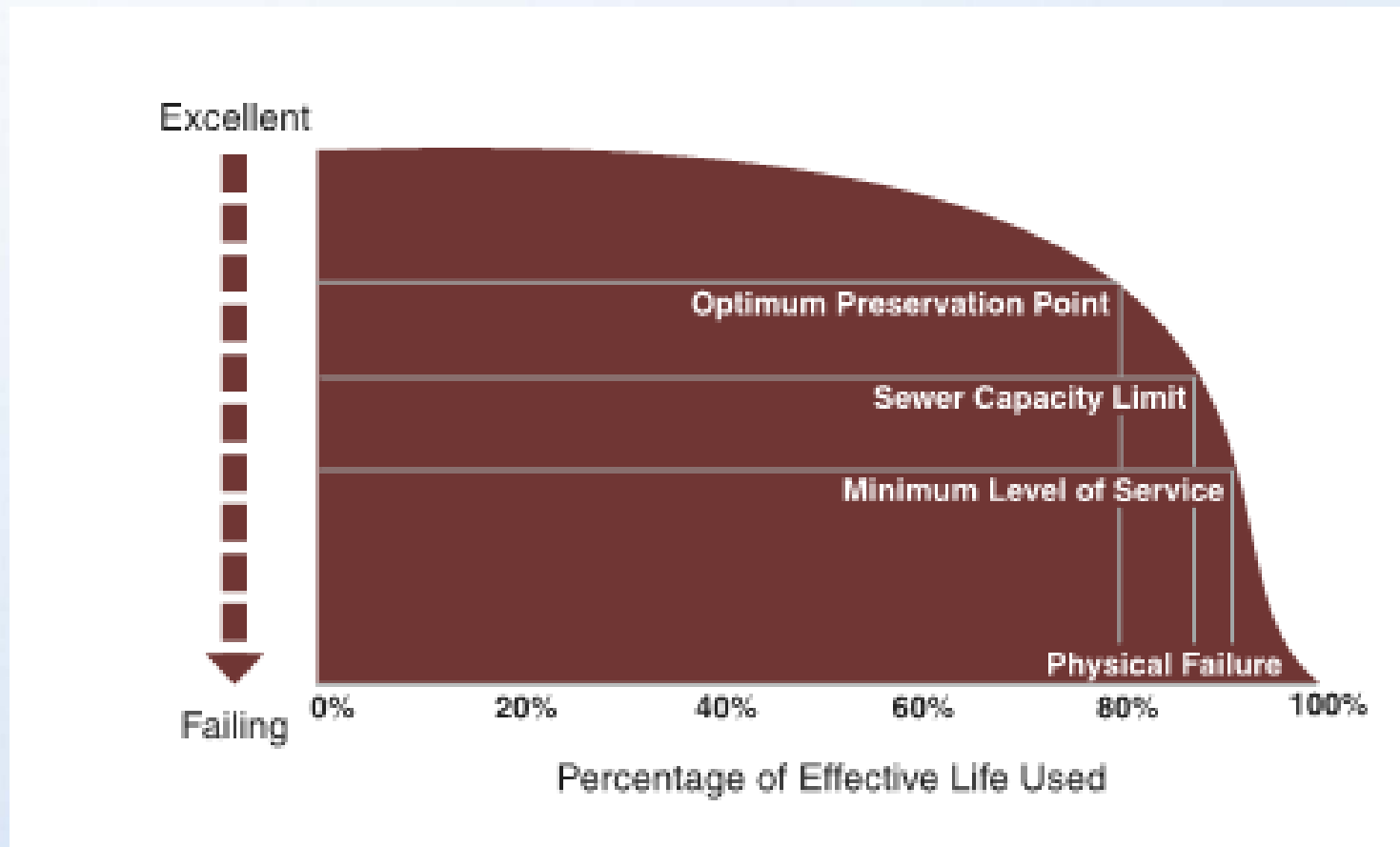
- Increase CCTV inspection
- Continue and expand Back-Yard Mains Program
- Implement a Pump Station Renewal Program



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- System Background
- Policies and Criteria Review
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- Operation and Maintenance (O&M) Recommendations
- **Repair and Replacement (R&R) Projects**
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What is Remaining Useful Life?



EPA 2002

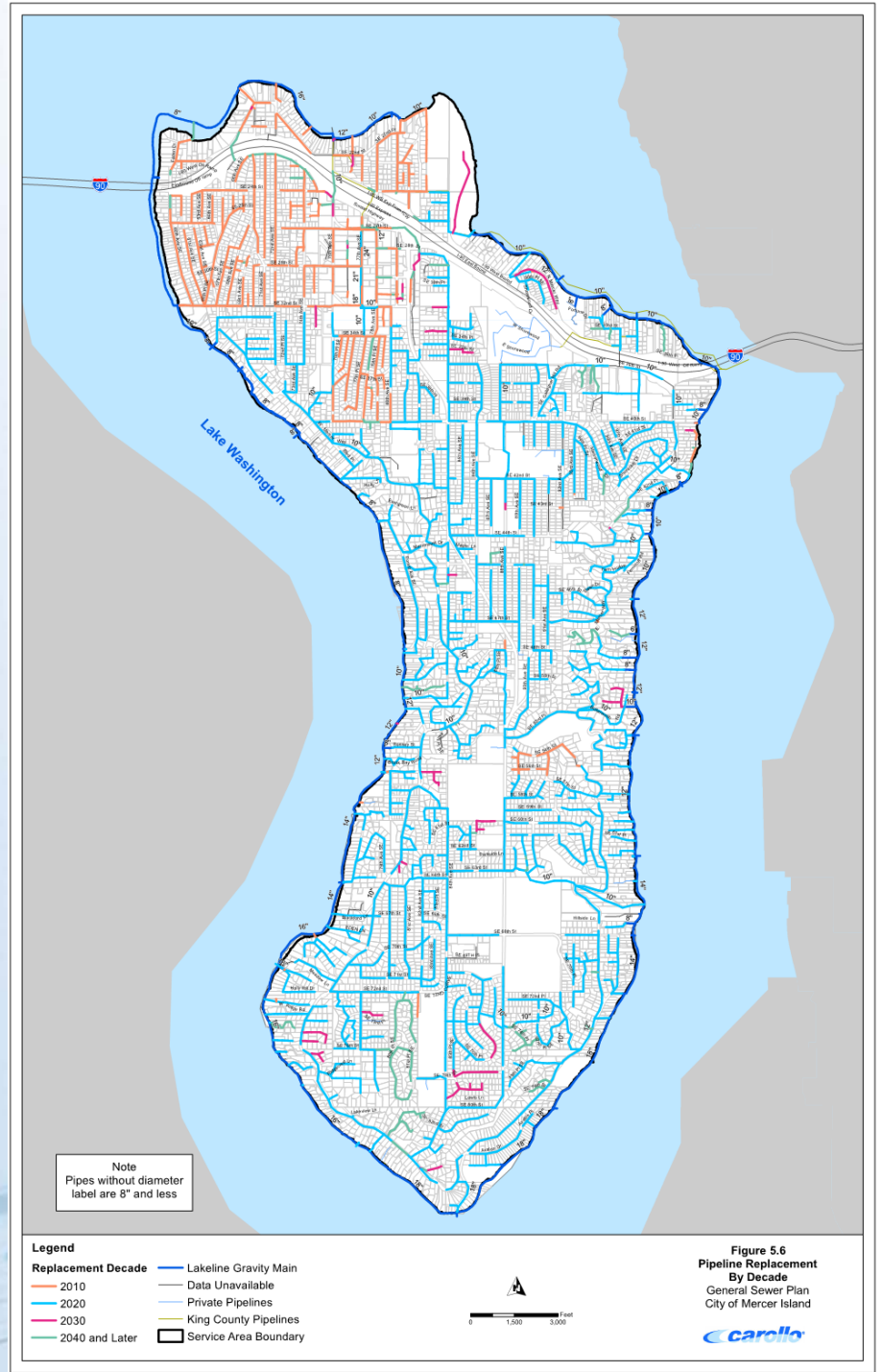
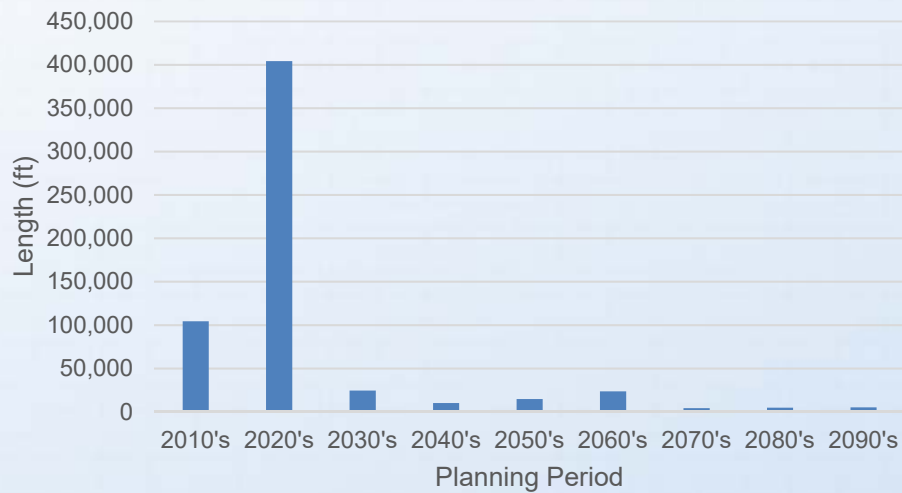
How is RUL Calculated?

- Initial estimate using
 - **Age**
 - **Material**
- Verified RUL using
 - CCTV Inspection
 - Maintenance history

Pipe Material	Useful Life Assumptions (years)
Asbestos Cement	75
Cast Iron	60
Concrete	60
Ductile Iron	80
Other	50
Poly Vinyl Chloride	80

Review Collection System R&R Needs

Length of Pipe Replacement by Decade

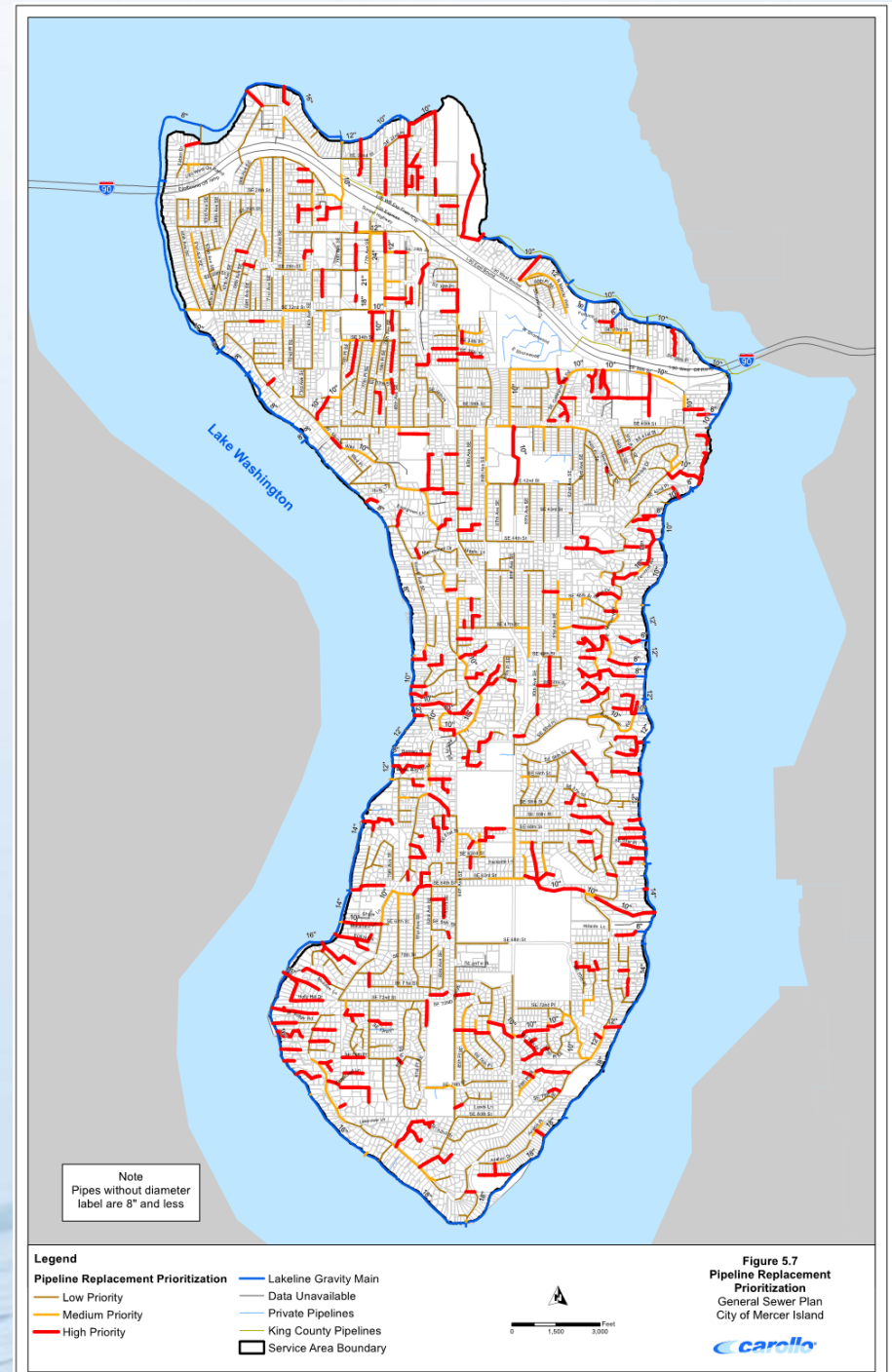


Collection system R&R were systematically prioritized

Criteria		Percentage of Collection System (%)	Criteria Scoring (1 = least, 5 = worst)
Pipe Size	Pipe Size (>8")	18%	2
	Accumulation of Solids	10%	1
Maintenance	Grease	<1%	3
	Roots	<1%	4
	Accessibility Issues	23%	5

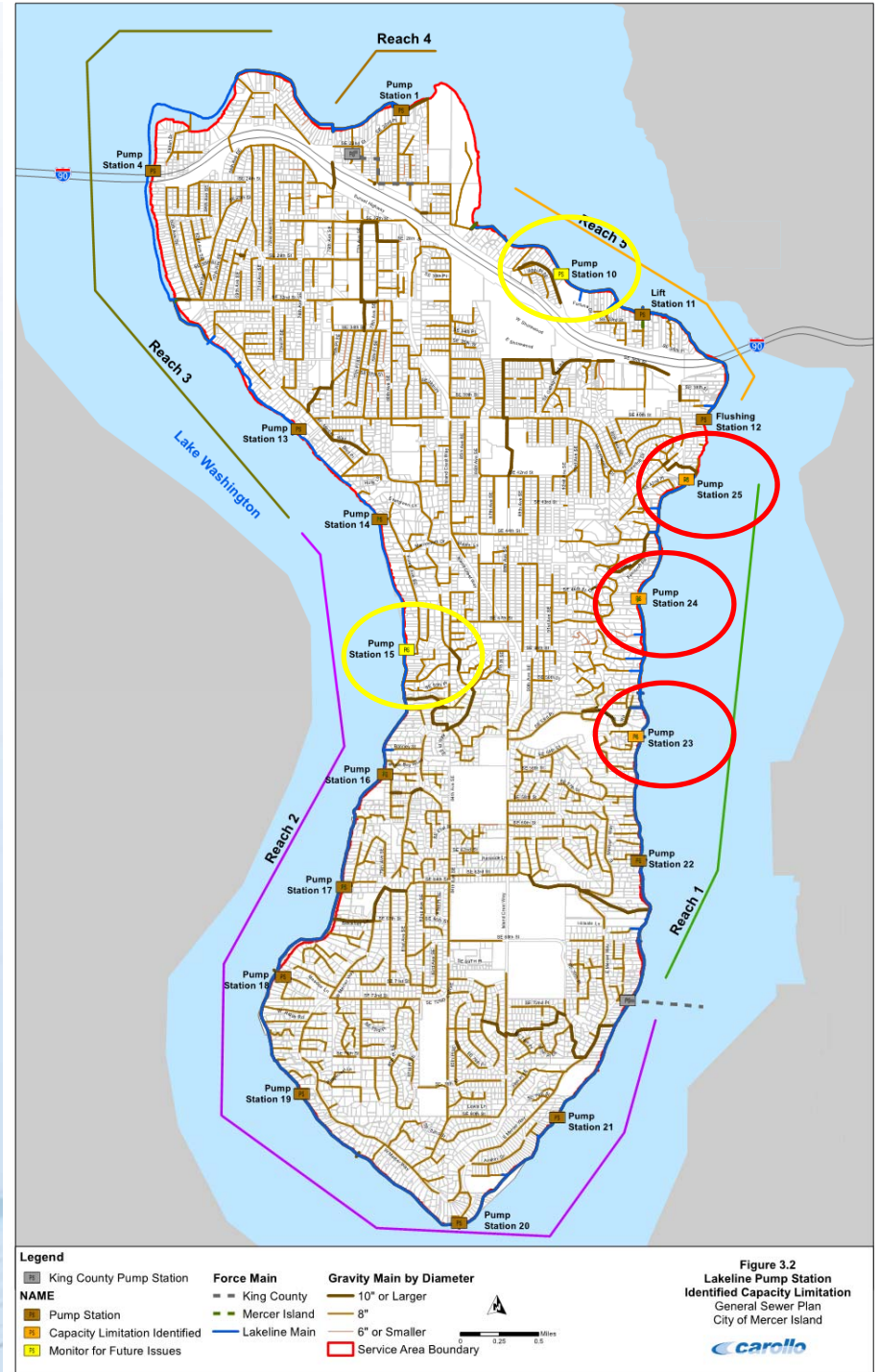
Review R&R Prioritization Results

Prioritization	Pipe Length (ft)
High	130,872
Medium	118,129
Low	294,033



Several pump stations may have capacity issues

- Known issues at PS 23, PS 24, and PS 25.
- Suspected issues at PS 10 and PS 15
 - Future monitoring recommended



More information is needed to identify improvements for pump station capacity limitations

- Potential solutions for PS 23, PS 24, and PS 25
 - I&I reduction
 - Increased storage at Pump Station
 - Lakeline System Improvements
- Flow monitoring is needed to conduct the evaluation.
 - Within Basin
 - At Pump Station

Pump station SCADA improvements are recommended

- Obtain ongoing telemetry maintenance contract for existing system
- Use the software for both Water and Sewer
- Explore upgrades to existing telemetry improvements to allow additional capabilities
 - Flow monitoring



The condition of the Lakeline is not well known due to access limitations



Confluence Environmental

Feasibility of replacing Reach 4 is budgeted for 2020

- Reach 4 is Asbestos Cement (AC) Pipe
 - Higher risk for failure
 - Similar to Reach 3 that was replaced in 2010



City is updating its Special Catch Basins to facilitate access to the Lakeline

- A new proto-type has been developed
 - Will allow cleaning and CCTV access to the Lakeline
- Access to SCBs is an known issue



Lakeline access improvements are budgeted in the current CIP

- 2017, 2019, 2020 & 2021
Lakeline Access
 - Verify information on Lakeline and service laterals
 - Identify easements and right of ways
 - Obtain additional access in later years



Confluence Environmental

A comprehensive condition assessment is needed on the remaining Lakeline

1. Inspection and assessment.
 - Non-contact technologies recommended.
2. Invasive Testing only as required
 - Lakeline temporarily out of service.
3. Develop R&R needs and improvements
4. Prioritize improvements using risk.
5. Implement R&R improvements.

Summary of Recommendations for R&R Programs

- Priority Collection System R&R Program
- Pump Station 23, 24, and 25 Flow Monitoring and Study
- Lakeline Accessibility Program
- Lakeline Reach 4 Replacement Feasibility
- Special Collection Basin Improvements
- Comprehensive Lakeline Condition Assessment

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Priority Short Term Recommendations

- Programmatic Approach to O&M
 - Pump Stations
 - Telemetry/SCADA
- Expand CCTV Inspection
- Access improvements for the Lakeline
- Special Collection Manhole Replacement

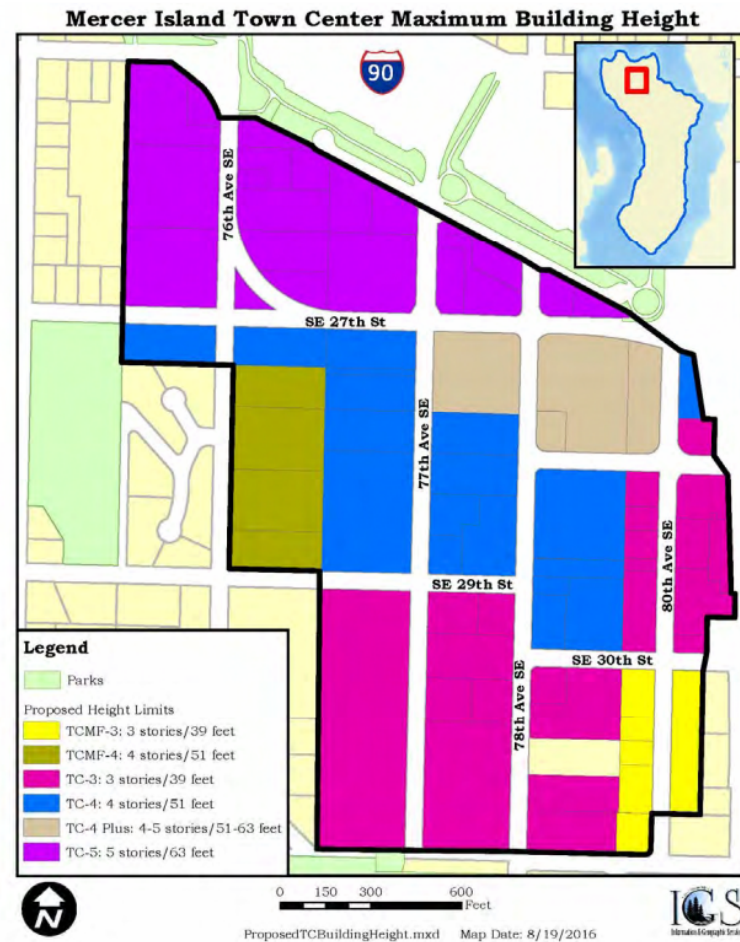
Next Steps

- Confirm Capital Improvement Plan projects Prioritization
- Financial Summary
- City Council Meeting
- Draft Plan for Agency Review
- Final City Approval

QUESTIONS?

The City is essentially Built-out, except in the Town Center

- Redevelopment of Town Center will become more dense
 - Increases wastewater flows



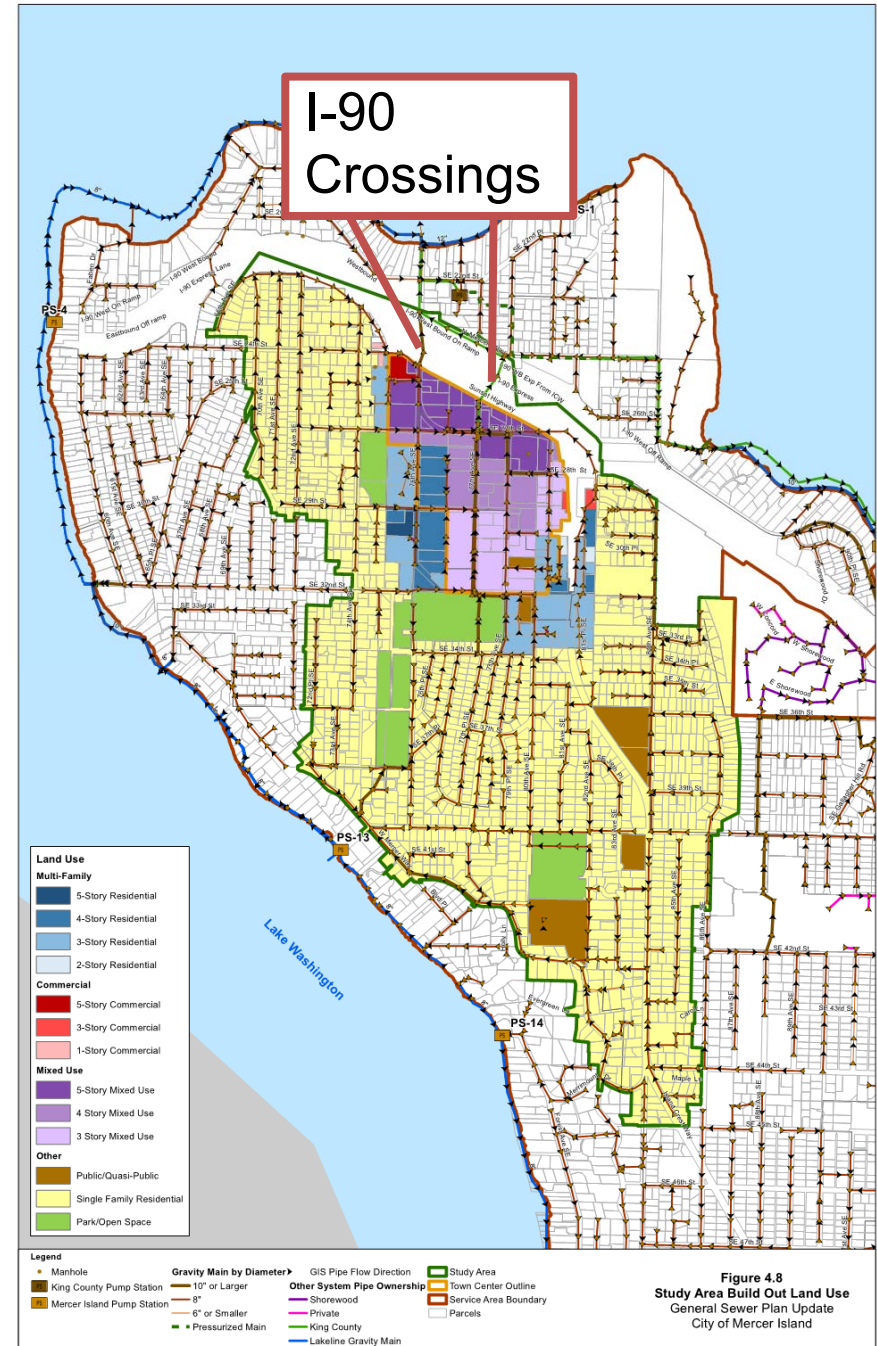
AT12

delete

Anne Tonella-Howe, 3/13/2017

Flow from surrounding areas is routed through the Town Center

- Mostly single family residential
- Discharges into the KC System, crossing I-90 in two locations



Slide 51

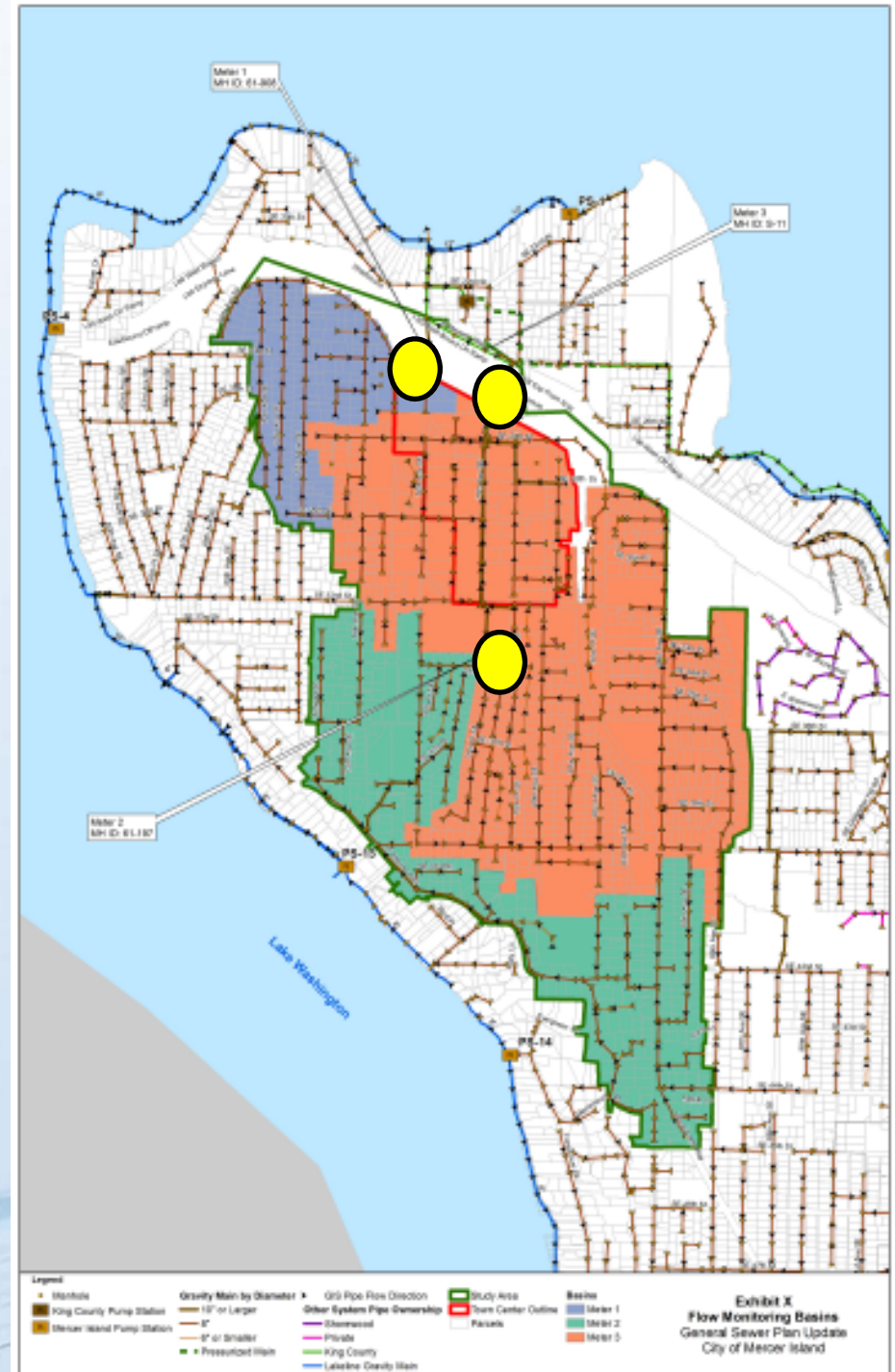
AT13

delete

Anne Tonella-Howe, 3/13/2017

City conducted temporary flow monitoring to improve reliability of model

- 3 meters were installed by ADS
- Monitoring in place between January 21, 2016 and July 22, 2016



AT15

delete

Anne Tonella-Howe, 3/13/2017



**BUSINESS OF THE CITY COUNCIL
CITY OF MERCER ISLAND, WA**

**AB 5276
April 3, 2017
Regular Business**

GENERAL SEWER PLAN UPDATE

Proposed Council Action:

No action necessary. Receive presentation.

DEPARTMENT OF	Public Works (Anne Tonella-Howe)
COUNCIL LIAISON	David Wisenteiner
EXHIBITS	1. Sewer System Vicinity Map
APPROVED BY CITY MANAGER	

AMOUNT OF EXPENDITURE	\$	n/a
AMOUNT BUDGETED	\$	n/a
APPROPRIATION REQUIRED	\$	n/a

SUMMARY

In accordance with WAC 173-240, governmental agencies (cities) providing sewer service are required to have a general sewer plan that can demonstrate the agency’s ability to provide service consistent with the requirements of the State. Updates to these plans are only necessary when conditions within the City have changed.

The current General Sewer Plan was completed in 2003. Since that time, the City has experienced growth through redevelopment in the Town Center, and the City has completed a significant undertaking in the replacement of Reach 3 of the Lakeline (sewer pipe located in Lake Washington), including installation of a new pump station (Pump Station 4).

In 2015, an update to the General Sewer Plan (“Plan”) began. The City hired Carollo Engineers, an engineering firm specializing in water and wastewater services, to assist staff with updating the Plan. The cost for consultant services for this plan is \$155,000.

The Plan was reviewed with the Utility Board at their March 14th meeting. Lara Kammereck, vice president and Dan Reisinger, project manager with Carollo Engineers will be presenting an overview of the work that has been accomplished to date and a look ahead at the next steps.

Staff have been working on individual chapters of the Plan and four of the seven chapters are now complete: *Chapter 2 Planning Considerations; Chapter 3 Existing System; Chapter 4 Collection System Analysis; and Chapter 5 Operations and Maintenance*. It is these four chapters that will be presented on Monday night. Once the remaining chapters are complete staff will return to the Council with a presentation on *Chapter 6 Capital Improvement Program and Chapter 7 Financial Program*. The final draft Plan will be available for the Council’s review during the SEPA process.

Existing System

The City's sewer system is a complex system that is nearing the end of its projected useful life. It is comprised of 115 miles of collection system (pipes), 2,446 manholes, 16.7 miles of Lakeline, 17 pump stations and a flush station. Much of this system was originally constructed in the late 1950s and early 1960s under three local improvement districts (ULIDs) by the Mercer Island Sewer District.

The City takes advantage of the steep slopes and topography of the Island by relying on gravity flow for much of the collection system. A significant portion of the collection system, carrying flow from the spine of the Island to the lake, are in watercourse ravines that are difficult to access. Portions of the sewer system are also located in the backyards of homes ('backyard sewers') where these mains are inaccessible but still require maintenance, cleaning, or replacement and repairs.

A major feature of the collection system is the Lakeline system, which utilize 17 pump stations, the flush station and sewer mains that convey the flow around the perimeter of the Island. The Lakeline system discharges the flow into the King County facilities located on the Island, which is then conveyed to the County's South Treatment Plant located in Renton (see Exhibit 1). The Lakeline system has extremely limited access which restricts staff's ability to clean or inspect the line. Access to pump stations is restricted in some locations due to private property encroachment into utility easements, while other pump stations do not have easements for access. In addition, the topography of the Island and location of the pump stations makes access challenging for crews (steep slopes or stairs).

Purpose of the Plan

The purpose of the Plan is to evaluate the existing sewer system, identify current and future needs and develop a program to meet those needs. The Plan is intended to be a road map that is flexible and that can be modified to respond to future redevelopment and reinvestment in aging infrastructure.

The updated Plan addresses the following changes which have occurred since the City's 2003 General Sewer Plan ("2003 Plan") was adopted:

- Revise future buildout in the Town Center due to zoning and land use changes
- Evaluate current Operations & Maintenance (O&M) programs
- Evaluate infrastructure repair and replacement (Capital) needs
- Update recommendations

Since the adoption of the 2003 Plan, the Town Center has undergone significant redevelopment. While the 2003 Plan evaluated long-term conditions based on projected growth, this updated Plan evaluates the Town Center system utilizing current monitored flows as a base line and projecting into the future based on revised zoning and land use changes.

Recommended improvements identified in the 2003 Plan specific to the O&M programs and Capital needs have been implemented. This updated Plan evaluates the City's current way of doing business, recommends modifications and changes to O&M practices, and identifies capital projects to guide future reinvestment in the sewer infrastructure.

2017-2018 Capital Projects

Consistent with the recommendations of this updated Plan, staff have taken a proactive approach, putting into place several action items and projects to better understand the system and to lay the groundwork for future reinvestment.

The following projects are funded in the 2017/2018 Capital Budget:

- **Lakeline Access:** Evaluate feasibility and confirm locations for construction of future access points to the Lakeline; scheduled for 2017.
- **Pump Station Access Evaluation:** Evaluate existing conditions and prioritize future work for improving access; scheduled for 2017.
- **Sewer System Special Catch Basins:** Construct modifications of Special Catch Basins to provide access to the Lakeline for video inspection and cleaning; currently underway.
- **SCADA System Upgrade:** Upgrade the outdated telemetry system; evaluation of the system is currently underway and implementation is scheduled to begin in 2018.
- **General Sewer System Improvements:** Evaluate inflow & infiltration (I/I) in the Pump Station 25 sewer basin to quantify I/I and prioritize future work: currently underway.
- **Enterprise Asset Management System (EAMS):** Replace the outdated work order system; currently underway and scheduled for 2017-2018 implementation.

Additionally, contractors are now required to complete video inspection (CCTV) of the sewer system to apply the standardized NASSCO PACP condition rating to pipes and required to provide this data to the City in a GIS compatible format. This change provides the City with the tool to consistently evaluate pipe replacement, utilizing industry best management practices, and to identify future projects.

Next Steps

At the meeting, Council will receive the “first bite of the apple” with an overview of the updated Plan’s evaluation and recommendation for the Town Center, O&M program, and repair and reinvestment (R&R) needs.

At a future meeting (expected Q2/Q3 2017), staff will return with a presentation on the draft Capital program and 20-year capital plan and financial strategy to fund reinvestment in the sewer system. Financial projections for the Sewer Utility will be developed by the Finance Department based on the draft 20-year capital plan, which will be incorporated into the rate structure.

The updated draft Plan will then be submitted for SEPA review. During this process the draft Plan will be sent to King County and adjacent agencies, including Bellevue, Renton and Seattle, for review and comment, and it will be posted on the City’s website for public review. Once comments have been received and incorporated, the final draft Plan will be submitted to Department of Ecology for their review and approval, prior to coming back to the Council for final Plan approval.

RECOMMENDATION

Assistant City Engineer

No action required. Receive presentation.

Mercer Island Sewer System



AB 5276
 Exhibit 1
 Page 4



SewerSystemAgendaBill.mxd
 Map Date: 3/28/2017

PS Pump Stations

— King County Sewer Main
 — Mercer Island Lakeline Sewer Main

Sewer Main Size:
 — 10" or Larger
 — 8"
 — 6" or Smaller

□ Shorewood
Pressurized/Forced Main:
 - - - King County
 - - - Mercer Island



Utility Board 2018 Work Plan

Meeting Date	Agenda Item
January 16	General Sewer Plan - CIP Focus
February 13	Scada Master Plan
March 13	Solid Waste Contract Review and Schedule
April 10	Solid Waste Contract - Continued
May 8	Water Quality Metrics & CIP Classification EAM Implementation Update
June 12	Board Elections Utility CIP Preview
July 10	2018 Project Updates
August 8	Recess
September 11	Sewer Budget & Rates Stormwater Budget & Rates
October 9	Water Budget & Rates EMS Rates
November 13	Solid Waste Contract
December 11	Meter Master Plan Implementation
To Be Scheduled	Rate Methodology