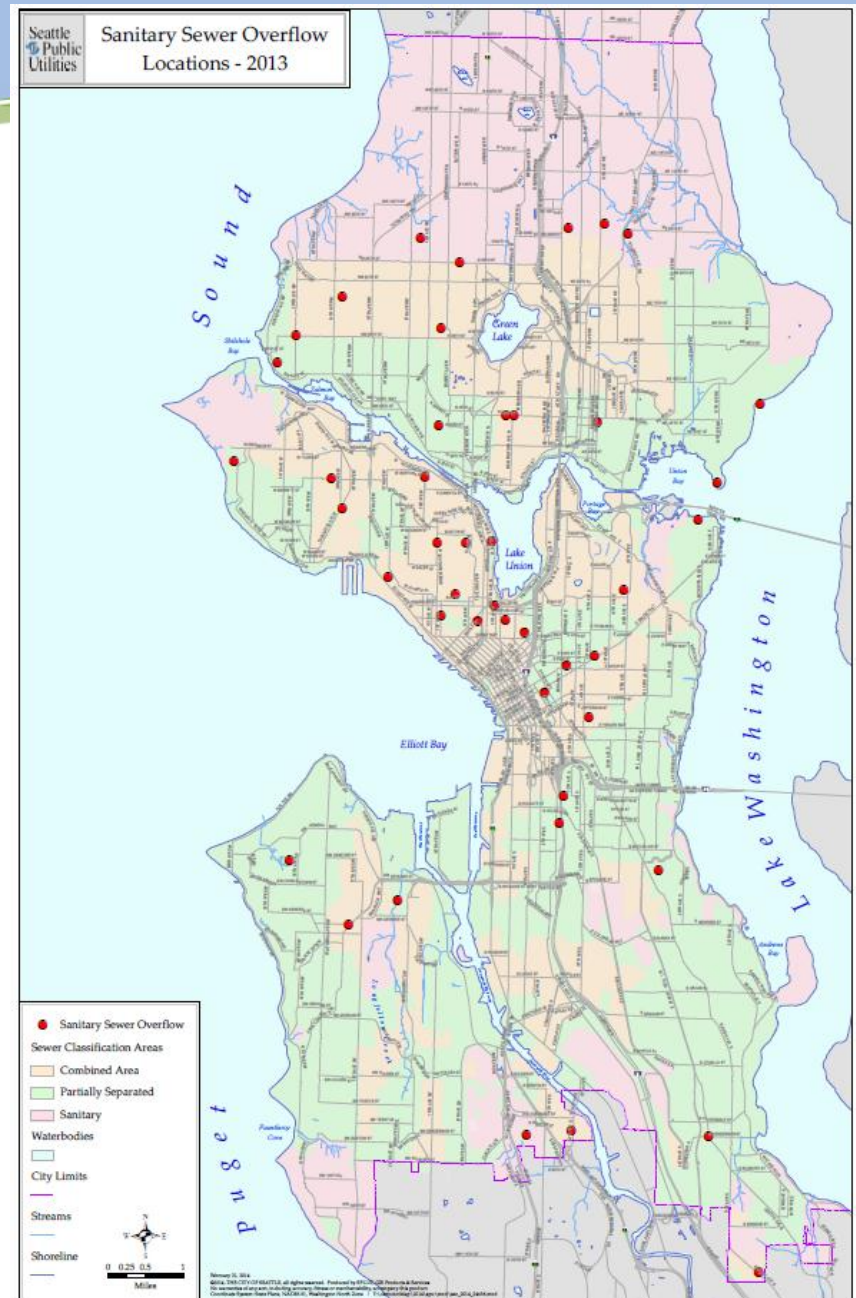


Sewer Inspection & Rehabilitation Plan and Sewer Cleaning Plan: Implementing the Consent Decree

Seattle Sanitary Sewer Overflows (SSOs)

- 1,416 miles of sewer pipes (& 68 pumps)
- Regulatory Standard
 - Zero Sanitary Sewer Overflows (ultimately)



What Is the Problem?

Achieving performance; avoiding one size fits all prescriptions.

Sanitary Sewer Overflows - Causes

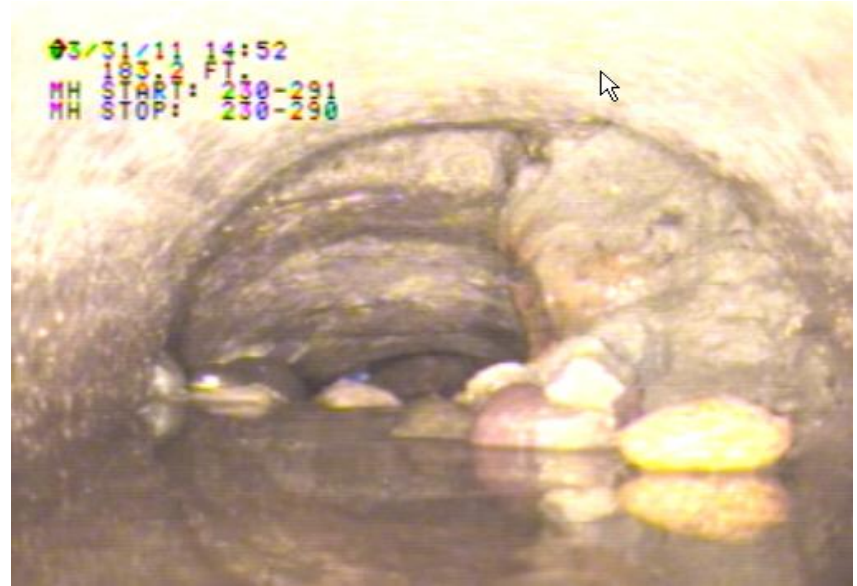
	Events in 2013		Volume	
Cause	Number	% of Number	Gallons	% of Gallons
Debris	2	4%	6	0%-1%
Fats, Oil, Grease	4	9%	860	1%
Roots	17	36%	10,103	8%
Other	11	23%	27,172	21%
Structural	<u>13</u>	28%	<u>91,837</u>	71%
Total	47		129,978	

Emergency/Urgent Response (Weeks to Months)

Collapse – Significant Blockage



Oil & Grease – Significant Blockage



Accelerated Response

(Weeks to 1 Year)

Void – Visible



Broken Deformed – Roots



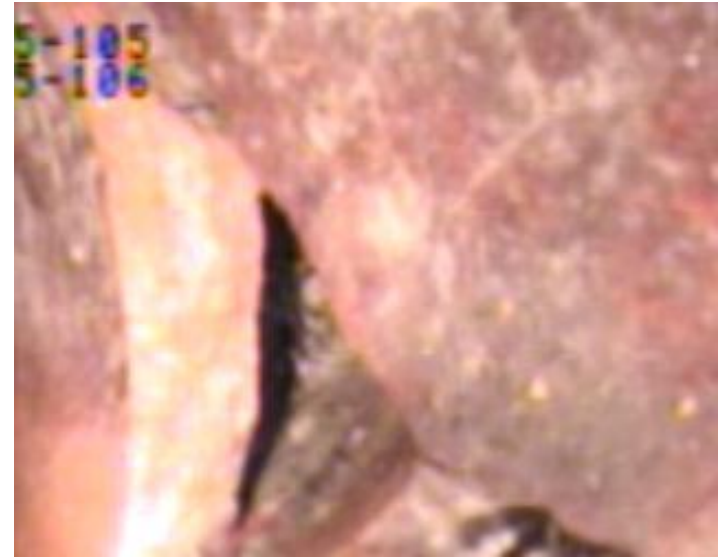
Planned Response

(2 to 5 Years)

Broken – Crown



Broken – Soil Visible



Monitor (5-20 years)



Multiple Fractures at Crown.
Assess degradation rate.



Significant corrosion on Non-Reinforced
Pipe.
Assess degradation rate.

Collection System Characterization

Criticality	Current Backlog	Identified/Yr	Desired LOS
Emergency Response	17	10	wks – 3 mths
Accelerated Response	200	65	mths-1yr
Planned Response	1,520	400	2-5 yrs
Monitor	<u>3,500</u>	<u>700</u>	<u>5-20 yrs</u>
Total	5,237	1,175	

What Are We Required To Do?

Inspect, Clean, Rehabilitate, Inspect, Clean, Rehabilitate

Implement a Performance Based Program

The **RIGHT** work,
at the **RIGHT** time,
at the **RIGHT** cost.

Promise and Consequence:

- Implement **adaptive** asset management approach and stay within the national high performance service band (less than 4 overflows per hundred miles of pipe).
- Failing to meet the performance target = corrective action plan and more costs.

Adaptive & Performance Based Management

- Allows SPU to focus on delivering control benefits specific to SPU system.

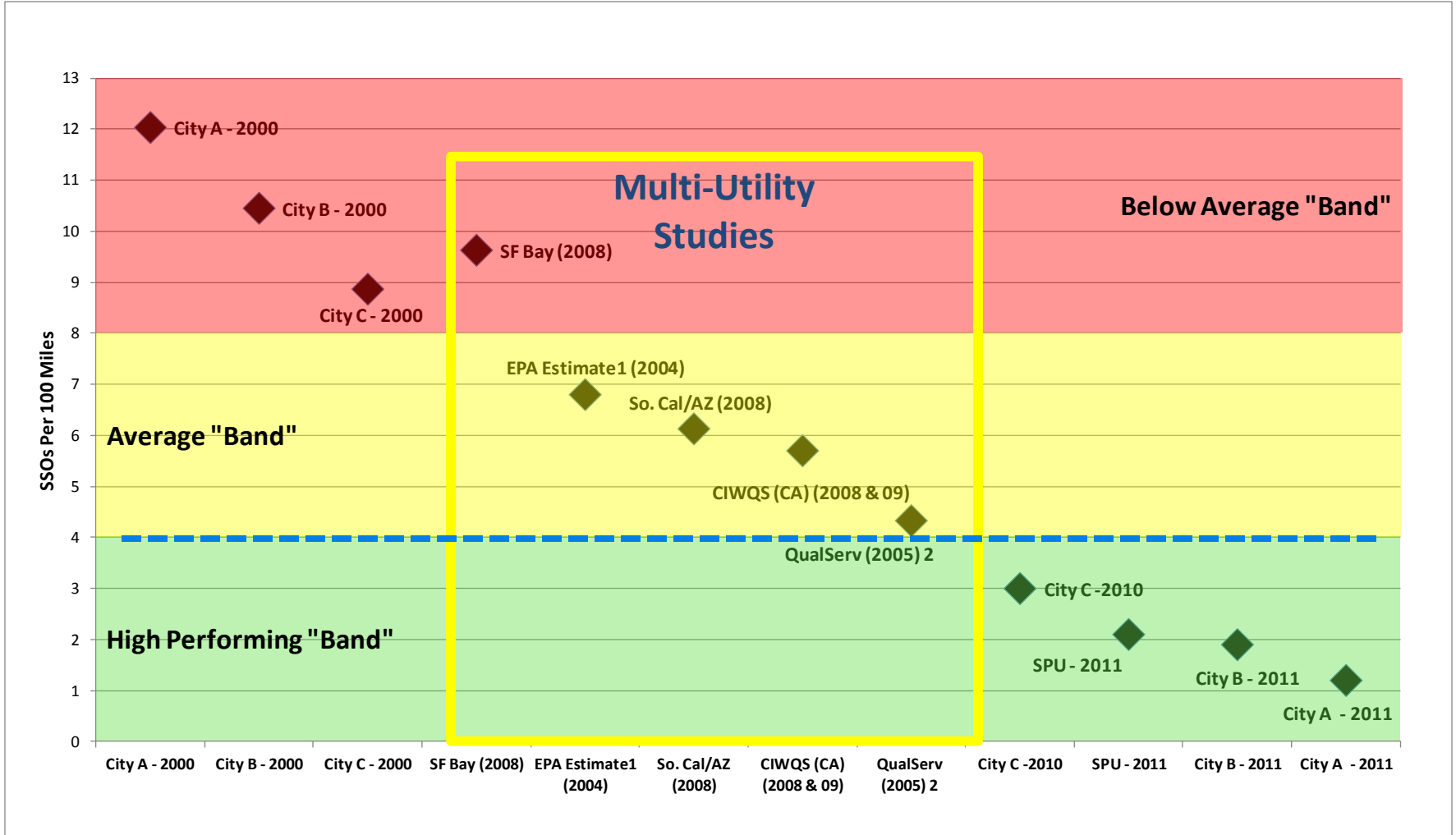
System Element	Prescriptive	SPU Requirement
Inspection (CCTV)	10% to 20% of system per year.	Performance based.
Cleaning	X miles per year.	Performance based.
Rehabilitation	Y miles per year.	Performance based.

Adaptive & Performance Based Management

- Allows SPU to focus on delivering control benefits specific to SPU system.

System Element	Prescriptive – Los Angeles	Seattle Public Utilities	
		Requirement	Prescriptive
Inspection (CCTV)	9.2% per year.	Performance based.	130 miles per year
Cleaning	43% per year.	Performance based.	609 miles per year
Rehabilitation	55 specific projects.	Performance based.	21 miles per year

State of Utility Performance



Impact to SPU of Not Meeting Performance Threshold

- Requires corrective action plan, limiting or losing ability to use adaptive management approach.
- Additional cost of \$375 M over compliance period (to 2025).
- Loss of National and State Regulatory credibility.
- Loss of Public confidence.

The Key Elements

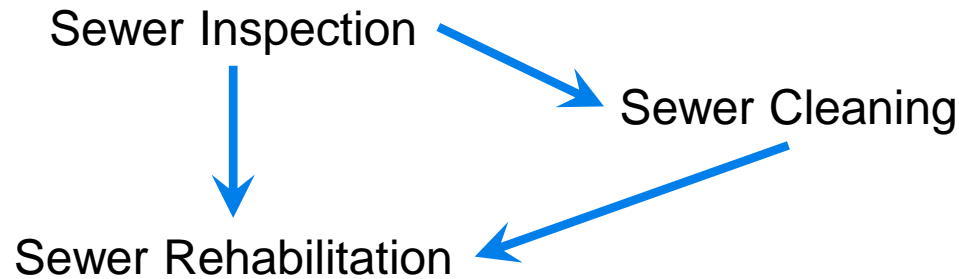
A More Detailed Look

Action Plan Objectives

- Improve SPU's work level to industry best practices.
- Provide additional resources to minimize risk of regulatory non-compliance.

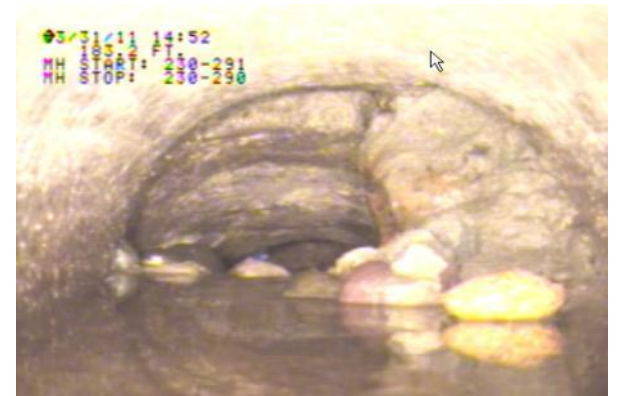
Sewer Inspection & Rehabilitation Plan

Sewer Cleaning Plan



Collection System Inspection

- Conducted using closed circuit television.
- Identifies pipes that need to be cleaned.
- Allows for condition assessment of pipes.
 - Establishes criticality of corrective action.
 - Supports determination of appropriate technology.

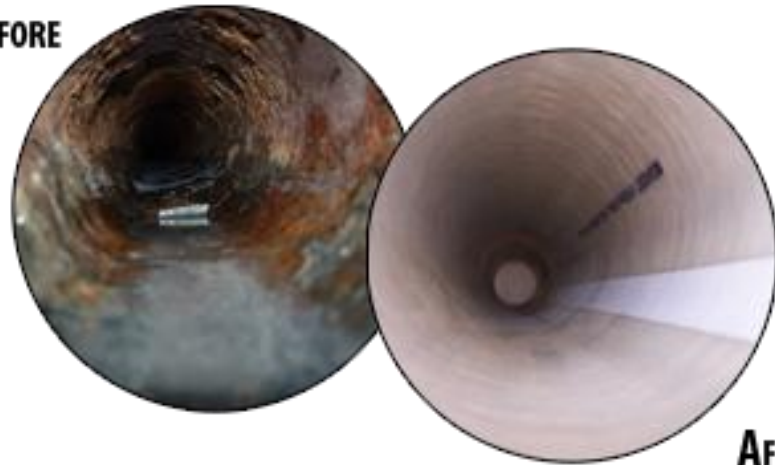


Collection System Rehabilitation

- Directly addresses pipe failures that could result in overflows.
- Extends the structural life of the pipes.



BEFORE



AFTER

New Resources Needed (O&M) – Sewer Inspection and Rehabilitation

- Action Plan requests 9 FTEs beginning in 2016.

Changes in staffing for Sewer Inspection	2015	2016	2017	2018	2019	2020
Baseline staffing level	12	12	12	12	12	12
Plus adds in this Action Plan – CCTV staff	0	4	4	4	4	4
Plus adds in this Action Plan – Assessment and support staff	0	5	5	5	5	5
Proposed staffing levels	21	21	21	21	21	21

Changes in staffing for Sewer Rehabilitation	2015	2016	2017	2018	2019	2020
Baseline staffing level	2.5	2.5	2.5	2.5	2.5	2.5
Plus adds in this Action Plan	0	0	0	0	0	0
Proposed staffing levels	2.5	2.5	2.5	2.5	2.5	2.5

Collection System Inspection – Sewer Inspection and Rehabilitation Action Plan

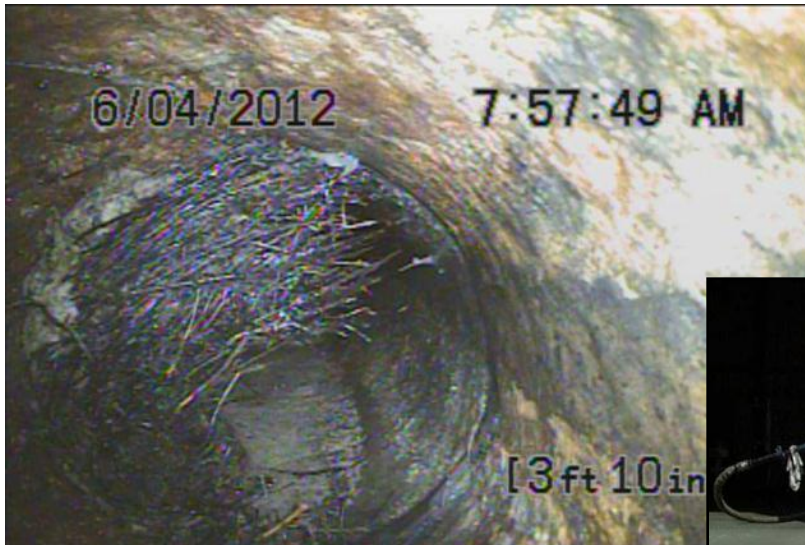
- **Capital Expenditures**
 - \$1.1 Million for purchase of two CCTV trucks
 - \$250,000 for overhaul of two existing trucks.
- **Amount of system inspected**
 - Currently - 30%
 - Action Plan – 50%
- **Benefit** - provides improved targeting of system cleaning and rehabilitation efforts.

Collection System Rehabilitation – Sewer Inspection and Rehabilitation Action Plan

- **Capital Expenditures**
 - \$60.5 Million 6-year total for additional rehabilitation of system.
- **System rehabilitation**
 - Currently – \$4.74 Million rehabilitating 17 miles/year
 - Action Plan – \$21 Million total rehabilitating 76 miles/year in 2020
- **Benefit** - provides additional resources to fix system failures and extend service life of pipes.

Collection System Cleaning

- Removes roots; fats, oil, and grease; debris that cause blockages and overflows.



New Resources Needed (O&M) – Sewer Cleaning

- Action Plan requests 14 FTEs by 2020.
- Current level of productivity = 6 jobs/day.
- Best Practice = 10 jobs per day.
- Assuming efficiency gains, net new resources required by 2020 = 1 FTE.

Changes in staffing for Sewer Pipe Cleaning	2015	2016	2017	2018	2019	2020
Baseline staffing level	21	21	25	25	25	25
Plus adds in this Action Plan	9	12	13	13	14	14
Less efficiencies from increased productivity	-6	-9	-13	-13	-13	-13
Proposed staffing levels	24	24	25	25	26	26
Net change from baseline	3	3	0	0	1	1

Collection System Cleaning – Action Plan

- Capital Expenditures
 - \$1.0 Million for purchase of two vactor trucks
- Amount of system on cleaning program
 - Currently – 21%
 - Action Plan – 50%
- Benefit - provides additional resources to remove system blockages causing overflows.

Summary

Managing a Performance Based Compliance Program

The **RIGHT** work,
at the **RIGHT** time,
at the **RIGHT** cost.

Q&A

Seattle's Consent Decree

- Signed July 2013 by US EPA, Washington Department of Ecology, and the City of Seattle
- Comprised of several requirements
 - Early Action Control Programs and Measures
 - Long Term Control Plan
 - Capacity, Management, Operations, and Maintenance (CMOM) Performance Program Plan
 - Fats, Oils, and Grease Control Program Plan
 - Revised Floatable Solids Observation Program Plan