Asset Management & Capital Projects Overview

City of Tacoma | Environmental Services

Environmental Services Commission
May 9, 2024

Teresa Dressler, P.E.
Principal Engineer

Teresa Peterson, P.E.
Principal Engineer

Shauna Hansen, P.E.
Principal Engineer

Kristy Beardemphl, P.E.
Engineering Manager

PRESENTATION OVERVIEW

- Asset Management Basics
- CIP Ranking Overview
- Stormwater Watershed Planning Tool
- Delivery of Capital Projects Overview
- Highlight Recently Complete and Upcoming Projects
- Long Range Funding Model

ASSET MANAGEMENT BASICS

Inventory
- What do we own?

Likelihood of Failure
- What condition is it in?

Consequence of Failure
- What are the impacts if it fails?

Risk = Likelihood of Failure x Consequence of Failure
- How do we mitigate risks?

Funding
- How do we pay for it?

ASSET INVENTORY

Wastewater

- 700 miles pipe
- 50 Pump Stations
- 2 Wastewater Treatment Plants
  - 13,000+ Assets

Stormwater

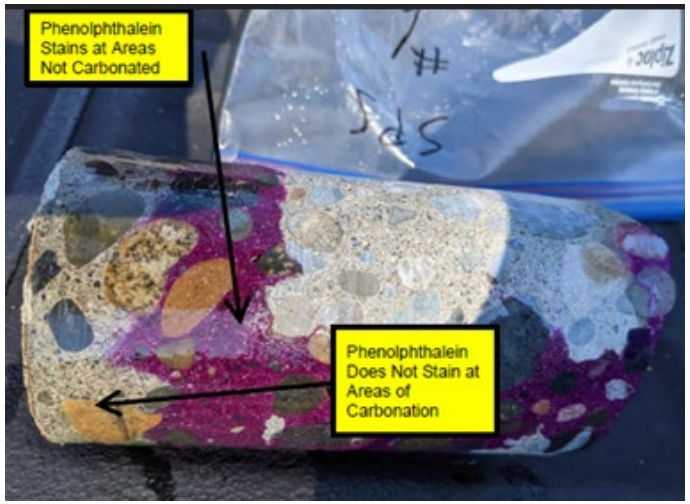
- 480 miles pipe
- 32 Holding Basins/Ponds
- 3 Pump Stations
- 19,000 Catch Basins
- 400+ Treatment Devices

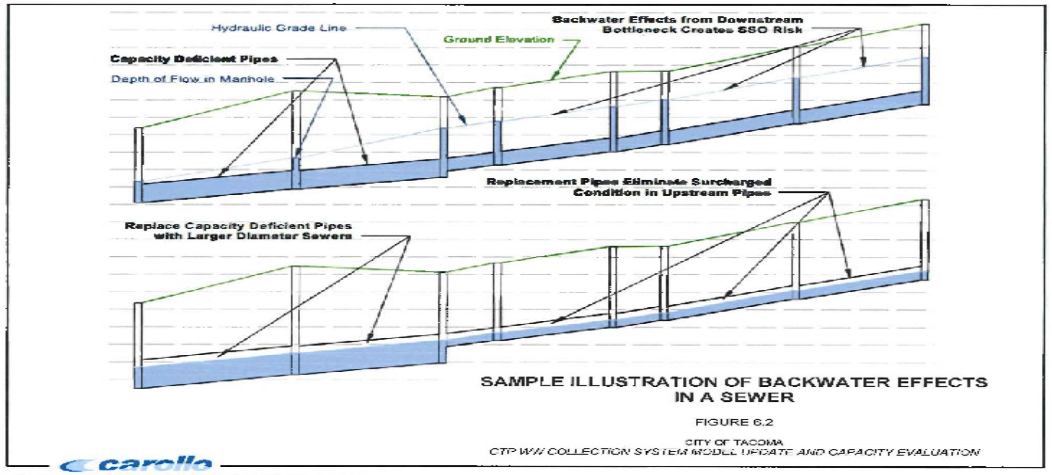
Solid Waste

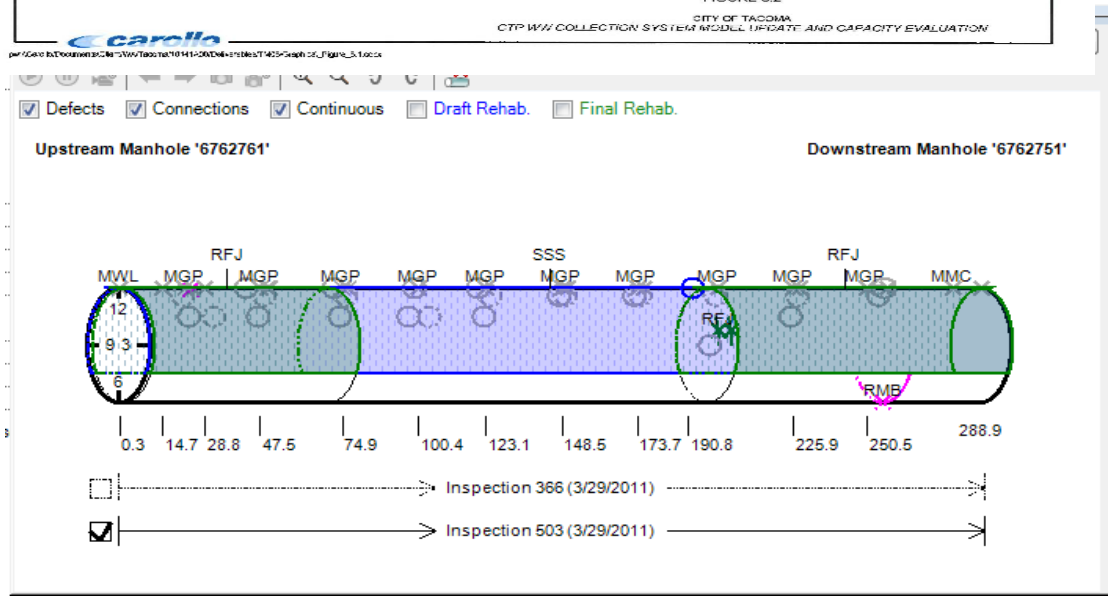
- 135 acres landfill cap
- Onsite Facilities

LIKELIHOOD OF FAILURE

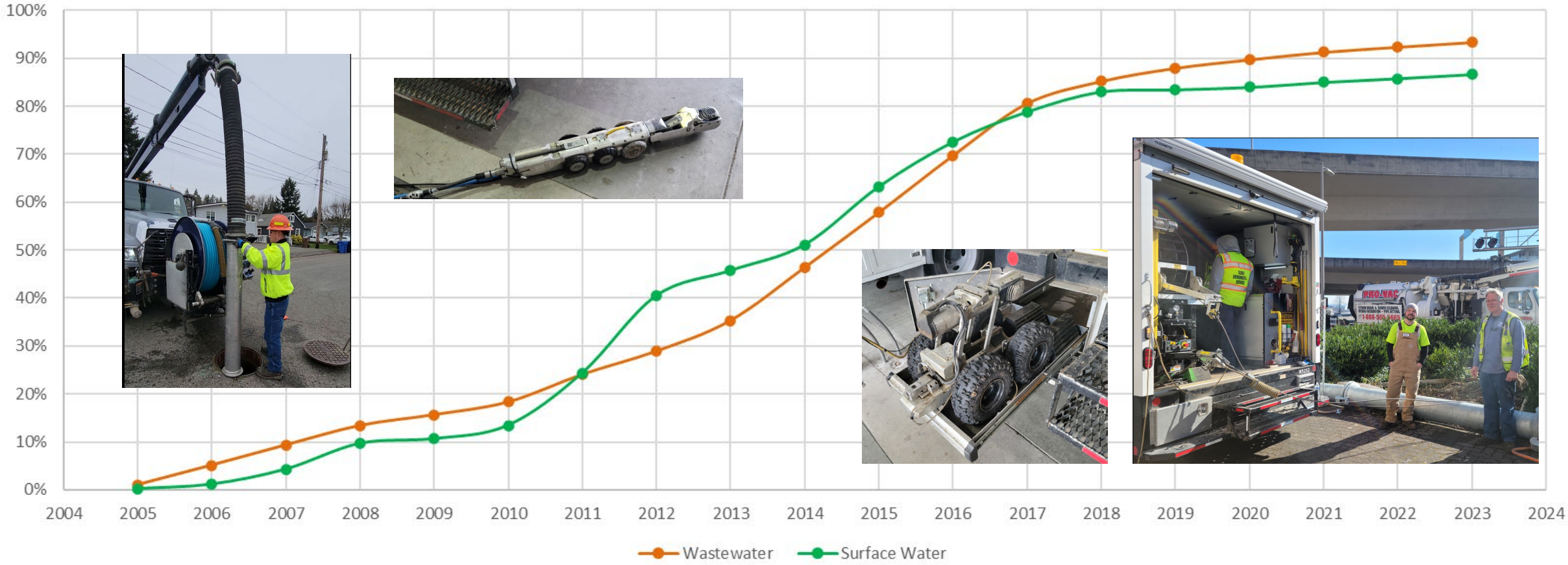
- Remaining Useful Life
- Maintenance History
  - Preventative & Corrective
- Video inspections
- Modeling
- Material Testing



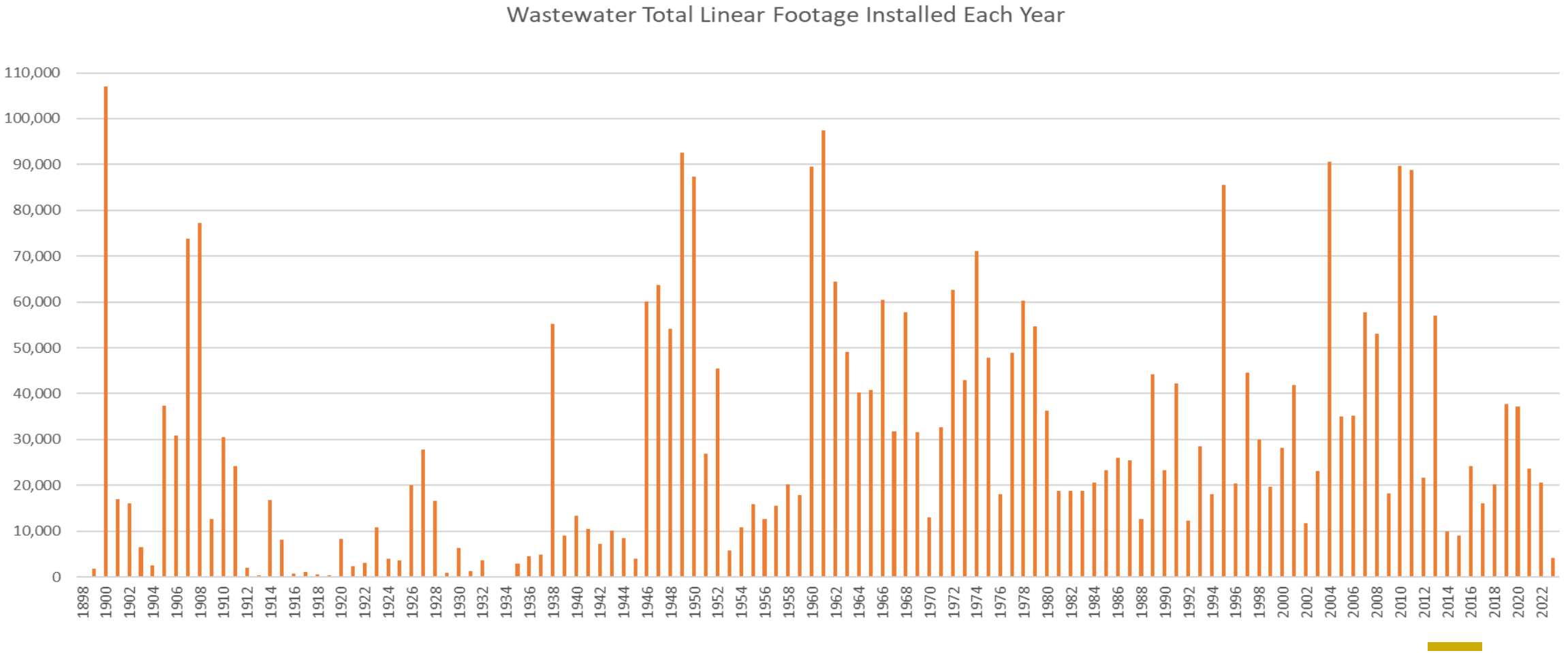




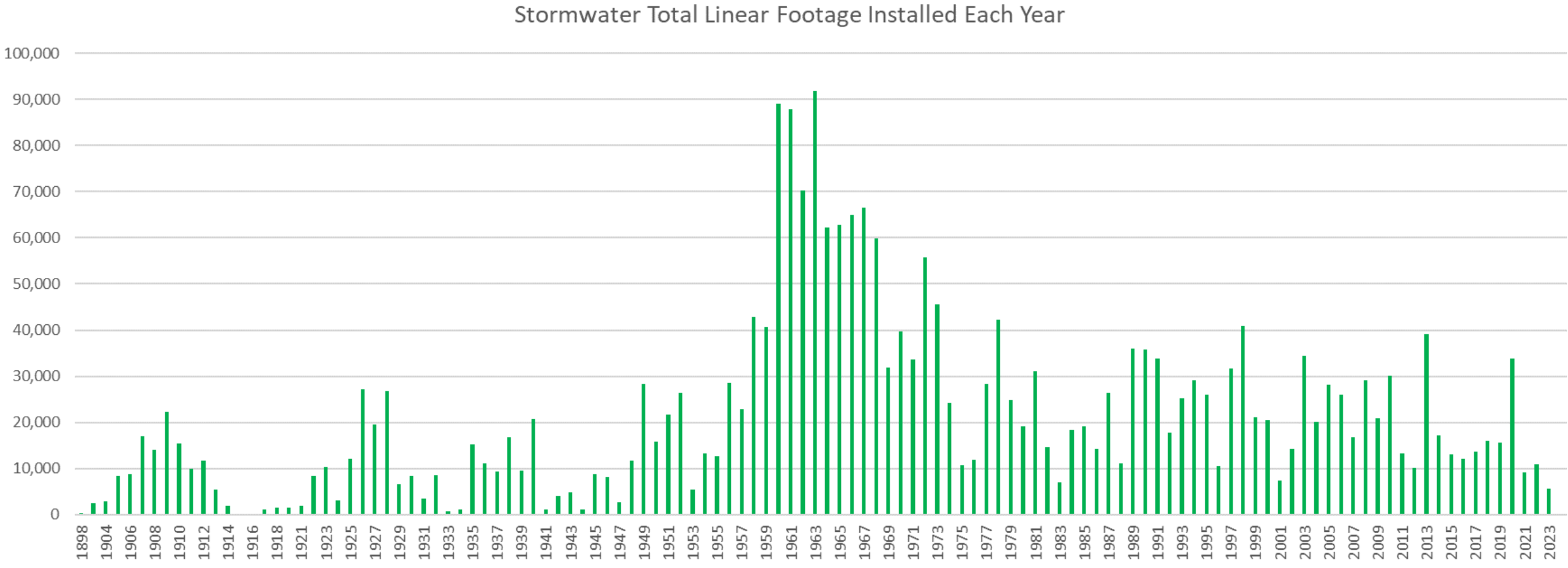
LOF – CONDITION ASSESSMENTS



LOF – WASTEWATER PIPE AGE

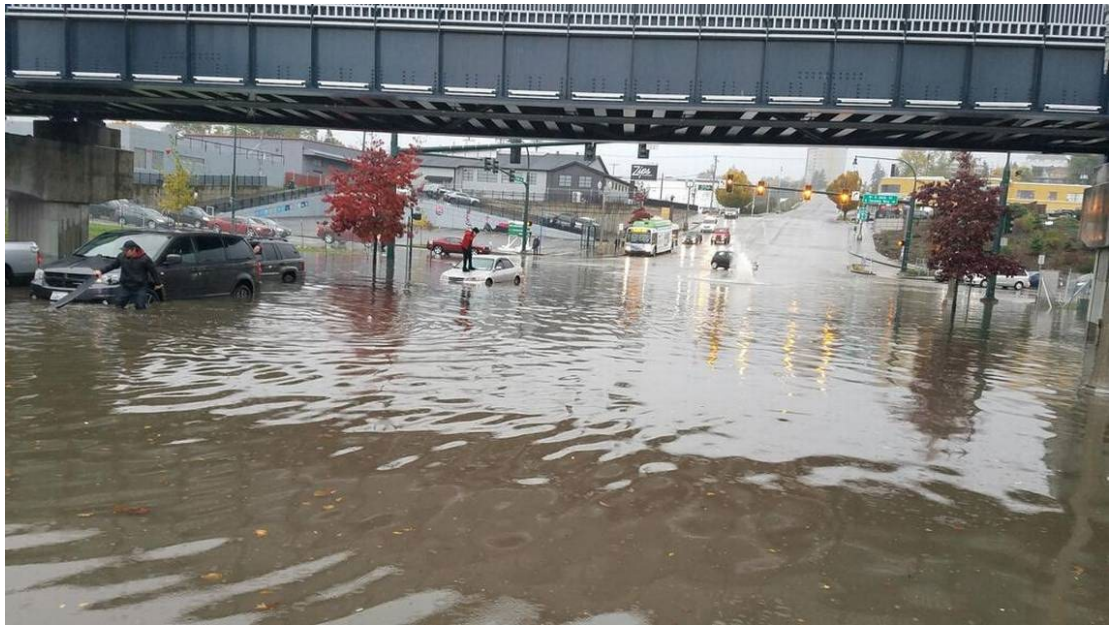


LOF – STORMWATER PIPE AGE

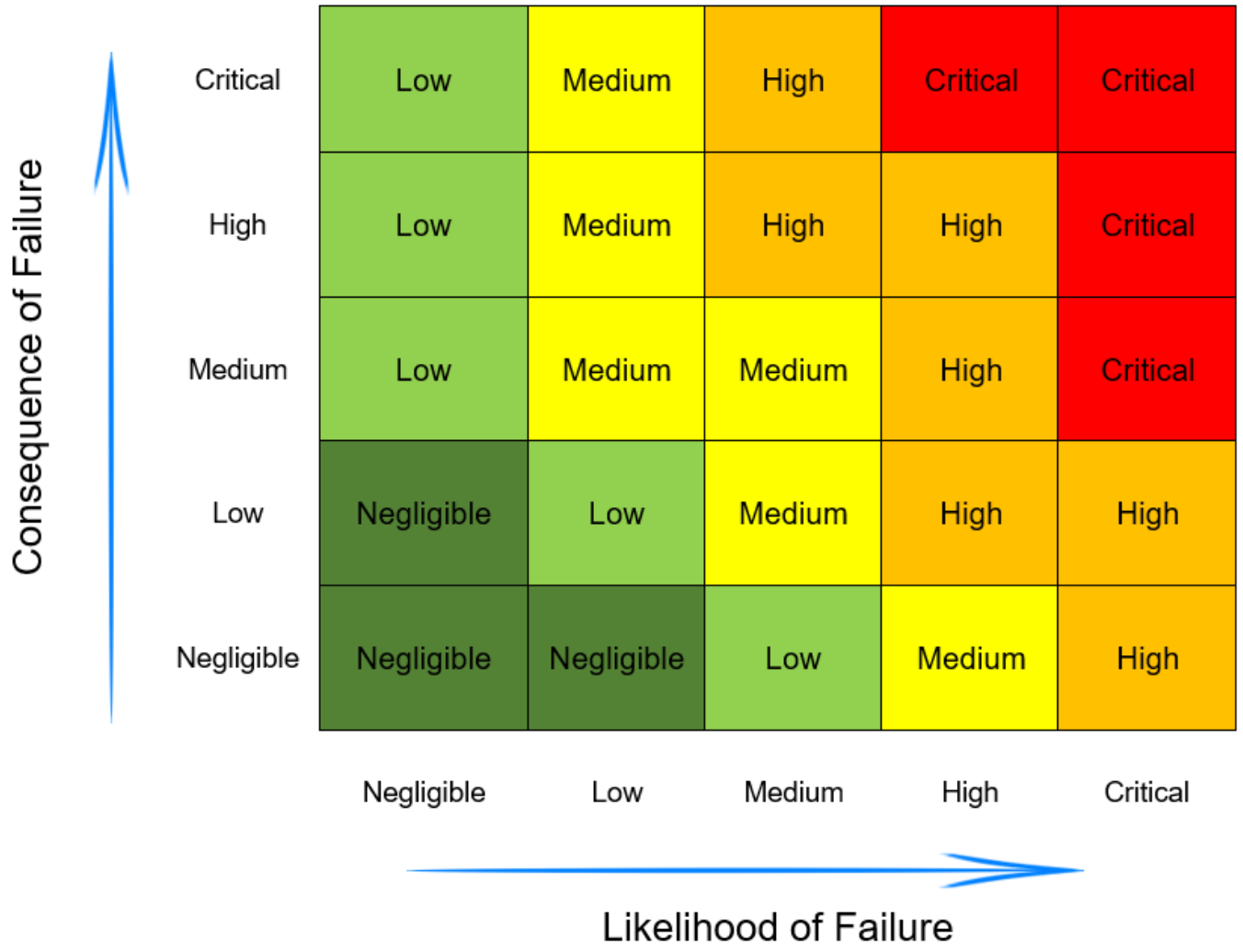


CONSEQUENCE OF FAILURE

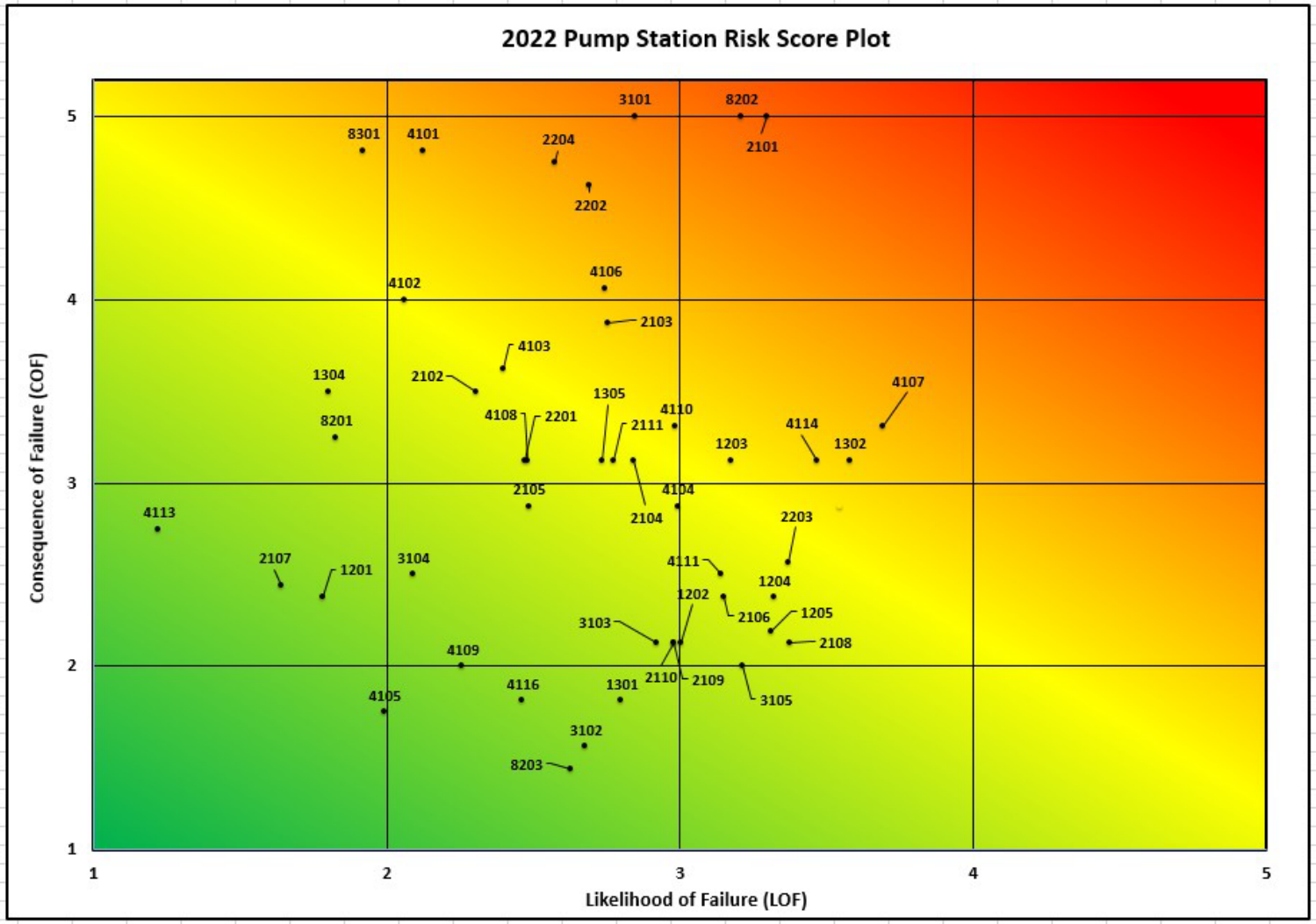
- Location
  - Steep slopes
  - Under buildings/highways/railroad tracks
  - Wetlands
- Flooding impact
- Size of Pipe



RISK EVALUATION



PUMP STATION RISK PLOT



	Pump Station	LO	CO	Ris
2101	SOUTH TACOMA PUMP STATION	3.30	5.00	16.49
8202	LEACH CREEK PUMP STATION	3.21	5.00	16.04
3101	DOCK STREET PUMP STATION	2.84	5.00	14.22
2202	MEMORIAL PARK PUMP STATION	2.69	4.63	12.44
4107	TAYLOR WAY PUMP STATION	3.69	3.31	12.23
2204	GRANDVIEW PUMP STATION	2.57	4.75	12.23
1302	PARK SIDE PUMP STATION	3.58	3.13	11.18
4106	LINCOLN & TAYLOR PUMP STATION	2.75	4.06	11.15
4114	HARBOR RIDGE PUMP STATION	3.47	3.13	10.83
2103	72ND STREET S & L PUMP STATION	2.75	3.88	10.67
4101	LINCOLN & OLYMPIC PUMP STATION	2.12	4.81	10.21
2113	CREEK RIDGE PUMP STATION	3.54	2.88	10.19
1203	NARROWS DRIVE PUMP STATION	3.17	3.13	9.92
4110	OVERLOOK PUMP STATION	2.99	3.31	9.89
8301	CLEVELAND WAY PUMP STATION	1.92	4.81	9.24
2104	S 73RD & WAPATO PUMP STATION	2.84	3.13	8.89
4103	LINCOLN AV / MARINE VIEW DR.PUMP	2.40	3.63	8.70
2111	CHINA LAKE PUMP STATION	2.77	3.13	8.66
2203	WESTERN SLOPES PUMP STATION	3.37	2.56	8.64
4104	LINCOLN AV / PORT OF TAC PUMP ST	2.99	2.88	8.60
1305	SALMON BEACH UPPER PUMPSTATION	2.73	3.13	8.54
4102	LINCOLN / ALEXANDER PUMP STATION	2.06	4.00	8.23
2102	ORCHARD STREET PUMP STATION	2.31	3.50	8.07
1204	MARINARA DR NORTH PUMP STATION	3.32	2.38	7.89
4111	HYLEBOS VIEW PUMP STATION	3.14	2.50	7.85
4108	MARINE VIEW DRIVE PUMP STATION	2.48	3.13	7.75
2201	TITLOW PUMP STATION	2.47	3.13	7.72
2106	S 61ST & AINSWORTH PUMPSTATION	3.15	2.38	7.48
1205	GOLD CREEK CONDOS PUMP STATION	3.31	2.19	7.24
2108	S 52ND & PACIFIC AV PUMP STATION	3.37	2.13	7.17
2105	S 93RD & HOSMER PUMP STATION	2.48	2.88	7.14
3105	PICKS COVE PUMP STATION	3.21	2.00	6.43
1202	VISTA VIEW DRIVE PUMP STATION	3.00	2.13	6.38
2109	VILLARD #1 PUMP STATION	2.98	2.13	6.33
2110	VILLARD #2 PUMP STATION	2.98	2.13	6.33
1304	SALMON BEACH LOWER PUMPSTATION	1.80	3.50	6.30
3103	11TH STREET BRIDGE PUMP STATION	2.92	2.13	6.21
8201	FLETT CREEK PUMP STATION	1.83	3.25	5.94
3104	15th and DOCK STREET PUMP STATION	2.09	2.50	5.22
1301	PARK PLACE PUMP STATION	2.80	1.81	5.08
4109	MILWAUKEE WAY PUMP STATION	2.26	2.00	4.52
4116	MARSHALL / PORT OF TAC PUMP STAT	2.46	1.81	4.46
1201	WINGATE S & L PUMP STATION	1.78	2.38	4.23
3102	91ST & EAST D ST PUMP STATION	2.68	1.56	4.18
2107	7TH & PACIFIC PUMP STATION	1.64	2.44	4.00
8203	LANDFILL PUMP STATION	2.63	1.44	3.78
4105	ROSS WAY & PORT OF TAC PUMP ST	1.99	1.75	3.48
4113	DASH POINT ESTATES PUMP STATION	1.22	2.75	3.36

PROJECT RANKING TOOLS

- Individual Assets → Project
- Methods of Grouping Assets into a Project:
  - Location and/or Process Area
  - Various Areas of Similar Work
  - Operational Impact
  - Bypassing
  - Sustainability
  - Other
- Alternatives Analysis
- Selected Alternative → CIP
- Next Step: Project Rankings

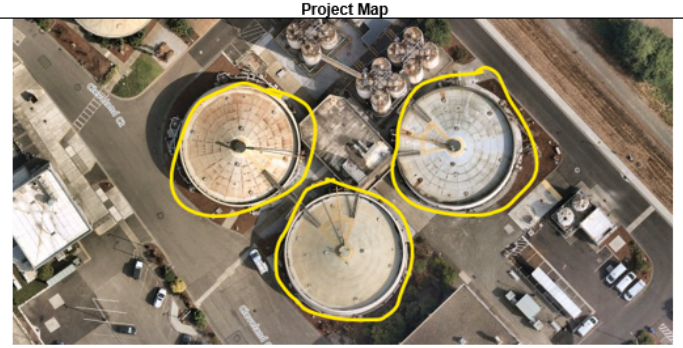
Project Name: AN3105 Picks Cove Rehab

Project Map

Project Type (Capital or Expense)		
Location	AN3105 Picks Cove Wastewater Pump Station	
Description	Rehabilitate and coat the wet well, replace wet well piping, pumps, and pump rails. Install venting for wet well. Rebuild or replace generator (TBD by O&M), remove abandoned control panel	
Consultant Info	N/A	
AMG Engineer	Matt Torrey	
O&M Contacts	Shelton Carr	
Consultant or Internal Design	Internal	
Disciplines Involved	Civil	X
	Structural	
	Mechanical	X
	Electrical	X
	Instrumentation & Control	
	Geotechnical	
	Coating	X
Project Challenges	Bypassing setup for coating and wet well work.	
Location of Supporting Info	\\fs005\group\ES_Asset_Management\12.0 Facilities\12.4 Pump Stations\Projects\AN4110 & AN3105 Rehab	
Permitting Requirements	N/A	
Estimated Cost	$400,000 (TBD based on generator outcome)	
Estimated Construction Duration (Months)	3	
Seasonal Requirements	Dry Season	
Construction Year	2024	

Project Name: CTP Digester Lid Coatings

Project Map



Project Type (Capital or Expense)	Capital (PLPT-100202)	
Location	Central Treatment Plant – Anaerobic Digesters	
Description	Prepare and apply engineered coatings to the top, interstitial interior space, and solids side of each anaerobic digester lid. The coatings are original to the digester and are failing.	
Consultant Info	N/A	
AMG Engineer	Matt Torrey	
O&M Contacts	Scott Long, Gary Peterson	
Consultant or Internal Design	Internal	
Disciplines Involved	Civil	X
	Structural	
	Mechanical	
	Electrical	
	Instrumentation & Control	
	Geotechnical	
	Coating	X
Project Challenges	Surface preparation of interstitial and solids interior surfaces.	
Location of Supporting Info	\\fs005\group\ES_Asset_Management\12.0 Facilities\12.2 CTP\12.2.3 Studies\Digester 3 Inspections 2022	
Permitting Requirements	N/A	
Estimated Cost	$1,797,739	
Estimated Construction Duration (Months)	Four	
Seasonal Requirements	Yes – Weather requirements for coating	
Construction Year	2025	

PROJECT RANKING TOOLS

Filter Projects: WW Central Treatment Plant

Project Name

CTP Thermophilic Digester Tower - Quad C

Project Description

Recoat the inside of each of the four towers, replace or rehabilitate the sludge distribution box, rebuild each of the mixers, recoat the handrails, replace the grating and drain piping, and repair the exterior Dryvit insulation system.

Project Challenges

Ingress for coating. Use lessons learned from A quad rehab.

Open Tableau Report

	Impact to Interconnected Processes	Impact to Hydraulic Capacity (Flow only, not treatment)	Impact on Redundancy	Impact to Regulatory Permits (NPDES, Air Quality, Biosolids)	Impacts to Safety	Impact of Delay
COF	0	0	7	0	7	7

	System Reliability	Condition or Remaining Useful Life
LOF	7	7

	Sustainability	Efficiency Improvements	Customer Exp/Satisfaction	Equity Index	Community & Econ Development	Grant Funding
OTHER	0	0	5	0	0	0

	Consequence of Failure (COF)	Likelihood of Failure (LOF)	Other Factors	Risk
SCORES	3.5	7	5	24.5

CRITERIA OVERVIEW (WW FACILITIES)

COF	Impact to Interconnected Processes	Impact to Hydraulic Capacity (Flow only, not treatment)	Impact on Redundancy	Impact to Regulatory Permits (NPDES, Air Quality, Biosolids)	Impacts to Safety	Impact of Delay
	7	3	0	0	3	0

0 No impact to other processes
3 Minor impact to other process (Process can still function)
5 Major impact to one other process (Process can not function)
7 Major impact to two other process (Process can not function)
10 Major impact to 3 or more process areas (Process cannot function)

OTHER	Sustainability	Efficiency Improvements	Customer Exp/Satisfaction	Equity Index	Community & Econ Development	Grant Funding
	0	3	5	0	0	0

0 No impact on sustainability
3 Moderate impact on sustainability
5 Significant impact on sustainability

TOOLTIP

o Reduce energy use

o Reduce toxic chemical usage

o Reduce number of unsewered homes

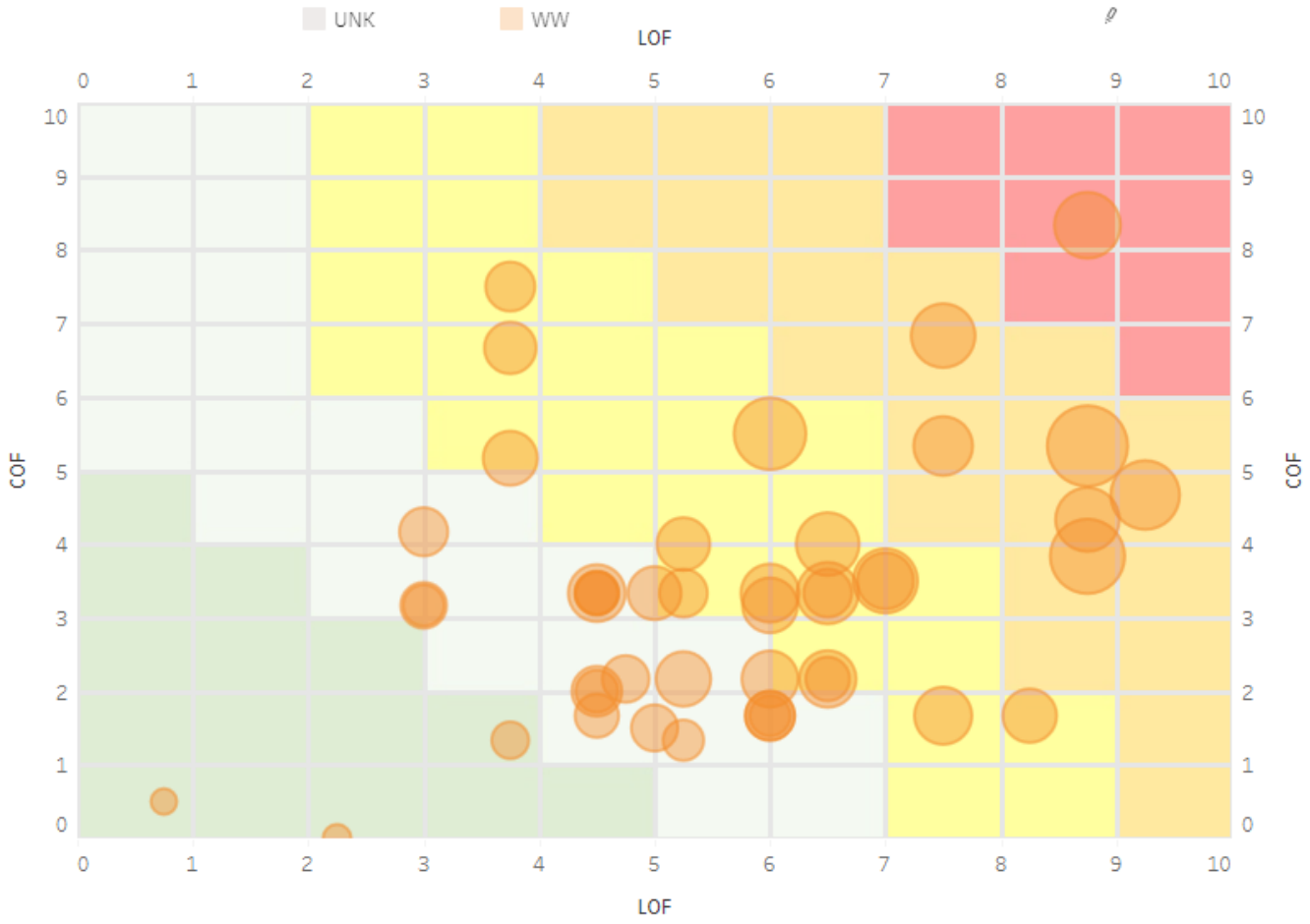
o Increase on-site energy generation

o Reduce greenhouse gas emissions

PROJECT RANKING TOOLS

SW | WW (Multiple values) | SWM

Project Risk Matrix



Project List Scoring

TITLE	FUND	COF	LOF	OTHER	COLOR
CTP SEPS and NIPS VFD Replacement	WW	8.3	8.8	0.5	1
CTP Mixed Liquor Channel Pipe Replacement	WW	3.8	8.8	0.5	2
CTP O2 Deck Flow Meter and Yard Water Header Replacement	WW	4.3	8.8	0.0	2
NETP Influent PS Rehabilitation	WW	6.8	7.5	1.5	2
Titlow and Grandview Pump Station Rehab	WW	5.3	7.5	1.0	2
WW CTP BSST Transfer Pump Replacement Project	WW	4.7	9.3	1.7	2
WW NETP Trickling Filter Upgrade	WW	5.3	8.8	1.3	2
CTP - Inf/Eff/PWW Flow Meter Replacement	WW	4.0	5.3	0.0	3
CTP - Bldg P HVAC Process	WW	3.2	6.0	1.8	3
CTP Building A HVAC Replacement	WW	1.7	8.3	2.2	3
CTP DAFT Odor Control System Rehabilitation/Media Replacement	WW	5.5	6.0	1.0	3
CTP Digester Lid Coatings	WW	3.3	5.3	0.0	3
CTP Effluent River Outfall Vault Rehab	WW	7.5	3.8	0.0	3
CTP Elevator Modernization Upgrades	WW	2.2	6.0	0.5	3
CTP Lincoln Avenue Pipe Bridge	WW	6.7	3.8	1.0	3
CTP Outfall ARV Replacement	WW	4.0	6.5	0.8	3
CTP Primary Settling Tank 2213	WW	3.3	6.5	0.0	3
CTP Primary Settling Tank 2214	WW	3.3	6.5	0.0	3
CTP Thermophilic Digester Tower - Quad B	WW	3.5	7.0	0.8	3
CTP Thermophilic Digester Tower - Quad C	WW	3.5	7.0	0.8	3
WW - AN1204 Marinera	WW	2.2	6.5	0.0	3
WW - AN1302 Parkside	WW	2.2	6.5	0.0	3
WW - AN3105 Picks Cove Pump Station Rehab	WW	1.7	7.5	0.8	3
WW CTP Biofilter Media Replacement	WW	3.3	6.0	1.5	3
WW CTP Secondary Clarifier #4 & #6 Restoration	WW	5.2	3.8	0.5	3
WW CTP Thermophilic Digester Tower A Restoration and Improvemen..	WW	3.3	5.0	0.8	3

STORMWATER FACILITY PRIORITIZATION TOOL

Ranking priority neighborhoods based on watershed goals:

Goal 1: Clean Water

1.1 Prioritize high pollutant concentrations of COCs:

Phthalate
PAHs (Phenanthrene, Pyrene)
Metals (Copper, Zinc)
Nutrients (Nitrogen, Phosphorus)
Total Suspended Solids

1.2 Focus on areas with less existing treatment devices

Goal 2: Climate Resilience

2.1 Target Urban Heat Islands

2.2 Known Pipe capacity issues

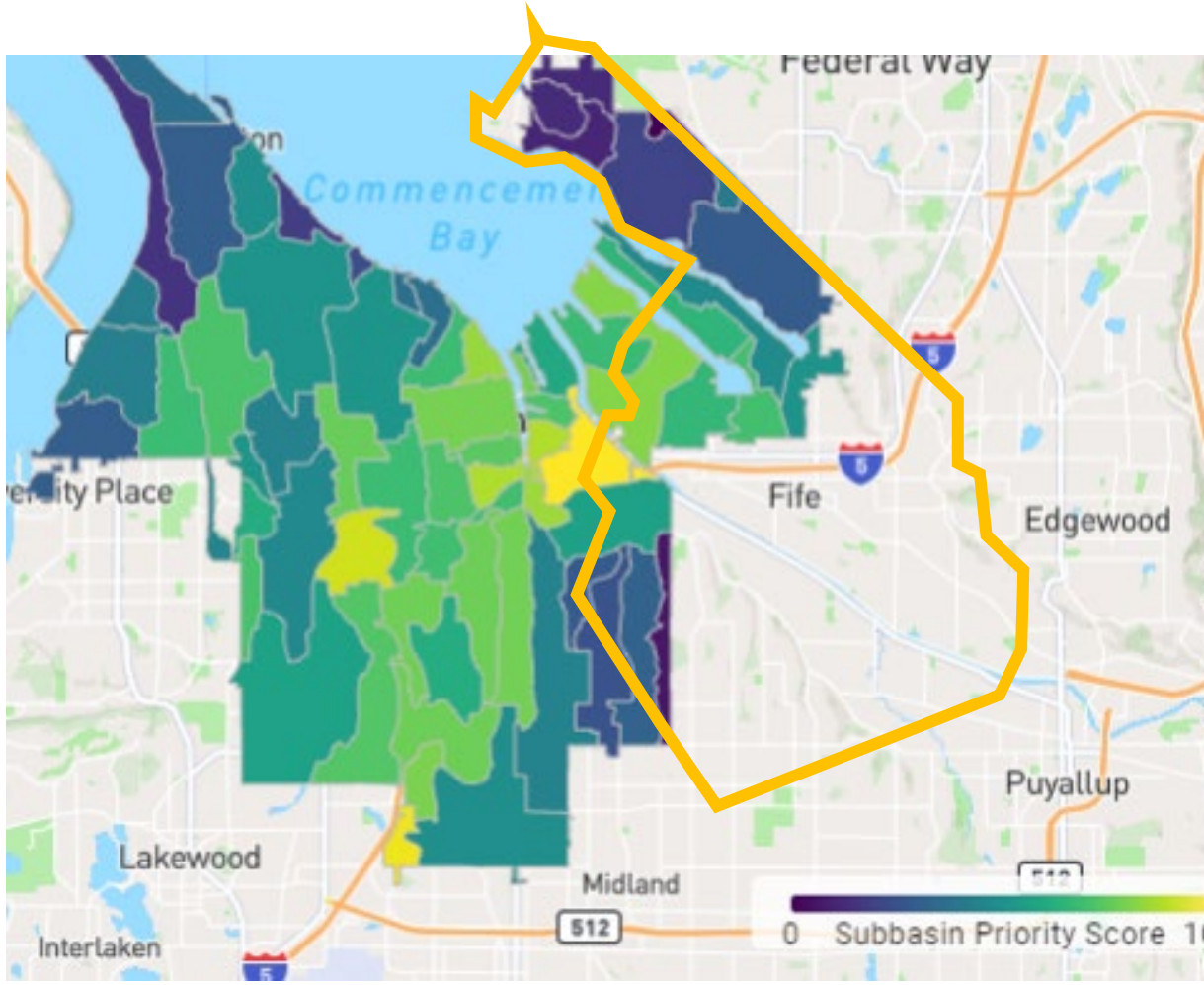
Goal 3: Sensitive Habitat Protection

3.1 Presence of Open space/Biodiversity Corridors

Goal 4: Health Equity

4.1 Apply Equity Index and Livability Criteria

4.2 Roadway Condition

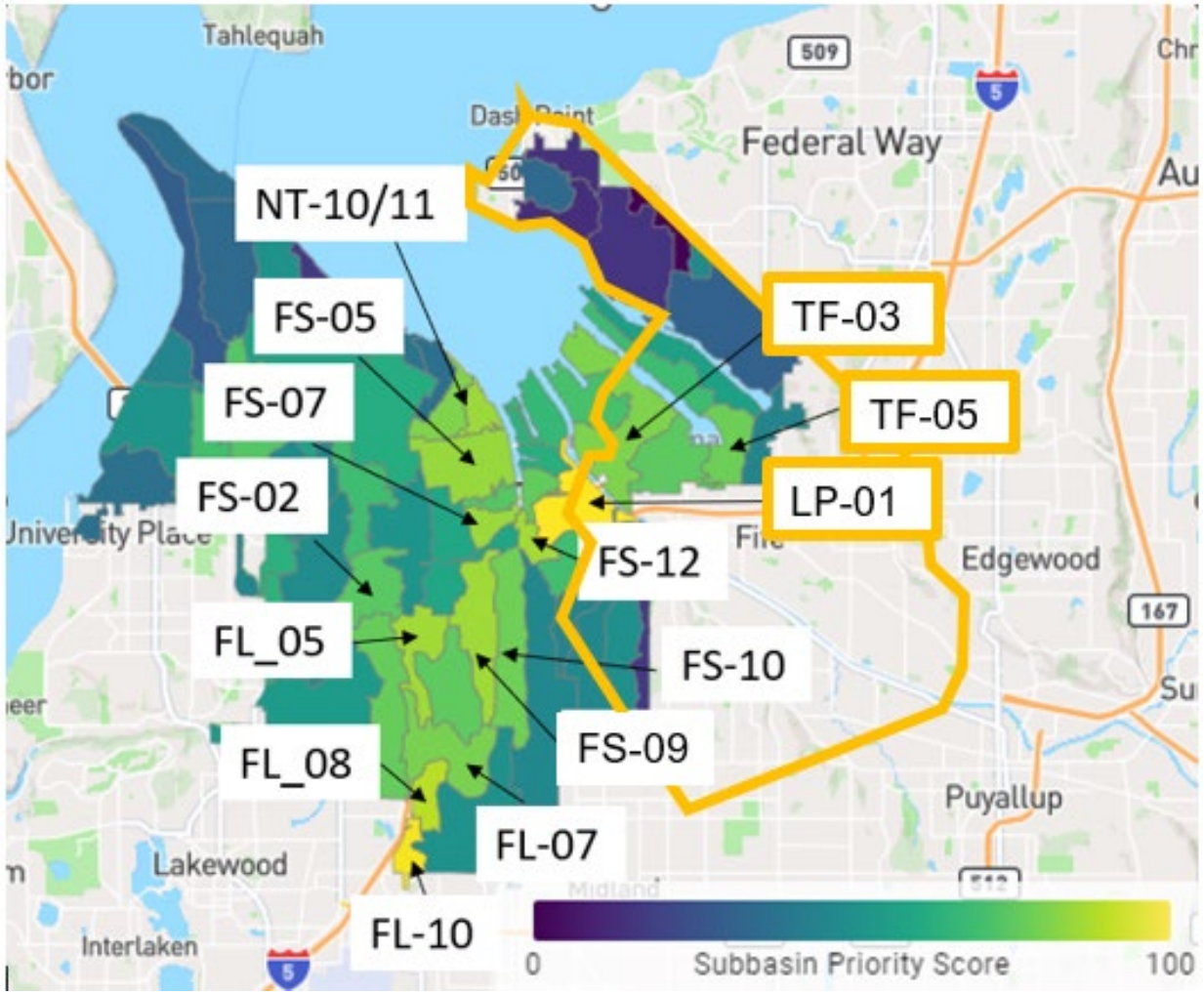


Puyallup Tribe 1873 Reservation Lands Survey boundary

Stormwater/Watershed Focus Areas

Top priority watershed neighborhoods :

- **Lower Puyallup** LP-01
- **Tideflats** TF-03, TF-05
- **Flett Creek (South Tacoma)** FL-10, FL-08, FL-07, FL-05
- **Thea Foss Waterway (Tacoma Mall, Lincoln District & Downtown)** FS-12, FS-10, FS-09, FS-07, FS-05, FS-02
- **North Tacoma (Schuster/Stadium)** NT-11, NT-10



Puyallup Tribe 1873 Reservation Lands Survey boundary

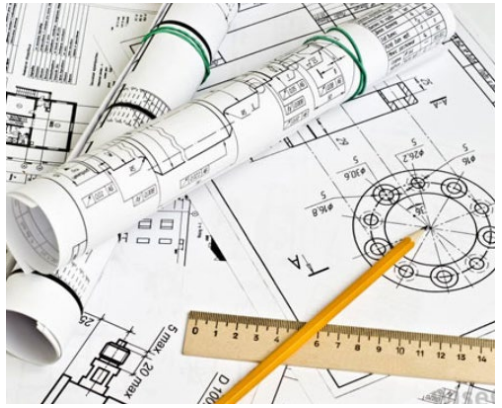
Stormwater Priority Action List 2024-2025

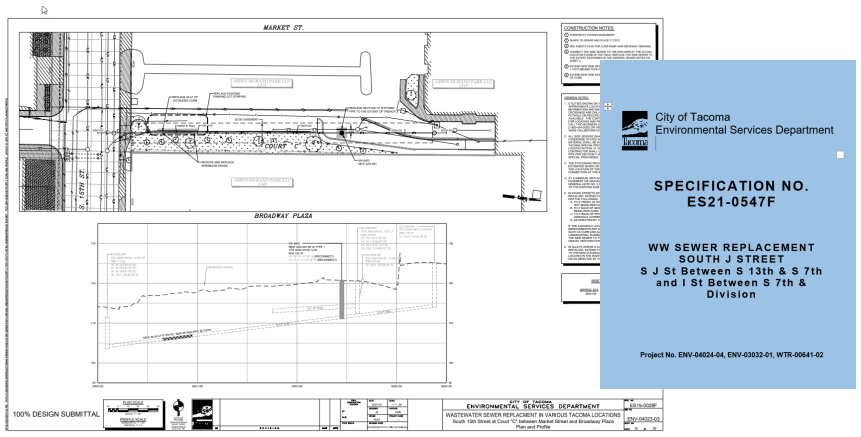
Urban Waters Protection (UWP) Plan framework for priority areas:

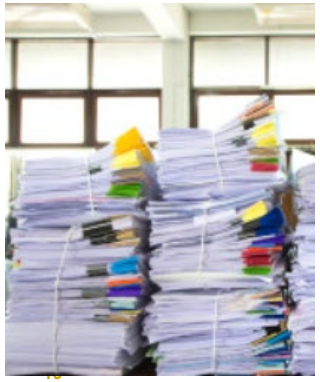
- List of potential regional stormwater system retrofits or new capital facilities
- List of Stormwater Management Program activities to enhance:
  - Street Sweeping
  - Public Outreach and Engagement
  - Business Assistance

DELIVERING CAPITAL PROJECTS

Surveyors ● Engineering Technicians ● Engineers ● Construction Managers ● Inspectors

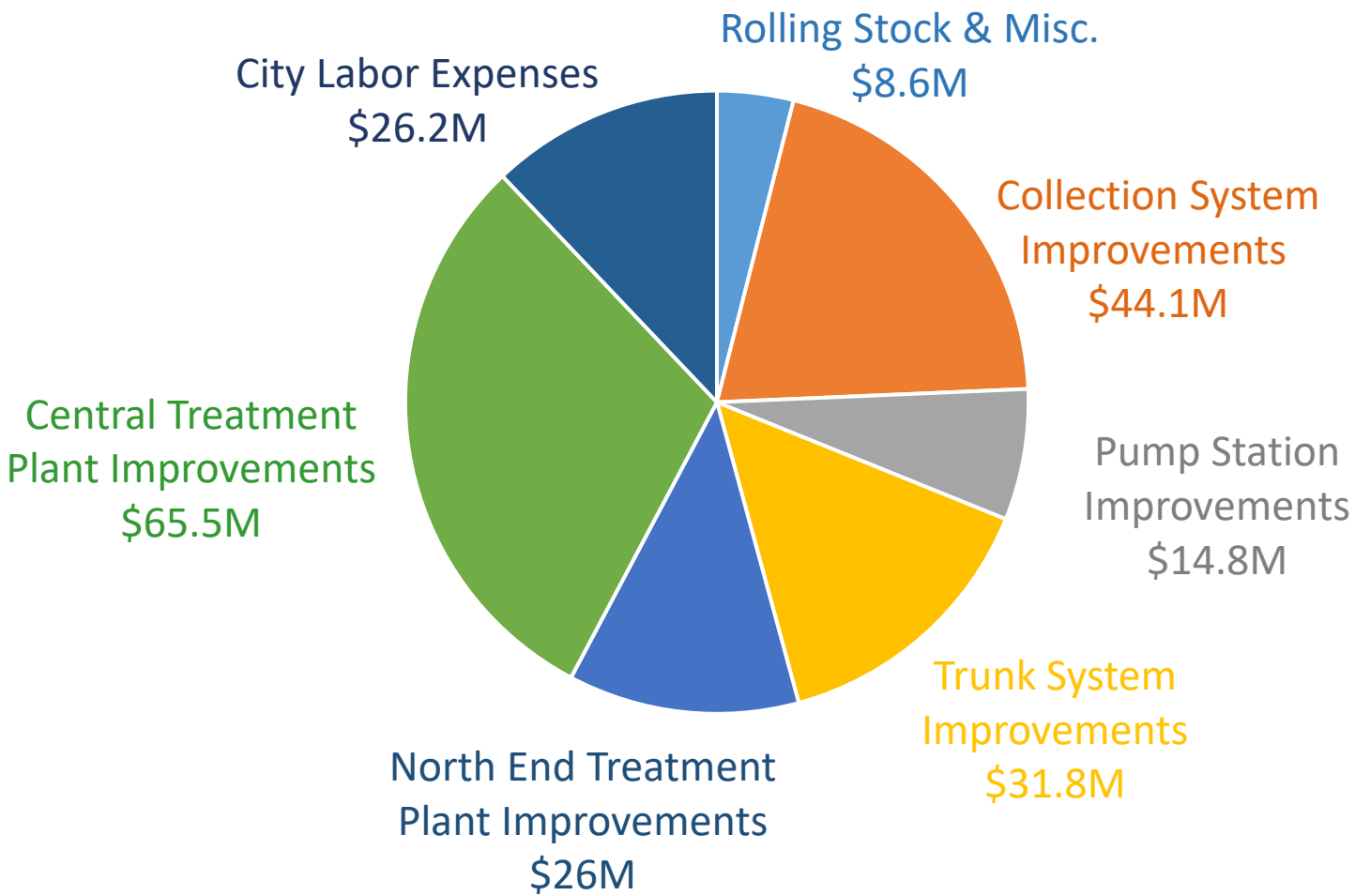


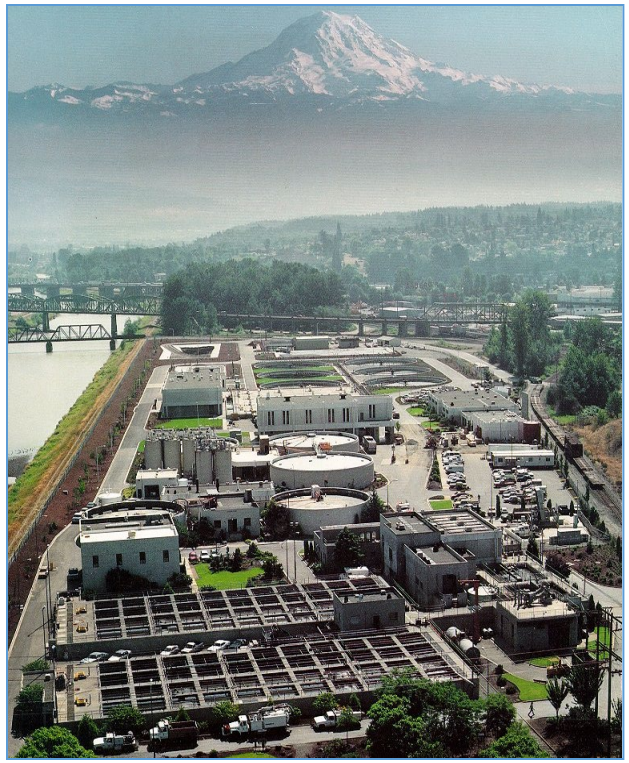




WASTEWATER CATEGORIES & COSTS

6 Year Total Cost (2025-2030) = $217M
Annual Average = $36.2M





RECENTLY COMPLETED WASTEWATER PROJECTS

Secondary Clarifier #5
Mechanical Improvements
& Coating
$2M
2023

NETP Solids Holding Tank
Bioscrubber Project
$1.5M
2024

South Tacoma Pump
Station Rehabilitation
Phase 1
$6.2M
2023

Concrete Rehab – Secondary Clarifier Tank

FUTURE SIGNIFICANT WASTEWATER PROJECTS

CTP Concrete Repairs/Coatings
$22M
2025-2030

NETP Trickling Filter Project
$20M
2025-2027

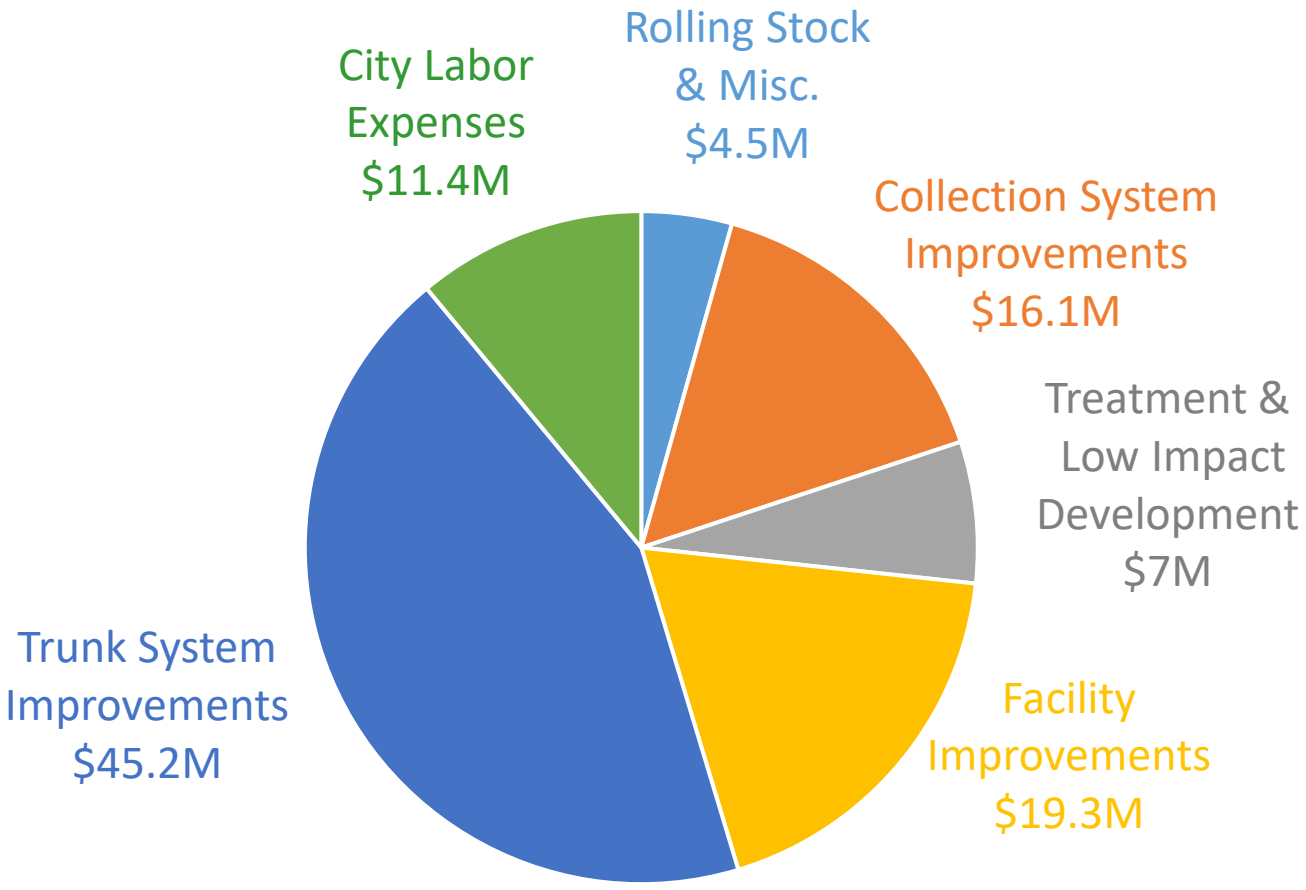
Approximately 2.3 Miles of Misc. Underground Pipe Improvements
$49.7M
2025-2030

Puyallup Avenue Wastewater Trunk Line Replacement Project
$26.3M
2024-2027

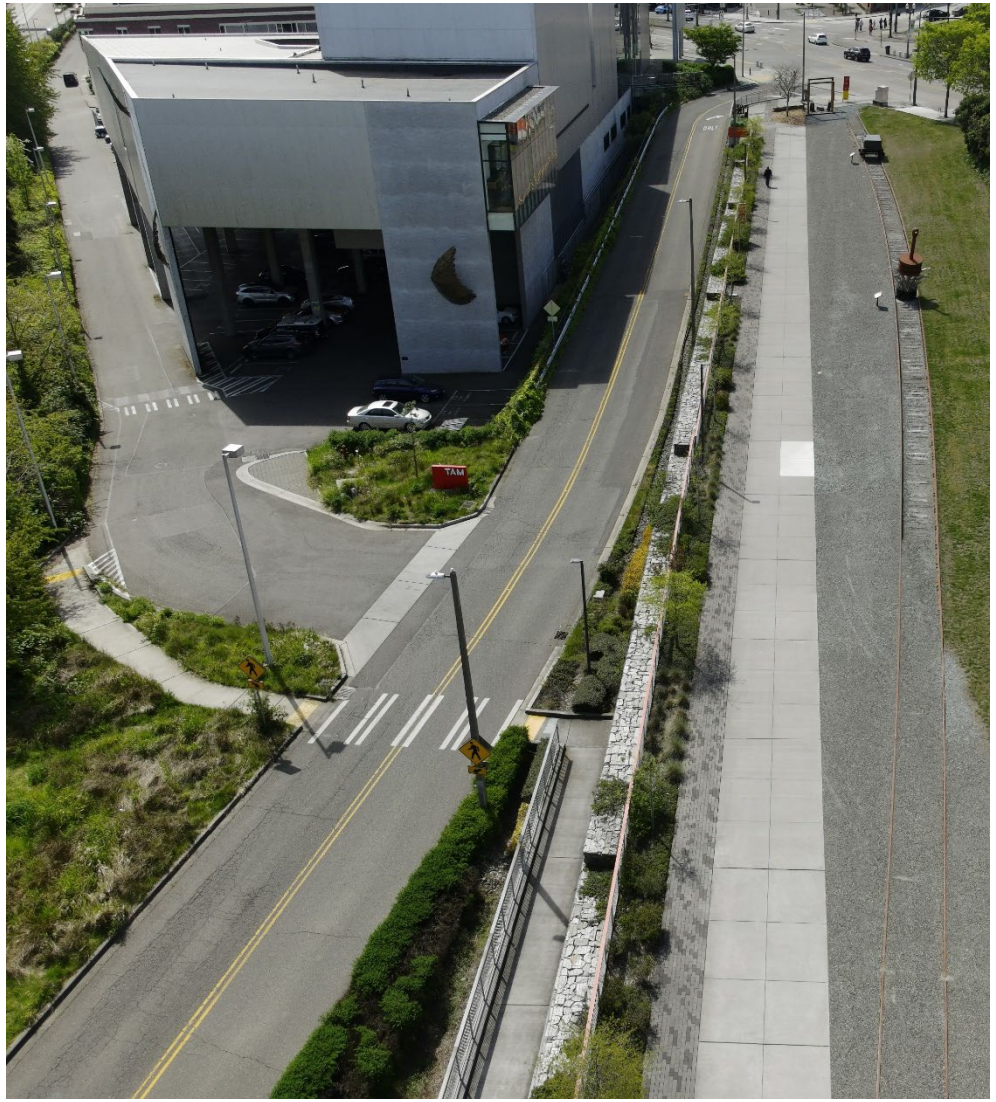
North End Wastewater Treatment Plant
Second Trickling Filter Project

STORMWATER CATEGORIES & COSTS

6 Year Total Cost (2025-2030) = $103.5M
Annual Average = $17.3M



RECENTLY COMPLETED STORMWATER PROJECTS



Manitou District Green Infrastructure Project
$3.4M
2024

Jefferson/Hood Stormwater Interceptor Project
$36M
2023

Larchmont District Pervious Pavement Project
$9M
August 2024

Madison District Green Infrastructure Project
$8.2M
2024

GREEN STORMWATER PERVIOUS PAVEMENT

FUTURE SIGNIFICANT STORMWATER PROJECTS

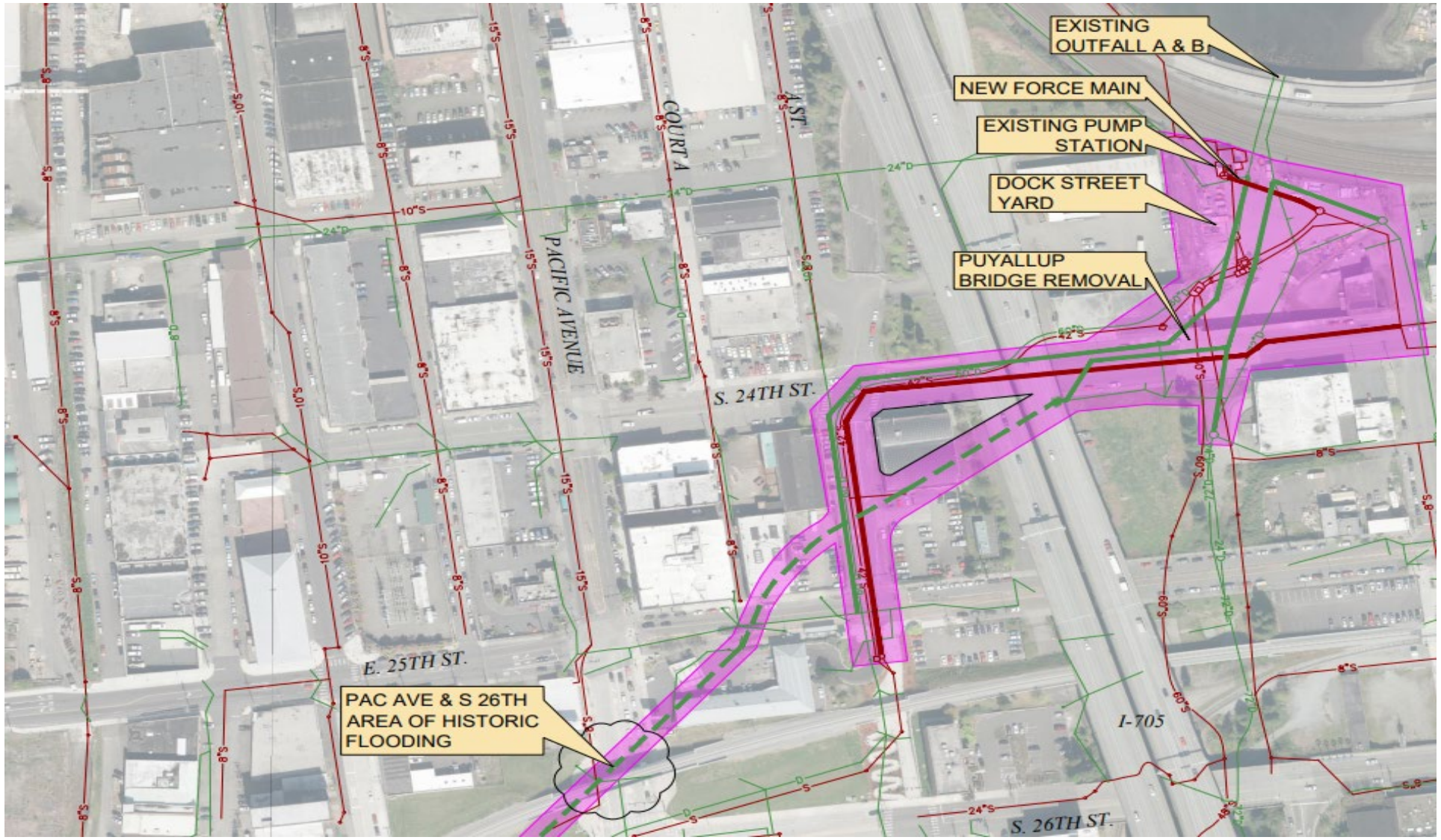
Titlow Park
Regional Treatment
$7M
2026-2027

Approximately 0.5 Miles of Misc. Underground Pipe Improvements
$4.7M
2025-2030

Storm Sewer Upgrades in Partnership with Public Works Street Improvement Projects
$6.5M
2025-2027

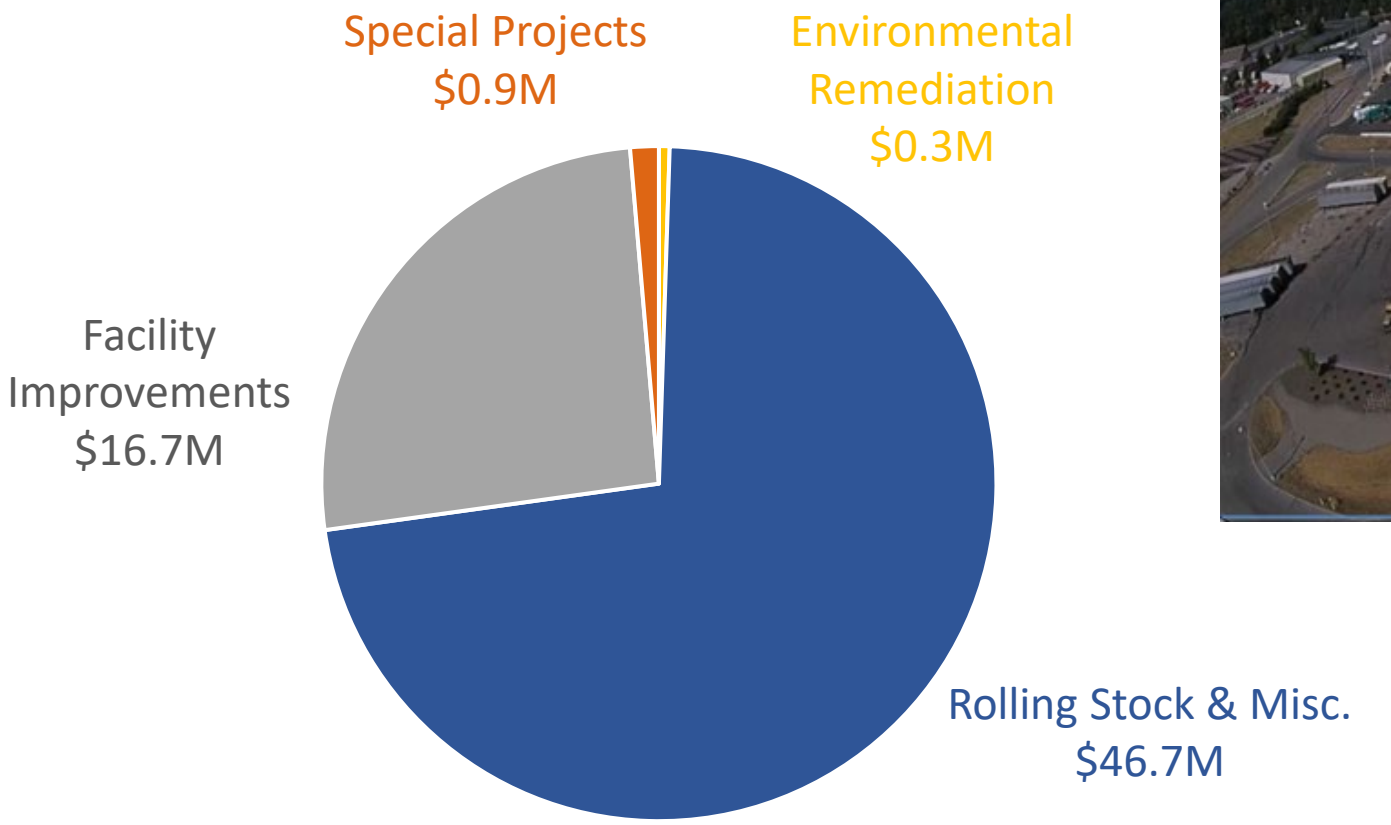
Puyallup Avenue Stormwater Trunk Line Project
$39.3M
2024-2027

PUYALLUP AVENUE STORMWATER & WASTEWATER INTERCEPTOR PROJECT

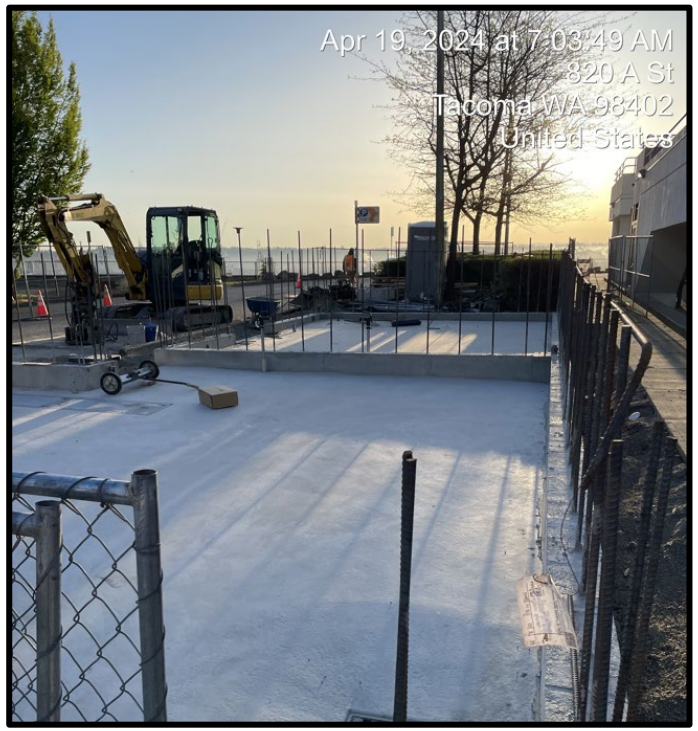


SOLID WASTE CATEGORIES & COSTS

6 Year Total Cost (2025-2030) = $64.6M
Annual Average = $10.7M



RECENTLY COMPLETED SOLID WASTE PROJECTS

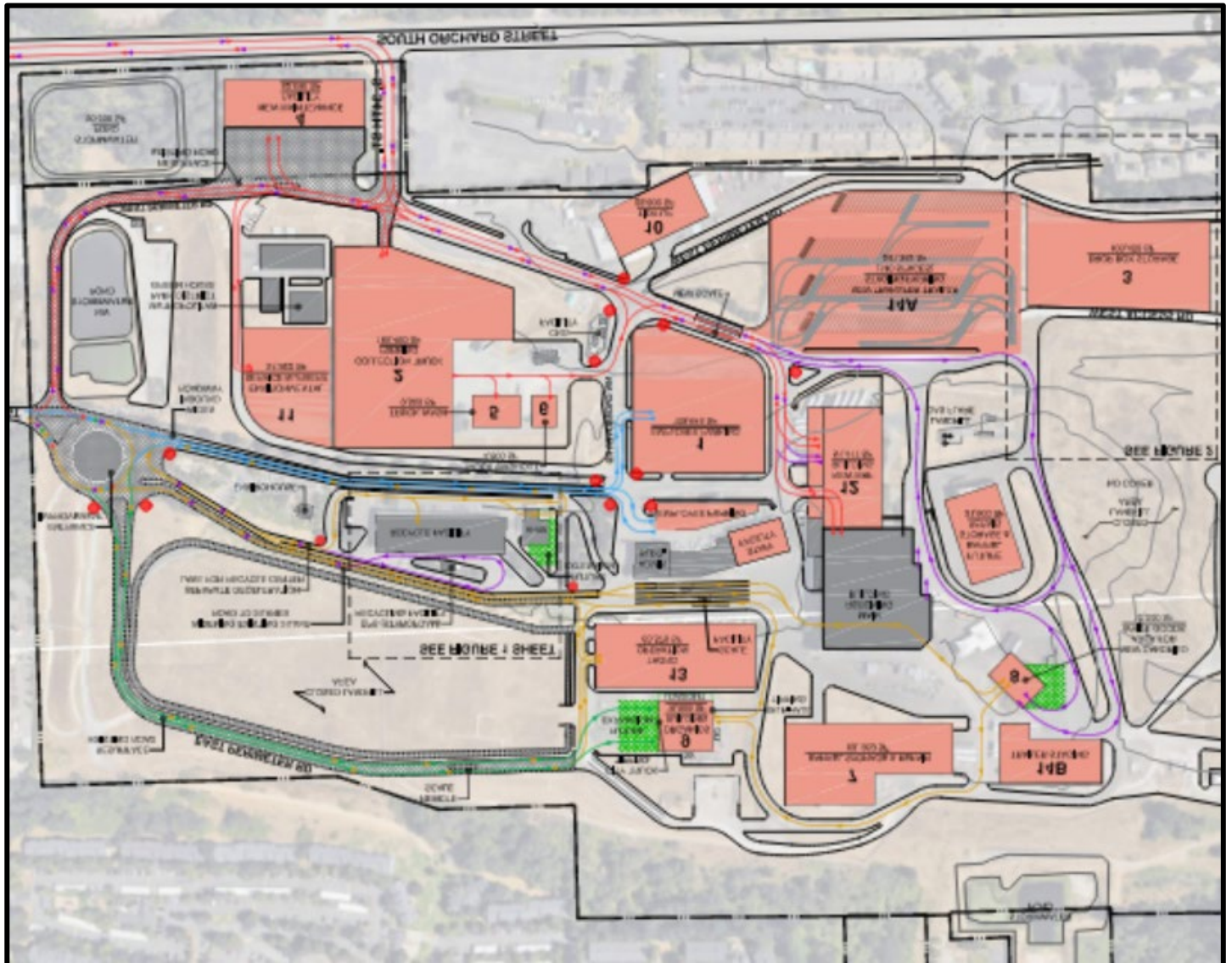


Downtown Compactors
Sites A&B
$1.5M
2024

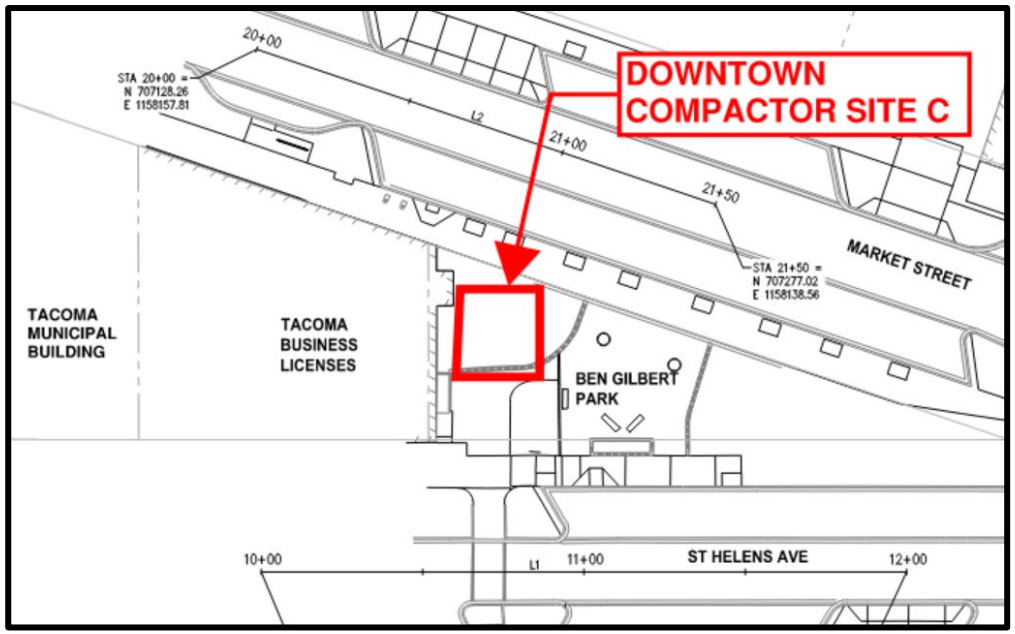
Facility Master Plan
$400K
2024

Flare Station Landfill
Cap Repair
$200K
2023

SOLID WASTE FACILITY MASTER PLAN



FUTURE SIGNIFICANT SOLID WASTE PROJECTS



Downtown
Compactor Site C
$1.1M
2024-2025

Main Receiving Building
Backup Generator
$900K
2024-2026

CNG Fueling Expansion
$1.2M
2024-2025

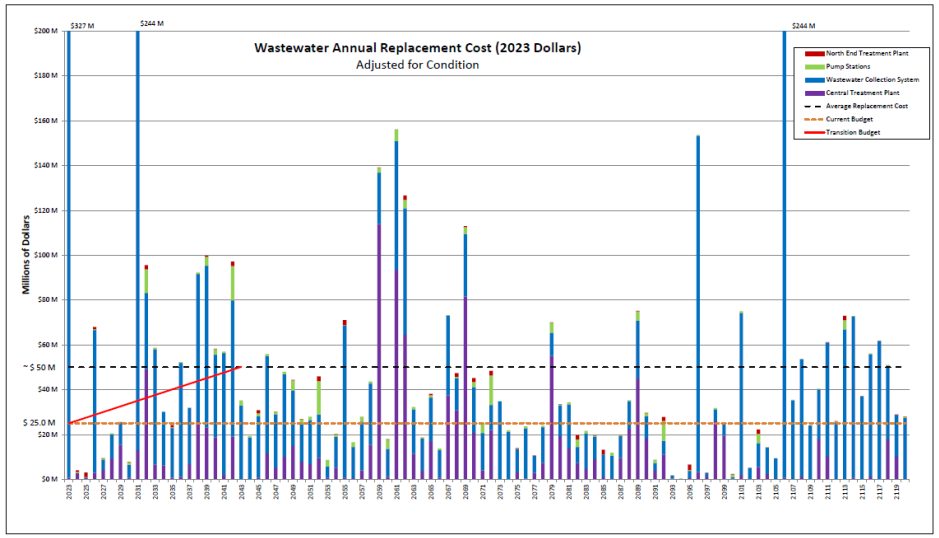
LONG RANGE FUNDING MODEL

What we know:

- Thousands of Existing Assets
- Different Design Life
- System built in Waves
- Construction Cost Increasing
- Aging Infrastructure

Questions:

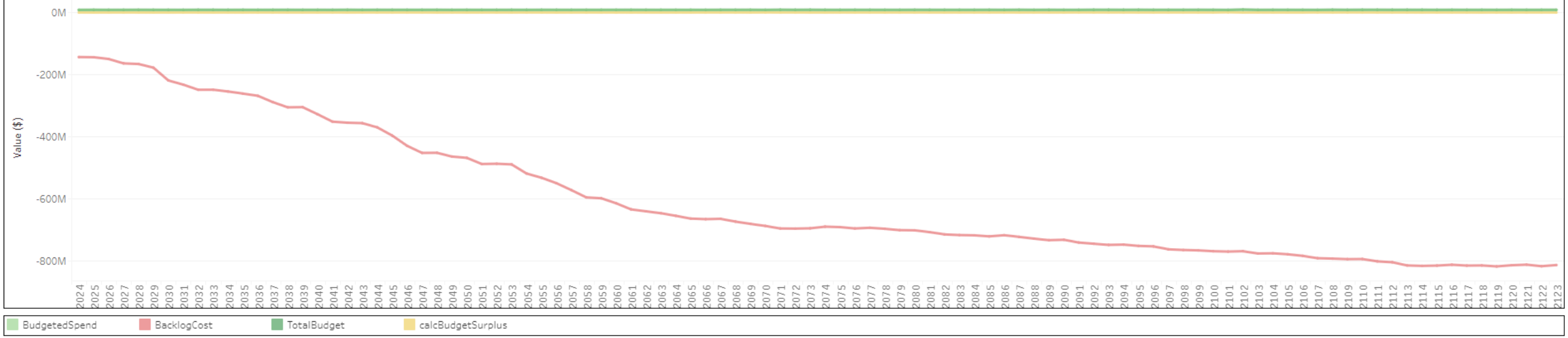
- How do we know if we are adequately funding the renewal/replacement of our existing assets now and into the future?
- What risk is there to the utilities?
- What steps can we take now to better position the utilities to address future needs?



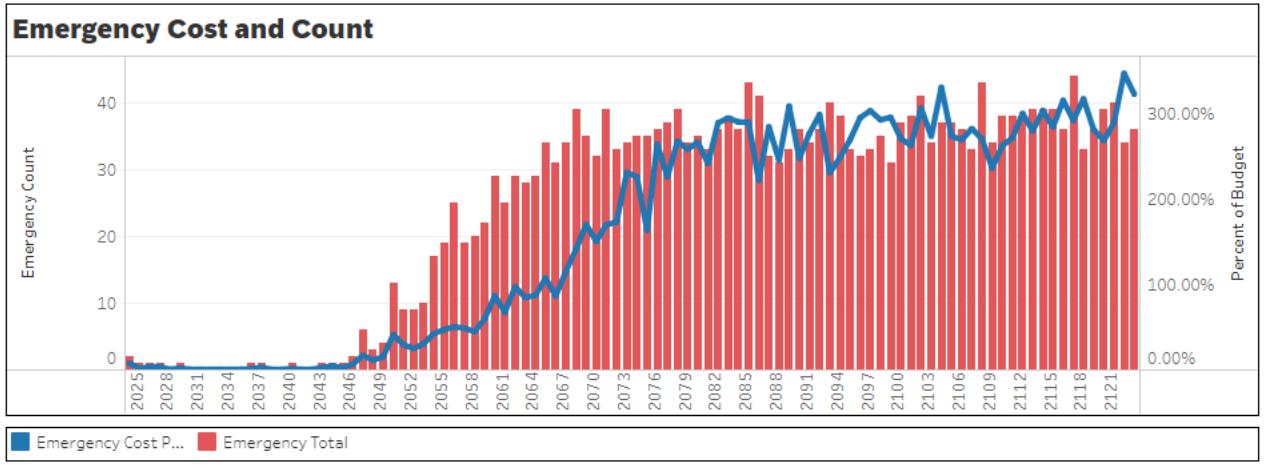
LONG RANGE FUNDING MODEL
WW Collection System

Model: 33: WW Collection Conveyance - Existing Spend Rate

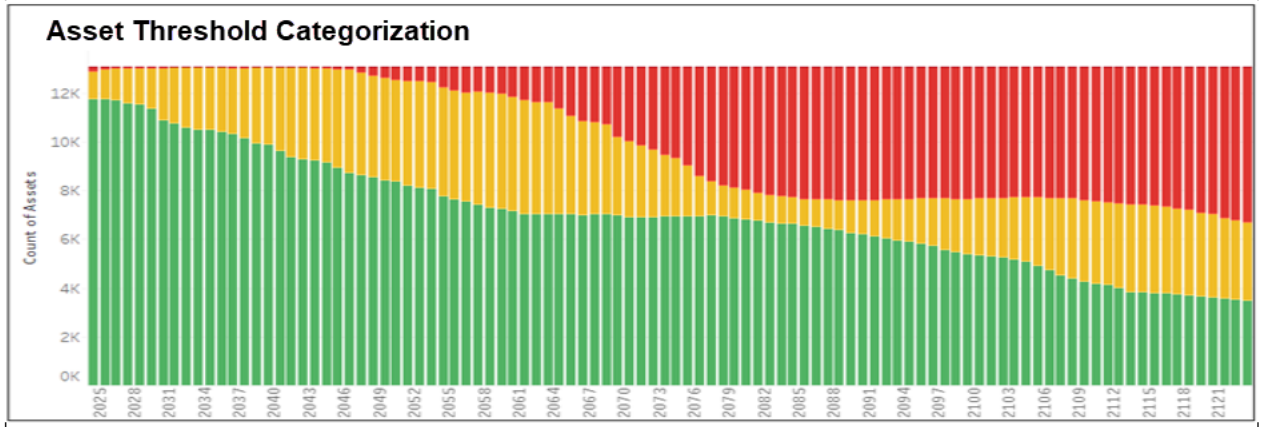
Backlog Projection



Emergency Cost and Count



Asset Threshold Categorization

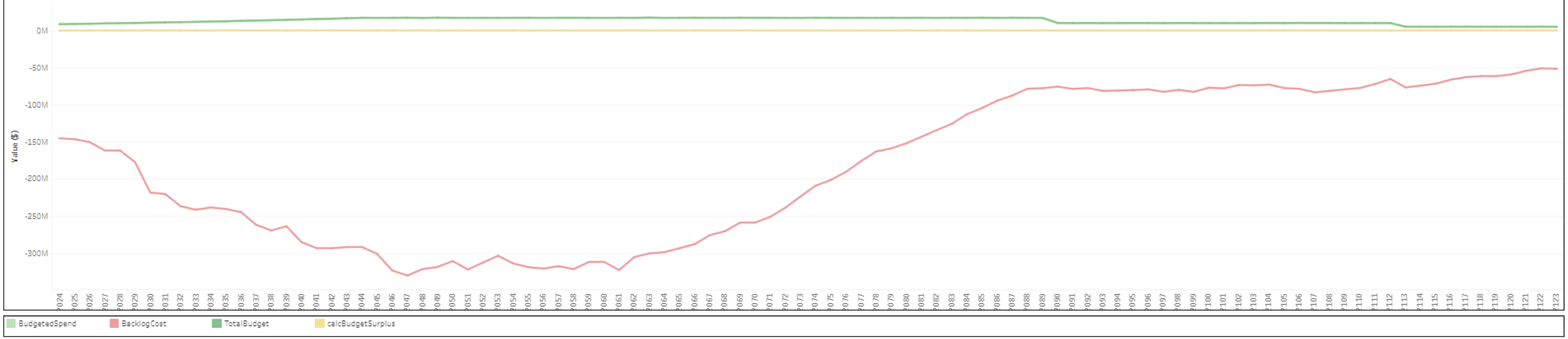


Budget Projection | System Population Charts | Actions Taken | Raw Data

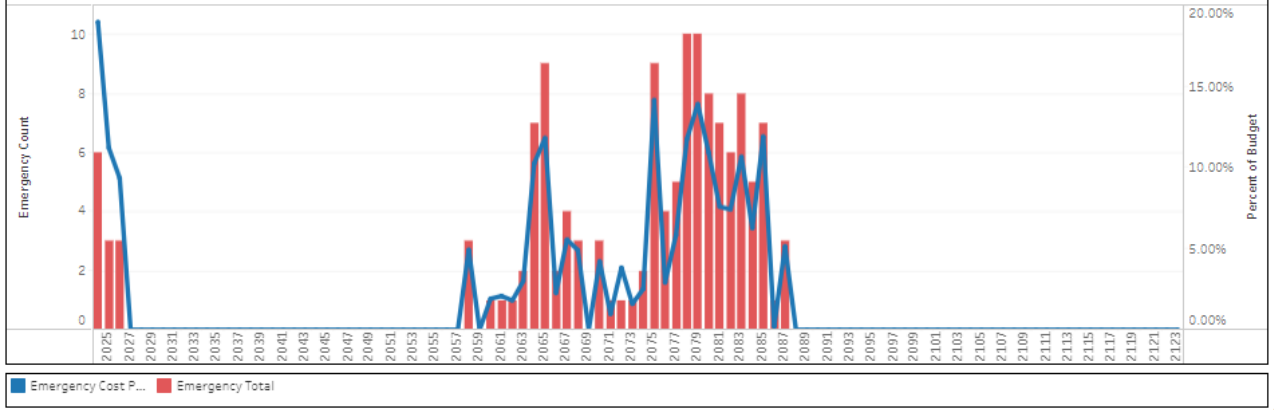
LONG RANGE FUNDING MODEL
WW Collection System

Model: 34: WW Collection Conveyance - 2X spending by 2043

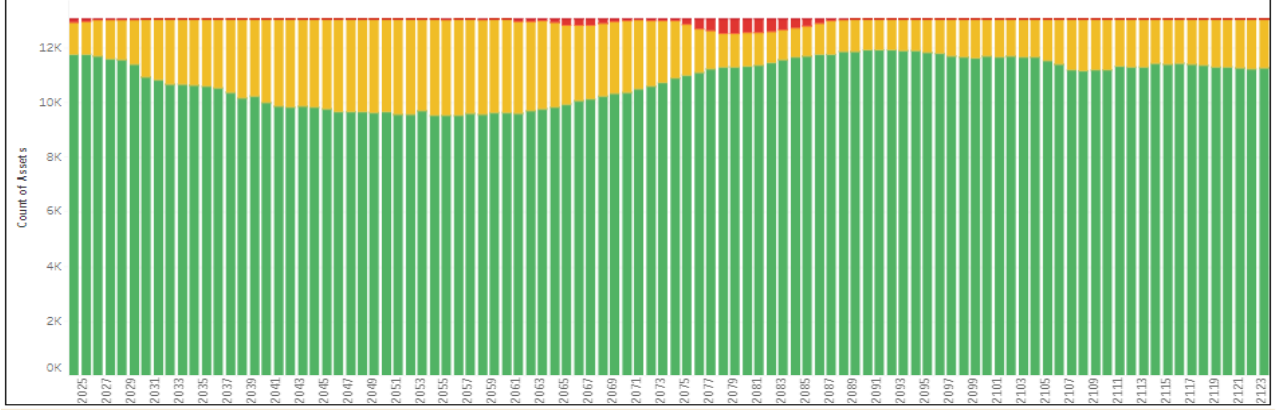
Backlog Projection



Emergency Cost and Count

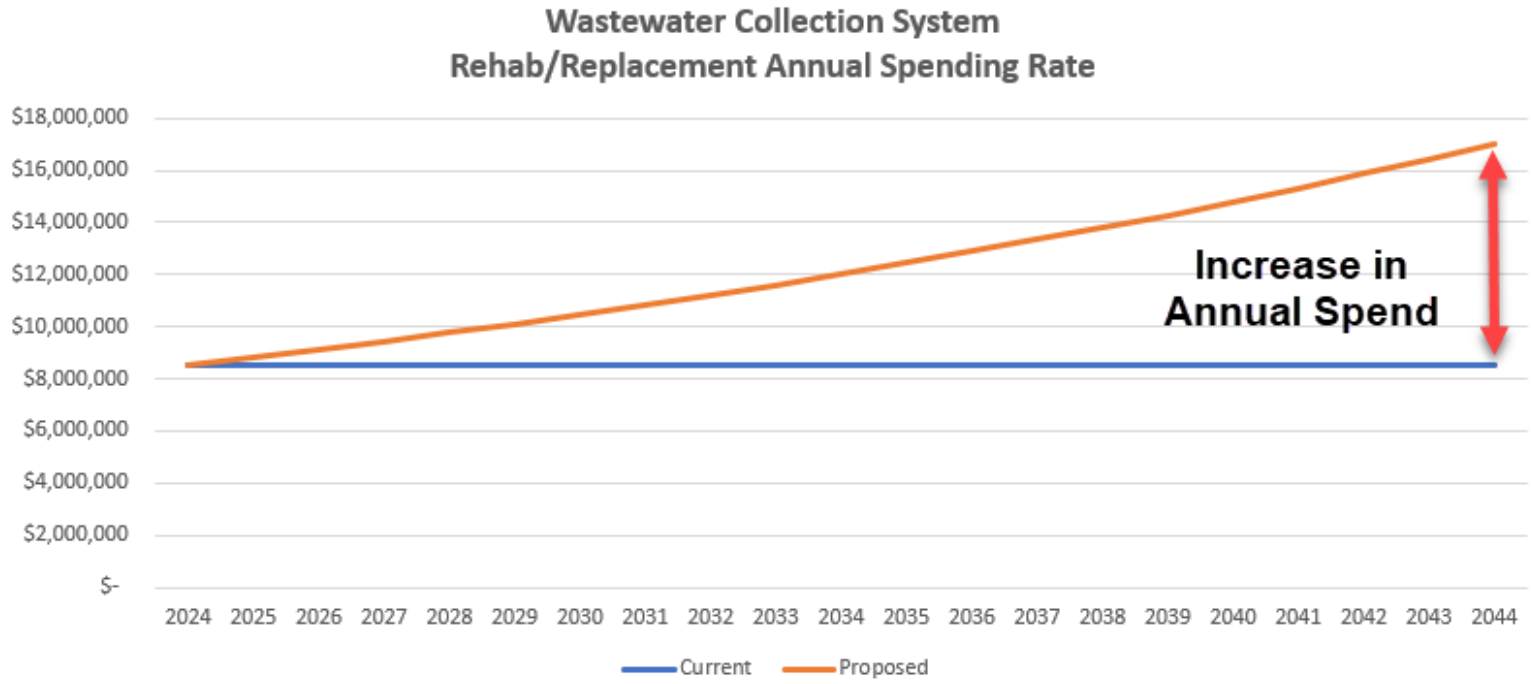


Asset Threshold Categorization



Budget Projection | System Population Charts | Actions Taken | Raw Data

STRATEGY FOR ANNUAL SPEND INCREASE



Next Steps:

Complete Model for all Assets

Work with Budget/Rates Team to Evaluate Strategies to Increase Spending Rate.

QUESTIONS & DISCUSSION