



Pairing Wastewater & Roadway Risk-Based Assessments

to Prioritize South Portland, Maine's Infrastructure Investments



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COMMITMENT & INTEGRITY DRIVE RESULTS

Presentation Outline

- Why Asset Management?
- Asset Management Plan
- Updates From the City
- Enterprise Asset Management Program
- Next Steps



City of South Portland

Water Resource Protection Department

Sanitary Sewer Utilities

9.3 MGD wastewater treatment facility

- 31 pumping stations
- 2,571 manhole structures
- 107 miles of piping

Municipal Stormwater System

- 3,723 catch basin and manhole structures
- 61 miles of piping

Public Works Department

- Street and sidewalk maintenance
- Street sweeping, snow plowing
- Trash and recycling collections
- Operates Solid Waste Transfer Facility
- 118 miles of roadway
- 92 miles of sidewalks
- 1,200+ pedestrian ramps
- Installs and maintains street and traffic signs, and pavement markings for roadways



Asset Management Framework



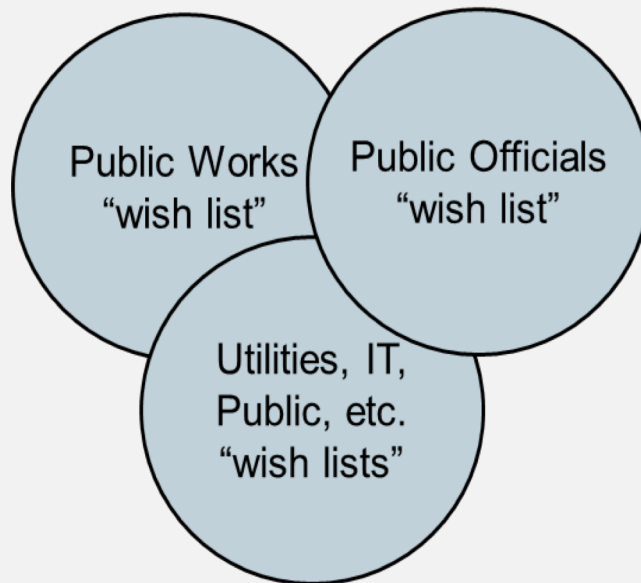
Asset Management: Mission and Vision

***Mission:** Integrate long-term standard operating procedures to analyze and prioritize the management of city-wide assets and data to support cost efficient decisions.*

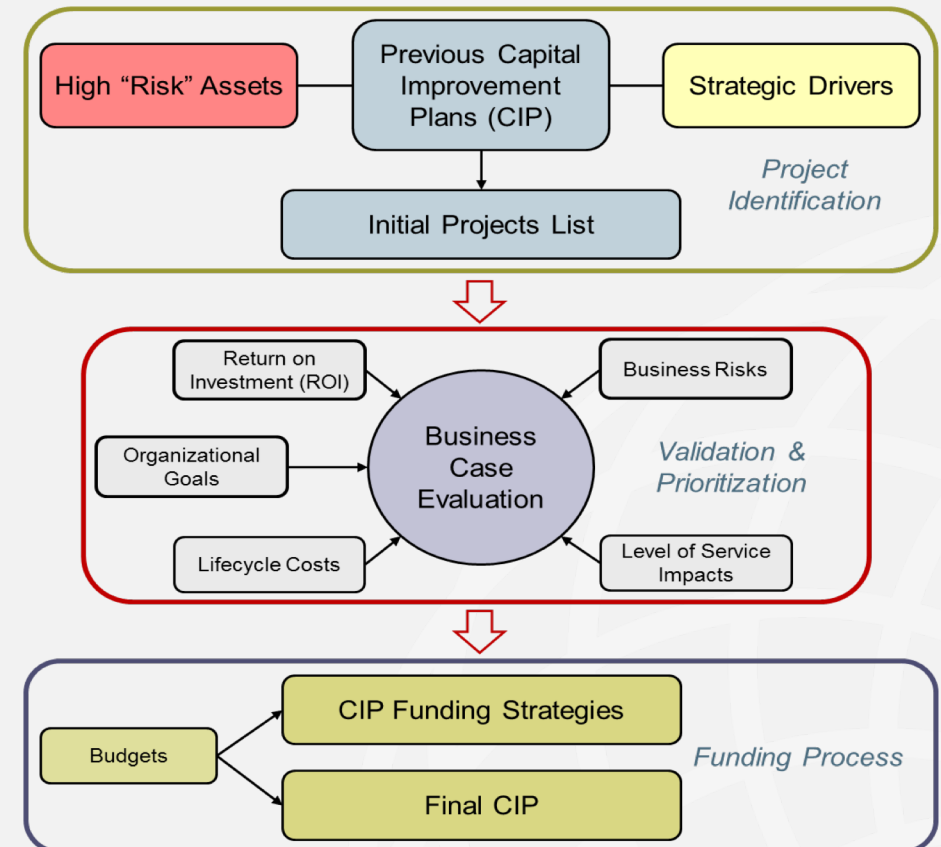
***Vision:** Be a self-sustaining and fiscally responsible entity providing effective solutions for public infrastructure needs.*

CIP Models

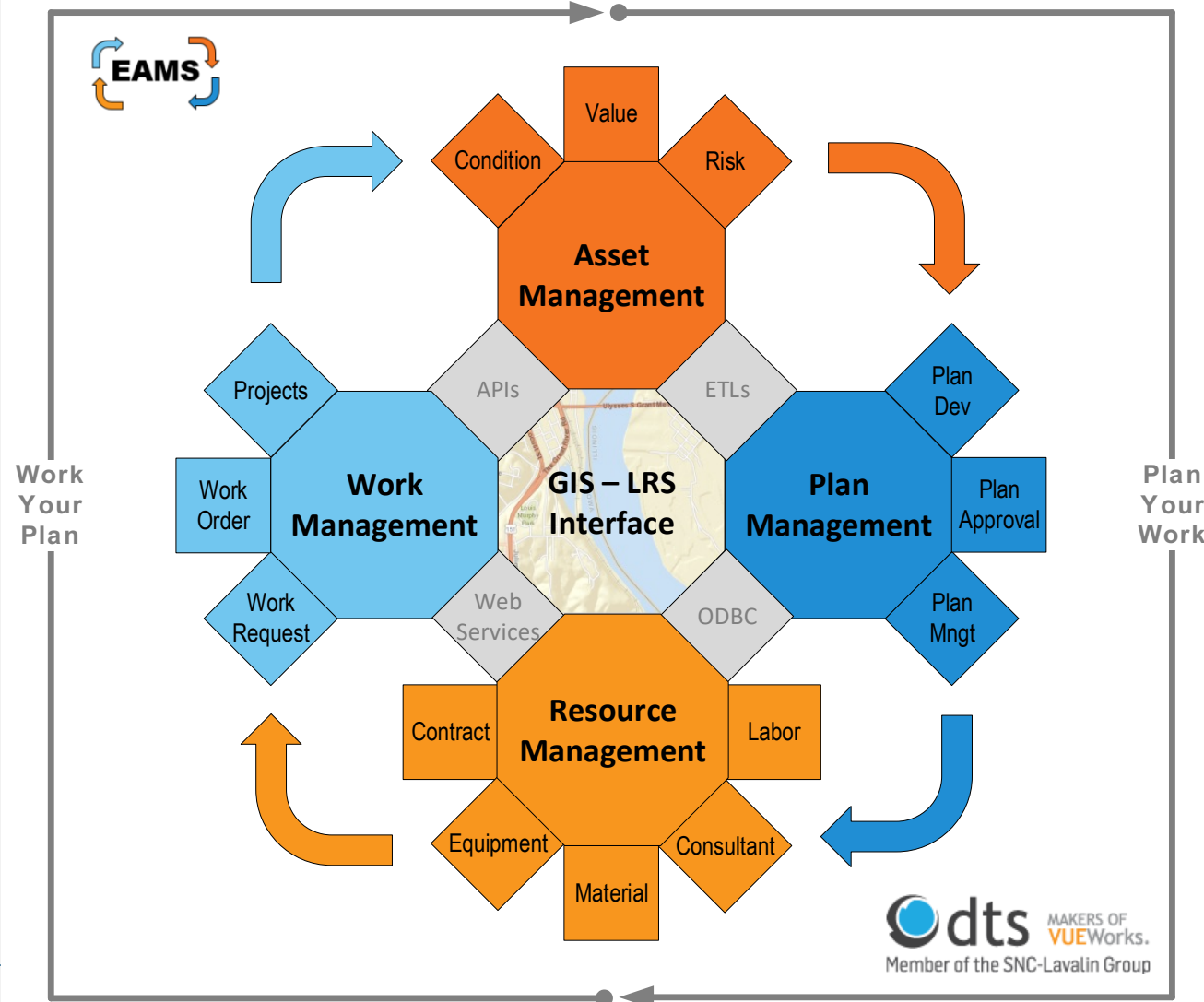
Traditional Model



Enhanced CIP Model



Enterprise Asset Management



Approach

Risk Analysis and Capital Planning

Develop
Likelihood of
Failure
Parameters

Develop
Consequence
of Failure
Parameters

Run Risk
Analysis

Develop CIP
Recommendations

Data and Practices Gap Assessment

Map Key
Business
Processes

Perform
SIMPLE SAM
GAP
Assessment

Assess Data
Gaps

Establish Level of
Service Goals

CMMS Software Procurement

Research
CMMS
Vendors

Presentations
By
CMMS Vendors

Issue
Request for
Proposals

Review
CMMS
Vendor
Proposals

Execute CMMS
Contract with
VUEWorks

Asset
Management
Plan

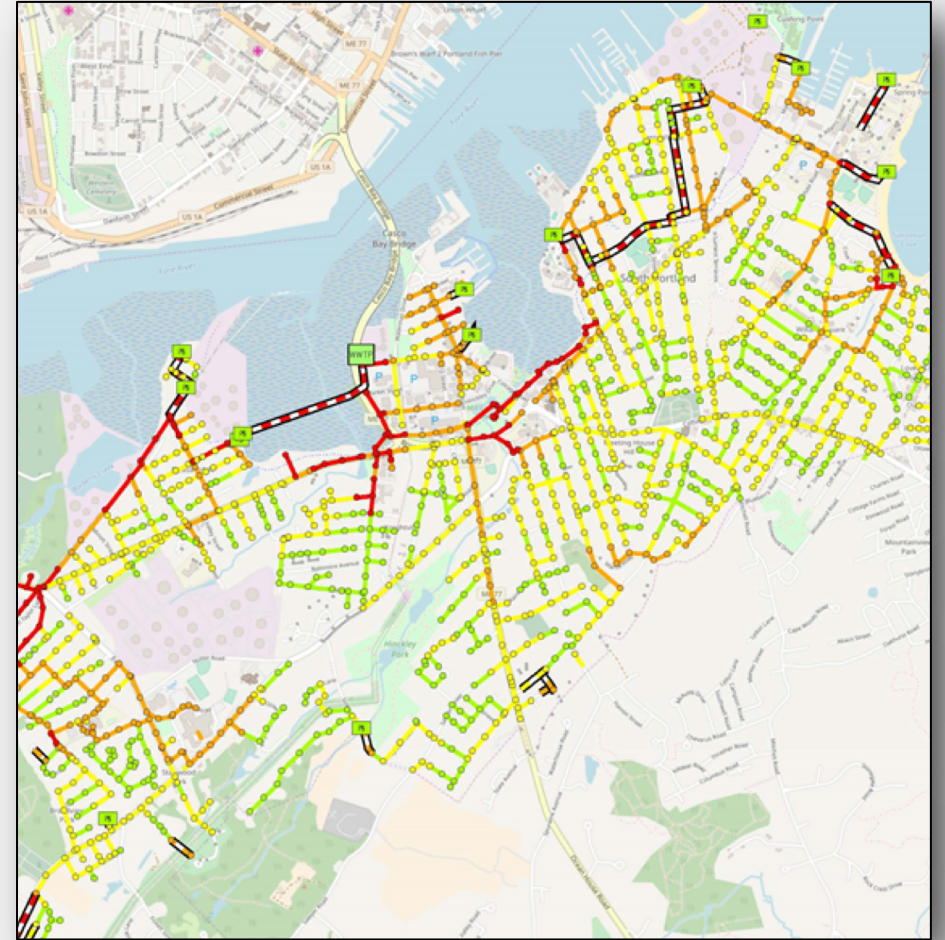
Risk Analysis Process – CoF & LoF

- Risk: the likelihood of an event occurring and the consequences of that event.
- Consequence of Failure: Measure of the impacts that would result if the asset were to fail.
- Likelihood of Failure: Measure of an asset's condition.
- $\text{Risk} = \text{CoF} \times \text{LoF}$



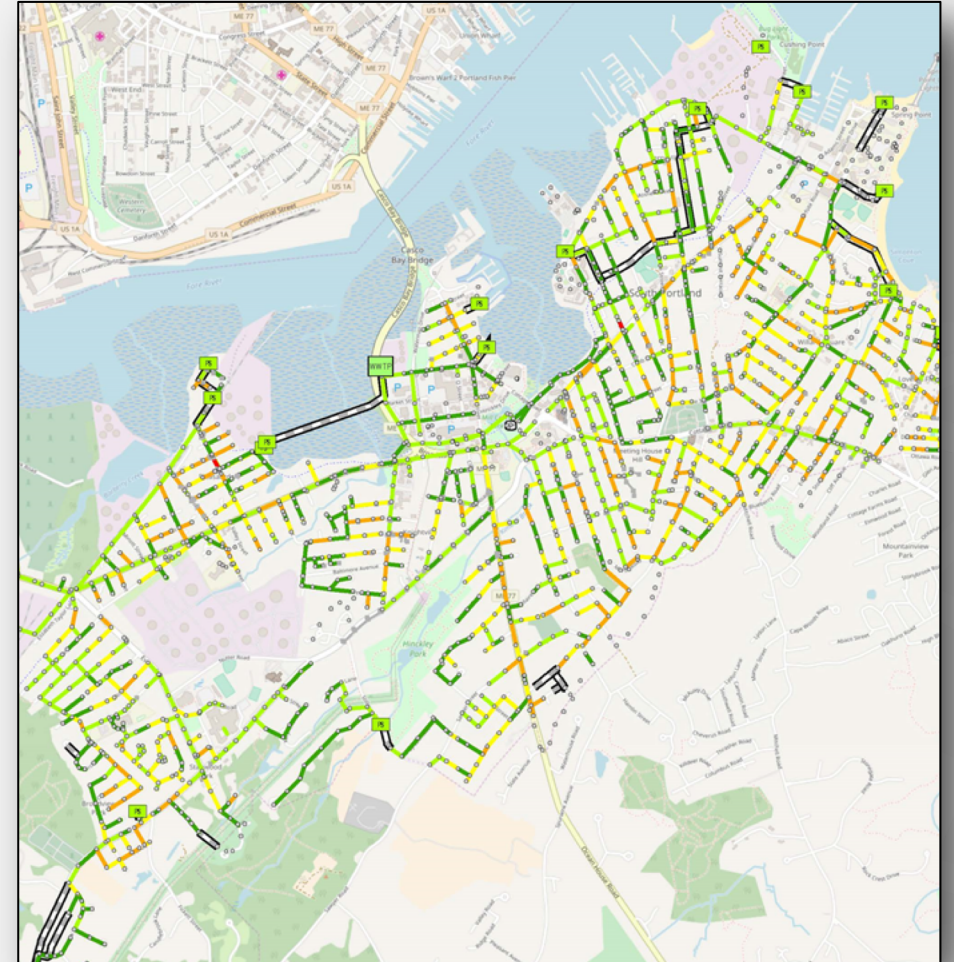
CoF Scoring- Sewer Parameters

- Measurable Parameters Scored 1-5:
 - Network Position (Pipe Size & Depth)
 - Asset Location (Road Class, Proximity to Railroad, Accessibility)
 - Proximity to Environmental Features (Wetlands & Waterbodies, Flood Plain)
 - Proximity to Critical Users (Critical User upstream, Land Use)
- Parameters are Weighted based on TBL+

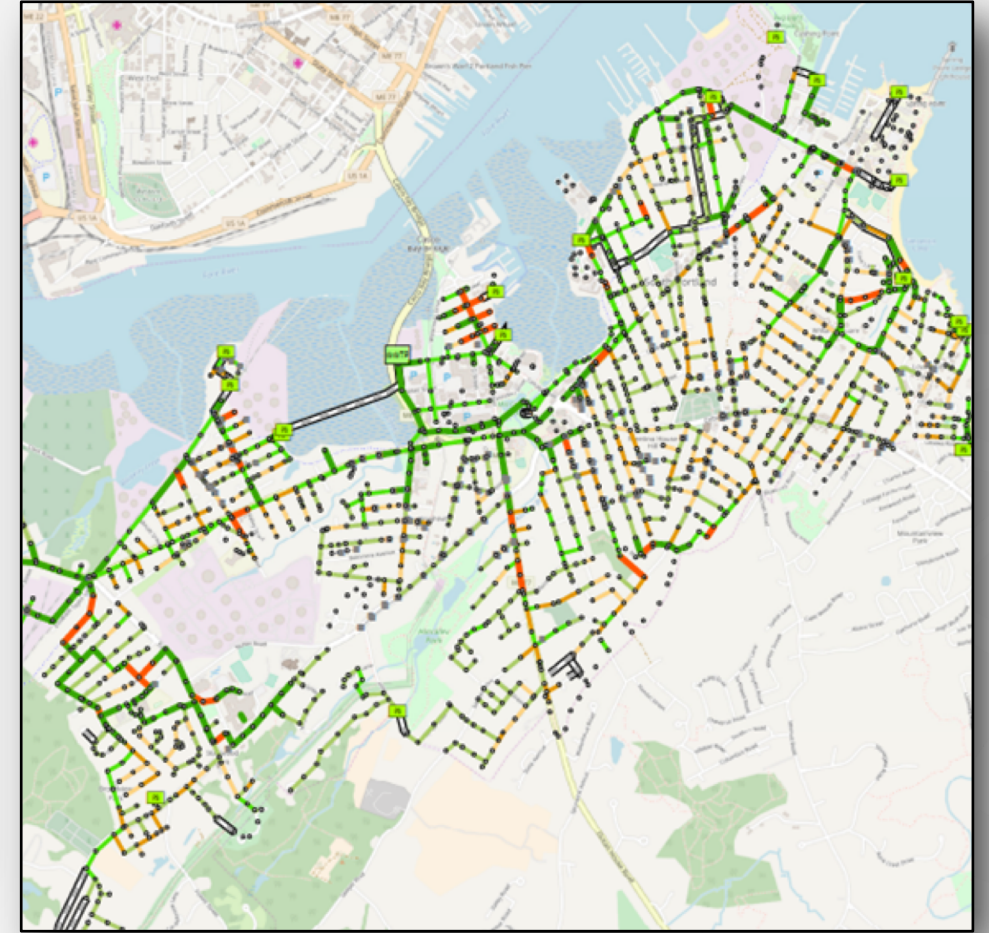
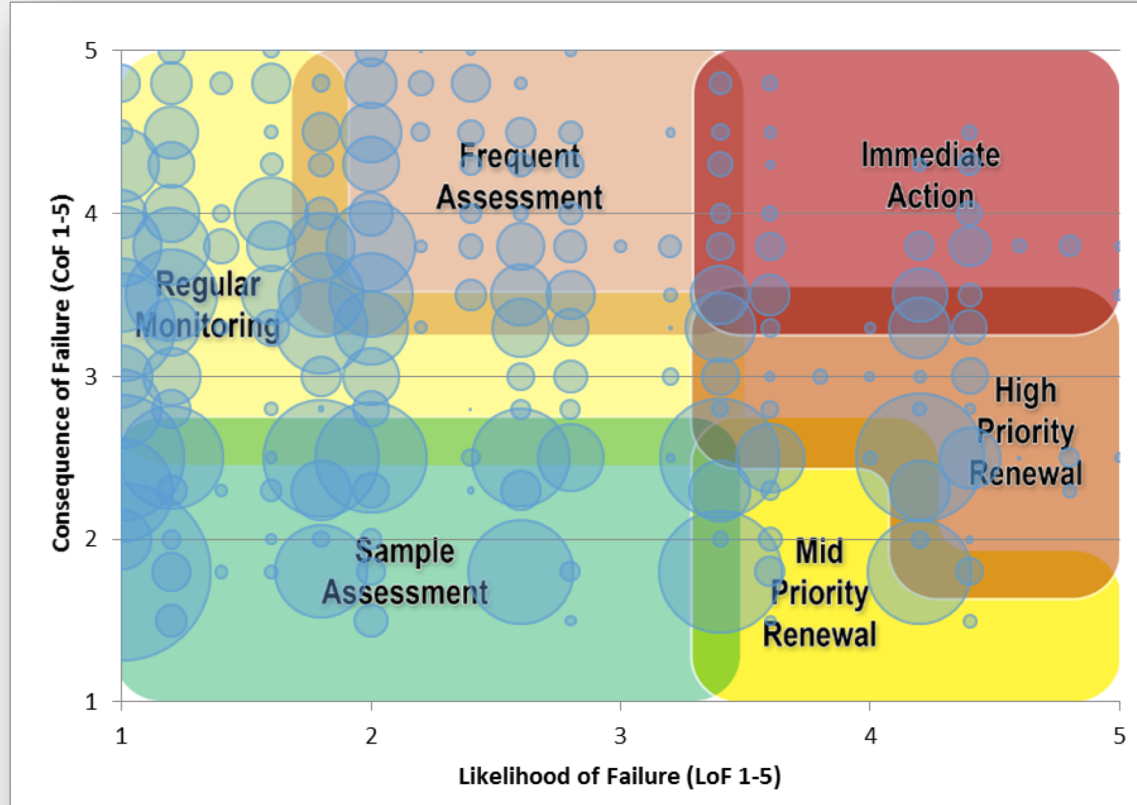


LoF Scoring

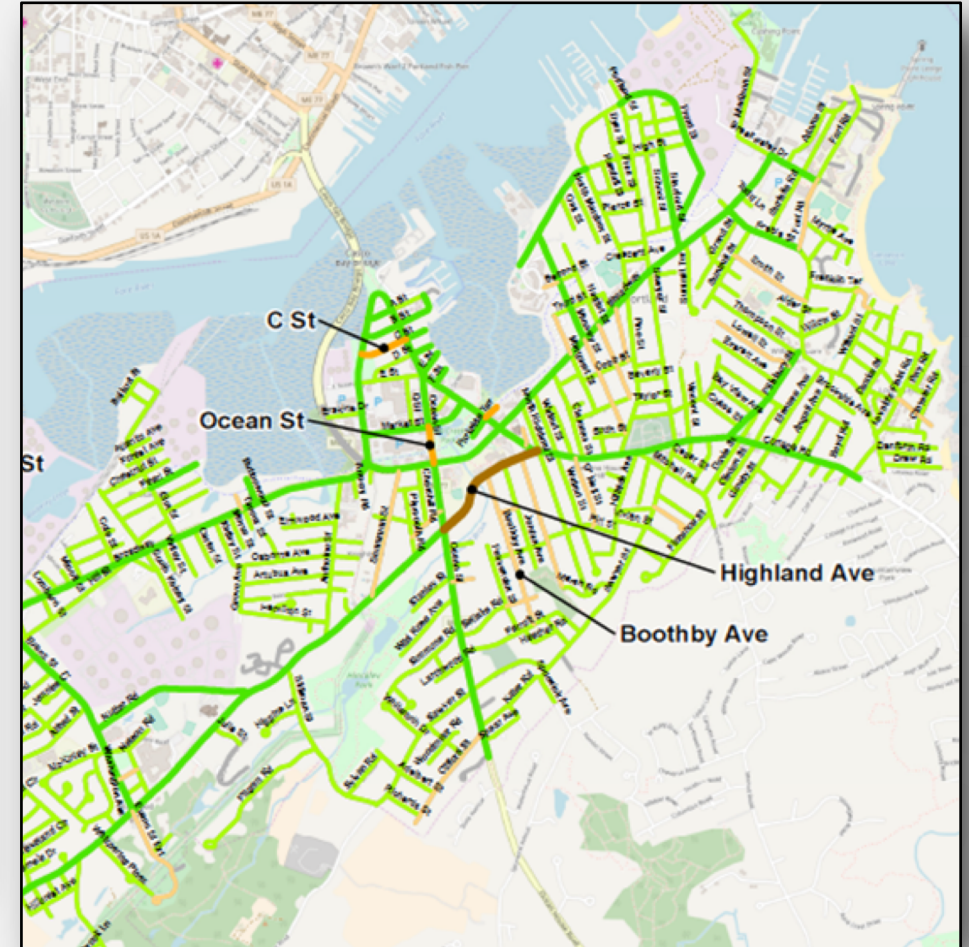
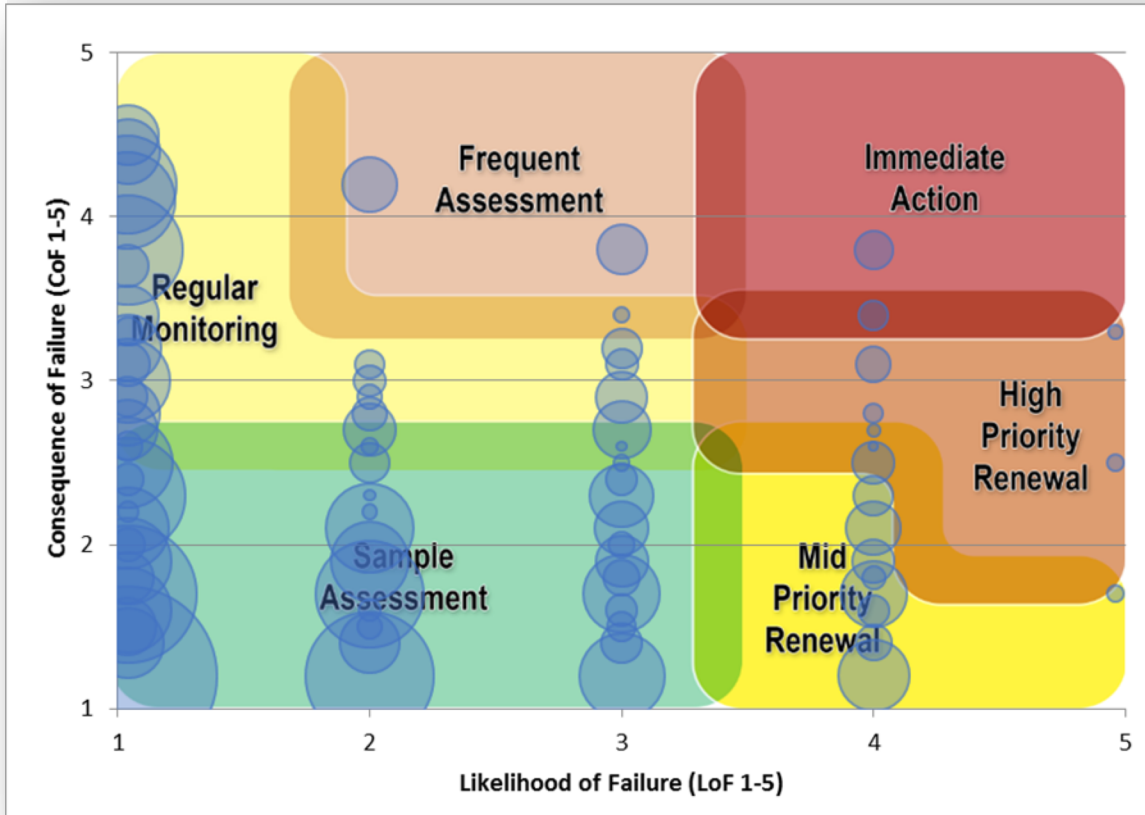
- Assets Scored from 1 to 5:
 - 1 = fully functional, over ¼ life remaining
 - 5 = not functional, requires full rebuild
- Gravity Mains:
 - Condition (CCTV)
 - Hydraulic Capacity
- Roadways: PCI



Risk Analysis – Gravity Mains

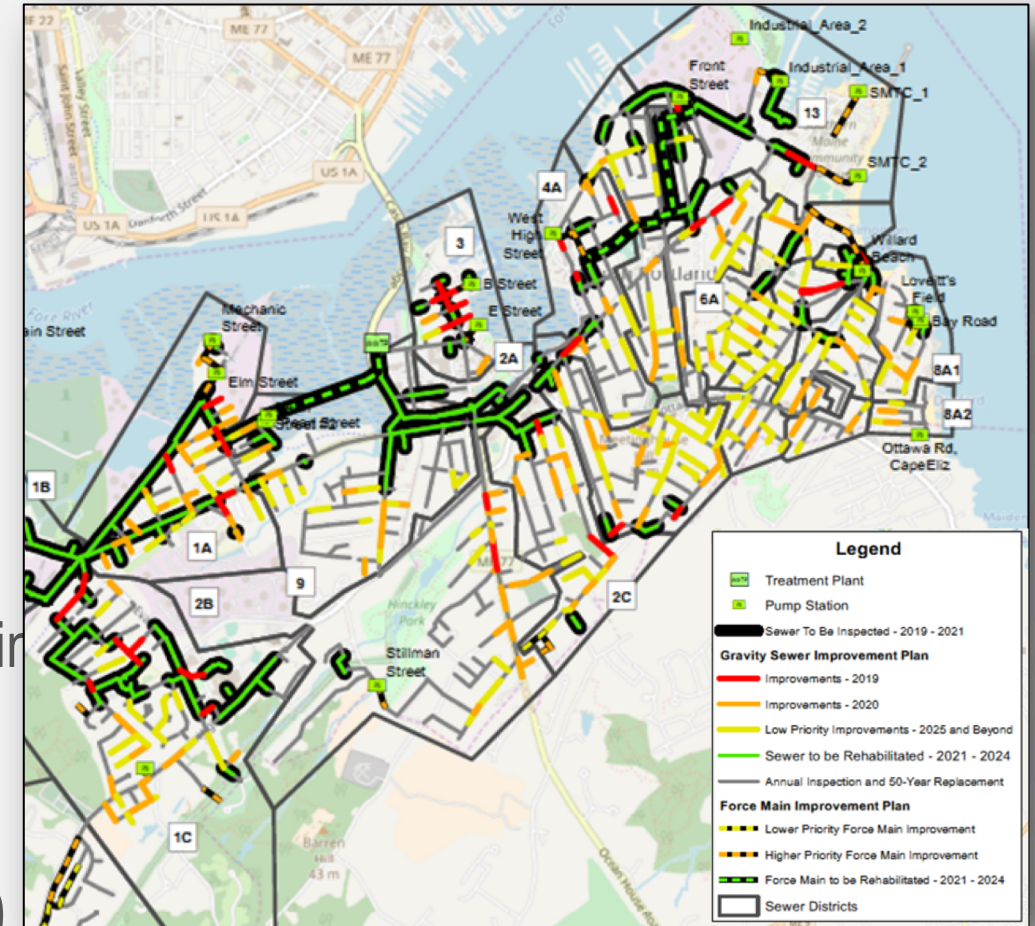


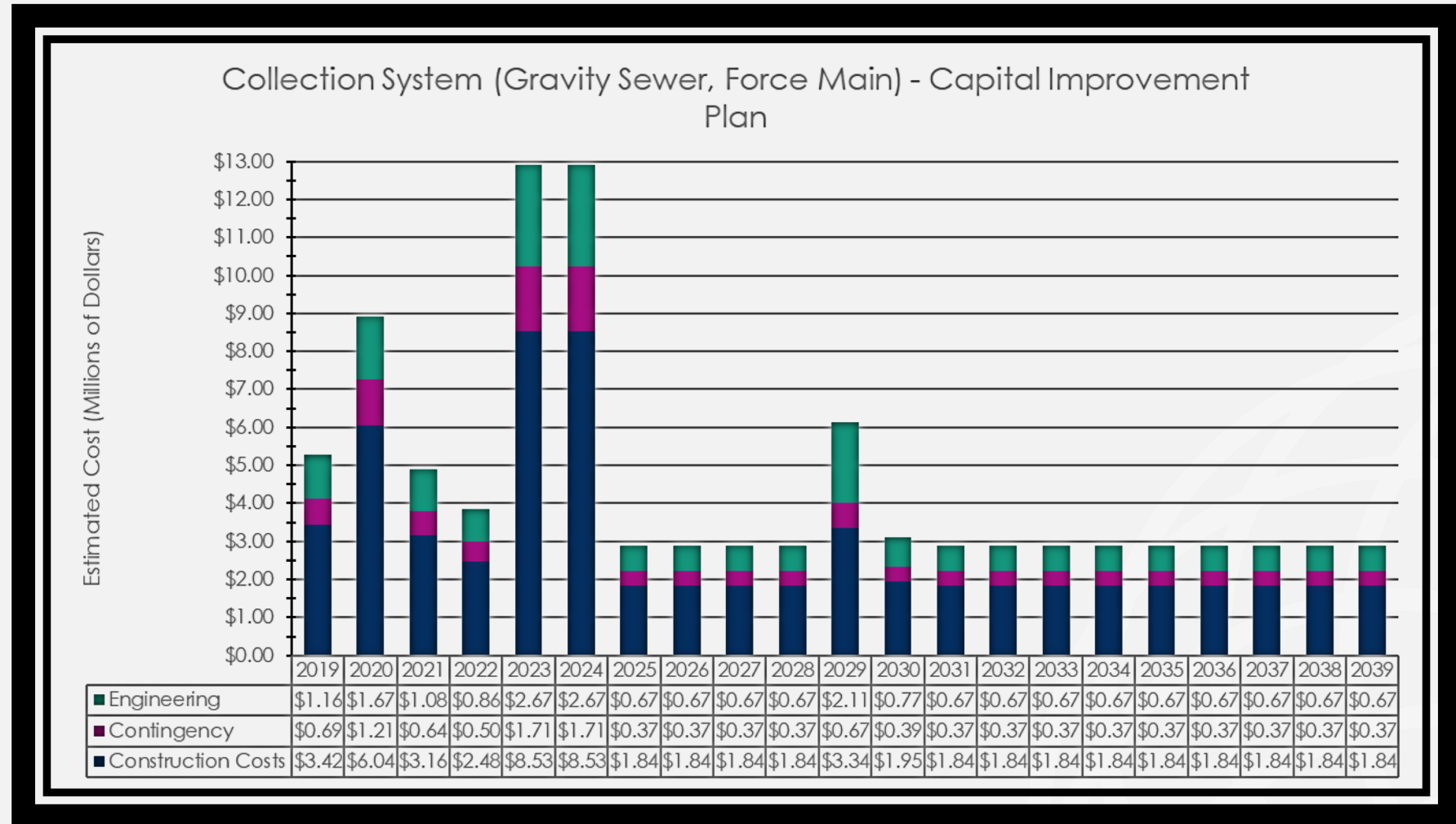
Risk Analysis – Roadway



CIP Sewer Collection

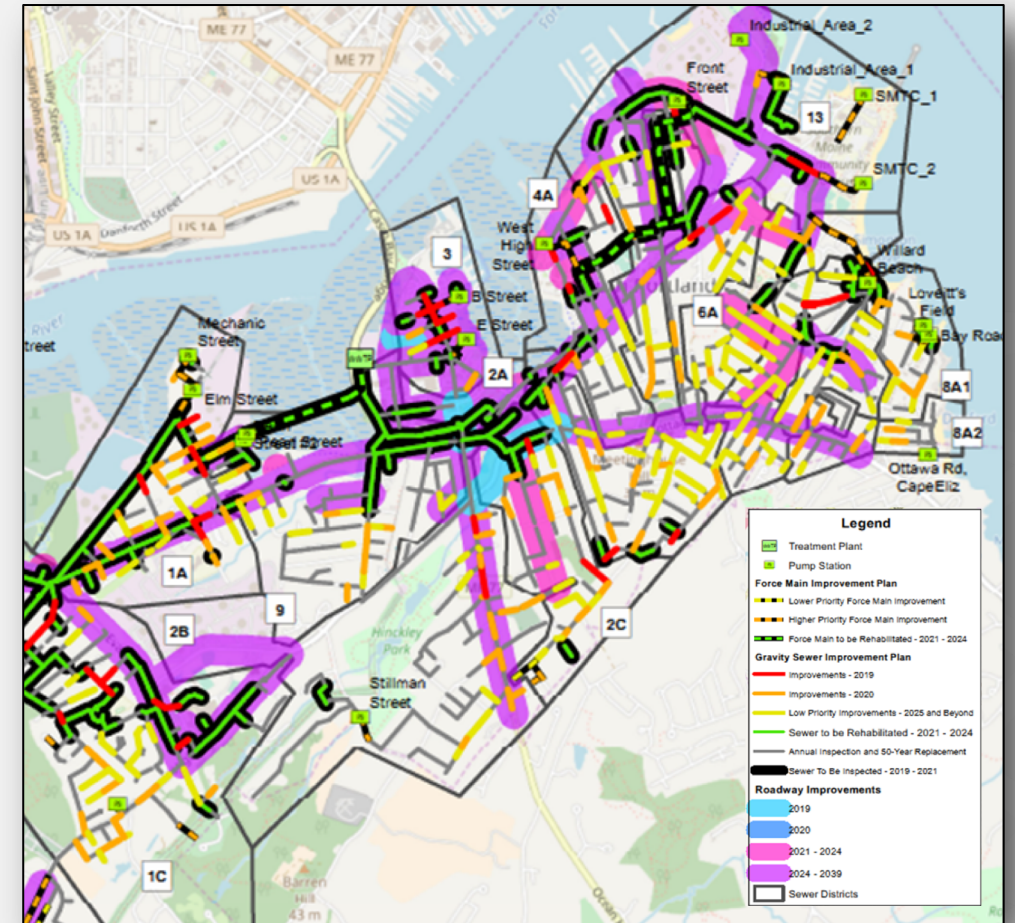
- Priority 1:
 - Rehabilitate Known Risks: Immediate Action and High Priority Assets
 - Inspect critical infrastructure
 - Identify excessive Infiltration/Inflow
- Priority 2:
 - Inspect sewers prior to roadway paving
 - Consider annual rehabilitation to maintain service levels
- Iterative process of inspection and rehabilitation to renew system every 50 years



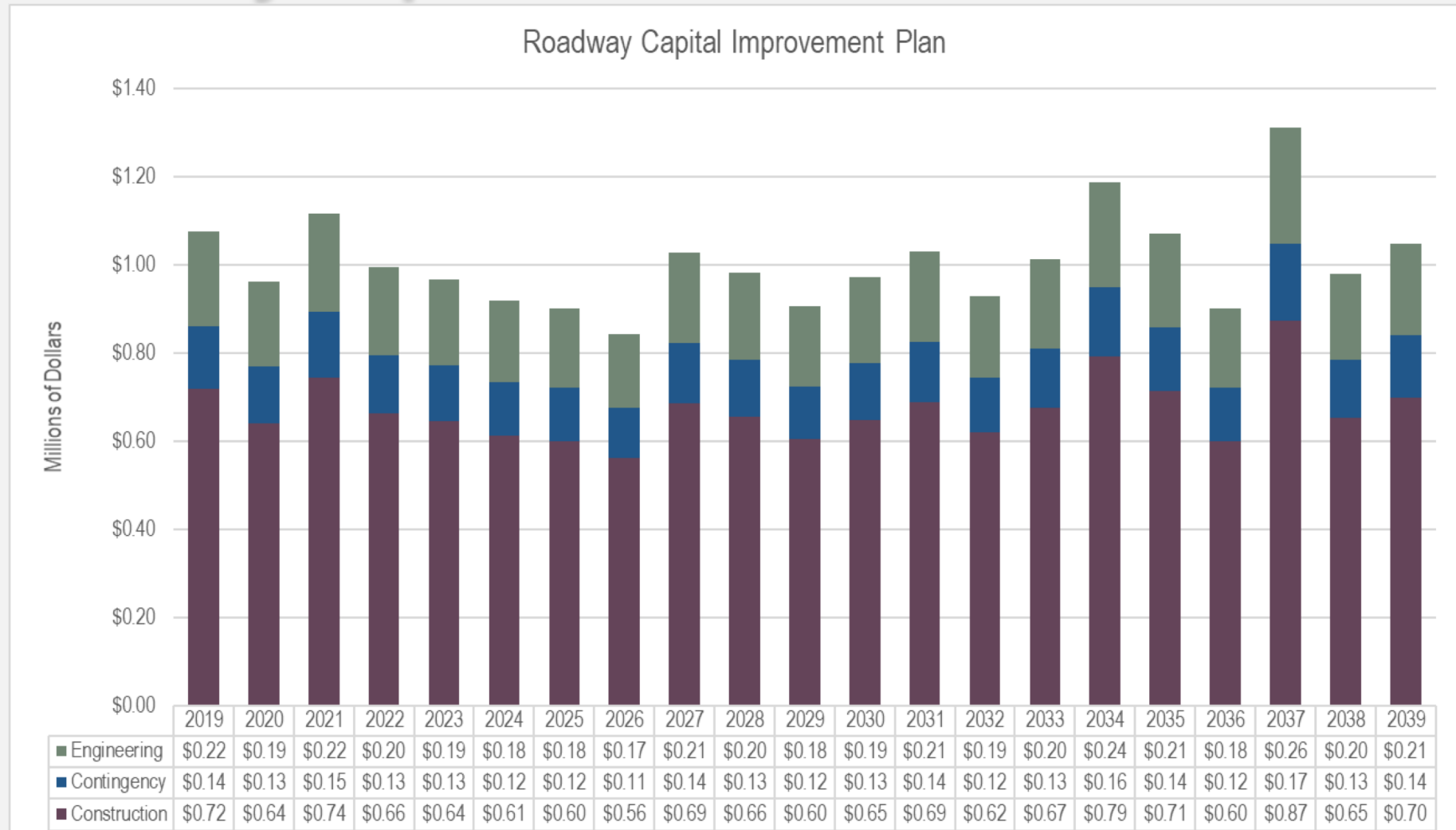


CIP Roadway

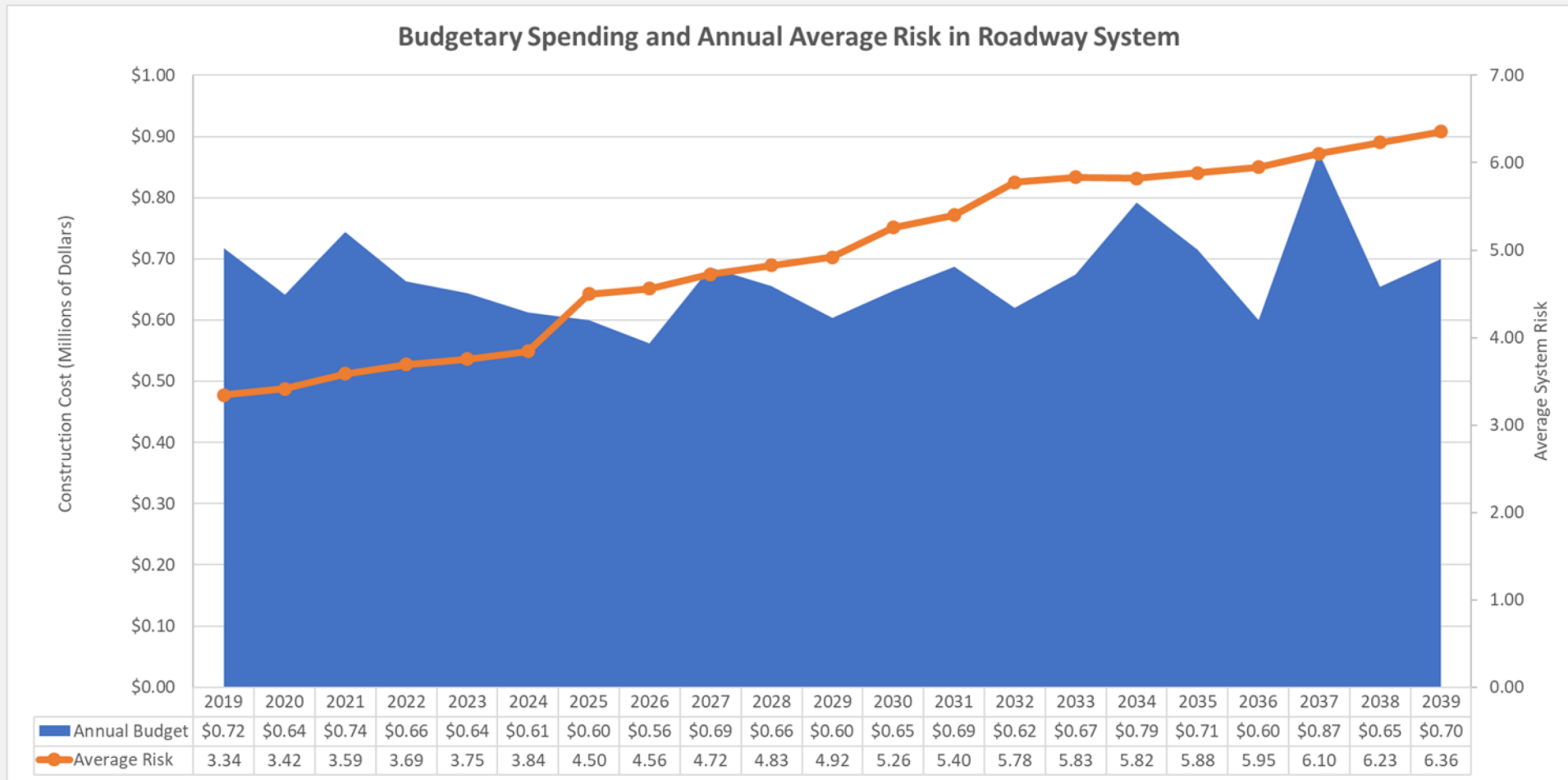
- Prioritized Known Risks: Immediate Action & High Priority Renewal
- Assigned estimated cost to each asset based on roadway treatment strategy (selected based on PCI).
- Grouped into yearly projects based on priority.
- Iterative process:
 - Roads rehabilitated during the previous year moved to bottom of the priority list
 - Renewal frequency based on road criticality/ CoF



Roadway Repair



Roadway Repair



■ GAP Assessment:

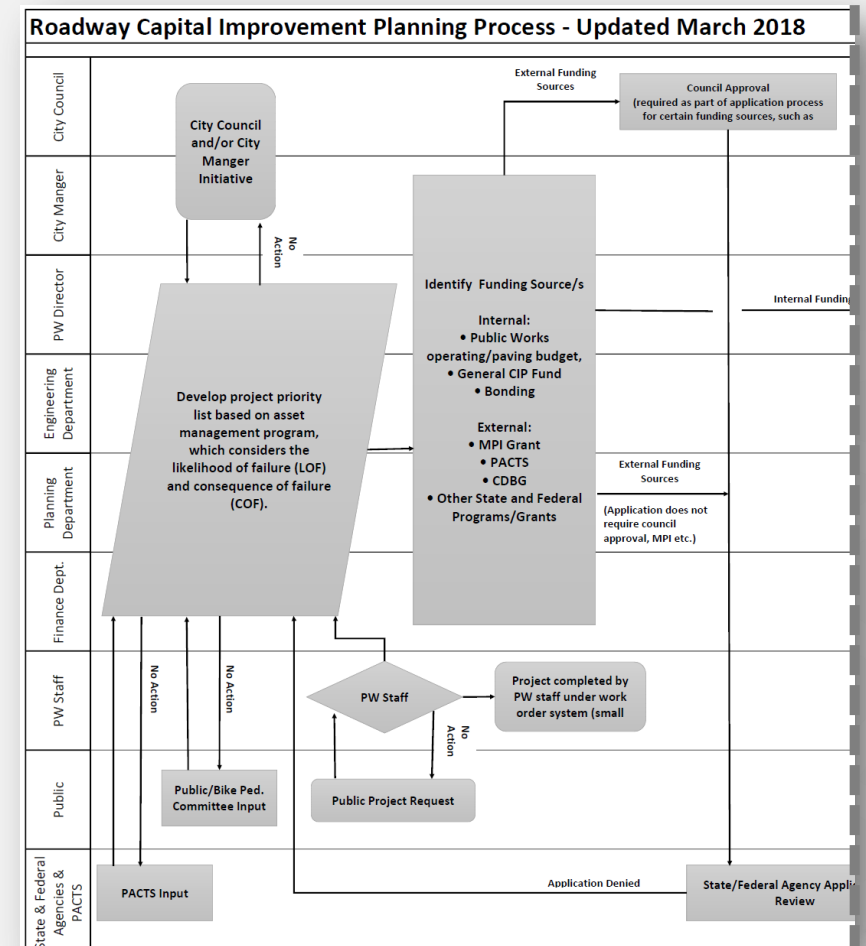
- Future work order process diagrams for emergency and planned work
- Future CIP process diagram for enhanced asset management

- Levels of Service:

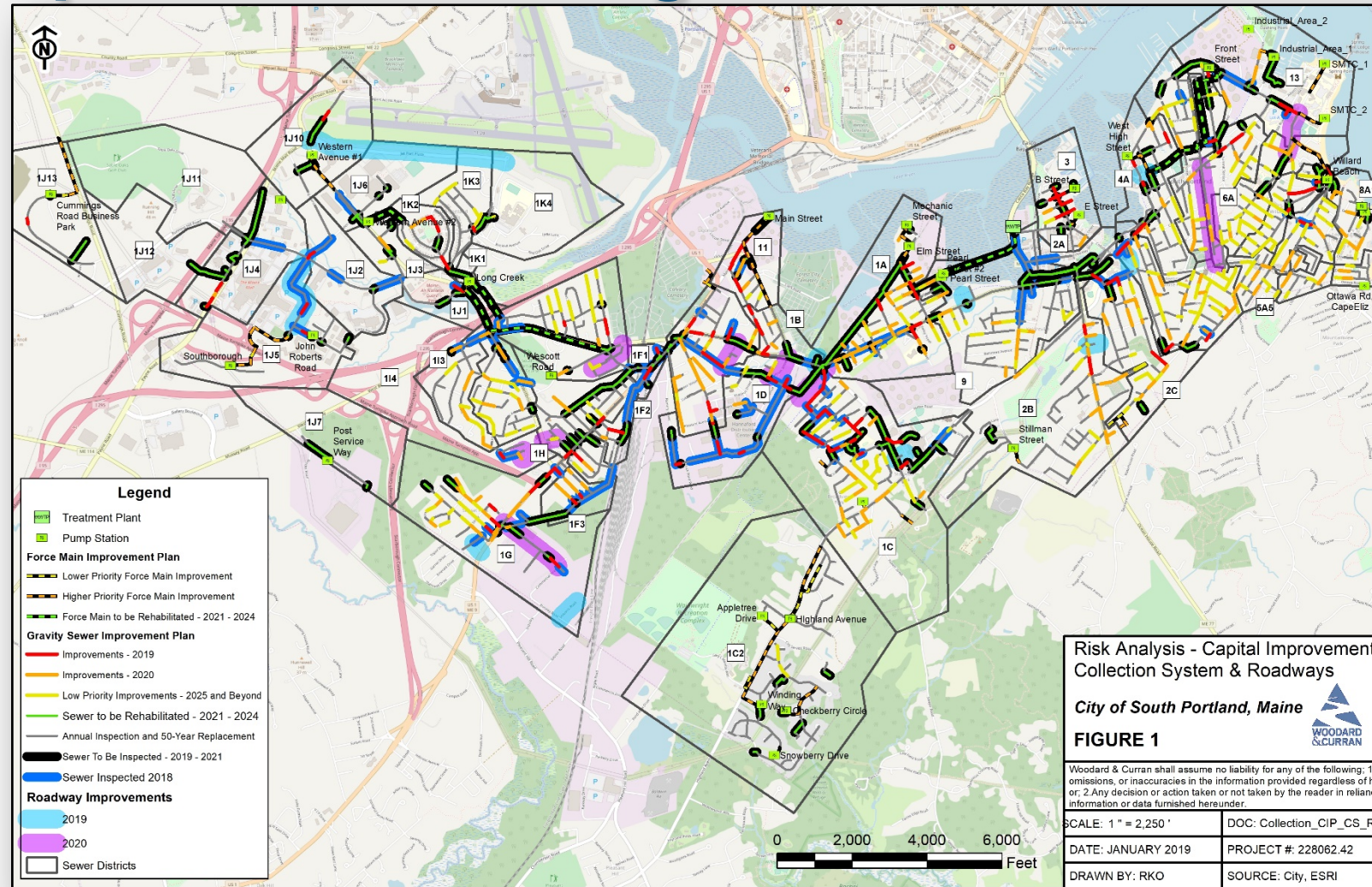
- Identified metrics outside those required by regulation
- Set goals for #s of Service calls, sewer construction projects and CCTV/Cleaning

■ CMMS/EAMS Software Procurement

- 
- VUEWorks

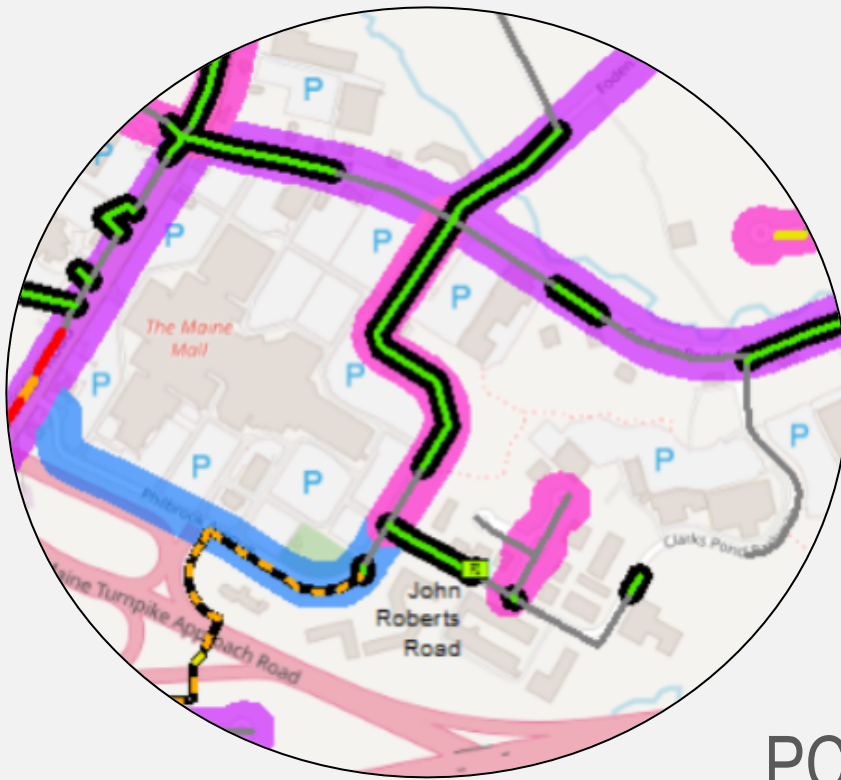


City Update – 2018 Progress



Example- Philbrook Ave Reclamation

2018 CIP Recommendation



December 2018 CIP

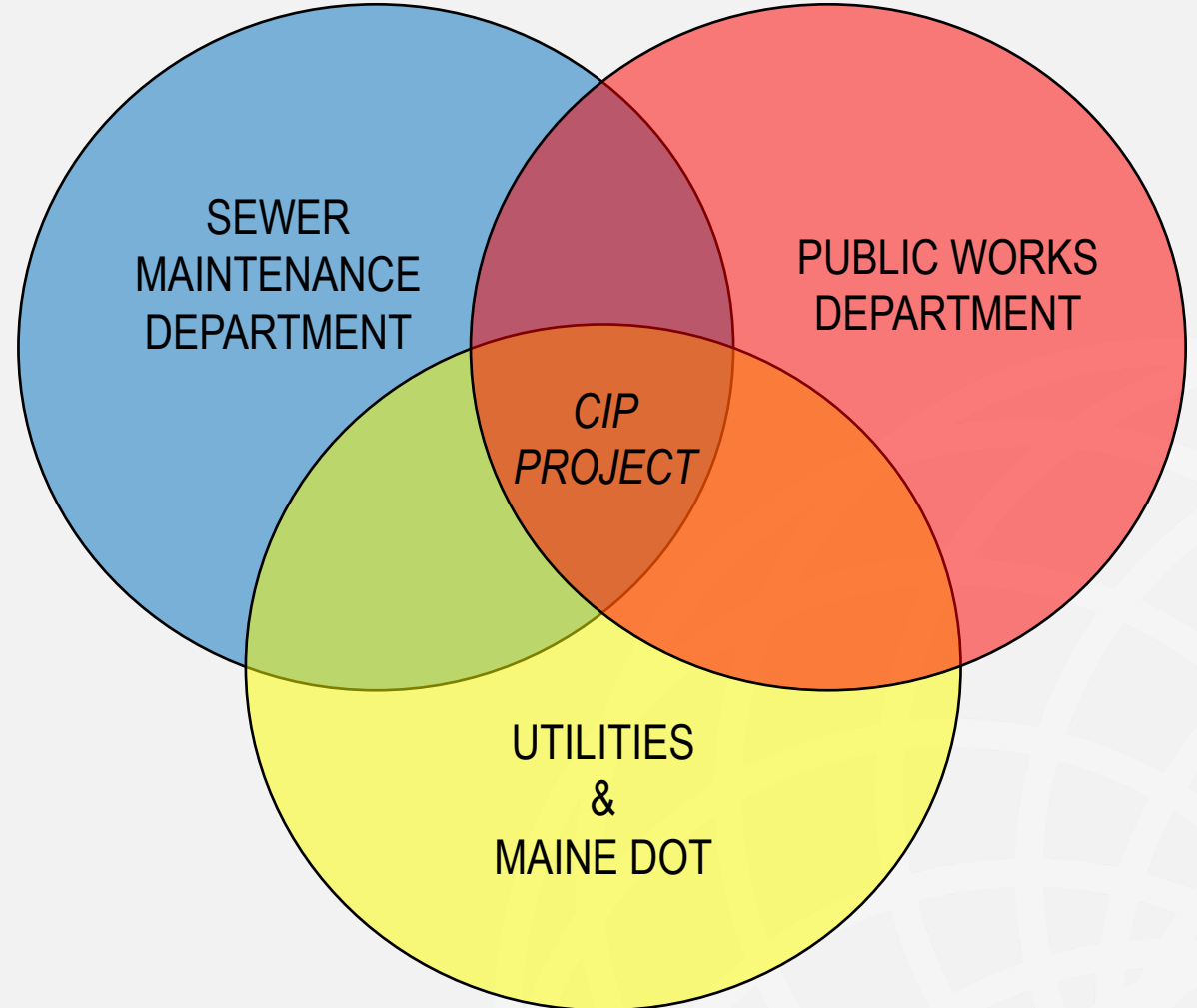


PCI: 45 = High LoF

CCTV Structural Defect: Sag (Severe) = High LoF

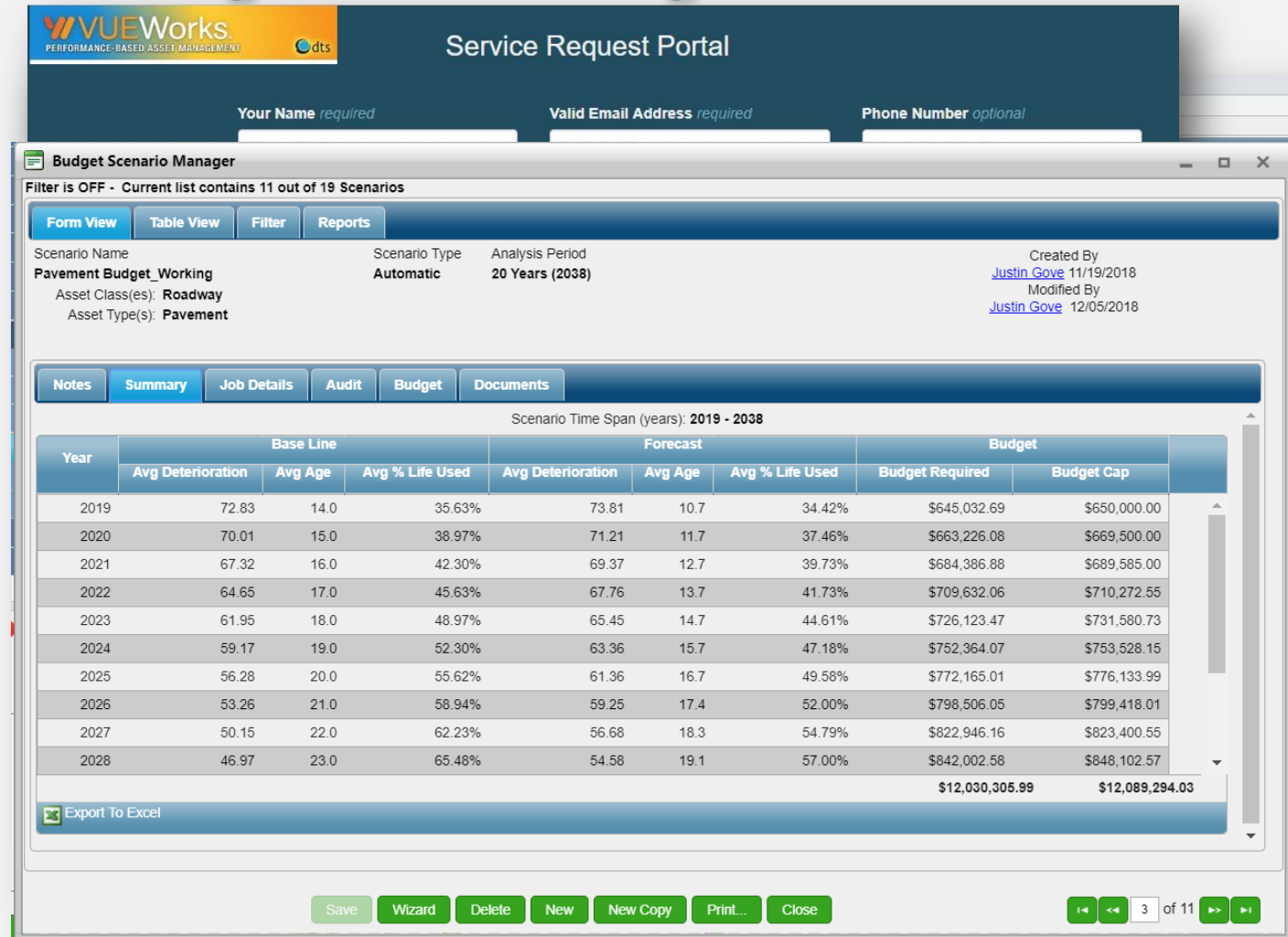
Collaboration

- Workflow for CIP Process
- Sewer Maintenance & Public Works
 - CCTV at before/ early in design phase
- Broadway Project & Utilil
 - Project Reprioritization
 - Timing of Paving
- Cottage Road & PWD
 - 1894 Water Main



Enterprise Asset Management Program

- Workflows established for work order process.
- Work Orders Go Live
- MobileVUE
- Service Request Portal
- DataLinks: CoF/LoF/Risk
- Roads: Budget Forecasting/ Valuation/ Risk



VUEWorks PERFORMANCE-BASED ASSET MANAGEMENT

Service Request Portal

Your Name *required* Valid Email Address *required* Phone Number *optional*

Budget Scenario Manager

Filter is OFF - Current list contains 11 out of 19 Scenarios

Form View Table View Filter Reports

Scenario Name: Pavement Budget Working Scenario Type: Automatic Analysis Period: 20 Years (2038)

Asset Class(es): Roadway Asset Type(s): Pavement

Created By: Justin Gove 11/19/2018
Modified By: Justin Gove 12/05/2018

Notes Summary Job Details Audit Budget Documents

Scenario Time Span (years): 2019 - 2038

Year	Base Line			Forecast			Budget	
	Avg Deterioration	Avg Age	Avg % Life Used	Avg Deterioration	Avg Age	Avg % Life Used	Budget Required	Budget Cap
2019	72.83	14.0	35.63%	73.81	10.7	34.42%	\$645,032.69	\$650,000.00
2020	70.01	15.0	38.97%	71.21	11.7	37.46%	\$663,226.08	\$669,500.00
2021	67.32	16.0	42.30%	69.37	12.7	39.73%	\$684,386.88	\$689,585.00
2022	64.65	17.0	45.63%	67.76	13.7	41.73%	\$709,632.06	\$710,272.55
2023	61.95	18.0	48.97%	65.45	14.7	44.61%	\$726,123.47	\$731,580.73
2024	59.17	19.0	52.30%	63.36	15.7	47.18%	\$752,364.07	\$753,528.15
2025	56.28	20.0	55.62%	61.36	16.7	49.58%	\$772,165.01	\$776,133.99
2026	53.26	21.0	58.94%	59.25	17.4	52.00%	\$798,506.05	\$799,418.01
2027	50.15	22.0	62.23%	56.68	18.3	54.79%	\$822,946.16	\$823,400.55
2028	46.97	23.0	65.48%	54.58	19.1	57.00%	\$842,002.58	\$848,102.57
							\$12,030,305.99	\$12,089,294.03

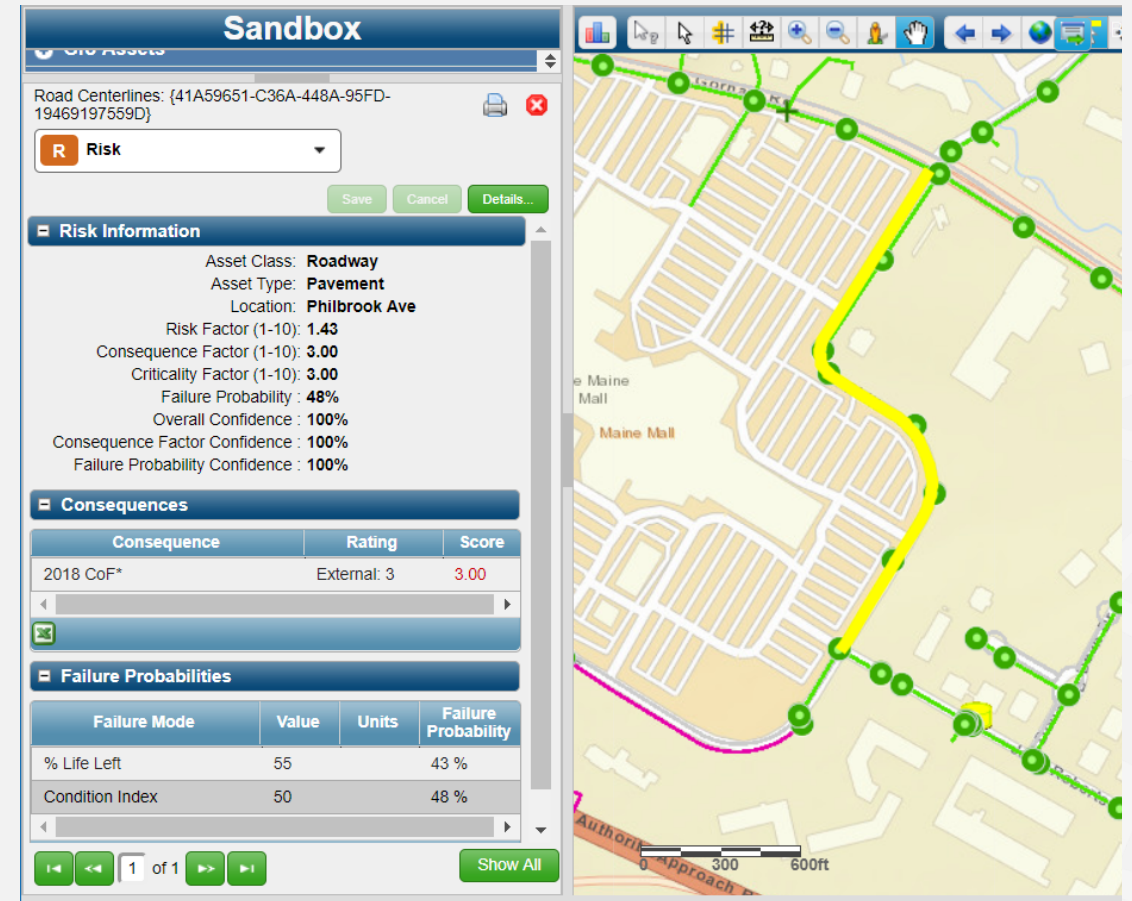
Export To Excel

Save Wizard Delete New New Copy Print... Close

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Next Steps

- Continue to Implement EAMS
 - Asset Management Team
- Streamline Risk & CIP Updates:
 - CCTV data integration
 - CIP Planning



Questions?

