

Bridge Strategic Asset Management Plan

Bridge Maintenance Audit Update

Our Vision, Mission, Values, & Goals

Seattle is a thriving equitable community powered by dependable transportation. We're on a mission to deliver a transportation system that provides safe and affordable access to places and opportunities.

Core Values & Goals:

Equity, Safety, Mobility, Sustainability, Livability, and Excellence.

Purpose

To provide a status update on the ten recommendations that came from the 2020 *Seattle Department of Transportation: Strategic Approach to Vehicle Bridge Maintenance is Warranted* audit report.

Presentation Outline

- Key takeaways
- Path to the BSAMP
- Recommendations Update
- Life Cycle Cost Analysis
- Q&A



Key Takeaways

In this presentation, you'll learn:

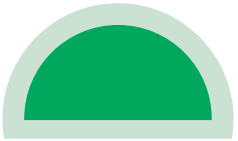
- 1 recommendation is implemented
- 3 recommendations have been submitted to the City Auditor
- 5 recommendations will be complete by year end
- The Bridge Strategic Asset Management Plan will be finalized in Q1 of 2024



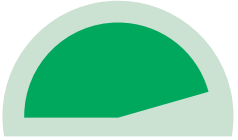
Pathway to the BSAMP



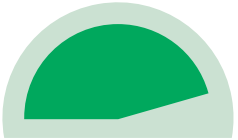
Bridge Strategic Asset Management Plan



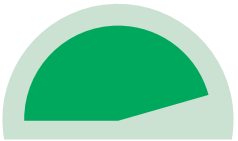
Inventory & Condition



Bridge Performance



Life Cycle Plans



Risk Management



Implementation Plan

Together, the audit recommendations create the Bridge Strategic Asset Management Plan, a holistic, proactive approach to bridge preservation that plans for the right treatment at the right time.

Recommendation 1

- Recommendation 1: The Seattle Department of Transportation should take immediate steps to resolve all the issues identified in the 2019 Federal Highway Administration review.

STATUS: SUBMITTED

Recommendation 2

- Recommendation 2: The Seattle Department of Transportation (SDOT) should reduce the share of the department's bridge maintenance workload that is currently dedicated to reimbursable projects unrelated to SDOT bridge maintenance. Such a change could be done incrementally.

STATUS: IMPLEMENTED

Recommendation 3

- Recommendation 3: The Seattle Department of Transportation should develop draft legislation to replace Ordinance 96715 to address current City of Seattle bridge maintenance priorities and ensure adequate oversight of private bridges.

STATUS: SUBMITTED

Recommendation 3

Implemented: Ordinance 96715 has been amended since its initial adoption and states that Director of Transportation may inspect structures annually or *as often as deemed necessary* for public safety.



Recommendation 4

- Recommendation 4: The Seattle Department of Transportation should develop policies and procedures to adequately oversee private bridges that align with a revised version of Ordinance 96715, as mentioned in Recommendation 3.

STATUS: SUBMITTED

Recommendation 4

Implemented: New policy approved by SDOT Director in September 2023.

- SDOT will inspect privately owned bridges every four years
- SDOT will review the owner furnished inspection report every two years
- This change reduces safety inspection for 49 to 12 annually.



Recommendation 5

- Recommendation 5: The Seattle Department of Transportation should conduct a staffing analysis to determine the number and type of staff required for the implementation of a bridge preservation program.

STATUS: PENDING

Recommendation 5

Pending, complete by year end

- Three positions have been secured in 2024 to provide support to the bridge management program.
- The staffing analysis will be completed for two life cycle plan scenarios: Preventative Maintenance and Preventative Maintenance Plus.

Recommendation 6

- Recommendation 6: The Seattle Department of Transportation should incorporate the City's Race and Social Justice Initiative values into the staffing analysis of its bridge program.

STATUS: PENDING

Recommendation 6

Pending, complete by end of year

- Recommendations are related to:
 - Diversity and Inclusion
 - Promotion
 - Staff Morale
 - Recruitment
 - Retention



Recommendation 7

- Recommendation 7: The Seattle Department of Transportation should conduct a cost benefit analysis of technology upgrades needed to improve staff efficiency as part of their staffing analysis.

STATUS: PENDING

Recommendation 7

Pending, complete at year end

- Cost benefit analysis were completed for six upgrades:
 - Workflow Optimization
 - Digital Bridge Inspection
 - Programmatic Scheduling
 - Develop Data Insights
 - Mobile Data Collection
 - Standardize Data Collection



Recommendations 8, and 9

- Recommendation 8: The Seattle Department of Transportation should update the estimated useful life of their bridges using the condition data of individual bridge components.
- Recommendation 9: The Seattle Department of Transportation should use the updated useful life estimates of its bridges to plan for preservation work and lifecycle costs.

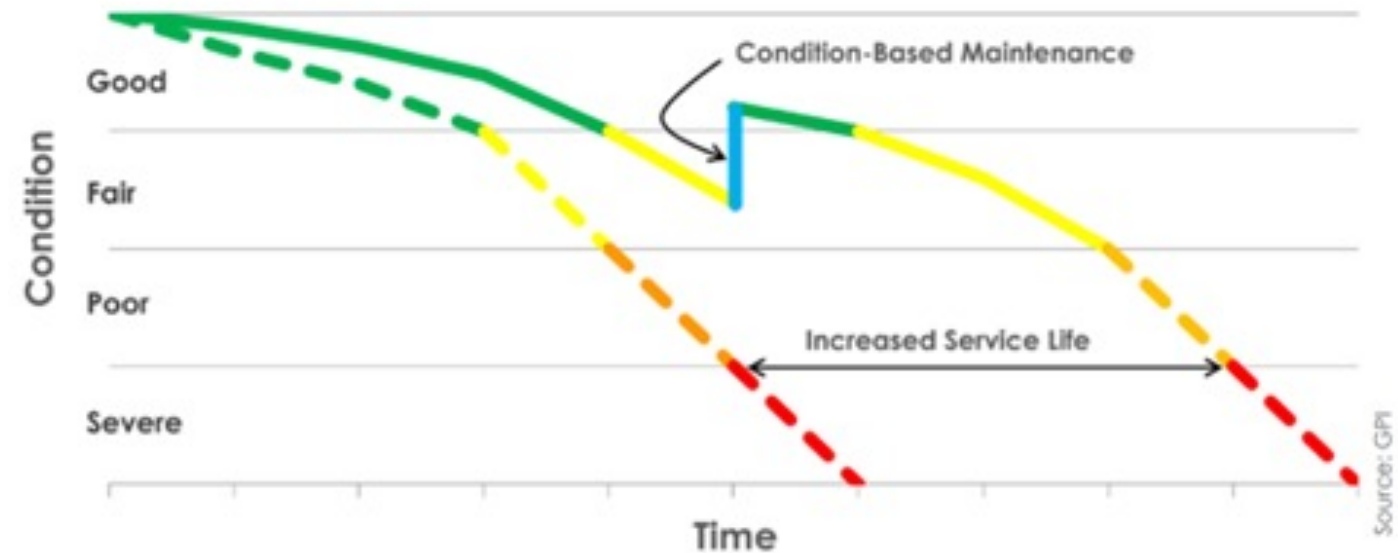
STATUS: PENDING

Pending, complete by year end

- A life cycle cost analysis was done for six life cycle plan scenarios based on an annual funding threshold that prioritized preventative maintenance to maintain bridges in good and fair conditions to extend the life of a bridge up to and beyond its design life.
- The analysis period identifies end of service life over a 30- year analysis period.

Recommendations 8 & 9

Solid-colored lines = With Preservation (cyclical and condition-based maintenance)
Dashed-colored lines = Without Preservation



Life Cycle Plan Scenarios

Current Funding without levy	Current Funding with levy	Preventative Maintenance	Preventative Maintenance Plus	State Target Performance	Unconstrained
<ul style="list-style-type: none"> • Describes bridge maintenance treatment plans and consequent outcomes based on limited funding. 	<ul style="list-style-type: none"> • Describes bridge maintenance treatment plans and consequent outcomes based on current funding. • Defer replacements of many bridges and has limited funds for rehabs/repairs 	<ul style="list-style-type: none"> • Maintains ideal preservation treatments for maintenance and bridge painting • Defer replacements of many bridges and has modest funds for rehabs/repairs 	<ul style="list-style-type: none"> • Maintains ideal preservation treatments for maintenance and bridge painting • Defer replacements of some bridges and plans for significant funds for rehabs & repairs of those bridges 	<ul style="list-style-type: none"> • National best practices for bridge asset management • Plans for bridge preservation, rehabilitation, and replacement work needed to maintain 90% of bridges in good and fair condition 	<ul style="list-style-type: none"> • Assumes no funding and resource constraints • Plans for bridges to receive “the right treatment at the right time”
<p>Outcome: Increase in anticipated bridge closures</p>	<p>Outcome: Reduce anticipated bridge closures</p>	<p>Outcome: Extends length of time bridges are in fair/good conditions</p>	<p>Outcome: 90+% of bridges in fair/good for only 30 years</p>	<p>Outcome: 90+% of bridges in fair/good for 30 years and beyond</p>	<p>Outcome: all bridges receive treatment on ideal cycles</p>

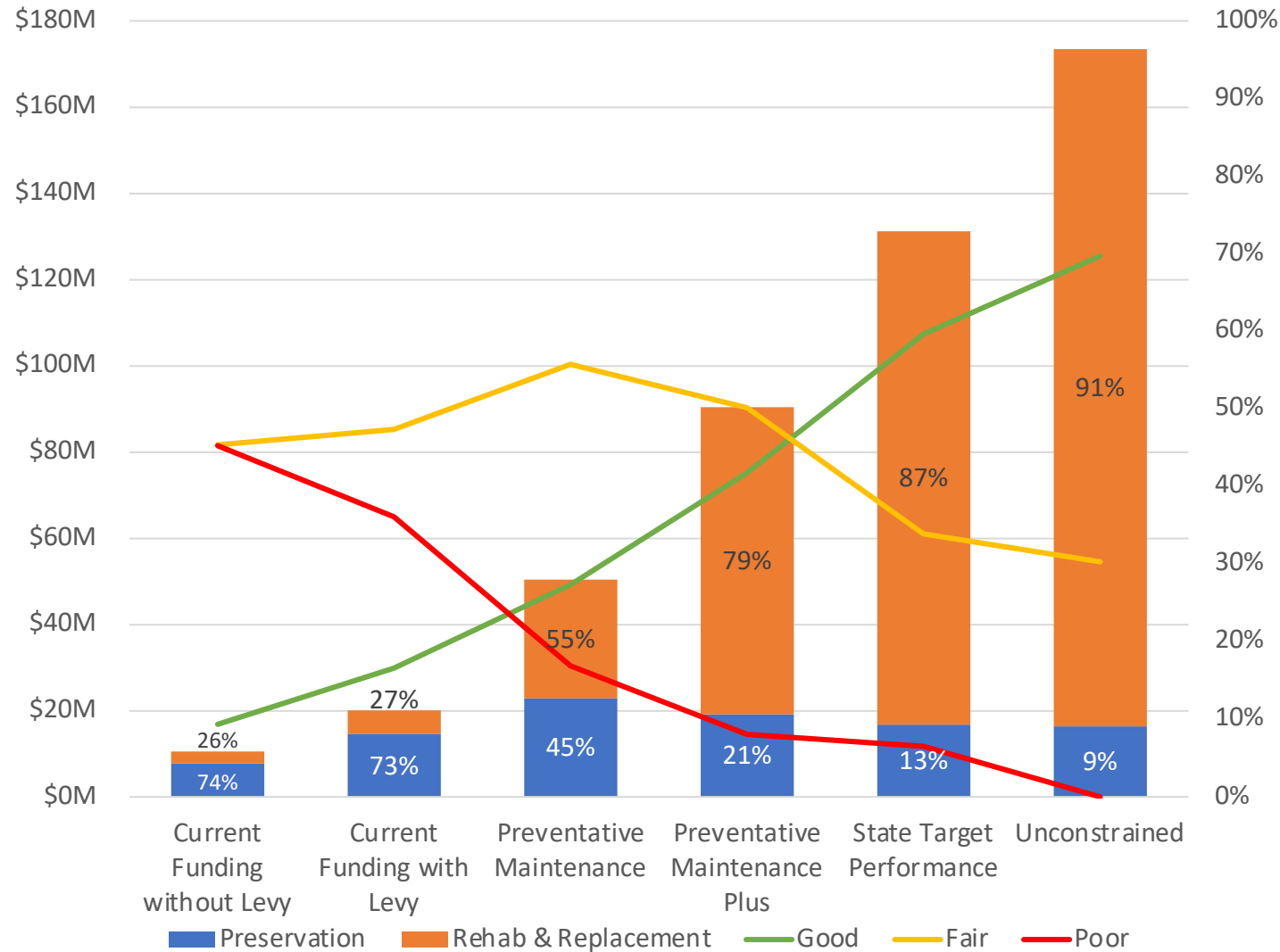
Critical Priority: Establish Preventive Maintenance Programs

- Follows industry best practices for preventative treatments

Major Capital Investment

- Rehabilitation
- Reconstruction
- Seismic Retrofit

Condition State vs Investment



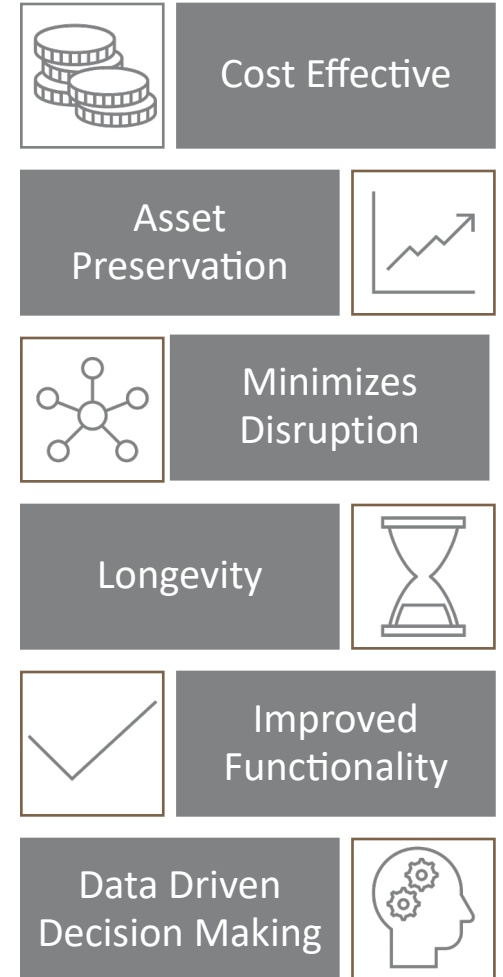
Preventative Maintenance Treatments & Cycles

Activity/Treatment	Current Funding without Levy	Current Funding with Levy	Preventative Maintenance	Preventative Maintenance Plus	State Target Performance	Unconstrained
Inspection & Monitoring	Inspection frequencies are mandated by FHWA (every 2 years for routine inspections).					
Painting Program	All full repainting projects and some spot painting projects deferred.	All full repainting projects are deferred. Spot paint every 18 years.	Ideal cycles for full (54 years) and spot (18 years) painting. Projects vary per scenario depending on bridge replacements.			
Deck & Joint Program	All deck replacement and overlays projects deferred and some joint	1000 SF of deck per year. Most overlays are deferred.	1000 - 3000 SF of deck per year . Overlays and joints are programmed for replacement every 25 years. Projects vary per scenario depending on bridge replacements.			
Cleaning Program	Deck, joint, and drainage cleaning every 2 years, pier and abutment cleaning every 10 years, bearing work every 30 years.					
Movable Bridge Maintenance	Reactive approach to outages, which may be prolonged.	Limited preservation of movable bridge components.	Ideal cycles for movable bridge components. Projects vary per scenario depending on bridge replacements.			
Spot Repairs & Misc. Maintenance	Increased need for repairs, but insufficient funds to address all needs.	Increased spot repairs due deferring deck overlay, joint replacement and bridge replacements.			Minimal due to the amount invested in painting program, deck overlays, joint replacement, rehabilitations, and replacements.	

Preventative Maintenance Recommendations

Actions to align the City's current practices with industry-leading asset management strategies:

- Continue current preservation program
 - Bridge Painting
- Fund new preservation programs
 - Bridge Cleaning
 - Deck and Joint
- Identify on-going funding for preservation programs



With significant maintenance increases, significant capital investment is still needed

10 Year Replacements

- N 79th St Ped Tunnel
- Albro Pl/Airport Way
- Westlake Ped/Ship Canal
- 4th Ave S Viaduct/Argo RR ^{1, 2}
- 33rd Ave W Ped/RR ¹
- NE 105th/Thornton Ck ^{1, 3}
- NE 110th/Thornton Ck ¹
- 39 Ave NE/Thornton Ck ¹
- 45th Ave NE/Thornton Ck ¹
- Magnolia Br ¹
- Elliott Bay Marina Ramps ^{1, 3}
- 2nd Ave Extension S ¹
- E Waterway (N Br)
- W Dravus St / RR
- W Dravus St / 15th Ave W ²
- McGilvra Blvd Br ²

11-20 Year Replacements

- 30th Ave NE@ NE 107th St
- Admiral Way - N Br ^{1, 2}
- Admiral Way - S Br ^{1, 2}
- University Br-N Apr Concrete ¹
- 1st Ave S / Argo RR ²
- Ballard Br – Bascule ^{1, 2}
- Ballard Br - Conc Apprs ¹
- Ballard Br - Steel Apprs ¹
- W Emerson St Viaduct
- 15th Ave W Interchange
- 15 Ave NW/NW Leary Way ²

21-30 Year Replacements

- Fauntleroy Expressway ²
- SW Spok St Viad Eastbound
- E Boston Terrace Br ²
- 2730 Westlake Ave N
- Airport Way / Argo RR
- 4th Ave S Jack-Airport-E Half ²
- 4th Ave S Jack-Airport- N Appr ²
- 4th Ave S Jack-Airport-W Half ²
- Seattle Blvd Br ²
- Jackson St, 4th to 5th-W Br ^{1, 2}

Legend

- ¹ Planning Study
- ² Conceptual Design Report (Seismic)
- ³ Contains multiple bridge segments

Recommendation 10

- Recommendation 10: After the Seattle Department of Transportation (SDOT) has accurate condition data, updated estimated useful life calculations, and lifecycle cost data, SDOT should develop a strategic asset management plan for its bridges and the City should develop and implement strategies to fill the bridge maintenance funding gap.

STATUS: PENDING

Questions?

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www.seattle.gov/transportation/



From the entire SDOT Team:
Thank you!