



REGIONAL TRANSPORTATION PLAN

2026–2050

DRAFT

MAINTENANCE, PRESERVATION AND
OPERATIONS

Final Draft – April 2026



Puget Sound Regional Council



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Puget Sound Regional Council
Information Center
1201 Third Avenue, Suite 500
Seattle, WA 98101-3055
206-464-7090 | info@psrc.org | psrc.org

Contents

Introduction.....	4
Priority in the Draft Regional Transportation Plan.....	4
State of Good Repair.....	5
Research Methods.....	5
Overview.....	5
Cities/Counties.....	6
Cost Effectiveness of Pavement Preservation.....	6
Seismic Retrofits.....	9
Fish Passage Barriers.....	10
Local Transit.....	11
Transit Revenue Service.....	11
Sound Transit.....	11
WSF.....	12
WSDOT.....	12
MP&O Needs.....	13
Review of estimates.....	13
Summary.....	16

Introduction

Maintenance, preservation, and operations (MP&O) encompass the activities that keep the region's transportation system moving safely. MP&O activities involve every type of transportation facility and impact every mode and user type.

The safe and effective movement of people and goods throughout the PSRC region relies on billions of dollars of capital infrastructure, including roads, bridges, ferries and transit, pedestrian, and bicycle facilities. To remain safe and usable, these investments require ongoing care in the form of maintenance and preservation. Safe and effective transportation also relies on thousands of workers and millions of labor hours to safely operate the system; without them, the transportation system would not function.

While often discussed together, maintenance and preservation are generally understood as separate activities. **Maintenance** is preventative work designed to extend the useful life of an asset. **Preservation** is work intended to improve the functional condition of an asset. Maintenance includes work like chip seals, where a protective surface is applied to existing pavement, while preservation includes projects like roadway reconstruction or a bridge seismic retrofit. **Operations** are activities associated with operating all facets of the transportation system, for example, operating buses and managing traffic signals.

There is an assortment of other terms for activities aimed at maintaining the condition of transportation infrastructure that are also considered part of maintenance and preservation. These include rehabilitation, replacement, restoration, and retrofit, among others. In some cases, the construction of new infrastructure (e.g. expanded stormwater infrastructure built to meet increased permit requirements or the purchase of new transit vehicles to support existing service) is also included under the maintenance and preservation umbrella.

Priority in the Draft Regional Transportation Plan

While the transportation system continues to function, the overall condition of assets has declined in recent years. Historic funding has not been sufficient to meet the maintenance and preservation needs, resulting in a pattern of deferred maintenance.

The short-term savings resulting from deferred maintenance come at a cost. Deferred maintenance ultimately increases the region's maintenance bill over time; not only will the maintenance eventually need to be completed but the relative condition of assets will be

worse, meaning bringing them into a state of good repair will be more expensive than it otherwise would have been.

State of Good Repair

Commonly used in M&P discussions, “state of good repair” refers to a condition in which physical assets, individually and as a system, are operating at full performance and are being sustained through regular maintenance and replacement programs.

Cities, counties, transit agencies, [port districts](#), [tribes](#), and the state are coping with increasingly strained budgets and applying innovative approaches to reduce costs, including by identifying less expensive alternative materials and new approaches to retrofitting.

The revenue that is currently identified to fund transportation MP&O is not sufficient to maintain the system at a state of good repair. Recognizing the funding challenges and the substantial investment need, PSRC’s boards explicitly prioritized MP&O and bringing and maintaining the system to a state of good repair as part of the RTP. The costs to do so are reflected in the plan’s financial strategy. More information on the board deliberations may be found in the draft RTP and on the RTP Engagement Hub.

PSRC does not maintain or operate facilities directly and so relies on our member agencies to put regional priorities into action. When the resources are made available, M&P work can be transformative. The aging Alaskan Way Viaduct, in need of major rehabilitation, was replaced with a toll tunnel and a surface street that reshaped the Seattle waterfront. WSF, faced with an aging ferry fleet in need of rebuilding, is transitioning to a hybrid-electric fleet. Working to comply with a 2013 injunction, the state has been working to repair hundreds of culverts that currently block fish from migrating up- or down-stream. Efforts by the state also keep the three longest floating bridges in the world operational.

The rest of this document provides background on the methodologies applied and surveys conducted to estimate the full MP&O needs today and into the future for all assets of the regional transportation system.

Research Methods

Overview

Measuring regional and local MP&O need is a challenge. Estimates in the RTP were based on a combination of limited datasets, including information on the condition of transportation assets, historic MP&O spending, and planned future spending. Complete data is not available from every jurisdiction; many have insufficient resources to collect new data

and/or lack the tools required to process asset condition data to estimate need at a local scale.

Local agencies implement a variety of approaches to collecting and managing data on the condition of transportation facilities. The lack of comprehensive and consistent data across transportation asset categories makes it difficult to accurately estimate what maintenance and preservation is needed on a regional scale. The approach to estimating MP&O needs and costs for the RTP involved a mix of methodologies to match the patchwork of available data.

The approach for this plan relied on outreach to jurisdictions to obtain the necessary data and information, including by circulating surveys and following up with staff. PSRC leveraged lessons learned from previous efforts to assess where gaps in data availability could be addressed to improve estimates.

Cities/Counties

Estimating regional maintenance and preservation needs for cities and counties presented a unique challenge due to the number and variety of jurisdictions. Jurisdictions often take differing approaches to collecting and managing condition data, complicating efforts at producing a regional estimate. Given these challenges, the approach to estimating city and county MP&O needs was highly varied by asset type.

Pavement Preservation

Pavement preservation includes activities dedicated to maintaining and preserving the surface of the roadway, including the application of a protective surface to existing pavement, replacement of the pavement surface, and full reconstruction of the roadway. In some cases, roadway preservation projects also involve the repair or improvement of sidewalks, bike lanes, or other infrastructure. Where possible, those costs are calculated separately (see below).

Pavement condition is measured using a pavement condition index (PCI), where sections of pavement are rated between 0 and 100 based on their general condition. A

Cost Effectiveness of Pavement Preservation

The condition of a roadway plays a major role in determining the cost to maintain it. Because activities like the application of a surface treatment are much more affordable than repaving or reconstruction, the better condition a roadway is in, the more affordable it is to extend the useful life of the facility. Roadway facilities in worse condition also tend to decline at a faster rate than better maintained facilities, as they become more vulnerable to the impact of vehicles and the environment.

PCI rating of 70 or higher is considered satisfactory and is the standard for determining a “state of good repair.” Because roadways in poorer condition are more expensive to maintain, a roadway with an average PCI score of 70 is considered to be in the “sweet spot” of the maintenance cost curve; roadways at this PCI or higher can be maintained in that condition more affordably than those with a lower PCI. The assessment of roadway PCI is performed by individual local agencies, who as noted do not collect information at a uniform level of detail across the region. To accommodate this variety, PSRC estimates pavement preservation need based on a weighted jurisdictional average.

The estimate of pavement preservation needs for the RTP is dependent on three key components. Information on **existing pavement conditions** by jurisdiction, an estimate of the **investment backlog** by jurisdiction (an estimate of the cost to improve the jurisdiction-wide average PCI up to 70), and an estimate of **long-term pavement preservation need** (an estimate of the cost to maintain the current and future system in a state of good repair, i.e. PCI 70).

This information was collected in a survey that was circulated to all the cities and counties in the region. Not every jurisdiction responded to the survey, but those that did account for over 95% of the region’s total roadway lane miles. Data reported in the survey was used to develop average costs on a per-lane mile basis, which were then used to extrapolate costs for jurisdictions that did not respond to the survey. The cost to overcome the pavement backlog is calculated as being addressed in the first ten years of the plan. The cost to overcome the backlog was then combined with projections of long-term pavement preservation need for every year of the plan.

Stormwater Drainage

Stormwater runoff from the transportation system has been an issue of heightened importance in the central Puget Sound region for many years. Pollutants from vehicles and activity on the roadway, including construction and maintenance activities, are carried from roadways to waterways where they affect water quality, fish, and other species. The construction of additional impervious surfaces and inadequate stormwater drainage and treatment systems means intervention is required to avoid continued pollution. For more information on the impacts from stormwater runoff and mitigation activities refer to the [Water Quality](#) report.

The National Pollutant Discharge Elimination System (NPDES) permitting process creates minimum stormwater infrastructure requirements for new construction activities and requires planning and construction of retrofits for existing facilities. Increased development and expanding maintenance requirements mean that stormwater MP&O costs are expected to continue to grow throughout the life of the plan.

These costs were projected using three main activity categories as defined in the Washington State Auditor's Office Budget and Reporting System (BARS): stormwater maintenance, stormwater preservation/construction, and street cleaning. Data is reported in BARS by local jurisdictions and is used by PSRC staff to determine the current and historic costs associated with these activities. That data was also used to estimate the historic growth rate at which costs have risen, adjusting for inflation, and to estimate the anticipated rate at which costs will increase over the life of the plan.

Local Traffic Operations

Traffic operations are components of the transportation system used to facilitate the flow of traffic. This includes traffic signals, dynamic messaging signs and other traffic control infrastructure such as traffic circles and speed bumps. Understanding the anticipated cost of local traffic operations in the future requires both an understanding of the current inventory of facilities and the long-term need of those facilities.

Without a uniform measurement system, previous work with PSRC's traffic operations stakeholders defined "optimal" condition as being when an agency is fully staffed and able to carry out all intended functions in a timely manner, including regular maintenance, and all capital components of traffic operations systems will be replaced at the end of their useful life.

Information about actual and optimal traffic operation costs was collected in a survey that was circulated in parallel with the pavement preservation survey to all cities and counties in the region. Not every jurisdiction responded to the survey, but those that did represented over 85% of traffic signals in the region, with traffic signals being the most feasibly measured proxy of a jurisdiction's traffic operations obligations. To supplement the survey, data from BARS describing maintenance costs associated with traffic control devices was also analyzed. Data reported in the survey and in BARS was used to establish current and historic costs associated with local traffic operations and to estimate the rate of future growth of local traffic operation costs. These calculations were used to project the cost of local traffic operations needs for the plan period.

Bridges

Maintenance and preservation activities associated with bridges are varied, including expansion joint replacement, bridge deck rehabilitation, steel bridge painting, and superstructure rehabilitation. WSDOT regularly inspects bridges on state, city, and county road systems to ensure they are in working order and to prioritize maintenance and preservation activities.

In coordination with the WSDOT Bridge and Structures Office, locally-owned bridge maintenance and preservation costs were estimated based on assumptions WSDOT utilizes for their state-owned bridge needs assessment. Costs varied depending on the bridge's primary material (steel or concrete) and on the size of the bridge.

While every bridge requires regular maintenance and preservation, not every bridge is anticipated to need replacement during the plan period. A bridge's replacement schedule is dependent on its age and useful life, as determined by WSDOT. Like maintenance and preservation, replacement costs are largely dependent on the primary material and size of the bridge being replaced. These elements – maintenance, preservation, and replacement – were used in combination to calculate MP&O costs associated with city- and county-owned bridges for the RTP.

Seismic Retrofits

Washington state has the second highest risk of large, damaging earthquakes in the country. In the Puget Sound region, earthquakes have the potential to damage critical transportation infrastructure, including bridges.

WSDOT has identified bridges around the state in need of seismic retrofit and is ~~working to make~~ **prioritizing** the required improvements to the more than 900 bridges that are part of the seismic retrofit program. An estimated need of over \$1 billion exists for state-owned bridges in the Puget Sound region in the plan period. To manage this large need, WSDOT is focused on a network of critical corridors supporting essential services and emergency response.

Washington Department of Transportation. Bridge & structure preservation (2025). Retrieved from <https://wsdot.wa.gov/construction-planning/preserving-our-roads-bridges/bridge-structure-preservation>.

Culverts

Fish Passage Barriers

In 2013, in response to twenty-one Washington tribes filing with the U.S. District Court to enforce the State of Washington's treaty obligation to preserve fish runs, a federal injunction required WSDOT to significantly increase the effort for removing state-owned culverts that block habitat for salmon and steelhead. The removal of fish passage barriers allow fish better access to habitat they rely on to feed, spawn, and shelter from predators and winter weather.

Statewide, there are over 2,000 documented state-owned fish passage barriers. In the PSRC region, 4,000 culverts owned by cities and counties are also identified as presenting some kind of barrier to fish passage. The replacement of culverts is prioritized based on many factors, including how much habitat will be opened to fish, the condition of the culvert, the presence of any downstream barriers, tribal input, project readiness, and more.

Transportation infrastructure is frequently built above or near water. Sometimes, this water is diverted into culverts, allowing the water to flow but often limiting the ability of fish to travel. Culverts require some routine maintenance, and there is sometimes the need for emergency work to address a blocked or broken culvert. Culverts are regularly inspected by the state to assess their pass-ability to fish and there are efforts by both the state and local jurisdictions to correct city and county owned fish passage barriers.

Coordination with the Washington State Department of Fish and Wildlife (DFW), the Fish Barrier Removal Board, and the Association of Washington Cities informed the approach for determining the city and county culvert maintenance and preservation need for the RTP. A state inventory of culverts was used to determine the number of facilities in the region. The anticipated rate of replacement was then based primarily on culverts expected to reach the end of

their useful life in the plan period and culverts anticipated to be replaced to correct fish passage barriers. The projected cost of culvert replacements was based on actual costs associated with completed culvert replacements funded by the Fish Barrier Removal Board.

Other Assets

There is not enough data available to estimate the anticipated MP&O need of every city and county owned and operated transportation asset over the life of the plan to the level of detail described above. To develop an estimate of the cost associated with MP&O for these facilities with limited data, annual transportation-related expenditure information reported by cities and counties in BARS was used to project future expenditures in the same categories. BARS data was used for a number of asset types, including bicycle and pedestrian infrastructure, street lighting, roadside development (the right-of-way beyond

the outside edge of the shoulder), several other miscellaneous activities (like snow/ice removal), and administrative costs.

Not every jurisdiction reports costs in every category every year. To account for this phenomenon, expenditures were analyzed both individually and in the aggregate for a better understanding of the total change in city and county expenditures for MP&O from year to year. Growth rates developed using this analysis were then utilized in combination with reporting on current expenditure levels to project out the need for these assets through the life of the plan

Local Transit

Local transit operators are responsible for a large fleet of vehicles, operating over 2,000 buses across the region. Transit operators also maintain hundreds of transit stations and stops, park and rides, and maintenance facilities. Operating costs are by far the area of greatest cost for local transit agencies, whose costs also include vehicle purchases and maintenance and preservation of maintenance bases and other equipment.

Transit Revenue Service

“Revenue Service” is time when a vehicle is available to the general public and there is an expectation of carrying passengers. Revenue Service is typically measured in either hours, trips, or miles.

Costs to maintain existing local transit operations were calculated based on an array of transit agency-level observed data from the National Transit Database (NTD). This data included operating costs by agency and service type on a per revenue service hour basis. Information about total revenue service by agency and service type

was also collected from NTD. This data was combined with projections of future service hours and costs per hour based on local transit agency growth assumptions in the RTP.

Administrative costs and capital investments (e.g. bus replacement) required to maintain existing transit operations are also projected based on historic NTD data. In addition, projected operating and capital costs to maintain passenger-only ferry service were provided by King County Metro and Kitsap Transit.

Sound Transit

Sound Transit maintains and operates the [Link light rail](#) system, the regional [Sounder commuter rail](#), and [Sound Transit Express](#) bus service. The agency manages a fleet of 160 light-rail vehicles and over 300 buses, as well as a number of other facilities. Like their local transit counterparts, the majority of Sound Transit’s MP&O costs are operating costs. Maintenance and preservation costs make up a lower share of total agency need when compared to local transit agencies, consistent with the age of the system being maintained.

Cost estimates for maintaining and preserving existing Sound Transit service were provided by Sound Transit's staff based on their Fall 2024 Financial Plan. This includes projected costs through 2050 for all operations and maintenance costs associated with existing Sound Transit light rail, streetcar, commuter rail, and regional express bus service.

Per Sound Transit's Long-Range Financial Plan, the future MP&O expenditure forecasts for each mode were based on cost models for each function (such as vehicle operations, vehicle maintenance, and facilities maintenance). The modal forecasts also include Sound Transit staff and additional administrative expenditures. Each cost category is forecasted using different metrics (such as platform hours, number of vehicles, number of stations, etc.). The pertinent metrics are based on historical and current year budget data, and other available information.

For more information on Sound Transit's financial assumptions in the RTP, refer to the [Financial Strategy](#) report.

WSF

Washington State Ferries (WSF) currently operate 21 ferries and 11 passenger facilities, in the PSRC region. WSF plans to build 16 new hybrid electric ferries and electrify 6 existing vessels by 2040. Beyond vessel replacement, WSF's MP&O needs include operating costs and the electrification of and improvements to passenger facilities – WSF has plans to electrify 11 ferry terminals to charge hybrid electric vessels by 2040.

WSF staff provided cost estimates to PSRC, broken down by vessel maintenance, preservation, and operations, as well as costs associated with terminals including maintenance, preservation, operations, and overhead costs.

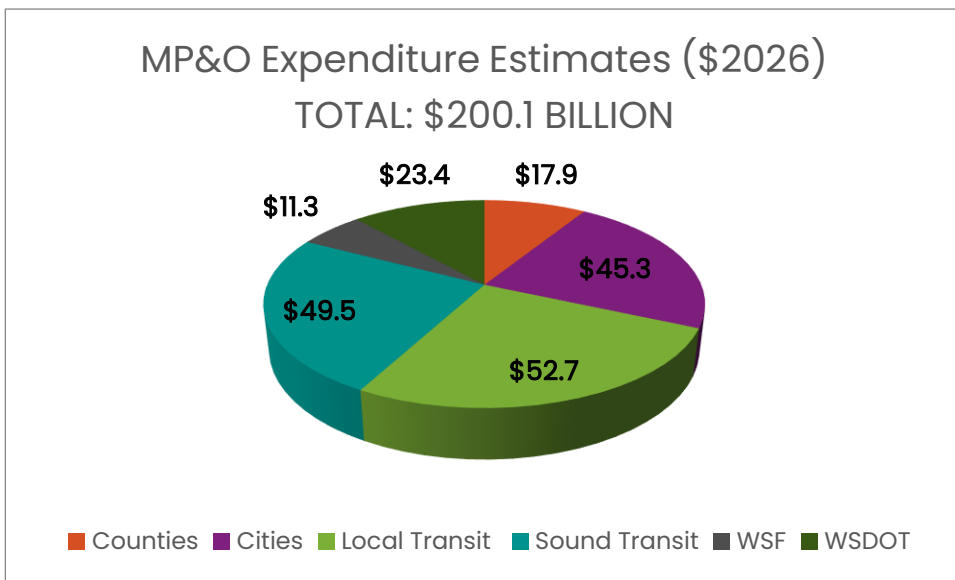
WSDOT

The Washington State Department of Transportation (WSDOT) is responsible for a great variety of MP&O activities in the PSRC region. Work includes maintenance and preservation of state highway facilities, bridge maintenance and preservation, traffic operations, toll operations and maintenance, fish passage barrier corrections and other activities.

PSRC and WSDOT staff coordinated to review WSDOT MP&O assumptions for the RTP and developed updated estimates based on the current projection of needs as reflected in the State Highway System Plan, Capital Program Development & Management (CPDM) estimates and the 25-27 Capital Improvement & Preservation Program Report.

MP&O Needs

Review of estimates



Costs for maintenance, preservation, and operations are rising across the board. These increases are impacting essentially every program area and have been driven by rising labor and materials costs. In some cases, more extensive regulatory or permitting requirements are also contributing to higher

costs. The projected MP&O need required to address backlogs and keep the system in a state of good repair exceeds the capacity of currently authorized revenues to fully fund. These costs are expected to continue to increase during the plan period. Additionally, the condition of transportation assets is decreasing overall, contributing to a maintenance and preservation backlog that will continue to grow if left unaddressed. Together, the rising costs of routine maintenance and the growing backlog has the potential to negatively impact the

useful life of transportation assets.

The overall decrease in the condition of transportation assets is not taking place uniformly throughout the region.

Not every agency is facing a funding shortfall, but those that do are facing a variety of different challenges in funding their MP&O needs. These challenges include increasingly constrained revenue and expanding number of assets to maintain. There is also variance from jurisdiction to jurisdiction in the amount of deterioration experienced by a given transportation asset type. Jurisdictions

Estimated Maintenance, Preservation and Operation Needs through 2050

Sponsor	Cost (in millions)
Counties	\$17,900
Cities	\$45,300
Local Transit	\$52,700
Sound Transit	\$49,500
WSF	\$11,300
WSDOT	\$23,400
TOTAL	\$200,100

with a high concentration of heavy vehicle traffic, for example, often face a larger backlog of pavement rehabilitation and reconstruction. A large maintenance and preservation backlog, for pavement or any other transportation asset, often leaves little funding for proactive preventative maintenance that might help to preempt future maintenance backlogs.

This deterioration will have a lasting impact. As the condition of assets continues to deteriorate, those assets become more expensive to bring back to a good condition than if they had been addressed earlier. Even after funding is made available, it will take time to address the preservation backlog for the parts of the system that have deteriorated the most.

The RTP commits to fully funding the maintenance, preservation, and operations of the transportation system at the optimal state of good repair through 2050. As noted above, costs for MP&O have risen and expenditures to date have not kept pace with increased costs required to meet those needs.

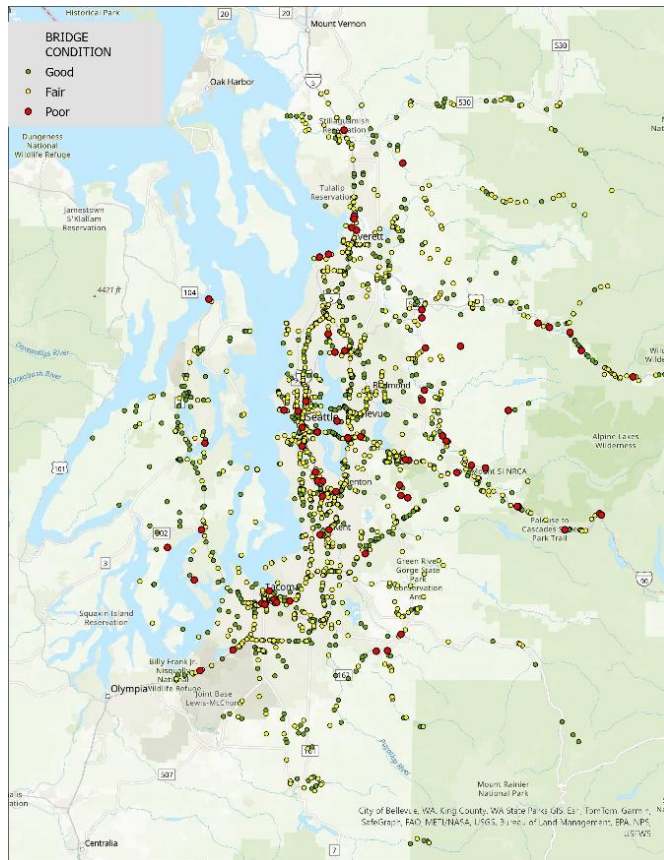
Where available, data on transportation asset conditions and related MP&O costs is described below.

Roads and Highways

The condition of state and locally owned roadways is declining. Cities and counties reported that their roadway networks have declined in condition since the previous plan adopted in 2022. The regionwide average PCI, measured using responses from individual jurisdictions to the pavement condition survey circulated by PSRC for this and the 2022 plan, fell from 69 to 64 (with 70 being the benchmark for state of good repair). This decline in condition contributes to an over 50% increase in the cost to overcome the maintenance backlog for pavement. The decline also contributes to rising costs associated with just maintaining the current condition because roadways in worse condition require more extensive and expensive care to be kept from further degrading.

The condition of state owned roads is also declining, with the share of lane miles rated “poor” and “very poor” increasing, according to the [WSDOT Gray Notebook](#). WSDOT estimates that current investment in state highway preservation is 40% of what is needed to preserve assets in a state of good repair.

Bridges



The overall condition of bridges is also deteriorating. According to bridge inventories provided by the WSDOT bridge office, between 2020 and 2023 (the last year of available data), the total number of bridges rated “poor” increased by 19, increasing the share of bridges rated “poor” from 2.8 to 3.6%. 49 of the 88 bridges in “poor” condition are state owned, while 39 are locally owned. The “poor” rating is reflective of more than just the condition of the bridge deck. It assesses the condition of the bridge deck, superstructure, and substructure. A bridge does not need to be rated poor in all categories to be rated poor overall. There is a complicated relationship between a bridge’s condition and the decision to repair or replace it, meaning that just because a bridge is rated “poor” does not necessarily mean that it needs to be

replaced.

Over 50 locally owned bridges are anticipated to need replacement or substantial rehabilitation in the plan period, representing over 5% of all locally owned bridges. WSDOT estimates that 14 state owned bridges will require replacement in the next 10 years. WSDOT’s approach to bridge maintenance means that bridges reaching the end of their useful life in more than 10 years may be replaced or may instead undergo extensive rehabilitation to extend its useful life. Bridge replacements are costly and time-consuming; costs depend on the size and material of the bridge, but average over \$50M per bridge.

Culverts

Statewide there are over 2,000 documented state-owned fish passage barriers. Of these, approximately 1,500 block a significant amount of upstream habitat. Statewide as of June 2024, WSDOT has corrected 173 barrier culverts. These projects have opened access to nearly 600 miles of habitat statewide. Sixty-eight of those barriers were in the PSRC region, and came at a cost of \$168M. In 2023 alone, WSDOT corrected 9 barriers at a cost of \$50 million in the PSRC region. WSDOT plans to correct over two hundred additional barriers during the plan period at an estimated cost of \$4.7B. Locally owned barriers, of which there are over 4,000, tend to be smaller (and less expensive to build and repair) than state owned barriers;

they are often located under smaller streets and roads instead of under highways or interstates. These culvers are not under legal obligation to be corrected, but, based on assumptions from staff at DFW, approximately a third of locally-owned culverts are anticipated to be repaired or replaced to address either a failure to properly convey water or to allow for fish passage.

Transit

All transit agencies that receive FTA funds are required to set and report annual performance targets for Transit Asset Management. The targets are reported to FTA through the National Transit Database. This includes information on vehicles, equipment, facilities, and infrastructure.

For more information on Transit Asset Management data, refer to the Regional FTA Performance Targets section of the [System Performance Report](#). Many transit agencies also post their Transit Asset Management Plans (TAMPs), which include more detailed TAM performance data, on their websites.

Ferries

Washington State Ferries (WSF) anticipates needing to replace 13 of their 21 vessels currently operating in the PSRC region during the plan period. The agency is currently working to convert one existing ferry into a hybrid-electric vessel and has plans to convert an additional six. WSF also plans to acquire 16 new hybrid-electric vessels, increasing the size of the fleet from 21 to 26 vessels and allowing for the retirement of aging vessels as they reach the end of their useful life. To accommodate the new hybrid-electric vessels, WSF is also planning to electrify 11 terminals and to replace several aging terminals.

For more information on the ferry system, refer to the Ferries section of the [Current and Future Transportation System Reports](#).

Summary

Addressing the region's MP&O needs presents a challenge to jurisdictions and agencies, who are confronting rising costs, declining conditions, and increasingly constrained revenue. They address these challenges with a variety of approaches, including developing innovative approaches and deferring maintenance.

Requirements for maintaining infrastructure have been and are expanding, which contribute to increasing MP&O costs. ADA and stormwater requirements have increased the cost to maintain roadway pavement, and Buy America requirements have also put increasing strain on the ability of ports and transit agencies to purchase vehicles and equipment. Rising

administrative costs associated with transportation maintenance, preservation, and operations also place additional pressure.

Transportation related costs have also outpaced regular inflation in the region. Rising material and labor costs combine with increased demands on skilled construction/maintenance crews to make transportation maintenance and operation costs increasingly more expensive. This phenomenon will have an acute effect on the future cost of addressing deferred maintenance, increasing it even in inflation adjusted dollars. While the RTP financial strategy captures the full MP&O needs of the system through 2050 and outlines mechanisms to fund that need, the challenge ahead is significant particularly in the short-term to address the existing backlogs.

The draft RTP describes the financial strategy and work ahead in greater detail. PSRC further commits to continued collaboration and research to support these efforts including:

- Continuing to refine methodologies and analysis tools to reflect regional needs and impacts related to maintenance and preservation.
- Exploring expanded data collection opportunities, including better and more consistent information on system conditions.
- Continuing monitoring overall investment levels in MP&O and the availability of funding sources.