

GNB

GRAY NOTEBOOK



Washington State
Department of Transportation

Quarterly performance analysis of WSDOT's multimodal systems and programs

Roger Millar, Secretary of Transportation, PE, FASCE, FAICP

Edition 88 ■ Quarter ending December 31, 2022

THE OPEN ROAD

MOVE AHEAD WASHINGTON FUNDS HELPING
WSDOT MAINTENANCE PLOW FORWARD

Sea trials

WSF working to improve its network of vessels and terminals for travelers

Hard work

WSDOT striving to keep its pavement in good condition

High voltage

WSDOT looking to increase electric vehicle options

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The Gray Notebook team

WSDOT's Gray Notebook is produced by the Performance Management and Strategic Management offices of the Transportation Safety & Systems Analysis Division: Hide Aso, Hui Dong, Sreenath Gangula, Mani Goudarzi, Joe Irwin, Dustin Motte, Amy Shaffer and Michele Villnave. TSSA is directed by John Milton.

On the cover: Snowplows work through some tough northeastern Washington winter weather to clear US 97 about nine miles north of Brewster in this December 19, 2022 photo taken by WSDOT Area 3 Superintendent Don Becker.

PERFORMANCE HIGHLIGHTS for the quarter ending December 31, 2022



WASHINGTON STATE FERRIES VESSELS PRESERVATION BACKLOG increased 29.3% since 2018

40 of WSDOT-administered **freight rail projects** were underway as of December 31, 2022

92 PERCENT

of WSDOT pavement lane miles were in **fair or better condition** in 2021, a decrease from 93.0% in 2020 (not including chip seal)

44 PERCENT of **highway maintenance** condition targets were missed in 2022

31 PERCENT increase in Washington **electric vehicle** registrations from 2021 to 2022

\$56.3 MILLION leveraged by Washington state for **public-use airport investments** in FY2023

\$23.3 MILLION in economic benefit provided by WSDOT's **Incident Response** teams clearing 10,252 incidents during the quarter

46 of 139 **Pre-existing Funds** projects were advertised during the quarter

Washington State Department of Transportation is pleased to share the agency's updated strategic plan, which outlines the vision, mission and values that guide the work of the agency. The plan has undergone updates to improve the way the agency does business, and now includes the following three goal areas:

- **Workforce Development** – To attract, support and retain a quality workforce possessing the skills to meet our legislative, regulatory, service and public expectations.
- **Diversity, Equity and Inclusion** – To purposefully engage with and listen to our employees, communities and partners as we work together to deliver programs.
- **Resilience** – To preserve and sustain the entire multimodal transportation system in preparation for challenges including aging infrastructure, changing weather patterns, natural disasters and other emergencies.

WSDOT's previous goal of Inclusion has expanded to Diversity, Equity and Inclusion. WSDOT has many activities underway in this area including implementing the agency's recently released DEI Plan, collaborating with the new state Office of Equity to work towards a more inclusive workplace culture, and incorporating the Healthy Environment For All Act into our programs and services. The agency is also changing the name of the team focused on those topics to better define its work; the Office of Equal Opportunity, also known as OEO, is transitioning to the Office of Equity and Civil Rights.

The Practical Solutions goal from past years has evolved into Resilience. While Practical Solutions remains a large part of how the agency does business day in and day out, the expanded focus now includes addressing the resilience of the state's transportation system. For WSDOT, resilience means the ability to mitigate, prepare for and respond to emergencies; combat climate change; and build a transportation system that provides equitable services, improves multimodal access and supports Washington's long-term resilience. In some ways this is a continuation of work the agency has always done, but it is also a bigger picture focus on the many ways to make the agency as prepared, nimble and responsive as it can be—not only for agency staff but for the people WSDOT serves and the state as a whole.

For more information about WSDOT's strategic plan, visit: <https://wsdot.wa.gov/about/secretary-transportation/strategic-plan>.

WSDOT's Vision

Washington travelers have a safe, sustainable and integrated multimodal transportation system.

WSDOT's Mission

We provide safe, reliable and cost-effective transportation options to improve communities and economic vitality for people and businesses.

WSDOT's Values

- Safety
- Engagement
- Innovation
- Integrity
- Leadership
- Sustainability

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STATEWIDE TRANSPORTATION POLICY GOALS DASHBOARD

Statewide policy goal/ WSDOT performance measure	Previous period	Current period	Goal	Goal met	Five-year trend (unless noted)	Desired trend
Safety						
Rate of traffic fatalities per 100 million vehicle miles traveled statewide ¹ (Annual measure: calendar years 2020 & 2021)	1.07	1.15	<1.00	—		↓
Total pedestrian and bicyclist fatalities (Annual measure: calendar years 2020 & 2021) ¹	127	156	0	—		↓
Rate of recordable incidents for every 100 full-time WSDOT workers (Annual measure: calendar years 2020 & 2021)	4.4	5.7	<5.0	—		↓
Preservation						
State highway pavement in fair or better condition by lane miles (minus chip seal) ² (Annual measure: calendar years 2020 & 2021)	93.0%	92.0%	≥ 90%	✓		↑
WSDOT-owned bridges in fair or better condition by bridge deck area (Annual measure: fiscal years 2020 & 2021)	93.2%	92.6%	≥ 90%	✓		↑
Mobility²						
Average clearance times for Incident Response (Calendar quarterly measure: Q4 2021 & Q4 2022)	17.4 minutes	17.8 minutes	*	N/A		↓
Highway Maintenance Accountability Process funded Level of Service targets made (Annual measure: calendar years 2021 & 2022)	56%	56%	*	N/A		↑
Washington State Ferry trips departing on time ³ (Fiscal quarterly measure: Q2 FY2022 & Q2 FY2023)	88.6%	90.3%	≥ 95%	—		↑
Amtrak Cascades on-time performance ⁴ (Annual measure: calendar years 2020 & 2021)	62%	51%	≥ 88%	—		↑
Environment						
Number of WSDOT stormwater management facilities constructed (Annual measure: fiscal years 2021 & 2022)	72	88	*	N/A		Not applicable
Cumulative number of WSDOT fish passage improvement projects constructed (Annual measure: calendar years 2020 & 2021)	365	379	*	N/A		↑
Cumulative number of electric vehicles registered in Washington (Annual measure: calendar years 2021 & 2022)	87,685	114,600	*	N/A		↑
Stewardship						
Number of Connecting Washington projects and contracts completed (on time/on budget) ⁵ (Biennial quarterly measure: Q5 2021-2023 & Q6 2021-2023)	1 0/1	0	*	N/A		Not applicable
Pre-existing Funds projects advertised (Biennial quarterly measure: Q5 2021-2023 & Q6 2021-2023)	36	46	*	N/A		Not applicable

Data source: WSDOT Transportation Safety & Systems Analysis.

Notes: (*) = goal has not been set. Dash (—) = goal was not met in the reporting period. **1** The goal for this performance measure differs from the federal Transportation Performance Management goal for the same measure. **2** Excludes chip seal pavement. **3** Washington State Ferries' on-time departures include any trip recorded by automated tracking as leaving the terminal within 10 minutes of scheduled time. **4** Amtrak Cascades' on-time performance includes any trip arriving within 10 or 15 minutes, depending on the route, of scheduled arrival time. **5** Projects and contracts are on time if they are completed within the quarter planned in the last approved schedule, and on budget if costs are within 5% of the budget set in the last approved state transportation budget.

88 TRANSPORTATION PERFORMANCE MANAGEMENT

WSDOT sets its federally-mandated 2023 TPM highway safety baselines, targets

WSDOT set its Transportation Performance Management highway safety baselines and targets for 2023 and sent them to the Federal Highway Administration in October 2022. FHWA in 2022 determined WSDOT did not show significant progress toward achieving its 2021 targets for highway safety (also referred to as PM1). States that did not show significant progress on PM1 must develop a strategic Highway Safety Implementation Plan and obligate federal HSIP funds based on the previous year's allocations. WSDOT outlines how it will address these efforts in its 2022 HSIP.

Washington's Strategic Highway Safety Plan ([Target Zero](#)) aims to achieve the goal of zero fatalities and serious injuries by 2030. This differs from the federal TPM targets listed below, which are based on a five-year average.

WSDOT reports PM2 and PM3 progress for 2022, sets its new two-year and four-year targets

WSDOT reported its federally-required TPM four-year actual targets set for bridges and pavement (PM2), and highway system performance, freight, and Congestion Mitigation and Air Quality (PM3) on December 16, 2022. These used data from five-year rolling averages from 2015-2019 and emissions data from 2013-2016.

FHWA will use the full-performance period progress reports for the period ending in calendar year 2021 to determine whether WSDOT has made significant progress toward its PM2 and PM3 targets. Not showing significant progress toward targets requires an explanation to FHWA of what WSDOT

TPM safety reporting on annual cycle

Targets for the highway safety rules (included in PM1) are on an annual reporting cycle, which differs from the two-year and four-year reporting cycles for PM2 and PM3.

TPM performance measures by program area	2021 baselines	2023 targets ¹
Highway Safety (PM1)		
Number of traffic fatalities on all public roads ³	≤ 575.4	≤ 447.5
Rate of traffic fatalities per 100 million vehicle miles traveled (VMT) on all public roads ³	≤ 0.974	≤ 0.757
Number of serious traffic injuries on all public roads ³	≤ 2,412.6	≤ 1,876.5
Rate of serious traffic injuries per 100 million VMT on all public roads ³	≤ 4.087	≤ 3.178
Number of non-motorist traffic fatalities plus serious injuries	≤ 594.0	≤ 462.0
Special Rules (Safety)		
Rate of per capita traffic fatalities for drivers and pedestrians 65 or older	Show yearly progress	
Rate of fatalities on high-risk rural roads ²	Show yearly progress	
Highway-railway crossing fatalities ³	Show yearly progress	

Data source: WSDOT Transportation Safety & Systems Analysis.

Notes: The PM1 targets for 2023 were submitted on August 31, 2022, using the five-year rolling average of 2017-2021 for current baseline data. The term "target" is required for federal reporting of the five-year rolling average; the figure does not represent the state's goal.

¹ The Strategic Highway Safety Plan for Washington (Target Zero) aims to achieve the goal of zero fatalities and serious injuries by 2030.

² Performance metric includes all individuals (for example, pedestrians and bicyclists) who died or were seriously injured as a result of a crash with a motorist in Washington. ³ Includes bicyclists and pedestrians.

will do to make progress in the future, and may trigger a financial penalty if PM1 and PM2 targets are not met.

These penalties require redistributing federal monies to help ensure significant progress toward specific targets in the future.

In some cases, WSDOT also set new two-year and four-year targets for PM2 and PM3 for reporting periods ending in 2023 and 2025 (refer to chart below). The 2023 mid-performance period progress reports on PM2 and PM3 (due in October 2024) allow WSDOT to update two-year condition/performance

and investment strategy discussions as well as have target adjustment discussions.

WSDOT updates its [TPM folios](#) as needed to ensure the agency and its partners are aligned as the federally-mandated work progresses.

TPM performance measures by program area	4-year targets (2021) ¹	4-year actuals (2021) ¹	Desired trend	2-year targets (2023) ²	4-year targets (2025) ²
Pavement and Bridges (PM2)					
Pavement					
Percent of Interstate pavement on the NHS in good condition	30%	46.0%	↑	30%	30%
Percent of Interstate pavement on the NHS in poor condition	4%	1.9%	↓	4%	4%
Percent of non-Interstate pavement on the NHS in good condition	18%	46.8%	↑	45%	45%
Percent of non-Interstate pavement on the NHS in poor condition	5%	4.2%	↓	5%	5%
Bridges					
Percent of NHS bridges classified in good condition ³	30%	32.8%	↑	30%	30%
Percent of NHS bridges classified in poor condition ³	10%	8.8%	↓	10%	10%
Highway System Performance, Freight, and Congestion Mitigation & Air Quality (PM3)					
Highway System Performance (Congestion)					
Percent of person-miles traveled on the Interstate System that are reliable	68.0%	82.4%	↑	77.2%	72.5%
Percent of person-miles traveled on the Non-Interstate NHS System that are reliable	61.0%	87.8%	↑	88.1%	88.4%
National Freight Movement Program					
Truck Travel Time Reliability (TTTR) Index	1.75	1.49	↓	1.51	1.53
Congestion Mitigation & Air Quality Program					
Peak hours of Excessive Delay per capita in Seattle urbanized area	28.0	18.9	↓	28.0	28.0
Peak hours of Excessive Delay per capita in Spokane urbanized area	N/A	11.4	↓	10.0	10.0
Peak hours of Excessive Delay per capita in Tri-Cities urbanized area	N/A	3.9	↓	4.5	4.5
Non-Single Occupancy Vehicle travel in Seattle urbanized area	32.2%	36.4%	↑	35.5%	36.8%
Non-Single Occupancy Vehicle travel in Spokane urbanized area	N/A	24.2%	↑	24.0%	25.1%
Non-Single Occupancy Vehicle travel in Tri-Cities urbanized area	N/A	20.6%	↑	21.4%	21.9%
Particulate Matter less than 2.5 microns (PM _{2.5}) (kg/day)	8.7000	49.230	↓	2.160	5.310
Nitrogen Oxides (NOX) (kg/day)	116.540	18.320	↓	42.640	84.120
Particulate Matter less than 10 microns (PM ₁₀) (kg/day)	224.000	-95.154	↓	223.838	447.676
Carbon Monoxide (CO) (kg/day)	309.060	793.068	↓	19.274	34.928

Data sources: WSDOT Pavement Office, WSDOT Bridge and Structures Office, WSDOT Transportation Safety & Systems Analysis, WSDOT Rail, Freight, and Ports Division, WSDOT Environmental Services Office.

Notes: Federal rule allows state and MPOs to adjust four-year targets during the mid-performance (2-year) progress report. Targets with desired trends going up (↑) should be above the level stated, and down (↓) should be below the level stated. ¹ The first reporting period is from 2018-2021 (Oct. 1, 2017 through Sept. 31, 2021 for CMAQ) with data and actuals submitted Dec. 16, 2022. ² The current two-year target period for PM2 is for calendar years 2022-2023 with data and actuals submitted on October 1, 2024. The current four-year target period for PM2 is for calendar years 2022-2025 (Oct. 1, 2021 through Sept. 30, 2025 for CMAQ) with data and actuals submitted on October 1, 2026. These reports align with the federal fiscal year, which runs October 1 through September 30. ³ Weighted by deck area.

88 PAVEMENT ANNUAL REPORT

WSDOT pavement conditions worsen in 2021, preservation funding issues continue

The condition of WSDOT-managed pavement lane miles in fair or better condition worsened from 93.0% in 2020 to 92.0% in 2021. Due to COVID-19 restrictions, chip seal roadways were not included in 2020 data, but they were included in the 2021 analysis.

Weighted by the amount of traffic carried, 92.5% of vehicle miles traveled (VMT) in 2021 were driven on pavement in fair or better condition, down 1.0 percentage point from 93.5% in 2020.

When VMT is considered in pavement condition measures, roadways with higher traffic volumes and that must perform to higher standards are given additional weight in calculations than less-traveled roads. As a result, the pavement condition is higher when measured via vehicle miles traveled; 92.5% for VMT compared to 92.0% for lane miles.

WSDOT ensures interstate pavement preservation takes priority over other roadways due to Federal Highway Administration Transportation Performance Management requirements. The emphasis on these more-traveled strategic freight corridors (also known as T-1 and T-2 corridors, refer to box at right) is one reason the state did not experience a larger decrease in the percentage of VMT-weighted pavement in fair or better condition between 2020 and 2021.

Move Ahead Washington transportation revenue package will assist statewide pavement conditions

The 16-year, \$3 billion Move Ahead Washington transportation revenue package is intended to preserve and maintain infrastructure and help ensure roadway safety for the traveling public and commerce. The revenue package helps empower WSDOT to program projects to achieve actual needs instead of relying on less expensive and less effective treatment methods. It will also allow WSDOT to tackle the growing infrastructure backlog.

Preservation and maintenance of Washington's transportation system—including WSDOT-owned pavement—has been underfunded for decades. WSDOT's approach to pavement preservation has focused on extending how long its pavement assets remain in fair or better condition. However, this strategy is no longer sustainable as preservation funding issues have reached a breaking point. According to backlogs, WSDOT would need approximately \$320 million annually for pavement maintenance and preservation needs; the agency currently receives less than half that amount.

Notable results

- *WSDOT pavement lane miles in fair or better condition worsened from 93.0% in 2020 to 92.0% in 2021 (chip seal roadways were included in 2021)*
- *WSDOT's pavement Deferred Preservation Liability increased 51.5% from \$346 million in 2017 to \$524 million in 2021*
- *WSDOT estimates it will need up to \$112 million annually over the next 24 years for concrete preservation*

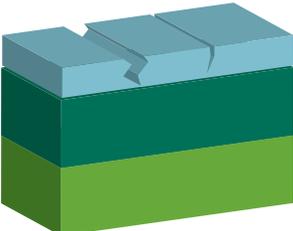
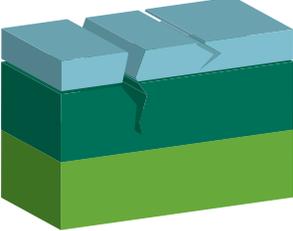
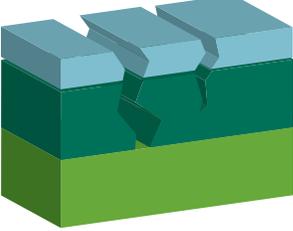
Strategic freight corridor classifications

WSDOT classifies highway segments, or corridors, by how much freight travels on them. T-1 freight corridors are the most heavily traveled and see over 10 million tons of truck freight per year. Corridors that see between four million and 10 million tons of truck freight annually are T-2 corridors and corridors that see between 300,000 and four million tons of truck freight annually are T-3 corridors. Both T-1 and T-2 corridors are considered strategic freight corridors under the definition established in [RCW 47.06A.020](#).

For additional information, refer to: <https://wsdot.wa.gov/freight/fgts>.

Percentage of WSDOT's pavement in poor condition decreases between 2017 and 2021

Actual values for 2017 and 2021; Characteristics of pavement at each condition; Percentage of lane miles and vehicle miles traveled (VMT) by condition category

WHAT DRIVERS SEE	WHAT IS HAPPENING	2017	2021	Trend ¹	Desired trend
GOOD/VERY GOOD 		By lane miles 75.0% By VMT² 73.0%	 	↓ ↑	
FAIR 		By lane miles 16.8% By VMT² 18.5%	 	↑ ↓	N/A³
POOR 		By lane miles 5.6% By VMT² 6.3%	 	↑ ↓	
VERY POOR 		By lane miles 2.6% By VMT² 2.2%	 	↓ ↓	

Data source: WSDOT Materials Lab, WSDOT Capital Program Development and Management.

Notes: Percentages were slightly affected in 2020 due to COVID-19 impacts on data collection. Percentages may not add to 100 due to rounding. WSDOT collects data on the condition of pavement annually using a van equipped with lasers, cameras and other equipment (refer to GNB 68, p. 21). Condition figures for 2019 include chip seal pavement, also known as Bituminous Surface Treatment. Chip seal data for 2017 and 2018 was collected, but has not yet been processed. **1** Trends are based on observed condition trends between 2017 and 2021. Arrows indicate trends by lane mile. **2** When pavement condition is weighted by VMT, roadways with more traffic are weighted more heavily than less traveled roads. Weighting pavement condition by VMT better accounts for the higher costs to maintain and preserve roads with more traffic. **3** N/A = Not Applicable. Because pavement in fair condition may have entered that category by either improving from poor condition or deteriorating from good condition, WSDOT does not have a desired trend for the percentage of pavement in fair condition.

Lowest cost pavement rehabilitation should occur at fair condition

WSDOT prefers to begin the rehabilitation process to protect the pavement structure and manage pavement at the lowest life-cycle cost when it is in fair condition. The condition of WSDOT-managed roadways is evaluated annually using three indicators:

- Surface cracking (an indicator of structural deterioration);

- Rutting (which is monitored for safety and structural reasons); and
- Roughness (measured using the International Roughness Index).

WSDOT uses these criteria to classify pavement conditions into four categories: good/very good, fair, poor and very poor (refer to chart on p. 8).

The good, fair, poor indicators are useful for short-term evaluations of current conditions but do

not provide information about past performance or forecasted future performance. Long-term performance indicators provide a more in-depth assessment of pavement infrastructure, as they account for the impact funding has on asset sustainability, pavement service life and preservation backlog (refer to chart below).

All long-term WSDOT pavement performance measures worsen between 2020 to 2021

2020 and 2021; Annual pavement performance measures

Annual pavement performance measures ¹		2020	2021	Agency Target	Target ²	Trend	Desired trend
Short term	Percent of pavement in fair or better condition When pavement is in fair condition this is where typically WSDOT begins the rehabilitation process to protect the pavement structure and manage the pavement at the lowest life-cycle cost.	Without chip seal ³	With chip seal				
	Lane Miles	93%	92.0%	90.0%	✓	↓	↑
	VMT ⁴	93.5%	92.5%			↓	
	Asset Sustainability Ratio⁵ Years of pavement service life added to the pavement network through rehabilitation in a given year divided by the service life consumed in that year.	0.84	0.49	0.90 to 1.10	—	↓	↑
Long term	Remaining Service Life⁵ Average percentage of original total useful life remaining before rehabilitation or replacement is needed; average years remaining before rehabilitation or replacement is needed.	47.1% (7.6 yrs)	47.5% (7.6 yrs)	45% to 55%	✓	↑	↑
	Deferred Preservation Liability (backlog) An estimate of the accumulated cost (in current dollars) to fund the backlog of past-due (deferred) pavement rehabilitation work.	\$478 million	\$524 million	\$0	—	↑	↓

Data source: WSDOT Pavement Office.

Notes: Fair or better percentages were slightly affected in 2020 by COVID-19 impacts on data collection. ¹ Refer to pp. 10-11 for additional discussion of long-term measures. ² Check indicates target met, dash indicates target not met. ³ Due to COVID-19 restrictions, chip seal data was not collected in 2020. ⁴ VMT = vehicle miles traveled. ⁵ Measure is weighted by vehicle miles traveled to better capture the typical road user's experience.

Asset Sustainability Ratio shows insufficient funding

The Asset Sustainability Ratio is a measure that reflects the level of asset replenishment that is being invested into the pavement network. If the value is equal to or above 1.0, sufficient investments are being made to keep the pavement assets sustained and preserved into the future. A value less than 1.0 indicates insufficient funding for pavement asset sustainability.

Implementing sustainable pavement

WSDOT has increased efforts to recycle both concrete and asphalt as part of its effort to improve energy efficiency, reduce pollution and enhance resilience. The Interstate 5 and State Route 16 Connectors Realignment project recycled the old cement pavement on-site and reincorporated it into the roadway. On SR 508 in Morton, maintenance crews reused asphalt grindings from previous paving jobs to extend a small, highly used shoulder along the highway into town. These are examples of how WSDOT is working toward a sustainable practice to reduce waste and equitably improve mobility, access and safety.

WSDOT's long-term pavement performance measures continue to worsen in 2021

Asset Sustainability Ratio declines by 45.6% since 2017

In 2021, WSDOT was not preserving enough pavement to replenish what was used, and the backlog of pavement needing repair continued to grow.

WSDOT pavement assets had an Asset Sustainability Ratio below 1.0—indicating insufficient funding for pavement asset sustainability—for four of the past five years (refer to chart below). The average ASR of WSDOT's pavement assets for the past five years was 0.77, which was 14.4% (0.13 points) below the lowest sustainable range of a 0.9 ASR.

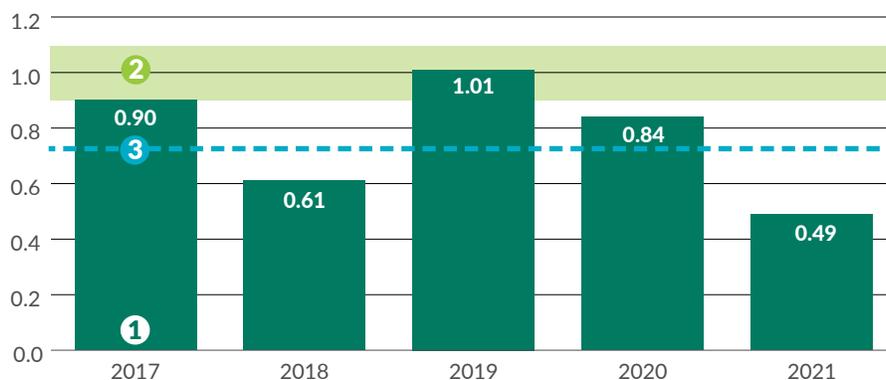
The ASR dropped 41.7% from 0.84 in 2020 to 0.49 in 2021 and has had a five-year decrease of 45.6% since 2017.

The ASR is calculated by determining the years of pavement service life added to the network in a given year divided by the pavement service life consumed during the same year. For example, a network of 18,500 lane-miles will consume 18,500 lane-mile years of life by aging one year.

Asset Sustainability Ratio drops 45.6% from 2017 to 2021

2017 through 2021

- ① Asset Sustainability Ratio for WSDOT-owned pavement
- ② Sustainable range: 0.9 to 1.1
- ③ Five-year average ASR (2017-2021)



Data source: WSDOT Materials Lab.

Notes: The Asset Sustainability Ratio is calculated by dividing the years of pavement service life added to the network in a given year by the years of pavement service life consumed in that same year.

Remaining Service Life increases

The Remaining Service Life of state-owned pavement gained 0.4 percentage points in 2021, with a value of 47.5%, compared to of 47.1% in 2020 (refer to chart at right). The target value is between 45% to 55% and is expected to remain within this range into the future.

RSL is a measure of average remaining pavement life summed for each section across the roadway network. It is calculated by first estimating the number of years remaining before the condition of a pavement section is expected to become unacceptable (poor or very poor) and then dividing by the pavement section's total expected lifetime. This number is then averaged over all of the pavement sections in the network to yield the statewide RSL.

Preservation backlog increases

WSDOT's pavement Deferred Preservation Liability (also known as the pavement preservation backlog) increased 9.6% from \$478 million in 2020 to \$524 million in 2021 (refer to chart at right).

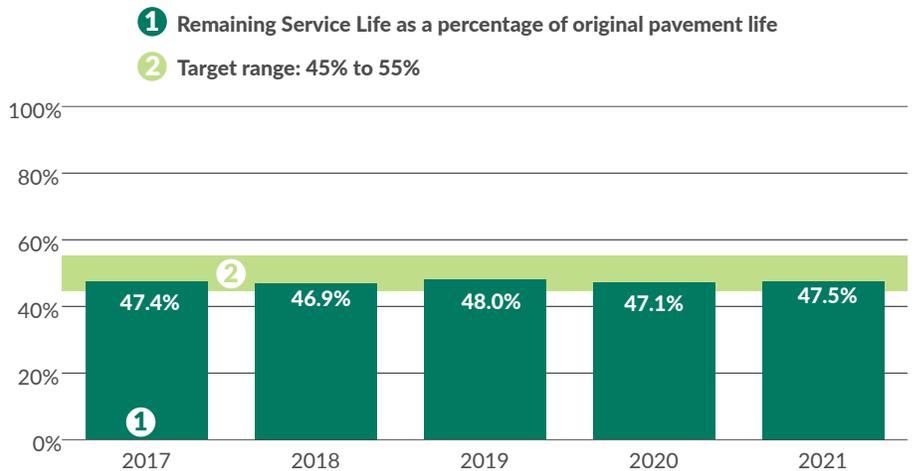
When funding is inadequate to maintain pavement in an acceptable condition, WSDOT uses Deferred Preservation Liability to indicate the investment that will eventually be needed to restore the pavement network to an adequate condition.

The DPL estimates the accumulated cost to fund the backlog of past-due (deferred) pavement rehabilitation work. The goal is to have a DPL of \$0.

Over the past five years, WSDOT's DPL has increased approximately

WSDOT pavement Remaining Service Life stays within target range in 2021

2017 through 2021; Remaining Service Life shown as a percent of original pavement life

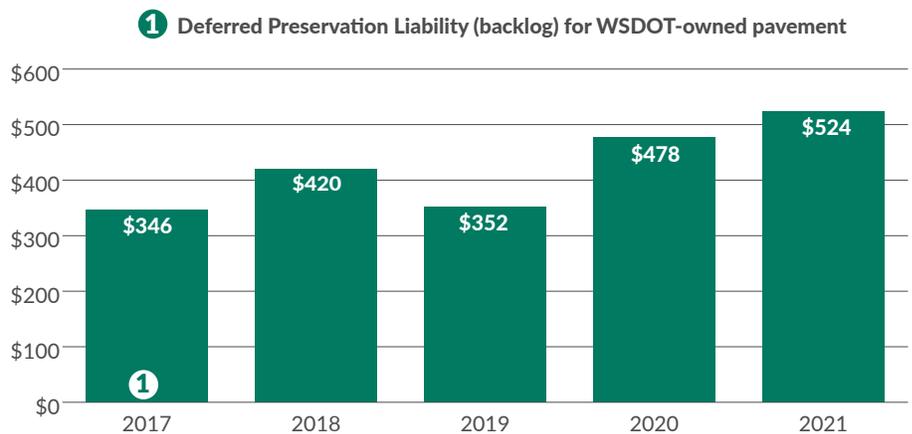


Data source: WSDOT Materials Lab.

Notes: For 2021, the Remaining Service Life of 47.5% is equivalent to an average of 7.6 years remaining before rehabilitation is needed.

WSDOT's pavement backlog experiences 51.5% increase from 2017 to 2021

2017 through 2021; Dollars in millions



Data source: WSDOT Materials Lab.

Notes: Deferred Preservation Liability is defined as the funding necessary to address past due pavement rehabilitation for all pavement types. WSDOT's goal is to have \$0 in Deferred Preservation Liability.

51.5% from \$346 million in 2017. The DPL will continue to increase until necessary preservation funding is allocated. While Move Ahead Washington funding will help WSDOT more adequately address

its growing backlog of pavement preservation needs, the funding is expected to present challenges such as planning, designing, constructing and staffing. Due to the extensive backlog, the agency does not anticipate immediate results.

Concrete pavement preservation expected to need as much as \$2.69 billion through 2045

WSDOT estimates it will need \$2.26 billion-\$2.69 billion for concrete preservation through 2045—an average of between \$94 million-\$112 million annually. This estimate, which does not account for inflation, reflects an average annual need to reconstruct 50 lane miles of concrete pavement and rehabilitate 45 lane miles.

WSDOT manages approximately 2,080 lane-miles of concrete pavement, most of which were constructed in the 1950s and 1960s. This pavement has far exceeded its original design life and has carried several times the traffic load than originally anticipated. More than 65% of WSDOT's lane miles (1,365) are over 40 years old and almost half of these lane miles (638) have never been improved.

WSDOT's lowest-cost network preservation strategy requires that a reasonable number of lane miles of concrete pavement be reconstructed each year on a continuing basis. The average annual requirement was 50 reconstruction lane miles and 45 triage lane miles over a 30-year period (2016-2045). However, seven years have passed, and WSDOT has reconstructed about 28 lane miles due to constrained pavement preservation funds.

Most of the concrete network must be reconstructed within the next 20 years to avoid the risks of unexpected failures in critical areas and more costly construction. The concrete pavement most needing reconstruction is in highly congested areas (primarily in King County). These areas present additional challenges due to the complicated nature of the projects and the short work windows available because of traffic delay concerns.

Due to the age of the roadway, WSDOT must reconstruct I-5 from milepost 155 (near Southcenter) to milepost 178 (near the King/Snohomish county line), this amounts to approximately 200 lane miles over the next 15 years. Unavoidable traffic impacts will be significant and must be coordinated with bridge and barrier construction occurring in the same vicinity. This scenario will be repeated in these critical transportation areas every year.

Seventy lane miles of concrete reconstruction per year is needed for the next 20 years. Of that total, 25 lane miles per year are in critical congestion areas, which will involve extensive traffic control and construction difficulties.

This work is in addition to 45 lane miles per year of triage projects, which are needed to extend life so that reconstruction can be delayed for 10 to 15 years.

Concrete reconstruction methods at WSDOT

■ **Crack and Seal with Asphalt Overlay**
Cost: \$900,000 per lane mile
Longevity: 15 to 20 years
Fractures existing concrete pavement, turning it into a stable base for a thick layer of new asphalt pavement

■ **Asphalt Replacement**
Cost: \$1.3 million per lane mile
Longevity: 15 to 20 years
Removes the concrete slab and subbase, and lays new asphalt pavement

■ **Unbonded Concrete Overlay**
Cost: \$1.5-\$2 million per lane mile
Longevity: 50 years
Places a thin layer of asphalt on top of the existing roadway, followed by a full-depth concrete overlay on top of the new asphalt

■ **Concrete Replacement**
Cost: \$2.5-\$3.5 million per lane mile
Longevity: 50 years
Removes the existing concrete slab and subbase, and replaces it with a new, thicker slab. Used when an existing decades-old slab is not thick enough for current traffic levels

Note: Costs and longevity are approximations.

WSDOT wins three pavement awards

In fall 2022, WSDOT received three Perpetual Pavement Awards from the Asphalt Pavement Alliance for 2021. This was WSDOT's eighth PPA by Performance since the program began in 2001, and its second PPA by design and PPA by Conversion. WSDOT was the first to earn these awards in 2020, and was one of only two road owners to win a 2021 PPA in all three categories. APA developed these awards to recognize long-life asphalt pavement in the U.S. and honor asphalt pavement work that demonstrates outstanding design and construction.

The Perpetual Pavement by Performance Award in the original category of Performance was for a 4.39-mile section of State Route 7 in Pierce County, which is more than 69 years old. This award's qualifications are that the pavement must be at least 35 years old and have never suffered a structural failure. It must also demonstrate excellence in design, quality construction and high value to taxpayers.

To qualify for the PPA by Design, the winning pavement must be a newly designed and constructed asphalt road built over a new or reconditioned subgrade that meets strict Perpetual Pavement criteria. WSDOT earned this award for the 4.25-mile westbound widening of SR 502 in Clark County that opened to traffic in 2017.

The third award PPA by Conversion, recognizes new asphalt roads constructed over an existing road. The WSDOT winning project is 2.41 miles of Pavement Rehabilitation on Interstate 5 southbound in King County, completed in 2017. The winning sections of SR 7, SR 502 and I-5 all meet the criteria for a PPA and will continue to serve the travelers in Washington well into the future, requiring little maintenance.

Contributors include Karen Carlie, Kyler Carlson, Rob Charbonneau, Jianhua Li, Tim Rydholm, Karen Strauss, Joe Irwin and Michele Villnave

Perpetual Pavement by Performance Awards

Over the past 20 years, the Asphalt Pavement Alliance has awarded WSDOT eight Perpetual Pavement by Performance awards. This illustrates that WSDOT has many miles of roadway that have been in place for over 35 years and are in excellent condition.

- 2021 - SR 7 Pierce County
- 2020 - US 395 Mesa to Connell, Franklin County
- 2019 - SR 12 Lewis County
- 2018 - SR 195 / SR 271 Junction, Whitman County
- 2017 - SR 16 Pierce & Kitsap counties
- 2016 - SR 512 / SR 161 Interchange, Pierce County
- 2008 - I-5 Snohomish County
- 2001 - I-90 Corridor, Kittitas & Grant counties

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Challenges continue for WSDOT Maintenance

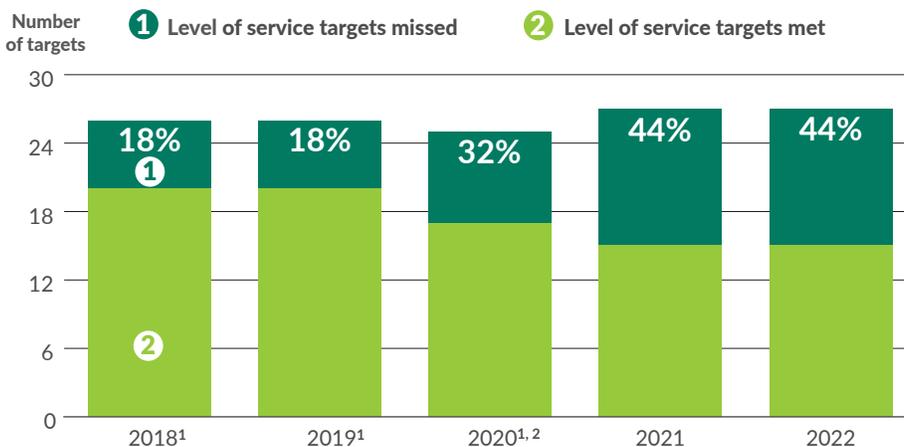
WSDOT missed 44% (12 of 27) of its highway Maintenance Accountability Process (MAP) funded Level of Service (LOS) targets for 2022, which was unchanged from 2021. Over the past five years, the percentage of LOS targets missed has steadily increased and has averaged 31.2% as long-standing preservation funding challenges persist throughout the state (refer to chart below).

The 16-year, \$3 billion Move Ahead Washington transportation revenue package was approved by Gov. Jay Inslee and the Washington State Legislature in 2022. The package—which set aside \$750 million for maintenance—is intended to preserve and maintain infrastructure and help ensure roadway safety for the traveling public and commerce.

While the Move Ahead Washington plan is a significant investment for WSDOT, it is not without its challenges for the programs. WSDOT's current LOS scores represent years of underfunding and will not quickly transition to a State of Good Repair. It will take years of planning and implementation for both the maintenance and preservation programs to attain the targeted levels of service. Unplanned activities, including severe weather and other unexpected events, can adversely impact WSDOT's ability to meet LOS targets because they pull personnel from planned maintenance activities.

WSDOT misses 44% of its Level of Service maintenance targets in 2022

Number of targets missed and met 2018-2022; percentage of targets missed



Data source: WSDOT Maintenance and Operations Office.

Notes: 1 All facilities in the Urban Tunnel Systems Operations category were under construction during the reporting period, so the category was not included in target calculations for 2018, 2019 or 2020. 2 WSDOT was unable to complete condition assessments for Regulatory/Warning Sign Maintenance and Guide Sign Maintenance due to COVID-19 and carpooling restrictions in 2020.

Notable results

- WSDOT missed 44% (12 of 27) of its highway maintenance asset condition targets in 2022
- WSDOT added 4,908 assets and processed 215,912 maintenance records in 2022 using HATS (a Maintenance Management System)

Level of Service scores

LOS is reported on a scale of "A" through "F." The general definition of each LOS is as follows:

- "A" - The assets are in excellent condition and all systems are operational.
- "B" - The assets are in good condition and all systems are operational.
- "C" - The assets are in fair condition and systems may occasionally be inoperable.
- "D" - The assets are in poor condition and system failures could occur.
- "F" - The assets are in poor and failing condition and system failures are likely.

How WSDOT measures its Level of Service targets

WSDOT measures the annual performance of 27 maintenance activities using two metrics:

- **Asset condition Level of Service** is measured for each asset using data collected from site surveys or operational assessments that evaluate the asset's performance.
- **Task completion** is an evaluation of planned maintenance tasks for specific activities compared to how many of those tasks were completed. [Task completion data can be viewed on this attachment.](#)

WSDOT scores its LOS using a letter grading scale, with A being the highest and F being the lowest (refer to box on p. 14). Of the 27 maintenance activities measured in 2022, WSDOT missed LOS targets for the following 12 activities:

- Snow and Ice Control Operations
- Regulatory/Warning Sign Maintenance
- Pavement Striping Maintenance
- Culvert Maintenance
- Shoulder Maintenance
- Sweeping and Cleaning
- Slope Repair
- Vegetation Obstruction Control
- Guidepost Maintenance
- Noxious Weed Control
- Roadside Cleanup
- Guide Sign Maintenance

WSDOT misses 44% of highway maintenance asset condition targets

2021-2022; Funded Level of Service asset condition targets and scores achieved

Category	Funded level (LOS target)	2021 results	2022 results
Special Bridge and Ferry Operations	A	A	A
Snow and Ice Control Operations	A	B	B
Traffic Signal System Operations	C	B	B
Catch Basin and Inlet Maintenance	A	A	A
Urban Tunnel System Operations	B	B	B
Regulatory/Warning Sign Maintenance	C	F	F
Barrier Maintenance	B	A	B
Pavement Striping Maintenance	B	C	D
Stormwater Facility Maintenance	A	A	A
Bridge Cleaning	B	A	B
Intelligent Transportation Systems	A	A	A
Culvert Maintenance	D	F	F
Shoulder Maintenance	C	D	D
Rest Area Operations	B	B	B
Ditch Maintenance	B	B	B
Raised/Recessed Pavement Marker Maintenance	C	C	C
Sweeping and Cleaning	A	C	C
Slope Repair	B	D	F
Pavement Marking Maintenance	D	F	D
Vegetation Obstruction Control	C	C	D
Guidepost Maintenance	D	F	F
Highway Lighting Systems	B	B	B
Noxious Weed Control	B	C	C
Roadside Cleanup	D	F	F
Guide Sign Maintenance	C	F	F
Nuisance Vegetation Control	D	D	D
Landscape Maintenance	D	D	C
Percent of targets achieved or exceeded		56%	56%
Percent of targets missed		44%	44%

Data source: WSDOT Maintenance Office.

Notes: The 27 maintenance activities are listed in prioritized order. Highlighted boxes indicate missed targets. Asset condition Level of Service is affected by maintenance activity, rehabilitation/reconstruction of highway infrastructure, third-party damage, disaster events and new construction projects. LOS assessments occur throughout the reporting year, and scores are based on asset conditions at the time of assessment.

WSDOT faces a shortage of maintenance employees

It is estimated between 2021 and 2031, 1.7 million people per year will leave their jobs in the transportation infrastructure sector, according to the Bureau of Labor Statistics. Nationwide, there has been an increasing demand for drivers with Commercial Driver's Licenses (CDL) and mechanics. For states this has resulted in shortages due to:

- Fewer people are becoming CDL drivers, which translates into fewer people available to fill these positions

- Higher private salaries and signing bonuses, which make states less competitive

- An aging workforce starting to retire

To keep up with the ever-growing demand for qualified employees, WSDOT is hiring more people without their CDLs and providing the training to obtain them. WSDOT has provided CDL training to 129 individuals and has another 22 waiting for a spot in a commercial school or to start an in-house training.

WSDOT Maintenance offers an in-house workforce development program in many different areas to ensure that Washingtonians have a safe, sustainable, and integrated multimodal system.

The different tiers of in-house training consist of entry-level, technical, and leadership-focused curriculums. In 2021-2022, WSDOT started a "High School to Highways program," which directly led to 23 people being hired.

WSDOT's Low Voltage Auto Start system saves time and money

Maintenance employees are encouraged to share and implement ideas or solutions to everyday problems and issues that crews encounter through the department's annual Innovations Program. Many teams across the state bring forward new ideas to save time and resources while increasing work zone and personnel safety.

The Low Voltage Auto Start system took first place at the WSDOT Innovations Challenge in 2022. WSDOT vehicles equipped with beacon lights or message signs need to be left in work zones or near hazard locations for prolonged periods. The system allows the operator to leave a vehicle unattended while it powers devices that communicate information to the traveling public.

When activated, the system battery voltage is monitored, and when it drops to 11.5 volts, the vehicle will start up and run for a predetermined time period to properly recharge the batteries. Once the batteries are charged, the system then shuts off the vehicle. The system will continue to operate in this manner until it is deactivated. It includes safety features for technicians that prevent activation if the hood is open or the doors are unlocked, the engine shuts off when the system is activated and the brake pedal is pressed to reduce the likelihood of the vehicle being stolen.

Benefits of the Low Voltage Auto Start system include:

- A 70% reduction in idle time
- Reduced fuel consumption
- Smaller carbon footprint
- Less maintenance on heavy truck emission components



Auto start system wins innovation challenge.

In 2022, four maintenance academies were held, training 240 entry-level employees in classroom settings and hands-on. Eight technical trainings were offered, ranging from tree falling to crane certifications.

In addition, training focused on leadership was provided to 388 employees who recently took leadership roles.

WSDOT looks to shore up shortages and gaps

WSDOT faces the challenge to deliver a resilient and resourceful maintenance program that has become exacerbated by the national and global supply chain shortages and material gaps for many commodities.

These shortages and gaps make it difficult for the Transportation Equipment Fund program (TEF) to find repair parts, tools, shop equipment, vehicles, and

heavy equipment. The program has been innovative to meet the fleet's needs and every effort is being made to keep the fleet operational and replace equipment innovatively. New equipment brands are being introduced into the TEF fleet and contracts have been made with a more diverse vendor base. In the end, the solutions enacted by WSDOT to overcome the global supply chain issues have led to a more resilient TEF fleet.

Data collection shows guardrail conditions

WSDOT used its maintenance management system (HATS) to complete the guardrail assessment process and obtain a point-in-time count of damage. In 2022, WSDOT maintenance crews assessed 100% of the state's 20,034 guardrail lengths/runs and determined that 4,380 (21%) were identified as damaged and in need of repair. In 2019, maintenance crews assessed 20,090 runs of guardrail and determined that 4,656 (23%) had damage.

Guardrail data was not collected in 2020 and 2021 due to COVID-19 restrictions.

Contributors include Bruce Castillo, Kelly Shields, Daryl Blumberg, Tina Werner, Jim Weston, Dustin Motte and Michele Villnave

HATS data collection increases 15.7% in 2022

WSDOT continues to develop and enhance HATS, a tool that documents work activities in the field with 1,500 iPads used by frontline maintenance staff each day. Since the launch of HATS in 2008 followed by a major update in 2015, the agency has developed a clearer understanding of the condition of assets in the field; along with maintenance tasks performed. The system helps WSDOT better manage the funding it receives each biennium.

Maintenance technicians added 4,908 assets to the HATS inventory and completed 215,912 records of work activities in 2022. This averages to 592 HATS record entries per day, a 18.6% increase from 499 records per day in 2021.

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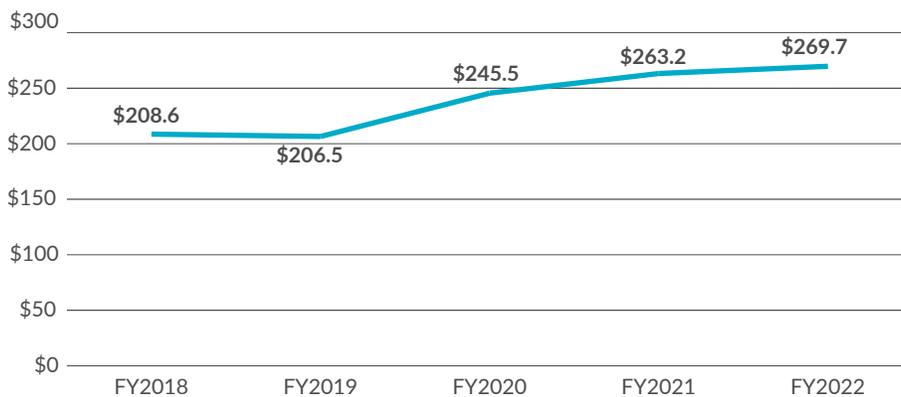
Washington State Ferries vessel preservation backlog increases by \$61.1 million since fiscal year 2018

The Washington State Ferries vessel preservation backlog reached \$269.7 million in fiscal year 2022, up \$6.5 million (2.5%) from \$263.2 million in FY2021. At the start of the 2021-2023 biennium, WSF allotted \$91.9 million to vessel preservation, but later revised that amount to \$141.5 million—funding sources are approximately 63% federal and 37% state.

This investment level (\$141.5 million) meets approximately 52% of the \$269.7 million preservation backlog WSF identified in FY2022. Over the past five years, the vessel preservation backlog has increased 29.3% (\$61.1 million) from \$208.6 million in FY2018 (refer to chart below).

WSF vessel preservation backlog increases 29.3% in five years

Fiscal years 2018 through 2022; Dollars in millions



Data source: Washington State Ferries.

Note: Values have been rounded.

Sixty-two percent of WSF's fleet in State of Good Repair; annual preservation gap projected to continue increasing

As of June 2022, 13 of 21 vessels (62%) met the agency targets for State of Good Repair. This did not achieve the agency goal of 90% that is required by the Vessel Asset Management Plan. The SOGR preservation target for each vessel is defined as having fewer than 20% of systems that are overdue for replacement or rehabilitation. The percentage is relative to the total number of systems onboard each vessel. Eight vessels in the fleet (38%) had between 20% and 25% of systems overdue for replacement or rehabilitation and were not in a SOGR in FY2022 (refer to table on p. 19).

Vessels asset management plan highlights preservation

WSF's investment strategy for the next six years is to maintain as many vessels as possible in a SOGR with available funding. Preservation will be prioritized over improvement, and funding will be directed as required to keep all 21 vessels operating and within regulatory compliance—any remaining preservation funding will then be directed toward vessels at the

Notable results

- The WSF vessel preservation backlog increased 29.3% from \$208.6 million in FY2018 to \$269.7 million in FY2022
- WSF determined that 43% (nine out of 21) vessels met the target for State of Good Repair in FY2022
- WSF had 93.6% of terminal assets in a State of Good Repair in FY2022

How WSF defines State of Good Repair for terminals

State of Good Repair (for terminals assets) is based on the risks of operational failure and the economic consequences of these failures. Under risk-based, life-cycle cost analysis, a system with risk cost below the annualized cost of installing and operating a new system is considered to be in a SOGR; a system with risk cost above the annualized cost of installing and operating a new system is considered not in a SOGR.

mid-point of their service lives. This includes the Issaquah, Jumbo, and Jumbo Mark II classes.

WSF is not directing discretionary funding toward newer Olympic and Kwa-di Tabil classes and as a result, the preservation backlog will likely increase for these vessels. Discretionary funding will also not be directed at the Super class vessels M/V *Kaleetan* and M/V *Yakima*. As a result, any unforeseen deficiencies on these vessels could require them being removed from service.

WSF plans major preservation projects in the 2021-2023 biennium

Following its investment strategy in an effort to maintain regulatory compliance, WSF has the following major preservation projects (defined as those costing over \$5 million) planned for the 2021-2023 biennium:

■ Jumbo Mark II Propulsion Controls Replacement

(\$17.9 million): The propulsion controls and monitoring systems on these vessels have reached the end of their service lives and cannot be supported. WSF completed the upgrade design in the 2019-2021 biennium, and materials were procured. Work on the M/V *Wenatchee*, M/V *Tacoma* and M/V *Puyallup* is scheduled to occur in the 2023-2025 biennium.

■ M/V *Tacoma* Drydock & Preservation

(\$6.2 million): This Jumbo Mark II class vessel will receive routine drydock inspections, extensive underwater body repairs and painting, selected bilge and topside painting, vehicle

WSF vessel preservation backlog increases in FY2022

Fiscal years 2021 and FY2022; Dollars in millions

Vessel classes and vessels	Age	Systems past due in FY2022 ^{1,2}	Preservation backlog FY2021	Preservation backlog FY2022	Change in backlog
Jumbo Mark II Class (202-vehicle)					
M/V <i>Tacoma</i>	25	12%	\$16.6	\$16.6	\$0.0
M/V <i>Wenatchee</i>	24	22%	\$32.2	\$35.2	\$3.0
M/V <i>Puyallup</i>	24	21%	\$28.4	\$30.2	\$1.8
Jumbo Class (188-vehicle)					
M/V <i>Spokane</i>	49	17%	\$12.4	\$12.4	\$0.0
M/V <i>Walla Walla</i>	45	18%	\$16.6	\$16.3	-\$0.3
Super Class (144-vehicle)					
M/V <i>Kaleetan</i>	55	12%	\$2.0	\$2.1	\$0.1
M/V <i>Yakima</i>	55	11%	\$13.0	\$13.0	\$0.0
Olympic Class (144-vehicle)					
M/V <i>Tokitae</i>	8	0%	\$0.0	\$0.0	\$0.0
M/V <i>Samish</i>	7	1%	\$0.0	\$0.5	\$0.5
M/V <i>Chimacum</i>	5	0%	\$0.0	\$0.0	\$0.0
M/V <i>Suquamish</i>	4	0%	\$0.0	\$0.0	\$0.0
Issaquah Class (124-vehicle)					
M/V <i>Issaquah</i>	43	24%	\$19.4	\$19.4	\$0.0
M/V <i>Kitsap</i>	42	18%	\$14.4	\$14.2	-\$0.2
M/V <i>Kittitas</i>	42	22%	\$17.3	\$18.4	\$1.1
M/V <i>Cathlamet</i>	41	25%	\$17.4	\$17.4	\$0.0
M/V <i>Chelan</i>	41	21%	\$20.2	\$20.5	\$0.3
M/V <i>Sealth</i> ³	40	25%	\$18.4	\$18.6	\$0.2
Evergreen State Class (87-vehicle)					
M/V <i>Tillikum</i>	63	22%	\$20.8	\$20.8	\$0.0
Kwa-di Tabil Class (64-vehicle)					
M/V <i>Chetzemoka</i>	12	5%	\$5.4	\$5.4	\$0.0
M/V <i>Salish</i>	11	3%	\$5.3	\$5.3	\$0.0
M/V <i>Kennewick</i>	10	1%	\$3.4	\$3.4	\$0.0
Fleet-wide	Avg. 31	Avg. 13%	Total \$263.2	Total \$269.7	Net Change \$6.5

Data source: Washington State Ferries.

Notes: Numbers may not add perfectly due to rounding. **1** Vessel condition is reported as a percent of systems included in WSF's vessel Life-Cycle Cost Model past due for investment. A vessel is considered in a state of good repair if fewer than 20% of LCCM systems are past due. **2** Green highlighted cells indicate vessels not in State of Good Repair. **3** The M/V *Sealth* is a 90-vehicle vessel in the Issaquah Class.

deck repairs, fire screen door replacement, propulsion shaft bearing renewals and propulsion control system updates.

■ **M/V Chelan Preservation (\$6.3 million):** WSF's only remaining vessel certified for international service will receive an underwater body inspection, vehicle deck steel repairs, renewal of deck coatings, fire main and sewage piping repairs, and an overhaul of a propulsion reduction gear.

■ **M/V Samish Drydock and Preservation (\$3.2 million):** This Olympic class vessel will receive routine dry-docking and inspections, extensive stern tube repairs, complete rudder overhauls and repair, propeller hub exchanges, and bilge preservation.

■ **M/V Tillikum Drydock and Preservation (\$20 million):** This Evergreen State class vessel will receive a major preservation investment to extend its life another 10 years due to lack of new vessels. Scheduled work includes routine dry-docking and inspections, propulsion shaft bearings renewals, shaft coupling replacement, complete rudder overhauls and repair, motor generator overhauls, vehicle and shelter deck steel replacement, extensive underwater body repairs and coatings, complete topside preservation of all exterior surfaces, and extensive bilge preservation.

■ **M/V Yakima and M/V Kaleetan Drydock and Preservation (\$15 million-\$20 million per vessel):** This work is under review, however, recommended at this point. The vessel class will receive a major preservation investment to extend its life another 5-10 years due to a lack of new vessels. Work scheduled would be similar to M/V Tillikum.

WSF faces challenges as it looks to address preservation issues

While WSF continues working on much-needed preservation projects, the following challenges remain:

Reliance on federal funds: The over-reliance on federal funding for the vessel preservation program is increasingly problematic. Restrictions on international purchases and competitive procurement requires specialized attention and contracting approaches to ensure compliance. New Buy America rules effective in November 2022 have further restricted WSF's ability to purchase manufactured products and have increased its reliance on state funds to address critical preservation maintenance items.

Shipyard capacity: The number of qualified shipyards has fluctuated during the last year; one local shipyard closed, and a new shipyard has started the process of becoming certified for WSF contract work. Foss Shipyard in Seattle recently went out of business, and Snow

Marine on Lake Union recently applied for certification as a Pre-qualified WSF contractor for dockside preservation work, but cannot perform underwater repairs. Everett Ship Repair, which was previously established, has taken on several WSF preservation contracts over the last two years. Dakota Creek Industries shipyard received state approval for its apprenticeship program, making that Anacortes-based business eligible for WSF preservation contracts. Vigor remains competitive in the Puget Sound ship repair industry; however, it has signed multiyear contracts with the US Navy which are limiting its available drydock space for WSF vessels. All shipyards in Puget Sound are suffering from workforce shortages which have impacted their capabilities and project throughput.

Vessel availability: WSF does not have enough spare vessels to cover service while meeting preservation and regulatory inspection requirements. The situation worsened in the 2021-2023 biennium due to ship repairs that exceed the normal timelines, in particular M/V *Wenatchee* (onboard fire because of a crankcase explosion), M/V *Tokitae* (gear box complications), M/V *Chimacum* (failed gearbox as a result of a manufacturer default) and M/V *Cathlamet* (collision with dock). Drydock times are also extended because of continued labor shortages at shipyards.

WSF vessel improvements include hybrid-electric conversions

The most significant improvement planned in the 2021-2023 biennium is the hybrid-electric conversion of the Jumbo Mark II class vessels.

In conjunction with a planned propulsion control system replacement preservation project, the M/V *Wenatchee* will undergo an extensive conversion to hybrid-electric propulsion. Funded primarily through a \$35 million grant from Washington State Department of Ecology (Washington's allocation of federal Volkswagen settlement mitigation trust funds), this project will establish WSF as a leader in sustainable marine transportation. The project replaces two of the four diesel generators with two lithium-ion energy storage banks. Design work was completed, and materials were procured during the 2019-2021 biennium and construction is scheduled for September 2023-June 2024.

The M/V *Wenatchee* will initially operate in hybrid-electric mode with approximately a 25% reduction in fuel consumption. Once terminal electrification is complete, the vessel will operate in full battery mode, with a fuel consumption savings of approximately 95%. With additional funding provided in the 2022 Move Ahead Washington package, the conversions of M/V *Tacoma* and M/V *Puyallup* are also funded, so WSF intends to bid this work as a three-vessel contract. M/V *Tacoma* is scheduled to be completed between

September 2024-June 2025, and M/V *Puyallup* is scheduled to be completed September 2025-June 2026. Once all three vessels are converted, this program is expected to save nearly five million gallons of fuel each year, with corresponding reductions in CO₂, NO_x and particulates. The preliminary life-cycle cost analysis projects a net savings of \$60 million over the remaining 40-year service life of these vessels.

New hybrid-electric propulsion vessels currently in the works

The legislature authorized the extension of the Olympic class new construction program, including an update of the design to include hybrid-electric propulsion, and construction of up to five vessels. With the addition of \$836.7 million from the 2022 Move Ahead Washington package, a total of \$1.055 billion is available.

While the contractor completed the design update for the vessels to incorporate hybrid-electric propulsion, WSF and the contractor were unable to agree on terms or price for vessel construction. As a result, WSF is proceeding to issue a new request for proposals for a design-build contract in accordance with Revised Code of Washington and anticipates the contract to be awarded in March 2024. The first vessel is expected to be delivered in late 2027.

Once all five vessels are delivered, WSF projects a savings of 300 million gallons of diesel fuel over 60 years, and \$55 million in life-cycle cost savings.

WSF replaces Maintenance Management System for vessels and terminals

The legislature provided \$3.7 million to fund a new Maintenance Management System (for vessels and terminals) to replace the existing system. An additional \$1.1 million was provided because of project implementation delays. This amount covers an additional six months through June 30, 2023. The new system will support critical asset management functions for both vessels and terminals, including procurement, inventory management, maintenance planning, execution, and history. It will also have Life-Cycle Cost Model functionality to project preservation needs.

WSF conducted a needs analysis in the 2019-2021 biennium and moved forward to procure and implement an Enterprise Asset Management System. The project officially kicked off in early October 2021, although there was significant preparation in the months prior. WSF is using a top rated, highly effective cloud-based software to manage the agency's assets and equipment.

The new system is scheduled to roll out in the beginning of 2023, however, it will not include inventory management and enhanced asset management. This is scheduled for a later date, pending funding for the program. Current budget approval does not provide FTEs to support the program nor the licenses fees, which then need to be funded from the WSF maintenance or preservation budget.

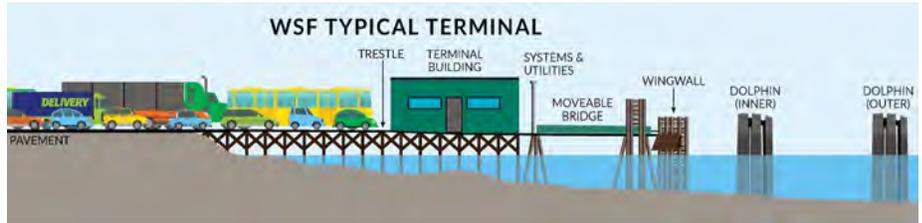
Washington State Ferries keeps 93.6% of terminal assets in State of Good Repair

As of July 2022, 93.6% of WSDOT's 881 terminal assets were in a State of Good Repair.

A total of 55.4% of passenger-only ferry facilities by replacement cost were not in a SOGR as of July 2022—the largest percentage of any asset category. Many of these assets are located at the Eagle Harbor maintenance facility and do not pose risk to ferry operations. Of the 129 Information Technology Systems, 23.3% by replacement cost were not in a SOGR. Preservation projects are programmed to address the condition of these systems.

In their current state, the terminals at Fauntleroy, Orcas Island, and Bremerton have the greatest value of assets not in a SOGR which poses some risk to the ferry operations. In response, WSF has planned preservation projects at all three terminals in the next 10 years.

The project at Fauntleroy will address the deteriorating timber trestle constructed in the 1950s, sea-level rise, operational inefficiencies, and the seismic condition of the structure. The project is halfway through the environmental process. Community, technical, and executive advisory groups have each met multiple times and provided input on this project.



WSF identifies state of good repair values for terminal assets

Facility or system type	Number of systems	In SOGR	Not in SOGR	Not rated
Buildings ¹	130	99.0%	1.0%	0.0%
Landing aids ²	174	99.3%	0.7%	0.0%
Overhead loading systems ³	60	86.8%	13.2%	0.0%
Passenger-only ferry facilities ^{3,4}	9	44.6%	55.4%	0.0%
Pavement	116	88.8%	11.2%	0.0%
Trestles and bulkheads	62	94.9%	5.1%	0.0%
Vehicle movable bridge systems ³	201	89.9%	10.1%	0.0%
Information Technology Systems ⁵	129	76.7%	23.3%	0.0%
Total/weighted average FY2022	881	93.6%	6.4%	0.0%

Data source: Washington State Ferries.

Notes: Percentages are weighted by replacement cost. Percentages may not add to 100 due to rounding. In the past, WSF reported on condition of terminal assets only. WSF now reports on state of good repair. 1 Buildings include terminal buildings, agent buildings, storage buildings, maintenance buildings, and toll booths. 2 Landing aids ensure the ferry vessels are aligned correctly at the terminals, and include wingwalls and dolphins. 3 Systems include foundation supports, movable bridge span, electrical parts, and mechanical parts. 4 Passenger-only ferry systems are located at the Eagle Harbor maintenance facility and are only used for maintenance functions. 5 Information Technology Systems include camera systems, access control systems, phones, electronic fare systems, visual paging, network, and cables/conduits.

At the Orcas Island terminal, two separate projects will preserve the vehicle movable bridge systems in the near term and the trestle in the long term. Similarly, at the Bremerton terminal, a preservation project currently in design will replace the aging vehicle movable bridge systems and landing aids.

Other major terminal design projects in the near term include:

- Design of a new Anacortes terminal building that will replace the aging and seismically-deficient terminal building.

- A preservation project in Kingston to address seismic deficiencies of the trestle and vehicle movable bridge.
- A preservation project in Southworth to replace the timber trestle and terminal building. WSF is partnering with Kitsap Transit to improve transit operations around the terminal by building a pick-up/drop-off zone for buses.

WSF opens its flagship terminal in Seattle

WSF opened the Seattle Terminal building at Colman Dock on Nov. 18, 2022—a key milestone for the Colman Dock project.

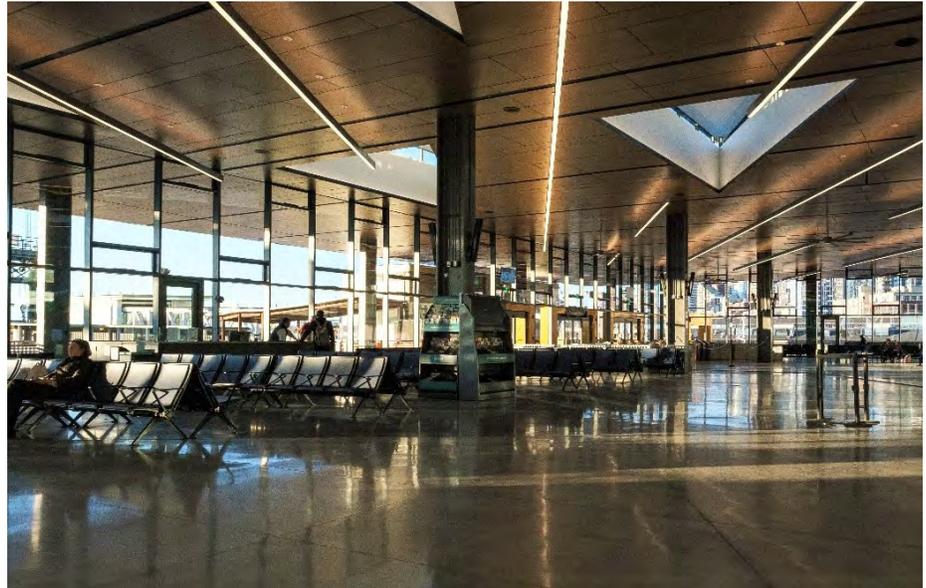
The new terminal building includes increased seating, more turnstiles to accommodate larger volumes of walk-on passengers, and several spaces for future retail. The terminal building is also lined with many windows and glass panels to provide a more welcoming and brighter atmosphere.

Construction work is still underway on the entry building along Alaskan Way and the elevated pedestrian walkway that links to the terminal building. Those key elements are expected to open in spring 2023.

WSF continues terminal work at Bainbridge and Anacortes

WSF began construction at the Bainbridge terminal on the passenger overhead loading fixed walkway in 2022. The modern steel structure that replaces the wooden supported walkway is earthquake resistant and functionally more efficient. Mechanical and electrical systems will also be replaced to improve system reliability.

The Anacortes tollbooth replacement project is currently in the construction phase and is scheduled to be completed in 2023. The project will replace the existing tollbooths (built in 1984), install a canopy over the new tollbooths, and meet current design standards and ADA requirements.



Interior of the completed Seattle Terminal Building at Colman Dock.

WSF continues to focus on resilience

WSF plans to reevaluate risks and reexamine the risk response plan in the coming year. This is in alignment with the agency's goal of building resilience to uncertain and/or unforeseen events. Identified below are some areas of focus:

- Loss of workforce capacity and skill levels has been rated very high in WSF risk evaluations. WSF is enacting mitigation strategies such as nationwide recruitment, workforce development, flexible schedules, and training.
- The seismic risk to WSF terminal systems is high. WSF continues to identify critical routes for seismic resiliency and includes seismic risk while prioritizing capital projects. WSF's 10-year budget includes several preservation projects that upgrade terminal structures to

the latest seismic code. WSF also considers tsunami effects in new designs to ensure it is building structures that are more resilient to potential tsunamis after an earthquake.

- In response to the changing climate worldwide, WSF is conducting a study on how climate change and sea-level rise will affect existing terminal structures. New preservation projects will also consider those impacts to design a more resilient system that can perform as designed during its lifetime.

Contributors include John Bernhard, Jeri Bernstein, Srikanth Sree Ramoju, David Sowers, Eric Visser, Tim Weatherly, Donna Thomas, Joe Irwin and Dustin Motte

88 AVIATION ANNUAL REPORT

State leverages \$1.3 million to secure \$53.6 million in federal funds for airport improvements

WSDOT's Airport Aid Grant Program awarded \$2.7 million for airport investments during fiscal year 2023 (July 2022 through June 2023). Public-use airports in the state leveraged \$1.3 million of these funds to secure \$53.6 million in federal grants, which will support 20 projects at 20 airports in FY2023. The leveraged WSDOT dollars comprised 48.5% of the \$2.7 million in total state funds for the Airport Aid Grant Program (see table below). The remaining 51.5% (\$14 million) assists airports not eligible for federal funding.

A total of \$60.3 million in local, state, and federal funding support airport investment projects in Washington during FY2023. Most of these funds (\$55.4 million or 918%) have been slated for pavement projects, including \$732,486 to the Sequim Valley Airport for runway rehabilitation. Safety improvement projects at airports account for 4.3% of the total dollars (\$2.5 million), while 3.4% (\$2.1million) has been scheduled for planning & other projects, and the remaining 0.5% (\$315,000) has been allocated for airport transformation. For more information about WSDOT's Airport Aid Grant Program, visit: www.wsdot.wa.gov/aviation/Grants.

Majority of airport investment funding slated for pavement projects

Funding by source for fiscal year 2023

Project type	Local	State	Federal	Total
Safety	\$615,000	\$375,000	\$1,582,000	\$2,573,000
Transformation	\$31,500	\$283,500	\$0	\$315,000

Data Source: WSDOT Aviation Division.
Note: Numbers have been rounded.

WSDOT completes 2022 Airport Master Record Reviews

WSDOT Aviation completed its Airport Master Record Reviews for 40 airports scheduled in 2022. The inspections verify the physical and operational features of civil public-use airports. They also ensure airports meet minimum safety standards, comply with regulations and follow Federal Aviation Administration recommendations.

During the inspections, WSDOT determined 71% of runway pavement at 28 airports (12 airports had turf, gravel, or water runways) was in excellent or good condition. Inspectors found that of the 33 runways at the 31 airports (some have more than one runway), approximately 88% had markings that were in good or fair condition.

Notable results

- Washington's public-use airports leveraged \$1.3 million to secure \$53.6 million in funding for airport investments in FY2023
- Community Aviation Revitalization Board loan program awarded \$9.2 million for 17 projects at airports since 2019
- WSDOT published its 2022 Electric Airport Feasibility Study
- Commercial Aviation Coordinating Commission continues work of expanding airport capacity

WSDOT conducts Airport Master Record Reviews annually

WSDOT conducts Airport Master Record Reviews each year on Washington Airports. These reviews, also known as [5010 Inspections](#), report on items such as runways, taxiways, and ramps, fuel types, repairs and other services available at the airport, radio frequencies, wind indicators, and gather information regarding the types of aircraft serviced such as single-engine, multi-engine, jet, helicopter, gliders, military and ultra-light. The Federal Aviation Administration recommends that 5010 inspections occur every three years.

Community Aviation Revitalization Board awards approximately \$9.2 million in loans to 17 projects

In May 2021, the Community Aviation Revitalization Board (CARB) loan program was made permanent with the passage of Senate Bill 5031 and funded with an additional

\$5 million for the 2021-2023 biennium. The revolving loan program provides low-interest loans to airports for revenue-producing projects that will help them become more self-sufficient and less reliant on state and federal funding. To date, the program has received 38 applications totaling \$23,038,096. The CARB has awarded loans for 17 projects

totaling \$9,184,402 (refer to table below).

Eight of the 17 (47%) projects have been completed, with four of them starting on loan repayments. A \$750,000 CARB loan partially funded the Port of Bremerton's new \$4.2 million multi-purpose facility at the Bremerton National

CARB loan program awards approximately \$9.2 million to 17 projects statewide since inception in 2019

Project location	Project description	Amount awarded
Port of Port Angeles, William R. Fairchild Airport	Utility and hangar development	\$750,000
City of Chehalis, Chehalis-Centralia Municipal Airport	Above ground fueling facility	\$750,000
City of Othello, Othello Municipal Airport	10-unit hangar facility	\$450,000
Sequim Valley Airport, Inc., Sequim Valley Airport	Underground storage tank removal	\$15,000
Port of Bremerton, Bremerton National Airport	Multi-purpose facility	\$750,000
Sequim Valley Airport, Inc., Sequim Valley Airport	Access road, fueling area repaving	\$70,000
Pierce County, Thun Field	Hangar doors replacement	\$750,000
City of Chewelah, Chewelah Municipal Airport	Aviation fuel tank facility	\$425,000
City of Moses Lake, Moses Lake Municipal Airport	New fuel system	\$175,000
Kittitas County, Bowers Field	Hangar utility extension	\$105,000
City of Deer Park, Deer Park Municipal Airport	Sewer main installation	\$730,000
Port of Benton, Richland Airport	Hangar acquisition	\$750,000
City of Auburn, Auburn Municipal Airport	Hangar rehabilitation	\$750,000
City of Colville, Colville Municipal Airport	New fuel system	\$300,000
Lewis County, South Lewis County Airport	New fuel system	\$514,000
City of Kelso, Southwest Washington Regional Airport	Replace fuel system	\$1,200,000
Port of Ephrata, Ephrata Municipal Airport	Nine-unit hangar facility	\$700,000
	Total	\$9,184,000

Source: WSDOT Aviation Division.

Airport, which includes a multi-plane hangar, aeronautical office space, a pilot flight-planning room, multiple restrooms, and a 147-seat restaurant.

Another round of CARB loans are planned for July 2023 subject to additional funding being secured in the 2023-2025 capital budget.

WSDOT publishes 2022 Electric Airport Feasibility Study

WSDOT, in collaboration with the University of Washington Department of Civil and Environmental Engineering, released the 2022 Washington Electric Airport Feasibility Study, which presents recommendations on how regional airports can prepare for electric aviation. The report provides two example airports—Paine Field and the Grant County International Airport—to identify the capabilities of existing utility infrastructure to support the use of electric aircraft.

Electric aircraft include hybrid-electric, all-electric airplanes and vertical take-off and landing aircraft. The study notes that each aircraft has unique power requirements, and not all airports will host the same complement of aircraft.



An illustration showing Port of Bremerton's new \$4.2 million multi-purpose facility at the Bremerton National Airport.

WSDOT-managed airports provide critical staging areas for wildfire management in 2022

WSDOT-managed airports served as critical staging areas for statewide wildland fire management efforts in 2022.

A wet spring in Washington delayed use of the state-managed airports for wildland fire fighting staging efforts until mid-August, however, as seasonal conditions changed, the summer fire season extended well into October.

Three state-managed airports closed to the public in 2022 to accommodate critical helibase staging operations for several large wildland fires:

- The Lake Wenatchee State Airport was closed for two months to accommodate U.S. Forest Service managed staging operations for the White River Fire.

- The Tieton State Airport closed for 18 days to support the U.S. Forest Service fire fighting efforts on the Goat Rocks Fire, which shared helibase locations with the Packwood Airport.
- The Skykomish State Airport was closed for approximately 40 days to support fire fighting efforts at the Bolt Creek, Murphy Lake, and Loch Katrine fires.

Throughout the 2022 wildland fire season, the Methow Valley State Airport located in Winthrop (home of the U.S. Department of Agriculture Forest Service Smokejumper Base) continued to play a critical national level role in fast-strike smokejumper base response efforts across several states.

In 2022, WSDOT Aviation continued to negotiate formal fee-based access approvals for helicopter staging operations at the state-managed airports. These land-use agreement formats provided by the U.S. Department of Agriculture Forest Service and the Washington State Department of Natural Resources serve to bring in much-needed preservation and maintenance funds that can be used to support future helibase staging efforts.

For more information regarding state-managed airports or long range planning efforts and associated preservation objectives, visit [WSDOT's airport planning page](#).

WSDOT aims to keep pace with emerging aeronautics technology

Throughout 2022, Advanced Air Mobility (AAM) and alternate propulsion technology made significant strides toward their near-term implementation both in state and globally. WSDOT continues to work toward implementing emerging technologies into its planning process and explore how best to meet the needs of the traveling public.

In preparation for widespread adoption of AAM, the Federal Aviation Administration released design standards for Vertical Takeoff and Landing airports, termed "Vertiports." This will allow communities to begin formulating plans as to where to site and construct such installations.

On April 1, 2022, WSDOT established the registration of commercial drones



Columbia Helicopters of Aurora, Oregon stages their CH-47D Chinook and Fuel Tanker Truck at the Tieton State Airport supporting the Goat Rocks Forest fire located near Packwood. The Tieton State Airport provided alternate access in the summer of 2022 due to changing winds and heavy fire smoke that pushed the fire crews out of the Packwood Airport. Tieton State Airport also provides access for quick turnaround refueling operations as an essential need for helibase staging operations that allows crews to refuel faster and deliver critical water more frequently.

as required by the Revised Code of Washington. Funds collected from drone registrations support WSDOT's collaborative assessments and work to integrate emerging technologies.

WSDOT monitors AAM developments around the world

On Sept. 28, 2022, Washington-based Eviation's all-electric passenger aircraft, the "Alice," successfully completed its inaugural flight. There was a strong showing of industry support in 2022 for the new aircraft with over \$2 billion in orders for the model. Interest in the "Alice" has been global, with operators securing orders from Cape Air (USA), Air New Zealand, Evia Aero (Germany), Aerus (Mexico), and Northern Territory Air Services (Australia).

Amazon started making deliveries by drone in Washington in 2022, although the company has been testing deliveries in the state since

at least 2015. It is unclear if progress in Amazon's drone division will be hampered by recently announced layoffs within the division.

Vancouver-based KinectAir launched corporate accounts for on-demand, point-to-point air travel in 2022. Examples of destinations included Napa, Bend, Seattle, Sun Valley, and other destinations throughout California, Oregon, Washington and Idaho. While the company is currently focusing on operating out of the West Coast, it aims to be a leader in the AAM marketplace as soon as aircraft become available. Zipline, a drone and future AAM provider, has been successfully flying medical drone deliveries across Africa and Japan. The company recently announced that it will be working with MultiCare Health System to provide delivery within the Tacoma area by 2024.

Commercial Aviation Coordinating Commission continues the work of expanding airport capacity

Over the course of 2022, the Commercial Aviation Coordinating Commission—charged with making recommendations to increase capacity to accommodate air passenger service, air cargo operations and general aviation—made significant progress toward meeting its requirements. The CACC began in October 2019 and is required to meet three deadlines:

- Provide an initial list of six possible locations to the Legislature by January 1, 2021 (Completed).
- Provide a list of the top two locations (options) by October 15, 2022 (Completed).
- Provide a single preferred location recommendation by June 15, 2023 (In progress).

As part of the recommendation approved by the Commission in September 2022, the number of locations provided by the consultant working on the aviation system plan was narrowed to three based on the technical data available. The recommendations were:

- Add capacity to Paine Field according to its Airport Master Plan (with potential for additional capacity), assume the Seattle-Tacoma International Airport executes its Sustainable Airport Master Plan, and assist other airports interested in pursuing regional commercial service supported by emerging technologies.
- Continue to develop a location option with a two-runway configuration. Pierce County Central, Pierce County East and Thurston County Central are the three remaining locations under consideration for a new airport (out of the 10 analyzed by the state's consultant).

In 2023, the CACC will focus on community engagement and additional technical analysis in order to narrow down the location options. The CACC continues to do various public engagement which includes an online open house, virtual public meetings, virtual drop-in office hours and providing various infographics and data to the public.

Contributors include Dave Chenaar, Christina Crea, David Ison, Eric Johnson, John MacArthur, Tracy Paul, Paul Wolf, Joe Irwin and Dustin Motte

WSDOT meets aircraft registration annual goal

WSDOT registered 7,341 aircraft and provided 2,804 exemptions to qualifying aircraft during the 2022 aircraft registration and renewal cycle. WSDOT has met its annual goal of registering at least 95% of all aircraft in the state for 17 years in a row.

For more information, visit: <https://wsdot.wa.gov/travel/aviation/pilots-aircraft/register-aircraft>.

Number of aircraft registered by type during 2022 registration period

Aircraft type	Quantity
Single Engine	5,037
Home built	1,169
Unpiloted aircraft	279
Piston, multi-engine, small	230
Helicopter	200
Turbojet, multi-engine	184
Sail/Glider	115
Turboprop, multi-engine	52
Lighter than air	35
Piston, multi-engine, large	18
Aircraft 8,001-9,000 lbs.	14
Aircraft 4,001-6,000 lbs.	5
Aircraft under 4,001 lbs.	2
Aircraft 9,001-12,500 lbs.	1
Total	7,341
Data source: WSDOT Aviation Division.	



INCIDENT RESPONSE QUARTERLY UPDATE

WSDOT Incident Response teams help improve driver safety at 10,252 incidents

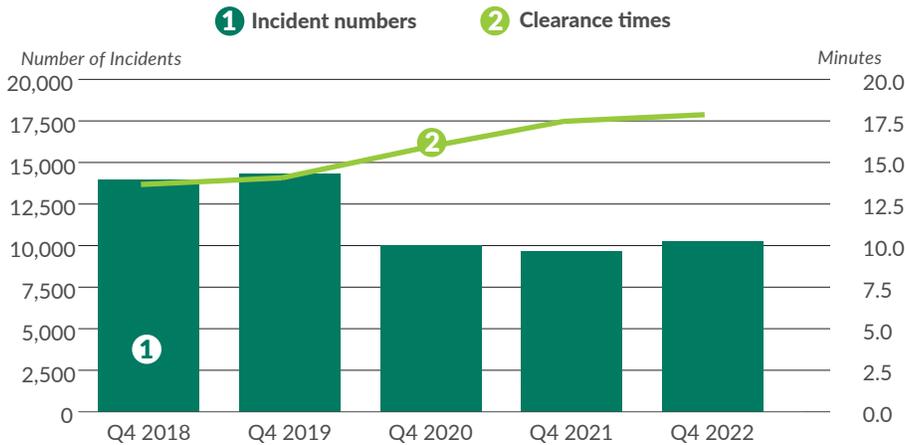
WSDOT’s Incident Response teams assisted at 10,252 incidents during the fourth quarter (October through December) of 2022. On average, IR teams responded to an incident scene every 12 minutes and 55 seconds during the quarter. There were 588 (6.1%) more incidents during the fourth quarter of 2022 compared to the same quarter in 2021 (9,664).

On average, IR teams cleared each of the 10,252 incidents in 17 minutes and 48 seconds. This was 24 seconds (2.3%) slower than the average incident clearance time for the same quarter in 2021.

Of the 10,252 total incidents, 6,794 (66.3%) lasted less than 15 minutes, 3,240 (31.6%) lasted 15-90 minutes and 218 (2.1%) incidents lasted more than 90 minutes (refer to chart at bottom-right). During the fourth quarter of 2022, there was a 2.7% decrease in incidents lasting more than 90 minutes compared to the same quarter in 2021, while there were 14.2% more incidents lasting 15-90 minutes and 2.9% more incidents lasting less than 15 minutes. Average clearance times increased 31% over the past five years due to a higher percentage of incidents lasting between 15 and 90 minutes.

Average clearance times increase 31% over the past five years

Fourth quarters; 2018 through 2022; Number of incident responses; Clearance times in minutes



Data source: Washington Incident Tracking System.

Notes: The data above only accounts for incidents to which an IR unit responded. IR data reported for the current quarter (Q4 2022) is considered preliminary. In the previous quarter (Q3 2022), WSDOT responded to 11,168 incidents, clearing them in an average of 15.8 minutes. These numbers have been confirmed and are now finalized.

WSDOT teams respond to 218 over-90-minute incidents

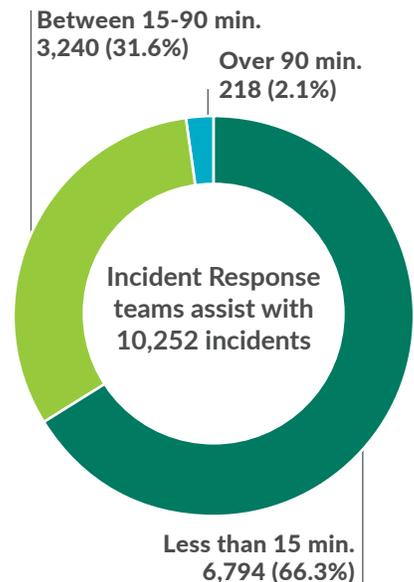
IR teams provided assistance at the scene of 218 incidents that lasted more than 90 minutes during the fourth quarter of 2022. This was six fewer incidents—a 2.7% decrease—than in the same quarter in 2021. While these

Notable results

- WSDOT responded to 10,252 incidents during the fourth quarter of 2022, 588 (6.1%) more than during the same quarter in 2021
- WSDOT cleared incident scenes in an average of 17 minutes and 48 seconds during the fourth quarter of 2022, 24 seconds (2.3%) slower than the same quarter in 2021
- In the fourth quarter of 2022, IR teams provided an estimated \$23.3 million in economic benefit by reducing the effects of incidents on drivers
- For every dollar spent on the program during the quarter, the IR teams provided \$15.50 in economic benefit.

WSDOT clears majority of traffic incidents in 15 minutes or less

Fourth quarter 2022; Times to clear incidents; Number and percentage of incidents



Data source: Washington Incident Tracking System.

over-90-minute incidents accounted for 2.1% of all incidents, they resulted in 23.8% of all incident-related delay costs (refer to chart on p. 31).

Ten of the 218 over-90-minute incidents took six hours or more to clear (referred to as extraordinary incidents). This was two more extraordinary incidents than the same quarter in 2021. The 10 incidents took an average of 10 hours and 38 minutes to clear, and accounted for 4.0% of all incident-induced delay costs for the quarter.

The average incident clearance time for all over-90-minute incidents was two hours and 56 minutes. This was about seven minutes and 39 seconds (4.5%) slower than the same quarter in 2021. Excluding the 10 extraordinary incidents, WSDOT's average clearance time for over-90-minute incidents was two hours and 33 minutes.

WSDOT focuses on safety when clearing incidents, working to reduce incident-induced delay as well as the potential for secondary incidents. Secondary incidents occur in the congestion resulting from a prior incident and may be caused by distracted driving, unexpected slowdowns or debris in the roadway.

Incident Response provides economic benefit to travelers

The Incident Response teams help alert drivers to incidents and clear roadways to reduce the likelihood of new incidents. WSDOT's assistance at incident scenes provided an estimated \$23.3 million in economic benefit during the fourth quarter of 2022 by reducing the impacts of incidents on drivers. This benefit is provided in two ways:

- WSDOT reduces the time and fuel motorists waste in incident-induced traffic delay by clearing incidents quickly. About

\$13.4 million of IR's economic benefit for the quarter resulted from reduced traffic delay.

- WSDOT helps prevent secondary incidents by proactively managing traffic at incident scenes. About \$9.9 million of IR's economic benefit for the quarter resulted from preventing an estimated 1,944 secondary incidents and resulting delay. This figure is based on Federal Highway Administration data that indicates 20% of all incidents are secondary incidents.

Based on WSDOT's budget for IR, every dollar spent on the program during the quarter, the IR teams provided \$15.50 in economic benefit.

WSDOT's Incident Response teams provide an estimated \$23.3 million in economic benefit

Fourth quarter 2022; Incidents by duration in minutes; Time in minutes; Costs and benefits in millions of dollars

Incident duration	Number of incidents ¹	Percent blocking ²	Average incident clearance time ³ (all incidents)	Cost of incident-induced delay	Economic benefits from IR program ⁴
Less than 15 min.	6,794	20.2%	5.3	\$9.2	\$4.2
Between 15 and 90 min.	3,240	61.4%	33.0	\$31.5	\$13.7
Over 90 min.	218	88.4%	176.3	\$12.7	\$5.3
Total	10,252	34.7%	17.8	\$53.5	\$23.3
Percent change from the fourth quarter of 2021	↑6.1%	↑1.3%	↑2.3%	↑9.6%	↑9.2%

Data source: Washington Incident Tracking System.

Notes: Some numbers do not add up to 100% due to rounding.

¹ Teams were unable to locate 530 of the 10,252 incidents. Because an IR team attempted to respond, these incidents are included in the total incident count. Other performance measures do not include the incidents that, IR teams were unable to locate.

² An incident is considered blocking when it shuts down one or more lanes of travel.

³ Incident clearance time is the time between an IR team's first awareness of an incident and when the last responder has left the scene.

⁴ Estimated economic benefits include benefits from delay reduction and prevented secondary incidents. Refer to [WSDOT's Handbook for Corridor Capacity Evaluation, 2nd edition, pp. 45-47](#) for WSDOT's methods to calculate IR benefits.

Incident numbers do not always directly influence the costs associated with incident induced delay

The 10,252 incidents during the quarter had a total incident-induced delay cost of \$53.5 million. The majority of these incidents were less than 15 minutes. The cost of these 6,794 incidents, which comprised 66.3% of all incidents, was \$9.2 million (17.3% of the total cost). There were 3,240 incidents lasting 15-90 minutes, which accounted for 31.6% of all incidents, and cost \$31.5 million (59.0% of the total cost). Incidents lasting more than 90 minutes made up 2.1% (218) of all incidents during the quarter, but accounted for \$12.7 million (23.8% of the total cost).

Performance data reported in this article is from WSDOT's Washington Incident Tracking System, which tracks incidents to which a WSDOT IR team responded.

For more information on how WSDOT calculates these figures and all IR performance metrics, refer to [WSDOT's Handbook for Corridor Capacity Evaluation, 2nd edition, pp. 45-47.](#)

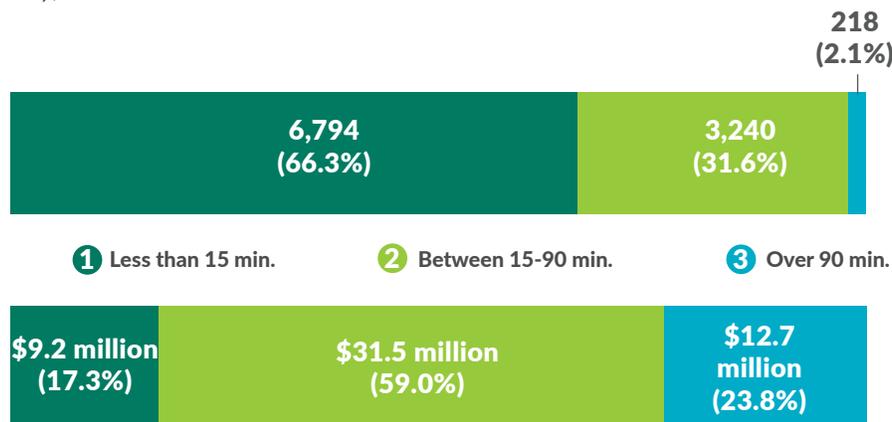
Contributors include Vince Fairhurst, Tony Leingang, Takahide Aso, Michele Villnave

Customer feedback:

- "I am blown away in a good way! My tire blew out on I-5 in Seattle and within 5 minutes Robert Kahrig was there to save the day! We were on the road again within 20 minutes. He saved our lives."
- "Jacob was great, friendly and helpful. The problem was the work done on the downtown street. I ran over a corner that was sharp and blew my tire!"
- "Dave was going southbound and saw me in the northbound lanes. He got off I-5 and came back to help me!! So awesome and knowledgeable."

Cost of incident-induced delay not proportional to response numbers

Fourth quarter 2022; Number and percentage of incidents; Cost of incident induced delay; Time to clear incidents



Data source: Washington Incident Tracking System.

Incident Response helps reduce congestion

The mission of WSDOT's Incident Response program is to clear traffic incidents safely and quickly, minimizing congestion and the risk of secondary incidents. The statewide program has a biennial budget of \$12 million, about 59 full-time equivalent positions and 69 dedicated vehicles. Teams are on-call 24/7 and actively patrol approximately 1,300 centerline miles (3,400 lane miles) of highway on major corridors around the state during peak traffic hours. This covers approximately 18% of all state-owned centerline miles statewide.



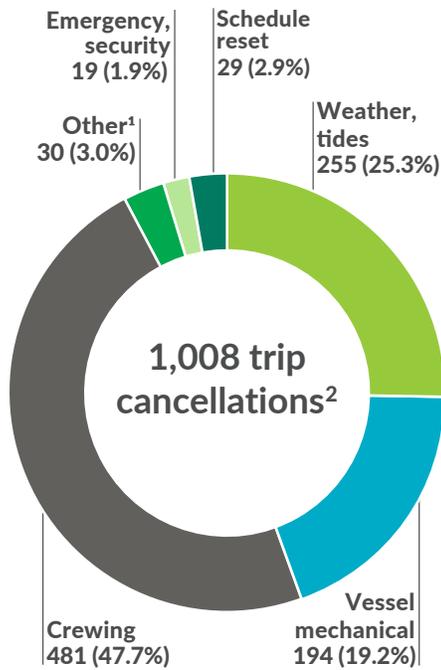
WASHINGTON STATE FERRIES QUARTERLY UPDATE

Notable results

- *WSF completed 33,938 (97.2%) of its 34,922 regularly scheduled trips in the second quarter of fiscal year 2023*
- *WSF ridership was approximately 4.0 million in the second quarter of fiscal year 2023, 10.4% more than the corresponding quarter in FY2022*

Crewing issues cause nearly half of all cancellations for the quarter

Second quarter FY2023



Data source: Washington State Ferries.
 Notes: Fiscal years run from July 1 through June 30. As a result, October through December 2022 represents the second quarter of FY2023.
¹ The category for "Other" includes events like disabled vehicles, environmental reasons and non-vessel related incidents that can impact operations.
² WSF replaced 24 of the 1,008 canceled trips for a total of 984 net missed trips.

WSF service reliability improves to 97.2%

WSF continued to operate on an alternate service plan with reduced service and a maximum of 15 vessels during the second quarter of fiscal year 2023 (October through December 2022).

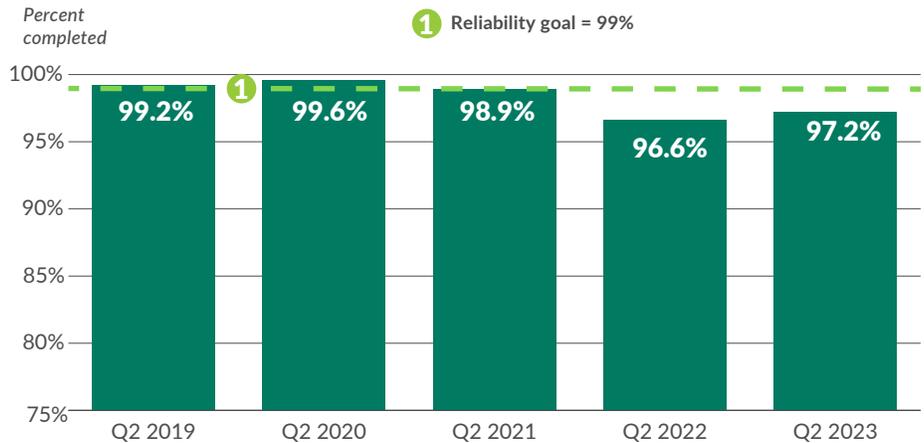
There were 34,922 regularly scheduled ferry trips for the quarter, compared to 30,277 in the same quarter of FY2022. WSF completed 97.2% (33,938) of these trips compared to 96.6% (29,261) in the previous year. Quarterly performance missed the annual service reliability performance goal of 99% by 1.8% (refer to table on p. 33).

There were 1,008 trip cancellations system-wide for the quarter, and WSF replaced 24 of them for a total of 984 net missed trips.

The largest category for cancellations (481) was crewing. WSF continues to train new crew members, but additional crew are still needed. Vessel breakdowns accounted for the second highest number of cancellations (194). A malfunction of the main engine turbo on the M/V *Suquamish* caused 43 cancellations, and a control transfer failure caused an additional 10 cancellations on the same vessel. A switchboard breaker issue on the M/V *Yakima* led to 33 cancellations. Steering problems caused 24 cancellations on the M/V *Salish* and 17 on the M/V *Kitsap*. A faulty propulsion charger resulted in 17 cancellations on the M/V *Issaquah* and a governor replacement on the M/V *Tillikum* was responsible for 10 missed trips. The 40 remaining vessel related cancellations occurred on a variety of vessels with no more than six trips missed during an event.

WSF trip reliability improves for the quarter, but misses goal

Second quarters; Fiscal years 2019 through 2023; Percent of scheduled ferry trips completed



Data source: Washington State Ferries.
 Notes: Fiscal year = July 1 through June 30. As a result, October through December 2022 represents the second quarter of FY2023.

WSF canceled 175 trips due to severe weather, with 135 cancellations occurring during the ice storm in December. Tides caused 80 cancellations with 68 on the Port Townsend/Coupeville route where these cancellations normally occur due to the shallow landing area in Coupeville during low tides. Unusually high tides resulted in 12 cancellations on the Point Defiance/Tahlequah route when the vehicle transfer span was too high to line up with the vessel at the Point Defiance terminal.

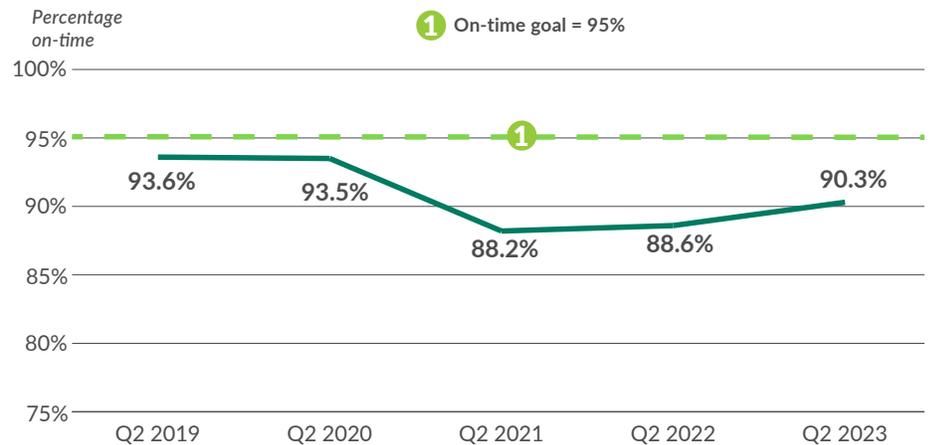
There were 29 cancellations for schedule resets; these occurred when vessels became so late that canceling a trip was required to get the vessel sailings back on schedule. Eight of the 15 terminal-related

cancellations occurred when there was a hydraulic leak in the vehicle transfer span at the Edmonds Terminal. Medical emergencies

caused 10 trip cancellations. The remaining 24 cancellations were due to various reasons with no one event causing more than six missed trips.

On-time performance improves for the quarter, but misses goal

Second quarters; Fiscal years 2019 through 2023; Percentage of ferry trips reported as on-time¹



Data source: Washington State Ferries.

Notes: Fiscal year = July 1 through June 30. As a result, October through December 2022 represents the second quarter of FY2023. **1** A trip is considered delayed when a vessel leaves the terminal more than 10 minutes after the scheduled departure time.

WSF on-time performance and reliability improve in the second quarter of fiscal year 2023

Second quarters (October through December) FY2022 and FY2023; Annual on-time goal = 95%; Annual service reliability goal = 99%

Route	On-time performance (second quarter)				Trip reliability (second quarter)			
	FY2022	FY2023	Status	Trend	FY2022	FY2023	Status	Trend
San Juan Domestic	71.3%	86.7%	15.4%	↑	92.7%	96.0%	3.3%	↑
Anacortes/Friday Harbor/Sidney, B.C. ¹	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Edmonds/Kingston	96.3%	94.8%	-1.5%	↓	99.0%	93.9%	-5.1%	↓
Fauntleroy/Vashon /Southworth	88.2%	85.8%	-2.4%	↓	98.9%	98.0%	-0.9%	↓
Port Townsend/Coupeville	98.1%	97.1%	-1.0%	↓	94.7%	92.6%	-2.1%	↓
Mukilteo/Clinton	95.0%	96.1%	1.1%	↑	98.6%	97.5%	-1.1%	↓
Point Defiance/Tahlequah	97.6%	94.2%	-3.4%	↓	94.2%	98.7%	4.5%	↑
Seattle/Bainbridge Island	86.6%	83.9%	-2.7%	↓	98.2%	99.1%	0.9%	↑
Seattle/Bremerton	89.1%	92.2%	3.1%	↑	98.5%	99.7%	1.2%	↑
Total system	88.6%	90.3%	1.7%	↑	96.6%	97.2%	0.6%	↑

Data source: Washington State Ferries.

Notes: FY = fiscal year (July 1 through June 30). As a result, October through December 2022 represents the second quarter of FY2023. A trip is considered delayed when a vessel leaves the terminal more than 10 minutes after the scheduled departure time. WSF reports on nine routes. Anacortes/Friday Harbor service is combined with San Juan Interisland service as San Juan Domestic for on-time performance and service reliability. Numbers shown in the table have been rounded to the tenth. **1** The Anacortes/Friday Harbor/Sidney, B.C. route has been closed since the beginning of the COVID-19 pandemic.

On-time performance increases for the quarter

On-time performance increased to 90.3% in the second quarter of FY2023 compared to 88.6% for the same quarter in FY2022. The quarterly rate was below WSF's annual on-time performance goal of 95%.

On average in the second quarter of FY2023, 37 of the 378 (9.7%) daily trips did not leave the terminal within 10 minutes of the scheduled departure time, an improvement from the average of 39 out of 339 trips (11.4%) for the same quarter in FY2022.

On-time performance increased on three routes compared to the second quarter of FY2022. The San Juan domestic route had the largest increase (15.3%), while the Seattle/Bremerton route increased 3% and the Mukilteo/Clinton route improved by 1.2%.

Ridership increases in the second quarter of FY2023

Washington State Ferries' ridership was approximately 4.0 million during the second quarter of FY2023. This was 375,239 (10.4%) more than the same quarter in FY2022, but 295,684 (6.9%) below projections. All the routes but the Fauntleroy/Vashon/Southworth route had increased ridership with the highest increase (21.9%) occurring on the Seattle/Bainbridge route which operated on one-boat service in FY2022 and two-boat service in FY2023. WSF continues its efforts to restore full service levels to routes as crewing levels allow.

Ridership in the second quarter of FY2023 was 1.5 million (27%) lower than the same quarter of FY2020 (5.0 million).

Farebox revenue up in second quarter of FY2023

WSF farebox revenue was \$35.5 million for the second quarter of FY2023. This was about \$2.2 million (6.6%) more than the same quarter in FY2022 (\$33.3 million), but was about \$1.94 million (5.2%) below projections for the quarter. Revenue in the second quarter of FY2023 was \$6.4 million (18%) less than the same quarter in FY2020 (\$41.9 million).

Passenger and employee injury rates decrease

The rate of passenger injuries per million riders was 100 in the second quarter of FY2023, down 40% from 1.66 in the same quarter of FY2022. Passenger injuries are defined by the National Transit Database as any injury that results in transport to a medical facility. The passenger injury rate during the quarter (1.0) met the annual WSF goal of 1.0 injuries or fewer per million riders.

The rate of employee injuries reported to the Occupational Safety and Health Administration (OSHA)

in the second quarter of FY2023 was 9.5 per 10,000 revenue service hours, a decrease of 2.0 from the 11.5 per 10,000 revenue service hours in the same quarter in FY2022. The employee injury rate was above the WSF annual goal of fewer than 7.6 employee injuries per 10,000 revenue service hours.

Of the 26 employee injuries reportable to OSHA during the second quarter of FY2023, the most frequently reported was pain and soreness with 16 injuries.

Rate of passenger complaints decreases significantly

There were 336 complaints during the second quarter of FY2023, compared to 742 complaints in the same quarter last year. Expressed as a ratio related to ridership, there were 8.4 complaints per million riders in FY2023, down 59% from 20.5 in FY2022. The most common complaint was employee behavior with 2.8 per million riders (112) followed by schedule at 1.7 per million riders (66). There were 18 compliments in the second quarter of FY2023 compared to 25 in the corresponding quarter of FY2022.

Contributors include Matt Hanbey, Donna Thomas, Joe Irwin and Dustin Motte

Customer compliments WSF for service and communications

"[A WSF employee] was a life saver. Our ferry from Friday Harbor to Anacortes was very late and we were not going to make our Coupeville to Port Townsend ferry. By this time, the customer service number was closed and it was within the two-hour limit to change our reservation. [The employee] took the time to look up the after hours terminal number to make sure we could get on the last ferry to Port Townsend. Whew!! He saved us the cost of an overnight stay and we only had one day (Thursday) to see our friend. Thank you so much [employee]. You are a jewel!!!"

88 ELECTRIC VEHICLES ANNUAL REPORT

Washington's electric vehicle registrations increase 31% from 2021

Washington was sixth in the nation in terms of electric vehicle market share in 2022 with EVs comprising 3.4% of all registered vehicles. There were 114,600 EV registrations in the state as of December 31, 2022, approximately a 31% increase from 87,685 in 2021 and a 167% increase from 42,878 registrations in 2018.

The total EV count in Washington for 2022 included 87,769 battery electric vehicles and 26,831 plug-in hybrid electric vehicles, which is a ratio of more than three to one BEVs for every PHEV (refer to table below).

Electric vehicle registrations surge upward in Washington

2018 through 2022; Number of electric vehicle registrations by vehicles type; Includes battery electric vehicles and plug-in hybrid electric vehicles

Vehicle type	2018	2019	2020	2021	2022
BEV	27,853	36,129	45,292	64,647	87,769
PHEV	15,025	17,178	17,967	23,038	26,831
EV totals	42,878	53,307	63,259	87,685	114,600

Data source: Washington State Department of Licensing.

Notes: BEV = Battery electric vehicles. PHEV = Plug-in hybrid electric vehicles. EV = Electric vehicles.

To help ensure these vehicles have ready access to power when needed, Washington has worked with its EV partners to increase the number of charging stations. As of 2022, the state had:

- 1,462 Level 2 charging stations (Level 2 Charging: 208-Volt to 240-Volt). Depending on the vehicle, this takes around eight hours to completely charge.
- 226 Direct Current fast charging stations (Fast Charging: 400-Volt to 900-Volt). Fast chargers allow most vehicles to recharge in minutes as opposed to hours.

The Washington state's [Interagency Electric Vehicle Coordinating Council](#) along with [National Electric Vehicle Infrastructure Formula Program](#) are leveraging state and federal resources to ensure electric vehicle incentives, infrastructure, and opportunities are available and accessible to everyone.

Notable results

- *Electric vehicle registrations in Washington increased 167% between 2018 and 2022*
- *Twenty-six percent of WSDOT's passenger vehicle fleet is electric*

Electric vehicles

- **Battery electric vehicles (BEVs)** are fully electric vehicles that have a battery as their sole energy source.
- **Plug-in hybrid electric vehicles (PHEVs)** have both a battery and an internal combustion engine. PHEVs run off the battery but can switch to the conventional engine to extend the range.
- **Hydrogen fuel cell electric vehicles (FCEVs)** run on electricity produced from a fuel cell using hydrogen gas.

Hybrid vehicles have both a battery and an internal combustion engine that work in synergy. They do not plug into an external power source to recharge the battery and are not considered EVs.

the Washington State Department of Ecology, Department of Enterprise Services and Volkswagen.

In 2022, WSDOT installed Level 2 charging stations in Seattle and Spokane as part of these grant agreements. WSDOT also completed installation projects in Shoreline, 26 Level 2 charging stations were added and one DC fast charging station. The new Olympic Region headquarters facility, added five Level 2 charging stations. WSDOT has also ordered a solar-powered electric vehicle charging station that will be installed in Bellevue in 2023. Solar-powered charging stations do not require permits, construction, or additional electrical capacity to be added; they have no utility costs.

WSDOT decreases passenger vehicle fleet by 5% in five years

Over the past five years, WSDOT has reduced the number of vehicles in its statewide passenger vehicle fleet by 5.0%, from 395 in 2018 to 375 in 2022.

COVID-19 restrictions, and more widespread use of video conferences and teleworking resulted in less vehicle use and ultimately helped fuel this reduction.

WSDOT working to replace internal combustion passenger vehicles

WSDOT prioritizes purchasing electric vehicles to replace internal combustion engine passenger vehicles to meet the Washington State Legislature's goal to reduce greenhouse gas emissions by 45% below 1990 levels by 2030.

With the goal in mind, WSDOT has increased the number of EVs in its passenger vehicle fleet by 45.5% from 66 in 2018 to 96 in 2022 in the past five years.

WSDOT faces challenges in purchasing electric vehicles

Supply chain shortages resulting from the COVID-19 pandemic have hindered the ability of manufacturers to build enough EVs to meet the growing demand.

These supply chain issues have created significant challenges for the WSDOT to purchase vehicles and equipment. The biggest challenges have been equipment availability, vehicle lead time, and contract vendors canceling orders.

Contributors include Tonia Buell, Georgina Willner, Joe Irwin and Michele Villnave

WSDOT's electrification plan moves forward

In 2022, the Interagency Electric Vehicle Coordinating Council jointly led by the Department of Commerce and WSDOT submitted the Washington State Plan for [Electric Vehicle Infrastructure Deployment](#) (PDF 2MB). The two agencies will oversee the strategy for meeting the state's Clean Cars 2030 target: that all passenger and light-duty vehicles of model year 2030 or later sold in Washington will be electric vehicles.

E-bikes not included in statewide EV counts

Because electric-assist bikes are not registered, their growing numbers and usage are not tracked in this article. E-bikes (and bicycles) are defined as vehicles under the rules of road and WSDOT's Active Transportation Division is working with other agencies to promote more e-bike access to electrical outlets at bike parking locations throughout the state.

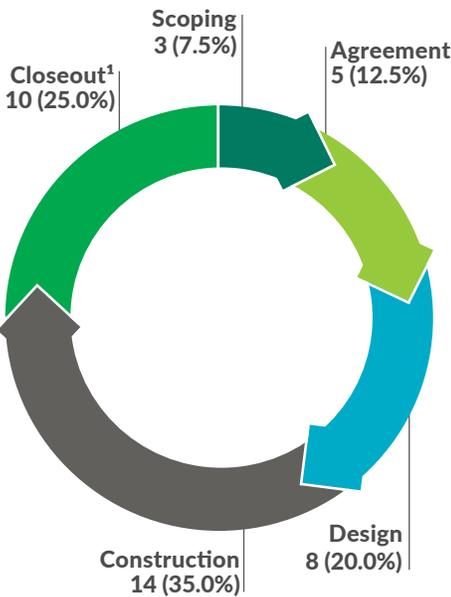
88 FREIGHT SEMI-ANNUAL REPORT

Notable results

- As of December 31, 2022, 40 WSDOT-administered projects to improve freight rail structures and freight movement were underway
- WSDOT received \$25 million in federal money for the Salmon Bay Bridge project over the Ballard locks

Ten of 40 freight rail projects reach final closeout stage in 2022

As of December 31, 2022



Data: WSDOT Rail, Freight, and Ports Division.

Notes: Percentages may not add to 100 percent due to rounding. Projects include those funded through the Freight Rail Assistance Program and the Freight Rail Investment Bank, as well as any freight rail projects funded federally or through Connecting Washington. ¹ Closeout includes capturing final records and closing the corresponding work orders.

WSDOT administers grants and loans funding 40 freight rail projects underway in 2022

A total of 40 WSDOT-administered projects to improve freight rail infrastructure and freight mobility were underway as of December 31, 2022. The work will continue in upcoming years and includes projects funded by the Connecting Washington and Move Ahead Washington transportation packages, state and federal freight rail grants, and a state freight rail loan program.

Of these 40 freight rail projects, three (7.5%) were in the scoping phase, five (12.5%) were in the agreement stage, eight (20%) were being designed, 14 (35%) were under construction, and 10 (25%) were in the final closeout phase (refer to chart at left).

The legislature approved 21 of these projects as part of the 2021-2023 biennial transportation budget, the remaining 19 projects were approved in previous biennia (refer to chart below).

Twenty-one of 40 rail projects approved in 2021-2023 biennium underway

Projects underway as of December 31, 2022

Biennium originally approved	Projects
2015-2017	1
2017-2019	6
2019-2021	12
2021-2023	21
Total	40

Data source: WSDOT Rail, Freight, and Ports Division.

Notes: Projects include those funded through the Freight Rail Assistance Program and the Freight Rail Investment Bank, as well as any rail projects funded federally or through the Connecting Washington funding package.

Connecting Washington funds seven freight rail projects in 2022

As of December 31, 2022, seven freight rail improvement projects funded through the Connecting Washington transportation package were underway. These CW projects were approved by the legislature as part of the 2017-2019 or 2019-2021 transportation budgets. They include rail interchange improvements, rail infrastructure work at several ports, landslide mitigation along railroad tracks and rehabilitation of existing rail lines.

The one 2017-2019 biennium CW project was in Moses Lake and was in the design phase. The remaining six projects were funded in the 2019-2021 biennium, three were in close-out, one was in design, one was in construction, and one was in the scoping phase as of December 31, 2022.

Four Federal Rail Assistance Program projects in the closeout phase

As of December 31, 2022

Project Status	FRAP projects	FRIB projects
Scoping		
Agreement	2	
Design		2
Construction	6	4
Closeout	4	
Total	12	6

Data source: WSDOT Rail, Freight, and Ports Division.

Freight Rail Assistance Program funds 12 projects underway in 2022

A total of 12 projects funded through the Freight Rail Assistance Program were underway as of December 31, 2022. Eight of these were new projects awarded for the 2021-2023 biennium for a total of \$6.6 million.

These projects include rail and tie replacements, rail safety improvements, bridge replacements, new sidings (short segments of track that allow a train to pull off the main line so another train can pass), crossing improvements, tunnel repairs, noise abatement and preservation. Of these 12 FRAP projects, four were in closeout as of December 31, 2022 (refer to table above).

Freight Rail Investment Bank loan program assists six projects in 2022

Six projects financed using state Freight Rail Investment Bank loans were underway in 2022. Four of the loans active in 2021 were for Tacoma Rail projects; and there was one each for the Port of Everett and the Port of Benton. Four of these six projects are in construction, with the remaining two in the design phase.

The Legislature funds the FRIB loan program to help deliver projects that improve the state's long-term economic vitality by improving freight movement. Past loan repayments have all been made on time, with 40 loans currently being repaid under 10-year or 15-year terms.

The map (below left) shows the locations of all the rail projects for the current 2021-2023 biennium as well as the past several biennia.

State funds 12 additional freight rail projects underway in 2022

Twelve freight rail capital projects received state funding through specifically designated line items in the transportation budget. These are administered by WSDOT and include work on the Chelatchie Prairie Railroad, Spokane Airport Transload Facility, as well as bridge replacements, grade separations, and track improvements across the state.

Rail, Freight, Ports Division Freight Rail Program: 2015-2023



Click anywhere on the image to view a larger version of this map.

Palouse River and Coulee City Rail System

The PCC is the largest short line freight rail system in Washington, serving five eastern Washington counties: Grant, Lincoln, Spokane, Adams, and Whitman. The WSDOT-owned system allows farmers and growers to ship their agricultural products via rail from their more remote locations, thus connecting them with larger railroads, barges and container ships for distribution throughout the world.

WSDOT completes rural rail rehabilitation project, starts to make slope repairs at seven landslide-prone sights

After beginning construction in 2020, WSDOT's Washington State Rural Rail Rehabilitation project—funded by a \$5.6 million Better Utilizing Investments to Leverage Development (BUILD) grant from the U.S. Department of Transportation—was closed out (refer to definition in pie chart note on p. 38) in 2022.

This \$5.6 million WSDOT project was awarded through the BUILD grant in 2018. It improves strategically significant sections of the 298-mile state-owned Palouse River and Coulee City short line rail system in eastern Washington (refer to box at left). State and local funds were used to match the federal grant monies, providing a total of \$11.2 million for capital improvements.

WSDOT and BNSF use federal grants for landslide mitigation projects

WSDOT and BNSF Railway were awarded three separate federal Consolidated Rail Infrastructure and Safety Improvements grants in 2018, 2020 and 2021 to reduce the risk of landslides at landslide-prone sites along railroad tracks between Seattle and Everett.

Two projects were funded with the 2018 grant, and are in the design stage with construction scheduled in 2023. The 2020 grant is in the agreement stage and will address landslide hazards at five additional locations. The 2021 grant is still being scoped. Work includes:

- Constructing walls to stop debris from reaching tracks
- Enhancing slope stabilization and making drainage improvements, and
- Adding slide warning fences.

Salmon Bay Bridge awarded federal grant

In 2022, it was announced that WSDOT will be receiving a \$25 million federal Infrastructure for Rebuilding America (INFRA) grant to rehabilitate the Salmon Bay Bridge, north of Seattle over the Ballard locks. BNSF Railway is funding the remainder of the \$110 million project.

This project is not included in the 40 rail projects currently underway as the funds have not yet been awarded to the state.

Contributors include Cameron Harper, Janet Matkin, Carolyn Simmonds, Joe Irwin and Michele Villnave

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ADVERTISEMENT RECORD QUARTERLY UPDATE

Connecting Washington Account projects in construction ¹ Through December 31, 2022; (County); Dollars in millions	Schedule status	Operationally complete date	Total project cost
SR 167/SR 509 Puget Sound Gateway (multiple counties)			
SR 509/SeaTac Stage 1 Elements (WSDOT Contribution)	On schedule	Jun-2023	\$49.4
SR 509/King County Trail (WSDOT Contribution)	Delayed	Jul-2023	\$12.0
SR 509/I-5 & SR 516 I/C to 28th/24th Ave. South - SR 509 Completion Stage 1	Delayed	Oct-2025	\$458.0
SR 167/I-5 to SR 509 - Stage 1B	Delayed	Sep-2026	\$602.9
I-405/Renton to Bellevue - Corridor Widening (King)			
I-405/Renton to Bellevue - Corridor Widening & ETL (Stage 2)	Delayed	May-2025	\$811.2
I-405/Toll Vendor for Renton to Bellevue - Toll System	On schedule	May-2025	\$42.5
I-405/Lakehurst Creek Culvert - Emergency Repair	Delayed	Feb-2023	\$7.4
SR 167 Toll Upgrade	Delayed	Mar-2023	\$64.6
SR 167/Toll Vendor for SR 167 Corridor - Toll System	Delayed	Mar-2023	\$23.0
Land Mobile Radio Upgrade (multiple counties)			
Wireless Communication	Delayed	Jun-2023	\$37.0
SR 520 Seattle Corridor Improvements - West End (King)			
SR 520/Montlake to Lake Washington - I/C and Bridge Replacement	Delayed	Jun-2023	\$712.5
SR 520/I-5 to Lake Washington - Bridge Replacement - Mitigation	On schedule	Jul-2023	\$24.2
SR 520/I-5 Interchange - Improvement	Delayed	Nov-2023	\$ 114.1
SR 520/I-5 to Montlake - Bridge Replacement	On schedule	Sep-2030	\$1,204.8
US 395 North Spokane Corridor (Spokane)			
US 395/NSC Wellesley Ave. Improvements	Delayed	Sep-2023	\$38.4
US 395/NSC Spokane River to Columbia	Delayed	Sep-2023	\$51.9
US 395/NSC Spokane River to Columbia - Shared Use Path	Delayed	Jul-2023	\$14.8
US 395/NSC Sprague Ave. to Spokane River	Delayed	Dec-2023	\$123.5
US 395/NSC Spokane River Crossing	Delayed	Dec-2025	\$92.3
US 12/Walla Walla Corridor Improvements (Walla Walla)			
US 12/Nine Mile Hill to Frenchtown Vicinity - Build New Highway	Delayed	Jul-2023	\$161.3
I-90 Snoqualmie Pass - Widen to Easton (Kittitas)			
I-90/Cabin Creek I/C to W Easton I/C Phase 3 - Add Lanes/Wildlife Bridges	Delayed	Oct-2027	\$392.1
I-90/Barker to Harvard - Improve Interchanges & Local Roads (Spokane)			
I-90/Barker to Harvard Phase 2 - Improve Interchanges and Local Roads	Delayed	Jun-2023	\$12.6
SR 305 Construction - Safety Mobility Improvements (Kitsap)			
SR 305/Johnson Rd. - Roundabout	Delayed	Mar-2023	\$6.3
I-405/NE 132nd Interchange - Totem Lake (King)			
I-405/NE 132nd Street I/C Improvements	Delayed	Dec-2023	\$83.4
I-5/Northbound Marine View Dr. to SR 529 - Corridor & Interchange Improvements (Snohomish)			
I-5/NB Marine View Dr. to SR 529 - Corridor & I/C Improvements	Delayed	Sep-2024	\$122.8

Data source: WSDOT Capital Program Development and Management.

Note: **1** Connecting Washington advertisements show projects currently in construction, and do not represent a comprehensive list of completed Connecting Washington projects. I/C = Interchange. ETL = Electronic Toll Lanes.

Connecting Washington Account projects in construction Through December 31, 2022; (County); Dollars in millions (continued)	Schedule status	Operationally complete date	Total project cost		
SR 520/148th Ave NE Interchange - Overlake Access Ramp (King)					
SR 520/148th Ave NE I/C - Overlake Access Ramp	Delayed	Aug-2023	\$68.3		
US 395/Ridgeline Intersection (Benton)					
US 395/Ridgeline Drive - Construct Interchange	Delayed	Apr-2023	\$19.0		
I-90/SR 18 Interchange Improvements (King)					
I-90/SR 18 I/C to Deep Creek - I/C Improvements & Widening	Delayed	Oct-2024	\$188.5		
SR 9/SR 204 Interchange (Snohomish)					
SR 9/SR 204 Intersection - Improvements	Delayed	Oct-2023	\$69.0		
SR 26/Dusty to Colfax (Whitman)					
SR 26/Dusty to Colfax - Add Climbing Lanes	Delayed	Oct-2023	\$10.1		
Nickel & TPA projects in construction Through December 31, 2022; (County); Dollars in millions	Fund type	Advertised on time	Ad date	Operationally complete date	Award amount
SR 99 Alaskan Way Viaduct Replacement (King)					
SR 99/Tunnel Alternative, South Access Surface Street Connection	Nickel/TPA	Late	Feb-2021	Jan-2023	\$25.0
SR 99/Alaskan Way and Elliot Ave Surface Street Restoration	Nickel/TPA	✓	Nov-2018	Feb-2024	\$153.0
The City of Seattle is the lead on this project.					
I-5/Tacoma HOV Improvements (Pierce)					
I-5/Portland Ave to Port of Tacoma Rd. - Southbound HOV	TPA	Late	Sep-2017	Nov-2022	\$159.8
SR 290/Spokane River E. Trent Bridge - Replace Bridge (Spokane)					
SR 290/Spokane River E Trent Bridge - Replace Bridge	TPA	Late	Dec-2019	Oct-2022	\$20.1

Data source: WSDOT Capital Program Development and Management.

WSDOT tracks three change orders of \$500,000 or more

WSDOT had three change orders of \$500,000 or more recorded during the quarter ending December 31, 2022.

1) A \$537,000 change order on the SR 506, 1.5 Miles North of Frontage Rd. to I-5 Emergency Bridge Repair project increased costs to account for fully replacing one of the bridge spans. 2) A \$790,000 change order on the I-5 Dike Access West Bridge MP 22.7 & BNRR Bridge Painting project increased costs to account for revised work associated with cleaning and painting the bridge as well as testing and the disposal of containment waste. 3) A \$744,000 change order on the I-5, Southbound S. Spokane St. to I-90 West-South Ramp Deck Overlay project increased costs to account for additional bridge deck rut repairs and installation of joint tapers on expansion joints.

When changes must occur to build projects, WSDOT issues a change order to modify the original contract. The order directs contractors how to handle the change, and also modifies the contract cost, plans and specifications as necessary. Oftentimes, these costs are included in the project's risk reserves. Each month, WSDOT posts all change orders estimated at \$500,000 or more online at [Change orders over \\$500,000 | WSDOT \(wa.gov\)](https://www.wa.gov/change-orders-over-500000).

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PRE-EXISTING FUNDS QUARTERLY UPDATE

WSDOT advertises 46 Pre-existing Funds projects in the sixth quarter of the biennium

WSDOT advertised 46 of 139 Pre-existing Funds projects in the sixth quarter of the 2021-2023 biennium (October through December 2022). Of the 46 total projects advertised, two were advanced from future quarters, eight were on time, 14 were emergent, three were emergency projects and 19 were late. Of the remaining 93 projects originally scheduled to be advertised during the quarter, WSDOT advertised eight in earlier bienniums, delayed 50 within the 2021-2023 biennium, deferred 34 out of this biennium and deleted one.

As of December 31, 2022, WSDOT's current cost to complete the 293 PEF projects advertised through the sixth quarter of the 2021-2023 biennium was about \$1.54 billion, approximately \$607.3 million (64.9%) more than the original value of \$935.6 million (refer to chart at right).

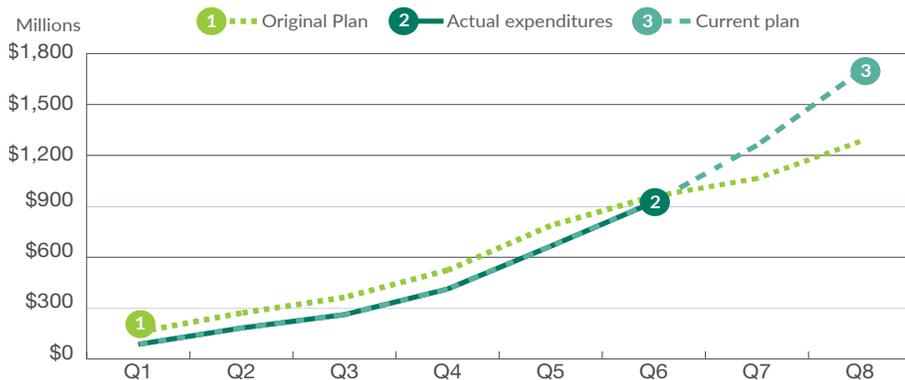
Cash flows currently lower than original projections

WSDOT originally planned to have approximately \$959.3 million in cumulative, combined PEF improvement and preservation cash flows at the end of the sixth quarter of the 2021-2023 biennium, but had \$924.7 million, approximately \$34.6 million (3.6%) less in actual expenditures due to adjustments in the delivery plan.

Current cash flows can vary from originally planned cash flows for a number of reasons. For example, emergent projects may add cash flow to the current reporting quarter, whereas project deletions can remove cash flow. As the biennium continues, WSDOT uses the original plan as a goal while working to meet the projections in the current plan. The current plan is more fluid and reflects quarterly changes due to projects being emergent, emergency, delayed, deferred, advanced or deleted.

Cumulative Pre-existing Funds improvement and preservation combined cash flows during the 2021-2023 biennium lower than planned

2021-2023 biennium; Quarter ending December 31, 2022; Planned vs. actual expenditures and current plan; Dollars in millions



Data source: WSDOT Capital Program Development and Management.

Note: Q6 refers to the sixth quarter (October through December 2022) of the 2021-2023 biennium, which runs from July 2021 through June 2023.

Current cost to complete PEF advertisements \$607.3 million more than original value

2021-2023 biennium (July 2021 through June 2023); sixth quarter (ending December 31, 2022); Dollars in millions

	Number of projects	Original value	Current cost to complete
Planned PEF advertisements for the 2021-2023 biennium	426	\$2,896.2	\$4,028.2
Actual PEF advertisements through the sixth quarter	293	\$935.6	\$1,542.9

Data source: WSDOT Capital Program Development and Management.

WSDOT advertises 293 PEF projects during the 2021-2023 biennium

Advertisement status	Quarter ¹	Cumulative ²
Advanced ³	2	19
On time	8	85
Emergent ⁴	14	76
Emergency	3	43
Late	19	70
Total projects advertised	46	293
Early ⁵	8	23
Delayed within the biennium	50	194
Deferred out of the biennium	34	49
Deleted	1	7

Data source: WSDOT Capital Program Development and Management.

Notes: **1** Quarter refers to October through December 2022. **2** Cumulative refers to July 2021 through June 2023. Total projects were updated in Q5 to correct a previous error. **3** Advanced projects were moved up from future quarters. **4** Emergent projects include unanticipated projects. **5** Early projects were planned for the quarter but advertised in a previous quarter.

WSDOT advertises 46 Pre-existing Funds projects during the sixth quarter of the 2021-2023 biennium

October through December 2022

Advanced (2)

SR 202/Evans Creek Vic. to SE Fish Hatchery Rd. Vic. - Stormwater Retrofit 2021-2023 SWR Regionwide Safety Features - Signing

On time (8)

I-5/Northbound Snohomish River Bridge (BNRR) - Painting

SR 20/Unnamed Tributary to Red Creek - Fish Passage

I-5/Southbound Snohomish River Bridge (BNRR) - Painting

US 12/Heron St. Bridge Tier 1 - Bridge Rehabilitation

I-5/Southbound Joe Leary Slough to Nulle Rd Vic. - Concrete Rehabilitation

SR 240/Columbia Center Blvd. - Upgrade Signal & Illumination

SR 9/SR 528 to 132nd St. NE Vic. - Paving with Exceptions

US 395/Old Maid Coulee Bridge Southbound - Deck Rehabilitation

Emergent (14)

SR 504/Forest Learning Center SRA - HVAC Replacement - SWR

SR 4/1.5 Miles East of Grays River Bridge - Culvert Repair

SR 167/Southbound UP Railroad Bridge - Deck Overlay (Toll)

SR 503 Spur/Unnamed Tributary to Dog Creek - Temporary Culvert Installation

SR 7/SR 702 to North of 267th St. E - Paving

SR 127/Elmer C. Huntley Snake River Bridge - Deck Rehabilitation

US 101/Grays Harbor Creeks - Remove Fish Barriers

US 2/Colbert Rd. - Intersection Revision

SR 167/Toll Vendor for SR 167 Corridor - Toll System

SR 127/Central Ferry to Big Alkali Rd - Paving

SR 167/SR 410 to SR 18 - Northbound Toll Equipment Upgrade

US 195/Babbit Rd. to Colfax - Paving

SWR 2021-2023 Signal Controller and Cabinet Replacements

SR 270/Bishop Blvd. to Idaho State Line - Paving

Emergency (3)

SR 28/East Wenatchee Bypass - Wall and Drainage Repair

1/2 Mile South of Jct. SR 260 - Emergency Culvert Replacement

SR 109/South of Capoean Dr. - Emergency Project

Late (19)

SR 167/Southbound UP Railroad Bridge - Deck Overlay

US 2/Creston to Rocklyn Rd. - Paving

SR 518/24th Avenue S Bridge - Girder Replacement

SR 20/Spruce Canyon Rd. to South Fork Mill Creek Rd. - Paving

SR 534/Unnamed Tributary to Carpenter Creek - Fish Passage

SR 21/I-90 to Canniwai Creek - Chip Seal

SR 28/White Trail Rd. - Roundabout

SR 25/Fruitland to US 395 - Chip Seal

SR 7/Unnamed Tributary to South Creek 1 & South Creek 2 - Remove Fish Barriers

SR 28/Grant County Line to Lamona - Chip Seal

US 101/Elwha River Bridge - Bridge Replacement

SR 31/Metaline Falls to Canada - Chip Seal

SR 109/W of Hoquiam - Stabilize Slope

SR 231/Reardan to Fisher Rd. - Chip Seal

SWR Breakaway Cable Terminal Replacement - Freeways 2021-2023

SR 292/Springdale to Loon Lake - Chip Seal

SR 433/Lewis and Clark Bridge - Expansion Joint Replacement

US 395/Columbia River to Boyds - Chip Seal

I-90, US 97 & SR 970 Ellensburg Vic. - CED Planning and Mitigation

Data source: WSDOT Capital Program Development and Management.

Notes: SRA = Safety Rest Area. Vic. = Vicinity. WSDOT Regions: ER = Eastern Region, NCR = North Central Region, NWR = Northwest Region, OR = Olympic Region, SCR = South Central Region and SWR = Southwest Region. HMA = Hot Mix Asphalt. PCCP = Portland Cement Concrete Pavement. CED = Chronic Environmental Deficiencies. ITS = Information Technology Systems.

WSDOT delays 50 Pre-existing Funds projects during the sixth quarter of the 2021-2023 biennium

October through December 2022

Early (8)	
I-5/Denny Way Overcrossing Bridge - Expansion Joint Replacement	I-5/Southbound Lake Washington Ship Canal Bridge - Deck Overlay
I-5/Southbound Denny Way-Lakeview Viaduct - Deck Overlay & Expansion Joint	I-5/Southbound Ravenna Blvd. to NE Northgate Way - Deck Seal & Expansion Joint
I-5/Southbound Yesler Way to Ship Canal Bridge - Concrete Pavement Rehabilitation	NCR Strategic Pavement Preservation 2021-2023
I-5/Northbound Lake Washington Ship Canal Bridge - Deck Overlay	US 101/Delphi Rd. to I-5 - Paving
Delayed (50)	
I-5/Bow Hill North/Southbound SRA - Rehabilitate Manholes - NWR	SR 500/NE 42nd and 54th Ave. - Intersection Improvements
I-5/Southbound King-Jackson Street Bridge - Deck Rehabilitation & Joints	I-82/Columbia River Bridge at Umatilla Eastbound - Bridge Painting Stage 1
I-5/Secret Creek - Fish Passage	I-82/Columbia River Bridge Eastbound - Special Repairs
I-405/SR 522 to SR 527 - Widening & Express Toll Lane	I-82/SR 14 Interchange - Plymouth Weigh Station Improvements
SR 530/59th Ave NE & 211th Place NE - Intersection Improvements	I-90/Wilson Creek Bridge Westbound - Deck Rehabilitation
SR 530/Montague Creek Bridge to Seeman St. Vic. - Paving	I-90/West Side Canal Bridge Eastbound - Deck Rehabilitation
SR 542/Squalicum Creek to Bellingham Bay - Fish Passage	I-90/Columbia River Vantage Bridge - Special Repairs
NCR Breakaway Cable Terminal Replacement - Freeways	I-90/Upper Snoqualmie River Bridge Westbound - Deck Rehabilitation
US 2/Leavenworth East - Paving	I-90/S Fork Snoqualmie River Bridge Eastbound - Deck Rehabilitation
US 2/Peshastin Vicinity - Curb Ramp Upgrades	I-90/Homestead Valley Rd. Bridge Eastbound - Deck Rehabilitation
SR 17/Soap Lake to Lake Lenore Caves Site 1 - Unstable Slope	I-90/Coal Creek Bridge Westbound - Deck Rehabilitation
SR 17/Soap Lake to Lake Lenore Caves Site 2 - Unstable Slope	I-90/Vantage Bridge - Replace Bridge Deck
SR 17/Soap Lake to Lake Lenore Caves Site 3 - Unstable Slope	I-90/Bandera Rd. Bridge Eastbound - Deck Rehabilitation
SR 17/Soap Lake to Lake Lenore Caves Site 7 - Unstable Slope	US 97/Jones Rd. - Intersection Improvements
SR 17/Soap Lake to Lake Lenore Caves Site 8 - Unstable Slope	US 97/Satus Creek Vic. to Dry Creek Vic. - Chip Seal
SR 17/Moses Lake Vicinity - Paving	SR 128/Snake River Bridge to Idaho State Line - Chip Seal
SR 17/Soap Lake to Lake Lenore Caves Site 9 - Rock Slope Scaling	US 395/Pioneer Memorial Bridge - Bridge Painting Stage 2
SR 17/Soap Lake to Lake Lenore Caves Site 10 - Rock Slope Scaling	SR 410/Miner Creek to 1 Mile East of Hells Crossing - Stormwater Retrofit
SR 17/Soap Lake to Lake Lenore Caves Site 11 - Rock Slope Scaling	US 730/3.0 Miles North of Oregon Border - Rockfall Prevention
SR 17/Moses Lake Vicinity - Curb Ramp Upgrades	US 730/4.1 Miles North of Oregon Border - Rockfall Prevention
US 97/North of Blewett Pass - Paving	US 730/4.4 Miles North of Oregon Border - Rockfall Prevention
US 97A/Knapps Hill Tunnel - Illumination Upgrades	US 730/5.2 Miles North of Oregon Border - Rockfall Prevention
SR 3/SR 304 to SR 303 - Paving	21-23 ER Region Wide Safety Features - Signing
SR 8/US 12 to US 101 - Paving	US 2/Sunset Interchange - Illumination Replacement
SR 20/Discovery Rd. & Kearney St. Intersection - Roundabouts	I-90/Sprague Interchange TO SR 904 Interchange - Illumination Rebuild

Data source: WSDOT Capital Program Development and Management.

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WSDOT defers 34 Pre-existing Funds projects during the sixth quarter of the 2021-2023 biennium

October through December 2022

Deferred (34)

US 195/Horn School SRA - Interior Renovation & Site Improvement - ER	I-90/Westbound East Fork Issaquah Creek Bridge - Seismic
US 2/Groeneveld & Unnamed Creek to Skykomish River - Fish Passage	I-405/Ripley Lane Stream Connection Project
I-5/Unnamed Tributary to Silver Creek - Fish Passage	I-405/Operational Improvements Associated with SR 522 Vic. to SR 527 Electronic Toll Lanes
SR 9/Unnamed Tributaries to Prairie & Quilceda Creeks - Fish Passage	I-405/Crystal Creek Downstream Conveyance Project
SR 9/Unnamed Tributary to Nookachamps Creek - Fish Passage	SR 530/Sauk River Roadway Embankment - Stabilization
I-90/Eastbound Mercer Slough Bridge - Rehabilitation	SR 531/Fish Creek - Fish Passage
SR 546/SR 539 to Fishtrap Creek - Paving	SR 971/Navarre Coulee Site 3 - Rock Slope Scaling
SR 546/Unnamed Tributary to Fishtrap Creek - Fish Passage	SR 971/Navarre Coulee Site 4 - Rock Slope Scaling
US 2/2 Miles East of Orondo - Rock Slope Scaling B	SR 971/Navarre Coulee Site 5 - Rock Slope Scaling
US 2/2 Miles East of Orondo - Rock Slope Scaling C	SR 971/Navarre Coulee Site 6 - Rock Slope Scaling
SR 17/Cunningham Rd. - Intersection Safety Improvement	I-5/Capitol Lake Bridge - Foundation Repair
US 97/10 Miles South of US 2 - Unstable Slope	US 101/Discovery Bay/SR 104 Hood Canal Ferry Eastbound - Variable Message System
US 97A/South of Entiat - Site 1 - Rock Slope Scaling	SR 160/Long Lake Rd. SE - Roundabout
US 97A/South of Entiat - Site 2 - Rock Slope Scaling	US 12/Snake River Clarkston Bridge - Bridge Painting
US 97/North of Orondo - Unstable Slopes	SR 24/Bell Rd. Intersection - Intersection Safety
SR 971/Navarre Coulee Site 1 - Rock Slope Scaling	I-90/Yakima River Bridge West of Easton Eastbound - Deck Rehabilitation
SR 971/Navarre Coulee Site 2 - Rock Slope Scaling	SR 129/Highland Ave. to US 12 and SR 129 Spur - ADA Compliance

Deleted (1)

US 12/Snake River Vaughn Hubbard Bridge Eastbound - Repair Floor Beams

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STATEWIDE TRANSPORTATION POLICY GOALS & GRAY NOTEBOOK INFORMATION GUIDE

Statewide transportation policy goals

Laws enacted in 2007 established policy goals for transportation agencies in Washington (RCW 47.04.280). Throughout its editions, WSDOT's Gray Notebook reports on progress toward the six statewide transportation policy goals that include:

- **Safety:** To provide for and improve the safety and security of transportation customers and the transportation system;
- **Preservation:** To maintain, preserve, and extend the life and utility of prior investments in transportation systems and services;
- **Mobility:** To improve the predictable movement of goods and people throughout Washington, including congestion relief and improved freight mobility;
- **Environment:** To enhance Washington's quality of life through transportation investments that promote energy conservation, enhance healthy communities, and protect the environment;
- **Economic Vitality:** To promote and develop transportation systems that stimulate, support, and enhance the movement of people and goods to ensure a prosperous economy; and
- **Stewardship:** To continuously improve the quality, effectiveness, and efficiency of the transportation system.

Gray Notebook edition archives available online

Readers can access past GNB editions online. The GNB archives include the past five years of publications. Earlier editions are available on request; refer to details on the [archive page](#).

GNB reporting periods

WSDOT programs report their performance data during different periods to best fit the work they do. For example, a program that receives substantial federal funds may report performance based on the federal fiscal year (refer to charts below).

GNB credits

The GNB is developed and produced by members of the WSDOT Transportation Safety & Systems Analysis Division's Performance Management and Strategic Management offices, and articles feature bylines indicating key contributors from dozens of WSDOT programs. This edition of the GNB was completed entirely by staff members who were teleworking to help reduce the spread of COVID-19 in Washington. WSDOT's Headquarters Graphics Division (Marci Mill, Erica Mulherin and Steve Riddle) provides creative assistance, and WSDOT program staff and communicators take the photographs in each edition.

Calendar, state fiscal and federal fiscal quarters

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
		GNB 85			GNB 86			GNB 87		GNB 88		
Calendar	Q1 2022			Q2 2022			Q3 2022			Q4 2022		
State Fiscal	Q3 FY2022			Q4 FY2022			Q1 FY2023			Q2 FY2023		
Fed. Fiscal	Q2 FFY2022			Q3 FFY2022			Q4 FFY2022			Q1 FFY2023		

2021-2023 biennial quarters (used by Legislature)

Period	Quarter	Period	Quarter
Jul – Sep 2021	Q1	Jul – Sep 2022	Q5
Oct – Dec 2021	Q2	Oct – Dec 2022	Q6
Jan – Mar 2022	Q3	Jan – Mar 2023	Q7
Apr – Jun 2022	Q4	Apr – Jun 2023	Q8

The Gray Notebook is prepared by:
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