

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 76 ■ December 2019



PLOWING FORWARD

WSDOT MAINTENANCE KEEPS WASHINGTON MOVING YEAR ROUND

Crack down

WSDOT working hard to preserve state's aging pavement

Charge it

Plug-in Electric Vehicle use, charging stations continue to expand

Safe travels

How transit helps improve safety on roadways statewide

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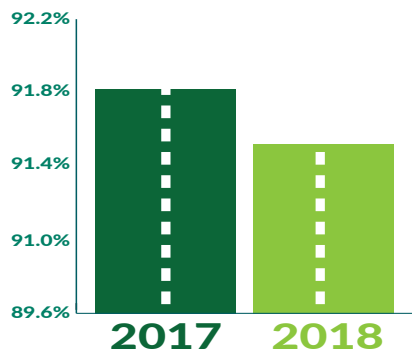
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The Gray Notebook team

WSDOT's Gray Notebook is produced by the Performance Management and Strategic Management offices of the Transportation Safety & Systems Analysis Division: Hide Aso, Dan Davis, Sreenath Gangula, Helen Goldstein, Joe Irwin, Lisa Mikesell, Dustin Motte and Yvette Wixson. TSSA is directed by John Milton.

PERFORMANCE HIGHLIGHTS reported for the quarter ending December 31, 2019

PERCENTAGE OF PAVEMENT LANE MILES IN FAIR OR BETTER CONDITION DROPPED FOR FOURTH CONSECUTIVE YEAR TO 91.4% IN 2018



383 of 421 projects completed with **Nickel** or **Transportation Partnership Account** funds

77 PERCENT of **highway maintenance** asset condition targets were achieved by WSDOT in 2019

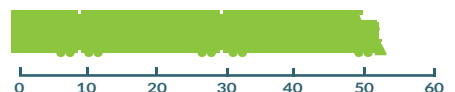
9 written **environmental violation** notices issued to WSDOT and its contractors in 2019, up from six in 2018

206 PERCENT increase in **public charging ports** for electric vehicles between 2015 and 2019

WSDOT has 53 FREIGHT RAIL PROJECTS UNDERWAY in 2018

\$25.0 MILLION in economic benefit provided by WSDOT's **Incident Response** teams clearing 14,335 incidents during the quarter

6.0 PERCENT improvement in WSDOT's agency-wide **Recordable Incident Rate** from 2018 to 2019



76 STRATEGIC PLAN

WSDOT's Strategic Plan has three goals, Inclusion, Practical Solutions and Workforce Development. This plan continues WSDOT's focus on how the agency makes investments and delivers projects with limited resources.

The agency has an online interactive strategic plan dashboard, which can be accessed at <http://www.wsdot.wa.gov/about/secretary/strategic-plan/>. The dashboard contains leading indicators for the plan's 15 strategies—five for each goal—and details progress on the plan's work.

Under the strategic plan, WSDOT's Inclusion efforts ensure it engages its employees, communities and partners as the agency collaboratively delivers the program. Practical Solutions allows WSDOT to leverage finite funding to get the most capacity and safety out of the entire multimodal transportation system. WSDOT's focus on Workforce Development ensures the agency attracts and retains a quality workforce to meet its legislative, regulatory, service and public expectations.

Recent editions of the Gray Notebook have featured articles on Inclusion, Workforce Development and Practical Solutions efforts at WSDOT. See [Gray Notebook 75, pp. 45-49](#) for the Inclusion Annual Report, [Gray Notebook 74, pp. 28-30](#) for the Workforce Development Annual Report and [Gray Notebook 72, pp. 33-35](#) for the Practical Solutions Annual Report.

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



■ Inclusion Goal

Strengthen commitment to diversity and engagement in every aspect of our work.

■ Practical Solutions Goal

Prioritize innovative, timely and cost-effective decisions, with our stakeholders and partners.

■ Workforce

Development Goal

Be an employer of choice by hiring, training and retaining skilled workers to meet Washington's transportation needs.

76 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 (Annual measure: calendar years 2017 & 2018)	0.92	0.88	<1.00 ¹	✓		↓
Rate of recordable incidents for every 100 full-time WSDOT workers (Annual measure: calendar years 2018 & 2019)	5.0	4.7	<5.0	✓		↓
Preservation						
Percentage of state highway pavement in fair or better condition by vehicle miles traveled (Annual measure: calendar years 2017 & 2018)	91.8%	91.4%	≥ 90%	✓		↑
Percentage of state bridges in fair or better condition by bridge deck area (Annual measure: fiscal years 2018 & 2019)	92.5%	92.9%	≥ 90%	✓		↑
Mobility² (congestion relief)						
Highways: Vehicle Miles Traveled (VMT) on state highways (Annual measure: calendar years 2017 & 2018)	34.6 billion	35.4 billion	*	N/A		↓
Highways: Average incident clearance times for all Incident Response program responses (Calendar quarterly measure: Q4 2018 & Q4 2019)	13.6 minutes	14.0 minutes	*	N/A		↓
Ferries: Percentage of trips departing on time ³ (Fiscal quarterly measure: year to year Q2 FY2019 & Q2 FY2020)	93.6%	93.5%	≥ 95%	—		↑
Rail: Amtrak Cascades on-time performance ⁴ (Annual measure: fiscal years 2017 & 2018)	56.3% ⁵	53.9%	≥ 88%	—		↑
Environment						
Number of WSDOT stormwater management facilities constructed (Annual measure: fiscal years 2018 & 2019)	78	66	*	N/A		Not applicable
Cumulative number of WSDOT fish passage improvement projects constructed (Annual measure: calendar years 2017 & 2018)	330	345	*	N/A		↑
Stewardship						
Cumulative number of Nickel and TPA projects completed ⁶ and percentage on time ⁷ (Biennial quarterly measure: Q1 2019-2021 & Q2 2019-2021, trendline for percentage on time)	383/ 86%	383/ 86%	≥ 90% on time	—		↑
Cumulative number of Nickel and TPA projects completed ⁶ and percentage on budget ⁷ (Biennial quarterly measure: Q1 2019-2021 & Q2 2019-2021, trendline for percentage on budget)	383/ 91%	383/ 91%	> 90% on budget	✓		↑
Variance of total project costs ⁶ compared to budget expectations ⁷ (Biennial quarterly measure: Q1 2019-2021 & Q2 2019-2021)	Under budget by 1.5%	Under budget by 1.5%	On or under budget	✓		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 Statewide Transportation Policy Goal for this performance measure is different than the federal MAP-21 goal for the same measure. **2** Mobility does not yet include goals for people walking/biking for transportation. **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** Amtrak Cascades' 2017 on-time performance was reported for calendar year 2017 in GNB 70 and 71. **6** Construction projects only. **7** Projects 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.

76 MOVING AHEAD FOR PROGRESS IN THE 21ST CENTURY (MAP-21)

FHWA set to make determination on WSDOT MAP-21 highway safety performance

In March 2020, the Federal Highway Administration will provide its first determinations of whether WSDOT has made significant progress toward achieving its 2018 Moving Ahead for Progress in the 21st Century targets for highway safety (also referred to as PM1). WSDOT reported its MAP-21 highway safety targets for 2019 to the FHWA on August 31, 2018. FHWA will inform WSDOT whether significant progress has been made on those targets in March 2021.

On May 20, 2018, WSDOT established its federally-required MAP-21 targets for bridges and pavement (also referred to as PM2), and highway system performance, freight, and Congestion Mitigation and Air Quality (also referred to as PM3). Like the PM1 targets, WSDOT needs to show significant progress toward meeting PM2 and PM3 targets. These targets were established collaboratively by WSDOT and Metropolitan Planning Organizations.

WSDOT and state MPOs submitted MAP-21 targets for PM2 and PM3 to the FHWA's Washington state division office in the Baseline Performance Report on October 1, 2018, and the targets were recommended for acceptance to the FHWA national headquarters office. This begins a four-year reporting cycle for PM2 and PM3 performance measures, which includes WSDOT producing a Mid-Performance Period Progress Report (due by October 1, 2020) and a Full-Performance Period Progress Report (due by October 1, 2022). When WSDOT and MPOs report on their progress toward achieving PM2 and PM3 targets in the 2020 mid-performance period progress report, they will provide updates on two-year condition/performance and investment strategy discussions as well as target adjustment discussions.

MAP-21 safety reporting on an 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. The safety targets established for 2019 represent the second annual reporting cycle since the initial reporting of MAP-21 safety targets for 2018.

MAP-21 performance measures by program area		2019 target	Penalty ¹
Highway Safety (PM1)	23 CFR Part 490 ID No. 2125-AF49		
Number of traffic fatalities on all public roads ²		≤ 489.2	Yes
Rate of traffic fatalities per 100 million vehicle miles traveled (VMT) on all public roads ²		≤ 0.813	Yes
Number of serious traffic injuries on all public roads ²		≤ 1,855.0	Yes
Rate of serious traffic injuries per 100 million VMT on all public roads ²		≤ 3.068	Yes
Number of non-motorist traffic fatalities plus serious injuries		≤ 511.8	Yes
MAP-21 Special Rules (Safety)			
Rate of per capita traffic fatalities for drivers and pedestrians 65 or older		Show yearly progress	No
Rate of fatalities on high-risk rural roads ²		Show yearly progress	Yes
Highway-railway crossing fatalities ³		Show yearly progress	No

Data source: WSDOT Transportation Safety & Systems Analysis.

Notes: The PM1 targets for 2019 were submitted on August 31, 2018, using 2013-2017 for current baseline data. ¹ Penalties will not be assessed if WSDOT shows significant progress on four of five PM1 targets. Significant progress is achieved if the five-year rolling average is less than or equal to the target or less than or equal to the baseline level. 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.

WSDOT and MPOs can also adjust their four-year targets at that time, but must explain the basis for the changes and how adjusted targets support expectations documented in longer-range plans.

improvements on certain targets. While not showing significant progress toward targets triggers a penalty—and requires an explanation of what WSDOT will do to make future progress or require additional

reporting—specific measures in PM1 and PM2 invoke financial penalties if targets are not met. These penalties require redistributing federal monies to help ensure significant progress toward specific targets in the future.

In 2022, FHWA will use the full-performance period progress report to determine whether WSDOT has made significant progress toward its PM2 and PM3 targets. WSDOT may face penalties (see table below) if it does not show necessary

MAP-21 folios helping MPOs, stakeholders

WSDOT has developed informational folios to ensure the agency and its partners are aligned as MAP-21 work progresses. For links to WSDOT-specific MAP-21 folios, visit www.wsdot.wa.gov/Accountability/MAP-21.

MAP-21 performance measures by program area		Current data	2-year target ^{1,2}	4-year target ^{1,2}	Penalty
Pavement and Bridges (PM2) 23 CFR Part 490 ID No. 2125-AF53					
Pavement					
Percent of Interstate pavement on the NHS in good condition		32.5% ³	N/A	30%	No
Percent of Interstate pavement on the NHS in poor condition		3.6% ³	N/A	4% ⁴	Yes
Percent of non-Interstate pavement on the NHS in good condition		18% ³	45%	18%	No
Percent of non-Interstate pavement on the NHS in poor condition		5% ³	21%	5%	No
Bridges					
Percent of NHS bridges classified in good condition (weighted by deck area)		32.8%	30%	30%	No
Percent of NHS bridges classified in poor condition (weighted by deck area)		7.8%	10%	10% ⁴	Yes
Highway System Performance, Freight, and Congestion Mitigation & Air Quality (PM3) 23 CFR Part 490 ID No. 2125-AF54					
Highway System Performance (Congestion)					
Percent of person-miles traveled on the Interstate System that are reliable		73%	70%	68%	No
Percent of person-miles traveled on the Non-Interstate NHS System that are reliable		77%	N/A	61%	No
National Freight Movement Program					
Truck Travel Time Reliability (TTTR) Index		1.63	1.70	1.75	No
Congestion Mitigation & Air Quality Program					
Non-Single Occupancy Vehicle (SOV) travel in Seattle urbanized area (NHS)		32%	32.8%	33.2%	No
Peak hours of Excessive Delay per capita in Seattle urbanized area (NHS)		23	N/A	28	No
All Pollutants (kg/day) ²		1,658.640	366.285	658.300	No
Carbon Monoxide (CO) (kg/day) ²		313.160	309.000	309.060	No
Particulate Matter less than 10 microns (PM ₁₀) (kg/day) ²		435.690	0.305	224.000	No
Particulate Matter less than 2.5 microns (PM _{2.5}) (kg/day) ²		36.820	2.100	8.700	No
Nitrogen Oxides (NOX) (kg/day) ²		872.970	54.880	116.540	No

Data sources: WSDOT Bridge and Structures Office, WSDOT Pavement Office, WSDOT Strategic Assessment Office, 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 period progress report. **1** Two-year and four-year reports for PM2 and PM3 are due October 1, 2020, and October 1, 2022. **2** Base emissions are for the four-year period 2013-2016 as reported in the CMAQ Public Access System. **3** PM2 "Current data" is relative to four-year pavement targets only. **4** The National Highway Performance Program (NHPP) targets require the percent of Interstate pavement on the NHS in poor condition not exceed 5% and the percent of NHS bridges classified in poor condition (weighted by deck area) not exceed 10%.

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WASHINGTON STATE FERRIES ANNUAL REPORT SUMMARY DASHBOARD

Policy goal/Performance measure	FY2018	FY2019	Goal	Goal met	Comments
Capital Program and Maintenance Effectiveness					
1 Percent of terminal projects completed on time ¹	50%	100%	90%	✓	One of one terminal projects completed on time; increased from FY2018
2 Percent of terminal projects completed on budget ^{1,3}	100%	100%	90%	✓	One of one terminal projects completed on budget; no change from FY2018
3 Percent of vessel contracts completed on time A) Existing vessels ² B) New vessels	82% N/A	78% 100%	75% 100%	✓ ✓	A) Seven of nine vessel contracts completed on time; decreased from FY2018 B) M/V <i>Chimacum</i> completed on time; no new vessels in FY2018
4 Percent of vessel contracts completed on budget ³ A) Existing vessels ² B) New vessels	73% N/A	67% 100%	75% 100%	— ✓	A) Six of nine vessel contracts on budget; decreased from FY2018 B) M/V <i>Chimacum</i> completed on budget
14 Preliminary engineering costs A) As a percent of terminal capital project costs B) As a percent of existing vessel capital project costs	2.2% 4%	19.3% 14%	<24.2% <17%	✓ ✓	A) Preliminary engineering costs for terminal capital projects met goal B) Preliminary engineering costs for vessel capital projects met goal
15 Average vessel out of service time	9.8 weeks	11.9 weeks	<8 weeks	—	Missed vessel out of service time due to vessel mechanical issues; increased from FY2018
Safety Performance					
5 Passenger injuries per million passenger miles ⁴	0.41	1.65	<1.0	—	Passenger injury rate did not meet goal of less than one in one million; increased from FY2018
6 OSHA ⁵ recordable crew injuries per 10,000 revenue service hours	9.9	5.7	<7.6	✓	Made goal for OSHA recordable crew injuries; decreased from FY2018
Service Effectiveness					
7 Passenger satisfaction with WSF staff customer service ⁶	95%	94%	90%	✓	Made passenger satisfaction with customer service goal; decreased from FY2018
8 Passenger satisfaction with cleanliness and comfort of WSF terminals, facilities and vessels ⁶	88%	85%	90%	—	Missed passenger satisfaction with cleanliness and comfort goal; decreased from FY2018
9 Passenger satisfaction with service requests made via telephone or WSF website ⁶	90%	88%	90%	—	Missed goal for passenger satisfaction with service requests; decreased from FY2018
16 On-time performance ⁷ level	91%	90%	95%	—	Missed on-time performance level goal; decreased from FY2018
17 Service reliability level (percent of scheduled trips completed)	98.9%	99.2%	99%	✓	Made service reliability level goal; increased from FY2018
Cost Containment Measures					
10 Annual operating cost estimate per passenger mile compared to budgeted cost	1.02%	0.36%	Within 5% of budget	✓	Made goal for annual operating cost per passenger mile; improved from FY2018
11 Annual operating cost estimate per revenue service mile compared to budgeted cost	2.4 ⁸ %	-1.0%	Within 5% of budget	✓	Made goal for annual operating cost per revenue service mile; improved from FY2018
12 Overtime hours as a percentage of straight time hours compared to budgeted overtime hours	0.8%	1.2%	Within 1% of budget	—	Missed goal for annual overtime as a percentage of straight time; worsened from FY2018
13 Gallons of fuel consumed per revenue service mile compared to budgeted fuel consumption	1.3 ⁸ %	0.1%	Within 5% of budget	✓	Met goal for fuel consumption per revenue service mile; improved from FY2018

Data source: Washington State Ferries.

Notes: Goals above are out of sequence to better show what categories they are under. All reporting periods are based on fiscal years. Prior reporting period is FY2018 (July 2017 through June 2018) and current reporting period is FY2019 (July 2018 through June 2019). "<" means the goal is less than percent or number indicated. **1** Includes preservation and improvement projects. **2** Includes preservation and improvement projects with the exception of new vessels. **3** Budget goal is based on last approved legislative budget. **4** How the National Transit Database counted passenger injuries changed in FY2019. **5** OSHA = Occupational Safety and Health Administration. **6** Percentages include neutral responses from customers. **7** Vessels leaving within 10 minutes of scheduled departure time. **8** Numbers updated and corrected from GNB 72.

76 PUBLIC TRANSIT SAFETY ANNUAL REPORT

Notable results

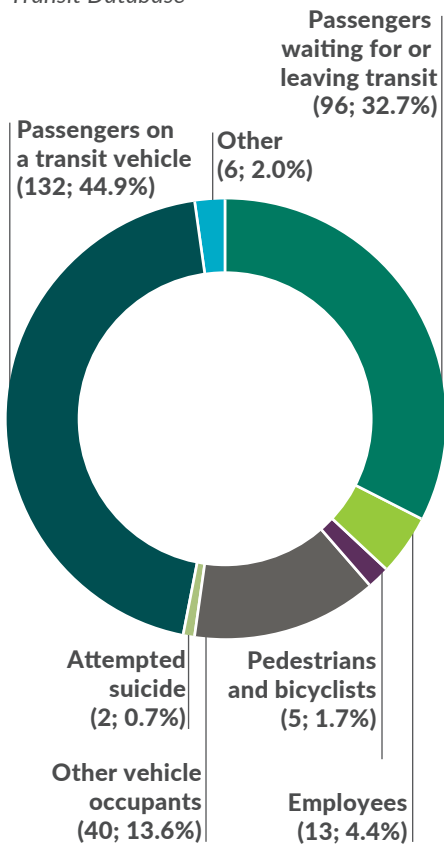
- Washington had three transit-related fatalities in 2018, a 57% decrease from seven in 2017
- Washington's transit systems reported 294 injuries in 2018, a drop of 20% from 368 in 2017

Traveling by transit continues to be far safer than general travel on public roadways

In 2018, there were three fatalities related to transit (buses, light rail trains, trolley buses and vanpools) in Washington state, a 57% decrease from seven in 2017 (see chart below). The transit-related fatality rate in 2018 was 0.02 per million vehicle revenue miles, a 60% drop from 0.05 in 2017. The five-year (2014-2018) average fatality rate was 0.03 per million VRM. The rate of fatalities on all public roads in Washington averaged 87.9 per million vehicle miles traveled from 2014 through 2018 (see [Gray Notebook 75, p. 14](#) for details).

Washington transit agencies report 294 injuries in 2018

2018; Injuries reported to the National Transit Database

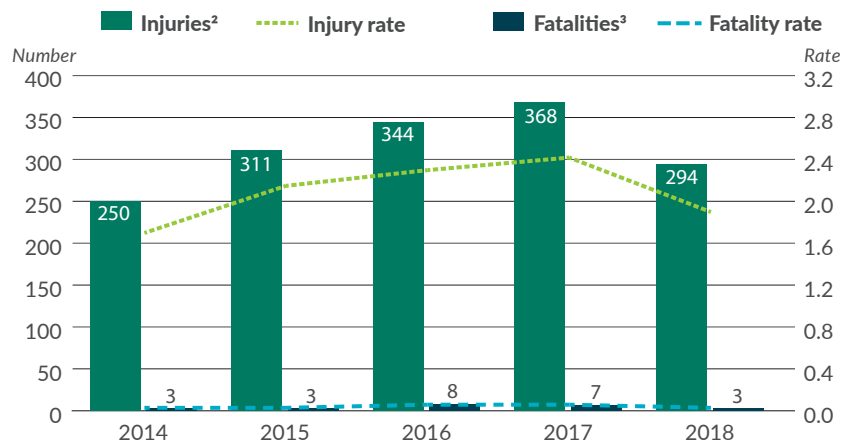


Transit-related injuries decreased by 20% in 2018, dropping to 294 from 368 in 2017 and marking the end of a three-year trend of increasing injuries (see chart below). The decrease in statewide injuries reported in 2018 follows large increases in 2015, 2016 and 2017. The 2016 and 2017 increases coincide with improved injury reporting at Sound Transit (see [Gray Notebook 68, p. 12](#)). The 2018 reduction in statewide injuries may be attributable to a shift to safety management system frameworks at Washington's transit agencies (see box on p. 9). The bulk of this reduction comes from Sound Transit, which saw a decline of 55 injuries between 2017 and 2018.

The transit-related injury rate in 2018 was 1.91 per million VRM, a 22% decrease from 2.45 in 2017 (see chart below). Of the 294 injuries reported by Washington transit agencies in 2018, 132 (44.9%) were to passengers on a transit vehicle, and 96 (32.7%) were to passengers waiting for or leaving a transit vehicle (see chart at left).

Transit-related fatalities and injuries in Washington both decrease in 2018

2014 through 2018; Number of injuries and fatalities; Rate of injuries and fatalities per million VRM¹



Data sources: WSDOT Public Transportation Division and the National Transit Database

Notes: For information on requirements for reporting to the National Transit Database, see [Gray Notebook 63, p. 12](#).

Data sources: WSDOT Public Transportation Division and the National Transit Database.

Notes: Data for 2014, 2015 and 2016 has been updated since Gray Notebook 68 to include Demand Response transit service. **1** Vehicle Revenue Miles (VRM) is the number of miles traveled by a transit vehicle while in revenue service; this measurement excludes miles traveled to or from an assigned route. **2** Injuries are individuals transported away from the scene of a transit-related incident for medical attention, including for emotional harm. **3** Fatalities are deaths related to transit-related incidents confirmed within 30 days of the incident, excluding deaths due to illness or natural causes.

WSDOT administers three transit safety programs

WSDOT administers three statewide transit safety and compliance oversight programs that promote safe public transportation services at Washington's 32 transit agencies. The programs include:

- State Safety Oversight program,
- Transit Asset Management program, and
- Drug and Alcohol Policy program

State Safety Oversight program

In 2018, WSDOT's State Safety Oversight program conducted its triennial reviews of each rail transit agency's safety program implementation. These reviews evaluate the extent to which rail transit agencies comply with their own safety plans as well as with the Washington State Rail Safety Oversight Program Standard (see [bit.ly/WSDOT_RSSOPS](#)).

WSDOT's SSO program ensures the state's two rail transit agencies (Sound Transit and City of Seattle) implement system-wide safety programs for the four rail public transportation systems (Link Light Rail, Tacoma Link, Seattle Streetcar and Seattle Center Monorail). WSDOT established its SSO program in 1997 to meet requirements in state and federal law. In 2016, federal law established new requirements for state safety oversight programs, including:

- Increasing SSO program involvement in the investigation of accidents and hazards; and

- Requiring rail transit agencies to develop and implement safety management system frameworks (see box at right).

In July 2018, the Federal Transit Administration certified WSDOT's SSO program as compliant with federal law.

FTA also requires that WSDOT's SSO program certify rail transit agencies' safety plans by July 2020. As of December 31, 2019, the program was on track to certify agency plans by the deadline.

Transit Asset Management program

In 2019, WSDOT completed 28 capital/vehicle maintenance reviews as part of its Transit Asset Management program (see box at right). These reviews involve visually inspecting a transit agency's vehicles for safety and functionality, and reviewing maintenance records for consistency with the agency's transit asset management plan.

Also in 2019, WSDOT completed its own transit asset management plan as a part of the agency's broader statewide transportation asset management plan.

Drug and Alcohol Policy program

In 2019, WSDOT completed 12 drug and alcohol compliance reviews to help ensure transit agencies which receive federal grants have drug and alcohol policies, testing procedures and recordkeeping systems that meet federal requirements.

Federal law requires WSDOT to enforce regulations covering drug and alcohol misuse in the public transportation industry.

Safety management system frameworks

Safety management system frameworks at transit agencies integrate safety into the culture of the agency from the executive to the line employee level. Under a safety management system, every safety issue is treated with equal emphasis.

Transit Asset Management

Transit asset management is a business model that prioritizes funding based on the condition of public transportation capital assets to maintain the assets in a state of good repair.

Transit assets in Washington state include over 9,360 transit vehicles.

For additional details on transit asset management, see [Gray Notebook 68, p. 13](#).

WSDOT's Drug and Alcohol Policy Program works with transit agencies that receive federal grants to improve their drug and alcohol policies and procedures. The program provides technical assistance through training, networking and policy development.

Contributors include Robert Gibson, Colin Pippin-Timco and Helen Goldstein

Notable results

- From 2018 to 2019, WSDOT's agency-wide recordable incident rate improved 6%
- From 2018 to 2019, WSDOT's agency-wide days away, restricted or transferred rate improved 9.7%
- Both RIR and DART rates worsened agency-wide between 2015 and 2019, increasing by 9.3% and 55.6% respectively

WSDOT offers new online safety training

In January 2020, WSDOT rolled out online safety training for New Employee Orientation. Moving to online training ensures all incoming employees throughout the agency receive the same information. It also affords WSDOT the opportunity to talk with new employees about the agency's culture of safety.

WSDOT's culture of safety reflects the attitudes, beliefs, perceptions and values employees share about safety. Each WSDOT region has established ways for employees to share their reasons for working safely and share with coworkers statewide, allowing WSDOT employees to see how and why safety is incorporated into their daily lives.

Recordable incident and days away, restricted or transferred rates improve from 2018 to 2019

WSDOT's agency-wide recordable incident rate improved 6.0% from 5.0 recordable injuries per 100 workers at agency worksites in 2018 to 4.7 in 2019. The agency-wide "days away, restricted or transferred" rate improved 9.7% from 3.1 in 2018 to 2.8 in 2019. The DART rate is a subset of the RIR and includes only those injuries that resulted in days away from work, restricted work activities or a transfer of job duties.

These recent improvements are in contrast to long-term trends. Between 2015 and 2019, the agency-wide RIR worsened by 9.3%, and the DART rate worsened by 55.6%.

Washington State Ferries, which has a marine work environment, has experienced more substantial changes to its injury rates than WSDOT as a whole. Between 2018 and 2019, the RIR for WSF worsened 1.4% from 7.0 to 7.1, and its DART rate improved by 5.9% from 5.1 to 4.8. Between 2015 and 2019 the RIR for WSF worsened by 47.9% and its DART rate was 100% worse. In addition to an aging workforce, WSF attributes these worsening rates to advancements in how it captures incidents through its database as well as new resources dedicated to incident reporting.

WSDOT as a whole continues to focus on safety improvement efforts like new signage, an updated hearing conservation program, more frequent communications about safety awareness, and stretch and flex exercising to reduce sprain and strain injuries.

By John Gancel, Jesse Labalan, Lisa Mikesell and Yvette Wixson

WSDOT's agency-wide RIR and DART rates improve between 2018 and 2019

2015 through 2019; Recordable incident rate and DART rate for every 100 full-time employees per year

Recordable Incident rate ¹	2015	2016	2017	2018	2019	1-year % change ²	5-year % change ²
WSDOT	4.2	4.3	4.3	4.3	3.8	-11.6%	-9.5%
WSF ³	4.8	5.4	5.9	7.0	7.1	+1.4%	+47.9%
Agency-wide ³	4.3	4.6	4.7	5.0	4.7	-6.0%	+9.3%
DART rate ¹							
WSDOT	1.6	1.6	1.7	2.4	2.1	-12.5%	+31.3%
WSF ³	2.4	3.6	3.7	5.1	4.8	-5.9%	+100.0%
Agency-wide ³	1.8	2.2	2.3	3.1	2.8	-9.7%	+55.6%

Data source: WSDOT Office of Human Resources and Safety.

Notes: **1** The recordable incident rate is calculated as the number of recordable incidents multiplied by 200,000 hours and divided by the total hours worked. The "days away, restricted or transferred" or DART rate is the count of recordable incidents involving days away, restricted duty, or job transfer, multiplied by 200,000 hours, and divided by the total hours worked. **2** Rates: (-%) = improve; (+%) = worsen. **3** Washington State Ferries is reported separately due to its marine work environment; agency-wide includes WSF and the rest of WSDOT.

76 PAVEMENT ANNUAL REPORT

WSDOT faces difficult tradeoffs as pavement conditions worsen and funding is unchanged

With years of maintenance and preservation funding levels that don't meet the need, the backlog of needed work has only continued to grow. Outside of just pavement preservation, more broadly WSDOT is faced with deciding which parts of the system to maintain and preserve—what segment of pavement, what bridge, ferry or rail line. All of which need to be maintained or preserved, but with only enough funding to do a portion of the needed work.

As a result, some needs are deferred and addressed later, often, at a higher cost. As the agency grapples with these issues, WSDOT will engage partners and the Legislature to discuss options to address this lack of funding.

WSDOT's infrastructure assets are reaching critical age thresholds, and the consequences of years of unsustainably low preservation funding are becoming visible in the agency's pavement performance measures—all of which worsened in 2018 (see [p. 14](#)). The longer WSDOT waits to address pavement needs the worse they become and the more they will cost to fix. For example, repairing a section of asphalt pavement that has deteriorated to very poor condition can cost up to five times as much as repairing the same section of pavement when it was in fair condition and could have been rehabilitated at the lowest life cycle cost (see chart at bottom of [p. 12](#)).

Due to expected funding constraints, the agency currently faces a series of increasingly difficult asset management decisions and associated tradeoffs. Among these tradeoffs is the plan to end WSDOT's chip seal conversion program. Ending the agency's chip seal conversion program does not align with lowest life cycle cost asset management, as it will increase costs in the long term.

WSDOT plans to stop converting asphalt pavement to chip seal in 2021

Given the limited funding expected to be available for preservation, WSDOT plans to end its highly cost-effective Practical Solutions strategy of resurfacing asphalt roads with chip seal surfacing beginning in the 2021-2023 biennium.

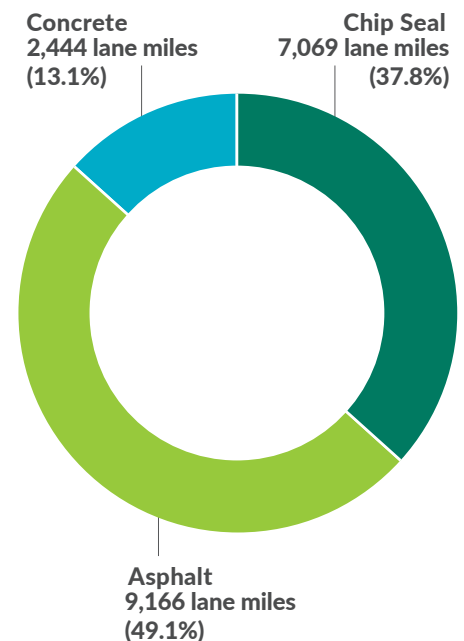
As of December 31, 2018, WSDOT had converted nearly 2,500 miles of asphalt pavement to chip seal, bringing the total amount of chip seal pavement to 7,069 lane miles (37.8%; see chart at right). The agency originally intended to convert 3,000 lane miles of asphalt pavement to chip seal between 2010 and 2024. Due to the gap between needs and funding available for pavement preservation, WSDOT has chosen to end the program in 2021 in order to use its limited preservation funding on interstates, expressways and key freight routes.

Notable results

- Washington is expected to meet federally mandated MAP-21 targets for NHS pavement condition in 2022, but miss them by 2028
- WSDOT pavement lane miles in fair or better condition declined for the fourth year in a row, going from 91.8% in 2017 to 91.4% in 2018
- WSDOT plans to stop its chip seal conversion program in 2021 due to funding constraints
- WSDOT estimates it will need up to \$88 million annually over the next 30 years for concrete preservation

Chip seal comprises 37.8% of WSDOT pavement

2018; Lane miles of WSDOT-owned pavements by surface type



Data source: WSDOT Highway Log.

Notes: Includes bridge decks. Does not include on-ramps, off-ramps, collector/distributor lanes or some special-use lanes (such as chain-up lanes, two-way turning lanes, bicycle lanes, transit lanes and truck climbing lanes).

WSDOT estimates that it saves approximately \$13,000 per year for each lane mile of asphalt pavement that is resurfaced with chip seal. Roads resurfaced with asphalt last about twice as long as those resurfaced with chip seal, but the cost of chip seal resurfacing is only about one-fifth the cost of asphalt resurfacing. WSDOT estimated that it saved \$32.3 million from chip seal conversion in 2018 alone, and had saved a cumulative total of over \$160 million dollars since the program began in 2010 (see chart at right).

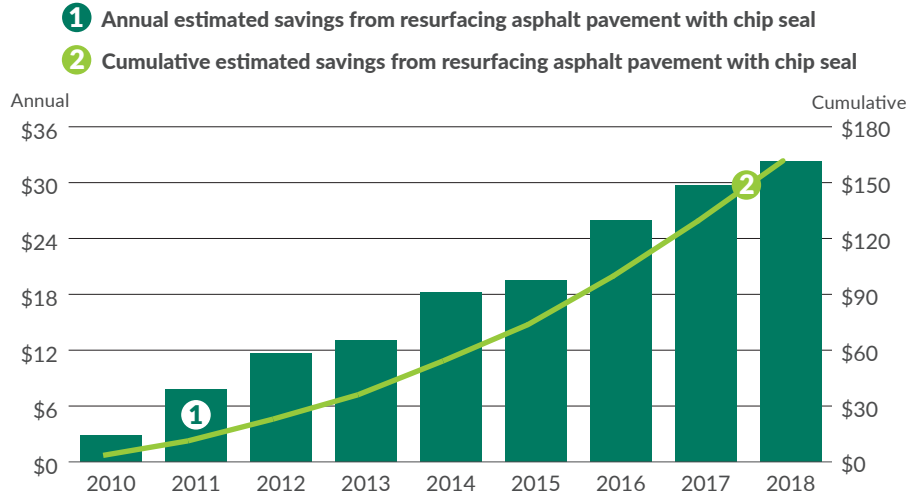
Because of this substantial savings, WSDOT prioritized resurfacing asphalt pavement with chip seal where appropriate (roads with average daily traffic over 10,000 vehicles, roads in urban areas and roads on which trucks frequently make turns are generally not appropriate for chip seal resurfacing).

Chip seal resurfacing

Resurfacing an asphalt road with chip seal (also known as Bituminous Surface Treatment, or BST) involves coating the surface of an existing road with a thin layer of liquid asphalt and then covering it with aggregate chips that bond to the surface.

Estimated savings from chip seal conversion pass \$160 million in 2018

2010 through 2018; Dollars in millions



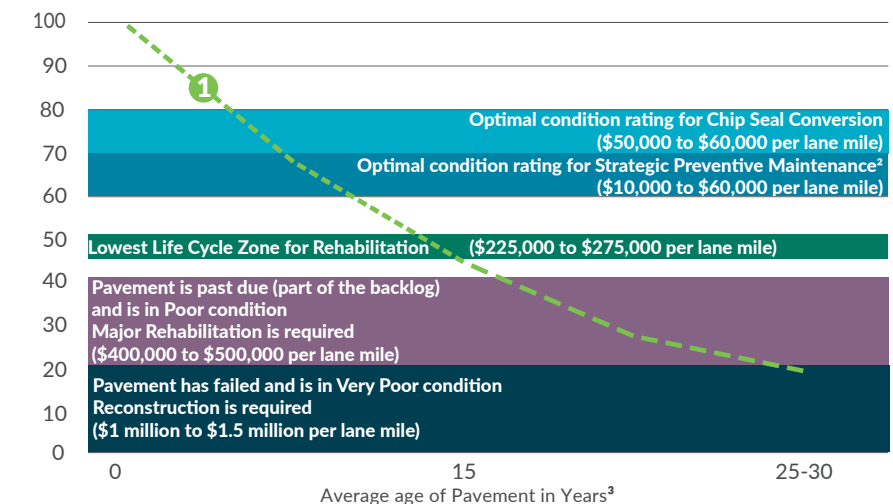
Data source: WSDOT Pavement Office.

Note: Savings are calculated based on an estimate of \$13,000 saved per lane mile per year.

Reconstructing failed asphalt pavement costs five times as much as rehabilitating asphalt pavement that is in the Lowest Life Cycle Zone

Asphalt pavements

1 Approximate condition rating of asphalt pavement without rehabilitation



Data source: WSDOT Pavement Office, WSDOT Capital Program Development and Management.

Notes: **1** A Pavement Condition Index between 80 and 100 is considered Very Good; 60-80 is Good, 40-60 is Fair, 20-40 is Poor and 0-20 is Very Poor. **2** Strategic Preventive Maintenance, also known as the “one-touch” policy, is the practice of extending pavement life by using capital budget funds to perform maintenance treatments at a strategic time. **3** A typical WSDOT asphalt pavement will have a condition rating of 45 when it is 15 years old.

Concrete pavement preservation expected to need as much as \$2.64 billion through 2049

WSDOT estimates that it will need a total of \$2.25 billion to \$2.64 billion for concrete preservation through 2049, or \$75 million to \$88 million annually for the next 30 years. This estimate, which does not account for inflation, reflects an average annual need to reconstruct 41 lane miles of concrete pavement and rehabilitate 45 lane miles.

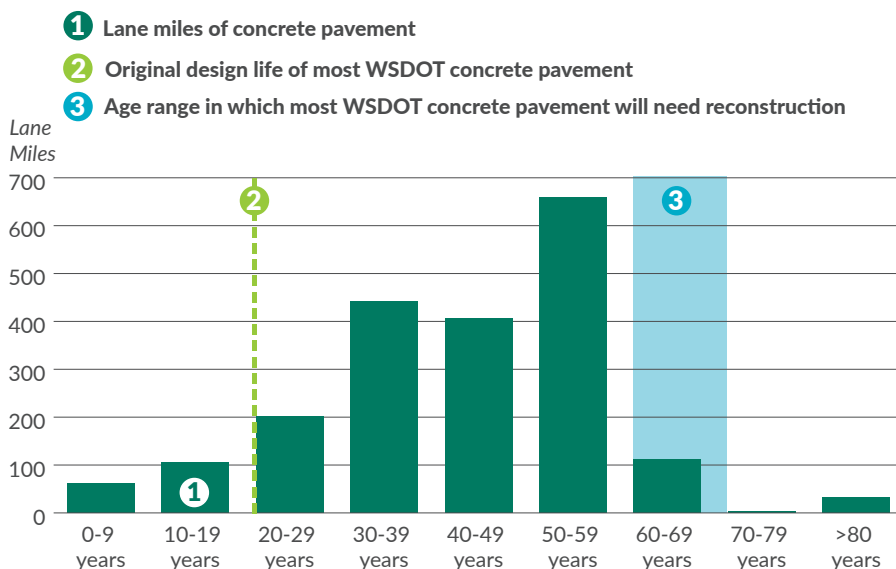
Much of WSDOT's pavement was constructed as part of the interstate highway construction program in the 1960s and 1970s, when concrete roadways were designed to last for about 20 years. WSDOT has been able to use a variety of rehabilitation treatments such as dowel bar retrofit, diamond grinding and selective slab replacement to extend the life of its concrete pavement. These rehabilitation treatments typically cost \$400,000 to \$800,000 per lane mile, and can extend pavement life by 10 to 15 years.

Rehabilitation cannot extend the life of concrete pavement indefinitely. As its condition declines, pavement becomes rougher, unexpected panel failures become more common, and rehabilitation becomes less cost effective. WSDOT estimates that most of its concrete pavement will reach the point where rehabilitation is no longer cost effective between the ages of 60 and 70 years. Concrete reconstruction costs between \$900,000 and \$3.5 million per lane mile, and can be done using one of four methods (see box at right).

WSDOT manages 2,020 lane miles of concrete pavement (excluding bridge decks), of which 1,212 lane miles (60%) are over 40 years old (see chart below) and 734 lane miles (36%) have never been repaired. The agency's never-repaired concrete pavement has an average age of 43 years.

Over half of WSDOT's concrete pavement is more than 40 years old in 2018

Lane miles of WSDOT concrete pavement by age group



Data source: WSDOT Materials Lab

Concrete reconstruction methods at WSDOT

Crack and Seat 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: Cost and longevity are approximations.

State's National Highway System pavement expected to miss federal target by 2028

In 2018, WSDOT analyzed the impact of four potential funding scenarios on the condition of state-owned pavement on the National Highway System in 2022 (a four-year estimate) and in 2028 (a 10-year estimate). None of the four scenarios allow Washington to meet its 2028 target under the federal Moving Ahead for Progress in the 21st Century Act (see [p. 5](#)). WSDOT's MAP-21 pavement performance targets are:

- To have no more than 4% of interstate NHS pavement in poor condition in 2022;
- To have no more than 5% of non-interstate NHS pavement in poor condition in 2022; and
- To have no more than 5% of interstate NHS pavement in poor condition at any time.

The NHS is a network of strategic highways in the United States, and includes both state and local highways as well as roads serving major airports, ports, rail and/or truck terminals, and other transport facilities. Washington's NHS network includes 14,789 lane miles of pavement, of which 77% is state-owned roadway and 23% is owned by local agencies. MAP-21 pavement performance targets apply specifically to pavement on the NHS.

Under the current funding scenario (WSDOT's best estimate of the funding it expects to receive), Washington will have sufficient funding to meet the MAP-21 targets in 2022, but not in 2028. WSDOT completed these scenario analyses as part of its 2019 Transportation Asset Management Plan, which communicates how WSDOT preserves bridge and pavement networks to meet targets under MAP-21. For more information, visit bit.ly/WSDOT_TAMP.

Pavement conditions decline for fourth consecutive year

In 2018, 91.4% of WSDOT-managed pavement lane miles were in fair or better condition, down from 91.8% in 2017 (see table below). Although the agency continued to meet its goal of having at least 90% of pavement lane miles in fair or better condition, 2018 was the fourth year in a row of declining conditions.

WSDOT's pavement performance worsens from 2017 to 2018

2017 and 2018; Pavement annual performance measures

PAVEMENT ANNUAL PERFORMANCE MEASURES ^{1,2}		2017	2018	Agency Target	Target ³	Trend	Desired trend
Short term	Percent of pavement in fair or better condition Measured for asphalt and concrete pavement (chip seal data was collected but has not yet been processed). Condition is shown by lane miles and by vehicle miles traveled to reflect road use.	91.8%	91.4%	90.0%	✓	↓	↑
	Lane Miles						
	VMT ⁴	91.5%	91.2%				
	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 same year.	0.90	0.61	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.	47.4% (7.7 yrs)	46.9% (7.6yrs)	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.	\$346 million	\$420 million	\$0	—	↑	↓

Data source: WSDOT Pavement Office.

Notes: **1** Calculations for all measures, excluding percent of pavement in fair or better condition, include all pavement types (asphalt, chip seal and concrete). **2** See [p. 16](#) for additional discussion of long-term measures. **3** Check indicates target met, dash indicates target not met. **4** VMT = vehicle miles traveled. **5** Measure is weighted by vehicle miles traveled to better capture the typical road user's experience.

Percentage of WSDOT's pavement in good condition decreases; percentage in poor or very poor condition increases

Actual values for 2014 and 2018; Characteristics of pavement at each condition; Percentage of lane miles and vehicle miles traveled (VMT) by condition category

WHAT DRIVERS SEE	WHAT IS HAPPENING	2014	2018	Trend ¹	Desired trend
<p>GOOD/VERY GOOD</p> 		<p>By lane miles 76.9%</p> <p>By VMT² 73.1%</p>		<p>71.8%</p> <p>71.6%</p>	<p>↓</p> <p>↑</p>
<p>FAIR</p> 		<p>By lane miles 17.0%</p> <p>By VMT² 20.3%</p>		<p>18.7%</p> <p>19.6%</p>	<p>*³</p> <p>N/A⁴</p>
<p>POOR</p> 		<p>By lane miles 4.4%</p> <p>By VMT² 5.4%</p>		<p>6.4%</p> <p>6.3%</p>	<p>↑</p> <p>↓</p>
<p>VERY POOR</p> 		<p>By lane miles 1.7%</p> <p>By VMT² 1.3%</p>		<p>3.1%</p> <p>2.5%</p>	<p>↑</p> <p>↓</p>

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

Notes: Percentages may not add to 100 due to rounding. Condition figures do not include chip seal pavement, also known as Bituminous Surface Treatment, which was not evaluated from 2010 through 2016 due to budget restrictions. Chip seal data for 2017 and 2018 was collected, but has not yet been processed. Chip seal pavement accounts for 37.8% of lane miles on the state's highway network (up from 36.7% in 2017), but because chip seal roads have less traffic than asphalt or concrete, they account for only 8.7% of the vehicle miles traveled on WSDOT's roadway network. Projections of future conditions are now reported in WSDOT's Transportation Asset Management Plan, available at bit.ly/WSDOT_TAMP. **1** Trends are based on observed condition trends between 2014 and 2018. **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** The trend for fair condition differs when measuring by lane miles and by VMT. **4** 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.

The agency evaluates the condition of asphalt and concrete pavement on state-owned roadways annually using three indicators: surface cracking (an indicator of structural deterioration); rutting (which is monitored for safety and structural reasons); and smoothness (measured using the International Roughness Index). These criteria are used to classify pavement conditions into four categories: good/very good, fair, poor and very poor (as seen in chart on [p. 15](#)).

Long-term pavement performance measures

WSDOT's long-term pavement performance measures (the Asset Sustainability Ratio, Remaining Service Life and Deferred Preservation Liability) supplement the information provided by condition ratings (see chart on [p. 14](#)), informing the agency about long-term trends and capturing long-term impacts on the pavement network.

For example, resurfacing a section of asphalt pavement with new asphalt would take it from fair to very good condition, as would resurfacing it with chip seal. However, while chip seal can increase service life by an average of nine years, resurfacing with new asphalt typically adds about 17 years. Long-term indicators capture this difference, with asphalt resurfacing resulting in larger increases in RSL and ASR than chip seal resurfacing.

Pavement performance measures worsen between 2017 and 2018

Asset sustainability ratio declines in 2018, falling out of sustainable zone

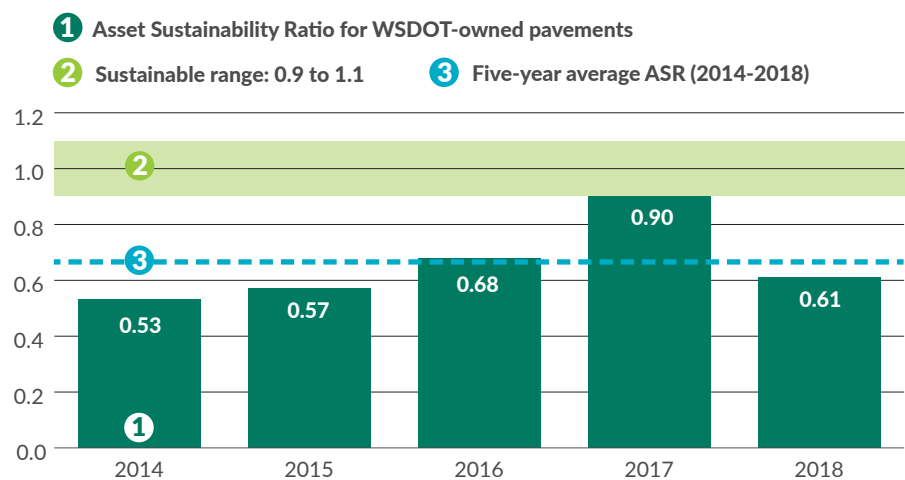
The Asset Sustainability Ratio is the ratio between years of pavement life added to the pavement network in a given year and years of pavement life the network lost through aging in that same year.

The ASR for WSDOT's pavement network was 0.61 in 2018, failing to reach its target of 0.90-1.1, and indicating that for each year of pavement life used up in 2018, 0.61 years of pavement life were added. This represents a drop from 2017, when projects supported by the 2015 Connecting Washington funding package temporarily increased the level of pavement preservation work completed and brought the ASR to 0.9 (see chart below)—the first time the ASR reached the sustainable zone since it was first calculated in 2011.

The ASR measures the sustainability of WSDOT's annual level of investment in the pavement network. If the ASR is below 1.0 for a particular year, then fewer years of service life were added to the pavement network than were consumed. A sustainable level of investment would yield an ASR that averaged 1.0, but varied between 0.9 and 1.1 in any given year. From 2014 through 2018, WSDOT's average ASR was 0.66—indicating an unsustainably low level of investment (see chart below). The results of this low level of investment are reflected in the declining condition of WSDOT's pavement network (see [p. 15](#)).

WSDOT's Asset Sustainability Ratio falls to 0.61, missing target in 2018

2014 through 2018

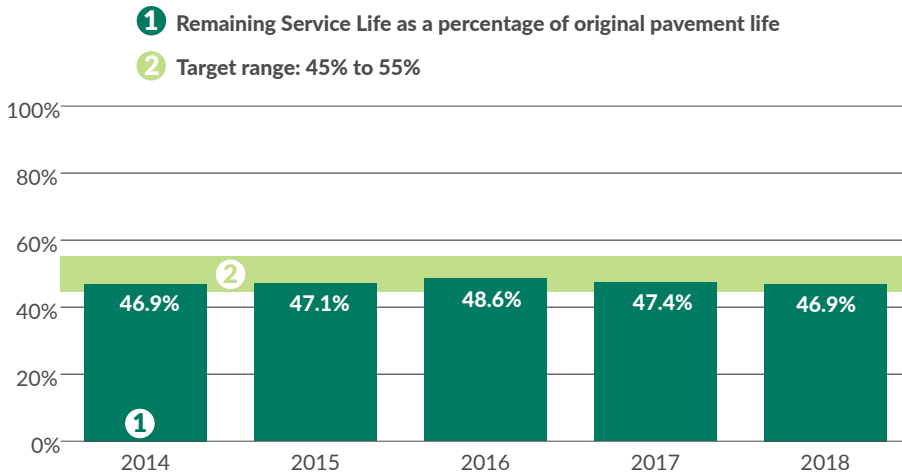


Data source: WSDOT Materials Lab.

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.

WSDOT pavements' Remaining Service Life falls, stays in target range in 2018

2014 through 2018; Remaining Service Life shown as a percent of original pavement life



Data source: WSDOT Materials Lab.

Notes: For 2018, the Remaining Service Life of 46.9% is equivalent to an average of 7.6 years remaining before rehabilitation is needed.

Remaining Service Life declines

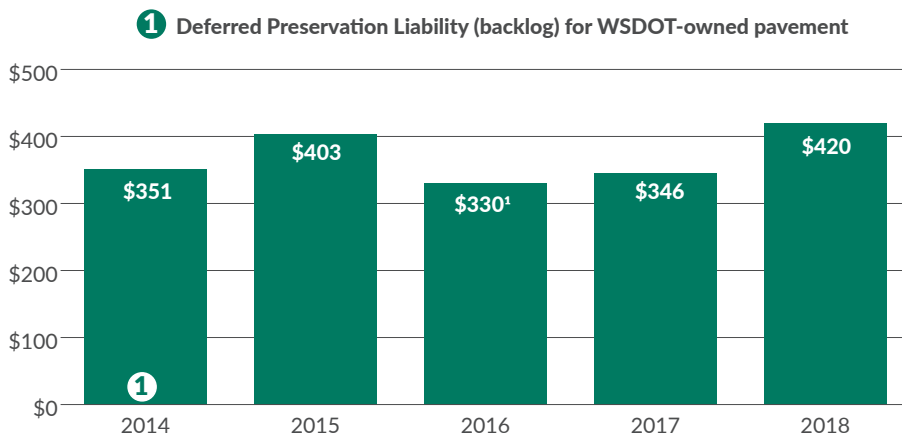
The Remaining Service Life of state-owned pavement decreased between 2017 and 2018, going from 47.4% to 46.9%. The RSL remained within WSDOT's target range of 45% to 55% (see chart at left).

RSL indicates how much of its original life span an average section of WSDOT-owned pavement has left before it will need rehabilitation work. In 2018, an average section of WSDOT-owned pavement had about 46.9% of its life span left before it was expected to need rehabilitation.

The RSL for each section of pavement is calculated by first estimating the number of years remaining before the condition of that section is expected to become unacceptable (poor or very poor), and then dividing by that pavement section's total expected life span. This number is calculated separately for each section of pavement in WSDOT's network, and then averaged to yield the statewide RSL.

WSDOT's Pavement Deferred Preservation Liability rises \$74 million in 2018

2014 through 2018; 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. ¹ The 2016 reduction in the Deferred Preservation Liability was due partly to the completion of a large project on Interstate 405 and partly to an increase in preservation funding as a result of the 2015 Connecting Washington funding package.

Preservation backlog grows in 2018

WSDOT's pavement Deferred Preservation Liability (also known as the pavement preservation backlog) increased by \$74 million (21.4%) from \$346 million in 2017 to \$420 million in 2018 (see chart at left). Growth in the backlog is a result of WSDOT's pavement preservation needs continuing to exceed the funding available to address them.

WSDOT uses DPL to track how much investment is needed to restore the entire pavement network to fair or better condition. The agency's goal is to have a DPL of \$0.

WSDOT receives fifth Perpetual Pavement Award

In November 2019, WSDOT received a Perpetual Pavement Award from the Asphalt Pavement Alliance for a 5.88-mile section of State Route 195 in Whitman and Spokane counties. The 2019 award was WSDOT's fifth Perpetual Pavement Award.

To qualify for a Perpetual Pavement Award, a 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.

WSDOT successfully tests precast concrete pavement

In spring 2019, WSDOT conducted a trial installation of precast concrete pavement on I-90 near Preston. The trial results showed that precast concrete could be a viable option for locations where higher traffic volumes make it impractical to close roads for longer periods to pour conventional concrete.

Slabs of precast pavement are fabricated offsite and then trucked to the repaving site for placement. The process costs more than conventional concrete pavement (the precast concrete pavement itself costs three times as much as conventional concrete, before accounting for other project costs such as labor) but provides an alternative for high-traffic locations where closing the road for long periods of time has substantial impacts on large numbers of road users.

In conventional concrete paving, the concrete must harden before vehicles can travel on the new pavement. Waiting for the concrete to harden contributes substantially to the duration of road closures. With conventional concrete paving, the road must be closed for at least a weekend (Friday night through Monday morning) while the concrete hardens. Precast concrete can be installed during overnight lane closures, resulting in no traffic disruption during peak travel times.

WSDOT to research impact of pavement friction on safety performance

In 2020, WSDOT will begin a research project to evaluate the effects of pavement friction on roadway safety performance. As part of this research, the agency will test a device that can measure pavement friction continuously. WSDOT's current practice is to measure the friction of 0.1 mile sections of pavement spaced 1 mile apart.

The research project will investigate the effects of pavement friction on roadway safety performance using two different sets of friction measurements: one taken using WSDOT's current method, which involves a locked wheel skid trailer, and one taken using a device called a Sideway-Force Coefficient Routine Investigation Machine, which can take continuous measurements of pavement friction. Using both sets of friction measurements will allow WSDOT to determine whether the method of friction measurement (continuous or at intervals) affects the extent to which friction impacts roadway safety performance.

The results of this research will be used in WSDOT's friction management system and will also provide data for the agency's safety and improvement programs.

Contributors include Kim Alexander, Kyler Carlson, Jianhua Li, Mark Russell, Tim Rydholm, Jeff Uhlmeier, Helen Goldstein and Joe Irwin

76 HIGHWAY MAINTENANCE ANNUAL REPORT

WSDOT strives to meet level of service targets

WSDOT was able to meet 77% (20 of 26) of its highway maintenance asset condition targets for 2019—the same percentage as in 2018. Maintenance funding has not kept pace with the increased needs associated with system additions from new projects, or the inflation-adjusted costs of construction materials and supplies like salt used for snow and ice control.

Static funding and increased prices have driven WSDOT to defer some highway maintenance activities, reducing levels of service (LOS) and making it more difficult to adequately maintain highway infrastructure. To see a table showing the desired results as indicated by the LOS and the task completion percentage for selected assets, go to <http://bit.ly/TaskComp2020>.

WSDOT reduced its LOS targets on three of its 26 maintenance activities in 2019. The reductions—affecting slope repair, barrier maintenance, and highway lighting—were based on a five-year history of WSDOT being unable to consistently meet LOS targets with available funds.

WSDOT meets 20 of 26 maintenance LOS targets in 2019

WSDOT measures the annual performance of 26 maintenance activities. Annual performance is measured 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 performance of the asset.
- **Task completion** is an evaluation of planned maintenance tasks for a specific activity compared to how many of those tasks were completed.

LOS scores use a letter grading scale, with A being the highest and F being the lowest (see box at right). Of the 26 maintenance activities measured, 12 were funded at a target level of “C” or lower in 2019. This level of funding contributes to the growing highway maintenance backlog, which has increased 12.2% from \$98 million in 2017-2019 to approximately \$110 million in the 2019-2021 biennium.

All 26 categories and their scores are shown in the table on p. 20. As seen below and the next page, WSDOT's response to snow and ice removal due to severe winter weather reduced the funds originally planned to support other maintenance activities. The following six LOS activities—five of which are lower priority categories—received letter grades below target levels:

- **Regulatory Sign Maintenance** missed its target of a C, receiving a D. Allocated funding failed to keep up with needs, contributing to a growing backlog. In the last five years, WSDOT's regulatory sign inventory increased by 25%, mostly due to system additions. Late winter weather also affected maintenance activities for sign work.

Notable results

- *WSDOT met 77% of its highway maintenance asset condition targets in 2019, the same percentage as in 2018*
- *WSDOT processed 216,472 maintenance records in 2019 using HATS (Highway Activities Tracking System)*
- *WSDOT assessed the condition of all guardrail (approximately 20,090 runs) in the state in 2019 using HATS*

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 likely occur.

■ **Sweeping and Cleaning** missed its target of an A, receiving a B. This is primarily a result of staffing challenges, and late winter weather.

■ **Slope Repair** missed its target of an B, receiving a D rating. This is primarily a result of a late, wet winter and spring, which caused excessive erosion. Budget and staffing challenges were also contributing factors.

■ **Guidepost Maintenance** missed its target of a D, receiving an F. This is a result of deferred funding due to late winter weather.

■ **Roadside Cleanup** missed its target of a D, receiving a F. This is primarily a result of uncovered loads, delay of litter pickup from winter weather.

■ **Guide Sign Maintenance** missed its target of a C, receiving a D. Allocated preservation funding failed to keep up with demand, contributing to a growing backlog. In the last five years, guide sign inventory has increased by 9%, mostly due to system additions. Late winter weather also affected maintenance activities for sign work.

Successful MAP pilot project uses Practical Solutions

In 2019, WSDOT piloted a project that centralized the MAP field assessment process, the results of which are used to obtain Level of Service scores. The process was centralized through the creation of two two-person teams that completed MAP assessments

WSDOT meets 77% of highway maintenance asset condition targets

2017-2019; Funded Level of Service asset condition targets and scores achieved

Category	Funded level (LOS target)	2017 results	2018 results	2019 results
Special Bridge and Ferry Operations	A	A	A	A
Snow and Ice Control Operations	A	A	A	A
Traffic Signal System Operations	C	B	B	C
Catch Basin and Inlet Maintenance	A	A	A	A
Urban Tunnel System Operations	B	N/A ¹	N/A ¹	N/A ¹
Regulatory/Warning Sign Maintenance	C	D	C	D
Barrier Maintenance	B ²	B	B	B
Pavement Striping Maintenance	B	A	B	B
Stormwater Facility Maintenance	A	A	A	A
Bridge Cleaning	B	B	B	B
Intelligent Transportation Systems	A	A	A	A
Culvert Maintenance	D	C	D	D
Shoulder Maintenance	C	C	C	C
Rest Area Operations	B	B	B	B
Ditch Maintenance	B	B	B	B
Raised/Recessed Pavement Marker Maintenance	C	C	C	C
Sweeping and Cleaning	A	C	B	B
Slope Repair	B ²	B	C	D
Pavement Marking Maintenance	D	F	F	D
Vegetation Obstruction Control	C	C	C	C
Guidepost Maintenance	D	D	D	F
Highway Lighting Systems	B ²	C	B	B
Noxious Weed Control	B	A	C	B
Roadside Cleanup	D	D	D	F
Guide Sign Maintenance	C	C	C	D
Nuisance Vegetation Control	D	C	D	D
Landscape Maintenance	D	C	C	C
Percent of targets achieved or exceeded		77%	77%	77%
Percent of targets missed		23%	23%	23%

Data source: WSDOT Maintenance Office.

Notes: The 27 maintenance activities are listed in prioritized order. The Urban Tunnel System Operations category was excluded from calculations of targets achieved because all facilities in that category were under construction during the reporting periods, leaving 26 maintenance activities. Highlighted boxes indicate failing scores. 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 the asset condition at the time of assessment. ¹ All facilities in the Urban Tunnel Systems Operations category were under construction during the reporting periods, so the category was not included in calculations of targets achieved. ² LOS targets were reduced from "A" to "B" in 2019 due to funding and reduced buying power issues.

statewide. The 2019 MAP team members were Bruce Castillo, Fred Griss, Jerri Lawson, and Jeffrey Gibson. The pilot project was managed by Kelly Shields and Andrea Fortune.

The centralized process resulted in more consistent data used to grade LOS for specific maintenance activities. In addition, having a dedicated MAP assessment team reduced the number of employees

pulled away from other work to complete MAP field assessments. The process created workforce development opportunities because the teams were able to share their unique experiences and expertise with their MAP team members. The teams also participated in maintenance program management at a statewide level. After a six-month assignment, the team members returned to their previous

positions to share their experience with regional staff. The 2020 MAP team will begin its work in April.

WSDOT crews work hard to keep pavement in State of Good Repair

WSDOT uses an integrated approach for managing pavement assets. This "one-touch" policy consists of performing planned and coordinated

WSDOT Maintenance rises to the challenge to help state through historic 2019 winter

Snowstorms in February and March 2019 produced several daily and month-long records. WSDOT maintenance crews were on non-stop, 12-hour shifts for extended periods in efforts to keep people and goods moving safely. Dangerous, drifting snow in central and eastern Washington continued into March, swamping vehicles and forcing road closures. Some roads faced issues with drifting snow almost as soon as they were plowed.

Western Washington experienced below-normal temperatures and repeated snowfall in elevations above 500 feet, resulting in increased costs as WSDOT crews dealt with snow and ice. Eastern Washington had extremely low temperatures well into March and repeated snowstorms coupled with high winds. Adverse weather resulted in numerous road closures, in addition to much higher snow and ice removal costs than anticipated.

Notable statistics from the 2019 winter include:

- Statewide average temperatures for February were 9.6 degrees colder than normal
- Seattle experienced its largest February snowfall in 70 years (20.2 inches compared to the typical snowfall of 1.7 inches)
- Snoqualmie Pass set a 10-year record for snowfall in 24 hours (31.5 inches), and had 68 inches in 72 hours. For a video of the pass in February 2019, visit: <http://bit.ly/SnoPass>
- Spokane experienced its second snowiest February on record (30 inches compared to the typical snowfall of 6.8 inches)



Portions of SR 27 (milepost 55) near Latah in eastern Washington experienced snow drifts that were 12 feet high.

Data collection shows guardrail conditions

WSDOT used HATS to complete the guardrail assessment process and obtain a point-in-time count of damage. In 2019, WSDOT Maintenance crews assessed 20,090 runs of guardrail and determined that 23% had various degrees of damage.

Compared to the results of the 2018 assessment, the total inventory has increased but the damage has decreased by 6%. This decrease is partially due to additional funding obtained in 2019 from the legislature to address third party damage. HATS was used to create a Geographic Information System map of the locations of the damaged guardrail runs. To view the map, visit <http://bit.ly/WSDOTguardrail>.

maintenance activities at least once before pavement rehabilitation takes place. While effective at extending life, this has led to increased pavement maintenance activity required to help keep pavement in a State of Good Repair.

Although pavement performance is affected by many factors, insufficient funding for capital preservation construction projects is also having adverse effects on it. As a result WSDOT maintenance crews are increasingly having to respond to emergent roadway needs to help keep pavement in a State of Good Repair. This has a negative impact on the maintenance budget.

With current preservation funding below the lowest life cycle cost needed, and WSDOT maintenance funding being impacted as a result, the backlog of roadway maintenance is growing and beginning to affect the LOS of other activities.

With reduced funding to the capital preservation program it can be expected that the decline of

pavement performance and other maintenance activities will continue until funding can be stabilized to meet minimum preservation requirements.

HATS innovations win "Best in Washington"

In 2019, WSDOT received the "Best in Washington" award at the Washington Digital Government Summit. The award recognized WSDOT's technology modernization efforts including the cloud deployment of the agency's nationally recognized Highway Activities Tracking System (HATS).

WSDOT crews use iPads to collect data for HATS—allowing the agency to monitor real-time conditions of roadway assets and maintenance tasks being performed. The data collected is instrumental in maintenance and budget planning.

WSDOT added 17,132 assets to HATS and completed 216,472 work records in 2019—an average of 593 work record entries per day. This was a 2.7% decrease compared to 222,585 work records completed in 2018, primarily due to a streamlined approach to snow and ice control operations in 2019. This process improvement uses continuously-updated automated vehicle location data to simplify work record entries.

Another addition to HATS in 2019 was the launch of the budgeting tool application. This allows the maintenance program to manage its complex \$520 million biennial budget at all levels across all maintenance activities.

Contributors include Andrea Fortune, Barbara LaBoe, Kelly Shields, Jim Weston, Joe Irwin and Dustin Motte



On November 7, 2019, WSDOT received the "Best in Washington" award for technology modernization. From left to right: Gov. Jay Inslee, Joe Schmidt, Andrea Fortune, Greg Selstead, Leif Abbott, Donald Harris, Mike Sheppard and James Weaver. Not pictured: Aaron Hutchinson and Josh Hudson.

76 INCIDENT RESPONSE QUARTERLY UPDATE

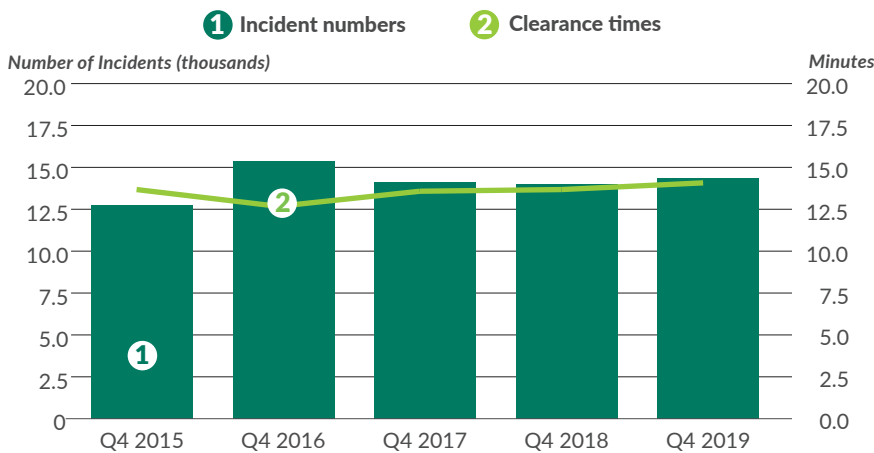
WSDOT Incident Response teams help improve driver safety at 14,335 incidents

WSDOT's Incident Response teams assisted at 14,335 incidents during the fourth quarter (October through December) of 2019. On averages, the IR teams responded to an incident scene every nine minutes and 15 seconds during the quarter. There were 351 (2.5%) more incidents during the fourth quarter of 2019 compared to the same quarter in 2018 (13,984).

On average, IR teams cleared each of the 14,335 incidents in 14 minutes. This is 24 seconds (2.9%) slower than the average incident clearance time for the same quarter in 2018.

Average clearance times increase slightly over past five years

Fourth quarters; 2015 through 2019; Number of incident responses in thousands; Clearance times in minutes



Data sources: 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 2019) is considered preliminary. In the previous quarter (Q3 2019), WSDOT responded to 15,791 incidents, clearing them in an average of 13.3 minutes. Data for Q3 2019 has been confirmed and finalized.

Of the 14,335 total incidents, 10,586 (73.8%) lasted less than 15 minutes, 3,584 (25%) lasted 15-90 minutes and 165 (1.2%) incidents lasted more than 90 minutes. During the fourth quarter of 2019, compared to the same quarter in 2018, there was a 6.8% decrease in incidents lasting more than 90 minutes, while there were 5.9% more incidents lasting 15-90 minutes and 1.6% more incidents lasting less than 15 minutes.

WSDOT teams respond to 165 over-90-minute incidents

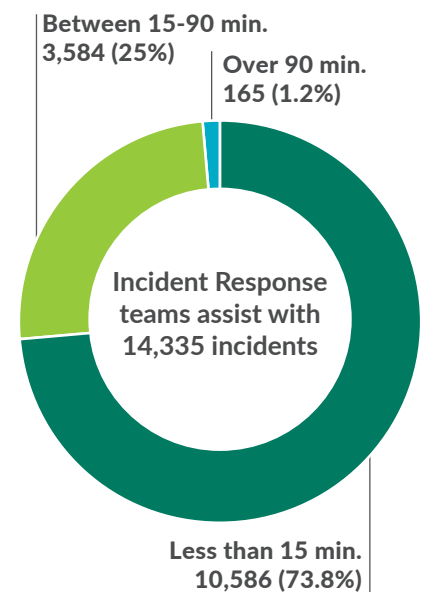
IR teams provided assistance at the scene of 165 incidents that lasted more than 90 minutes during the fourth quarter of 2019. This is 12 fewer incidents - a 6.8% decrease - than the same quarter in 2018. While these over-90-minute incidents accounted for 1.2% of all incidents, they resulted in 19.0% of all incident-related delay costs (see chart on p. 25).

Notable results

- WSDOT responded to 14,335 incidents during the fourth quarter of 2019, 351 (2.5%) more than during the same quarter in 2018
- WSDOT cleared incident scenes in an average of 14 minutes during the fourth quarter of 2019, 24 seconds (2.9%) slower than the same quarter in 2018
- In the fourth quarter of 2019, IR teams provided an estimated \$25.0 million in economic benefit by reducing the effects of incidents on drivers
- For every \$1 spent on WSDOT's IR program the program provided drivers \$16.69 in economic benefit

WSDOT clears majority of traffic incidents in 15 minutes or less

Fourth quarter 2019; Times to clear incidents; Number and percentage of 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.

Twelve of the 165 over-90-minute incidents took six hours or more to clear (referred to as extraordinary incidents). This is one fewer extraordinary incident than the same quarter in 2018. The 12 extraordinary incidents took an average of 12 hours and four minutes each to clear, accounting for 5.3% of all incident-induced delay costs for the quarter.

The average incident clearance time for all over-90-minute incidents was three hours and 17 minutes. This is about three minutes slower than the same quarter in 2018. Excluding the 12 extraordinary incidents, WSDOT's average clearance time for over-90-minute incidents was two hours and 37 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.

IR program provides \$25 million in economic benefit

The IR teams help alert drivers about incidents and clear the roadway to reduce the likelihood of new incidents.

WSDOT's assistance at incident scenes provided an estimated \$25.0 million in economic benefits during the fourth quarter of 2019 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 \$14.2 million of IR's economic benefit for the quarter result from reduced traffic delay.

WSDOT's Incident Response teams provide an estimated \$25.0 million in economic benefit

Fourth quarter 2019; 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.	10,586	16.0%	4.9	\$13.1	\$6.1
Between 15 and 90 min.	3,584	56.0%	31.7	\$32.9	\$14.4
Over 90 min.	165	83.5%	197.8	\$10.8	\$4.6
Total	14,335	26.8%	14.0	\$56.8	\$25.0
Percent change from the fourth quarter of 2018	↑2.5%	↓0.6%	↑2.9%	↑5.1%	↑5.3%

Data source: Washington Incident Tracking System.

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

- 1 Teams were unable to locate 774 of the 14,335 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. See [WSDOT's Handbook for Corridor Capacity Evaluation, 2nd edition, pp. 45-47](#) for The IR program methods for calculating benefits.

- WSDOT helps prevent secondary incidents by proactively managing traffic at incident scenes. About \$10.8 million of IR's economic benefits results from preventing an estimated 2,712 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 \$1 spent on the program during the fourth quarter of 2019 provided drivers \$16.69 in economic benefit.

Incident numbers do not always directly influence the cost of incident induced delay

The 14,335 incidents during the quarter had a total incident-induced delay cost of \$56.8 million. Incidents lasting less than 15 minutes accounted for 73.8% of total incidents but only 22.9% of total costs. Twenty-five percent of all incidents lasted 15-90 minutes but accounted for 58% of total costs. Incidents lasting more than 90 minutes made up 1.2% of all incidents for the quarter but accounted for 19% of total costs.

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, see [WSDOT's Handbook for Corridor Capacity Evaluation, 2nd edition, pp. 45-47.](#)

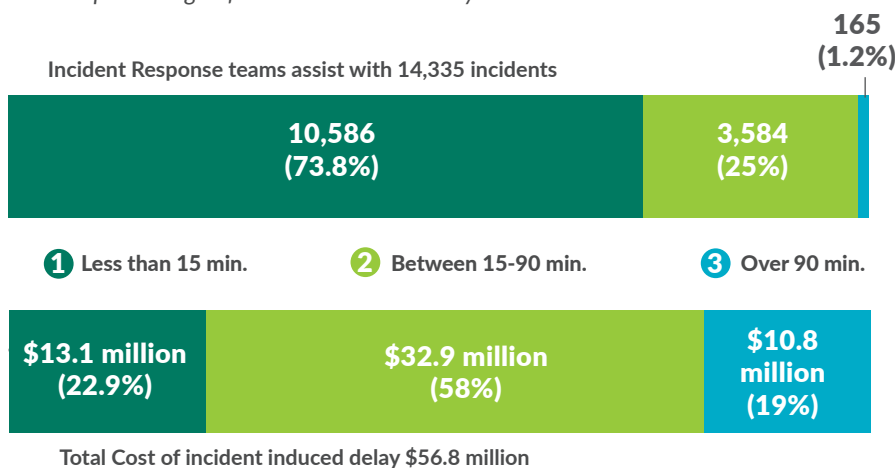
Contributors include Tony Leingang, Ron Vessey, Michele Villnave, Takahide Aso and Dustin Motte

Customer feedback:

- "In rainy weather, Bryan fixed our flat tire and gave us directions to where we got a new one. He was very helpful. Great guy and a wonderful program!!"
- "Brandon was very helpful, kept my safety in mind and clearly tried to help me relax, he was efficient and knowledgeable."
- "Kim was AMAZING! I have seen the incident response trucks, but never knew what they did. I thought you just responded to collisions. Kim was so helpful."

Cost of incident-induced delay not proportional to response numbers

Fourth quarter 2019; Number and percentage of incidents; Time to clear incidents; Cost and percentage of incident-induced delay



Data source: Washington Incident Tracking System.

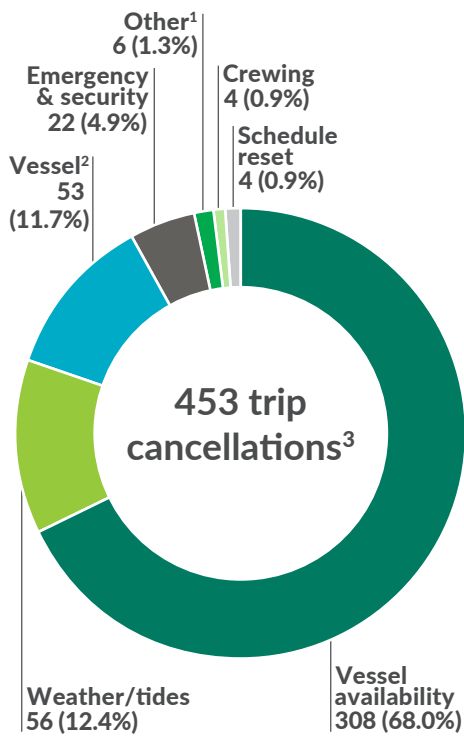
76 WASHINGTON STATE FERRIES QUARTERLY UPDATE

Notable results

- WSF completed 40,585 (99.6%) of its 40,757 regularly scheduled trips in the second quarter of fiscal year 2020
- WSF ridership was approximately 5.5 million in the second quarter of fiscal year 2020, which was 89,573 (1.6%) fewer than the corresponding quarter in FY2019

Vessel availability issues cause most cancellations for the quarter

Second quarter (October - December) FY2020



Data source: Washington State Ferries.

Notes: Fiscal years run from July 1 through June 30. As a result, October through December 2019 represents the second quarter of FY2020. Percentages do not equal 100 due to rounding.

1 The category for "Other" includes issues at terminals, and events like disabled vehicles, environmental reasons and incidents that can impact operations. 2 The category "Vessel" refers to cancellations due to maintenance issues. 3 WSF replaced 281 of the 453 canceled trips for a total of 172 net missed trips.

WSF achieves 99.6% service reliability

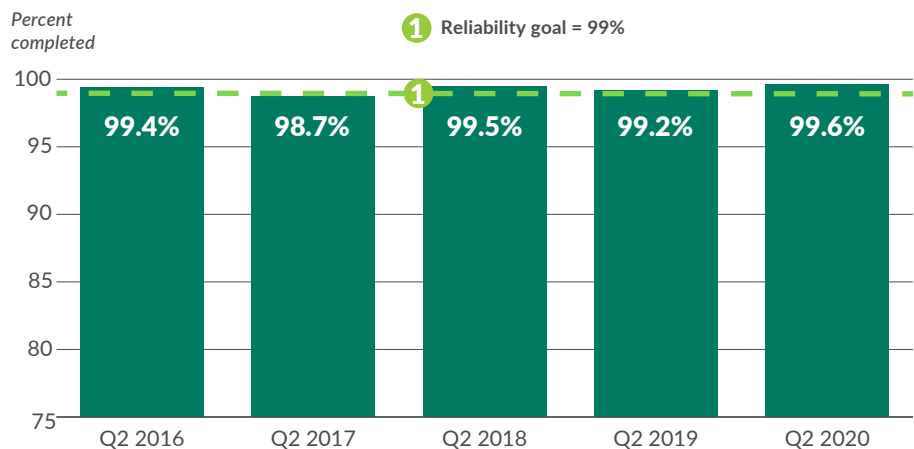
There were 40,757 regularly scheduled ferry trips during the second quarter of FY2020 (October through December 2019). Washington State Ferries completed 99.6% (40,585) of these trips. This exceeds the annual service reliability performance goal of 99% (see table on p. 27). There were 453 trip cancellations system-wide and WSF replaced 281 of them for a total of 172 missed trips.

Most of the trip cancellations (308) were due to lack of vessel availability. The Fauntleroy/Vashon/Southworth route operated a two-boat schedule instead of its normal three vessels from October 28-31, 2019, when the M/V Cathlamet was out for unplanned maintenance. This two-boat schedule resulted in 254 canceled trips, but 144 trips were added to the route for a net loss of 110 trips.

Low tides on the Port Townsend/Coupeville route accounted for the second highest number of cancellations with 56.

WSF service reliability remains relatively steady in five-year trend

Second quarters; Fiscal years 2016 through 2020; 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 2019 represents the second quarter of FY2020.

On-time performance decreases during the fall quarter

On-time performance decreased slightly to 93.5% in the second quarter of FY2020 compared to 93.6% for the same quarter in FY2019. The quarterly rate was below WSF annual on-time performance goal of 95%.

On-time performance in October (92.1%) pulled the average for the quarter down, as November and December exceeded the on-time performance goal at 96.0% and 96.3%, respectively. In October 2019, WSF engaged in seven days of underwater noise studies for which captains modified vessel speeds to simulate various conditions. This may have adversely affected on-time performance for the routes serving these areas.

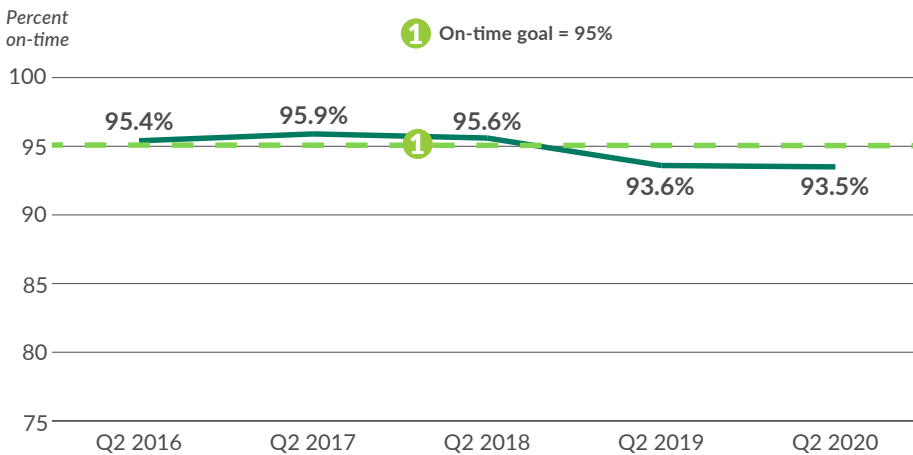
On-time performance decreased on three of nine routes compared to the second quarter of FY2019. The San Juan domestic route had the largest decrease (4.4%) compared to the same quarter last year.

The Seattle/Bainbridge route had the most improved on-time performance, which was 3.6% higher than the same quarter in FY2019. Even though construction continued

on Colman Terminal during the quarter, both routes that service the terminal (Seattle/Bainbridge and Seattle/Bremerton) saw on-time performance improve from the same quarter last year. On average in the second quarter of FY2020, 29 out of 441 (6.5%) daily trips did not leave the terminal within 10 minutes of the scheduled departure time, increasing from an average of 28 out of 437 trips (6.4%) for the same quarter in FY2019.

On-time performance for WSF down slightly in five-year trend

Second quarters; Fiscal years 2016 through 2020; Percent 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 2019 represents the second quarter of FY2020. **1** A trip is considered delayed when a vessel leaves the terminal more than 10 minutes after the scheduled departure time.

Ridership decreases in second quarter of FY2020

Washington State Ferries' ridership was approximately 5.5 million during the second quarter of FY2020. This was 89,573 (1.6%) fewer than the same quarter in FY2019, and 3.1% under projections. Ridership during the second quarter of FY2020 decreased on five of the nine routes compared to the same quarter in FY2019.

WSF on-time performance down slightly, reliability up in the second quarter of fiscal year 2020

October through December FY2019 and FY2020; Annual on-time goal = 95%; Annual service reliability goal = 99%

Route	On-time performance (second quarter)				Service reliability (second quarter)			
	FY2019	FY2020	Status	Trend	FY2019	FY2020	Status	Trend
San Juan Domestic	87.9%	83.5%	-4.4%	↓	99.8%	100%	0.2%	↑
Anacortes/Friday Harbor/Sidney, B.C. ¹	91.6%	87.7%	-3.9%	↓	98.7%	70.7%	-28.0%	↓
Edmonds/Kingston	96.9%	98.4%	1.5%	↑	99.8%	99.9%	0.1%	↑
Fauntleroy/Vashon/Southworth	94.2%	93.7%	-0.5%	↓	99.0%	98.9%	-0.1%	↓
Port Townsend/Coupeville	95.9%	97.9%	2.0%	↑	91.4%	97.3%	5.9%	↑
Mukilteo/Clinton	96.4%	96.9%	0.5%	↑	99.8%	100%	0.2%	↑
Point Defiance/Tahlequah	98.3%	98.7%	0.4%	↑	100%	99.9%	-0.1%	↓
Seattle/Bainbridge Island	88.3%	91.9%	3.6%	↑	99.8%	99.9%	0.1%	↑
Seattle/Bremerton	93.0%	94.4%	1.3%	↑	99.7%	99.8%	0.1%	↑
Total system	93.6%	93.5%	-0.1%	↓	99.2%	99.6%	0.4%	↑

Data source: Washington State Ferries.

Notes: FY = fiscal year (July 1 through June 30). As a result, October through December 2019 represents the second quarter of FY2020. A trip is considered delayed when a vessel leaves the terminal more than 10 minutes after the scheduled departure time. Numbers shown in the table have been rounded to the tenth. **1** WSF operates 10 routes but combines the Anacortes/Friday Harbor route with the San Juan Interisland route as the San Juan Domestic for on-time performance and service reliability. Due to unique fare collection methods in the San Juan Islands, and similar origin and destination legs on both routes, some statistics cannot be separated between the two routes. The Anacortes/Friday Harbor - Sidney, B.C. route has a low number of trips, so changes in on-time performance and trip reliability result in large percentage values.

Ridership in FY2020 has been lower each month than the corresponding month in FY2019, with a net decrease of about 371,000 (2.8%) passengers. Roughly 85% of that decrease occurred on the two routes that service Colman Dock (Seattle/ Bainbridge Island and Seattle/ Bremerton).

There are a couple of factors that are likely contributors to this drop in ridership—one is a disruptive reconstruction project at Colman Dock, where the entire terminal is being replaced while continuing operations. Another factor is the addition of passenger-only service between Seattle and the two ports of Bremerton and Kingston, which is drawing some ridership from both the WSF Bremerton and Bainbridge routes. The Port Townsend/ Coupeville route had 12,875 (8.2%) more riders in the second quarter of FY2020 than the same quarter last year, primarily due to 100 weather related canceled trips on that route in FY2019.

The largest percentage decrease in ridership was on the Anacortes/ Friday Harbor/Sidney, B.C. route. The 18% (3,235 riders) decrease as compared to the second quarter in FY2019 was primarily due to vessel availability. Service to and from Sidney was suspended from November 12 through December 8, 2019, when seven vessels were out of service. While the percent change on this route compared to last year is high, 3,235 riders is equivalent to 0.06% of total WSF ridership for the quarter.



The online version of this article links to an interactive map at bit.ly/GNBferriesmap.

Passenger injuries increase, employee injuries decrease

The rate of passenger injuries per million riders was 2.02 in the second quarter of FY2020, up 124% from 0.90 in the same quarter last year. Passenger injuries are defined by the National Transit Database reporting system as any injury that results in transport to a medical facility. Prior to July 1, 2018, only injuries in which the passengers were transported by ambulance were reportable. The passenger injury rate during the quarter did not achieve the WSF goal of 1.0 injury or fewer per million riders.

The rate of employee injuries reportable to the Occupational Safety and Health Administration in the second quarter of FY2020 was 9.5 per 10,000 revenue service hours. This was an improvement from 11.1 per 10,000 revenue service hours in the same quarter last year. This represents five fewer injuries

than the same quarter in FY2019, but remains above WSF annual goal of fewer than 7.6 employee injuries per 10,000 revenue service hours. Of the 30 employee injuries reportable to OSHA during the second quarter of FY2020, the most frequently reported were hearing loss (33%) and pain and soreness (33%).

Revenue increases, continues five-year trend

WSF farebox revenue continued its upward trend, coming in at about \$41.9 million for the second quarter of FY2020. Farebox revenue was about \$305,000 (0.7%) more than the same quarter in FY2019, but also reflected a 2% fare increase that went into effect October 1, 2019. Fare collection was about \$1.6 million (3.7%) below WSF projections. WSF farebox revenue during second quarters has increased every year since FY2016, when it was \$37.7 million.

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

Customer feedback: WSF goes above and beyond

“I am writing to express my deep gratitude to the employees of the WSF who assisted me on Sunday, October 20 near the Mukilteo terminal. I was not a WSF passenger, but was paddling my sea kayak in the vicinity of the Mukilteo ferry terminal when I capsized and, despite my best efforts, was not able to self-rescue. A WSF employee saw me from the stern of the ferry while it was at dock. After several unsuccessful attempts on my part to self-rescue, I was incredibly grateful to see one of the rescue vessels from the ferry coming to my assistance. The rescue vessel reached me quickly and Helen and Steve (I did not catch their last names) from WSF provided life-saving assistance. While I was not injured, I was facing the very real possibility of hypothermia. I hate to think about what could have happened to me if Helen, Steve and the other WSF employees had not reacted so quickly and effectively. I cannot thank enough Helen, Steven and the other WSF employees who provided critical assistance and hope that they are recognized for their exemplary work. Best Regards”

(Comment edited and is an excerpt)

76 PLUG-IN ELECTRIC VEHICLES ANNUAL REPORT

State exceeds Results Washington goal of registering 50,000 electric vehicles by 2020

Washington state had 53,307 plug-in electric vehicle registrations (EVs) as of December 31, 2019, surpassing Gov. Jay Inslee's Results Washington goal of 50,000 registered EVs by 2020. This is a 24% increase in EV registrations from 42,878 in 2018 and a 222% increase from 16,579 in 2015. Washington state is second in the nation in terms of EV market share, with more than 26 EVs per 1,000 registered vehicles.

The total EV count in Washington includes 36,129 battery electric vehicles (BEVs) and 17,178 plug-in hybrid electric vehicles (PHEVs). Washington has maintained a ratio of approximately two BEVs for every PHEV since 2015 (see table below). For a county by county perspective, see map on p. 30.

Increased EV adoption is expected to help the state progress toward its goals of reducing greenhouse gases, protecting public health and the environment, and promoting economic growth.

Plug-in electric vehicle registrations surge upward in Washington

2015 through 2019; Number of plug-in electric vehicle registrations by vehicles type; Includes battery electric vehicles and plug-in hybrid electric vehicles

Vehicle type	2015	2016	2017	2018	2019
BEV	11,551	14,573	20,010	27,853	36,129
PHEV	5,028	7,424	10,015	15,025	17,178
EV totals	16,579	21,997	30,025	42,878	53,307

Data source: Washington State Department of Licensing.

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

WSDOT buys EV passenger vehicles as part of the Washington State EV Fleets Initiative

In an effort to reduce its environmental footprint, WSDOT is purchasing an increasing number of EVs for its passenger vehicle fleet. As of 2019, EVs made up 23% of WSDOT's fleet with 88 vehicles, up from 21 EVs in 2015. WSDOT has also reduced the total number of vehicles in its statewide passenger vehicle fleet by 17% from 455 in 2015 to 390 in 2019.

Gov. Inslee announced an update to the Washington State EV Fleets Initiative in January 2019, accelerating the target for state agencies to update their fleet vehicles. Under the update, at least 50% of all new state passenger

Notable results

- Plug-in electric vehicle registrations in Washington increased 222% between 2015 and 2019
- WSDOT decreased its passenger vehicle fleet by 17% between 2015 and 2019, and increased the percentage of electric vehicles in its fleet from 5% to 23%
- Public charging ports for EVs in Washington state increased 206% between 2015 and 2019

Electric vehicle terms

Plug-in electric vehicles (EVs)

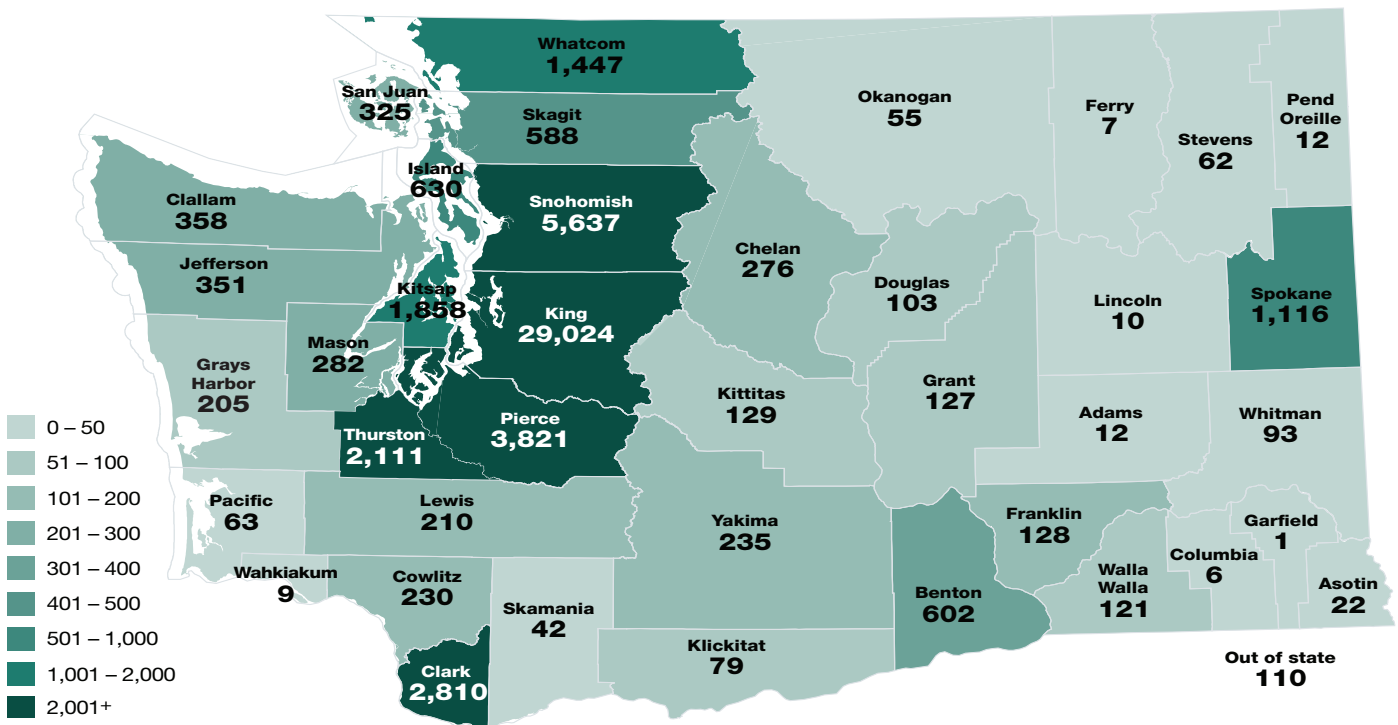
are cars and trucks that use an electric battery as part or all of their fuel source. These vehicles need to be plugged into an electrical outlet to charge their battery. EVs include both battery electric vehicles and plug-in hybrid electric vehicles:

- **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 when necessary.

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

Washington's total registered plug-in electric vehicles top 53,000

Number of plug-in electric vehicle registrations by county; As of December 31, 2019



Data source: Washington State Department of Licensing.

Notes: Map includes all plug-in electric vehicles produced by major auto makers since 2011. It does not include cars converted to EVs by their owners, neighborhood EVs, or motorcycles. As of December 31, 2019, San Juan County had 325 EVs, Island County had 630 and Kitsap County had 1,858. "Out of state" vehicles are registered in the state of Washington, but the registered owner's address is out of state.

vehicle purchases must be electric vehicles by 2020. EVs include BEVs and PHEVs (see sidebar on previous page).

This initiative is expected to help reduce vehicle operating costs and reduce greenhouse gas emissions. Gov. Inslee directed all state agencies to purchase electric vehicles instead of traditional internal combustion engine vehicles in applicable vehicle categories (namely passenger vehicles) unless there is not an EV option in the marketplace that meets the operational needs of the agency.

Nuts for Bolts program

To support the EV Fleets Initiative, WSDOT created the "Nuts for Bolts" program to encourage offices to volunteer to trade their state-owned gas vehicles for all-electric Chevrolet Bolts. As part of the program, electric vehicle charging stations were installed at WSDOT facilities to support the new Bolts if a charger was not already available. Since early 2018, 14 internal combustion engine vehicles have been replaced with Bolts at WSDOT facilities including Union Gap, Aberdeen, Port Angeles, and Everett.

WSDOT facilities add EV chargers across the state for agency vehicles

WSDOT has installed 36 EV charging stations at agency facilities around the state, with charging ports for up to 66 EVs. Another eight facilities will be live by July 2020, with charging ports for another 15 EVs. The agency is building this network to encourage staff to use newly purchased EVs for business travel. WSDOT charging stations are available for staff use in Aberdeen, Bainbridge Island, Burlington, Cle Elum, Olympia, Port Orchard, Seattle, Shoreline, Spokane, Tumwater, Union Gap, Vancouver and Wenatchee.

WSDOT completes fast charging network to the Tri-Cities

EV drivers traveling from Seattle or Spokane to the Tri-Cities on I-90, I-82 and US 395 can now access public fast chargers every 40 miles along their routes. WSDOT invested about \$2.5 million in grants and partnership matching funds into new EV charging infrastructure during the 2017-2019 biennium through WSDOT's Electric Vehicle Infrastructure Partnerships Program.

EVIPP contributed to the installation of fast charging equipment within a mile of highway exits in 15 communities throughout Washington state (see map below). Nine new stations in eastern Washington bridged the charging gap between the Tri-Cities and I-90 to both the west and the northeast of Tri-Cities. Six new charging sites on the I-5 corridor strengthened the existing fast charging network. These new stations and other charging infrastructure investments increased the number of public

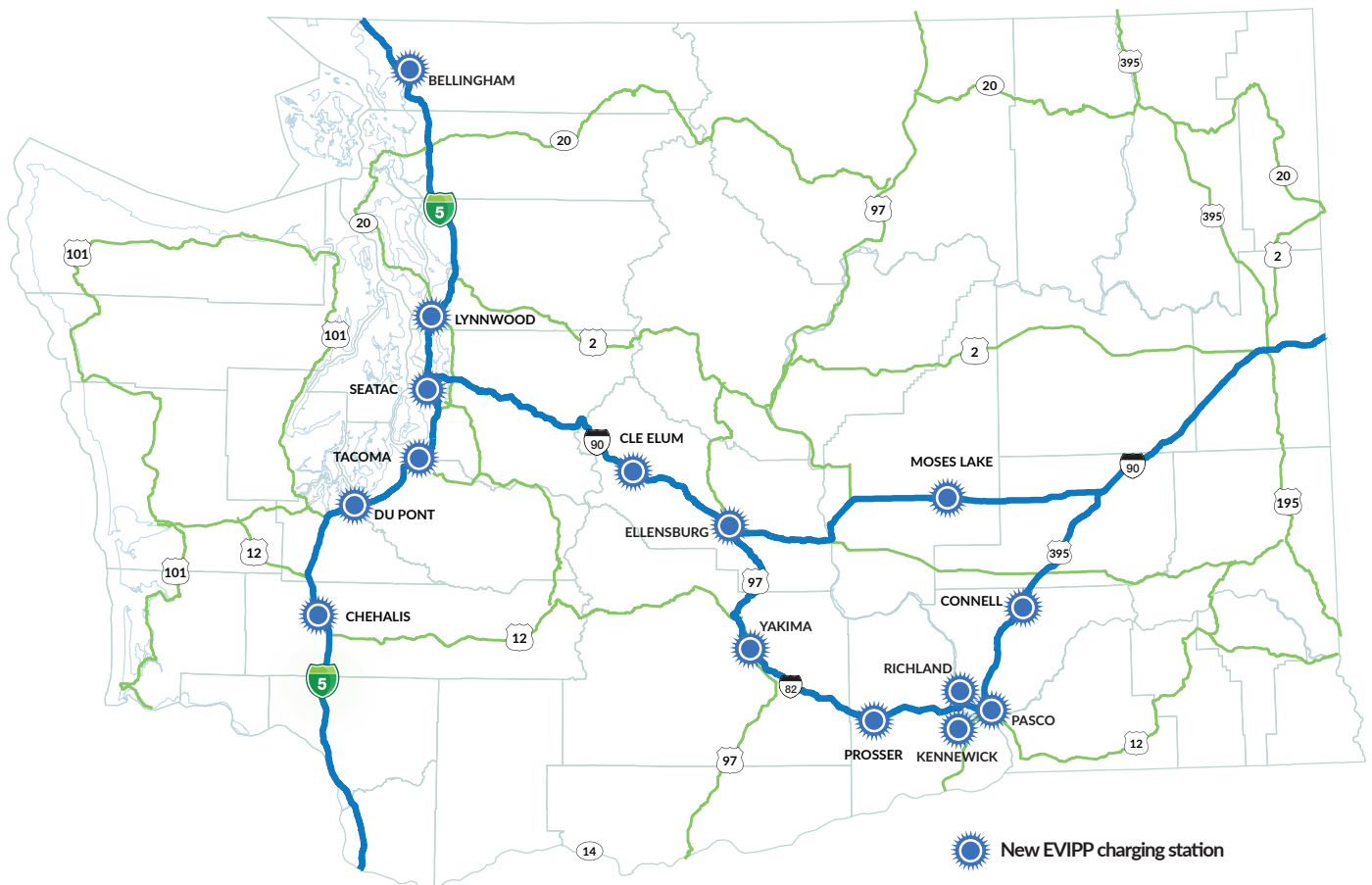
charging ports in Washington 206%, from 949 in 2015 to 2,905 in 2019.

The EVIPP grant funding encouraged private sector investment by sharing costs for finding sites, equipment purchases, electrical upgrades, installation, operations and maintenance. WSDOT aims to continue expanding the state's network of EV charging stations along major highway corridors in Washington. For more information, visit <http://bit.ly/EVIPP>.

Contributors include Tonia Buell, Georgina Willner, Joe Irwin and Lisa Mikesell

Electric Vehicle Infrastructure Partnership Program (EVIPP) investments from 2017-2019

As of February 2020; New public electric vehicle charging stations supported by the EVIPP program



Map source: Washington State Department of Transportation Innovative Partnerships office.

Notes: A map of all charging locations statewide is available on plugshare.com.

Notable results

- *WSDOT and its contractors received nine notices of environmental violations in 2019*
- *WSDOT's Steamboat Slough mitigation site project exemplified agency values while creating 11.3 acres of estuary habitat*

WSDOT and its contractors receive nine written violation notices in 2019

WSDOT had 827 active construction projects, completed 162,135 ferry sailings, and performed 216,472 maintenance activities in 2019. During this time, WSDOT and its contractors received nine notices of environmental violations, an increase from the six violation notices received in 2018. For the purposes of this report, any written notice received from regulatory agencies about a non-compliance event is considered a violation notice.

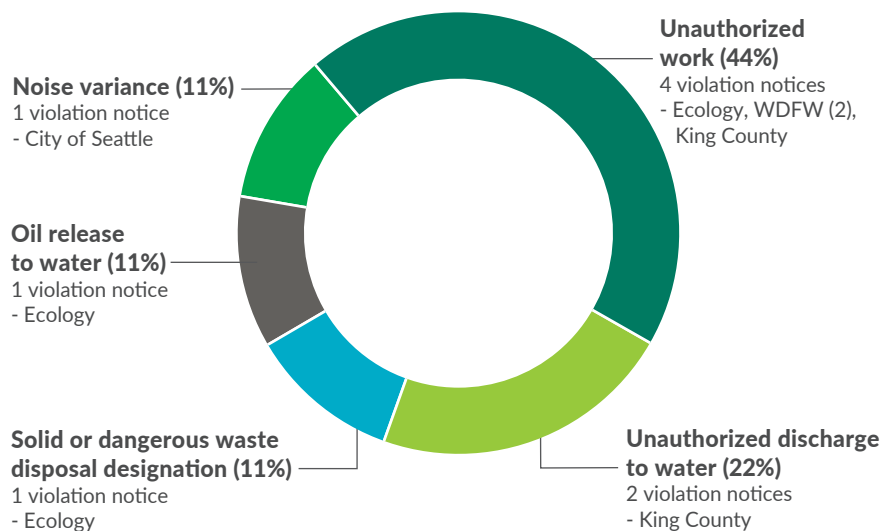
In 2019, regulatory agencies issued four environmental violation notices for two highway construction projects, two violation notices for a ferry terminal construction project, and three violation notices for maintenance activities.

The violations in 2019 included two unauthorized discharges of water to local sewers, one solid or dangerous waste disposal, one oil release to water, one noise variance citation and four instances of unauthorized work. One of the violation notices received in 2019 was for an incident of unauthorized work that occurred in 2018.

Eight of the nine violation notices were issued to WSDOT, while the ninth was issued by the City of Seattle directly to a subcontractor working on a WSDOT project. Violation notices are issued directly to the contractor or subcontractor when the regulatory agency determines they are solely responsible or are the permit-holder.

WSDOT activities receive nine environmental violation notices in 2019

Number of notices and percent of total by category and issuing agency



Data source: WSDOT Environmental Services Office.

Note: Percentages do not add to 100 due to rounding. Ecology = Washington State Department of Ecology. WDFW = Washington Department of Fish and Wildlife.

WSDOT subcontractor receives a monetary penalty

In 2019, the City of Seattle issued a WSDOT subcontractor a noise violation notice which included a monetary penalty of \$475. The violation was for performing a prohibited nighttime activity during permitted nighttime work hours on the Alaskan Way Viaduct Project.

Steamboat Slough mitigation site project exemplifies WSDOT values

The Steamboat Slough mitigation site project won the 2019 WSDOT Environmental Director's Choice Award, chosen from 12 projects that received nominations. While all of the nominated projects demonstrated commitment to WSDOT's values of safety, engagement, innovation, integrity, and sustainability, the SR 529 Steamboat Slough mitigation site project stood out because of its proactive and practical approaches.

The design and construction of this mitigation site were funded through the Connecting Washington funding package. The mitigation site, which is adjacent to I-5 and SR 529 and was previously a Superfund Site, had technical challenges due to limited space for wetland buffers, an extremely tight schedule, and a lack of third-party wetland mitigation resources in the area. The project constructed and restored 11.3 acres of estuary habitat that will benefit salmon—especially Chinook salmon, an endangered species—located in the Snohomish Basin. Additional benefits of this project include:

- The use of a site already owned by WSDOT, which is located adjacent to the proposed roadway impacts. This practical use of WSDOT property saved the taxpayers millions of dollars in not having to purchase additional property for mitigation.
- Opening the dike at this location reduced the need to maintain it, and improved the safety of the adjacent bridge and roadway structures.
- Through community engagement, WSDOT worked with the Tulalip Tribe to respond to the U.S. Army Corps of Engineers' initial concerns regarding the use of this site for mitigation.
- WSDOT carried out the mitigation work prior to roadway impacts occurring to maximize sustainability benefits. This mitigation site is consistent with the goal of the Snohomish River Basin Salmon Conservation Plan to protect or create estuary.

This innovative approach resulted in improved relations between regulators and WSDOT employees as they addressed complex technical, regulatory and policy issues. Further, the efficiency of the project team in completing the mitigation site on an extremely tight schedule avoided a \$2.6 million project delay.

To view a time-lapse video capturing the team's effort, visit: <https://www.youtube.com/watch?v=5J1pOnRSZOc>.

Contributors include Gretchen Coker, Eliza McGovern, Ruth Park, Vanessa Rogers, Patrick Svoboda, Lisa Mikesell and Dustin Motte

Design Manual updated to include non-compliance event reporting

Prior to the development of the Design Environmental Compliance Assurance Procedure in 2019, projects that encountered non-compliance events during the design phase lacked a formal tool to evaluate and track such events.

The Design ECAP offers guidelines for recording and tracking non-compliance events that occur on projects. This new administrative process offers greater accountability and fosters improved communication by assigning the project design engineer as the primary contact during the design phase.

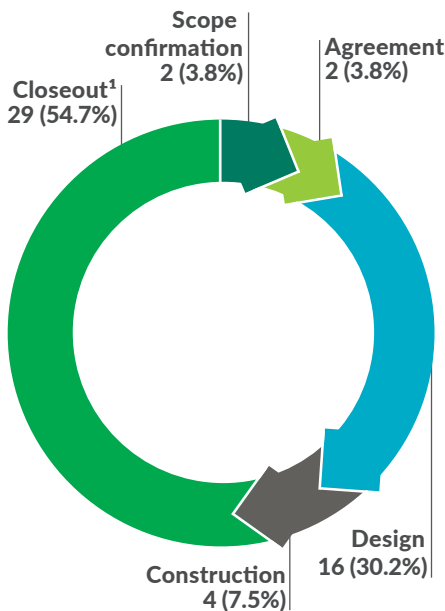
These non-compliance events will be recorded in the internal WSDOT Environmental Commitment Tracking System.

Notable results

- As of December 31, 2019, 53 WSDOT-administered projects to improve freight rail structures and freight movement were underway
- The Washington Grain Train shipped 2,604 rail carloads of grain in 2019, up 29% from 2,011 in 2018

Twenty-nine of 53 freight rail projects reach final closeout stage in 2019

As of December, 31 2019



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 53 freight rail projects underway in 2019

A total of 53 WSDOT-administered projects to improve freight rail infrastructure and freight mobility were underway as of December 31, 2019. The work, which will continue throughout the 2019-2021 biennium and beyond, includes projects funded by the Connecting Washington transportation package, state and federal freight rail grants, and a state freight rail loan program.

Of these 53 freight rail projects, 29 (54.7%) were in the final closeout phase, four (7.5%) were under construction, 16 (30.2%) were being designed, two (3.8%) were in the agreement stage and two (3.8%) were in the initial scope confirmation stage (see chart at left). Some of these projects were paused in December 2019 pending Legislative budget action.

The legislature approved 14 new projects as part of the 2019-2021 transportation budget, while the remaining 39 projects had been approved in previous biennia (see chart below).

Fourteen of 53 rail projects underway were approved in 2019-2021

As of December 31, 2019

Biennium originally approved	Projects	Funding
2013-2015	2	\$1,503,000
2015-2017	15	\$8,855,000
2017-2019	22	\$50,293,000
2019-2021	14	\$15,015,000
Total	53	\$75,666,000

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

Notes: Funds are rounded to the nearest thousand. 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 11 freight rail projects underway in 2019

As of December 31, 2019, 11 freight rail improvement projects funded through the Connecting Washington transportation package were underway. These CW projects, which totaled \$37.8 million, were all approved by the Legislature as part of the 2015-2017 or 2017-2019 transportation budgets. They include rail interchange improvements, rail infrastructure work at several ports, landslide mitigation along railroad tracks and rehabilitation of existing rail lines.

Two of the 2015-2017 biennium CW projects were in closeout phase, and the two others funded in that biennium were in final construction. The remaining seven projects were funded in the 2017-2019 biennium and were in the agreements, design or construction phases as of December 31, 2019.

Freight Rail Assistance Program funds 36 projects underway in 2019

Approximately \$24.9 million in Freight Rail Assistance Program funds supported 36 state freight rail grant projects that were underway in 2019. 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 the 36 FRAP projects, 16 were either operationally complete (constructed enough to be used for their intended purpose) or in close out as of December 31, 2019 (see table below).

Sixteen FRAP projects in close out or operationally complete

As of December 31, 2019

Biennium Funded	Total projects underway	Projects operationally complete or in close out
2013-2015	2	2
2015-2017	11	11
2017-2019	13	3
2019-2021	10	0
All	36	16

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

Federal Grant providing funds for new freight rail overpass

In December 2019, WSDOT awarded the construction contract for a \$900,000 federally-funded project for a new freight rail overpass in Ridgefield, which will provide waterfront access for motorists and pedestrians.

Freight Rail Investment Bank loan program assists five projects underway in 2019

A total of five projects financed using state Freight Rail Investment Bank loans were underway in 2019. WSDOT awarded four FRIB loans totaling over \$7 million for the 2019-2021 biennium. These include financing for two Tacoma Rail projects, one for the Port of Benton and one for the Port of Everett.

In addition, the Port of Everett had received a separate \$5 million FRIB loan in 2018 for a rail modernization project that was under construction as of December 31, 2019.

The Legislature funds the FRIB loan program to help deliver projects that improve the state’s long-term economic vitality by improving freight movement.

WSDOT undertakes federally-funded work on short line railroad

In 2018, WSDOT's Washington State Rural Rail Rehabilitation project was awarded a \$5.6 million Better Utilizing Investments to Leverage Development grant from the U.S. Department of Transportation. A contractor was selected to undertake the work in 2019 and construction is expected to begin in 2020.

This WSDOT project will improve strategically significant sections of the 298-mile state-owned Palouse River and Coulee City short line rail system in eastern Washington (see box at right). State and local funds will match the federal grant monies, providing a total of \$11.2 million for capital improvements.

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 the Class I railroads, barges and container ships for distribution throughout the world.

What is the Grain Train?

The Washington Grain Train, which WSDOT jointly manages with the ports of Whitman County, Walla Walla and Moses Lake, consists of 125 WSDOT-owned rail cars operating on four short line railroads in eastern Washington. It serves more than 2,500 cooperative members and farmers. Since its creation in 1994, the Grain Train has transported over 5 million tons of grain to domestic and international markets while supporting short line railroads, farmers and rural businesses in Washington.

The Grain Train program forms part of the supply chain that brings Washington-grown wheat and barley to domestic and international markets. Grain Trains carry thousands of tons of grain from rural areas of eastern Washington to larger distribution centers every year. The program uses four rail corridors, including three state-owned short line tracks—the P&L, PV Hooper and CW branches—as well as the privately owned Columbia Basin line.

Planned improvements include replacing or rehabilitating 10 bridges, replacing 4.6 miles of track and rehabilitating 20.8 miles. These projects are expected to improve reliability, increase speeds and reduce the potential for incidents on the line by helping maintain it in a state of good repair.

WSDOT selects new operator for section of PCC

In 2019, WSDOT selected Omaha Track as the new operator of the P&L Branch line, a section of the state-owned Palouse River and Coulee City short line rail system in eastern Washington. WSDOT selected Omaha Track through a competitive process and signed a 10-year contract in summer 2019. On August 5, 2019, the Nebraska-based railroad company assumed control of the P&L, which runs from the Idaho state line near Pullman to Marshall (just south of Spokane).

The P&L is one of three lines in the PCC rail system. The other two are the PV Hooper Branch in Whitman County, operated by Palouse River and Coulee City Railroad, and the CW Branch between Cheney and Coulee City, operated by Washington Eastern Railroad. To see a map of the PCC, visit bit.ly/PCC_Map.

WSDOT adds 25 rail cars to the Grain Train in 2019

An additional 25 rail cars joined WSDOT's Grain Train program in 2019, bringing the total to 125 cars in operation. The cars are divided into four fleets of between 20 and 40 rail cars apiece, each operating on a different short line track. WSDOT owns the Grain Train cars and maintains them in coordination with the operators.

Washington Grain Train ships over 2,600 carloads of grain in 2019

The Washington Grain Train shipped 2,604 rail carloads of grain in 2019—over double the 1,083 carloads shipped in 2018 and 29% more than the 2,011 carloads shipped in 2014. One rail carload is approximately 100 tons, or about three to four truckloads.

The Grain Train frequently sees large fluctuations in the amount of grain shipped due to factors such as the variable nature of harvests and changes to the short rail lines on which Grain Train cars travel. For instance, in 2019 two of the four short line railroads that use the Grain Train cars transitioned to new operators. Since its inception in 1994, the program also has shifted from moving grain directly to deep water ports to moving it to shuttle elevators (high capacity, high-speed grain loading facilities that help get goods to international markets).

Contributors include Cameron Harper, Barbara LaBoe, Janet Matkin, Mark Nickerson, Helen Goldstein and Lisa Mikesell

76 CAPITAL PROJECT DELIVERY PROGRAMS QUARTERLY UPDATES

WSDOT completes two Connecting Washington projects during the quarter

WSDOT completed two Connecting Washington projects—making access improvements to SR 14 in Clark County and intersection improvements to SR 14 in Skamania County—during the second quarter of the 2019-2021 biennium (October through December 2019). Also during the quarter, WSDOT completed four Nickel contracts to rehabilitate I-5 concrete in King County, and two Transportation Partnership Account contracts to construct I-90 wildlife fencing in Kittitas County.

WSDOT has completed a total of 383 Nickel and TPA construction projects since July 2003, with 86% on time and 91% on budget. The cost at completion for the 383 Nickel and TPA construction projects was approximately \$10.3 billion, 1.5% less than the baseline cost of \$10.5 billion. The agency currently has four Nickel and TPA projects underway (see p. 42 for additional information).

Nickel and Transportation Partnership Account funding continues to be lower than original projections

Fuel tax collections show 2003 and 2005 revenue forecasts, which were used to determine project lists, did not anticipate the economic recession in projecting future growth in fuel tax revenues. The 2003 Nickel and 2005 TPA gas taxes that fund projects are based on a fixed tax rate per gallon. As such, reduced gasoline and diesel consumption and sales lead to reduced tax revenue.

Fuel tax funding from the 2005 TPA package has been lower than the original March 2005 projection. The original projection for the TPA account was \$4.9 billion over a 16-year period from 2005 through 2021. Current TPA projections through 2021 are \$4.0 billion, roughly \$930 million (18.9%) less than the original 2005 projection. The 2003 Nickel transportation package was originally a 10-year plan, with revenues forecasted to total \$1.9 billion from 2003 through 2013. Fuel tax revenues collected during this period were 10.2% lower than the original March 2003 projection.

Nickel and TPA gas tax revenues are used to pay the debt on the bonds sold to finance planned projects. Once all the bonds are sold, revenues collected will be used to pay the debt.

Beige Page contributors include Mike Ellis, Penny Haeger, Heather Jones, Thanh Nguyen, Aaron Ward, Dan Wilder, Joe Irwin and Lisa Mikesell

Notable results

- *WSDOT has completed 383 Nickel and TPA projects since 2003, with 86% on time and 91% on budget*
- *WSDOT advertised 39 of 63 Pre-existing Funds projects during the second quarter of the 2019-2021 biennium*

WSDOT's Watch List projects available online:

To streamline work and ensure accuracy and consistency, the Watch List is no longer featured in the quarterly Gray Notebook. It is now reported monthly at <http://bit.ly/ProjectDeliveryReports>. This change helps the Gray Notebook better align with WSDOT's Capital Program Development and Management Office and its monthly online version of the Watch List of projects that have or may have significant changes in scope, schedule or budget.

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CURRENT LEGISLATIVE EVALUATION & ACCOUNTABILITY PROGRAM QUARTERLY UPDATE

Combined Nickel & Transportation Partnership Account Status of projects to date; 2003 through December 31, 2019; Dollars in millions	Number of Projects	Value of Program
Subtotal of completed construction projects ¹	383	\$10,485.5
<i>Non-construction projects that have been completed or otherwise removed from Nickel/TPA lists^{2,3}</i>	9	\$205.0
Projects included in the current transportation budget but not yet complete	11	\$4,989.7
<i>Projects that have been deferred indefinitely or deleted and removed from Nickel/TPA lists^{3,4}</i>	13	\$499.2
<i>Projects now funded by Connecting Washington and removed from Nickel/TPA lists (see GNB 63, p. 35)</i>	5	\$103.3
Total number of projects ⁴ in improvement and preservation budget	421	\$16,282.7
Schedule and budget summary Nickel & TPA combined: Results of completed construction projects in the current Legislative Transportation Budget and prior budgets; Dollars in millions	Completed in 2019- 2021 Biennium Budget	Cumulative Program
Total number of projects completed	1	383
<i>Percent completed early or on time</i>	0%	86%
<i>Percent completed under or on budget</i>	100%	91%
Baseline cost at completion	\$564.9	\$10,485.5
Current cost at completion	\$564.5	\$10,330.3
Percent of total program over or under budget	0.1% under	1.5% under
Advertisement record: Results of projects entering the construction phase or under construction	Combined Nickel & TPA	
Total current number of projects in construction phase as of December 31, 2019	5	
<i>Percent advertised early or on time</i>	100%	
Total number of projects advertised for construction during the 2019-2021 biennium (July 1, 2019 through June 30, 2021)	1	
<i>Percent advertised early or on time</i>	0%	
Projects to be advertised: Results of projects now being advertised for construction or planned to be advertised	Combined Nickel & TPA	
Projects being advertised for construction (January 1, 2020 through June 30, 2020)	1	
Percent on target for advertisement on schedule or early	0%	
Budget status for the 2019-2021 biennium; Dollars in millions	WSDOT biennial budget	
Budget amount for 2019-2021 biennium	\$556.4	
Actual expenditures in 2019-2021 biennium to date	\$153.5	
<i>Total 2003 Transportation Funding Package (Nickel) expenditures</i>	\$7.0	
<i>Total 2005 Transportation Partnership Account expenditures</i>	\$108.7	
<i>Total Pre-existing Funds expenditures</i>	\$37.8	

Data source: WSDOT Capital Program Development and Management.

Notes: Numbers have been rounded. This chart was updated in GNB 63 to reflect reconciled Nickel and TPA project counts, and as a result it does not exactly match Current Legislative Evaluation and Accountability Program charts from editions prior to GNB 63. **1** Cumulative projects completed from July 1, 2003 to December 31, 2019. **2** Non-construction projects include commitments for engineering and right of way work. **3** Projects that have been deferred indefinitely or deleted include projects that have no funding available, projects that have been halted by the Legislature and those for which other entities (e.g., cities and counties) are now serving as the lead agency. **4** The project total has been updated to show "unbundled" projects which may have been previously reported in programmatic construction groupings (such as Roadside Safety Improvements or Bridge Seismic Retrofit). See [Gray Notebook 38, p. 55](#) for more details.

76 COMPLETED PROJECTS & CONTRACTS UPDATE

WSDOT completes two Connecting Washington project during the quarter

WSDOT completed two Connecting Washington projects, four Nickel contracts and two Transportation Partnership Account contracts during the second quarter of the 2019-2021 biennium.

SR 14 Access Improvements

CLARK COUNTY (CONNECTING WASHINGTON - PROJECT)

This project constructed two roundabouts on SR 14 at 15th St. and 32nd St. in Washougal to provide better access to the SR 14 corridor.

Project benefits: This project improves access to the SR 14 corridor, improves safety and promotes economic vitality in the region.

Budget performance: The project was delivered for \$7.5 million, on budget with the current approved amount of \$7.5 million.

Schedule performance: This project was delivered in October 2019, 10 months early with respect to the current approved schedule.

Highlights/challenges: WSDOT determined that the original advertisement date of April 2018 was not realistic. The project's right of way certification, advertisement and operationally complete dates were pushed out one year to 2019 to allow the project team time to examine design alternatives and perform the necessary community engagement.

SR 14 Wind River Junction

SKAMANIA COUNTY (CONNECTING WASHINGTON - PROJECT)

This project reconstructed the intersection at Wind River Road and SR 14, improving truck access to Wind River Road.

Project benefits: Wind River Road is one of two routes into Carson from SR 14. The other, Hot Springs Avenue, is being undermined by the Wind River and experiences frequent closures, repairs and high maintenance costs. This project reconstructed the intersection at Wind River Road and SR 14 so Wind River Road can be used by all drivers.

Budget performance: The project was delivered for \$8.7 million, which is \$3.6 million (70%) above the initial budget of \$5.2 million.

Schedule performance: This project was delivered in October 2019, three months late with respect to the initial schedule.

Highlights/challenges: The project advertisement was delayed one year for further geotechnical investigation, analysis of intersection alternatives and community engagement during design. The final project added culvert repair and erosion control features to the original project.

GNB reporting on projects and contracts

The Gray Notebook differentiates completed projects from completed contracts. Larger projects frequently include multiple smaller contracts (for example, a pavement replacement contract on a section of I-5 that is part of a larger concrete rehabilitation project). Completing a contract does not mean that the larger project is finished. For example, a project can involve three contracts total and have two contracts finished. This project would be complete when the third and final contract is done.

I-5 Concrete Rehabilitation Program

KING COUNTY (NICKEL - PROJECT)

WSDOT completed four contracts as part of the larger project that will replace 16 miles of concrete on Interstate 5 from Tukwila through downtown Seattle to Northgate. The concrete was past its lifespan and is being removed and replaced with thicker concrete pavement reinforced with steel dowels at the joints. This work is planned to extend the life of this section of I-5 at least another 40 years, and create a smoother ride for the traveling public. The following four contracts were completed this quarter:

I-5/Southbound S. Lucile Street to Spring Street - Pavement Repair (CONTRACT)

This contract replaced damaged concrete panels, ground the pavement surface in all lanes to

eliminate ruts, repaved several on- and off-ramps, and repaired the gate at the south end of the I-5 express lanes.

Budget performance: The contract was delivered for \$10.4 million, on budget with respect to the last approved amount of \$10.4 million.

Schedule performance: This contract was delivered in October 2019, on time with respect to the last approved schedule.

I-5/Northbound Boeing Access Road to N.E. Ravenna Bridge - Pavement Repair (CONTRACT)

This contract replaced expansion joints and large sections of concrete pavement, ground and repaved the roadway, added pedestrian ramp upgrades, and added safety barrier improvements.

Budget performance: The contract was delivered for \$21.8 million, which is \$300,000 (1%) above the last approved budget of \$21.4 million.

Schedule performance: This contract was delivered in October 2019, one month behind the last approved schedule.

I-5/Northbound S. Spokane Street Vicinity - Concrete Pavement Replacement (CONTRACT)

This contract replaced the concrete pavement and adjusted concrete panel longitudinal joints to match existing lane lines while maintaining drainage features.

Budget performance: The contract was delivered for \$12.2 million, which

is \$700,000 (6%) above than the last approved budget of \$11.5 million.

Schedule performance: This contract was delivered in October 2019, one month behind the last approved schedule.

I-5/Northbound I-90 Vicinity to James Street Vicinity - Concrete Pavement Replacement (CONTRACT)

This contract replaced the concrete pavement, including affected traffic data loop detectors.

Budget performance: The contract was delivered for \$11.8 million, on budget with respect to the last approved amount of \$11.8 million.

Schedule performance: This contract was delivered in September 2019, on time with respect to the last approved schedule.

I-90/Hyak to Keechelus Dam Phase 1F - Fencing 1B KITTITAS COUNTY (TPA - CONTRACT)

This contract constructed wildlife exclusionary fencing along the I-90 Snoqualmie Pass East corridor.

Project benefits: This contract installed fencing on I-90 between milepost 55.1 and milepost 59.9 to keep animals off the roadway and to direct them to crossing structures, which will reduce animal/vehicle collisions.

Budget performance: The contract was delivered for \$1.5 million, on budget with respect to the last approved amount of \$1.5 million.

Schedule performance: This contract was delivered in October 2019, on time with respect to the last approved schedule.

Highlights/challenges: Because fencing contractors are typically sub-contractors and not prime contractors for WSDOT projects, there was a limited number of pre-qualified contractors interested in submitting bids for this work. For more information about the I-90/Hyak to Keechelus Dam project, see Gray Notebook 75, p. 52.

I-90/Keechelus Dam to Stampede Pass Phase 2F - Fencing 2A

KITTITAS COUNTY (TPA - CONTRACT)

This contract constructed wildlife exclusionary fencing along the I-90 Snoqualmie Pass East corridor.

Project benefits: This contract installed fencing from I-90 milepost 59.5 to milepost 62 to keep animals off the roadway and to direct them to crossing structures, which will reduce animal/vehicle collisions.

Budget performance: The contract was delivered for \$2.3 million, on budget with respect to the last approved budget of \$2.3 million.

Schedule performance: This contract was delivered in October 2019, on time with respect to the last approved schedule.

Highlights/challenges: Because fencing contractors are typically sub-contractors and not prime contractors for WSDOT projects, there was a limited number of pre-qualified contractors interested in submitting bids for this work. For more information about the I-90/Keechelus Dam to Stampede Pass project, see Gray Notebook 75, p. 53.

76 ADVERTISEMENT RECORD QUARTERLY UPDATE

Connecting Washington Account projects in construction ¹ Through December 31, 2019; (County); Dollars in millions	Schedule status	Completion date	Total project cost
I-5/Joint Base Lewis-McChord Corridor Improvements (Pierce)			
I-5/Steilacoom-DuPont Rd. to Thorne Ln. - Corridor Improvements	On schedule	Apr-2021	\$332.5
SR 167/SR 509 Puget Sound Gateway (multiple counties)			
SR 509/SeaTac Stage 1 Elements (WSDOT Contribution)	Advanced	Nov-2022	\$49.3
SR 167/I-5 to SR 509 - Stage 1A	On schedule	Apr-2021	\$57.4
I-405/Renton to Bellevue - Corridor Widening (King)			
I-405/Renton to Bellevue - Corridor Widening & ETL (Stage 2)	Delayed	Dec-2024	\$876.0
Land Mobile Radio Upgrade (multiple counties)			
Wireless Communication	Delayed	Nov-2021	\$37.0
SR 520 Seattle Corridor Improvements - West End (King)			
SR 520/Montlake to Lake Washington - Interchange and Bridge Replacement	Delayed	Apr-2023	\$628.1
US 395 North Spokane Corridor (Spokane)			
US 395/North Spokane Corridor BNSF - Second Railroad Alignment	Delayed	Oct-2021	\$77.9
I-5/Marvin Road/SR 510 Interchange (Thurston)			
I-5/SR 510 Interchange - Reconstruct Interchange	Delayed	Jul-2020	\$46.2
I-82/ Eastbound/Westbound On- and Off-Ramps (Yakima)			
I-82/South Union Gap Interchange - Construct Ramps	Advanced	Jun-2020	\$22.9
US 2 Highway Safety (Snohomish)			
US 2/Corridor Improvements	Delayed	Jul-2020	\$2.0
SR 107/Chehalis River Bridge (S. Montesano Bridge) Approach & Rail Repair (Grays Harbor)			
SR 107/Chehalis River Bridge - Structural Rehabilitation	Delayed	Jul-2020	\$21.9
I-90/Medical Lake & Geiger Interchanges (Spokane)			
I-90/Medical Lake Interchange to Geiger Field Interchange - Reconstruction	On schedule	Oct-2020	\$16.0
US 395/Safety Corridor Improvements (Spokane)			
US 395/Safety Corridor Improvements	Delayed	Sep-2020	\$13.6
I-90/Eastgate to SR 900 - Corridor Improvements (King)			
I-90/Eastgate to SR 900 - Corridor Improvements	Delayed	Oct-2020	\$73.0
US 12/Walla Walla Corridor Improvements (Walla Walla)			
US 12/Nine Mile Hill to Frenchtown Vicinity - Build New Highway	Delayed	Nov-2021	\$160.7

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.

Nickel & TPA projects in construction Through December 31, 2019; (County); Dollars in millions	Fund type	Advertised on time	Ad date	Operationally complete date	Award amount
I-5 Concrete Rehabilitation Program (King)	Nickel				
Work associated with the concrete rehabilitation is ongoing and additional contracts are forthcoming.					
SR 99 Alaskan Way Viaduct Replacement (King)	Nickel/TPA				
SR 99/South King Street Vicinity to Roy Street - Viaduct Replacement	Nickel/TPA	✓	May-2010	Feb-2021	\$1,089.7
The SR 99 Tunnel opened to traffic in February 2019. The award amount is for the SR 99 Tunnel contract. The Viaduct Demolition, Battery Street Tunnel Decommissioning and Surface Street Improvements are in process.					
SR 99/Alaskan Way and Elliot Ave Surface Street Restoration	Nickel/TPA	✓	Nov-2018	Jan-2023	TBD
I-5/Tacoma HOV Improvements (Pierce)	Nickel/TPA				
I-5/SR 16 Interchange - Construct HOV Connections	TPA	✓	Feb-2016	Apr-2020	\$121.6
I-5/Portland Ave to Port of Tacoma Rd. - Northbound/Southbound HOV	Nickel/TPA	Late	Jan-2018	Oct-2023	\$152.6
I-90/Concrete Rehabilitation (multiple counties)	Nickel				
I-90/Bullfrog Rd. Vicinity to Cle Elum Vicinity - Replace/Rehabilitate Concrete	Nickel	N/A	Jan-2019	Nov-2020	\$8.2
SR 290/Spokane River E. Trent Bridge - Replace Bridge (Spokane)	TPA				
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 has three change order of \$500,000 or more during the quarter

WSDOT had three change order of \$500,000 or more during the quarter ending December 31, 2019. **1)** The 468th Ave. SE to West Summit Rd. Rehabilitation of Concrete Bridge Deck project required a \$2.8 million change order. The contractor encountered significantly more deterioration on the bridge deck than what was outlined in the original plan, requiring additional materials, labor costs, and another construction season. **2)** The SR 99, Alaskan Way Viaduct - Replacement South Access SR 99 Connections project required a \$1.4 million change order due to production delays related to unforeseen obstructions. **3)** The I-5, Northbound MLK Jr. Way to NE Ravenna Bridge, Pavement Repair project required a \$546,000 change order due to additional pavement grinding required for sufficient surface friction.

After extensive reviews—which can involve subject matter experts, contract specialists and other outside stakeholders—WSDOT sometimes changes its engineers' original plans and specifications in order to complete projects. When this occurs, WSDOT issues a formal modification (or change order) to the contract containing a description of the change and details about how or if the contractor may be compensated for it. Each month, WSDOT posts all change orders estimated to cost \$500,000 or more online at <http://bit.ly/WSDOTchangeorders>.

76 PRE-EXISTING FUNDS QUARTERLY UPDATE

WSDOT advertises 39 Pre-existing Funds projects in the second quarter of the biennium

WSDOT advertised 39 of 63 Pre-existing Funds projects in the second quarter of the 2019-2021 biennium (October through December 2019). Of the 39 total projects advertised this quarter, 33 were on time, three were emergent, and three were late. An additional 24 projects—originally scheduled to be advertised during the quarter—were delayed within the biennium.

At the beginning of the 2019-2021 biennium, WSDOT’s current cost to complete the 63 planned PEF projects advertised during the quarter was about \$159.3 million, approximately \$6.3 million (4.1%) more than the original value of \$153.0 million. See chart at right for additional information.

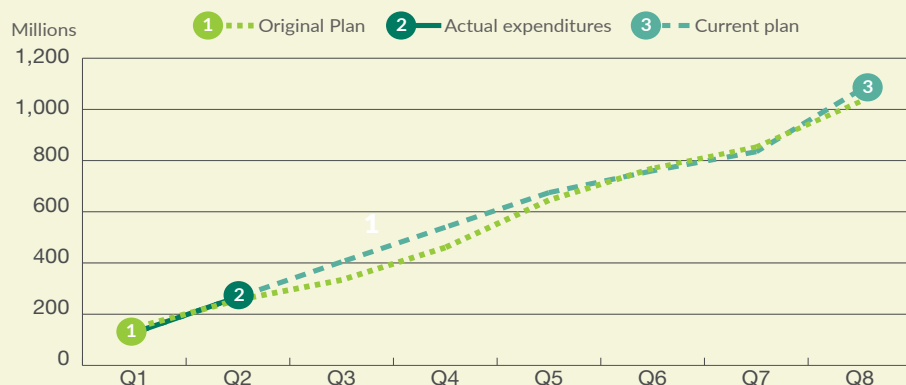
Cash flows currently higher than original projections

WSDOT originally planned to have \$255.9 million in cumulative combined PEF improvement and preservation cash flows at the end of the second quarter of the 2019-2021 biennium, but had \$267.2 million (approximately \$11.3 million, 4.4% more). Current cash flows can vary from originally planned cash flows due to a number of reasons. For example, emergent projects may add cash flow to the current reporting quarter, whereas project deletions can remove cash flow.

The original plan—which is the 2019 delivery plan—will remain the same for the first four quarters of the biennium. It may be updated in the fifth quarter to reflect any revisions in the 2020 delivery plan. As the biennium continues, the agency will use these original plans as goals to achieve while working to meet projections set forth in the current plan. The current plan is more fluid and reflects quarterly changes in response to projects being emergent, delayed, deferred, advanced and deleted.

Cumulative Pre-existing Funds improvement and preservation combined cash flows during the 2019-2021 biennium slightly higher than planned

Quarter ending December 31, 2019; Planned vs. actual expenditures and current plan; Dollars in millions



Data source: WSDOT Capital Program Development and Management.

Note: Q2 refers to the second quarter (October through December 2019) of the 2019-2021 biennium, which runs from July 2019 through June 2021.

Current cost to complete actual PEF advertisements \$6.3 million more than original value

2019-2021 biennium (July 2019 through June 2021); Second quarter (ending December 31, 2019); Dollars in millions

	Number of projects	Original value	Current cost to complete
Total PEF advertisements planned for the 2019-2021 biennium	276	\$1,671.5	\$1,677.8
Actual PEF advertisements second quarter	63	\$153.0	\$159.3

Data source: WSDOT Capital Program Development and Management.

WSDOT advertises 63 PEF projects during the 2019-2021 biennium

Advertisement status	Quarter ¹	Cumulative ²
Advanced ³	0	0
On time	33	56
Emergent ⁴	3	4
Late	3	3
Total projects advertised	39	63
Early ⁵	0	2
Delayed within the biennium	24	36
Deferred out of the biennium	0	0
Deleted	0	3

Data source: WSDOT Capital Program Development and Management.

Notes: **1** Quarter refers to October through December 2019. **2** Cumulative refers to July 2019 through June 2021. **3** Advanced refers to projects that were moved up from future quarters. **4** Emergent refers to emergency or unanticipated projects. **5** Early refers to projects planned for the quarter that were advertised in a previous quarter.

WSDOT advertises 33 Pre-existing Funds projects on time during the second quarter of the 2019-2021 biennium

October through December 2019

On time (33)

US 2/Eagle Falls Vicinity to Tye Creek - Bridge Decks Overlay	US 97A/7 Miles North of Entiat - Rock Slope Scaling
I-5/SeaTac Northbound Weigh Station 1 - Weigh Station Preservation	US 97A/3 Miles North of Entiat - Rock Slope Scaling
SR 9/Acme Vicinity to Mt. Baker Highway Vicinity - Virtual Weigh In Motion	SR 153 /Pateros to South of Methow - Seal
SR 99/NB Duwamish River Bridge - Select Grid Deck Replacement	SR 153/Methow North - Seal
SR 522/I-5 to NE 123rd St. - Paving	SR 282/Ephrata East - Seal
SR 522/NE 78th St. to NE 123rd St. - ADA Compliance	SR 3/Chico Creek - Remove Fish Barrier
SR 522/NE 123rd St. to NE 147th St. - Paving	SR 3/Chico Way Bridge Vicinity - Remove Fish Barriers
SR 522/NE 123rd St. to SR 523 - ADA Compliance	SR 16/Snake Lake and Union Ave. - VMS Replacement
SR 522/58th Ave. NE to 61st Ave. NE - Paving	US 101/Lower Hoh Road - Intersection Improvements
SR 524/Yew Way - Railroad Crossing Improvements	US 101/Unnamed Tributary to Hoh River - Remove Fish Barrier
SR 20 & 153 Bridge Deck Preservation	US 12/SR 124 to McNary Pool Eastbound - Paving
US 2/Eastside of Stevens Pass - Paving	US 97/Lateral 1 - Intersection Improvements
SR 20/7 Mi. West of Rainy Pass - Flood Deflection Berm	US 97/SR 22 - Intersection Improvements
SR 20/Winthrop to SR 153 - Seal	US 97/Progressive Road - Intersection Improvements
SR 20/Aeneas Valley East - Seal	I-90/US 2 Garden Springs to Broadway Ave - Ramp Meters
SR 24/ Bench Rd. Intersection Improvements	I-90/Sprague I/C to Argonne I/C - Paving
US 97A/1 Mile North of Entiat - Rock Slope Scaling	

Emergent (3)

SR 99/George Washington Bridge - Emergency Bridge Repair	SR 21/Keller Ferry Sanpoil Repairs
I-82/SR 397 Interchange Eastbound - Emergency Bridge Repair	

Late (3)

SR 512/East of Pacific Ave. S to East of Canyon Rd. E - Paving	Southwest Region/Regionwide Curve Warning Sign Update 2017-2019
SR 512/SR 512 Bridge over Waller Rd. - Bridge Repairs	

Delayed (24)

I-5/Maytown/Scatter Creek SRA - Security Camera Installation - Olympic Region	I-90/Schrag Eastbound Safety Rest Area - Water System Rehabilitation - Eastern Region
US 101/Hoquiam River-Riverside Bridge - Bridge Painting	US 101/Bagley Creek - Remove Fish Barrier
SR 9/Unnamed Tributary to Pilchuck Creek - Fish Passage	SR 105 Spur South of Ocean Ave. and Montesano St. - Roundabout
SR 11/Hoag's Creek - Fish Passage	I-705/I-5 to Pacific Ave. - Expansion Joint Replacement Stage 3
SR 203/Eugene St. Vicinity to Carnation City Line - Paving (City Lead)	I-5/SR 506 to Rush Road Interchange - Illumination Rebuild
SR 527/Penny Creek - Fish Passage	I-5/Woodland Vicinity at Horseshoe Lake - Upgrade Pump System
North Central Region Sign Update 2017-2019	SR 14/0.8 Miles West of Wind River Rd. - Slope Stabilization
North Central Region Sign Update 2019-2021	SR 14/1.1 Miles West of Wind River Rd. - Slope Stabilization
I-90/Silica Rd. to Adams County Line - Cable Barrier Upgrades	I-205/SR 14 Interchange - Illumination Upgrade
US 12/Anderson Rd. to Moon Rd. - Safety Improvement	I-90/Cle Elum Vicinity Westbound - Weigh Station Preservation
US 101/Vicinity Deer Park Rd. to Dungeness River Bridge - Install Cable Barrier	SR 240/Columbia Center Blvd. - Pedestrian Facility Improvement
US 101/Siebert Creek - Remove Fish Barrier	I-90/Barker Rd. Intersection Improvements

Data source: WSDOT Capital Program Development and Management.

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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 every GNB published to date. Online versions might include corrections and may not exactly match print versions.

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 (see 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. The GNB and GNB Lite are printed in-house by Ronnie Jackson, Trudi Phillips, Talon Randazzo, Andrew Schoen and Larry Shibler. 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 73			GNB 74			GNB 75			GNB 76	
Calendar	Q1 2019			Q2 2019			Q3 2019			Q4 2019		
State Fiscal	Q3 FY2019			Q4 FY2019			Q1 FY2020			Q2 FY2020		
Fed. Fiscal	Q2 FFY2019			Q3 FFY2019			Q4 FFY2019			Q1 FFY2020		

2019-2021 biennial quarters (used by Legislature)

Period	Quarter	Period	Quarter
Jul – Sep 2019	Q1	Jul – Sep 2020	Q5
Oct – Dec 2019	Q2	Oct – Dec 2020	Q6
Jan – Mar 2020	Q3	Jan – Mar 2021	Q7
Apr – Jun 2020	Q4	Apr – Jun 2021	Q8

The Gray Notebook is prepared by:
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Washington State Department of
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