

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 72 • December 2018

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KEEPING UP WITH UPKEEP

WSDOT WORKING TO MAINTAIN HIGHWAY SYSTEMS STATEWIDE

On top of it

WSDOT's pavement program aiming to improve state roads

Amped up

Plug-in Electric Vehicle usage seeing upswing throughout Washington

Tracked results

WSDOT's freight rail systems help get goods across the state

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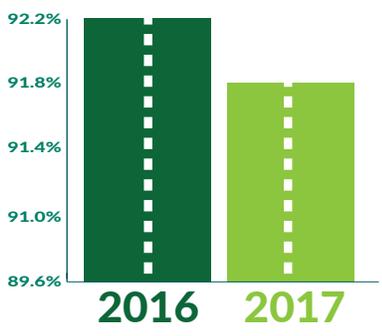
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Dashboard removal

The Gray Notebook no longer features dashboards on asset management as they were inconsistent with the state asset management plan. The Results Washington dashboard was also removed because the measures it previously tracked no longer exist.

PERFORMANCE HIGHLIGHTS reported for the quarter ending December 31, 2018

PERCENTAGE OF PAVEMENT LANE MILES IN FAIR OR BETTER CONDITION DECREASED TO 91.8% BETWEEN 2016 & 2017



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

77 PERCENT of **highway maintenance** asset condition targets were achieved by WSDOT in 2018

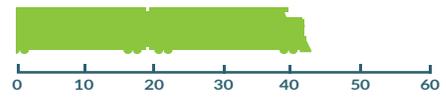
57 PERCENT decrease in the number of **environmental violations** issued to WSDOT and its contractors in 2018 compared to 2017

52.7 MILLION transactions were processed by **WSDOT toll facilities** during fiscal year 2018

WSDOT has 43 FREIGHT RAIL PROJECTS UNDERWAY in 2018

\$23.8 MILLION in economic benefit provided by WSDOT's **Incident Response** teams clearing 13,984 incidents during the quarter

7.4 PERCENT improvement in WSDOT's agency-wide **Recordable Incident Rate** from 2014 to 2018



72 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 launched 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 and details about 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 that the agency attracts and retains a quality workforce to meet its legislative, regulatory, service and public expectations.

The strategic plan's goal teams developed strategies, five for each goal area. Work plans define the actions and deliverables needed to achieve the agency's goals. Articles in this issue, indicated by a box with a goal name, show how these goals are being realized.

In addition to three goals, the strategic plan features a vision, mission and values. WSDOT's vision, defined as where the agency wants to go, is "Washington travelers have a safe, sustainable and integrated multimodal transportation system." The strategic plan's mission is a statement about the agency's core purpose, "We provide safe, reliable and cost-effective transportation options to improve communities and economic vitality for people and businesses."

WSDOT's Strategic Plan features six values, defined as "how we do business" or statements of guiding principles. The values are: safety, engagement, innovation, integrity, leadership and sustainability.

Recent editions of the Gray Notebook have featured articles on Workforce Development and Inclusion efforts at WSDOT. See [page 33](#) in this issue for the Practical Solutions Annual Report, [Gray Notebook 70, pp. 40-43](#) for the Inclusion Annual Report and [Gray Notebook 69, pp. 31-34](#) for the Workforce Development Annual Report.

■ Inclusion Goal

Strengthen commitment to diversity and engagement in all of WSDOT's business processes, functions and services to ensure every voice is heard.

■ Practical Solutions Goal

Prioritize innovative, timely and cost-effective decisions, with our partners, to operate, maintain, plan and build our multimodal transportation system.

■ Workforce Development Goal

Be an employer of choice, creating a modern workforce while attracting and retaining quality workers to deliver our legislative, regulatory, and service requirements.

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STATEWIDE TRANSPORTATION POLICY GOALS

Statewide policy goal/ WSDOT performance measure	Previous period	Current period	Target	Target met	Five-year trend (unless noted)	Desired trend
Safety						
Rate of traffic fatalities per 100 million vehicle miles traveled statewide (Annual measure: calendar years 2016 & 2017)	0.88	0.92	<1.00 ¹	✓		↓
Rate of recordable incidents for every 100 full-time WSDOT workers (Annual measure: calendar years 2017 & 2018)	4.7	5.0	<5.0	—		↓
Preservation						
Percentage of state highway pavement in fair or better condition by vehicle miles traveled (Annual measure: calendar years 2016 & 2017)	92.2%	91.8%	≥ 90%	✓		↑
Percentage of state bridges in fair or better condition by bridge deck area (Annual measure: fiscal years 2017 & 2018)	91.8%	92.5%	≥ 90%	✓		↑
Mobility² (congestion relief)						
Highways: Vehicle Miles Traveled (VMT) on state highways (Annual measure: calendar years 2016 & 2017)	34.2 million	34.6 million	*	N/A		↓
Highways: Average incident clearance times for all Incident Response program responses (Calendar quarterly measure: Q4 2017 & Q4 2018)	13.5 minutes	13.6 minutes	*	N/A		↓
Ferries: Percentage of trips departing on time ³ (Fiscal quarterly measure: year to year Q2 FY2018 & Q2 FY2019)	95.6%	93.6%	≥ 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 2017 & 2018)	129	78	*	N/A		Not applicable
Cumulative number of WSDOT fish passage improvement projects constructed (Annual measure: calendar years 2016 & 2017)	316 ⁶	330	*	N/A		↑
Stewardship						
Cumulative number of Nickel and TPA projects completed ⁷ and percentage on time ⁸ (Calendar quarterly measure: Q3 2018 & Q4 2018, trendline for percentage on time)	380/ 87%	382/ 86%	≥ 90% on time	—		↑
Cumulative number of Nickel and TPA projects completed ⁷ and percentage on budget ⁸ (Calendar quarterly measure: Q3 2018 & Q4 2018, trendline for percentage on budget)	380/ 91%	382/ 91%	> 90% on budget	✓		↑
Variance of total project costs ⁷ compared to budget expectations ⁸ (Calendar quarterly measure: Q3 2018 & Q4 2018)	Under budget by 1.5%	Under budget by 1.6%	On or under budget	✓		Not applicable

Data source: WSDOT Office of Strategic Assessment and Performance 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** The 2016 number differs from previous publications to reflect the most recent available data. **7** Construction projects only. **8** Budget and schedule expectations are defined in the last approved state transportation budget. See [p. 38](#) for more information.

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

WSDOT reports MAP-21 highway safety performance targets for 2019

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

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. WSDOT and

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.

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.

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

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.

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	FY2017	FY2018	Goal	Goal met	Comments
Capital Program and Maintenance Effectiveness					
1 Percent of terminal projects completed on time ¹	75%	50%	90%		One of two terminal projects were completed on time in FY2018; decreased from FY2017
2 Percent of terminal projects completed on budget ^{1,3}	100%	100%	90%		Two of two terminal projects were completed on budget in FY2018; no change from FY2017
3 Percent of vessel contracts completed on time A) Existing vessels ² B) New vessels	81% 0%	82% N/A	75% 100%	 N/A	A) Nine of 11 vessel contracts completed on time in FY2018; increased from FY2017 B) No new vessels in FY2018; M/V <i>Chimacum</i> delivered two weeks late in FY2017
4 Percent of vessel contracts completed on budget ³ A) Existing vessels ² B) New vessels	88% 100%	73% N/A	75% 100%	 N/A	A) Eight of 11 vessel contracts were on budget; decreased from FY2017 B) No new vessels in FY2018
14 Preliminary engineering costs A) As a percent of terminal capital project costs B) As a percent of existing vessel capital project costs	11.2% 9%	2.2% 4%	<16.7% <17%	 	A) Preliminary engineering costs for terminal capital projects met the goal in FY2018 B) Preliminary engineering costs for vessel capital projects met the goal in FY2018
15 Average vessel out of service time	9.3 weeks	9.8 weeks	<8 weeks		Missed vessel out of service time due to vessel mechanical issues; increased from FY2017
Safety Performance					
5 Passenger injuries per million passenger miles	0.70	0.41	<1.0		Passenger injury rate was within the goal of less than one in one million; decreased from FY2017
6 OSHA ⁴ recordable crew injuries per 10,000 revenue service hours	6.8	9.9	<7.6		Missed the goal for reduced OSHA recordable crew injuries; increased from FY2017
Service Effectiveness					
7 Passenger satisfaction with Ferries' staff customer service ⁵	95%	95%	90%		Exceeded passenger satisfaction for customer service goal; no change from FY2017
8 Passenger satisfaction with cleanliness and comfort of Ferries terminals, facilities and vessels ⁵	90%	88%	90%		Missed passenger satisfaction for cleanliness and comfort goal; decreased from FY2017
9 Passenger satisfaction with service requests made via telephone or Ferries' website ⁵	91%	90%	90%		Met goal for passenger satisfaction with service requests; decreased from FY2017
16 On-time performance level (percent of trips departing within 10 minutes of the scheduled departure time)	93.4%	91.3%	95%		Missed the on-time performance level goal; decreased from FY2017
17 Service reliability level (percent of scheduled trips completed)	99.4%	98.9%	99%		Missed service reliability level goal; decreased from FY2017
Cost Containment Measures					
10 Annual operating cost estimate per passenger mile compared to budgeted cost	-1.7%	1.0%	Within 5% of budget		Met goal for annual operating cost per passenger mile; worse than FY2017
11 Annual operating cost estimate per revenue service mile compared to budgeted cost	-0.3%	2.2%	Within 5% of budget		Met goal for annual operating cost per revenue service mile; worse than FY2017
12 Overtime hours as a percentage of straight time hours compared to budgeted overtime hours	0.8%	0.8%	Within 1% of budget		Met goal for annual overtime as a percentage of straight time; no change from FY2017
13 Gallons of fuel consumed per revenue service mile compared to budgeted fuel consumption	3.4%	1.0%	Within 5% of budget		Met goal for fuel consumption per revenue service mile; better than FY2017

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 FY2017 (July 2016 through June 2017) and current reporting period is FY2018 (July 2017 through June 2018). "<" 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** OSHA = Occupational Safety and Health Administration. **5** Percentages include neutral responses from customers.

Notable results

- From 2014 to 2018, WSDOT's agency-wide recordable incident rate improved 7.4%
- From 2014 to 2018, WSDOT's agency-wide days away, restricted or transferred rate worsened 14.8%

Worker health report moving to Workforce Development article

WSDOT's worker health report, previously included with worker safety, will become part of the Workforce Development Annual Report, scheduled to appear in Gray Notebook 73.

The report will feature information on WSDOT's Wellness Program, including employee participation in SmartHealth-related activities. SmartHealth is a voluntary, confidential health and wellness portal for state employees that focuses on positive lifestyle behavior changes.

WSDOT's recordable incident and days away, restricted or transferred rates see increases

WSDOT's agency-wide recordable incident rate (RIR) increased from 4.7 in 2017 to 5.0 in 2018, indicating a 6.4% increase in the number of Occupational Health and Safety Administration recordable injuries per 100 workers at agency worksites. The statewide "days away, restricted or transferred," or DART rate, increased 34.8% from 2.3 in 2017 to 3.1 in 2018. The DART rate is a subset of the RIR where the injuries sustained result in days away from work, restricted work activities or a transfer of job duties.

When looking at Washington State Ferries alone, changes have been more significant than those agency-wide. Between 2017 and 2018, the RIR for WSF went up 18.6 % from 5.9 to 7.0 and its DART rate increased (worsened) by 37.8% from 3.7 to 5.1.

The agency-wide RIR decreased (improved) 7.4% between 2014 and 2018; the DART rate increased (worsened) 14.8% in the same time period. Agency-wide number include WSF and the rest of WSDOT. Between 2014 and 2018, the RIR for WSF worsened by 55.5% and its DART rate was 64.5% higher.

Over the last five years, WSF has faced an increase in ridership coupled with an aging workforce. WSF attributes its rate increases to improvements in how it captures incidents, which are the result of training and awareness as well as proper reporting and documentation methods. WSDOT continues to focus on safety improvement efforts like training, engagement, safety meeting documentation, job shadowing, near miss reporting, and stretch and flex exercising to reduce sprain and strain injuries.

By John Gancel, Jesse Labalan, Anjali Bhatt and Yvette Wixson

WSDOT's agency-wide recordable rate shows five year improvement

2014 through 2018; Average number of recordable incidents and DART rate for every 100 full-time employees per year

Incident rate ¹	2014	2015	2016	2017	2018	5-year % change ²
WSDOT	5.7	4.2	4.3	4.3	4.3	-24.6%
WSF ³	4.5	4.8	5.4	5.9	7.0	+55.5%
Agency-wide ³	5.4	4.3	4.6	4.7	5.0	-7.4%
DART rate ¹						
WSDOT	2.5	1.6	1.6	1.7	2.4	-4.0%
WSF ³	3.1	2.4	3.6	3.7	5.1	+64.5%
Agency-wide ³	2.7	1.8	2.2	2.3	3.1	+14.8%

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" 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 separate due to its marine work environment; agency-wide includes WSF and the rest of WSDOT.

72 PAVEMENT ANNUAL REPORT

Pavement conditions decline slightly in 2017

In 2017, 91.8% of WSDOT-managed pavement lane miles were in fair or better condition, declining slightly from the 92.2% reported in 2016. Despite this drop, the agency met its goal of having at least 90% of pavement lane miles in fair or better condition.

WSDOT determined that 91.5% of vehicle miles traveled in 2017 were on pavement in fair or better condition, a decrease from 91.7% in 2016. Weighting pavement performance measures by vehicle miles traveled allows WSDOT to better capture the experience of the typical motorist.

The agency evaluates the condition of asphalt and concrete pavement on state-managed 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.

Notable results

- WSDOT pavement lane miles in fair or better condition declined, going from 92.2% in 2016 to 91.8% in 2017
- Estimated cumulative savings (since 2010) from resurfacing asphalt pavement with chip seal passed \$120 million in 2017
- WSDOT's pavement Deferred Preservation Liability increased from \$330 million in 2016 to \$346 million in 2017
- The average remaining service life of WSDOT pavement decreased from 48.6% in 2016 to 47.4% in 2017

WSDOT meets targets for short-term pavement conditions despite decline; long-term measures improve 2016 and 2017

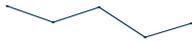
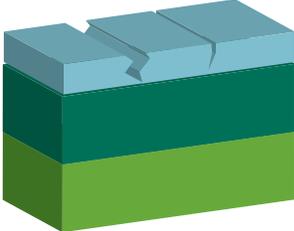
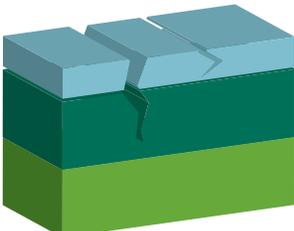
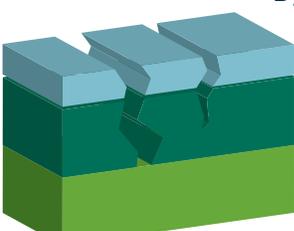
PAVEMENT ANNUAL PERFORMANCE MEASURES ^{1,2}		2016	2017	Agency Target	Target ³	Trend	Desired trend
Short term	Percent of pavement in fair or better condition Measured for asphalt and concrete pavement (chip seal data was not collected in 2016 due to budget constraints; 2017 chip seal data was collected but has not yet been processed). Condition is shown by lane miles and by vehicle miles traveled to reflect road use.	Lane Miles 92.2%	91.8%	90.0%	✓	↓	↑
		VMT ⁴ 91.7%	91.5%				
	Asset Sustainability Ratio ⁵ 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.	0.68	0.90	0.90	✓	↑	↑
Long term	Remaining Service Life ⁵ Average percentage of original total useful life remaining before rehabilitation or replacement is needed; average years remaining before rehabilitation or replacement is needed.	48.6% (7.6 yrs)	47.4% ⁶ (7.7 yrs) ⁶	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.	\$330 million	\$346 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. 11](#) for additional discussion of short- and 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. **6** Between 2016 and 2017, WSDOT updated its RSL calculations to reflect the increased use of strategic maintenance (see [p. 13](#)). This update caused both the RSL in years and the estimates of total expected pavement lifetime to increase. As a result, the RSL percentage decreased.

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

Actual values for 2013 and 2017; Characteristics of pavement at each condition; Percentage of lane miles and vehicle miles traveled (VMT) by condition category

WHAT DRIVERS SEE		WHAT IS HAPPENING		2013	2017	Trend ¹	Desired trend	
GOOD/VERY GOOD			By lane miles	76.5%		75.0%	↓	↑
			By VMT ²	73.5%		73.0%		
<p>This pavement is in good condition with minimal deterioration</p> <p>Road users experience a smooth road with minimal cracks, ruts or potholes</p>								
FAIR			By lane miles	16.7%		16.8%	*	N/A ³
			By VMT ²	19.1%		18.5%		
<p>Managing pavement by lowest life cycle cost (LLCC) means choosing the most cost-effective time to resurface or repair a road—when the surface shows wear, but before the underlying structure is damaged</p> <p>Preventive preservation (maintenance) repairs at this stage can maximize the road's service life</p>								
POOR			By lane miles	5.0%		5.6%	↑	↓
			By VMT ²	5.9%		6.3%		
<p>Waiting to repair a road until it is in poor condition costs more, because damage to the underlying structure requires more expensive pavement restoration (1.5 to 2 times the LLCC)</p> <p>Roads in poor condition cause more wear on vehicles and higher fuel use</p>								
VERY POOR			By lane miles	1.7%		2.6%	↑	↓
			By VMT ²	1.5%		2.2%		
<p>Delaying rehabilitation of pavement in poor condition can lead to deep pavement failure (very poor condition) which requires more expensive reconstruction (3 to 4 times the LLCC)</p> <p>Roads in very poor condition require reactive repairs to hold them together until reconstruction, which is not a good long-term cost saving strategy</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 was collected, but has not yet been processed. Chip seal pavement accounts for 36.7% of lane miles on the state's highway network (up from 35% in 2016), but because chip seal roads have less traffic than asphalt or concrete, they account for only 8% of the vehicle miles traveled on WSDOT's roadway network. Projections of future conditions are not included in this edition of the Gray Notebook because WSDOT's Transportation Asset Management Plan is still in development. The TAMP must be submitted to the Federal Highway Administration by June 30, 2019. ¹ Trends are based on observed condition trends between 2013 and 2017. ² When pavement condition is weighted by VMT, roadways with more traffic are weighted more heavily than less traveled roads. Weighting pavement condition by VMT better accounts for the higher costs to maintain and preserve roads with more traffic. ³ N/A = Not Applicable. Because pavement in fair condition may have entered that category by either improving from poor condition or deteriorating from good condition, WSDOT does not have a desired trend for the percentage of pavement in fair condition.

Long-term pavement performance measures reflect increased preservation investment in 2017

Connecting Washington funding package helps Asset Sustainability Ratio reach its target in 2017

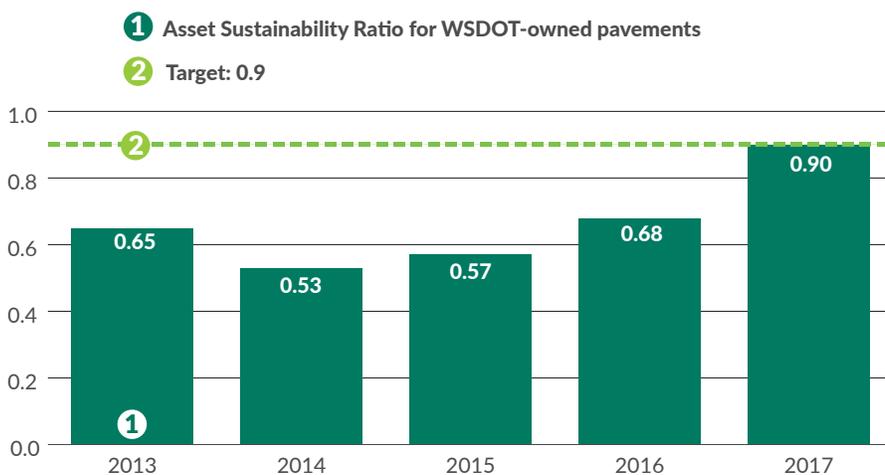
The Asset Sustainability Ratio is the ratio between years of pavement life added to the pavement network in a given year and years of pavement life used up in that same year.

The ASR for WSDOT's pavement network was 0.90 in 2017, reaching its target of 0.90 and indicating that for each year of pavement life consumed in 2017, 0.90 years were added. This represents an improvement from 2016, when the ASR was 0.68. This increase is one of the effects of Connecting Washington, a 2015 funding package that increased the level of pavement preservation funding.

The ASR measures the sustainability of the 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 in that year than were consumed. For example, a network of 18,700 lane miles will consume 18,700 lane-mile years of pavement life every year; if fewer than 18,700 lane-mile years are added to that network in any one year, then that year's ASR will be below 1.0. A sustainable level of investment would yield an ASR that averaged 1.0 over the long term, but varied between 0.9 and 1.1 in any given year. Because of this variation, WSDOT's ASR target is 0.9.

WSDOT's Asset Sustainability Ratio improves and reaches target in 2017

2013 through 2017



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. Projections of future performance measures are not included in this edition of the Gray Notebook because WSDOT's Transportation Asset Management Plan is in development. The TAMP must be submitted to the Federal Highway Administration by June 30, 2019.

Short- and long-term pavement performance measures

Short-term pavement condition indicators provide a snapshot of the state of the pavement network. The categories good/very good and fair indicate pavement conditions that are currently adequate (although pavement in fair condition may require preservation work in the near future). Pavement in poor condition is deficient and needs repair, while very poor condition indicates failure and the need for substantial restoration and possibly reconstruction.

Long-term pavement performance measures (the Asset Sustainability Ratio, Remaining Service Life and Deferred Preservation Liability) supplement the information provided by short-term indicators, informing WSDOT 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.

Remaining Service Life declines

The Remaining Service Life of state-owned pavement decreased between 2016 and 2017, going from 48.6% to 47.4%. The RSL remained within WSDOT's target range of 45% to 55%.

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

RSL is a much less volatile measure than the ASR, which reflects only changes made in a given year. All else being equal, in a year in which the ASR is equal to 1.0, the RSL percentage would be the same as in the previous year.

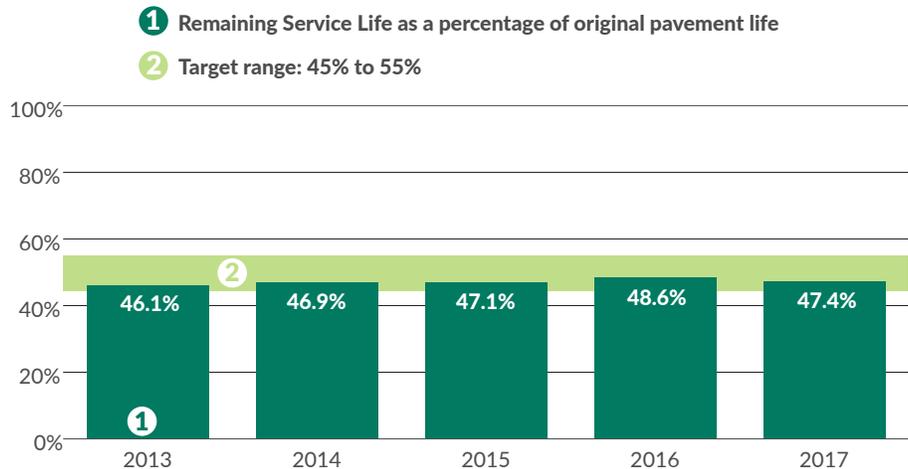
Preservation backlog grows in 2017

WSDOT's pavement Deferred Preservation Liability (also known as the pavement preservation backlog) increased 4.8% from \$330 million in 2016 to \$346 million in 2017. WSDOT's goal is to have a Deferred Preservation Liability of \$0.

WSDOT uses Deferred Preservation Liability—an estimate of the accumulated cost of performing all past-due pavement rehabilitation work—to track how much investment is needed to restore the entire pavement network to fair or better condition.

WSDOT pavements' Remaining Service Life stays in target range in 2017

2013 through 2017; Remaining Service Life shown as a percent of original pavement life

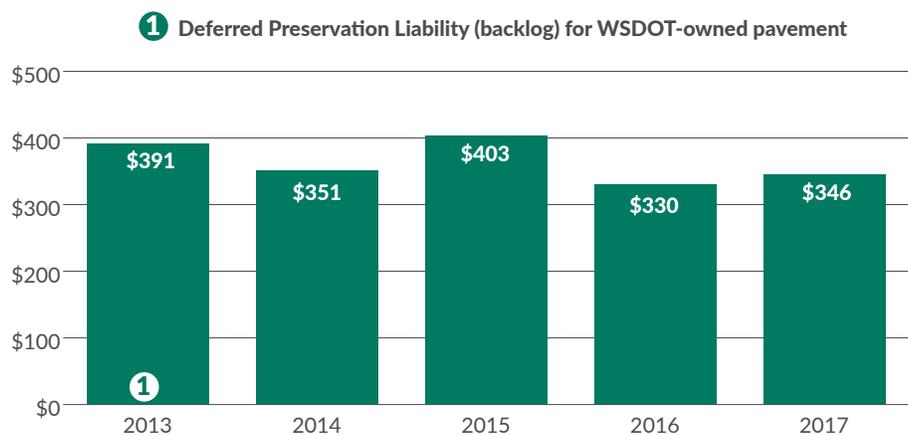


Data source: WSDOT Materials Lab.

Notes: For 2017, the Remaining Service Life of 47.4% is equivalent to an average of 7.7 years remaining before rehabilitation is needed. Projections of future performance measures are not included in this edition of the Gray Notebook because WSDOT's Transportation Asset Management Plan is in development. The TAMP must be submitted to the Federal Highway Administration by June 30, 2019.

WSDOT's Pavement Deferred Preservation Liability increases in 2017

2013 through 2017; 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. Projections of future performance measures are not included in this edition of the Gray Notebook because WSDOT's Transportation Asset Management Plan is in development. The TAMP must be submitted to the Federal Highway Administration by June 30, 2019.

WSDOT uses strategic asset management to better maintain pavements

WSDOT manages just under 18,700 lane miles of highway pavement, as well as over 2,000 lane miles of ramps and special use lanes.

WSDOT uses a Practical Solutions approach to managing its pavement assets by focusing on lowest life cycle cost, aiming to achieve the highest benefit at the lowest cost over the life of the pavement. In support of this goal, the agency uses strategically timed maintenance treatments to extend the lifespan of its asphalt pavements.

Optimally timed maintenance treatments can reduce the average annual cost of a section of pavement substantially. For example, a one-lane-mile section of asphalt pavement costs \$250,000 to resurface. Under certain conditions, spending \$20,000 on maintenance can increase the lifespan of a lane mile of pavement from 12 years to 15, reducing the average annual cost of the pavement by 12% overall.

WSDOT has used strategic maintenance to cost-effectively increase pavement life spans since 2010. This is the practice of using capital budget funds to perform maintenance at strategic times.

Final study results support earlier use of preventive maintenance treatments

Final results from WSDOT's research into preventive maintenance treatments show that all of the studied treatments are effective.

These treatments (such as sealing cracks, chip sealing short sections of pavement, and using asphalt to either patch the roadway surface or replace sections of pavement) can stabilize the pavement conditions for between two and four years, often reducing the annual cost by between 10% and 15%.

The primary recommendation resulting from this research is that preventive maintenance should be applied when pavement distress is first observed. Applying preventive maintenance treatments such as crack sealing and wheel path chip sealing at this stage is very effective, often confining pavement distress to the wheel path. If preventive maintenance treatments are delayed beyond this stage, other repairs such as wheel path digouts (digging out damaged pavement in the wheel path and patching it with new asphalt) can be used. However, these repairs are much more expensive than the treatments that could have been used earlier—for example, wheel path digouts cost nearly three times as much per lineal foot as wheel path chip sealing does.

The research also found that full-lane chip sealing can mitigate a number of pavement distress conditions, and could therefore be used more frequently.

The full final report of the WSDOT's Preventive Maintenance Study is available at: <https://www.wsdot.wa.gov/research/reports/fullreports/871-2.pdf>.

Strategic Plan Goal PRACTICAL SOLUTIONS

Preventive Maintenance:

WSDOT's policy is to not program any large-scale pavement resurfacing projects without first using a maintenance treatment. This policy began in 2014 and has been very successful, with maintenance treatments extending pavement life by up to four years.

Pavement treatments

Pavement treatments are divided into three categories:

- **Maintenance** treatments, such as crack sealing, are the least expensive, but also provide the shortest extension of pavement life.
- **Rehabilitation**, such as resurfacing asphalt pavement, is more expensive than maintenance but can extend pavement life by 10 to 20 years, depending on surface type.
- **Reconstruction**, the most expensive option, extends pavement life by between 15 years (for asphalt pavement) and 50 years (for concrete pavement).

Chip seal comprises 36.7% of WSDOT pavement

2017; 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).

Estimated cumulative savings from resurfacing asphalt pavement with chip seal pass \$120 million in 2017

In 2017, WSDOT's estimated cumulative savings from resurfacing asphalt roads with chip seal surfacing (also known as Bituminous Surface Treatment, or BST) passed \$120 million. Under this Practical Solutions effort, the agency has converted almost 2,300 lane miles of asphalt pavement to chip seal since 2010—over three-quarters of the 3,000 lane miles planned. Approximately 36.7% of WSDOT's pavement network is now made up of chip seal pavement (see graph at left).

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 estimates that it saves approximately \$13,000 per year for each lane mile of asphalt pavement that is resurfaced with chip seal.

Because of this substantial savings, WSDOT has 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). The graph below shows the cumulative savings from chip seal resurfacing since 2010.

WSDOT expects to finish converting the remaining 700 lane miles by 2024. Once all 3,000 lane miles have been converted to chip seal, the agency expects to save \$40 million annually. The progress of the conversion effort is shown in the graph on p. 15. This conversion process will take WSDOT's pavement network from 25% chip seal in 2010 to 40% chip seal in 2024.

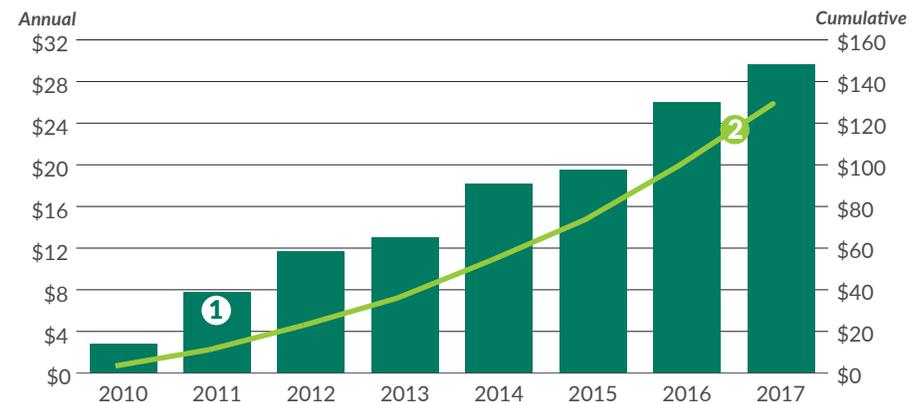
Chip seal resurfacing

Resurfacing an asphalt road with chip seal 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 \$120 million in 2017

2010 through 2017; Dollars in millions

- 1 Annual estimated savings from resurfacing asphalt pavement with chip seal
- 2 Cumulative estimated savings from resurfacing asphalt pavement with chip seal



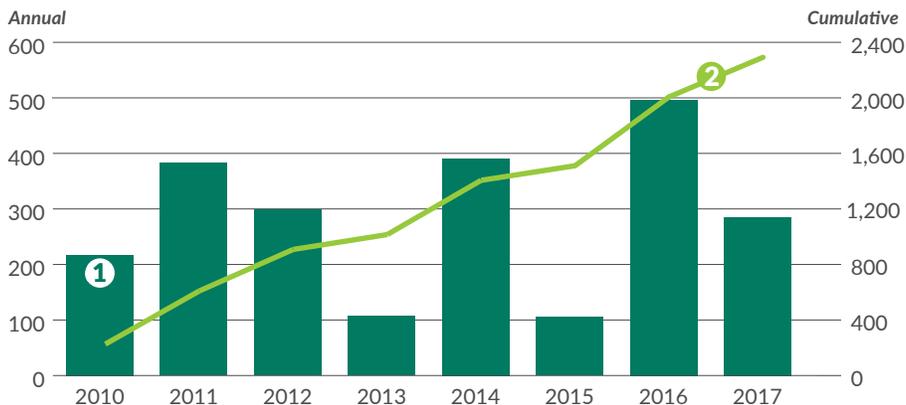
Data source: WSDOT Pavement Office.

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

WSDOT resurfaces nearly 2,000 lane miles of asphalt pavement with chip seal

2010 through 2017; Lane miles of pavement resurfaced

- 1 Lane miles of asphalt pavement resurfaced with chip seal annually
- 2 Cumulative lane miles of asphalt pavement resurfaced with chip seal



Data source: WSDOT Pavement Office.

Note: WSDOT plans to resurface a total of 3,000 lane miles of asphalt pavement with chip seal by the year 2024.

WSDOT collaborates with Washington Asphalt Pavement Association

WSDOT is working with the Washington Asphalt Pavement Association to develop new standards for asphalt pavement density.

The denser a section of asphalt pavement is, the more durable and resistant to water it is, and therefore the longer its lifespan will be. A 1% increase in density can increase asphalt pavement life by approximately 10%.

In order to leverage the impact of density on pavement life, WSDOT is working with WAPA to establish new, higher standards for the density of asphalt pavement in Washington state.

WSDOT receives fourth Perpetual Pavement Award

In November 2018, WSDOT received a Perpetual Pavement Award from the Asphalt Pavement Alliance for a 4.42-mile section of State Route 16 in Pierce County. The 2018 award was WSDOT's fourth 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.

Strategic Plan Goal

PRACTICAL SOLUTIONS

Resurfacing asphalt pavement with chip seal supports Practical Solutions by reducing the average annual cost of resurfaced pavement.

WSDOT uses Practical Solutions strategy for repaving asphalt

WSDOT's primary method of rehabilitating asphalt roadways—called milling and inlaying—allows the agency to resurface only those lanes in need of immediate preservation without creating an uneven road surface. In many areas, this Practical Solutions-based strategy allows WSDOT to pave less-used lanes (such as shoulders, turn lanes and parking strips) less often, reducing the cost of the asphalt pavement preservation program.

Milling and inlaying involves grinding away the top layer of damaged asphalt and overlaying it with new hot mix asphalt. Pavement that has been resurfaced using this technique will be the same thickness after rehabilitation as it was before, unlike pavement resurfaced by adding a layer of asphalt on top of the existing pavement.

WSDOT coordinates to ensure safe superload travel

In 2018, more than 20 superloads (loads weighing over 300,000 pounds, including the weight of the vehicles carrying the loads) traveled on Washington highways, including three superloads weighing more than 1 million pounds each.

Multiple WSDOT offices coordinate in order to ensure that these superloads can travel Washington highways safely and efficiently.

WSDOT developing Transportation Asset Management Plan

WSDOT is currently developing a Transportation Asset Management Plan in order to comply with federal requirements first established under the Moving Ahead for Progress in the 21st Century Act (MAP-21; see [pp. 5-6](#)). As part of this development process, which also includes establishing performance measures and targets, the agency must estimate future performance based on available funding and investment strategies. Because the process is not yet complete, projected pavement performance measures are not included in this edition of the Gray Notebook. The TAMP must be submitted to the Federal Highway Administration by June 30, 2019.

Offices involved include Commercial Vehicle Services (for permitting), and the Bridge & Structures and State Pavements offices (to ensure preservation of the integrity of WSDOT's infrastructure). WSDOT Region offices and the Washington State Patrol also analyze superloads to ensure safe and efficient transport as well as compliance with any movement restrictions.

WSDOT to test precast concrete pavement in 2019

In spring 2019, WSDOT will conduct a trial of precast concrete pavement on I-90 near Preston. Precast pavement consists of slabs of concrete that are fabricated offsite before being trucked to the repaving site. It costs more than conventional concrete pavement (the concrete pavement itself costs three times as much, before accounting for

other project costs) 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.

Contributors include Casey Fraisure, Jianhua Li, Mark Russell, Tim Rydholm, Jeff Uhlmeier, Kim Willoughby, Helen Goldstein and Joe Irwin



One of the three superloads weighing over one million pounds that traveled Washington highways in 2018. This superload, pictured just off SR 14 in Sundale, weighed 1,006,000 pounds.

72 HIGHWAY MAINTENANCE ANNUAL REPORT

Highway conditions hold steady in 2018

WSDOT met 77% (20 of 26) of its highway maintenance asset condition targets in 2018—the same percentage as in 2017. During the 2017-2018 winter, freezing lowland temperatures caused frequent black ice situations and mountain passes received above average snowfall. As a result, \$2.5 million in funding was redirected from other planned maintenance activities to respond to these conditions.

WSDOT has a highway maintenance backlog of approximately \$98 million per biennium. While funding has remained relatively consistent, it does not keep pace with system additions or increases in unavoidable costs. This leads to deferring highway maintenance activities and reducing levels of service, making it more difficult for WSDOT to achieve performance targets. To see a table that shows the desired results as indicated by the level of service and the task completion percentage for selected assets, go to <http://bit.ly/TaskCompletion>.

WSDOT meets 20 of 26 maintenance targets in 2018

WSDOT measures the annual performance of 26 maintenance activities, excluding Urban Tunnel System Operations. This activity was removed from 2017 and 2018 calculations because the facilities in that category were under construction. 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.

The table on the next page shows maintenance activities, ordered from highest to lowest priority; Level of Service scores; and funded level-condition targets for WSDOT. LOS scores use a letter grading scale, with A being the highest and F being the lowest.

The following LOS activities received letter grades below target levels:

- **Noxious Weed Control** missed its target of a B, receiving a C rating. This is a result of multiple years of budgetary and staffing challenges, as well as the prioritization of maintenance activities during weed control season.
- **Slope Repair** missed its target of an A, receiving a C rating. This is primarily a result of an unusually wet winter and spring, which caused excessive erosion. Budgetary and staffing challenges were also contributing factors.
- **Pavement Marking Maintenance** missed its target of a D, receiving an F rating. This work suffered due to a wet spring and ongoing budgetary and staffing challenges.

Notable results

- *WSDOT met 77% of its highway maintenance asset condition targets in 2018, the same percentage as in 2017*
- *WSDOT processed 222,585 maintenance records in 2018 using HATS (WSDOT's maintenance management system)*
- *WSDOT assessed the condition of all guardrail (approximately 2,100 miles) in the state in 2018 using HATS*

HATS data collection increases 22% in 2018

WSDOT continues to develop and enhance HATS, a tool that documents work activities in the field with 1,200 iPads used by frontline maintenance staff each day. Since the launch of HATS in 2008, and a major update in 2015, the agency has developed a clearer understanding of the condition of assets in the field, along with maintenance tasks performed. The system helps WSDOT better manage the funding it receives each biennium.

Maintenance technicians added 28,216 assets to the HATS inventory and completed 222,585 records of work activities in 2018. This averages to over 610 HATS record entries per day, a 22% increase from 2017.

■ **Barrier Maintenance** missed its target of an A, receiving a B. This is a primarily a result of damage caused by the traveling public (third party damage).

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

■ **Highway Lighting Systems** missed its target of an A, receiving a B rating. Resources for highway lighting were diverted to repairing third party damage. Staffing challenges and increasing utility and material costs were also contributing factors.

WSDOT uses HATS to rapidly assess guardrail conditions

In 2018, WSDOT assessed the amount of damaged guardrail statewide. As of October 2018, the agency had assessed 19,495 runs (approximately 2,100 miles) of guardrail and determined that 5,708 (29%) of the runs were damaged.

WSDOT used HATS (WSDOT's maintenance management system) to streamline the guardrail assessment process. Project managers were able to create reporting forms in HATS that were immediately sent—via iPads—to frontline maintenance staff, who then completed guardrail assessments and instantaneously uploaded their completed reports. HATS also has spatial capabilities, allowing WSDOT to create a Geographic Information System map showing the locations of the damaged guardrail runs. To view the map, visit <http://bit.ly/WSDOTguardrail>.

WSDOT meets 77% of highway maintenance asset condition targets

2016-2018; Funded Level of Service asset condition targets and scores achieved

	Funded level (LOS target)	2016 results	2017 results	2018 results
Special Bridge and Ferry Operations	A	A	A	A
Traffic Signal System Operations	C	C	B	B
Snow and Ice Control Operations	A	A	A	A
Bridge Cleaning	B	B	B	B
Urban Tunnel System Operations	B	B	N/A ¹	N/A ¹
Regulatory/Warning Sign Maintenance	C	C	D	C
Intelligent Transportation Systems	A	B	A	A
Slope Repair	A	A	B	C
Catch Basin and Inlet Maintenance	A	B	A	A
Barrier Maintenance	A	A	B	B
Pavement Striping Maintenance	B	B	A	B
Raised/Recessed Pavement Marking Maintenance	C	C	C	C
Vegetation Obstruction Control	C	A	C	C
Rest Area Operations	B	B	B	B
Sweeping and Cleaning	A	A	C	B
Highway Lighting Systems	A	B	C	B
Ditch Maintenance	B	A	B	B
Guidepost Maintenance	D	D	D	D
Stormwater Facility Maintenance	A	A	A	A
Culvert Maintenance	D	B	C	D
Pavement Marking Maintenance	D	C	F	F
Shoulder Maintenance	C	C	C	C
Noxious Weed Control	B	B	A	C
Guide Sign Maintenance	C	C	C	C
Nuisance Vegetation Control	D	D	C	C
Landscape Maintenance	D	C	C	C
Litter Pickup	D	D	D	D
Percent of targets achieved or exceeded		93%	77%	77%
Percent of targets missed		7%	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 2017 and 2018 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 2017 and 2018 reporting periods, so the category was not included in calculations of targets achieved.

Systematic Preventive Maintenance program extends useful life of assets

Systematic Preventive Maintenance focuses on using planned maintenance to extend the useful life of existing bridges in a cost-effective way. The WSDOT Bridge Preservation program has allocated \$6 million to perform SPM on bridges during the 2017-2019 biennium. This additional funding represents a 14% increase in the agency's overall bridge maintenance budget, and a 26% increase in the fixed bridge (bridges with no moveable parts) maintenance budget. Forty-four percent of

the existing bridge maintenance budget is allocated to maintaining and operating tunnels and movable bridges.

As of December 31, 2018, the agency had spent approximately \$3.7 million on SPM bridge projects, which included sealing over 539,000 square feet of deck area and 6,500 linear feet of joints to help keep out contaminants and debris.

Culvert maintenance moving forward with asset management

In July 2017, WSDOT initiated an ongoing effort to perform level one inspections on all culverts by better

capturing condition information. By recording level one inspection results in HATS, the agency has been able to accurately capture culvert feature locations, attributes, deficiencies, and condition assessments using good, fair, poor, critical rating criteria.

WSDOT performed level one inspections on 9,336 culverts—approximately 18% of the agency's statewide culvert inventory—as of October 2018. As referenced in the WSDOT maintenance manual, level one inspections should be performed once every five years. WSDOT's goal is to inspect 20% of culverts every year, in order to ensure that each culvert is inspected

WSDOT manages avalanches to improve pass safety

WSDOT employs two avalanche control teams; one team on Snoqualmie Pass and one on Stevens Pass. The teams make it possible to maintain these mountain passes in the winter and are key to opening Chinook and Washington passes in the spring.

WSDOT's experienced professionals carefully monitor weather and snow conditions to manage avalanche risks to state highways. Teams employ a number of techniques, including explosives, hand charges, bomb trams (a cable pulley that carries explosives into position) and surplus military artillery. The teams also make recommendations on other mitigation techniques such as diversion berms and fences.

The teams play a significant role in assisting maintenance crews in working avalanche danger zones through the use of avalanche beacons, safety protocols and annual training.





Top: WSDOT crews take a closer look at the detachable truck bed which saves time and work associated with unloading and loading trucks during guardrail repair projects.
 Middle: The guardrail rake innovation allows one equipment operator to clean debris from under guardrails—a task that used to require three manual laborers.
 Bottom: The hydraulic brush mower attachment allows one equipment operator to clear brush and tree limbs efficiently.

on this schedule. HATS allows the agency to track the locations of culverts that have not yet been inspected.

The statewide culvert inspection program is an important component of the agency's asset management goals and Practical Solutions. Information gained from tracking level one culvert inspections helps make strategic decisions about where and when to invest limited funds in the transportation system in order to maintain a state of good repair at the lowest practicable cost. Additionally, tracking this information may help with other issues including complying with the federal fish passage injunction and the WSDOT Municipal Stormwater Permit.

Innovation Challenge leads to Practical Solutions at WSDOT

In 2017, Maintenance Operations started a new employee recognition program (Innovation Challenge). The recognition program cultivates ideas, contributes to the agency's Practical Solutions goals and fosters Lean principles. The challenge is open to all full-time maintenance operations employees. All Innovations must be in use and show desired results.

The recognition program seeks to promote innovative solutions to everyday problems maintenance employees encounter. Innovations can range from the development of tools, equipment modifications, technology and techniques that increase safety, reduce costs, improve efficiency and the quality of

transportation. Winning innovations for 2018 included:

First place: Hook lift guardrail repair bed attachment OLYMPIC REGION, PORT ANGELES MAINTENANCE

This innovation creates a interchangeable truck bed that serves as an easy-access mobile work setup. The setup increases productivity by having all materials and tools and equipment in one spot. It also increases employee safety, as it can be placed behind the guardrail and safely off the roadway.

Second place: Guardrail rake attachment for mini excavator NORTH CENTRAL REGION, BRIDGE MAINTENANCE

This innovation eliminates the need for three manual laborers to manually clean under guardrail sections, which decreases the probability for strains and sprains. It also increases productivity and allows the operator to complete multiple tasks in one operation.

Third place: Excavator mounting bracket for hydraulic brush mower attachment OLYMPIC REGION, SHELTON MAINTENANCE

This innovation increased productivity by taking an obsolete cutter head and making it adaptable to a new piece of equipment. The tool allows the crew to clear brush and tree limbs in half the time it took before. It also contributes to safety goals by substituting manual labor for mechanical machine labor.

Contributors include Matt Beattie, Andrea Fortune, Gregor Myhr, Kelly Shields, Joe Schmit, Joe Irwin and Dustin Motte

72 INCIDENT RESPONSE QUARTERLY UPDATE

WSDOT sends Incident Response teams to improve driver safety at 13,984 incidents

WSDOT's Incident Response (IR) teams were dispatched to 13,984 incidents during the fourth quarter (October through December) of 2018. There were 157 fewer incidents during the fourth quarter of 2018 than during the same period in 2017, an 1.1% decrease.

WSDOT teams cleared incidents in an average of 13 minutes and 36 seconds. This is six seconds longer than the average incident clearance time for the same quarter in 2017. In the fourth quarter of 2018, there were 1.7% more incidents lasting more than 90 minutes while incidents lasting 15-90 minutes decreased 3.8%, and incidents lasting less than 15 minutes decreased 0.3% compared to the same quarter last year. The proportion of incidents which blocked at least one lane was 26.2% for this quarter compared to 27% during the same quarter last year.

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. The IR teams help alert drivers about incidents and assist in clearing the roadway to reduce the likelihood of new incidents. A table summarizing the IR program's performance and benefits for the quarter is on the next page.

WSDOT's assistance at incident scenes provided an estimated \$23.8 million in economic benefit during the fourth quarter of 2018 by reducing the impacts of incident on drivers. This benefit is provided in two ways:

- WSDOT reduces the time and fuel motorists waste in incident-induced traffic delay by clearing incidents quickly. About \$13.5 million of IR's economic benefits for the quarter resulted from reduced traffic delay.
- WSDOT helps prevent secondary incidents by proactively managing traffic at incident scenes. About \$10.3 million of IR's economic benefit results from preventing an estimated 2,642 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 this quarter provided drivers roughly \$15.85 in economic benefit.

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

Notable results

- WSDOT responded to 13,984 incidents during the quarter, providing about \$23.8 million in economic benefit
- WSDOT cleared incident scenes in an average of 13 minutes and 36 seconds, reducing traffic delay and the risk of secondary incidents

Fourth quarter (October through December) 2017 and 2018



Fourth quarter incidents trend slightly down from Q4 2017



Data source: Washington Incident Tracking System.

Notes: The data above only accounts for incidents to which an IR unit responded. IR data reported for the current quarter (Q4 2018) is considered preliminary. In the previous quarter (Q3 2018), WSDOT responded to 15,948 incidents, clearing them in an average of 13 minutes. These numbers have been confirmed and are now finalized.

WSDOT's Incident Response provides an estimated \$23.8 million in economic benefit

October through December 2018; Incidents by duration; Times in minutes; Costs and benefits in millions of dollars

Incident duration	Number of incidents ¹	Percent blocking ^{2,5}	Average incident clearance time ^{3,5} (all incidents)	Cost of incident-induced delay ⁵	Economic benefits from IR program ^{4,5}
Less than 15 min.	10,423	14.8%	4.7	\$12.3	\$5.7
Between 15 and 90 min.	3,384	58.0%	30.8	\$30.2	\$13.2
Over 90 min.	177	86.4%	195.1	\$11.5	\$4.8
Total	13,984	26.2%	13.6	\$54.1	\$23.8
Percent change from Q4 2017	↓1.1%	↓0.8%	↑0.7%	↑0.5%	↑0.3%

Data source: Washington Incident Tracking System.

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

- 1 Teams were unable to locate 775 of the 13,984 incidents. Because an IR team attempted to respond, these incidents are included in the total incident count, but are not factored into other performance measures.
- 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 WSDOT's methods to calculate IR benefits.
- 5 Performance measure result figures exclude the number of incidents IR team was unable to locate.

Customer feedback:

- Really appreciate Kyle's help when I got that flat tire on I-90. He was already there before I got done with the road side assistance call to my insurance.
- Dave was very kind and helpful. He was pleasant and very willing to take care of my flat tire. He was wonderful.
- Rachel was extremely helpful in a hard time. She was friendly at the same time: Professional Thank you!

WSDOT teams respond to 177 over-90-minute incidents

WSDOT Incident Response units provided assistance at the scenes of 177 incidents that lasted more than 90 minutes during the fourth quarter of 2018. This is three more incidents—a 1.7% increase—than the same quarter in 2017. While these over-90-minute incidents accounted for only 1.3% of all incidents, they resulted in 21.3% of all incident-related delay costs.

Thirteen of the 177 over-90-minute incidents took six hours or more to clear (referred to as extraordinary incidents). This is eight more incidents than in the fourth quarter of 2017. The 13 extraordinary incidents took an average of eight hours and 48 minutes to clear, accounting for 4.4% of all incident-induced delay costs for the quarter.

The average incident clearance time for all over-90-minute incidents was about three hours and 15 minutes. This is about 33 minutes slower than the same quarter in 2017. Excluding the 13 extraordinary incidents, WSDOT's average clearance time for over-90-minute incidents was two hours and 51 minutes. Performance data reported in this article comes 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 Vince Fairhurst, Michele Villnave, Takahide Aso and Dustin Motte

72 WASHINGTON STATE FERRIES QUARTERLY UPDATE

Ferries service achieves 99.2% reliability

There were 40,539 regularly scheduled ferry trips during the second quarter of FY2019 (October through December 2018). Washington State Ferries completed 99.2% (40,214) of these trips. This exceeds the annual service reliability performance goal of 99% (see table on the next page).

In the second quarter of FY2019, WSF canceled 530 trips and replaced 205 of them, resulting in 325 net missed trips. The highest number of trip cancellations came from the terminals category (175). Most were on the Fautleroy – Vashon – Southworth route due to a bent hanger bar at the Vashon terminal. The hanger bar, which supports the transfer bridge that allows vehicles to board and exit the vessel, was repaired on December 27 after 170 cancellations. A second ferry slip was used to replace 113 of the missed trips while the primary terminal was being repaired.

The second highest number of cancellations was from the “miscellaneous” category (107), with most of those due to reduced sailings; seven vessels were out of service between October 22 and November 3, 2018, which reduced the number of vessels available to service routes. This primarily affected the Fautleroy – Vashon – Southworth route that went from three-boat service to two-boat service, canceling 87 trips but replacing 55. The third highest reason for cancellations was tides and weather, specifically gale force winds, which accounted for 100 missed trips with none replaced on the Port Townsend – Coupeville route.

Ridership increases during the quarter

Washington State Ferries' ridership was approximately 5.5 million during the second quarter of FY2019. This was about 26,000 (0.5%) higher than the same quarter in FY2018, but 1% under projections. Ridership during the second quarter of FY2019 increased on five of the nine routes compared to the same quarter in FY2018.

The Point Defiance – Tahlequah route—one of two routes with service to Vashon Island—experienced the largest increase in ridership (3.5%) compared to the same quarter in FY2018. This increase is likely due to travelers using the Point Defiance – Tahlequah route to access Vashon Island in lieu of the Fautleroy – Vashon – Southworth route which had limited service as stated above.

The largest decrease in ridership was on the Anacortes – Friday Harbor – Sidney, B.C. route. Due to seven vessels being out of service on the dates noted above, a contingency schedule for the Sidney route suspended service for 13 days which resulted in a 15.2% decrease in ridership compared to the same quarter last year.

On-time performance decreases during the quarter

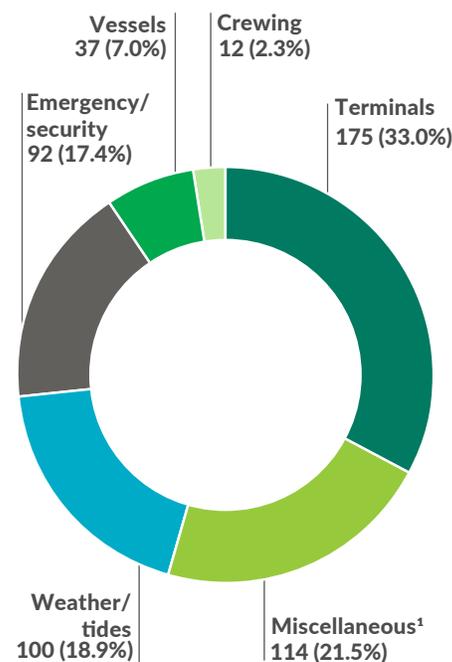
On-time performance decreased to 93.6% in the second quarter of FY2019 compared to 95.6% for the same quarter in FY2018. The quarterly rate is below WSF annual on-time performance goal of 95%.

Notable results

- Ferries made 99.2% of its regularly scheduled trips in the second quarter of fiscal year 2019
- Ferries ridership was approximately 5.5 million in the second quarter of fiscal year 2019, about 26,000 (0.5%) more than the corresponding quarter in FY2018

Terminal issues top reason for cancellations during the quarter

Second quarter (October - December)
FY2019



Data source: Washington State Ferries.

Notes: Fiscal years (FY) run from July 1 through June 30. As a result October - December 2018 represents the second quarter of FY2019. Percentages may not equal 100 due to rounding. ¹ The category for “Miscellaneous” includes schedule resets, reduced sailings, disabled vehicles, environmental reasons, non-vessel related incidents and miscellaneous events that can impact operations. ² Ferries replaced 205 of the 530 canceled trips for a total of 325 net missed trips.

Ferries on-time performance and reliability decrease slightly in the second quarter of fiscal year 2019

October through December FY2018 and FY2019; Annual on-time goal = 95%; Annual trip reliability goal = 99%

Route	On-time performance (second quarter)				Trip reliability (second quarter)			
	FY2018	FY2019	Status	Trend	FY2018	FY2019	Status	Trend
San Juan Domestic	92.5%	87.9%	-4.6%	↓	100.0%	99.8%	-0.2%	↓
Anacortes/Friday Harbor – Sidney, B.C. ¹	93.4%	91.6%	-1.8%	↓	100.0%	98.7%	-1.3%	↓
Edmonds – Kingston	96.9%	96.9%	0.0%	↔	99.8%	99.8%	0.0%	↔
Fauntleroy – Vashon – Southworth	94.3%	94.2%	-0.1%	↓	100.0%	99.0%	-1.0%	↓
Port Townsend – Coupeville	94.6%	95.9%	+1.3%	↑	92.7%	91.4%	-1.3%	↓
Mukilteo – Clinton	98.7%	96.4%	-2.3%	↓	99.6%	99.8%	+0.2%	↑
Point Defiance – Tahlequah	99.3%	98.3%	-1.0%	↓	99.9%	100.0%	+0.1%	↑
Seattle – Bainbridge Island	94.2%	88.3%	-5.9%	↓	100.0%	99.8%	-0.2%	↓
Seattle – Bremerton	96.9%	93.0%	-3.9%	↓	99.4%	99.7%	+0.3%	↑
Total system	95.6%	93.6%	-2.0%	↓	99.5%	99.2%	-0.3%	↓

Data source: Washington State Ferries.

Notes: FY = fiscal year (July 1 through June 30). As a result October - December 2018 represents the second quarter of FY2019. A trip is considered delayed when a vessel leaves the terminal more than 10 minutes later than the scheduled departure time. 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. ¹ Excludes the contingency schedule that suspended service on the route for 13 days.

On-time performance decreased on seven of nine routes compared to the second quarter of FY2018. The Seattle – Bainbridge Island route had the largest decrease (5.9%) compared to the same quarter last year. On average in the second quarter of FY2019, 28 out of 437 (6.4%) daily trips did not leave the terminal within 10 minutes of the scheduled departure time, increasing from an average of 20 out of 444 trips (4.5%) for the same quarter in FY2018.

Employee injury rate increases during the quarter

The rate of passenger injuries per million riders was 0.90 in the second quarter of FY2019. Passenger injuries are defined by the National Transit Database reporting system as any injury with 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 remained below WSF goal of 1.0 injury or fewer per million riders.

The rate of crew injuries reportable to the Occupational Safety and Health Administration increased from 8.9 per 10,000 revenue service hours in the second quarter of FY2018 to 11.1 during the same period in FY2019. This represents seven more injuries than the same quarter in FY2018, and is above WSF annual goal of fewer than 7.6 crew injuries per 10,000 revenue service hours. The category with the most injuries (73%) for the quarter was hearing loss.

Revenue follows ridership, trends up for the quarter

WSF farebox revenue continued its upward trend, coming in at about \$41.6 million for the second quarter of FY2019. Farebox revenue was about \$980,000 (2.4%) more than

the same quarter in FY2018, but also reflected a 2% fare increase that went into effect October 1, 2018. Fare collection was about \$800,000 (1.8%) below WSF projections.

Passenger complaints down for the quarter

WSF received 445 complaints during the second quarter of FY2019. The employee behavior category had the most complaints (134), and loading and unloading was the second largest category with 99 complaints. There were also 26 compliments during this quarter.

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

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

72 AMTRAK CASCADES QUARTERLY UPDATE

Amtrak Cascades on-time performance comes up short of goal in fiscal year 2018

Washington's Amtrak Cascades trains were on time 53.9% of the time in FY2018 (July 2017 through June 2018), down from 56.3% in FY2017. As of FY2018, Amtrak Cascades' on-time performance goal is 88%. This goal was contractually negotiated by WSDOT, Amtrak, and BNSF.

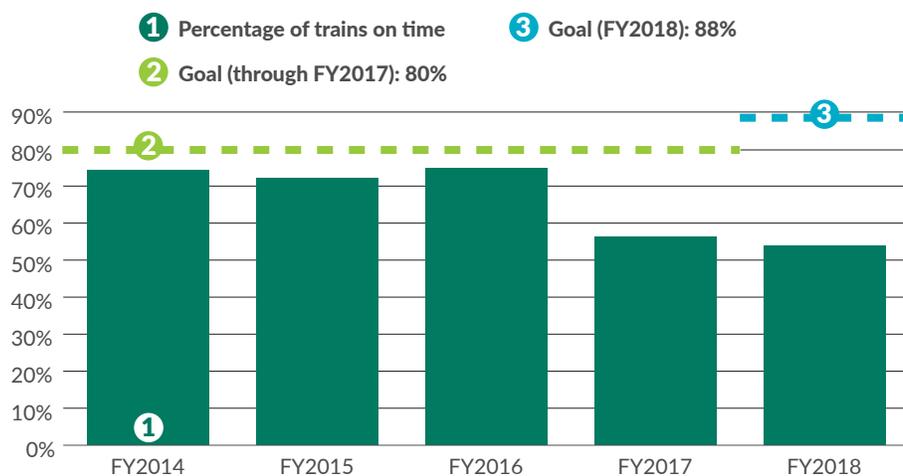
Speed restrictions, train interference top causes of delays affecting Amtrak Cascades on-time performance in FY2018

During FY2018, Amtrak Cascades trains between Portland, Oregon and Vancouver, British Columbia (the portion of the Amtrak Cascades corridor which WSDOT oversees) experienced 155,316 minutes of delay, which negatively impacted on-time performance. Although these delays fell into over 25 separate categories, more than 50% of delay minutes were due to three causes:

- Slow speed restrictions due to track conditions including congestion, raised bridges and weather caused more than 21.4% (33,000 minutes) of delay;
- Freight train interference caused 16.8% (26,092 minutes) of the delay; and
- Passenger train interference accounted for 11.8% (19,339 minutes) of the delay.

Amtrak Cascades on-time performance declines in FY2018

Fiscal years 2014 through 2018; Percentage of trains on time



Data source: WSDOT Rail, Freight and Ports Division.

Note: Data is for trains on Washington segments only. For FY2014-FY2017, trains operating on the Vancouver, British Columbia to Seattle and Seattle to Portland segments were considered on time if they arrived within 10 minutes of scheduled arrival, while trains operating on the Vancouver, British Columbia to Portland segment were considered on time if they arrived within fifteen minutes of scheduled arrival. Beginning in FY2018, all trains overseen by WSDOT are considered on time if they arrive within 10 minutes of scheduled arrival.

Notable results

- The percentage of Washington's Amtrak Cascades trains on time declined from 56.3% in FY2017 to 53.9% in FY2018
- Positive train control is now operational through the entire Amtrak Cascades corridor

Amtrak Cascades

Amtrak Cascades is an intercity passenger rail service that operates between Vancouver, B.C. and Eugene, Oregon.

The service is jointly sponsored and managed by WSDOT and the Oregon Department of Transportation. WSDOT oversees the portion of the Amtrak Cascades corridor between Portland, Oregon and Vancouver, B.C., while ODOT has primary responsibility for service between Eugene and Portland. WSDOT and ODOT pay Amtrak to operate the service.

Amtrak Cascades operates on privately owned tracks; BNSF owns the tracks in Washington and British Columbia, and Union Pacific owns the tracks in Oregon. BNSF provides dispatching services in Washington, as do Union Pacific in Oregon and Canadian National in British Columbia.

Amtrak Cascades' many partnerships are managed through collaboration, service contracts, and agreements.

Positive train control now operational on full Amtrak Cascades corridor

Positive train control is designed to automatically slow or stop trains to prevent collisions, speeding, or improper track movements. PTC is now operational for the entire Amtrak Cascades corridor. The implementation and activation process, completed by Amtrak and the two host railroads (BNSF and Union Pacific) had three elements:

- Trackside equipment was installed and operational;
- Onboard equipment on all WSDOT- and Amtrak-owned locomotives that travel the Amtrak Cascades corridor was operational;
- Amtrak, BNSF and Union Pacific servers were in place and communicating with one another.

All of these elements have now been completed, and system upgrades and corrections are being made as issues are identified.

Train interference delays occur when two trains try to use the same section of track, forcing one train to slow or wait on a siding (a short piece of track off the main line) while the other train passes. Additionally, when one train is delayed and operating outside its allotted time slot, it can affect all other trains operating in the corridor.

BNSF dispatchers in Fort Worth, Texas determine the movement of both freight and passenger trains along the Amtrak Cascades corridor, and are tasked with minimizing delays due to train interference. In keeping with contractual commitments, WSDOT is requiring BNSF to submit corrective action plans for mitigating these and other delays that are under its purview.

Amtrak Cascades sees fewer delays due to landslides in FY2018

In years past, landslides reaching the tracks have been responsible for significant delays. However, the relatively dry winter resulted in fewer landslides along the corridor during FY2018 than in FY2017. In total, 29 Amtrak Cascades trains were disrupted or canceled due to

landslides in FY 2018, compared to 237 trains in FY 2017.

Amtrak Cascades sets new goal of 88% on time

With the 2017 completion of WSDOT's federally-funded rail capital improvement projects, Amtrak Cascades now operates with a goal of 88% on-time reliability. This new goal was one of three service outcomes tied to the federal funding.

The others—two additional roundtrips between Seattle and Portland and a 10-minute travel time savings between the two cities—were delayed as a result of the December 2017 derailment on the new Point Defiance Bypass.

However, the on-time reliability goal is in effect and being enforced in keeping with contracts that WSDOT negotiated with BNSF, Amtrak and Sound Transit. The agencies use a shared database system to report delays; assign responsibility; and indicate that corrective actions are required if the goal is not reached.

Contributors include Teresa Graham, Barbara LaBoe, Janet Matkin, Helen Goldstein and Lisa Mikesell

72 PLUG-IN ELECTRIC VEHICLES ANNUAL REPORT

Plug-in electric vehicle registrations in state surge 42% from 2017 to 2018

Washington state had 42,542 plug-in electric vehicle registrations as of December 31, 2018. This is a 42% increase in PEV registrations from 30,025 in 2017 and a 443% increase from 7,831 in 2013. Washington state is third in the nation in terms of PEV market share, with more than nine PEVs per 1,000 registered vehicles (see map on next page).

The total PEV count includes 28,423 battery electric vehicles and 14,119 plug-in hybrid electric vehicles. In Washington, the general split between BEVs and PHEVs is two to one, respectively (see table below).

With 42,542 plug-in electric vehicles registered at the end of 2018, Washington is on target to meet Gov. Jay Inslee's Results Washington goal of 50,000 by 2020. Increased electric vehicle adoption is expected to help the state progress toward its goals to reduce greenhouse gases, protect public health and the environment and promote economic growth.

Plug-in electric vehicle registrations charge forward in Washington

2013 through 2018; Includes battery electric vehicles and plug-in hybrid electric vehicles

Vehicle type	2013	2014	2015	2016	2017	2018
BEV	5,475	8,499	11,551	14,573	20,010	28,423
PHEV	2,356	3,797	5,028	7,424	10,015	14,119
PEV totals	7,831	12,296	16,579	21,997	30,025	42,542

Data source: Washington State Department of Licensing.

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

WSDOT's electric vehicle ownership increases as part of the Washington State EV Fleets Initiative

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 vehicle purchases will be electric vehicles by 2020. Electric vehicles include battery electric and plug-in hybrid electric vehicles (see sidebar at left for definitions).

This initiative is expected to help reduce vehicle operating costs and reduce greenhouse gas emissions. Gov. Inslee is directing all state agencies, beginning in FY2019 to purchase electric vehicles instead of traditional

Notable results

- Plug-in electric vehicle registrations in Washington increased 443% between 2013 and 2018
- WSDOT decreased its passenger vehicle fleet by 18% from 2013 to 2018 and increased the number of battery electric vehicles and plug-in hybrid electric vehicles in its fleet from 0.2% to 17%

Electric vehicle terms

- **Electric vehicles (EV)** include cars and trucks that use an electric battery as part or all of their fuel source.
- **Plug-in electric vehicles (PEV)** include both battery electric vehicles and plug-in hybrid electric vehicles.
- **Battery electric vehicles (BEV)** are fully electric vehicles that have a battery as their sole energy source.
- **Plug-in hybrid electric vehicles (PHEV)** have both a battery and an internal combustion engine. PHEVs run off the battery until it is drained and then switch to the conventional engine.
- **Hybrid vehicles** have both a battery and an internal combustion engine that work together. Hybrids do not plug into an external power source to recharge the battery.

Note: Electric pedal-assist bicycle usage is not tracked in this article.

internal combustion engine vehicles in applicable vehicle categories (namely passenger vehicles) unless they can prove that an EV option in the market place does not meet the operational needs of the agency.

In an effort to reduce its environmental footprint, WSDOT reduced its statewide passenger vehicle fleet 18%, from 491 in 2013 to 401 in 2018. WSDOT also reduced the number of conventional vehicles in its fleet by 50%, from 409 in 2013 to 204 in 2018, while increasing purchases of EVs.

As of 2018, plug-in hybrids and battery electric vehicles make up 17% of the fleet with 67 vehicles, up from one EV in 2013.

Washington's fast charge network expanding to new corridors

WSDOT has awarded \$1 million in grants through its Electric Vehicle Infrastructure Partnerships Program, which in addition to \$1.5 million in partnership matching funds, is investing about \$2.5 million into new EV infrastructure during the 2017-2019 biennium. These funds are being used to install 15 new charging locations near highway exits about 40 miles apart along I-5, I-90, I-82, US 395 and I-182, expanding the EV network even further. The number of public charging ports in Washington has increased 282% from 629 in 2013 to 2,401 in 2018.

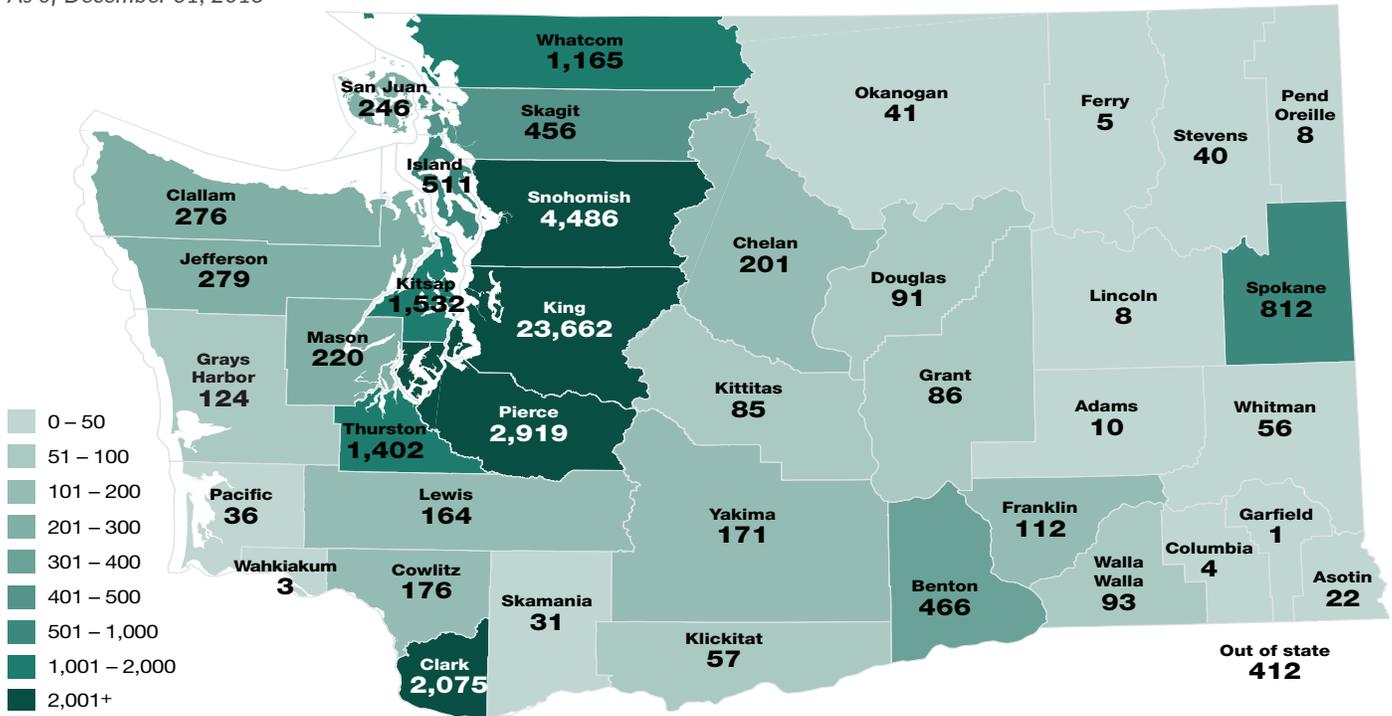
EVIPP grant funding pays for siting, equipment purchases, electrical upgrades, installation, operations and maintenance. WSDOT continues to work with partners across the state—such as Energy Northwest, Greenlots, EV4, Forth, EVgo, local utilities, host site business and car dealerships—to expand its network of electric vehicle charging stations along major highway corridors in Washington.

For more information and to view maps of Washington's current and proposed EV infrastructure, visit www.wsdot.wa.gov/funding/partners/evib.

Contributors include Tonia Buell, Karin Landsberg, Georgina Willner, Anjali Bhatt, Joe Irwin and Lisa Mikesell

Washington's total registered plug-in electric vehicles top 42,500

As of December 31, 2018



Data source: Washington State Department of Licensing.

Notes: Map includes all electric vehicles produced by major auto makers since 2011. It does not include cars converted to EVs by their owners, neighborhood EVs or EV models from the 1990s that are still registered in Washington, or motorcycles. As of December 31, 2018, San Juan County had 246 PEVs, Island County had 511 and Kitsap County had 1,532.

72 ENVIRONMENTAL COMPLIANCE ANNUAL REPORT

Environmental compliance at WSDOT improves in 2018

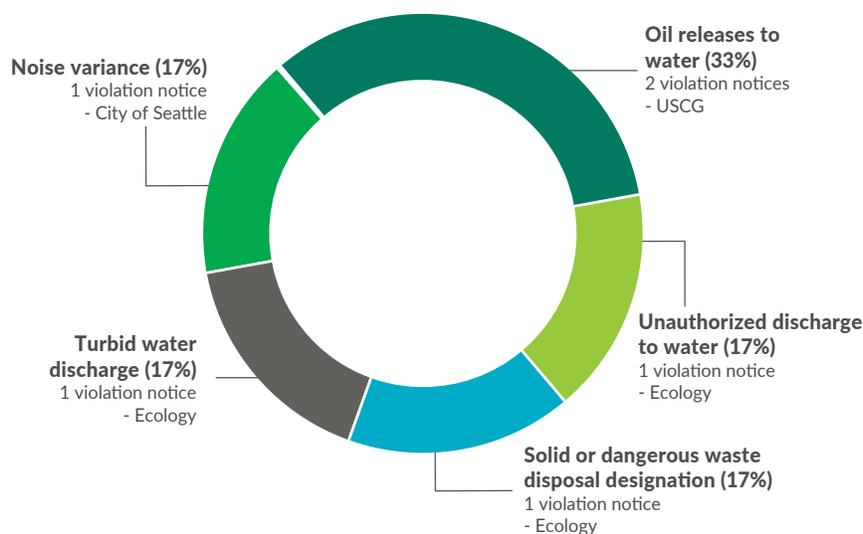
In 2018, WSDOT had 782 construction projects, performed nearly 2.5 million maintenance work hours and made over 161,000 ferry sailings. During this time, WSDOT and its contractors received six formal environmental violations—three from Washington State Department of Ecology, two from the United States Coast Guard and one from the City of Seattle. This was a 57% decrease from 14 formal environmental violations in 2017. This downward trend is attributed to WSDOT's continued efforts to improve compliance throughout the project development process.

Of the six violations, two were issued to highway construction projects and four to ferry terminal construction projects. No violations were issued to maintenance activities.

Violations included an unauthorized discharge to water, a turbid water discharge, two oil releases to water, a noise variance citation, and a solid or dangerous waste disposal designation. Of the six violations, regulatory agencies issued three directly to WSDOT's contractor, and three to WSDOT. Violations were issued directly to the contractor when the regulatory agency determined the contractor was solely responsible or was the permit-holder.

WSDOT activities receive six environmental violation notices in 2018

Number of notices by category and issuing agency



Data source: WSDOT Environmental Services Office.

Note: Percentages may not add to 100 due to rounding. USCG = United States Coast Guard
Ecology = Washington State Department of Ecology.

Notable results

- WSDOT completed nearly 2.5 million maintenance work hours in 2018 without receiving an environmental violation
- Of 782 active construction projects during 2018, fewer than 1% received environmental violation notices

Strategic Plan Goal

PRACTICAL SOLUTIONS

WSDOT and its contractors employ Practical Solutions to prevent costly cleanups and environmental damage. One such Practical Solution tool is the Spill Prevention, Control and Countermeasures Plan, which helps projects avoid and minimize spills. This is a key element for protecting the environment during construction.

Early collaboration results in Practical Solutions

Projects that require work in water must obtain a Hydraulic Permit Approval. The HPA includes strict windows of time for a project's in-water work to protect aquatic species. In the case of the SR 8 Middle and East Forks Wildcat Creek project, receiving approval to shift that work window by just one week led to less overall in-water work, allowed the project to be completed ahead of schedule, and allowed for early revegetation.

WSDOT receives three monetary penalties in 2018

The SR 520 West Approach Bridge North project received one monetary penalty of \$600 from the City of Seattle for a repeat noise violation. The SR 519 Seattle Terminal Building and North Trestle Replacement project received two monetary penalties totaling \$750 from the USCG for oil releases to water.

Collaboration leads to Environmental Process Improvement Award

WSDOT received 21 project nominations from staff for teams or individuals dedicated to environmental stewardship in

2018. While all the nominations demonstrated a commitment to improving environmental conditions, many also supported WSDOT's values of safety, community engagement, innovation, integrity, leadership and sustainability.

The SR 8 Middle and East Forks Wildcat Creek project, an Environmental Process Improvement winner, was exemplary for its innovative and proactive project approach. This project required two construction seasons to remove the fish passage barriers and restore the stream channel through the project footprint, opening up approximately 32 miles of upstream habitat.

To accomplish this, WSDOT coordinated with the Washington Department of Fish and Wildlife to revise the HPA permit to allow for early in-water work. This slight shift resulted in a 50% reduction of time needed for in-water work, which also reduced how long a temporary stream diversion and fish-exclusion were in place. The project also received permission to plant vegetation a year and a half earlier than originally planned, providing greater water absorption during rain events and resulting in less sediment and runoff into the river.

The SR 8 Middle and East Forks Wildcat Creek project displayed WSDOT's commitment to improving the environment while maintaining safe roadways for the traveling public. Coordination between WSDOT and its partner agencies allowed for reduced in-water work, early revegetation efforts, and expanded upstream habitat for a myriad of aquatic species.

Contributors include Gretchen Coker, Molly Sullivan, Anjali Bhatt and Dustin Motte



Above: The new overpass for East Fork Wildcat Creek at SR 8. The full-span bridge design was the preferred option for this project, allowing WSDOT to remove the fish passage barriers and restore the stream channel through the project footprint. Left: The culvert for East Fork Wildcat Creek at SR 8 before the project. The culvert was barely visible in this photo due to overgrown vegetation.

72 FREIGHT SEMI-ANNUAL REPORT

WSDOT has 43 projects underway to improve freight rail structures and movement in 2018

A total of 43 projects to improve freight rail structures and freight movement in Washington were underway as of December 31, 2018. The work, which will continue throughout the remainder of the 2017-2019 biennium and beyond, includes projects funded by the Connecting Washington transportation package, state and federal grants, and a loan program.

Of these 43 freight rail projects, 16 (37.2%) were in the final close out phases, 13 (30.2%) were under construction, nine (20.9%) were being designed, two (4.7%) were in the agreement stage and three (7.0%) were in the initial scope confirmation stage. WSDOT had 29 of 43 (67.4%) in the construction and close out phases by December 31, 2018. This was a higher percentage of projects compared to the end of 2017, when the agency had 24 of 48 (50%) projects in the construction and close out phases.

WSDOT has 13 freight rail projects in construction

2017-2019 biennium; As of December 31, 2017, and December 31, 2018

Program phase	December 2017		December 2018	
	Number	Funding	Number	Funding
Scope confirmation	8	\$5,540,000	3	\$3,127,000
Agreement	7	\$3,917,000	2	\$2,110,000
Design	9	\$12,539,000	9	\$14,350,000
Construction	10	\$22,958,000	13	\$23,343,000
Close out	14	\$6,607,000	16	\$10,759,000
Total	48	\$51,561,000	43	\$53,690,000

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

Notes: The 2017-2019 biennium covers July 2017 through June 2019. Comparison is through December 2017 and December 2018. Funds are rounded to the nearest thousand. Projects primarily consist of those funded through the Freight Rail Assistance Program and the Freight Rail Investment Bank and progress through the phases above each year until completed.

The overall number of projects for the 2017-2019 biennium shows a decrease because eight projects were completed and removed from the list above. Three new projects were approved in the 2018 supplemental budget and added to the list. The list includes projects that cross three different biennia (2013-2015, 2015-2017 and 2017-2019).

All Connecting Washington projects underway in 2018

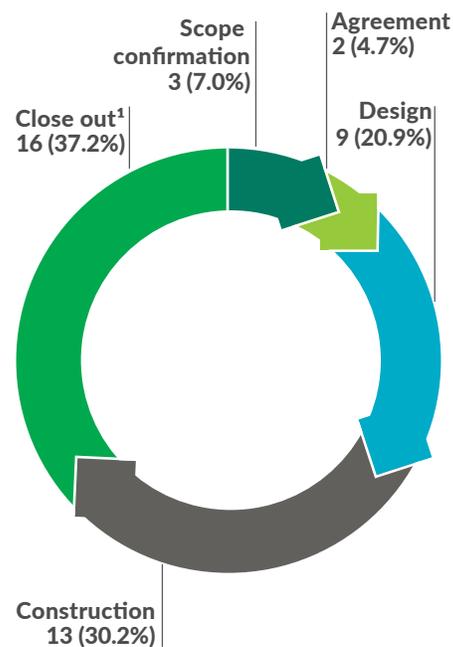
The Legislature funded seven freight rail improvement projects for the 2017-2019 biennium through the Connecting Washington transportation package. These CW projects totaled \$27.3 million and were all in progress by December 31, 2018. The projects included interchange improvements, work at several ports, landslide mitigation along railroad tracks and rehabilitation of existing rail lines.

Notable results

- WSDOT had 43 projects to improve freight rail structures and freight movement underway as of December 31, 2018
- Approximately \$19.7 million in Freight Rail Assistance Program funds supported 29 state freight rail grant projects that were underway in Washington in 2018

Sixteen of 43 freight rail projects reach final close out stage in 2018

As of December 31 2018
(2017-2019 biennium)



Data: WSDOT Rail, Freight, and Ports Division.

Notes: Percentages may not add to 100 percent due to rounding. The 2017-2019 biennium runs from July 1, 2017 through June 30, 2019. Projects primarily consist of those funded through the Freight Rail Assistance Program and the Freight Rail Investment Bank. ¹ Close out includes capturing final records and closing the corresponding work orders.

WSDOT selects new short line operator

The section of the state-owned Palouse River and Coulee City short line railroad between Cheney and Coulee City acquired a new operator in 2018. WSDOT selected The Western Group from Ogden, Utah through a competitive bid process that garnered seven proposers. The company assumed control of the PCC short line on November 5, 2018 and is operating it under the name Washington Eastern Railroad.

Under the 10-year contract, WERR will work with WSDOT, Spokane County, local governments, economic development authorities, shippers, and mainline Class I railroads to develop innovative and efficient operating and shipping methods primarily for eastern Washington farmers and growers.

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.

An eighth project was funded across two biennium (2015-2017 and 2017-2019), with \$2 million allocated in each funding cycle for expansion of the Port of Warden. Four additional projects, originally funded during the 2015-2017 biennium, were either in the closeout phase or were operationally complete in December 2018.

Freight Rail Assistance Program funds 29 projects

Approximately \$19.7 million in Freight Rail Assistance Program funds supported 29 state freight rail grant projects that were underway in 2018.

Of these 29 projects, two were funded in the 2013-2015 biennium and are operationally complete. Twelve were funded in the 2015-2017 biennium and 10 of these were operationally complete or in closeout by December 31, 2018.

The remaining 15 projects were funded in the 2017-2019 biennium at a cost of about \$12.2 million. Seven of these are under construction, three are in design, three are in the agreement phase and two are in the scope development stage. Projects will address work such as rail and tie replacements, rail safety, bridge replacement, new sidings, crossing improvements, tunnel repairs, noise abatement and preservation.

Federal Grant providing funds for new freight rail overpass

A \$900,000 federally-funded project administered by WSDOT had its design completed in 2018 and is about to begin construction on a new freight rail overpass in Ridgefield.

FRIB loan program assists Port of Everett project

A \$5 million project to improve rail operations at the Port of Everett received WSDOT Freight Rail Investment Bank loan program funding in 2018. 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 gets federal grant funds for short line railroad

The Washington State Rural Rail Rehabilitation project was awarded a \$5.6 million Better Utilizing Investments to Leverage Development grant from the United States Department of Transportation in December 2018. 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. State funds will match the federal grant monies, providing a total of \$11.2 million in capital improvements.

Planned improvements include replacing or rehabilitating 10 bridges, and replacing 4.6 miles and rehabilitating 20.8 miles of track. 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.

Contributors include Cameron Harper, Barbara LaBoe, Janet Matkin, Mark Nickerson, Helen Goldstein and Joe Irwin

72 PRACTICAL SOLUTIONS ANNUAL REPORT

Collaboration is key as Practical Solutions aligns WSDOT's investments with its values

Practical Solutions is WSDOT's path forward in a resource-constrained world and guides the agency's vision for aligning WSDOT's investments with its values. WSDOT is emphasizing collaboration with its partners to make the right investments, in the right places, at the right time, while using the right approach. This effort has been underway since 2015 but its development was accelerated when Practical Solutions became one of three agency strategic plan goals which were first emphasized in 2016. The other goals are Inclusion and Workforce Development. For information on the Inclusion goal, see [Gray Notebook 70, pp. 40-43](#), and for Workforce Development, see [Gray Notebook 69, pp. 31-34](#).

Multimodal performance outcomes will guide WSDOT's investment choices to achieve an integrated, sustainable transportation system. This Practical Solutions approach is guiding a 20-year investment strategy which will be developed over the next five years. This investment strategy will ensure legislative policy goals and data-driven return-on-investment analysis shape investment decisions and align with regional and local partners' priorities. For information on state transportation legislative policy goals, see [p. 55](#).

WSDOT's Practical Solutions current work plan is centered on five initial strategies:

- **Practical decision making** - WSDOT is basing agency investment and operating decisions on balancing transportation, community, economic and land use needs, within legal and budgetary constraints.
- **Asset management** - WSDOT is establishing asset management plans supported by needs and funding strategies. Managing assets to appropriate service levels is the agency's priority.
- **Integrate systems and modes** - WSDOT is integrating transportation modes to complement each other, considering system needs and operations (whether on the federal, state or local system) while managing demand to maximize under-utilized capacity.
- **Aligning investments** - WSDOT is working to engage partners to plan, operate and deliver complementary transportation system investments.
- **Budget and policy alignment** - WSDOT will work with policy makers to create a budget structure and legislative policy that allows the agency to fully maximize a Practical Solutions approach to project delivery and daily operations.

Notable results

- *The replacement value of WSDOT's assets was \$181.4 billion as of December 2018*
- *Sixty-three percent of WSDOT employees say they understand the agency's strategic goals, including Practical Solutions*
- *Four WSDOT manuals are being audited to identify changes needed to better support an integrated, sustainable transportation system*

WSDOT's values are part of the agency's strategic plan

- **Safety** - Promote public and employee safety
- **Engagement** - Include all perspectives, disciplines and backgrounds in our outreach and decision making, employing a diverse workforce that reflects the communities we serve
- **Innovation** - Encourage creativity, continuous improvement and the advancement of technology
- **Integrity** - Be ethical, accountable, responsive and trustworthy
- **Leadership** - Inspire, motivate, develop and support each other
- **Sustainability** - Be resource stewards by supporting economic, environmental and community needs

Annual unfunded needs approach \$690 million

\$181.4 B REPLACEMENT VALUE OF ASSETS
↑ **55%¹** HIGHER REPLACEMENT VALUE IN JANUARY 2019 THAN IN JANUARY 2018

\$510 M CURRENT AVERAGE ANNUAL SPENDING²
\$550 M FUTURE AVERAGE ANNUAL SPENDING³

\$690 M ANNUAL ADDITIONAL NEEDS⁴
\$1.24 B AVERAGE ANNUAL BUDGET + NEEDS⁵

Data source: WSDOT Capital Program Development and Management.

Notes: Assets include highways, multimodal (aviation, public transportation, rail), intra-agency (information technology, facilities, fleet, real estate) and ferries. 1 The higher replacement value is primarily due to the addition of the replacement value of WSDOT's land. 2 Ten-year average 2008-2018. 3 Ten-year average, 2018-2028. 4 Additional needs are to maintain assets in a state of good repair, this is the amount that is unfunded. 5 Total of future average annual spending plus annual additional needs.

What is risk management?

Risk management forecasts and evaluates financial risks while identifying procedures to minimize or avoid their impact. Wherever there is an asset, there is an inherent risk. WSDOT identifies, evaluates, analyzes and responds to these risks to minimize impacts, maximize the use of department resources, and improve organizational performance. State and federal laws, Gov. Inslee's and Transportation Secretary Roger Millar's executive orders define and prescribe how WSDOT manages its risks.

WSDOT assets valued at \$181.4 billion

WSDOT considers asset management a key component of Practical Solutions, which aims to cost-effectively manage the assets of the transportation system in good operating condition. As illustrated in the chart to the left, the current replacement value of WSDOT's assets is estimated at \$181.4 billion.

Asset management is a strategic, risk-based approach (see box at lower left for a definition of risk management) to cost-effectively and efficiently manage Washington's transportation system assets. WSDOT manages a range of assets, from highways and ferries, to building facilities, fleets and more. Over the last 10 years through 2018, WSDOT has spent, on average, \$510 million a year to maintain and preserve these assets, and is projected to spend about \$550 million a year over the coming 10 years through 2029.

Limited funds present challenges to performing routine maintenance and preservation activities while the agency's assets continue to age and deteriorate, leading to much more costly reconstruction or replacement of an asset. Currently, the annual additional asset management needs (unfunded) total about \$690 million.

One of the primary management and communication tools is an asset management plan. Asset management plans are a key tool for WSDOT to make decisions about where and when to invest state and federal funds in the transportation system.

As of January 2019, the individual asset management plans that make up the Statewide Asset Management

Plan were 25% complete. This percentage represents the collective progress toward formal completion of 22 individual asset management plans that are being developed as part of the STAMP; no single formal asset management plan is complete, although analysis of available data has been in place for decades to guide past investments. WSDOT expects to have 11 of the formal plans complete by June 2019 and all 22 complete by June 2021.

WSDOT working to achieve understanding of Practical Solutions

One of the first steps in advancing Practical Solutions is to achieve a common understanding of the core principles and how to implement them, which is one of the objectives of the strategic plan's practical decision making strategy.

WSDOT employees were surveyed in October 2018 to gauge their understanding all three of the agency's three strategic plan goals of Inclusion, Practical Solutions and Workforce Development; 63% of employees indicated they understand them. Although Practical Solutions understanding was not asked as a stand-alone question, the results show there is room for improvement. Agency efforts are underway this winter and spring to further that understanding, bringing a Practical Solutions "road show" to the agency's six regions, its Urban Mobility and Access Organization, Washington State Ferries, and other program and project staff.

Sustaining an integrated transportation system

WSDOT is auditing its key technical manuals, policies and other guidance to identify needed changes to better support a sustainable and integrated, multimodal transportation system. Fifteen documents have initially been identified as needing an audit; four of the manuals are currently being reviewed for needed changes, with an expected completion date of July 2019 for all 15.

These audits look for things like language use, lack of multimodal discussion, absence of modal analysis methods and/or tools/data and prioritization of capital solution types. An example of audited items, WSDOT's Design Manual provides polices, procedures and methods for developing and documenting the design of improvements to Washington state's transportation network. Other examples are transportation corridor planning studies guidelines and the agency's maintenance, construction and environmental manuals.

In addition to auditing manuals, WSDOT is identifying and examining possible gaps in policy, data and performance analysis capabilities that will ultimately help the agency achieve better multimodal outcomes and Practical Solutions implementation.

Practical decision making tool in development

The "performance framework" is a Practical Solutions decision making tool box that will help WSDOT establish investment priorities. The framework will help the agency work toward transparent and consistent decisions across business processes, modes and geography. The development of the framework is approximately 39% complete, while implementation, at 5% complete, has just begun.

The performance framework will facilitate consistent and transparent decisions, improve understanding of trade-offs across state legislative transportation policy goals and inform systems-level thinking, and help WSDOT align with its partners. It is being developed incrementally, one goal at a time. For information on state transportation legislative policy goals, see [p. 55](#).

For example, WSDOT is developing measures that will be used to evaluate how the transportation system affects economic vitality throughout the state. WSDOT executives have endorsed the evaluation of mobility performance through the measures of accessibility, predictability and efficiency. Some of these measures include connectivity and major destinations accessible. WSDOT has also endorsed the assessment of economic vitality performance through quality of life and business diversity and growth measures. Because community engagement, transparency and alignment with agency partners are priorities

for development, successful implementation will take time and continued commitment.

Strategies help maintain system and maximize performance

WSDOT uses transportation investment strategies to maintain and preserve our transportation system on an ongoing, systematic basis. Preserving the state's transportation assets saves money while maximizing performance across the transportation network. WSDOT's current budget request is an example of the Practical Solutions approach as it focuses on:

- Maintaining current operations and service levels
- Keeping the agency's challenges from worsening
- Continuing existing capital projects
- Collaborating with agency partners as stewards of an integrated, sustainable, multimodal system
- Making the right investments, in the right time, at the right location
- Identifying potential solutions to increase program and project delivery efficiency

The agency is currently identifying and verifying funding constraints and opportunities, with a goal of reducing the complexity and rigidity of the existing funding structure. This effort will help the agency implement Practical Solutions.

By Marshall Elizer, Brian Lagerberg, Steve Roark, Todd Trepanier, Doug Vaughn, Kerri Woehler and Yvette Wixson

72 WSDOT TOLLING ANNUAL REPORT

Notable results

- *The number of toll transactions increased to 52.7 million in fiscal year 2018, up 5% from 50.1 million transactions in fiscal year 2017*
- *Good To Go!—WSDOT’s all-electronic tolling system—was used to pay for 81% of all toll transactions in fiscal year 2018*
- *Travelers on the I-405 ETL saved an average of 11 minutes between Lynnwood and Bellevue during peak commute times in fiscal year 2018*

Transactions and revenues increase for WSDOT tolling facilities

Fiscal years 2017 and 2018 (July through June); Transactions and revenues in millions

Transactions ¹	FY 2017	FY 2018	Percent change
SR 520 bridge	23.9	25.7	+8%
TNB ²	15.0	15.3	+2%
SR 167 HOT lanes	1.5	1.6	+7%
I-405 ETL	9.6	10.1	+5%
Total	50.1	52.7	+5%
Revenues ¹			
SR 520 bridge	\$83.8	\$91.7	+9%
TNB ²	\$82.0	\$85.4	+4%
SR 167 HOT lanes	\$2.8	\$3.5	+25%
I-405 ETL	\$23.2	\$27.8	+20%
Total	\$191.9	\$208.4	+9%

Data source: WSDOT Toll Division.

Notes: **1** Numbers and percentages have been rounded. **2** TNB = Tacoma Narrows Bridge. I-405 is tolled on weekdays while all other facilities are tolled on weekends as well.

Toll transactions up 5% in fiscal year 2018

WSDOT toll facilities processed 52.7 million transactions in fiscal year 2018 (July 2017 through June 2018), a 5% increase from the 50.1 million transactions in FY2017. Gross revenue from toll facilities—including funds generated by tolls, transponder sales, civil penalties, toll bill reprocessing fees and interest income—increased as a result.

WSDOT collected \$208.4 million in gross toll facility revenue in FY2018, a 9% increase from the \$191.9 million collected in FY2017. In FY2018, toll facilities generated \$162.7 million in net revenue—after operations and maintenance expenses—to cover bond obligations and fund improvements for the corridors on which the money was collected.

WSDOT's tolling facilities in FY2018 included the SR 520 bridge between Seattle and Bellevue, the eastbound SR 16 Tacoma Narrows Bridge between Gig Harbor and Tacoma, the SR 167 High Occupancy Toll lanes between Auburn and Renton, and the I-405 Express Toll Lanes between Lynnwood and Bellevue.

I-405 express toll lanes provide faster, more reliable trips

Drivers made about 44 million trips on the I-405 ETL during the first three years of operation (October 2015 through September 2018). Overall, the I-405 corridor (between Lynnwood and Bellevue) carried up to 23% more vehicles during weekday peak periods, compared to before tolling began.

In FY2018, the I-405 ETL generally provided faster, more reliable trips each weekday for an average of more than 7,800 bus riders and 59,000 commuter vehicles, which included 40,000 toll-paying vehicles and 19,000 toll-exempt carpools and motorcycles. In FY2018, ETL users paid an average toll of \$3.50 and saved 10 minutes during the northbound peak commute between Bellevue and Lynnwood compared to traffic in the general purpose lanes and 11 minutes on the southbound peak commute.

In FY2018, vehicles in the ETL maintained speeds 45 mph or faster 80% of the time during peak periods, missing the legislatively mandated target of 45 mph or faster 90% of the time. Comparatively, in FY2015—prior to the opening of the ETL—the HOV lanes maintained speeds 45 mph or faster 56% of the time. WSDOT is reviewing a variety of operational strategies to improve performance monitoring trends and making adjustments as necessary.

SR 520 tolls and volumes increase in FY2018

WSDOT processed 25.7 million transactions at the SR 520 bridge toll facility in FY2018, an 8% increase from 23.9 million transactions in FY2017. The bridge generated about \$91.7 million in gross toll revenue in FY2018, up 9% from \$83.8 million in FY2017.

Traffic on the SR 520 bridge has increased steadily since tolling began in December 2011 (on the old bridge). On a typical weekday in FY2018, 81,000 vehicles used the bridge, up 2.5% from 79,000 vehicles in FY2017.

Tacoma Narrows Bridge sees more toll transactions in FY2018

On average, 45,000 drivers crossed the Tacoma Narrows Bridge each weekday in FY2018, with the majority (57%) paid using *Good To Go!* accounts. With weekends included, WSDOT processed approximately 15.3 million transactions on the bridge in FY2018, about 340,000 more than in FY2017. This 2% increase in transactions helped revenues grow to a total of \$85 million in gross toll revenue, up 4% from \$82 million in FY2017.

These revenues are keeping the facility on track to meet WSDOT's goal of repaying the debt from the bridge's construction by FY2032.

SR 167 toll lanes transactions increase

The SR 167 High Occupancy Tolling lanes have improved travel times since they were initiated in May 2008. Despite regional traffic growth, the HOT lanes provided faster, more reliable trips—compared to before the HOT lanes were initiated—for 5,800 paying customers and over 2,050 bus riders each weekday in FY2018.

Drivers saved an average of eight minutes during peak northbound and southbound commute times

compared to traffic in the general purpose lanes for an average toll of \$3.70 during peak periods.

WSDOT processed 1.6 million transactions on the SR 167 HOT lanes in FY2018, a 7% increase from 1.5 million transactions in FY2017. In FY2018, the SR 167 HOT lanes generated roughly \$3.5 million in gross revenue, a 25% increase from \$2.8 million in FY2017.

Dynamic tolling increases performance on SR 167 HOT lanes

During the first half of FY2018, SR 167 HOT lane travelers experienced speeds of 45 mph or faster during 77% of peak periods. Construction projects outside of the HOT lane corridor were causing increased congestion which decreased the performance of the HOT lanes. By applying dynamic tolling algorithms, WSDOT was able to increase the performance of the SR 167 HOT lanes during the second half of FY2018, resulting in travelers experiencing speeds of 45 mph or faster during 81% of peak periods—a four percentage point increase from before the algorithms were applied.

Good To Go! tolling system increases customer base

The *Good To Go!* electronic tolling system served more than 856,000 customers in FY2018. About 93,000 new *Good To Go!* accounts were created and 140,000 new passes were purchased in FY2018. Roughly 81% of all toll payments were made through *Good To Go!* accounts.

In July 2015, WSDOT introduced customer service rules allowing first-time forgiveness of civil

Good To Go! pass is the most cost-efficient collection method

Fiscal year 2018; Average WSDOT cost to collect per toll transaction

Payment method	Average collection cost ¹
Good To Go! Pass	\$0.49
Pay by Plate	\$0.50
Pay by Mail	\$1.24
Tollbooths ²	\$1.03

Data source: WSDOT Toll Division.

Notes: For more information about payment methods, visit <http://bit.ly/tollpay>. ¹ Costs averaged across all facilities operating in FY2018. ² Tollbooths are only used on the eastbound Tacoma Narrows Bridge.

Tolling operations annual report available online

For more information on WSDOT tolling operations see the WSDOT Toll Division Annual Report at <http://wsdot.wa.gov/Tolling/publications.htm>.

penalties when a customer agrees to pay their old toll bills. Since the start of the program, *Good To Go!* has helped 240,000 people resolve their toll billing issues, and collected \$10.6 million in late tolls.

In FY2018, WSDOT streamlined the customer service phone system. This reduced call durations and wait times, facilitated access to the program and improved overall service for *Good To Go!* customers.

Contributors include Ethan Bergerson, Meredith McNamee, Mariana Varotto, Joe Irwin and Dustin Motte

Notable results

- *WSDOT completed three Connecting Washington projects in the sixth quarter of the 2017-2019 biennium*
 - *WSDOT removed four projects from its Watch List during the sixth quarter of the 2017-2019 biennium and added 38 projects; 36 remain*
 - *WSDOT advertised 82 of 162 Pre-existing Funds projects during the sixth quarter of the 2017-2019 biennium*
-

WSDOT completes three Connecting Washington projects during the quarter

WSDOT completed three Connecting Washington projects and two Connecting Washington contracts during the sixth quarter of the 2017–2019 biennium (October through December 2018). The agency has completed 15 highway program CW projects (including studies) since the funding package was passed in 2015. These individual projects may represent only a portion of their respective legislative budget line items.

WSDOT also completed one Nickel and Transportation Partnership Account project and three Nickel and TPA contracts during the quarter. The agency also reported on one TPA project that was completed in an earlier quarter. WSDOT has completed 382 total Nickel and TPA construction projects since July 2003, with 86% on time and 91% on budget. The agency currently has five Nickel and TPA projects underway (see p. 48 for additional information).

The cost at completion for the 382 Nickel and TPA construction projects was \$9.77 billion, 1.6% less than the baseline cost of \$9.92 billion. As of December 31, 2018, WSDOT had 12 Nickel and TPA projects yet to be completed, with a total value of approximately \$5.56 billion.

Nickel, Transportation Partnership Account funding continue 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 and do not change with the price of fuel. 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 estimated to be \$4.0 billion, roughly \$904 million (18.3%) 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, Theresa Scott, Aaron Ward, Dan Wilder, Joe Irwin and Lisa Mikesell

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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, 2018; Dollars in millions	Number of Projects	Value of Program
Subtotal of completed construction projects ¹	382	\$9,920.6
<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	12	\$5,558.4
<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	\$16,286.4
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 2017- 2019 Biennium Budget	Cumulative Program
Total number of projects completed	5	382
<i>Percent completed early or on time</i>	40%	86%
<i>Percent completed under or on budget</i>	80%	91%
Baseline cost at completion	\$2,943.7	\$9,920.6
Current cost at completion	\$2,939.3	\$9,765.9
Percent of total program over or under budget	0.1% under	1.6% 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, 2018	5	
<i>Percent advertised early or on time</i>	100%	
Total number of projects advertised for construction during the 2017-2019 biennium (July 1, 2017, through June 30, 2019)	0	
<i>Percent advertised early or on time</i>	N/A	
Projects to be advertised: Results of projects now being advertised for construction or planned to be advertised	Combined Nickel & TPA	
Total number of projects being advertised for construction (January 1 through June 30, 2019)	0	
Percent on target for advertisement on schedule or early	N/A	
Budget status for the 2017-2019 biennium; Dollars in millions	WSDOT biennial budget	
Budget amount for 2017-2019 biennium	\$1,036.6	
Actual expenditures in 2017-2019 biennium to date (July 1, 2017, through December 31, 2018)	\$835.3	
<i>Total 2003 Transportation Funding Package (Nickel) expenditures</i>	\$92.9	
<i>Total 2005 Transportation Partnership Account expenditures</i>	\$615.5	
<i>Total Pre-existing Funds expenditures</i>	\$126.9	

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, 2018. **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.

72 COMPLETED PROJECTS & CONTRACTS UPDATE

Difference between contracts and projects

The Gray Notebook differentiates completed projects from completed contracts. Contracts are basically smaller segments of larger projects (for example pavement replacement on a section of I-5 that are part of a larger concrete rehabilitation program). Completing contracts may or may not mean these larger projects are finished. For example, a project can have three phases and two contracts finished. This project would be complete when all three phases are done.

WSDOT completes three Connecting Washington projects during the quarter

WSDOT completed three Connecting Washington projects and two Connecting Washington contracts during the sixth quarter of the 2017-2019 biennium (October through December 2018). WSDOT also completed two Nickel and Transportation Partnership Account projects and three contracts during the quarter and reported on one completed in an earlier quarter.

US 12/Wildcat Creek Bridge - Replace Bridge

YAKIMA COUNTY (CONNECTING WASHINGTON - PROJECT)

The bridge crossing Wildcat Creek on US 12 east of White Pass was built in 1936 and was showing signs of deterioration due to age and normal wear. This project replaced the older bridge to preserve the structural and functional integrity of this section of US 12.

Contract benefits: The new bridge provides more reliable transportation on US 12 over White Pass.

Budget performance: This project was delivered for approximately \$8.3 million, 31% (\$3.7 million) below the last approved budget of \$12.0 million.

Schedule performance: This project was delivered in October 2018, about one year and one month earlier than the last approved schedule.

Highlights/challenges: The total project cost decreased due to favorable bids provided through the design-build project. Additionally, the ad date was advanced by 13 months which also advanced the operationally complete date.

I-5/Chamber Way Bridge - Emergency Repair and Replacement

LEWIS COUNTY (CONNECTING WASHINGTON - CONTRACT)

The Chamber Way Bridge was hit by an over height load in the southbound lanes in July 2016, causing major structural damage to the southbound span. This emergency contract, which is part of a larger project to improve Chamber Way, removed the damaged span, installed a temporary span to keep Chamber Way open, and replaced the span with a structure consistent with a future interchange reconstruction project.

Contract benefits: The contract replaced the existing structure and temporary bridge that was in place with a taller, wider bridge across I-5 with improved pedestrian and bicyclist access.

Budget performance: This contract was delivered for approximately \$15.5 million, 0.4% (\$67,200) below the last approved budget of \$15.6 million.

Schedule performance: This contract was delivered in November 2018, about one month later than the last approved schedule.

Highlights/challenges: To expedite the repair and replacement contract and keep traffic on I-5 and Chamber Way flowing, WSDOT opted to go with design-build construction. WSDOT held multiple open houses on the project, and worked with the contractor to implement Practical Solutions (like utilizing the existing signal system instead of replacing it) to ensure the contract was completed as efficiently and cost-effectively as possible.

US 101/Lynch Road - Safety Improvements

MASON COUNTY (CONNECTING WASHINGTON & TPA - PROJECTS)

These combined CW and TPA projects built a new acceleration lane for drivers merging onto southbound US 101, eliminating the need for drivers to wait in the highway median before traveling southbound on US 101. Crews also added a second acceleration lane, giving Lynch Road drivers additional room to reach highway speeds before merging onto northbound US 101.

Project benefits: The project helps reduce the potential for collisions and improve traffic flow on US 101 at Lynch Road.

Budget performance: WSDOT initially contributed \$1 million in TPA funds to improve safety to the roadway network on US 101 at Lynch Road. This portion was completed in July 2018. Mason County served as the lead agency for this project and received WSDOT's financial assistance through an additional \$2.6 million from the Connecting Washington funding package. Both portions were on target with their last approved budgets.

Schedule performance: The overall project was delivered in November 2018, on target with the last approved schedule.

Highlights/challenges: The project team evaluated the existing operational and safety performance of the intersection to define the project need. Five alternatives were developed and feedback was solicited from community stakeholders through public and individual meetings. These meetings helped determine that a northbound and southbound acceleration lane would not only reduce the potential for collisions, but also reduce congestion.

US 195/Colfax to Spangle - Add Passing Lanes - Phase 2

WHITMAN & SPOKANE COUNTIES (CONNECTING WASHINGTON - CONTRACT)

This contract completes the overall US 195/Colfax to Spangle Passing Lane project, which provides additional passing opportunities on the corridor to reduce the potential for head-on collisions.

The project was split into two phases with the first phase constructing two passing lanes near Colfax in 2017 and the second phase building four additional passing lane segments on US 195 between the two cities. In total, US 195/Colfax to Spangle Add Passing Lanes project was completed for \$6.6 million.

Contract benefits: Adding northbound and southbound passing lanes helps reduce the potential for head-on collisions on this segment of US 195.

Budget performance: This contract was delivered for approximately \$5.5 million, 5% (\$25,100) above the last approved budget.

Schedule performance: This contract was delivered in October 2018, about one month earlier than the last approved schedule.

Highlights/challenges: Because this overall project was completed in two phases, some of the individual contract costs increased.

I-405/SR 167 Interchange Catch Basins - Drainage Repair

KING COUNTY (CONNECTING WASHINGTON - CONTRACT)

This contract, part of the larger I-405/Renton to Bellevue Corridor Widening project, repaired catch basins at the I-405/SR 167 Interchange to prevent further deterioration of existing drainage structures.

Contract benefits: The project helps extend the life of drainage structures at the I-405/SR 167 Interchange.

Budget performance: This project was delivered for approximately \$2.4 million, 30% (\$550,000) above the last approved budget of \$1.8 million.

Schedule performance: This project was delivered in November 2018, about two months earlier than the last approved schedule.

Highlights/challenges: The project's cost increased due to additional work required to coordinate work with full weekend closures on the I-405/SR 167 Interchange - Direct Connector project. The coordination efforts reduced the impact to the traveling public.



A bird's-eye view of construction at Freya Street as part of the US 395/North Spokane Corridor project. This portion of the larger NSC project was operationally complete in October 2018.

US 395/North Spokane Corridor Freya St. - Structures

SPOKANE COUNTY (NICKEL & TPA – CONTRACT)

This finished contract completes the larger US 395/North Spokane Corridor - Design and Right of Way - New Alignment project by constructing mainline bridges and retaining walls over Freya Street. It also constructed the second phase of mainline retaining walls adjacent to the BNSF tracks. The North Spokane Corridor project in its entirety is due to be completed in 2029 and will include Connecting Washington funds.

Contract benefits: The contract built two mainline freeway bridges over Freya Street, north of Francis Avenue. The bridges now carry the main freeway lanes of the North Spokane Corridor across Freya Street and connect to the existing freeway lanes to the Hillyard industrial area. The contract also separated highway traffic from local traffic, including pedestrians and bicyclists.

Budget performance: This contract was delivered for approximately \$10.3 million, 4.0% (\$397,290) above the last approved budget of \$9.9 million. The overall US 395/North Spokane Corridor - Design and Right of Way - New Alignment project was completed for \$223.4 million, about 2.7% (\$6.3 million) less than the last approved budget of \$229.7 million.

Schedule performance: This contract and overall project were delivered in October 2018, one month earlier than the last approved schedule.

Highlights/challenges: Contract costs were higher than planned primarily due to increases in the unit bid prices of structure items and the addition of railroad flagging.

I-5/M Street to Portland Avenue - HOV

PIERCE COUNTY (NICKEL & TPA
- CONTRACT)

This contract, which is part of the larger I-5/Tacoma HOV Improvement project, demolished and replaced the Pacific Avenue, McKinley Way and L Street bridges over I-5; removed the 30th Street Bridge and built a new northbound bridge over SR 7 and I-705, leaving the existing bridge for HOV. It also widened I-5 and built northbound and southbound HOV lanes from South M Street to Portland Avenue.

Contract benefits: The contract helps reduce congestion on this section of I-5 and enhance driver safety.

Budget performance: This contract was delivered for approximately \$177.2 million, on target with the last approved budget.

Schedule performance: This contract was delivered in November 2018, about three months later than the last approved schedule.

Highlights/challenges: The contract's cost increased by about \$16.4 million over the initial estimates due to different site conditions, unsuitable soil excavation, hazardous materials, additional traffic control needs and staging conflicts.

I-5/Portland Ave. to Port of Tacoma Rd. - Northbound HOV

PIERCE COUNTY (NICKEL & TPA
- CONTRACT)

This contract, which is part of the larger I-5/Tacoma HOV Improvement project, constructed a new northbound I-5 bridge across the Puyallup River. It also reconstructed the I-5/SR 167 interchange, widening the East Bay St. bridges and reconstructing all on- and off-ramps except for the southbound off-ramp to SR 167 and Portland Avenue.

The I-5/Portland Avenue Bridge was widened and the north side ramps were reconstructed. I-5 was widened and a northbound HOV lane was constructed from Portland Avenue to the Port of Tacoma Interchange.

Contract benefits: The contract helps reduce congestion on this section of I-5 and enhance driver safety.

Budget performance: This contract was delivered for approximately \$257.7 million, on target with the last approved budget.

Schedule performance: This contract was delivered in October 2018, on target with the last approved schedule.

Highlights/challenges: The bid opening was delayed to allow more time to negotiate with the Puyallup Tribe on the project's impacts and easement acquisition, and to allow for the in-water work window. These negotiations and addressing tribal concerns delayed the initial start of the project.

I-5/Northbound S. 260th St. to Duwamish River Bridge - Concrete Pavement Rehab

KING COUNTY (NICKEL - CONTRACT)

The contract, part of the larger I-5 Concrete Rehabilitation Program, rehabilitated concrete pavement on I-5 northbound, and included diamond grinding, milling and inlaying of hot mix asphalt road surfaces to match the concrete pavement. The project also rehabilitated two bridge decks.

Contact benefits: Replacing broken concrete panels, repaving and grinding the interstate improves the driving surface, extends the life of I-5 and creates a smoother, safer drive. Replacing expansion joints on the Interurban Avenue and Duwamish River bridges ensures those structures will remain open and operational.

Budget performance: This contract was delivered for approximately \$39.8 million, on target with the last approved budget.

Schedule performance: This contract was delivered in October 2018, on target with the last approved schedule.

Highlights/challenges: This contract's total cost increased by approximately \$8.8 million at award due to higher than expected bids on major work items like mobilization and concrete grinding and concrete panel replacement. The roadway condition was also worse than anticipated, requiring more materials than initially planned.

Watch List information:

A complete list of Watch List projects that have or may have significant changes in scope, schedule or budget can be found using the following link, reported by month: <http://bit.ly/ProjectDeliveryReports>.

Thirty-six projects remain on Watch List

WSDOT added 38 projects with Watch List issues to its two existing projects on the Watch List and removed four this quarter (October 2018 through December 2018), leaving 36 projects on the Watch List as of December 31, 2018. Watch List issues include significant changes or uncertainties in scope, schedule or budget. Projects may have more than one issue.

WSDOT maintains the Watch List to deliver on the agency's commitment to "No Surprises" reporting. WSDOT continuously monitors its projects' performance to ensure issues affecting schedule and/or budget are brought to the attention of legislators, executives and the public. The Watch List provides information on issues that have the potential to impact schedules or budgets of projects funded by Pre-existing Funds, Nickel, Transportation Partnership Account and Connecting Washington program revenue packages.

The Watch List helps track projects that have or may have issues and keep them in the spotlight so that they receive the necessary attention to resolve these issues. Projects are added and removed by WSDOT's Capital Program Development & Management Office. Projects are removed from the Watch List when the project has been completed or the issue has been resolved and the change has been approved by WSDOT.

Projects remaining on the Watch List

Project (County)	Funding	Date added	Project Phase & Watch List issue
SR 290/Spokane River East Trent Bridge - Replace Bridge (Spokane)	TPA	Sep-18	Design: The project was previously reported. The project's estimated cost increased by \$964,000 primarily due to the addition of new design elements.
SR 18/Eastbound Soosette Creek to Jenkins Creek - Paving (King)	PEF	Oct-18	Design: The project's estimated cost has increased from \$2.4 million to \$3.3 million, due mainly to an updated engineer's estimate adjusted for current bid item costs.
I-90/Sprague Ave. Interchange to Argonne Rd. Interchange - Portland Concrete Cement Pavement Rehabilitation Grinding (Spokane)	PEF	Oct-18	Design: The project is scoped to remove ruts in the roadway, primarily caused by studded tires. Grinding work was originally intended to address the pavement leading up to the four bridges, and excluded any bridge deck work. During preliminary engineering, severe rutting was identified on the bridges and WSDOT determined to modify the expansion joints and repair the bridge deck and the approach slab rutting. During the design phase an on-site review of the roadway was performed and more grinding is necessary which also requires a full review of the roadway lanes, curves, shoulders, and side slopes. This project's total cost has further increased by \$3.4 million, from \$7.6 million to \$11.4 million.
SR 181/SR 516 to West James St. - Paving (King)	PEF	Oct-18	Design: The project's estimated cost has increased from \$1.2 million to \$1.8 million. The increase is mainly due to including additional items that were not in the original estimate as the pavement condition has deteriorated more than originally anticipated.
SR 181/SR 516 to West Sam St. - ADA Compliance (King)	PEF	Oct-18	Design: The project's estimated cost has increased from \$440,000 to \$946,000. The increase is mainly due to including additional items that were not in the original estimate as the pavement condition has deteriorated more than originally anticipated.

Projects remaining on the Watch List (Continued)

SR 202/Two Tributaries to Patterson Creek - Fish Passage (King)	PEF	Oct-18	Design: The project's total cost estimate has increased from \$2.9 million to \$5.1 million, mainly due to a design solution change. During design, it was determined that the roadway could not be paved over the precast structures without additional roadway bed preparation.
SR 433/Lewis and Clark Bridge - Replace Navigation Lights (Cowlitz)	PEF	Oct-18	Design: The project's advertisement has been delayed by nine months, because it took longer than anticipated to complete the agreement with the Oregon Department of Transportation. This will delay the operationally complete date by one year, to winter 2020.
I-405/Northeast 132nd St. Interchange - New Interchange (King)	CW	Oct-18	Design: An additional fish barrier removal has increased the project's estimated cost from \$75 million to \$83 million.
SR 501/I-5 to Port of Vancouver - Intersection and Profile Improvements (Clark)	CW	Oct-18	Design: The project's advertisement date has been delayed by one year to winter 2020, and the operationally complete date by one year to fall 2021. The delay will allow WSDOT more time to work with local stakeholders to further define and agree upon the project's needs in order to finalize the scope of work for the project.
SR 507/North of Rainier to Junction SR 7 - Paving (Pierce, Thurston)	PEF	Oct-18	Design: The project's estimated cost has increased by \$1.4 million, to \$4.3 million. The increase is due to an updated engineer's estimate adjusted for current bid item costs, as well as additional bid items identified during the development of the design.
US 2/West of Leavenworth - Slope Stabilization (Chelan)	PEF	Oct-18	Design: The project was previously reported and this is an update to the June 2018 report. The project remains at risk due to design and environmental challenges.
SR 6/Two Tributaries to Chehalis River - Fish Passage (Lewis)	PEF	Oct-18	Design: The advertisement has been delayed by seven months to fall 2019. The schedule delay is because a waterline needs to be relocated.
SR 167/SR 410 to SR 18 - Congestion Management (King, Pierce)	PEF	Oct-18	Design: The project was previously reported. A fish barrier culvert was added to the project, which has increased the project's estimated cost by \$9.2 million and delayed construction by one year, delaying operational completion by one year to fall 2022.
I-205 and I-5 Pavement Rehabilitation (Clark)	PEF	Oct-18	Construction: The project was previously reported. This project was combined for construction efficiencies with the I-5/I-205 Urban Ramp Meter project, but the bid item costs for the urban ramp meter work were double the engineer's estimate. WSDOT decided to re-advertise the panel rehabilitation project as a standalone project in February or March 2019, which will delay the operationally complete date to fall 2019.
SR 518/42nd Ave. South and I-5/I-405 Bridges - Seismic Retrofit (King)	PEF	Oct-18	Design: The project was previously reported and this is an update to the July 2018 report. The project's estimated cost has further increased by \$1.2 million, to \$7.1 million, and reflects minor bid item and quantity cost adjustments prior to a fall 2018 advertisement.
I-5/Northbound I-90 to SR 520 - Active Traffic Management (King)	PEF	Nov-18	Design: The project's estimated total cost has increased from \$13.9 million to \$16.5 million. The increase is mainly due to realized construction risk, approved change orders, and pending high risks to the contract.
I-5/Northbound Seneca St. to Olive Way - Mobility Improvements (King)	PEF	Nov-18	Design: The project's estimated total cost has increased from \$6.6 million to \$8 million. Following the results of the hydraulic analysis, bridge drain modifications were required.
I-5/164th St. SW Interchange - Ramp Paving (Snohomish)	PEF	Nov-18	Design: The project's estimated total cost has increased from \$1.9 million to \$2.5 million, mainly due to an updated engineer's estimate adjusted for current bid item costs.
SR 9/Acme Vicinity to Mt. Baker Highway Vicinity - Weigh in Motion (Whatcom)	PEF	Nov-18	Design: The project's location has changed and adds a traffic enforcement area for the Washington State Patrol. This change has increased the project's estimated total cost by \$2.6 million and delayed the advertisement by nine months.

Projects remaining on the Watch List (Continued)

SR 107/Chehalis River Bridge - Bridge Painting (Grays Harbor)	PEF	Nov-18	Design: The project's estimated total cost has increased from \$3.4 million to \$4 million. The increase is mainly due to an updated engineer's estimate adjusted for current bid item costs as well as higher costs for the portal raising.
I-405/Renton to Bellevue - Corridor Widening & Electronic Toll Lanes (Stage 2) (King)	CW	Nov-18	Design: The Request for Proposal date has been delayed by four months, to allow WSDOT to repackage the environmental documents to meet Federal Highway Administration requirements.
I-405/SR 522 to SR 527 - Widening & Express Toll Lane (King, Snohomish)	PEF	Nov-18	Design: The project's estimated total cost has increased by \$20 million, to \$40 million. This increase will add a right-of-way phase so the project could be advanced to start construction in 2021 (if funded for construction).
SR 518/SR 509 to SR 99 - Paving (King)	PEF	Nov-18	Design: The project's estimated total cost has increased from \$3.7 million to \$4.4 million, due mainly to an updated engineer's estimate adjusted for current bid item costs.
SR 542/Britton Rd. Vicinity to Coal Creek Vicinity - Bituminous Surface Treatment (Chipseal) (Whatcom)	PEF	Nov-18	Design: The project's estimated total cost has increased from \$2.6 million to \$4.7 million. A recent inspection of the project's pavement condition revealed that the pavement has further deteriorated, which has increased the bridge deck and pavement repairs that are required for this project.
Seattle Terminal Preservation (King)	CW	Nov-18	Construction: The project requires an additional \$95.6 million to complete construction, bringing the total funding needed to \$468.5 million. The increase is due primarily to addition of previously deferred scope elements, additional risk reserve need, and final pricing of the 100% design of the contracted scope reflecting final design development.
Mukilteo Terminal Improvement (Snohomish)	CW	Nov-18	Design: The project's estimated total cost has increased by \$28.5 million, to \$195.5 million, due to an increase to the terminal uplands contract, addition of risk reserve and an updated estimate for the in-water work.
I-90/Lacey V. Murrow Bridge - Replace Anchor Cables (King)	PEF	Nov-18	Construction: The project was previously reported and this is an update to the July 2017 report. The project's estimated total cost has increased from \$5.2 million to \$8.6 million. The increase is mainly due to realized construction risk, approved change orders, and pending high risks to the contract.
I-90/Homer M. Hadley Bridge - Replace Anchor Cables (King)	PEF	Nov-18	Construction: The project was previously reported and this is an update to the July 2017 report. The project's estimated total cost has increased by \$1.8 million, from \$2.8 million to \$4.6 million. The increase is mainly due to realized construction risk, approved change orders, and pending high risks to the contract.
SR 107/Chehalis River Bridge - Structural Rehabilitation (Grays Harbor)	CW	Nov-18	Design: The project was previously reported and this is an update to the February 2018 report. The project budget is at risk of increasing. More information on this cost risk will be available at bid opening in January 2019.
I-5/Northbound SR 104 Vicinity to 212th St. Southwest Vicinity - Paving (King, Snohomish)	PEF	Dec-18	Design: The project's estimated total cost has increased from \$3.5 million to \$4.9 million. The increase is mainly due to the project's urban location (Seattle) that increased the unit bid prices for mobilization, asphalt paving, and traffic control.
SR 18/Holder Creek Bridge - Deck Overlay (King)	PEF	Dec-18	Design: The project's total estimated cost has increased by \$600,000, from \$1 million to \$1.6 million. The increase is mainly due to an updated engineer's estimate adjusted for current bid item costs as well as high bids.

Projects remaining on the Watch List (Continued)

SR 203/Loutsis Creek - Fish Passage (King)	PEF	Dec-18	Design: Final results from the Preliminary Hydraulic Design has increased the minimum structure span for the culvert from 17 feet to 30 feet. This has changed the structure type from a culvert to a bridge and will require increased design effort and WSDOT Bridge Office involvement. This has increased the project's estimated total cost from \$2.4 million to \$3.0 million. The project is now anticipated to be operationally complete fall 2020.
SR 522/North Creek Bridge to SR 9 Vicinity - Paving (King, Snohomish)	PEF	Dec-18	Design: The project's estimated total cost has increased from \$5.3 million to \$5.9 million. The increase is mainly due to an updated engineer's estimate adjusted for current bid item costs.
US 395/North Spokane Corridor BNSF - 2nd Railroad Realignment	CW	Dec-18	Design: The project's total cost increased from \$32.6 million to \$79.7 million. The project has realized the opportunity to do more extensive utility relocation work than originally planned, along with additional site preparation work ahead of the next planned North Spokane Corridor project.
US 101/Elwha River Bridge - Bridge Replacement (Clallam)	PEF	Dec-18	Design: The project was previously reported and this is an update to the January 2018 report. The additional work associated with completing the environmental permitting, hydraulic design and geotech designs has delayed construction by one year to 2019 and increased the total estimated cost from \$31.5 million to \$32.5 million.
I-82/Red Mountain Vicinity - Construct Interchange (Benton)	CW	Dec-18	Design: The project was previously reported and this is an update to the August 2018 report: The project schedule remains at risk pending a required Interchange Justification Report's approval by FHWA. This change has further delayed the advertisement date to winter 2021 but remains on schedule for a fall 2021 project completion.

Projects no longer on the Watch List

Project (County)	Funding	Date added	Date removed	Project Phase & Watch List issue
SR 150/No-See-Um Rd. - Intersection Improvements and Realignment (Chelan)	CW	Mar-17	Dec-18	Construction: The project was previously reported and this is an update to the September 2018 report. The outstanding budget risks on this project for contractor claims has been removed. The contractor claim for the project delay has been processed and all right of way negotiations have been settled.
I-90/468th Ave. SE to West Summit Rd. Westbound - Rehab Concrete (King)	PEF	Oct-18	Oct-18	Construction: The project was previously reported and this in an update to the September 2018 report. The project's estimated cost has further increased by \$1.5 million, to \$27.3 million. This increase is mainly due to higher unit bid item prices.
US 97/Swauk Creek Campground - Fish Passage Retrofit (Kittitas)	PEF	Nov-18	Nov-18	Construction: The project's estimated total cost has increased from \$6.5 million to \$7.2 million at award. The increase is mainly due to the project's remote location.
SR 536/Skagit River to I-5 - Paving (Skagit)	PEF	Nov-18	Dec-18	Design: The project was previously reported. The project's estimated total cost has increased from \$1.3 million to \$1.8 million, due mainly to an updated engineer's estimate adjusted for current bid items costs. This project has been awarded and the cost increase has been realized.

Data source: WSDOT Capital Program Development and Management.

Notes: TPA = Transportation Partnership Account. PEF = Pre-existing Funds. CW = Connecting Washington.

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ADVERTISEMENT RECORD QUARTERLY UPDATE

Connecting Washington Account projects in construction ¹ Through September 30, 2018; (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 (King)			
SR 509/SeaTac Stage 1 Elements (WSDOT Contribution)	Advanced	Aug-2022	\$77.9
I-405/Renton to Bellevue - Corridor Widening (King)			
I-405/SR 167 Interchange - Direct Connector (Stage 1)	Delayed	Mar-2019	\$168.3
I-5/116th St. and 88th St. Interchanges - Improvements (Snohomish)			
I-5/116th St. Northeast Interchange - Tulalip Tribes Lead	Delayed	Apr-2019	\$14.0
Land Mobile Radio Upgrade			
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	\$638.3
US 395 North Spokane Corridor (Spokane)			
US 395/North Spokane Corridor - Columbia to Freya	Advanced	Jun-2019	\$20.0
I-5/Marvin Road/SR 510 Interchange (Thurston)			
I-5/SR 510 Interchange - Reconstruct Interchange	Delayed	Dec-2020	\$72.0
I-82/ Eastbound/Westbound On- and Off-Ramps (Yakima)			
I-82/South Union Gap Interchange - Construct Ramps	Advanced	Oct-2019	\$34.4
US 2 Highway Safety (Snohomish)			
US 2/Corridor Improvements	On schedule	Oct-2019	\$2.0
SR 107/Chehalis River Bridge (S. Montesano Bridge) Approach & Rail Repair			
SR 107/Chehalis River Bridge - Structural Rehabilitation	Delayed	Jul-2020	\$12.2

Data source: WSDOT Capital Program Development and Management.

Note: **1** Connecting Washington advertisements show projects currently in construction, and does not represent a comprehensive list of completed Connecting Washington projects.

Nickel & TPA projects in construction Through December 31, 2018; (County); Dollars in millions	Fund type	Advertised on time	Ad date	Operationally complete date	Award amount
I-5 Concrete Rehabilitation Program (King)					
I-5/Northbound Boeing Access Rd. to Northeast Ravenna Bridge - Pavement Repair	Nickel	N/A	Dec-2016	Sep-2019	\$38.6
I-5/Southbound South Lucile St. to Spring St. - Pavement Repair	Nickel	N/A	Mar-2018	Nov-2019	\$8.2
Work associated with the I-5/Northbound South Spokane St. Vicinity - Concrete Pavement Replacement, and I-5/Northbound I-90 Vicinity to James St. Vicinity - Concrete Pavement Replacement is included in I-5/Northbound Boeing Access Rd. to Northeast Ravenna Bridge - Pavement Repair.					
SR 99 Alaskan Way Viaduct Replacement (King)					
SR 99/Alaskan Way and Elliot Way Surface Street Restoration	Nickel/ TPA	✓	May-2010	Feb-2019	\$1,089.7
The SR 99 Tunnel contract achieved substantial completion in October 2018. A ribbon cutting and tunnel opening event is scheduled for February 2, 2019.					
SR 99/South King Street Vicinity to Roy Street - Viaduct Replacement	Nickel/ TPA	✓	Nov-2018	Jan-2023	TBD
I-5/Tacoma HOV Improvements (Pierce)					
I-5/SR 16 Interchange - Construct HOV Connections	TPA	✓	Feb-2016	Oct-2019	\$121.6
I-5/Portland Ave to Port of Tacoma Rd. - Southbound HOV	TPA	Late	Jan-2018	Oct-2023	\$159.9
I-90/Snoqualmie Pass East - Hyak to Keechelus Dam - Corridor Improvement (Kittitas)					
I-90/Snowshed to Keechelus Dam to Stampede Pass - Add Lanes/ Build Wildlife Bridges	TPA	Late	Feb-2015	Oct-2018	\$72.8
I-90/Snowshed to Keechelus Dam Phase 1C - Replace Snowshed and Add Lanes	TPA	Late	Apr-2011	Oct-2018	\$177.1
Advertisement was delayed to alleviate fire and safety issues associated with the original snowshed design, resulting in long-term savings.					
I-90/Concrete Rehabilitation¹ (multiple counties)					
Nickel					

Data source: WSDOT Capital Program Development and Management.

Note: **1** The next I-90 concrete rehabilitation contract is scheduled to be advertised in 2019, but no contracts are currently under construction. It is listed here because it is an ongoing Nickel project.

72 SCHEDULE & BUDGET SUMMARIES QUARTERLY UPDATE

Biennial summary of Nickel and Transportation Partnership Account projects

Costs estimated at completion; Dollars in millions

Cumulative to date	Fund type	Advertised on time ¹	Completed on time	Within scope	Baseline cost	Current cost	Completed on budget ²
2017-2019 biennium summary <i>This information is updated quarterly during the biennium</i>	0 Nickel 5 TPA	3 on time 2 late	3 on time 2 late	2	\$2,983.7	\$2,939.3	4 on budget 1 over budget
2015-2017 biennium summary	0 Nickel 11 TPA	7 on time 4 late	10 on time 1 late	11	\$809.9	\$777.7	10 on budget 1 over budget
2013-2015 biennium summary	6 Nickel 15 TPA	16 on time 5 late	15 on time 6 late	21	\$555.7	\$514.0	18 on budget 3 over budget
2011-2013 biennium summary	5 Nickel 36 TPA	31 on time 10 late	32 on time 9 late	41	\$1,485.5	\$1,459.6	37 on budget 4 over budget
2009-2011 biennium summary	16 Nickel 74 TPA	73 on time 17 late	80 on time 10 late	90	\$1,641.6	\$1,597.0	85 on budget 5 over budget
2007-2009 biennium summary	42 Nickel 69 TPA	91 on time 20 late	96 on time 15 late	111	\$1,685.7	\$1,685.2	102 on budget 9 over budget
2005-2007 biennium summary	52 Nickel 24 TPA	71 on time 5 late	68 on time 8 late	76	\$673.9	\$668.8	67 on budget 9 over budget
2003-2005 biennium summary	27 Nickel	25 on time 2 late	27 on time 0 late	27	\$124.6	\$124.4	25 on budget 2 over budget

Data source: WSDOT Capital Program Development and Management.

Notes: Dollar amounts are rounded up. **1** Projects are "on time" if they are operationally complete within the quarter planned in the last approved schedule. **2** Projects are "on budget" if the costs are within 5% of the last approved budget.

WSDOT has seven change orders of \$500,000 or more during the quarter

WSDOT had seven change orders of \$500,000 or more during the quarter ending December 31, 2018. **1)** The SR 520 West Approach Bridge North project had approximately \$2.9 million in change orders stemming from a modular expansion joint claim, a decorative pedestrian railing design, and time related overhead and associated costs. **2)** The SR 99, Alaskan Way Viaduct - Replacement South Access SR 99 Connections project required a \$548,000 change order to modify the SR 99 roadway profile. **3)** A Practical Design Workshop on the I-5 Steilacoom-DuPont Rd. to Thorne Lane - Corridor project yielded \$567,000 in savings and required a change order. **4)** The I-5 Portland Ave. to Port of Tacoma Rd. - Northbound HOV required a change order of \$618,000 for bridge deck repair work. **5)** The SR 99/Alaskan Way Viaduct Demolition, Decommissioning, and Surface Street project had a change order of approximately \$6.3 million to switch traffic from under the AWW to Alaskan Way between S. King St. and Pike St. **6)** The 468th Ave. S.E. to W. Summit Rd. Rehab Concrete/Deck project required a change order of about \$2.2 million to remove and replace concrete bridge decking. **7)** The I-90, Floating Bridges Replace Anchor Cables project required an \$803,600 change order to address cable and excavation issues.

After an extensive review—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>.

72 PRE-EXISTING FUNDS QUARTERLY UPDATE

WSDOT advertises 342 Pre-existing Funds projects so far during the 2017-2019 biennium

WSDOT advertised 82 of 162 planned Pre-existing Funds projects in the sixth quarter of the 2017-2019 biennium (October through December 2018). Of the 82 total projects advertised this quarter, 10 were advanced from future quarters, 48 were on time, four were emergent and 20 were late. Additionally, three projects originally scheduled to be advertised during the quarter were advertised in a previous quarter, 25 were delayed within the biennium, 49 projects were deferred out of the biennium, and three were deleted. See pp. 52-54 for this quarter's PEF advertisements.

To date in the 2017-2019 biennium (July 2017 through June 2019), WSDOT's current cost to complete all 342 PEF projects that have been advertised is \$774.3 million, about \$49.1 million (6.8%) more than the original value of \$725.2 million. See charts at right for additional information.

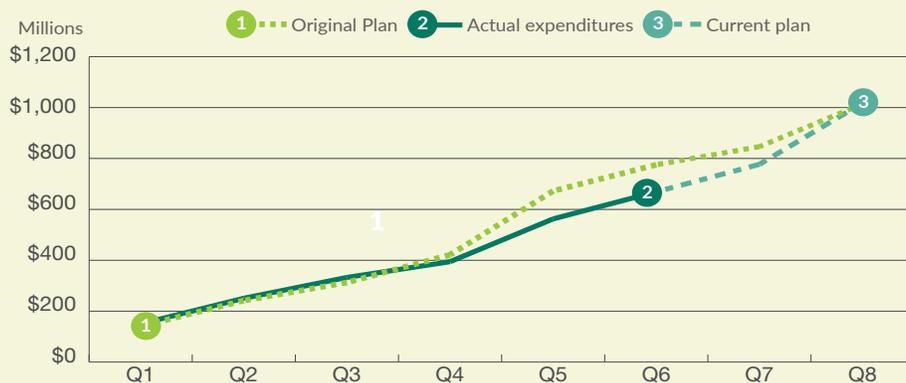
Combined improvement and preservation cash flows currently lower than original projections

WSDOT originally planned to have \$775.3 million in cumulative combined PEF improvement and preservation cash flows at the end of the sixth quarter of the 2017-2019 biennium, but had \$669.0 million (approximately 13.7% less). WSDOT expects to increase planned PEF expenditures in future quarters to meet the original biennial expenditure plan by the end of the biennium.

At the end of a biennium, funds not spent on active projects are reappropriated into the ensuing biennium, creating an expenditure plan that exceeds the PEF allotment plan. The allotment plan is adjusted when the first supplemental budget is approved. As an additional strategy, WSDOT may also over-program how many preservation projects are planned for a biennium to help ensure it uses all of its federal obligation authority.

Cumulative Pre-existing Funds improvement and preservation combined cash flows slightly lower than planned during the 2017-2019 biennium

Quarter ending December 31, 2018; Planned vs. actual expenditures; Dollars in millions



Data source: WSDOT Capital Program Development and Management.

Note: Q6 refers to the sixth quarter (October through December 2018) of the 2017-2019 biennium, which runs from July 2017 through June 2019.

Current cost to complete actual Pre-existing Fund advertisements \$49.1 million over original value

2017-2019 biennium (July 2017 through June 2019); Sixth quarter (ending December 31, 2018); Dollars in millions

	Number of projects	Original value	Current cost to complete
Total PEF advertisements planned for the 2017-2019 biennium	532	\$1,060.8	\$1,167.9
Actual PEF advertisements Dec. 31, 2018	342	\$725.2	\$774.3

Data source: WSDOT Capital Program Development and Management.

WSDOT advertises 342 PEF projects during the 2017-2019 biennium

Project status	Quarter ¹	Cumulative ²
Projects advanced ³	10	21
Projects advertised on time	48	226
Emergent projects advertised	4	31
Projects advertised late	20	64
Total projects advertised	82	342
Projects advertised early ⁴	3	13
Projects delayed within the biennium	25	121
Projects deferred out of the biennium	49	65
Projects deleted	3	8

Data source: WSDOT Capital Program Development and Management.

Notes: **1** Quarter refers to October through December 2018. **2** Cumulative refers to July 2017 through June 2019. **3** Advanced refers to projects that were moved up from future quarters. **4** Early refers to projects planned for the quarter that were advertised in a previous quarter.

WSDOT advertises 48 Pre-existing Funds projects on time during the sixth quarter of the 2017-2019 biennium

October through December 2018

Advanced (10)	
US 2/Bickford Ave. SE to Fryelands Blvd. SE Vicinity - Corridor Improvements	US 2/Fryelands Blvd. SE Vicinity To Cascade View Dr. Vicinity - ADA Compliance
US 2/87th Ave. Vicinity to Pilchuck Vicinity - Paving	US 2/Old Owen Rd. Vicinity to Sofie Rd. Vicinity - Paving
US 2/Pilchuck River Vicinity to Roosevelt Rd. Vicinity - Paving	SR 9/30th St. SE Vicinity to US 2 Vicinity - Paving
US 2/Roosevelt Rd. Vicinity to SR 522 Vicinity - Rumble Strip Installation	SR 510/North of Old Pacific Highway to East of Lake St. Clair Rd. - Paving
US 2/Roosevelt Rd. Vicinity to Cascade View Dr. Vicinity - Paving	North Central Region Guardrail Update 2017-2019
On time (48)	
I-5/Washington State Convention Center & Freeway Park Tunnels - Lighting Controls Upgrade	North Central Region Breakaway Cable Terminal Replacement - Interstate
I-5/Northbound I-90 to SR 520 - Active Traffic Management	North Central Region Breakaway Cable Terminal Replacement - Non-Interstate
I-5/Northbound Seneca St. to Olive Way - Mobility Improvements	SR 28/Ephrata Vicinity to Soap Lake -Chip Seal
I-5/Northbound SR 104 Vicinity to 212th St. SW Vicinity - Paving	SR 28/Ephrata Vicinity - ADA Compliance
I-5/SR 104 Vicinity to 212th St. SW Vicinity - Expansion Joint Replacement	SR 28/Ephrata Vicinity to Soap Lake - Paving
I-5/Southbound Off-Ramp to SR 104 Westbound Ramp - ADA Compliance	US 97/South of Blewett Pass - Paving
I-5/NB 220th St. - Redirectional Landform Mitigation 2017-2019	SR 155/Grand Coulee North - Chip Seal
I-5/164th St. SW Interchange - Ramp Paving	SR 155/South of Omak - Chip Seal
I-5/164th St. SW Interchange - ADA Compliance	SR 213 /Malott to US 97 - Chip Seal
SR 18/Eastbound Soosette Creek to Jenkins Creek - Paving	SR 243/Mattawa Vicinity - Chip Seal
SR 18/Holder Creek Bridge - Deck Overlay	SR 3/North of SR 308 On-Ramp to Thomson Rd. NW Vicinity - Paving
SR 20/Deception Pass Bridge - Painting	US 101/Old Gardiner Rd. to Southwest of Old Gardiner Rd. - Paving
SR 20/Deception Pass & Canoe Pass Bridges - Special Bridge Repair	US 101/Golf Course Rd. to North of W Uncas Rd. - Special Repair
SR 20/Canoe Pass Bridge - Bridge Painting	SR 166/Blackjack Creek to Whittier Ave. - Paving
SR 161/Milton Rd. S Vicinity to SR 18 - Paving	SR 166/Blackjack Creek to Whittier Ave. - ADA Compliance
SR 161/Milton Rd. S Vicinity to S 352nd St. - ADA Compliance	SR 304/East of Junction to SR 310 to SR 303 - Paving
SR 181/SR 516 to W James St. - Paving	SR 304/East of Junction to SR 310 to SR 303 - ADA Compliance
SR 181/SR 516 to W Sam St. - ADA Compliance	SR 507/North of Rainier to Junction SR 7 - Paving
SR 509/S 192nd St. Vicinity to Normandy Park Dr. SW Vicinity - Paving	South Central Region 2017-2019 Region Wide Breakaway Cable Terminal Replacement - Interstate
SR 509/Criminal Justice College to SW 185th St. - ADA Compliance	South Central Region 2017-2019 Region Wide Breakaway Cable Terminal Replacement - Non Interstate
SR 518/SR 509 to SR 99 - Paving	South Central Region 2017-2019 Region Wide Basic Safety - Guardrail
SR 518/Des Moines Way S to Airport Expressway Bridges - Deck Overlay	US 2/Reardan to Espanola Rd. - Paving
SR 518/42nd Ave. S and I-5/I-405 Bridges - Seismic Retrofit	I-90/SR 21 to Ritzville - Paving
SR 525/Freeland Vicinity - Corridor Improvements	SR 504/Forest Learning Center Safety Rest Area - Beam Replacement
Emergent (4)	
US 2/Pilchuck River Bridge - Expansion Joint Rehabilitation	I-90/Indian John Hill Rest Area Vicinity Westbound - Emergency Surface Repair
SR 3/Finn Hill Rd. to SR 305 - ADA Compliance	US 395/Pioneer Memorial Bridge - Bridge Painting Stage 1

Data source: WSDOT Capital Program Development and Management.

WSDOT delays 25 Pre-existing Funds projects during the sixth quarter of the 2017-2019 biennium

October through December 2018

Late (20)	
SR 202/Evans Creek & Patterson Creek - Fish Passage	North Central Region Centerline Rumble Strips/Section C
SR 202/Two Tributaries to Patterson Creek - Fish Passage	2017-2019 Olympic Region - Region Wide Basic Safety - Signing
SR 525 Spur/SR 525 to SR 526 - Paving	SR 104/Hood Canal - W.A. Bugge Bridge - Special Repair
SR 526/SR 525 to Boeing Access Rd. Vicinity - Paving	SR 107/Chehalis River Bridge - Bridge Painting
SR 526/SR 525 to Boeing Access Rd. Vicinity - ADA Compliance	SR 510/Meridian Rd. SE - Roundabout
SR 536/Skagit River to I-5 - Paving	Southwest Region - Regionwide Basic Safety - Guardrail 2017-2019
SR 536/Front Street to I-5 - ADA Compliance	I-5/Northbound Interstate Bridge - South Tower Trunnion Replacement
SR 542/I-5 to Britton Rd. - Paving	US 2/Reardan to Espanola Rd. ADA - Pedestrian Ramp Retrofit
SR 542/I-5 to Hannegan Rd. Vicinity - ADA Compliance	SR 21/Keller Ferry Terminal and Pontoon Replacement North and South
SR 542/Dewey Rd. Vicinity - Culvert Replacement	US 195/Thorpe Rd. - Intersection Improvements
Early (3) - Planned but not advertised during the quarter	
I-705/I-5 to Pacific Ave. - Expansion Joint Replacement Stage 2	SR 223/S Track Rd. - Railroad Crossing Improvements
I-90/468th Ave. SE to W Summit Rd. Westbound - Rehab Concrete	
Delayed (25) - Planned but not advertised during the quarter	
US 2/South Fork Skykomish River Bridge to Money Creek Tunnel - Bituminous Surface Treatments (BST)	SR 302/Purdy Bridge - Concrete Bridge Deck Repair
SR 9/Tawes Creek - Fish Passage	SR 302/Minter Creek - Remove Fish Barrier
SR 9/Two Tributaries to Tawes Creek - Fish Passage	SR 302/Little Minter Creek - Remove Fish Barriers
SR 530/Sauk-Suiattle Confluence - Chronic Environmental Deficiency (CED) Retrofit	Southwest Region - Regionwide Basic Safety - Signing 2017-2019
US 2/Stevens Pass - Avalanche Deflection Berm	SR 401/2 miles East of US 101 - Culvert Replacement
SR 155 Grand Coulee Bridge - Upgrade Illumination	I-90/Ryegrass to Vantage Westbound - Paving
US 101/Vic Deer Park Rd. to Dungeness River Bridge - Install Cable Barrier	I-90/Vantage Vicinity - Median Cable Barrier
US 101/Hoquiam River-Riverside Bridge - Bridge Painting	I-90/Cle Elum River Bridge Westbound - Bridge Painting
US 101/Fisher Creek - Remove Fish Barrier	I-90/Cle Elum River Bridge Eastbound - Bridge Painting
US 101/Steamboat Creek - Remove Fish Barrier	I-90/Cle Elum River Bridge Westbound - Deck Rehabilitation
US 101/Harlow Creek - Remove Fish Barrier	I-90/Sprague Ave. Interchange to Argonne Rd. Interchange - Portland Cement Concrete Pavement Rehabilitation Grinding
SR 302/East of Elgin Clifton Rd. to SR 16 - Paving	US 195/Smythe Rd. to Paradise Rd. - Decreasing Lanes Only - Paving
SR 302/East of Elgin Clifton Rd. to SR 16 - ADA Compliance	
Deleted (3) - Planned but not advertised during the quarter	
US 2/South Fork Skykomish River Bridge - Expansion Joint Replacement	SR 104/Kingston Ferry Terminal Traffic Improvement - Mobility
US 101/North of Queets River Bridge - Culvert Replacement	

Data source: WSDOT Capital Program Development and Management.

WSDOT defers 49 Pre-existing Funds projects out of the 2017-2019 biennium

October through December 2018

Deferred (49)	
SR 20/Boon Rd. Vicinity to Eagle Vista Dr. Vicinity - Paving	US 12/Satsop River Bridge Westbound - Bridge Painting
SR 20/NE Narrows Ave. to Ault Field Rd. Vicinity - Paving	US 12/Satsop River Bridge Eastbound - Bridge Painting
SR 20/Eagle Vista Dr. to Ault Field Rd. Vicinity - ADA Compliance	SR 99/I-5 - Westbound Left-turn Lane and Intersection Improvements
SR 164/Pussyfoot Creek - Fish Passage	US 101/Golf Course Rd. to North of W Uncas Rd. - Paving
SR 202/Snoqualmie Falls Park to Boalch Ave. NW Vicinity - Paving	SR 109/Grass Creek Bridge to Conner Creek Bridge - Chip Seal
SR 202/SE Snoqualmie Parkway to Meadowbrook Way SE - ADA Compliance	SR 115/Ocean Shores to SR 109 - Paving
SR 522/I-5 to NE 123rd St. - Paving	SR 162/East of 96th St. E to West of Orville Rd. E - Paving
SR 522/NE 78th St. to NE 120th St. - ADA Compliance	SR 162/East of 96th St. E to West of Orville Rd. E - ADA Compliance
SR 522/NE 123rd St. to NE 147th St. - Paving	SR 300/Belfair State Park to East of Union River Bridge - Paving
SR 522/NE 123rd St. to SR 523 - ADA Compliance	I-205/SR 14 Interchange - Illumination Upgrade
SR 522/58th Ave. NE to 61st Ave. NE - Paving	US 12/SR 124 to McNary Pool Eastbound - Paving
SR 524/Yew Way - Railroad Crossing Improvements	I-90/Bullfrog Rd. Interchange - Paving
SR 527/Penny Creek - Fish Passage	US 97/W Wapato Rd. Vicinity to Wapato Canal Northbound - Paving
SR 529/Northbound Snohomish River - Bridge Rehabilitation	SR 125/Oregon State Line to N 13th Ave. - Paving
SR 529/Northbound Union Slough Bridge - Scour Repair	SR 125 Spur/N 13th Ave. to Myra Rd. - Paving
SR 529/Southbound Union Slough Bridge - Rehabilitation	SR 125/Oregon State Line to N 13th Ave. - ADA Compliance
SR 529/Northbound Union Slough Bridge - Substructure Repair	SR 125 Spur/N 13th Ave. to Myra Rd. - ADA Compliance
North Central Region Sign Update 2017-2019	US 730/4.1 Miles North of Oregon Border - Rockfall Prevention
US 2/West of Leavenworth - Slope Stabilization	US 730/4.4 Miles North of Oregon Border - Rockfall Prevention
SR 20/Winthrop to SR 153 - Seal	US 730/5.2 Miles North of Oregon Border - Rockfall Prevention
I-90/Moses Lake West Westbound Lanes - Paving	SR 823/E Naches Ave. to N Wenas Rd. Wye - Paving
I-90/George East - Paving	SR 823/Eleventh Ave. to E Fifth Ave. Vicinity - Paving
SR 153 /Pateros to South of Methow - Seal	SR 823/Eleventh Ave. to E Fifth Ave. Vicinity - ADA Compliance
SR 153/Methow North - Seal	SR 823/E Naches Ave. to N Wenas Rd. Wye - ADA Compliance
SR 3/North of Shelton City Limits to North of Dawn Dr. - Chip Seal	
Deleted (3)	
US 2/South Fork Skykomish River Bridge - Expansion Joint Replacement	SR 104/Kingston Ferry Terminal Traffic Improvement - Mobility
US 101/North of Queets River Bridge - Culvert Replacement	

Data source: WSDOT Capital Program Development and Management.

72 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 (Congestion Relief):** 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 at bit.ly/GNBarchives. The archives include every GNB published to date and an easy to navigate chart explaining what edition articles are in.

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 the small team at WSDOT's Strategic Assessment Office, 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, Larry Shibley, Oma Venable and Deb Webb. 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 69			GNB 70			GNB 71		GNB 72		
Calendar	Q1 2018			Q2 2018			Q3 2018			Q4 2018		
State Fiscal	Q3 FY2018			Q4 FY2018			Q1 FY2019			Q2 FY2019		
Fed. Fiscal	Q2 FFY2018			Q3 FFY2018			Q4 FFY2018			Q1 FFY2019		

2017-2019 biennial quarters (used by Legislature)

Period	Quarter	Period	Quarter
Jul – Sep 2017	Q1	Jul – Sep 2018	Q5
Oct – Dec 2017	Q2	Oct – Dec 2018	Q6
Jan – Mar 2018	Q3	Jan – Mar 2019	Q7
Apr – Jun 2018	Q4	Apr – Jun 2019	Q8

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