



Washington State
Department of Transportation

GO LONG SR 520 BRIDGE GRAND OPENING APRIL 2-3



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The Gray Notebook

WSDOT's quarterly performance report on transportation systems, programs, and department management
Quarter ending June 30, 2016 • Published August 2016

Roger Millar, Secretary of Transportation

Sustaining highway safety

WSDOT works with other state agencies to reduce highway collisions

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Preserving critical links

WSDOT strives to improve statewide bridge conditions

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Getting the state into shipping shape

New opportunities lead WSDOT to update its freight plan

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YEARS



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PERFORMANCE HIGHLIGHTS reported for the quarter ending June 30, 2016

91.2% OF WSDOT BRIDGES BY DECK AREA



were in FAIR or BETTER condition AS OF JUNE 2016

96%

of **local agency projects** received environmental approval from WSDOT in fiscal year 2016, reducing the timelines for these projects by about 30 days

Note: 1 Data is preliminary until January 2017.

On the cover: This vibrant art was also used to promote the grand opening celebration of the State Route 520 bridge in King County.

22.7%

increase in **traffic fatalities** on all public roadways in Washington from 462 in 2014 to 567 in 2015¹

4,600 hours

of WSDOT staff time saved by using **general environmental permits** to streamline maintenance activities

3.2%

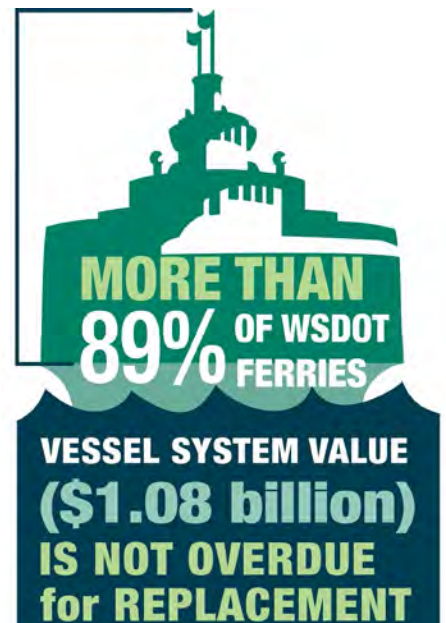
increase in the **number of freight trucks** crossing the Canadian border from 2014 to 2015

10

fish passage barriers corrected by WSDOT in 2015 restored fish access to 46 miles of potential upstream habitat

13

federally funded **rail projects** complete and seven in construction

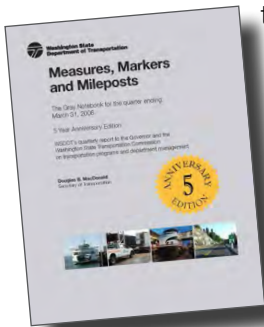


WSDOT celebrates 15 years of the *Gray Notebook*

Continuing WSDOT's celebration marking 15 years of the *Gray Notebook*, editions published in 2016 include a look back to articles from 2001, 2006 and 2011 and provide insight on how the report, agency and state have changed since the *Gray Notebook's* inception in 2001.

State sees similar increases in fatal roadway collisions in 2005 and 2015

Measures, Markers and Mileposts ([Gray Notebook 22](#)) in June 2006 noted that while a general downward trend had been experienced between 1994 and 2004, "In 2005, total fatalities on Washington's public roads increased 14%, from 567 in 2004 to 649 in 2005." The 2006 article continued, explaining, "There was also an increase nationally. Preliminary data suggests that Washington state's increase in highway fatalities in 2005 contributed to 15% of the increase in highway fatalities at the national level."



In this edition, readers will notice a similar increase in the number of fatalities on Washington state roads. Once again, more drivers on public roadways (due to an improving economy and lower gas prices) are cited as the primary reasons behind this increase.

This edition notes that in 2015, there were 567 traffic fatalities on all Washington state public roads. This is a 22.7% increase from the 462 recorded in 2014. Data for 2015 fatalities is preliminary until January 2017.

Bridge conditions decrease since *Gray Notebook 42* in June 2011

In June 2011, the [Gray Notebook 42](#) reported on bridge conditions, informing readers that for fiscal year 2011 (July 2010 through June 2011) 95% of WSDOT bridges were in fair or better condition. The 42nd edition highlighted painting on the State Route 433 Lewis and Clark bridge (which crosses the Columbia River from Longview, Washington), and included a project spotlight on the SR 303 Manette Bridge Replacement project in Bremerton. In this edition of the *Gray Notebook*, WSDOT reports having 91% of WSDOT-owned bridges by deck area in

fair or better condition as of June 2016. For both WSDOT-owned and locally owned bridges statewide, combined bridge conditions meet the state and federal goals of having no more than 10% of all bridges categorized as structurally deficient. WSDOT currently manages 3,865 bridge structures in its inventory, which include pedestrian structures, ferry terminal structures and railroad bridges.

The article highlights several potential risks—such as deterioration and earthquakes—affecting bridge service life, along with the preservation strategies used to mitigate these risks. WSDOT is currently drafting an agency-wide asset management and preservation plan to be used for the upkeep of its pavement and bridges.

Comics section short-lived, but comment made still going strong

In June 2001, the 19-page second edition of *Measures, Markers and Mileposts* featured the first ever comics page in the publication. It seems to have been the last, too, but featured a transportation-related reprint of Jeff MacNelly's famous bird newspaper journalist "Shoe." While this trend went the way of the dodo, the second edition of the GNB also introduced many readers to writer, professor, management consultant and "social ecologist" Peter Drucker's phrase "What gets measured, gets managed," which is still in wide circulation at WSDOT today.

Statewide transportation policy goals

Laws enacted in 2007 established policy goals for transportation agencies in Washington (RCW 47.04.280). The six statewide transportation policy goals are:

- **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.

Statewide policy goal/ WSDOT performance measure	Previous period	Current period	Goal	Goal met	Five-year trend (unless noted)	Desired trend
Safety						
Rate of traffic fatalities per 100 million Vehicle Miles Traveled statewide (Annual measure: calendar years 2014 & 2015)	0.80	0.95 ¹	<1.00	✓		↓
Rate of recordable incidents for every 100 full-time WSDOT workers (Annual measure: calendar years 2014 & 2015)	5.4	4.3	<5.0	✓		↓
Preservation						
Percentage of state highway pavement in fair or better condition by Vehicle Miles Traveled (Annual measure: calendar years 2013 & 2014)	92.6%	93.3%	≥ 90.0%	✓		↑
Percentage of state bridges in fair or better condition by bridge deck area (Annual measure: as reported for 2015 & 2016)	92.1%	91.2%	≥ 90.0%	✓		↑
Mobility (Congestion Relief)						
Highways: Annual (weekday) vehicle hours of delay statewide at maximum throughput speeds ² (Annual measure: calendar years 2013 & 2014)	32.5 million	32.3 million	N/A	N/A		↓
Highways: Average incident clearance times for all Incident Response program responses (Calendar quarterly measure: Q1 2016 & Q2 2016)	12.3 minutes	11.3 minutes	N/A	N/A	 (Five-quarter trend)	↓
Ferries: Percentage of trips departing on time ³ (Fiscal quarterly measure: year to year Q4 FY2015 & Q4 FY2016)	94.2%	93.0%	≥ 95%	—		↑
Rail: Amtrak Cascades on-time performance (Annual measure: fiscal years 2014 & 2015)	74.2%	71.5%	≥ 80%	—		↑
Environment						
Number of WSDOT stormwater management facilities constructed (Annual measure: fiscal years 2014 & 2015)	189	130	N/A	N/A		Not applicable
Cumulative number of WSDOT fish passage improvement projects constructed (Annual measure: calendar years 2014 & 2015)	291	301	N/A	N/A		↑
Stewardship						
Cumulative number of Nickel and TPA projects completed and percentage on time ⁴ (Calendar quarterly measure: Q1 2016 & Q2 2016, trendline for percentage on time)	371/ 87%	371/ 87%	≥ 90% on time	—	 (Five-quarter trend)	↑
Cumulative number of Nickel and TPA projects completed and percentage on budget ⁴ (Calendar quarterly measure: Q1 2016 & Q2 2016, trendline for percentage on budget)	371/ 91%	371/ 91%	≥ 90% on budget	✓	 (Five-quarter trend)	↑
Variance of total project costs compared to budget expectations ⁴ (Calendar quarterly measure: Q1 2016 & Q2 2016)	Under budget by 1.9%	Under budget by 1.9%	On or under budget	✓	 (Five-quarter trend)	Not applicable

Data source: WSDOT Office of Strategic Assessment and Performance Analysis.

Notes: N/A = not available; goal has not been set. Dash (—) = goal was not met in the reporting period. For the Economic Vitality Policy Goal, see [p. 9](#) for Results Washington Goal 2: Prosperous Economy measures. 1 Traffic fatality data for 2015 is considered preliminary until January 1, 2017. 2 Compares actual travel time to travel time associated with “maximum throughput” (defined as 70-85% of the posted speeds), where the greatest number of vehicles occupy the highway at the same time. 3 WSDOT Ferries’ on-time departures include any trip recorded by automated tracking as leaving the terminal within 10 minutes of scheduled time. 4 Budget and schedule expectations are defined in the last approved State Transportation Budget. See [p. 46](#) for more information.

Connecting Washington Revenue Package

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Notable results

- *Connecting Washington funds support the completion of the \$1.6 billion SR 520 project, which is scheduled to be complete in 2029*
- *Construction of a fly-over ramp in Renton will start the I-405/SR 167 direct connector project, scheduled to start in summer 2016*

Connecting Washington projects showing progress

WSDOT is making headway on the \$16 billion Connecting Washington (bitly.com/WSDOT-ConnectingWA) transportation revenue package, strategically using funds to support projects that improve public safety, reduce congestion and improve infrastructure throughout the state.

Approximately \$9.7 billion of the funding package supports 14 key road projects (see chart below and highlighted projects on this page and [p. 6](#)), while the remainder funds highway and bridge preservation work, multimodal options across the state and improvements to the ferries system.

Select Connecting Washington project highlights

Project	Cost
SR 167/SR 509 Gateway	\$1.9 billion
SR 520 "Rest of the West"	\$1.6 billion
I-405 Lynnwood to Tukwila Corridor improvements	\$1.3 billion
US 395 North Spokane Corridor	\$879 million
I-5/Joint Base Lewis-McChord Corridor improvements	\$494.4 million
I-90 Snoqualmie Pass	\$426.4 million
Fish passage barrier replacement	\$300 million
SR 9 Snohomish County Corridor improvements	\$211.6 million
I-82 improvements in Yakima area and Yakima to Oregon	\$127.2 million
I-5 Mill Plain Blvd.	\$98.7 million
SR 28/285 Wenatchee area improvements	\$81.5 million
Whatcom and Skagit County improvements	\$76.1 million
I-90 Western Washington improvements	\$75.5 million
I-90 Spokane Corridor improvements	\$53 million

Data source: Legislative Evaluation and Accountability Program.

SR 167/SR 509 Gateway

The \$1.9 billion SR 167/SR 509 Gateway project builds State Route 167 from Puyallup to Interstate 5 and on to SR 509 near the Port of Tacoma, and builds SR 509 near SeaTac Airport to I-5 in King County. The project also plans to enhance freight mobility to ports and

relieve congestion between Seattle and Tacoma while providing a new south access to SeaTac Airport. For more information, visit bit.ly/SR167-SR509Gateway.

SR 167/SR 509 status:

- State and consultant teams are currently being developed.
- Funding extends through 2031 and the project will be built in strategic stages, with tolling scheduled to start as each stage is completed.

SR 520 "Rest of the West"

The \$1.6 billion SR 520 "Rest of the West" projects complete the ongoing SR 520 improvements by extending the six-lane highway corridor to I-5; replacing old, vulnerable bridges on the west end of SR 520 and enhancing mobility by completing High-Occupancy Vehicle lanes. The projects also construct a multimodal transit hub on the Montlake lid, and improve regional and local trail connections for bicyclists and pedestrians. For more information, visit bit.ly/SR520-RestWest.

SR 520 status:

- The first phase will build the West Approach Bridge South and the Montlake interchange and lid. These projects are planned to be delivered via a design-build contract for which WSDOT is currently developing a request for proposals. WSDOT expects to hire a design-build contractor in 2017 and begin construction in 2018.
- Future phases include a new Portage Bay Bridge, the 10th and Delmar lid and connections to I-5; the final phase will be a new Montlake cut crossing—currently planned as a second drawbridge.
- Funding extends through the 2027-2029 biennium with all program work scheduled to be completed by this time.

I-405 Lynnwood to Tukwila Corridor

The \$1.3 billion Interstate 405 Lynnwood to Tukwila Corridor improvements are the next phase in the I-405 Master Plan to help manage congestion. The 2016 WSDOT supplemental budget addresses two congestion

WSDOT aims to finish North Spokane Corridor in 2029

hot spots, adds hard shoulder running on northbound I-405 from SR 527 in Bothell and I-5 in Lynnwood, and builds an auxiliary lane on northbound I-405 between SR 520 and Northeast 70th Street in Kirkland.

I-405 status:

- The bid for the I-405/SR 167 direct connector project was awarded June 6, 2016, and work is scheduled to start in summer 2016 with construction of a fly-over ramp in Renton which connects the SR 167 High-Occupancy Tolling lanes with the I-405 High-Occupancy Vehicle lanes. This project is scheduled to be completed in mid-2019. For more information, visit bit.ly/I-405-SR167flyover.
- WSDOT plans to begin preliminary engineering and right of way purchases in Kirkland for a new I-405 interchange at Northeast 132nd Street for new access to Totem Lake neighborhood. Work is scheduled to begin in 2017 and the interchange is planned open to traffic in 2023.
- WSDOT is working on preliminary engineering and right of way for the Renton to Bellevue Widening and Express Toll Lane project, which is included in the I-405 corridor work, and will construct a new lane in each direction from SR 169 in Renton and Northeast 6th Street in Bellevue. Construction is planned from 2019 to 2024 and will complete a 40-mile system of Express Toll Lanes on I-405 and SR 167.

US 395 North Spokane Corridor

The \$879 million US 395 North Spokane Corridor project completes the final 5.5 miles of a new 10.5-mile north/south route that connects US 395 to US 2 on the north end and I-90 to US 2 on the south end. The project is scheduled to be completed in 2029. For more information, visit bit.ly/US395-NSC.

US 395 status:

- Design is underway and right of way acquisition for the remainder of the corridor continues.
- A multi-agency technical stakeholder advisory team is in place and an executive-level advisory team is being formed.
- Construction on the Wellesley/Freya intersection is scheduled to begin in fall 2016 and Market Street improvements and utility relocations from the Spokane River to Francis Avenue are scheduled to begin in spring 2017.

Joint Base Lewis-McChord

The preferred alternative of the \$494 million Joint Base Lewis-McChord Congestion Relief project aims to reduce congestion along I-5 through JBLM by adding one

lane in each direction from DuPont-Steilacoom Road to Thorne Lane and adding a local connector road. For more information, visit bit.ly/JBLM-improvements.

I-5 JBLM status:

- Funding for design and construction extends through 2025 and work will be completed in stages.
- Design and construction of north end improvements, which include rebuilding interchanges at Thorne Lane and Berkeley Street, and adding a fourth lane each direction are planned between 2017 and 2020.
- South end improvements between DuPont-Steilacoom Road and Mounts Road are scheduled for construction between 2020 and 2023.
- Next steps for the project include: an environmental hearing; purchasing right of way; hiring a design-build contractor for north end improvements; and continuing to define build alternatives for south end improvements.

I-90 Snoqualmie Pass

The \$426 million I-90 Snoqualmie Pass project completes the remaining eight miles of an ongoing 15-mile project, widening the highway from four to six lanes, adding truck-climbing lanes and expanding chain-up areas while providing wildlife crossings. For more information, visit bit.ly/I-90SnoPassProject.

I-90 status:

- WSDOT is working on designs for three project stages—phases three through five—and is meeting with stakeholders, including community members and tribes.
- Construction on phase three is scheduled to begin in 2021, phase four is scheduled for 2022, and phase five is scheduled to start in 2029.

Contributors include Ann Briggs, Kris Rietmann and Joe Irwin

How the Connecting Washington revenue package funds transportation projects

The \$16 billion Connecting Washington transportation package approved in June 2016 by the Washington State Legislature and Gov. Jay Inslee is funded in part by an 11.9 cent fuel tax that was phased in over a two-year period. A 7.0 cent increase occurred on August 1, 2015, and was followed by a 4.9 cent fuel tax increase on July 1, 2016. There are increases to vehicle weight fees in the new revenue package which support multiple transportation modes.

Moving Ahead for Progress in the 21st Century (MAP-21)

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MAP-21 measures by program area	WSDOT penalty ¹ (Yes/No)	Date draft rule was released	Existing WSDOT performance measures for this program area
Combined Draft Rule – Notice for Proposed Rule Making			Federal Register Vol. 81, No. 78
- System Performance (Congestion)			
Percent of the Interstate System providing for reliable travel	No	4/22/16	WSDOT does not currently track the specific data or metrics for this measure as it is proposed in this NPRM
Percent of the non-Interstate NHS providing for reliable travel	No	4/22/16	WSDOT does not currently track the specific data or metrics for this measure as it is proposed in this NPRM
Percent of the Interstate System where peak hour travel times meet expectations	No	4/22/16	WSDOT does not currently track the specific data or metrics for this measure as it is proposed in this NPRM
Percent of the non-Interstate NHS where peak hour travel times meet expectations	No	4/22/16	WSDOT does not currently track the specific data or metrics for this measure as it is proposed in this NPRM
- National Freight Movement Program			
Percent of the Interstate System mileage providing for reliable truck travel time	No	4/22/16	WSDOT does not currently track the specific data or metrics for this measure as it is proposed in this NPRM
Percent of the Interstate System mileage uncongested	No	4/22/16	WSDOT does not currently track the specific data or metrics for this measure as it is proposed in this NPRM
- Congestion Mitigation and Air Quality Program			
Annual hours of excessive delay per capita	No	4/22/16	WSDOT does not currently track the specific data or metrics for this measure as it is proposed in this NPRM
Two- and four-year total emission reductions for each applicable criteria pollutant and precursor	No	4/22/16	No existing performance measure for criteria pollutants
National Highway Performance Program – Notice for Proposed Rule Making			Federal Register Vol. 80, No. 2
National Highway System (Interstate and Non-Interstate) pavement in good and poor conditions ²	Yes	1/5/15	See GNB 60, p. 19 an update on MAP-21 implications for pavement. On February 20, 2015, the Asset Management Plan draft rule was released which is linked to the draft rule for pavement and bridge performance measures.
National Highway System bridges classified in good and poor conditions ³	Yes	1/5/15	Several measures of bridge condition including good/fair/poor condition rating and structural deficiency rating, see GNB 58, p. 15
Highway Safety Improvement Program – FINAL			Federal Register Vol. 79, No. 60
Rate of traffic fatalities per 100 million Vehicle Miles Traveled on all public roads	Yes	N/A	Traffic fatality rates using the NHTSA ⁴ methodology, see GNB 62, p. 13
Rate of serious traffic injuries per 100 million VMT on all public roads	Yes	N/A	WSDOT does not currently track the data or metrics for this measure as it is currently proposed in this NPRM Final Highway Safety Rule
Number of traffic fatalities on all public roads	Yes	N/A	Traffic fatalities using the NHTSA ⁴ methodology, see GNB 62, p. 10
Number of serious traffic injuries on all public roads	Yes	N/A	Serious injuries using the NHTSA ⁴ methodology, see GNB 62, p. 10
Number of non-motorized traffic fatalities and serious injuries	Yes	N/A	Non-motorized (pedestrian/ bicyclist) fatalities and serious injuries using the NHTSA ⁴ methodology, see GNB 61, p. 10
Rate of per capita traffic fatalities for drivers and pedestrians 65 or older	No	N/A	Traffic fatalities for pedestrians (65 or older). The rate of traffic fatalities for older pedestrians is part of Washington's Target Zero ⁵ campaign
Rate of fatalities on high-risk rural roads	Yes	N/A	Traffic fatality rates on high-risk rural roads as part of Target Zero ⁵
Highway-railway crossing fatalities	No	N/A	Fatalities at highway-railway crossings

Data source: WSDOT Office of Strategic Assessment and Performance Analysis.

Notes: 1 Penalties apply for some measures if WSDOT or the MPO does not attain the target within a given time frame. Penalties apply only to WSDOT and include minimum allocations of federal funding toward programs to progress toward the desired target. 2 Federal benchmark on this measure is expected to be that the percent of pavement in poor condition does not exceed 5%, 3 Federal benchmark on this measure is expected to be that percent of structurally deficient bridges does not exceed 10%. 4 NHTSA = National Highway Traffic Safety Administration. 5 State strategic highway safety plan.

Results WSDOT is the agency's strategic plan for 2014-2017. The plan directs WSDOT's work with partners

and communities with three agency emphasis areas for 2016-2017: workforce development, inclusion and practical solutions. The strategic plan focuses on how the agency makes investments and delivers projects with limited resources.

To date, all strategies are on track to achieve their desired results. For a copy of Results WSDOT, go to bit.ly/ResultsWSDOTStrategicPlan.



Implementation plans define the actions and deliverables needed to achieve WSDOT's goals from 2014 through 2017.

Results WSDOT is based on these six goals:

- Strategic Investments
- Modal Integration
- Environmental Stewardship
- Organizational Strength
- Community Engagement, and
- Smart Technology.

Goals are defined in the table below, and are supported by strategies and tasks. Select *Gray Notebook* articles in this issue, indicated by a box with a goal logo, show how the plan's goals are being implemented.

Results WSDOT sets agency direction 2014 through 2017 Strategic Plan

Recent *Gray Notebook* articles linked to goals



Goal 1: STRATEGIC INVESTMENTS

Effectively manage system assets and multimodal investments on corridors to enhance economic vitality

- Aviation: [GNB 59, pp. 12-15](#)
- Bridges: [GNB 62, pp. 14-22](#)
- Capital facilities: [GNB 59, pp. 8-11](#)
- Ferries preservation: [GNB 62, pp. 23-28](#)
- Highway maintenance: [GNB 60, pp. 20-21](#)
- Pavement conditions: [GNB 60, pp. 11-19](#)



Goal 2: MODAL INTEGRATION

Optimize existing system capacity through better interconnectivity of all transportation modes

- Ferries: [GNB 62, pp. 29-30](#)
- Freight: [GNB 62, pp. 39-42](#)
- Highway system safety: [GNB 62, pp. 10-13](#)
- Pedestrian and bicyclist safety: [GNB 61, pp. 10-12](#)
- Rail: Amtrak Cascades: [GNB 62, pp. 31-32](#)
- Trip reduction: [GNB 60, pp. 22-24](#)



Goal 3: ENVIRONMENTAL STEWARDSHIP

Promote sustainable practices to reduce greenhouse gas emissions and protect natural habitat and water quality

- Air quality: [GNB 61, pp. 22-23](#)
- Environmental compliance: [GNB 60, pp. 32-33](#)
- Fish passage barriers: [GNB 62, pp. 35-36](#)
- General permitting: [GNB 62, p. 38](#)
- Water quality: [GNB 59, pp. 24-26](#)
- Wetlands protection: [GNB 61, pp. 26-28](#)



Goal 4: ORGANIZATIONAL STRENGTH

Support a culture of multi-disciplinary teams, innovation and people development through training, continuous improvement and Lean efforts

- Lean: [GNB 62, pp. 44-45](#)
- Worker safety and health: [GNB 60, p. 10](#)
- Workforce levels and training: [GNB 61, p. 33](#)



Goal 5: COMMUNITY ENGAGEMENT

Strengthen partnerships to increase credibility, drive priorities and inform decision making

- Disadvantaged Business Enterprise: [GNB 60, p. 40](#)
- Local programs: [GNB 62, p. 37](#)



Goal 6: SMART TECHNOLOGY

Improve information system efficiency to users and enhance service delivery by expanding the use of technology

- Commercial Vehicle Information Systems and Networks: [GNB 61, p. 29](#)
- Tolling: [GNB 60, pp. 36-38](#)
- Travel information: [GNB 61, p. 21](#)

Data source: WSDOT Office of Strategic Assessment and Performance Analysis.

Results Washington, the state's performance management system, outlines Gov. Jay Inslee's priorities. This strategic framework sets the state's vision and mission, as well as the foundational expectations for state agencies to achieve goals collaboratively. Results Washington has five focus areas: World Class Education; Prosperous Economy; Sustainable Energy and a Clean Environment; Healthy and Safe Communities; and Efficient, Effective and Accountable Government. For more information, visit <http://www.results.wa.gov/>.

Results Washington measures by goal area ¹	Previous period	Current period	On target ²	Current trend	Desired trend
Annual measures for which WSDOT is the lead agency					
Goal 2: Prosperous Economy					
Based on current funding levels, maintain the percent of Washington infrastructure assets in satisfactory condition at 2013 baseline levels through 2020 (2013 & 2014)	86% ³	85%	No	↓	↑
Based on current funding levels, control the percent of state and local bridges ⁴ in poor condition from increasing over 10% by 2017 (Fiscal years 2015 & 2016)	8.8%	9.3%	Yes	↑	↓
Based on current funding levels, control the percent of state and local pavement ⁴ in poor condition from increasing over 10% by 2017 (2013 & 2014)	6.0%	6.0%	Yes	↔	↓
Based on current funding levels, control the percent of ferry terminal systems that are past due for replacement from increasing over 6% by 2020 (Fiscal years 2015 & 2016)	3.7%	5.3%	Yes	↑	↓
Based on current funding levels, control the percent of ferry vessel systems that are past due for replacement from increasing over 10% by 2020 (Fiscal years 2015 & 2016)	8.3%	10.9%	No	↑	↓
Maintain percentage of transit fleet that exceeds the Federal Transit Administration's minimum useful life at 25% or below through 2020 (2014 & 2015)	37.3% ⁵	34.6% ⁵	No	↓	↓
Increase the percentage of Washingtonians using alternative transportation commute methods to 29% by 2020 (2013 & 2014)	27.3%	27.6%	No	↑	↑
Ensure travel and freight reliability (impacted by economic growth) on strategic corridors does not deteriorate beyond 5% from 2012 levels through 2017 (2013 & 2014)	1.7%	6.6%	No	↑	↓
Operate strategic corridors at 90% efficiency or higher through 2017 (2013 & 2014)	95.2%	94.6%	Yes	↓	↑
Reduce the number of pedestrian and bicyclist fatalities on public roadways from 84 in 2012 to zero in 2030 (2014 & 2015)	85 ³	100 ⁶	No	↑	↓
Annual measures for which WSDOT is not the lead agency, but has an interest					
Goal 2: Prosperous Economy					
Increase state agency and educational institution utilization of state-certified small businesses in public works and other contracting and procurement by 2017 to: Minority-owned businesses, 10%; Women-owned businesses, 6%; Veteran-owned businesses, 5%	Measure is under development. Expected to report in December 2016				
Goal 3: Sustainable Energy and a Clean Environment					
Reduce transportation related greenhouse gas emissions from 44.9 million metric tons/year (projected 2020) to 37.5 million metric tons/year (1990) by 2020 (2012 & 2013)	42.4	40.4 ³	Yes	↓	↓
Reduce the average emissions of greenhouse gases for each vehicle mile traveled in Washington by 25% from 1.15 pounds in 2010 to 0.85 pounds by 2020 (2012 & 2013)	1.11 ³	1.11	No	↔	↓
Increase the average miles traveled per gallon of fuel for Washington's overall passenger and light duty truck fleet (private and public) from 19.2 mpg in 2010 to 23 mpg in 2020 (2013 & 2014)	20.2	20.6	No	↑	↑
Increase the number of plug-in electric vehicles registered in Washington from approximately 8,000 in 2013 to 50,000 by 2020 (2014 & 2015)	12,351	16,529	No	↑	↑
Increase miles of stream habitat opened from 350 to 450 (per year) by 2016 (2014 & 2015) ⁷	599 ³	365	No	↓	↑
Increase number of fish passage barriers corrected per year from 375 to 500 by 2016 (2014 & 2015) ⁷	424 ³	479	No	↑	↑
Goal 4: Healthy and Safe Communities					
Decrease number of traffic-related fatalities on all roads from 454 in 2011 to zero in 2030 (2014 & 2015)	462	567 ⁶	No	↑	↓

Data sources: WSDOT Office of Strategic Assessment and Performance Analysis and Results Washington's Open Performance Program.

Notes: 1 In addition to the measures listed in the table, WSDOT contributes performance information that is combined and reported with data from all state agencies in Goal 5: Efficient, Effective and Accountable Government. 2 "On target" is defined as currently meeting the goal or making enough progress to meet the goal by the target date. Some measures may be trending in the desired direction but are not on track. 3 Data has been corrected from previous *Gray Notebook* editions. 4 This measures assets on the National Highway System. 5 Values differ from previous editions. To better align with the FTA, WSDOT has updated its method for calculating useful life; it is now based on age or mileage instead of just age. 6 Data is preliminary. 7 Includes work completed by all state agencies.

Notable results

- Washington had 567 roadway fatalities in 2015, a 22.7% increase from the 462 in 2014
- There was a 3.6% increase in Vehicle Miles Traveled in Washington from 2014 to 2015 that potentially resulted from an improving economy and lower fuel prices
- State roadways had 2,102 serious injury crashes in 2015, a 4.7% increase from the 2,007 in 2014
- Washington's traffic fatality rate increased 19% from 0.80 in 2014 to 0.95 per 100 million Vehicle Miles Traveled in 2015

Fatalities, serious injuries increase in 2014 and 2015

There were 567 traffic fatalities on all Washington state public roads in 2015. This is a 22.7% increase from the 462 recorded in 2014. Overall, the number of fatalities has trended downward 10.4% from the 633 recorded 10 years ago in 2006.

Serious injuries on all public roads increased from 2,007 in 2014 to 2,102 in 2015 (4.7%), but decreased 28.8% from the 2,952 recorded in 2006. Data for 2015 fatalities and serious injuries was preliminary when *Gray Notebook 62* was published and data from *Gray Notebook 58* has been updated and confirmed.

Although the number of traffic fatalities and serious injuries has trended downward since 2006, the decrease in these types of crashes has leveled out across most highway safety performance areas. Almost all states had increases in fatal and serious injury crashes in 2015. State transportation agencies note this nationwide increase is potentially attributed to an upswing in driving that is the result of the improving economy and lower fuel prices.

WSDOT has developed and is implementing strategies ranging from installing roundabouts at intersections to enhancing the visibility of personnel in work zones to further reduce traffic fatalities and serious injuries.

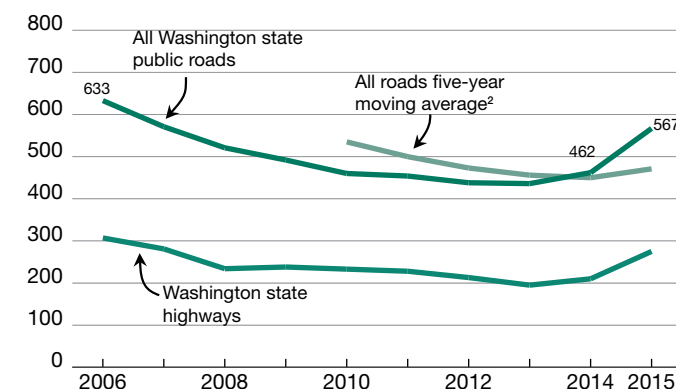
WSDOT sets new priorities under Target Zero Implementation Plan

Washington's Strategic Highway Safety Plan, "Target Zero," exemplifies the state's vision for zero traffic fatalities and serious injuries on all public roads by 2030. With this vision in mind, WSDOT released its Target Zero Implementation Plan in December 2015.

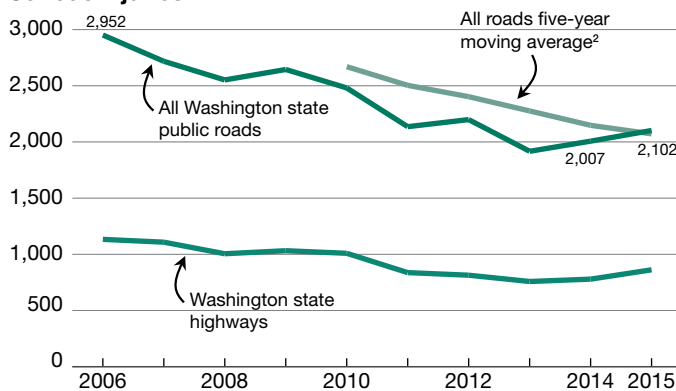
Traffic fatalities and serious injuries on all public roads in Washington state increase in 2015

2006 through 2015¹; Number of fatalities or serious injuries

Traffic fatalities



Serious injuries³



Data sources: Fatality Analysis Reporting System, WSDOT Transportation Data and Geographic Modeling Office.

Notes: 1 FARS data for 2015 is preliminary until January 2017.

2 A five-year moving average reflects five years of change at a time. Because it is more resistant to short-term fluctuations in data, the five-year moving average is effective at highlighting long-term trends. The graphs above show the average of 2006-2010 (the first five years) through 2011-2015 (the most recent five years). 3 Serious injuries are defined as any injury other than a fatal injury that prevents a person from walking, driving or continuing normal activities at the time of the crash.

WSDOT reviewing factors leading to crashes statewide

Using the implementation plan to inform decision-making contributes to Gov. Jay Inslee's statewide goals for reducing traffic-related fatalities, and furthers his efforts toward achieving Results Washington Goal 4: Healthy and Safe Communities (see [p. 9](#)). For more information on Target Zero, visit <http://www.TargetZero.com>.

The implementation plan tracks actions and performance measures that are consistent with the following Target Zero priority categories:

- Decision and performance improvement,
- High risk behavior,
- Crash type,
- Road users, and
- Other monitored emphasis areas (like wildlife areas and work zones).

Each category listed above includes contributing emphasis areas that are assigned priority levels—from one to three—depending on how often that area is a factor in traffic fatalities or serious injuries.

Category: Decision and performance improvement

Three emphasis areas have been identified as Target Zero Priority One items due to their overarching impact on fatal and serious injury crashes: traffic data systems; Emergency Medical Services and trauma response; and evaluation, analysis and diagnosis.

Traffic data systems: Timely, complete, accurate, and integrated safety data are the foundation for targeting resources and monitoring progress toward zero traffic fatalities and serious injuries. Leveraging Geographic Information Systems to enable data integration and analysis, working with partners toward safety data reporting that is consistent and accurate, and acquiring bike and pedestrian crash data when a motor vehicle is not involved in the incident are among methods that support traffic data systems at WSDOT.

Emergency Medical Services and trauma response:

Crash severity can depend on the speed of emergency response and as a result, teams make every attempt to take action within the “golden hour.” This time frame refers to the hour immediately following a traumatic injury during which there is the highest likelihood that prompt medical treatment will prevent death. WSDOT aids in this effort by helping facilitate quick EMS response and by maintaining an Incident Response program that can assist in clearing blocking incidents quickly and safely.

Evaluation, analysis and diagnosis: Highway system safety programs usually look at the “4 Es” (Engineering, Enforcement, Education and Emergency Medical Services) in addressing safety performance. WSDOT has defined a “5th E” as the Evaluation, analysis and diagnosis of crashes and their contributing factors. This approach allows WSDOT to better target contributing factors to

Washington State Target Zero categories help track traffic fatalities, serious injuries

2011 to 2015; Totals and numbers of annual traffic fatalities and serious injuries for Level One priority emphasis areas

	Fatalities / serious injuries per year				
	2011	2012	2013	2014	2015
High risk behavior¹					
Impairment involved	246 / 513	249 / 528	251 / 434	256 / 404	299 / 391
Speeding involved	169 / 586	162 / 578	184 / 523	162 / 521	156 / 515
Crash type					
Lane departure	259 / 836	244 / 863	252 / 744	254 / 752	283 / 860
Intersection related	89 / 759	75 / 752	92 / 672	109 / 705	119 / 706
Road users²					
Young drivers (16-25) involved	146 / 803	126 / 736	150 / 661	147 / 660	176 / 737
Totals for all^{3,4}	454 / 2,136	438 / 2,199	436 / 1,917	462 / 2,007	567 / 2,102

Data sources: Washington State Traffic Safety Commission - Fatality Analysis Reporting System; WSDOT Transportation Data and Geographic Information Systems Office.

Notes: FARS data for 2015 is preliminary until January 2017. To view the full data set for all priority levels, visit the [GNB62 Highway System Safety Extra](#). The category for decision and performance improvement is used to track the overall performance of traffic data systems, Emergency Medical Services and trauma response, and evaluation and diagnostics and not the numbers of fatalities and serious injuries. 1 High risk behaviors in the total include: distraction, unrestrained occupants and unlicensed drivers. 2 Road users in the total include: motorcyclists, pedestrians, drivers older than 70, heavy trucks and bicyclists. 3 The category for other monitored emphasis areas in the total include: wildlife, work zone, vehicle vs. train, and school bus-involved incidents. None of these are considered Level One priority areas. 4 Priority area numbers do not add to equal the overall total, as a crash can include a driver involved in one or more priority areas, e.g. an impaired, young driver who is speeding.

High risk behavior is the top reason for fatal crashes

lower crash potential, moving beyond standard solutions based on predetermined design criteria such as traffic volume and roadway type. By targeting contributing factors, WSDOT is able to better direct decision making and produce more focused and cost-effective solutions.

Category: High risk behavior

High risk behaviors, such as impairment, speeding, distracted driving, unrestrained occupants, unlicensed drivers, and drowsy drivers continue to be the biggest contributors to fatalities and serious injuries on Washington roadways. Of these, impairment and speeding are Priority Level One emphasis areas because historically they are factors that occur in at least 30% of all fatalities or serious injuries. Priority One Level factors receive the highest emphasis by Target Zero partners, including WSDOT, the Washington State Patrol and the Washington Traffic Safety Commission.

Impairment: There were 299 fatalities and 391 serious injuries involving impairment in 2015. This is an 16.8% increase from the 256 fatalities and a 3.2% decrease from the 404 serious injuries in 2014. This marks a 21.5% increase in fatalities over 2011 numbers when there were 246 fatalities related to impairment, but is a 23.8% decrease from 513 serious injury impairment-related collisions in 2011. This factor recognizes impairment issues for all transportation modes, not just motor vehicle drivers.

Speeding: Collisions involving speeding drivers resulted in 156 fatalities and 515 serious injuries in 2015, both decreasing slightly from the 162 fatalities and 521 serious injuries in 2014. Speed-related fatality and serious injury crashes are respectively 7.7% and 12.1% less than they were in 2011 when there were 169 fatalities and 586 serious injuries.

While WSDOT does not typically address driving behavior, engineering factors can assist in reducing crash severity. WSDOT strategies to address impairment- and speeding-related crashes include installing centerline and shoulder rumble strips, and incorporating safety performance data when setting speed limits. Additionally, WSDOT continues to support enforcement and outreach efforts to reduce speeding and impairment.

Category: Crash type

WSDOT and its Target Zero partners have identified lane departures and intersection-related crashes as Target Zero Priority One factors.



Washington State Patrol, Emergency Medical Services and WSDOT Incident Response converge at a crash site on Interstate 5 in Tacoma.

Lane departure: Collisions involving lane departures resulted in 283 fatalities and 860 serious injuries in 2015, an increase from 254 fatalities and 752 serious injuries in 2014. Lane departure fatality and serious injury collision numbers have been fairly consistent over the past five years.

In 2011, there were 259 fatalities and 836 serious injuries related to lane departure. Even so, an overall decrease in lane departure crashes has been realized over the past 10 years; in 2006 there were 388 fatalities and 1,174 serious injuries related to lane departure.

WSDOT uses widespread, low-cost strategies to reduce lane departures. Countermeasures include: enhanced warning signs, centerline and shoulder rumble strips to alert drivers when their vehicles are leaving the lane, high-friction surface treatments on curves and ramps, median barriers, and pavement edge safety treatments to reduce drivers over-correcting when their vehicle hits the edge of the pavement.

Intersections: Collisions at intersections resulted in 119 fatalities and 706 serious injuries in 2015, an increase from the 109 fatalities and 705 serious injuries in 2014. Intersection fatalities and serious injuries have respectively increased and decreased over the past five years from the 89 fatalities and 759 serious injuries in 2011. Both intersection fatalities and serious injuries have seen a reduction over the past 10 years; in 2006 there were 131 intersection related fatalities and 1,047 intersection-related serious injuries.

WSDOT uses several strategies to reduce serious crashes at intersections, including:

- Installing or converting intersections to roundabouts, optimizing traffic signal clearance intervals, and providing dynamic intersection warnings;
- Redesigning intersection approaches to improve sight distance, adding retro-reflective borders on

State's fatality rate increases with Vehicle Miles Traveled

signal backplates, and providing advance warning of intersections; and,

- Installing refuge islands and improved street lamps, and shortening crossing distances at intersections to reduce pedestrian risk.

Category: Road users

Some road users are more likely to be in vehicle crashes based on WSDOT crash data. These may include younger and older drivers, or non-motorists who are more vulnerable in vehicle crashes, such as pedestrians and bicyclists. Target Zero identifies six types of road users as emphasis areas: young drivers (age 16-25), motorcyclists, pedestrians, older drivers (age 70+), heavy truck drivers, and bicyclists.

Young drivers: Of the six types of road users, younger drivers are the only Priority One group. In 2015, young drivers were involved in crashes that resulted in 176 fatalities and 737 serious injuries. This compares to 147 fatalities and 660 serious injuries in 2014; and 146 fatalities and 803 serious injuries in 2011. Overall, fatalities and serious injuries have dropped since 2006 when young drivers were involved in 249 fatalities and 1,258 serious injuries.

WSDOT strategies to reduce young driver fatalities and serious injuries include: considering human behaviors while developing projects; implementing a corridor safety model at high-crash locations where data indicates a high rate of younger-driver-related crashes; and designs such as roundabouts, signage, and striping to make young drivers' decisions easier.

Category: Other monitored emphasis areas

Other monitored emphasis areas don't include any Priority One factors. This is due to the relative rarity of fatalities and serious injuries resulting from crashes involving wildlife, work zones, vehicles vs. trains, and school buses. Even so, WSDOT and its Target Zero partners use a variety of tactics to reduce the likelihood of incidents in these emphasis areas and to improve the safety of the roadways for all users. Efforts include:

- Providing grade separated wildlife crossings,
- Enhancing visibility of personnel in work zones,
- Improving highway-rail grade crossings, and
- Considering school bus and pedestrian needs during corridor planning efforts.



Strategic Plan Goal 2: MODAL INTEGRATION

Multimodal Safety Strategy - Align multimodal safety policy-making across the agency.

In support of this strategy, WSDOT worked with internal programs to create the WSDOT Target Zero Implementation Plan, and has also formed a Modal Safety Executive Committee tasked with integrating safety and risk reduction into all modes of transportation.

There were 12 fatalities and 44 serious injuries involving wildlife, work zones, vehicles vs. trains, and school buses in 2015 compared to three fatalities and 66 serious injuries during 2014.

WSDOT to track traffic fatality rates to meet federal requirements

WSDOT manages highway safety performance using crash frequency (the number of crashes per year), but tracks crash rates for federal reporting requirements (including the Moving Ahead for Progress in the 21st Century Act). Traffic fatality rates are commonly expressed as the number of fatalities per 100 million Vehicle Miles Traveled. For the MAP-21 Final Safety Rule (released in July 2016) WSDOT is required to report on:

- Number of fatalities on all public roads,
- Number of fatalities per 100 million VMT on all public roads,
- Number of serious injuries on all public roads,
- Number of serious injuries per 100 million VMT on all public roads, and
- Bicyclist and pedestrian fatalities and serious injuries on all public roads.

The fatality rate was 0.95 per 100 million VMT for all Washington state public roads in 2015, up 18.8% from 0.80 in 2014 on all public roads. This was accompanied by a 3.6% increase in total VMT statewide.

The fatality rate in Washington state has experienced long-term reductions since 1980 when the rate was 3.4 fatalities per 100 million VMT. Washington state's fatality rate continues to be below both the 2014 national average of 1.08 fatalities per 100 million VMT and the 2008 federal benchmark rate of 1.00 per 100 million VMT. The 2015 national fatality rate is not yet available.

Contributors include the Modal Safety Executive Committee, Multimodal Safety Working Group, John Milton, Jennene Ring, Ida van Schalkwyk, Dan Davis and Joe Irwin

Notable results

- In 2016, 91.2% of WSDOT-owned bridges by deck area are in fair or better condition, a slight decrease from 92.1% in 2015
- Of WSDOT's 3,294 vehicular bridges, 126 had weight restrictions in FY2016, an increase from 120 bridges in FY2015
- Washington continues to meet the MAP-21 and Results Washington goals of having less than 10% of bridges in poor condition
- WSDOT conducted 2,040 bridge inspections in FY2016, more than three quarters of which were routine inspections

Bridge conditions meet 90% performance goal

As of June 2016, 91.2% of WSDOT-owned bridges by deck area were in fair or better structural condition. This is a long-term improvement since 2011, when 90.8% of bridges by deck area were in fair or better condition, but a slight decrease from the 92.1% of bridges in fair or better condition in June 2015. The decrease in bridge deck area in fair or better condition from June 2015 to June 2016 is primarily due to the natural rate of concrete deterioration statewide.

Measuring bridge conditions by deck area incorporates bridge size, giving a more comprehensive picture of

conditions than counting the number of bridges. WSDOT also uses this method because it aligns with the federal Moving Ahead for Progress in the 21st Century Act, which sets a goal of having no more than 10% of bridges measured by deck area in poor condition. Results Washington, the state's performance management system, adopted this same goal. Washington met this goal for 2016 (see [p. 15](#) for performance indicator). All bridges, culverts, or ferry terminals over 20 feet in length and carry vehicular traffic are included in the overall bridge condition ratings.

Translating the 91.2% of deck area into number of bridges, 3,140 of the 3,294 WSDOT-owned bridges in Washington are in fair or better condition in 2016. There are 154 bridges

WSDOT has 91.2% of its bridges by deck area in fair or better condition, meeting performance goals

Number of bridges and percent of bridges by deck area by condition category; Deck area in millions of square feet

STRUCTURAL CONDITION

		2011	2015	2016	Trend
GOOD/VERY GOOD Bridges in good condition range from those with no problems to those having some minor deterioration of structural elements.	Bridge deck area	16.1	19.2	19.8	↑
	Percent of deck area	31.1%	36.0%	36.9%	↑
	Number of bridges	1,460	1,628	1,678	↑
FAIR Primary structural elements are sound; may have minor section loss, deterioration, cracking, spalling or scour. This is the most cost-effective time to rehabilitate before the underlying structure is damaged.	Bridge deck area	30.9	29.9	29.1	↓
	Percent of deck area	59.7%	56.1%	54.3%	↓
	Number of bridges	1,589	1,522	1,462	↓
GOOD/VERY GOOD & FAIR TOTALS: Goal = 90% or more deck area in fair or better condition	Bridge deck area	47.0	49.1	48.9	↓
	Percent of deck area	90.8%	92.1%	91.2%	↓
	Number of bridges	3,049	3,150	3,140	↓
POOR A bridge in poor condition has advanced deficiencies such as section loss, deterioration, scour, or seriously affected structural components, and may have weight restrictions. A bridge in poor condition is still safe for travel.	Bridge deck area	4.8	4.2	4.7	↑
	Percent of deck area	9.2%	7.9%	8.8%	↑
	Number of bridges	155	138	154	↑

Data source: WSDOT Bridge and Structures Office.

Notes: The above data shows WSDOT-owned bridges, culverts, and ferry terminals over 20 feet in length that carry vehicular traffic.

All numbers shown in the table above are based on the revised "out-to-out" calculation method (which includes curbs and rails on the bridge) instead of the bridge width curb-to-curb. The 2011 data has been updated using this revised calculation method.

Washington meets federal, state bridge condition goal

in poor condition (structurally deficient) in 2016, with 99 of these located on the National Highway System. From July 2015 through June 2016, 12 WSDOT-owned bridges totaling 91,000 square feet of deck area in poor condition were repaired, transitioning them to good condition. Additionally, 28 WSDOT-owned bridges—with a net total of 505,000 square feet of deck area—deteriorated to a poor condition state. See [Gray Notebook 58, p. 16](#) for information on how bridge conditions are determined.

Statewide structurally deficient bridges by deck area remain below 10% goal

Structurally deficient bridges represented 8.3% (5.9 million square feet) of the total 71.3 million square feet of bridge deck area in Washington as of June 2016 (includes both WSDOT-owned and locally owned bridges; see table below). By number of bridges, 342 of the 7,335 total bridges were considered structurally deficient. See [Gray Notebook 50, p. 14](#) for an overview of the bridge condition rating system.

Of the 342 state and local structurally deficient bridges in FY2016, 154 are WSDOT-owned bridges, an increase from 138 out of 334 statewide structurally deficient bridges in FY2015. WSDOT's 154 structurally deficient bridges account for 8.8% (4.7 million square feet) of WSDOT-owned deck area.

Total (state and local) structurally deficient bridge deck area on the NHS in Washington increased to 4.6 million square feet in 2016, up from 4.3 million square feet in 2015. The NHS is a strategic highway network used for federal and state performance reporting that includes both state and local highways and roads serving major airports, ports, rail and/or truck terminals, pipeline terminals and other transport

Washington achieves goal of keeping structurally deficient bridge deck area below 10% statewide

As of June 2016; Percent of bridge deck area considered structurally deficient (SD); Deck area in millions of square feet

	National Highway System		Statewide	
	Deck area ¹	Number of bridges	Deck area ¹	Number of bridges
WSDOT owned	44.4	2,259	53.5	3,294
<i>Amount SD (%)</i>	4.1 (9.2%)	99	4.7 (8.8%)	154
Locally owned²	4.6	189	17.8	4,041
<i>Amount SD (%)</i>	0.5 (10.0%)	19	1.2 (7.0%)	188
Total	49.0	2,448	71.3	7,335
<i>Amount SD (%)</i>	4.6 (9.3%)	118	5.9 (8.3%)	342

Data source: WSDOT Bridge and Structures Office and WSDOT Local Programs Office.
Notes: Structurally deficient is equal to the state's poor condition rating.
1 Due to rounding, some percentages are not computable based on numbers in the table. 2 Bridges owned by counties and cities.



Results Washington Leading Indicator

Based on current funding levels, control the percent of state and local bridges in poor condition from increasing over 10% by 2017.

Status: On plan (green)

Strategies:

- Replacing deteriorated bridge elements -** WSDOT performs major preservation repairs by addressing specific bridge elements to improve a bridge with a low condition rating. The most common types of repairs include floating bridge anchor cable replacement, expansion joint replacement and concrete column repair.
- Repainting steel bridges -** A protective paint coating on a steel bridge is essential to prevent corrosion, extend the bridge's service life and keep the bridge in fair or better condition. Continuing to keep up with painting can prevent the number of bridges in poor condition from increasing.
- Repairing concrete bridge decks -** WSDOT is working to reduce the number of bridges classified as structurally deficient by addressing bridges with the highest benefits and the most cost savings. One strategy is to repair and rehabilitate concrete bridge decks to extend their service life.

Percent of bridges on the NHS that are structurally deficient (by deck area)	
WSDOT owned	9.2%
Locally owned	10.0%
Combined	9.3%

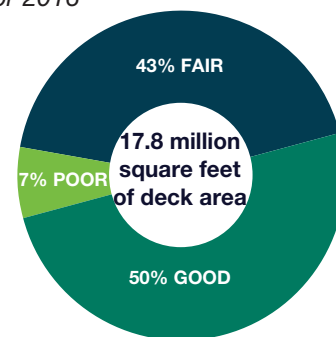
facilities (see [Gray Notebook 54, p. 6](#)). Washington's NHS includes 2,448 bridges; 2,259 (92.3%) are managed by WSDOT and 189 (7.7%) are managed by cities and counties.

Majority of locally owned bridges remain in fair or better condition

Of the 7,335 bridges across Washington, 4,041 are locally owned and support an average of 10 million crossings per day. Approximately 93% of all Washington's local bridges by deck area were considered to be in fair or better condition during the Federal Highway Administration 2016 reporting period (April 2015 through March 2016), holding steady from the 2015 reporting period.

The next Local Federal Bridge Program call for projects will occur in late fall 2016, and

Fair or better locally owned bridge deck remains at 93%
Local agency bridge conditions for 2016



Data source: WSDOT Local Programs Office.
Note: This graph shows conditions for all locally owned bridges, both on and off the NHS.

WSDOT increases its inventory of bridge structures



In 2016, Douglas County used federal and state funding to replace a damaged timber bridge on SR 173 over Foster Creek with a prestressed concrete girder bridge for increased stability.

eligible projects selected by the program will be awarded funds in fall 2017. The WSDOT-funded Local Federal Bridge Program aims to preserve and improve the conditions of city and county bridges that are physically deteriorated or structurally deficient through bridge replacements, bridge rehabilitation and preservation methods (such as scour repair, paint for steel structures, seismic retrofit, deck overlays and joint replacement).

Cities and counties are responsible for managing local bridges and are held to the same standards as WSDOT. Federal, state and local funding sources continue to help local agencies build new or maintain existing bridges.

Washington's bridge inventory grows by 98 structures

The WSDOT-owned bridge inventory includes 3,865 structures as of June 2016, with 53.5 million square feet of deck area. The inventory includes WSDOT-owned bridges, structures less than 20 feet long and structures not open to vehicular traffic (see table at right). The replacement value of all bridges on the state highway system is estimated to be nearly \$51 billion.

Additionally, there are 5,929 locally owned bridge structures in Washington as of June 2016, an increase of 82 structures from June 2015. Vehicular bridges longer than 20 feet account for 68% of the local bridge inventory, and total 17.8 million square feet of statewide deck area.

The new State Route 520 floating bridge opened to traffic in April 2016 and is the world's longest floating bridge. The previous SR 520 floating bridge that was built in 1963 is no longer in use and is being dismantled. WSDOT's bridge



The old SR 520 bridge was WSDOT's longest structurally deficient bridge, totaling 7,518 feet long (442,810 square feet of deck area). A new floating bridge was opened to traffic in April 2016.

inventory will not reflect the addition of the new bridge until the SR 520 bridge replacement contract is formally closed.

A contract to replace the SR 99 Alaskan Way Viaduct with a tunnel is also in progress. The existing double decker bridge will be removed from the state's bridge inventory once the new tunnel opens to traffic and the bridge can be removed.

Washington's bridge inventory increases by 16 WSDOT-owned and 82 locally owned structures Fiscal years 2015 and 2016; Inventory of WSDOT and local bridges

	WSDOT		Local	
	2015	2016	2015	2016
Vehicular bridges longer than 20 feet	3,108	3,109	4,038	4,041
Structures less than 20 feet long	410	418	1,409	1,465
Culverts longer than 20 feet	124	125	-	-
Pedestrian structures	79	81	252	264
Ferry terminal structures	68	69	9	9
Tunnels and lids	44	47	2	8
Border bridges ¹				
Maintained by border state	6 ²	6 ²	1 ³	1 ³
Maintained by Washington	5 ⁴	5 ⁴	-	-
Railroad bridges	5	5	137	142
Total bridge structures⁵	3,849	3,865	5,847⁶	5,929

Data source: WSDOT Bridge and Structures Office and WSDOT Local Programs Office.

Notes: 1 WSDOT funds 50% of preservation for 11 border bridges.

2 Five of these bridges are maintained by Oregon and one by Idaho.

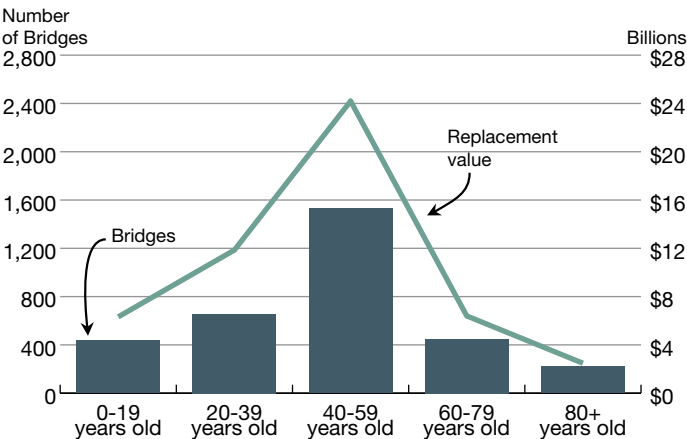
3 The locally owned border bridge count is included in the number of vehicular bridges longer than 20 feet; therefore the one border bridge is not included in the total bridge structures count. 4 Four of these bridges are shared with Oregon and one with Idaho. 5 Inventory totals do not equal the total number of state and local bridges on p. 15 because inventory includes miscellaneous structures that the Federal Highway Administration does not require to be inspected. FHWA requires states to report on conditions for all vehicular bridges, ferry terminals and culverts longer than 20 feet, which are the 3,294 WSDOT-owned and 4,041 locally owned structures. 6 This number differs from the inventory count in [Gray Notebook 58](#) due to a recalculation.

WSDOT maintains six bridges 100 years or older

Currently, six WSDOT-owned bridges and 117 locally owned bridges are 100 years or older. Five of the WSDOT-owned bridges are concrete earth-filled arches, which use concrete walls to retain the roadway fill—in most cases, earth—in an arch design with an asphalt overlay. These arch bridges, common in the early 1900s, were originally built to last about 50 years, but with continued inspection and maintenance they can remain in service for longer depending on the bridge material condition. Five out of the six WSDOT-owned bridges over 100 years are currently in fair or better condition.

Of WSDOT’s bridges, 223 are 80 years or older. Replacement of these bridges as they near 100 years of age would have a total project cost of nearly \$2.5 billion over the next 20 years, or approximately \$125 million per year (in 2016 dollars). Many of these bridges will still be in use during the next 10 years, and WSDOT will continue to focus on their preservation.

Replacing WSDOT’s 223 bridges that are 80 years or older would cost \$2.5 billion over the next 20 years
As of June 2016; Number of bridges by age; Replacement value in billions of dollars



Data source: WSDOT Bridge and Structures Office.
Notes: The graph shows WSDOT-owned bridges only. Replacement value describes the cost to replace all bridges in each age range.

Majority of bridge inspections required by FHWA are routine

WSDOT performed 2,040 bridge inspections in FY2016, more than three-quarters (1,584) of which were routine inspections. While the majority of WSDOT’s bridges are inspected on a two-year cycle as mandated by the FHWA, there are 25 bridges and six ferry terminals with specific watch items that require them to be inspected annually.

A total of 521 concrete bridges that are in good condition and meet defined FHWA criteria are inspected on a four-year cycle. WSDOT performs federally required

WSDOT performs 1,584 routine bridge inspections

Fiscal year 2016; Number of inspections by type

Type of inspection	Number
WSDOT routine bridge inspections	1,584
WSDOT Under Bridge Inspection Truck bridge inspections	204
Special bridge inspections ¹	46
WSDOT local agency inspections	60
Underwater bridge inspections	65
Mechanical and electrical inspections	48
WSDOT routine ferry terminal inspections	21
Fracture critical ferry terminal inspections	12
Total WSDOT bridge inspections	2,040

Data source: WSDOT Bridge and Structures Office.
Notes: These inspections are for WSDOT-owned bridges only. FHWA requires inspections on vehicular bridges longer than 20 feet. WSDOT performs inspections on all structures included in the inventory on [p. 16](#), but only reports on the inspections required by FHWA. 1 These are discretionary and based on known or suspected deficiencies.

inspections on all WSDOT-owned bridges as outlined in the National Bridge Inspection Standards to determine bridge conditions, maintain bridge safety, and identify preservation and maintenance needs.

Local agencies performed 2,356 bridge inspections in FY2016, 96% (2,264) of which were routine. In addition, they conducted 55 inspections on fracture critical structures (bridges that contain support pieces or members that are under tension, where failure would likely cause a portion of or the entire bridge to collapse) and 29 underwater inspections. Local agencies follow the same federal guidance for inspections as the state. Even though most local governments inspect their own bridges, WSDOT conducts field reviews and provides training and technical assistance to Washington cities and counties for inspecting bridges on local roads.

Under Bridge Inspection Trucks are vital for inspections and maintenance

WSDOT owns six Under Bridge Inspection Trucks with four used to conduct bridge inspections and one used for bridge maintenance activities such as annual steel bridge cleaning. WSDOT is currently refurbishing the sixth UBIT that will be used by the Eastern Region for bridge maintenance. A cost comparison analysis conducted by WSDOT found that refurbishing a UBIT in its fleet is a better value than purchasing a new vehicle.

UBIT operation requires one truck driver and two bridge inspectors or maintenance personnel stationed in the truck’s bucket. One employee operates the movement

Number of load restricted and posted bridges increase



A WSDOT crew uses an Under Bridge Inspection Truck to conduct an inspection on the State Route 99 Alaskan Way Viaduct.

of the bucket while the second employee performs the inspection or maintenance work. Operation of the UBIT must be done in daylight hours to ensure employee safety.

WSDOT has load restrictions, postings on 126 bridges in fiscal year 2016

A total of 126 WSDOT-owned bridges were load restricted or posted in FY2016, up from 120 in FY2015. Nearly half (60 out of 126) of WSDOT's load posted or restricted bridges are on the National Highway System, and slightly more than one-fifth (28 out of 126) were considered structurally deficient in FY2016. Additionally, there were 186 locally owned bridges that were load restricted in FY2016 (12 of which were on the NHS, and 69 of which were structurally deficient), an increase from 167 in FY2015.

As part of the bridge inspection program, WSDOT performs load rating evaluations to verify whether bridges can safely carry the weight of trucks using them. Some bridges are weight restricted because they were designed and built at a time when the standard truck weight was lower. If load rating evaluation results show the structure cannot safely carry certain loads because of when it

WSDOT has 126 load restricted or load posted bridges Fiscal years 2013 through 2016; Number of bridges with weight restrictions



Data source: WSDOT Bridge and Structures Office.

Notes: 1 A "load restricted" bridge cannot be legally used by an overloaded truck. 2 A "load posted" bridge limits the allowable weight of trucks to below typical legal weights.



Strategic Plan Goal 1: STRATEGIC INVESTMENTS

Strategic Investments Strategy – Create a process to identify strategic preservation and maintenance investments and strategic operational and multimodal capacity improvement investments in corridors to achieve performance levels.

Asset Management Strategy – Define a strategic, agency-wide asset management policy.

In support of these strategies, WSDOT is currently reviewing a draft instructional letter detailing a policy for strategically managing bridge structures. The instructional letter will then become a part of an agency-wide asset management and preservation plan.

was built or bridge deterioration or damage, WSDOT implements weight restrictions to reduce the risk of further damage and ensure bridges are safe to the traveling public.

A bridge may first be "load restricted," making it illegal for any overloaded truck to use the bridge. If the condition worsens and the bridge's capacity to carry heavy loads decreases, then the bridge will be "load posted." This limits the allowable weight of trucks to below typical legal weights. Preservation activities are required to correct load restricted or posted bridges.

WSDOT identifies potential risks affecting bridge service life

The federal MAP-21 legislation requires states to develop a risk-based asset management plan for the National Highway System within their boundaries. The plan outlines risk management techniques to improve or preserve the condition of assets and performance of the NHS (see box above).

Risk management is the systematic process used to identify risks, analyze consequences and develop treatment strategies. WSDOT encounters several types of risks related to preserving the bridge inventory such as deterioration, scour of foundations, earthquakes and over-height trucks. Each of these risks must be evaluated and preservation strategies must be determined for inclusion in the asset management plan.

Deterioration—the primary risk—is a natural occurrence that is determined by the material, design type, and the amount of maintenance and preservation received over the service life of the bridge. Most bridges are preserved until the preservation cost exceeds replacement cost, at which point replacement becomes the better value.

Deterioration presents highest risk for bridges statewide

Concrete bridge deck preservation will be WSDOT's largest bridge need in the next 10 years
2016 through 2026; Dollars in millions

Category	Current needs	Predicted additional needs	Total 10-year needs
Border bridge preservation ¹	\$81.2	N/A ²	\$81.2
Bridge element repairs	\$26.5	\$85.9	\$112.4
Expansion joint preservation ³	\$250.5	\$155.2	\$405.7
Movable bridge preservation ³	\$39.6	N/A ²	\$39.6
Concrete deck preservation	\$115.6	\$726.5	\$842.1
Steel painting	\$414.5	\$292.1	\$706.6
Bridge rehab or replacement	\$255.7	\$227.8	\$483.5
Bridge scour	\$9.5	\$20.0	\$29.5
Total	\$1,193.1	\$1,507.5	\$2,700.6

Data source: WSDOT Bridges and Structures Office.

Notes: 1 Border bridge preservation is the highest funding priority and includes work from other preservation categories in the table. 2 N/A = Not applicable; the predicted additional preservation need has not been defined. 3 Categories are separate to highlight specific bridge element repairs.

WSDOT currently builds bridges using two primary material types: concrete and steel. Some older bridges were built with timber. Bridge design methods include beams or girders, arches, and boxes and trusses. Each of these materials and design types have different rates of deterioration that can affect the overall service life of a bridge. WSDOT addresses bridge deterioration through several preservation activities such as bridge repairs, painting steel bridges, concrete bridge deck rehabilitation, and bridge rehab or replacement.

Risk: Bridge element deterioration

WSDOT hires contractors to address specific bridge element deterioration beyond what regional bridge crews can accomplish. Examples of this work include replacing steel anchor cables on floating bridges, repairing deteriorated concrete columns, replacing large steel expansion joints, and movable bridge mechanical and electrical rehabilitation.

Total funding in the 2015-2017 biennium (July 2015 through June 2017) for bridge repair is \$48.2 million. This includes a \$10.0 million reserve to be used for prioritized bridge

1,730 bridge element repairs needed in next 10 years
As of June 2016; Dollars in millions

Bridge element needs	Number of bridges	Cost to repair
Bridge element repairs	92	\$112.4
Expansion joints	1614	\$405.7
Movable bridges	12	\$39.6
Border bridge elements	12	\$12.9
Total 10-year needs	1,730	\$570.6

Data source: WSDOT Bridge and Structures Office.



WSDOT replaced an old maintenance traveler (a movable platform providing under-bridge access) with a new one (pictured above) on the SR 16 Tacoma Narrows Bridge in 2016, allowing WSDOT crews to complete work on the bridge more safely and efficiently.

repair needs during the biennium; repairs are prioritized based on engineers' judgements on the severity of the issue, route importance and the risk of doing nothing. Also included in the \$48.2 million budget are \$1.0 million and \$4.6 million reserves for as-needed preservation activities on the new SR 520 floating bridge and the new SR 16 Tacoma Narrows Bridge, respectively.

WSDOT completed a project to replace 41 expansion joints on six bridges along Interstate 5 near Marysville in August 2016. This project adds nearly 20 years of service life to the bridges. Three bridge element deterioration projects are scheduled for the SR 104 Hood Canal floating bridge to replace anchor cables, repair deteriorated prestressed concrete (a compression method to strengthen concrete) girders and replace gear boxes on the movable span.

Risk: Concrete bridge deck deterioration

The majority of WSDOT-owned bridges have reinforced concrete decks. The primary goal of WSDOT's comprehensive bridge deck program is economically repairing and overlaying concrete bridge deck to prolong their lifespan and avoid expensive deck replacements.

When funding becomes available, WSDOT hires contractors to perform deck repairs and add a protective

Thirty-eight bridge decks are past due for repair
As of June 2016; Dollars in millions

Bridge deck needs	Number of bridges	Cost to repair
Past due for repair ¹	38	\$38.4
Due for repair ²	47	\$77.2
Due within the next 10 years	223	\$726.5
Border bridge deck repairs	2	\$22.3
Total 10-year needs	310	\$864.4

Data source: WSDOT Bridge and Structures Office.

Notes: 1 Bridges with more than 5% of deck area patched or spalled are classified as "past due." 2 Bridges with 2% to 5% of deck area patched or spalled are classified as "due."

WSDOT manages 16 bridges that need replacing

overlay, normally a 1.5-inch thick layer of modified concrete. A full bridge deck rehabilitation and concrete overlay extends the bridge's service life by at least 25 to 30 years and is more cost-effective than replacing the entire deck or bridge for bridge decks that have repeat deterioration.

Using the modified concrete overlay method, WSDOT has extended the service life of 343 bridge decks (8.2 million square feet) by at least 25 years. As a result of WSDOT utilizing this overlay method as a bridge deck preservation strategy, only 14 total deck replacements have been necessary to date. WSDOT has identified another 198 overlays (6.5 million square feet) that are predicted to need replacing during the next 10 years.

Once the reinforcing steel in concrete bridge decks starts to corrode (for example, due to winter weather or the use of deicing salt), the concrete starts to "spall" (pothole) and deteriorate. WSDOT crews repair spalled areas annually, but these repairs are considered to be temporary and typically last one to three years. Once the total area of repairs and/or patching exceed 2% of the total deck area, the bridge is added to the list of future needs and classified as structurally deficient. Bridge deck overlay projects are prioritized based on the total square footage of deterioration and the type of freight route (see [p. 40](#)) on which the bridge is located. Bridges on the most vital freight routes and those leading to islands get higher priority.

WSDOT has one concrete overlay project under contract out of the 16 statewide projects planned to be completed or under contract in the 2015-2017 biennium. WSDOT plans to spend \$4.1 million for concrete bridge deck overlays during the biennium. Additionally, a six-year preservation funding plan includes \$84.1 million for concrete bridge deck rehabilitation and overlay.

Risk: Steel bridge deterioration

WSDOT preserves steel bridges on state highways by painting them as needed to protect the steel elements against premature corrosion. WSDOT currently maintains 311 steel bridges and eight steel border bridges that require painting on a regular basis. Though WSDOT does not directly manage all eight of the steel border bridges, painting costs are shared equally between the bordering states. WSDOT has completed six painting projects on steel bridges in the 2015-2017 biennium, with three additional projects under contract. The total planned biennial funding for steel bridge painting is \$45.3 million.

WSDOT determines a need of \$742 million to fully fund its 10-year steel bridge painting plan

As of June 2016; Dollars in millions

Painting needs	Number of bridges	Cost to paint
Past due for painting ¹	39	\$163.2
Due for painting ²	70	\$251.3
Due within the next 10 years	70	\$292.1
Border bridge painting	3	\$36.0
10-year total need	182	\$742.6

Data source: WSDOT Bridge and Structures Office.

Notes: 1 Steel bridges with more than 5% of steel exposed are classified as "past due for painting." 2 Steel bridges with 2% to 5% of steel exposed are classified as "due for painting."

Bridges are prioritized for repainting based on the amount of corrosion and the route on which they are located. Bridges on primary freight routes and those leading to islands are given top priority. Steel truss bridges require repainting every 20 to 25 years on average and steel girder bridges require painting every 30 to 40 years on average. WSDOT will need to repaint 182 of its 311 steel bridges within the next 10 years (see table above).

Painting steel bridges is the best economic decision based on the lowest lifecycle cost. A full paint removal and repainting project is approximately 20-25% of the cost to replace a bridge and provides an additional 20 to 25 years of service life.

Risk: Deterioration requiring bridge rehabilitation or replacement

WSDOT currently manages 16 bridges that are structurally deficient and require replacement (excluding the SR 99 Alaskan Way Viaduct bridge as it has an active replacement contract). An additional 16 structurally deficient bridges have been identified as needing rehabilitation (a major preservation repair) with three of those requiring bridge deck replacement, a more intensive project than bridge deck repair or concrete overlay (see [p. 19](#)).

WSDOT currently needs to replace 16 bridges

As of June 2016; Dollars in millions

Bridge needs	Number of bridges	Cost to replace
Current replacement need	16	\$148.1
Current rehabilitation need	16	\$107.6
Replacement/rehabilitation need within the next 10 years	60	\$227.8
Border bridge replacement/rehabilitation need	1	\$10.0
10-year total need	93	\$493.5

Data source: WSDOT Bridge and Structures Office.

Three bridges to be repaired after impact damages

Bridges that have reached the end of their service life require rehabilitation or replacement. Bridge rehabilitation is considered before replacement. Generally, if rehabilitation is 60% or more of the replacement cost then bridge replacement is chosen.

Risk: Scour of bridge foundations

Bridges experience “scour” when high volumes of water cause soil erosion around their foundation. Foundation scour is the leading cause of bridge failures in Washington and nationwide. There are 1,583 WSDOT-managed vehicular bridges and culverts longer than 20 feet that cross over water. WSDOT has evaluated these bridges using national inspection standards and determined 262 (16.6%) to be “scour critical,” meaning they are at risk for future scour. All of these bridges are monitored and inspected every two years as part of the routine bridge inspections.

WSDOT reviewed the conditions and original bridge plans for all of the scour critical bridges in spring 2016 and determined the top priorities that will need scour repair. The three highest scour priorities—US 101 Chehalis River bridge, SR 529 Union Slough bridge and the US 2 South Fork Skykomish River bridge—are in the design phase with construction planned to begin in 2018. The 2015-2017 biennium scour program funding is \$700,000.

In November 2015, a prestressed concrete bridge on US 2 at milepost 54 near Skykomish was partially closed and required an emergency foundation repair due to erosion caused by heavy rainfall. In May 2016, a bridge on US 12 at milepost 135 near Packwood also required an emergency foundation repair. Both bridges are currently open to traffic.

Risk: Over-height truck impacts

Steel truss bridges and other bridges that cross over state highways are frequently damaged by over-height truck impacts. The damage can result in bridge collapse (the I-5 Skagit River bridge collapse in 2012), bridge closure (the I-5 Koontz Road bridge closure in December 2015), or lane restrictions. Funding in the 2015-2017 biennium to address bridges damaged by truck impacts is nearly \$7.7 million.

WSDOT has recently completed contracts to replace truck-damaged prestressed concrete girders on three bridges: the I-5 northbound bridge over 41st Division Drive near Joint Base Lewis-McChord, the I-5/Birch Bay Road undercrossing in Custer and the I-90 eastbound bridge over Front Street in Issaquah.



The Koontz Road bridge over I-5 was severely damaged by an over-height truck impact in December 2015, requiring closure of the bridge until two of the four prestressed concrete girders can be replaced.

Three bridges are currently under design to be repaired:

- SR 121/93rd Ave. bridge – A northbound truck impacted the bridge in 2015. Bridge engineers determined the damaged girder needs replacement. Work is scheduled to be completed in 2017.
- I-5/Koontz Road bridge – A southbound truck impacted the bridge in 2015. Bridge engineers determined the bridge needed to be closed and two damaged girders replaced. Work is scheduled to be completed in 2017.
- Southbound I-5 Cowlitz River bridge – A southbound truck impacted a vertical member of the north steel truss span in 2015. Bridge engineers determined the vertical member needs replacement. Work is scheduled to be completed in 2017.

At the time of publication, the WSDOT-owned Chamber Way bridge over I-5 in Chehalis had been struck by an over-height truck on July 22, 2016, causing significant structural damage; the bridge was immediately closed to traffic. The next day, structural engineers performed a thorough inspection, determining that damages to the support girders over the southbound lanes of I-5 were irreparable. Emergency contractor crews completed demolition of the bridge during a nighttime closure of I-5 on July 26, 2016. A temporary span was constructed, reopening the bridge on August 4, 2016, to two-way vehicular traffic. On August 8, 2016, another over-height truck struck the bridge over the northbound I-5 lanes; damages were minor and did not affect the bridge structure. A long-term solution for the much-used overpass is still in development.

Risk: Earthquakes

Washington state bridges are at risk of earthquake damage, and risk is highest for those bridges west of the Cascade Mountains. WSDOT participated with federal agencies, California and Oregon during the “Cascadia Rising” earthquake drill in June 2016 which assumed a 9.0 magnitude earthquake along the Cascadia Subduction

Connecting Washington aids in bridge preservation

Zone along with a potential tsunami. Lessons learned from this drill will help agencies better understand how they will be able to respond to a major seismic event.

New bridges are designed based on current seismic design standards. Bridges may sustain some damage in large earthquakes, but should not collapse, and would need to be repaired following an extreme event like the Cascadia Rising earthquake simulation. WSDOT has coordinated with the state Department of Emergency Management and others to identify key routes (such as I-5 from JBLM to the I-405/SR 518 interchange, I-405 and I-90) determined to be critical to have open following a seismic event to help move emergency vehicles, goods and supplies for the response.

Connecting Washington addresses bridge preservation needs

As part of the \$16 billion Connecting Washington transportation revenue package, \$1.2 billion is allocated to state highway preservation, which includes maintaining pavement, bridges and traffic operations. WSDOT is working to identify bridge preservation projects as part of this investment. Three specific bridge projects identified by the Legislature will be addressed in the next six years:

- SR 241 Yakima River bridge near Mabton – \$12 million
- US 12 Wildcat Creek bridge near White Pass – \$12 million
- SR 107 Chehalis River bridge near Montesano – \$12.5 million

In addition to the \$1.2 billion, another \$57.5 million from Connecting Washington is allocated to bridge preservation and repair projects over the next 16 years. No specific projects have been identified as part of this investment.

Connecting Washington funding will not clear WSDOT's list of structurally deficient bridges. Structurally deficient does not mean that the bridge is unsafe or needs to be replaced; it generally indicates that one or more of the bridge components requires either repair or preservation. In delivering preservation strategies using a lowest lifecycle cost approach, there will continue to be bridge components that need to be addressed.

Connecting Washington will help address the most critical needs for bridges. In particular, it will help eliminate most of the weight restrictions on many of the deficient bridges and help prevent new weight restrictions from being imposed.

WSDOT has addressed bridge seismic retrofit needs for the past two decades, including identifying and retrofitting all or part of more than 400 bridges. WSDOT has invested nearly \$195 million since 1991 to strengthen bridges to better withstand earthquakes in Washington.

WSDOT has a current need of \$1.5 billion for seismic retrofitting. One bridge on SR 167 near Auburn is currently under contract to be retrofitted by adding steel jackets to the concrete columns. Funding in the 2015-2017 biennium for the seismic retrofit of state bridges is nearly \$6.7 million.

Contributors include Rico Baroga, Roman Peralta, DeWayne Wilson, Erica Bramlet and Tricia Hasan

A closer look at MAP-21, Results Washington and GASB bridge condition requirements

The federal Moving Ahead for Progress in the 21st Century legislation (see [p. 7](#)) requires that states have no more than 10% of bridge deck area classified as structurally deficient (poor condition) on the National Highway System. States failing to meet this target for three consecutive years must devote a portion of National Highway Performance Program funds to improve bridge conditions. The Results Washington goal mirrors this federal requirement (see [p. 9](#) for more on Results Washington; see [p. 15](#) for the progress toward this goal).

WSDOT also follows infrastructure asset reporting policies adopted by the state from the Governmental Accounting Standards Board, which establishes reporting standards for state and local governments that follow Generally Accepted Accounting Principles. For GASB reporting, WSDOT has set a condition goal of 90% of WSDOT-owned bridge deck area in fair or better condition. WSDOT is required to maintain an inventory of assets, document asset conditions, and estimate the annual preservation costs needed to maintain assets at the 90% bridge condition goal.

Bridge condition reporting requirements Condition targets by performance reporting system

Reporting system	Target	Included bridges
Moving Ahead for Progress in the 21st Century	≤10% of deck area on structurally deficient (poor condition) bridges	All NHS bridges (WSDOT- and locally owned)
Results Washington	≤10% of deck area on structurally deficient (poor condition) bridges	All NHS bridges (WSDOT- and locally owned)
Governmental Accounting Standards Board	≥90% of bridge deck area in fair or better condition	All WSDOT-owned bridges (NHS and non-NHS)

Data source: WSDOT Office of Strategic Assessment and Performance Analysis.
Note: NHS = National Highway System.

Ferries Vessel and Terminal Preservation Annual Report

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Notable results

- The percent of ferries vessel systems overdue for replacement increased from 9% in FY2015 to 11% in FY2016
- WSDOT had 87% of its ferry terminal systems in fair or better condition in 2015, a 1.6 percentage point decrease from 2014
- Of WSDOT Ferries' 139 buildings, 97.1% were in good or fair condition in 2015, down from 99.3% in 2014
- The total value of vessel systems needing replacement increased from \$88.3 million in FY2015 to \$132.3 million in FY2016

Vessel systems needing replacement see increase

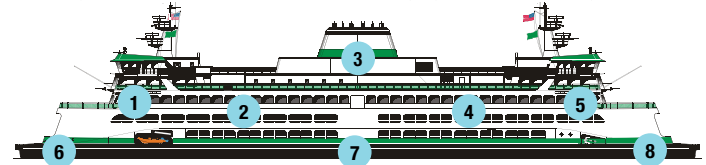
WSDOT removed two of the oldest vessels from its fleet in fiscal year 2016 when it decommissioned the Motor/Vessel *Hiyu* and the M/V *Evergreen State*. Even with their removal, the total number of vessel systems overdue for replacement at the end of FY2016 increased compared to the beginning of the fiscal year. This was due emergency work impacting planned preservation work, the addition of systems that were past due for replacement, and the changing of system conditions based on inspections.

WSDOT uses a risk assessment guide to help rate the condition of its vessel systems at the end of each fiscal year, which runs from July 1 through June 30. The agency assigns each system a Condition Rating of 1, 2 or 3 depending on the likelihood of failure and the impact a failure would have on ferry service (see risk assessment matrix on [p. 25](#)).

The percent of vessel systems included in Condition Rating 1 (systems not currently needing replacement) decreased from 56% in FY2015 to 52% in FY2016. This decrease was due to emergency repairs taking priority shipyard time away from planned preservation work.

The number of vessel systems in Condition Rating 2 (approaching the need for replacement) increased from 36% to 37%, and the number of systems in Condition Rating 3 (overdue for replacement) increased from 9% to 11%, between FY2015 and FY2016. Condition category ratings include the 22 vessels operating at the end of FY2016, with 1,966 total vessel systems tracked at the end of FY2016. This is 69 fewer than there were at the end of FY2015 when 24 vessels were included in the overall count.

Number of WSDOT ferry vessel systems that do not currently need replacement decreases in FY2016
Fiscal years 2015 and 2016; Results by type of vessel system



	Types of ferry vessel systems	Number of systems	Percent of systems in Condition Ratings ¹		
			1	2	3
1	Communications, navigation, lifesaving systems	613	65%	21%	14%
2	Piping systems	150	37%	40%	23%
3	Structural preservation (paint)	217	70%	28%	2%
4	Passenger and crew spaces	66	50%	48%	2%
5	Security systems	104	58%	42%	0%
6	Steel structures	173	64%	28%	8%
7	Mechanical/electrical systems	346	52%	38%	10%
8	Propulsion systems	297	11%	71%	18%
	Total/average FY2016	1,966	52%	37%	11%
	Total/average FY2015	2,305	56%	36%	9%

Data source: WSDOT Ferries.

Notes: Percentages may not add to 100 due to rounding. 1 Systems included in Condition Rating 1 do not currently need to be replaced; those in Condition Rating 2 should be monitored for replacement within the current or ensuing biennium; those in Condition Rating 3 are past due for replacement.

Emergency repairs to vessels impact preservation efforts, level of service

Eleven separate emergency events occurred to seven different vessels during FY2016, keeping those vessels out of service for a total of 306 days.

When vessels are unavailable for service due to emergencies, other vessels that are scheduled for preservation and maintenance work are placed into service to minimize disruptions for travelers.

WSDOT replaces propellers on four vessels in FY2016

WSDOT's ability to deliver preservation work as planned is further impacted as vessels receiving emergency repairs take up limited shipyard space.

During FY2016, WSDOT completed \$31 million in preservation work, replacing 43 inventory items on nine vessels. These efforts included topside painting of the M/V *Tacoma*, and M/V *Kaleetan*; replacing propellers on the M/V *Issaquah*, M/V *Spokane*, M/V *Yakima*, and M/V *Tacoma*; replacing the saltwater piping systems on the M/V *Elwha*, and completing other preservation efforts on other vessels.

At the end of FY2015, there were 24 vessels in operation with an average age of 32 years old. This changed slightly at the end of FY2016 after the M/V *Evergreen State* (built in 1954) and M/V *Hiyu* (built in 1967) were decommissioned and the average age of the fleet decreased to 31 years old.

WSDOT is expecting the delivery of two new 144-vehicle Olympic Class vessels, the M/V *Chimacum* (early 2017) and the M/V *Suquamish* (fall 2018). These vessels will join the fleet's most recent additions, the M/V *Tokitae* (2014) and M/V *Samish* (2015), to further reduce the average age of the fleet as they replace older vessels.

Propulsion, piping systems have high percentage of past due items

Propulsion and piping systems had the highest percentage of items that were past due for replacement in FY2016, with 23% and 18%, respectively. This is similar to FY2015 when 21% of propulsion systems and 20% of piping systems were in Condition Rating 3. See chart on [p. 23](#).

WSDOT weights ferry systems that are critical to service more heavily than those that do not immediately impact travel. For example, major mechanical and electrical systems are considered high priority because repairs can require removing the vessel from service, which can result in trip cancellations or delays in service if a suitable, spare vessel is not available.

Due to this high consequence of failure and to ensure continued service, these systems are elevated to Condition Rating 3 earlier in their life cycle than other, less critical systems. This can result in ferries having more critical systems (like propulsion and piping systems) in Condition Rating 3. For example, systems with the very

highest consequence of failure can become Condition Rating 3 while still having 24% of their life cycle remaining. Meanwhile, systems like passenger and crew spaces are less critical because the probability of disrupting service is low, even as they pass the end of their useful life.

Super, Evergreen State class vessels have higher percentage of systems needing replacement

Fiscal years 2015 and 2016; Inspection results by vessel

Vessel classes and vessels	Number of vessel systems	Year built or rebuilt	Percent of systems in Condition Ratings ¹		
			1	2	3
Jumbo Mark II Class					
M/V Tacoma	99	1997	55%	34%	11%
M/V Wenatchee	99	1998	47%	45%	7%
M/V Puyallup	99	1999	54%	42%	4%
Jumbo Class					
M/V Spokane	90	1972	52%	38%	10%
M/V Walla Walla	90	1973	41%	48%	11%
Super Class					
M/V Hyak	92	1967	27%	43%	29%
M/V Kaleetan	92	1967	42%	45%	13%
M/V Yakima	91	1967	40%	47%	13%
M/V Elwha	94	1967	31%	40%	29%
Olympic Class					
M/V Tokitae	87	2014	84%	16%	0%
M/V Samish	87	2015	85%	15%	0%
Issaquah Class					
M/V Issaquah	85	1979	45%	42%	13%
M/V Kitsap	86	1980	52%	35%	13%
M/V Kittitas	87	1980	41%	47%	11%
M/V Cathlamet	87	1981	53%	33%	14%
M/V Chelan	92	1981	53%	36%	11%
M/V Sealth	86	1982	35%	48%	17%
Evergreen State Class					
M/V Klahowya	83	1958	33%	49%	18%
M/V Tillikum	83	1959	36%	42%	22%
Kwa-di Tabil Class					
M/V Chetzemoka	83	2010	81%	17%	2%
M/V Salish	85	2011	81%	19%	0%
M/V Kennewick	85	2012	82%	15%	2%
Fleet wide FY2016	1,966	Avg. 1985	52%	37%	11%
Fleet wide FY2015	2,305	1984	56%	36%	9%

Data source: WSDOT Ferries.

Notes: M/V = Motor/Vessel. The M/V *Evergreen State* and M/V *Hiyu* were removed from service in fiscal year 2016. Percentages may not add to 100 due to rounding. 1 Systems included in Condition Rating 1 do not currently need to be replaced; those in Condition Rating 2 should be monitored for replacement within the current or ensuing biennium; those in Condition Rating 3 are past due for replacement.

Terminal systems see slight decline in conditions

WSDOT risk assessment matrix helps prioritize ferry vessel preservation

Based on the likelihood of the system failing combined with the likely consequences of the system's failure

Percent of life cycle remaining (Probability of failure factor)	Consequence of failure factor				
	Minimal impact: does not affect sailing	Marginal impact: less than 24 hours to repair	Moderate impact: one or more days to repair	Critical impact: one or more weeks to repair	Catastrophic: long-term, unscheduled impacts to sailings during repairs
Beyond life cycle (nearly certain to fail)	Condition Rating 2:		Condition Rating 3:		
0% - 9% (likely to fail)	System is approaching the point at which replacement should occur in the		System is overdue for replacement		
10% - 24% (failure possible)	Condition Rating 1:		current or ensuing biennia		
25% - 49% (unlikely to fail)	System does not currently need replacement				
50% - 100% (very unlikely to fail)					

Data source: WSDOT Ferries.

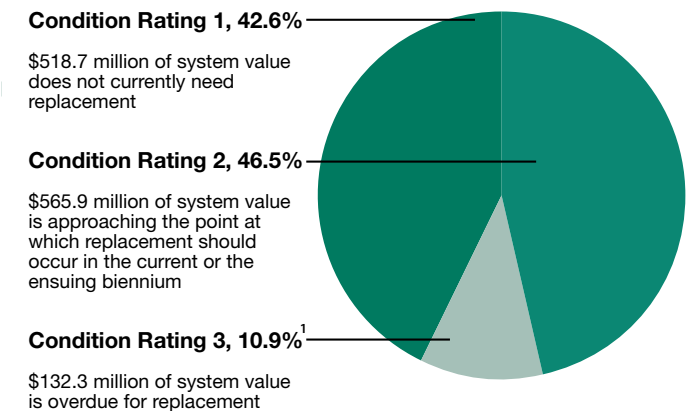
Applying dollar values to systems helps identify preservation funding needs

When weighted by the total dollar value of the vessel systems, Condition Rating 1 items not currently needing replacement comprised \$518.7 million (42.6%) of the total in FY2016, a decrease of \$20.9 million from FY2015.

This change was due to items moving from Condition Rating 1 to the other two condition ratings during FY2016. Condition Rating 2 items were \$565.9 million (46.5%), an increase of \$134.2 million from FY2015. The increase was due to a combination of some high cost system replacements, systems being added to some vessels and the adjustment of replacement costs for multiple vessels. At the end of FY2016, the dollar value of items in Condition Rating 3 was \$132.3 million (10.9%), marking a \$44.0 million increase from FY2015 in the dollar amount of items that are overdue for replacement.

More than 89% of total value of ferries vessel systems are not overdue for replacement

Fiscal year 2016; Percent of total dollar value



Data source: WSDOT Ferries.

Notes: 1 Measure used for Results Washington. Percentages may not add to 100 due to rounding.

Similar to the Condition Rating 2 increase, the addition of systems not previously accounted for and the recosting of existing systems resulted in the increase.

With the total vessel systems valued at approximately \$1.22 billion in FY2016, the valuations indicate that \$1.08 billion (89.1%) of items have Condition Ratings of 1 or 2 and are not currently overdue for replacement.

WSDOT regularly monitors the dollar value of its systems in Condition Rating 3 to determine the success of its ongoing efforts to reduce the number of past due systems. WSDOT reduces the number of Condition Rating 3 items by obtaining extended or extra shipyard periods and reprioritizing work prior to established shipyard visits are ways.

WSDOT loses ground on terminal preservation conditions in 2016

Approximately 87% of WSDOT Ferries terminal systems—which assist in the safe, efficient movement of people and vehicles to and from ferry vessels—were in fair or better condition at the end of calendar year 2015. This is a decline of 1.6 percentage points from the 88.6% that were in fair or better condition in 2014. WSDOT also saw an increase in the number of systems in the poor or substandard condition category by 1.2 percentage points, from 11.6% in 2014 to 12.8% in 2015.

Terminal system ratings are based on inspections that are mandated by state law to occur at least once every three years. Increases to system condition ratings occur after preservation work has been completed under the capital program, or after maintenance work is finished under the Ferries operating program. Decreases to the rating occur after normal use or weather conditions degrade an asset to a lower level of functionality or safety.

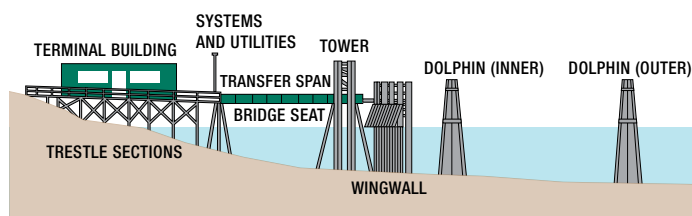
Terminal system conditions decrease slightly in 2015

Systematic inspections do not always occur during the same year work takes place on an asset. As a result, repairs and improvements to a system, terminal or individual asset may not be reflected in the reporting period the work was accomplished.

Buildings at WSDOT terminals rank highest in good/fair condition category

Buildings at WSDOT terminals continued to have the highest percent (97.1%) of inventory items in good or fair condition in 2015, a slight decrease from the 99.3% in 2014.

The condition of landing aids had the largest increase of systems in the good or fair category, improving from 78.0% in 2014 to 80.2% in 2015. Preservation and maintenance work on eight dolphins (see schematic below) occurred at the Bremerton (3), Edmonds (1), Eagle Harbor (1), Fauntleroy (2), and Vashon (1) terminals. Landing aids (wingwalls and dolphins) help guide vessels to the docks. Many of the older systems are constructed



Structural system conditions of WSDOT Ferries terminals see slight decrease in 2015

Calendar years 2014-2015; Inspection results by category

Type of facility or system	Number of systems	Good or fair (70-100)	Poor or substandard (0-69)	Not rated
Buildings	139	97.1%	1.4%	1.4%
Landing aids ¹	177	80.2%	19.8%	0.0%
Overhead loading systems	66	80.3%	19.7%	0.0%
Passenger-only ferry facilities	14	78.6%	21.4%	0.0%
Pavement	83	85.5%	14.5%	0.0%
Trestles and bulkheads	71	85.9%	14.1%	0.0%
Vehicle transfer spans	210	89.5%	10.5%	0.0%
Total/average 2015	760	87.0%	12.8%	0.3%
Total/average 2014	753	88.6%	11.3%	0.1%

Data source: WSDOT Ferries.

Notes: Percentages may not add to 100 due to rounding. 1 Landing aids ensure the ferry vessels are aligned correctly at the terminals, and include wingwalls and dolphins. The condition categories do not indicate whether systems are safe or unsafe, but rather how closely their condition should be monitored prior to spending funds on preservation. See [Gray Notebook 49, p. 13](#) for a description of the ratings.

of creosote-soaked wood pilings and have deteriorated in saltwater over the decades. To improve the system and reduce impacts on the marine environment, WSDOT continues to make replacing its aging creosote landing aids with steel and corrosion-resistant plastic structures a priority.

Overhead loading systems showed the largest decrease of inventory items in good or fair condition, dropping from 89.4% in 2014 to 80.3% in 2015. Four of the six items that moved into the poor or substandard category in 2015 are sections of a slip at Colman Dock in Seattle, which will be replaced during an upcoming renovation project.

At 21.4%, passenger-only facilities had the highest percentage of inventory items with a poor or substandard condition rating at the end of 2015. This is the same percentage as in 2014. Passenger-only facilities are located at Colman Dock in Seattle, the Vashon Terminal and the Eagle Harbor maintenance facility on Bainbridge Island and include transfer spans, floating docks, trestles and aprons.

Ferries uses life cycle costs, condition ratings to prioritize preservation work

WSDOT invested \$58.2 million in vessel and terminal preservation projects during FY2016 (the first year of the 2015-2017 biennium) in an effort to reduce the number of systems in the preservation backlog.

In order to estimate future terminal and vessel preservation needs per Legislative mandate, Ferries use a Life Cycle Cost Model. The LCCM is an inventory database of systems, which includes information like the year systems were constructed and their standard life cycles.

Ferries uses the LCCM to develop budget requests for preservation funding to address the backlog of maintenance and repair projects. In FY2016, there were 1,966 vessel systems and 760 terminal systems; but this number can change as systems are added or removed, or when new vessels are added or old ones retired.

WSDOT expects backlog increase during the 2015-2017 biennium

The 2015-2017 biennium vessel preservation plan is projecting an increase in the backlog of needed preservation work from 26.3% at the beginning of the 2015-2017 biennium (July 2015) to 28.1% at the end of the biennium (June 2017). If no vessel systems due for replacement are renewed in the biennium, the vessel preservation backlog is projected to rise to 32.3%.

Ferries works to address vessel preservation backlog

At the mid-point of the biennium, completed work has accounted for a 1.7% reduction of the vessel preservation backlog. If no additional work was completed through the end of biennium, the backlog would be 30.6%.

WSDOT needs to renew an additional 2.5% of systems in FY2017 to meet the original plan of a 28.1% backlog.

Vessel emergencies present challenges for preservation program

Fiscal year 2016 presented challenges for the vessel preservation program due to 11 emergency events. Planned preservation work had to be delayed or deferred to open up shipyard times for emergency work, and to cover service needs created by the vessels being unavailable for service.

How Preservation Needs Percentage works

The preservation backlog is measured as a Preservation Needs Percentage, which is the percent of the value of terminal or vessel systems needing replacement (see chart at right).

The PNP differs from the vessels' condition categories and terminals' condition ratings because it only tracks whether or not a system is past its originally planned year of replacement based on its life cycle. WSDOT makes adjustments as needed to the life cycle of terminals by comparing an item's condition to historical information of a similar item in similar condition.

WSDOT determines the baselines for the backlog at the beginning of each biennium, making projections on what the backlog will be at the end of the biennium while considering the value of systems coming due for replacement during the two-year period. At the close of each biennium, WSDOT reviews whether or not the legislatively-authorized biennial plan was successful.

WSDOT measures success in delivering the terminal preservation budget by comparing the target percent of the value of terminal assets beyond their condition-based life cycle at the end of the biennium to the actual percent of value achieved. To achieve this, WSDOT must reduce the backlog of preservation needs over the biennium so the value of systems preserved exceed the value of systems coming due for replacement during the two-year period.

WSDOT completed \$31.0 million of vessel preservation work in FY2016 from a biennial budget of \$43.3 million. The 2016 supplemental budget increased the 2015-2017 biennial vessel preservation budget by more than \$26.9 million to \$70.3 million. The M/V *Tacoma* had

Ferries vessel and terminal preservation needs see backlog increases so far in 2015-2017 biennium

Based on Life Cycle Cost Model and economic-based needs

Backlog status	Life cycle-based vessel needs	Economic-based terminal needs ¹
Original backlog at beginning of biennium	26.3%	3.7%
Additions to backlog during the biennium	6.0%	1.7%
Total backlog prior to preservation investments	32.3%	5.4%
Projected impact of planned preservation investments	4.2%	0.3%
End of biennium backlog based on preservation plan	28.1%	5.1%

Preservation spending as of June 2016 – mid-biennium (percent of biennial budget)	\$31.0 million of \$70.3 million (44.1%)	\$27.2 million of \$76.1 million (35.7%)
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Actual backlog as of June 2016	30.6%	5.3%
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Data source: WSDOT Ferries.

Notes: 1 WSDOT Ferries economic-based model was fine-tuned in FY2016, while inspection and maintenance efforts were updated. As a result, the information above is not directly comparable to that provided for FY2015 in *Gray Notebook* 58. Measure is also used for Results Washington.

Ferries uses condition-based and economic model to gauge its preservation needs

In FY2016, WSDOT implemented an asset management model with economic inputs to screen which preservation items fiscally make sense to replace. While the standard condition-based preservation backlog from the LCCM is dependent on when items are past their life cycles, the economic model's backlog are items whose maintenance cost, risks, and financial impacts of failure are higher than the cost of replacement.

WSDOT updates the economic model annually. These include updates to the costs of risks, impacts of failure, system replacement, and maintenance. Conditions of systems are updated based on inspections, and systems are also added or removed from the model to match the inventory database in the LCCM.

Terminal conditions meet Results Washington goal

the most preservation work completed (\$10.1 million) in FY2016, with the replacement of propellers, saltwater piping, draft indicator systems, and hull steel. Work also included the preservation of structures with the painting of the vessel's topside, and water and sewage tanks. The M/V *Kaleetan* also had its topside painted as a major part of preservation work (\$4.4 million) performed in FY2016.

Terminal preservation backlog sees increases from beginning of biennium

Using the terminal Life Cycle Cost Model preservation plan, the preservation backlog of the value of systems past due for replacement will increase from 3.7% at the beginning of the 2015-2017 biennium (July 2015) to 5.4% at the end of the biennium (June 2017) if no preservation inventory items are addressed. See chart on [p. 27](#) for details.

WSDOT has budgeted \$76.1 million to support the terminal preservation plan. This investment will help to reduce the backlog at the end of the biennium from 5.4% (with no investments) to a backlog of 5.1%. During the first half of the 2015-2017 biennium WSDOT removed and replaced four existing creosote dolphins with four new reconfigured steel dolphins at the Anacortes terminal. Also, at Anacortes, WSDOT removed three creosote wingwalls and replaced them with steel structures. In total, the project removed 416 tons of creosote-treated wood from the Guemes Channel in the San Juan Islands.

Terminal preservation is currently under its budgeted preservation target halfway through the 2015-2017 biennium. Actual spending to date is \$27.2 million or 35.7%



A floating crane removes creosote pilings at the Anacortes dock as part of a 2015 improvement project.

of the \$76.1 million biennial preservation budget. Due to the timing of projects over the biennium, planned spending was not expected to exceed 50% by the middle of the biennium.

Contributors include Jean Baker, John Bernhard, Tim Browning, Tom Castor, Jim Hasselbalch, Nicole McIntosh, Mehrdad Moini, Sio Ng, Kynan Patterson, Manny Quinteiro and Joe Irwin

Results Washington Leading Indicator

Based on current funding levels, control the percent of ferry vessel systems that are past due for replacement from increasing to over 10% by 2020.

Status: Off plan (red) — 10.9% as of June 30, 2016

Strategies:

- 1. Maintain vessel systems** - Focus capital program preservation and operating program maintenance resources on vessel systems designated to maintain vessel reliability and apply cost benefit analysis based on the Life Cycle Cost Model to determine how long other systems should be operated beyond their life cycles.
- 2. Efficient, effective use of resources** - Integrate capital program preservation and operating program maintenance planning and contracting to achieve the most effective and efficient use of resources.
- 3. Use flexible planning to achieve goals** - Minimize loss of preservation and maintenance opportunities by maintaining highly flexible project planning and execution that facilitates adjusting the biennial preservation and maintenance work plans to react to changes in vessel and shipyard availability.
- 4. Keep policy makers in the loop** - Inform policy makers about the strategic resource situation by applying the Life Cycle Cost Model to establish preservation performance objectives and program delivery.

Results Washington Leading Indicator

Based on current funding levels, control the percent of ferry terminal systems that are past due for replacement from increasing to over 6% by 2020.

Status: On plan (green) — 5.4% as of June 30, 2016

Strategies:

- 1. Reprioritize projects as needed** - Use economic based life cycle model to prioritize projects to match available capital budget.
- 2. Extend the useful life of systems** - Increase maintenance actions to extend the useful life on systems targeted for deferral by the economic model
- 3. Reduce reliability risks** - Target preservation dollars to reduce risk to degradation of service reliability.
- 4. Review asset conditions** - Periodically review system asset conditions and adjusted years of replacement, then compare results to planned budget amounts in future biennia to confirm program sizing.

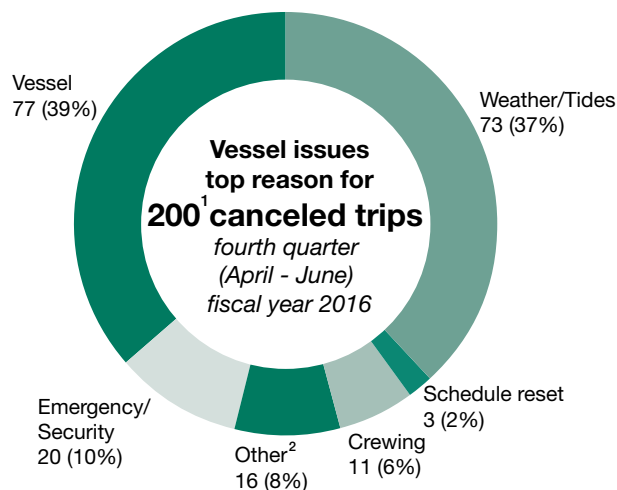
Notable results

- *Ferries' ridership was more than 6.3 million during the fourth quarter of fiscal year 2016, about 263,000 (4.3%) more than projected*
- *Ferries made 99.6% of its scheduled trips during the fourth quarter of FY2016, a slight increase from the same quarter in FY2015*

Ferries surpasses annual reliability goal for quarter

There were 40,789 regularly scheduled ferry trips during the fourth quarter of fiscal year 2016. Ferries completed 99.6% (40,634) of them, exceeding its annual reliability performance goal of 99% and coming in 0.2 percentage points higher than the same quarter in FY2015 (see table on [p. 30](#)). In the fourth quarter of FY2016 (April through June 2016), Ferries canceled 200 trips and was able to replace 45 of them, resulting in 155 net missed trips. This was 75 fewer net trips missed compared to the same quarter in FY2015.

Vessel mechanical and electrical problems were the leading reasons for cancellations during the quarter, totaling 77 (39%). WSDOT's three 64-vehicle Kwa-di Tabil class missed 70 of those trips, and related problems resulted in the delayed start of seasonal two-boat service on the Port Townsend – Coupeville by 18 days.



Data source: WSDOT Ferries.

Notes: Fiscal years run from July 1 through June 30. Percentages may not add to 100 due to rounding. 1 Ferries replaced 45 of the 200 canceled trips, for a total of 155 net missed trips. 2 "Other" includes events like disabled vehicles, issues at terminals, environmental reasons or non-ferries related incidents that can impact operations.

The Motor/Vessel *Kennewick* missed 42 trips due to rudder issues, the M/V *Chetzemoka* missed 20 due to rudder and steering issues, and the M/V *Salish* missed eight due to rudder issues. Weather and tides accounted for an additional 73 (37%) missed trips during the quarter.

Ferries ridership numbers continue to increase

WSDOT ferries' ridership was more than 6.3 million during the fourth quarter of FY2016. This was about 263,000 (4.3%) higher than WSDOT projected for the quarter and about 88,000 (2.9%) more in total ridership than the corresponding quarter in FY2015.

Ridership on the Point Defiance – Tahlequah route increased by more than 25,000 (13.1%) during the fourth quarter as compared to the same quarter in FY2015. Construction on Vashon Island has increased truck traffic, and some rider travel patterns have shifted from the Fauntleroy – Vashon – Southworth to Point Defiance – Tahlequah route.

Ferries on-time performance decreases, misses annual goal

On-time performance was 1.2 percentage points lower than the same quarter in FY2015, decreasing from 94.2% to 93.0% for the fourth quarter of FY2016. The quarterly rate misses Ferries' annual on-time performance goal of 95%, which has averaged 95.4% over the five previous fourth quarters. Quarterly ridership has increased 11.4% over that same period, affecting on-time performance.

In the fourth quarter of FY2016, 31 out of the average 448 daily trips did not leave the terminal within 10 minutes of the scheduled departure time, an increase from an average of 26 trips for the same quarter last year.

On-time performance declined on six of nine routes. During the quarter, the Fauntleroy – Vashon – Southworth route had the biggest decline compared to the fourth

Revenue up \$1.8 million over fourth quarter FY2015

Ferries' on-time performance down, trip reliability increases for the fourth quarter of fiscal year 2016

April through June FY2015 and FY2016; Annual on-time goal = 95%; Annual reliability goal = 99%

Route	On-time performance (fourth quarter)				Trip reliability (fourth quarter)			
	FY2015	FY2016	Status	Trend	FY2015	FY2016	Status	Trend
San Juan Domestic	90.0%	88.1%	-1.9%	↓	99.9%	99.9%	0.0%	↔
Anacortes/Friday Harbor – Sidney, B.C.	89.2%	91.8%	+2.6%	↑	99.1%	100.0%	+0.9%	↑
Edmonds – Kingston	99.0%	98.7%	-0.3%	↓	100.0%	99.8%	-0.2%	↓
Fauntleroy – Vashon – Southworth	92.1%	87.9%	-4.2%	↓	99.5%	99.9%	+0.4%	↑
Port Townsend – Coupeville	93.7%	92.2%	-1.5%	↓	94.2%	94.5%	+0.3%	↑
Mukilteo – Clinton	97.8%	96.5%	-1.3%	↓	99.8%	100.0%	+0.2%	↑
Point Defiance – Tahlequah	98.8%	98.5%	-0.3%	↓	99.7%	99.8%	+0.1%	↑
Seattle – Bainbridge Island	89.8%	93.5%	+3.7%	↑	99.8%	100.0%	+0.2%	↑
Seattle – Bremerton	97.6%	99.6%	+2.0%	↑	100.0%	99.9%	-0.1%	↓
Total system	94.2%	93.0%	-1.2%	↓	99.4%	99.6%	+0.2%	↑

Data source: WSDOT Ferries.

Notes: FY = fiscal year (July 1 through June 30). A trip is considered delayed when a vessel leaves the terminal more than 10 minutes later than the scheduled departure time. Ferries 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.

quarter of FY2015, decreasing from 92.1% to 87.9% in FY2016. Construction-related slip closures at the Vashon terminal were a major contributor to the drop. The Seattle – Bainbridge route saw the largest improvement compared to the same quarter in FY2015, and increased from 89.8% to 93.5% in FY2016. This increase was related to improved terminal vehicle flow due to changes in local construction constraints. In the prior year, traffic flow restrictions were present near terminals. These constraints did not occur this quarter and as a result on-time performance improved.

Passenger injuries remain steady

The rate of passenger injuries per million riders stayed the same at 0.32 during the fourth quarters of FY2015 and FY2016. This rate for both quarters represents two total passenger injuries. The number of Occupational Safety and Health Administration recordable crew injuries per 10,000 revenue service hours increased from a rate of 1.9 in FY2015 to 4.9 in FY2016. This represents seven more injuries this quarter as compared to the same quarter in FY2015, but falls well below the annual rate goal of less than 7.6.

Revenue trends up for the quarter

Ferries farebox revenue followed ridership numbers and continued its upward trend, coming in at about \$49.5 million for the fourth quarter of FY2016.

Farebox revenue was \$1.8 million (3.8%) more than the fourth quarter of FY2015, and about \$1.6 million (3.3%) more than projections. Farebox revenue is the largest source of funding for ferry operations.

Rider complaints decrease slightly

In total, Ferries received 446 complaints and 41 compliments from 6.3 million riders during the fourth quarter of FY2016. This was a decrease of 27 complaints and an increase of 12 compliments from the same quarter in FY2015.

Loading and unloading were the most common complaint types, with 80 (17.9%) in the fourth quarter of FY2016, which was 42 higher than the same quarter of FY2015. The jump in complaints was partly to a new ticketing procedure used to streamline loading at the Fauntleroy terminal. The procedure ended after three weeks following a review by operations management and customer feedback.

Trestle construction at the Vashon terminal also had a role in the increase in this category. Reservation complaints decreased compared to the same quarter last year from 150 (31.7%) in FY2015 to 51 (11.4%) in FY2016 due to increased customer familiarity, and improvements to reservation-related communications.

Contributors include Matt Hanbey, Kynan Patterson and Joe Irwin

Notable results

- *Half of the 18 Amtrak Cascades stations saw no decline in passengers getting on or off trains between fiscal years 2016 and 2015*
- *Thirteen federally funded rail projects were complete and seven were in construction as of June 30, 2016*

Passengers use stations 1.5 million times in FY2016

Nearly 1.5 million passengers got on or off trains at one of the 18 Amtrak Cascades stations in fiscal year 2016 (July 2015 through June 2016). Approximately 56% of these passengers used one of the 12 stations in Washington state. Washington stations saw passenger usage decrease less than 1% between FY2015 and FY2016. The overall corridor from Vancouver, British Columbia, to Eugene, Oregon, experienced a 1.4% decrease, primarily due to ongoing construction projects, schedule changes, and fluctuating exchange rates between the U.S. and Canada that have affected leisure travel.

Passenger use at each station is measured by “on-offs” that determine the number of riders who get on or off trains at a given station. For example, someone who rides Amtrak Cascades from Bellingham to Seattle is counted as one passenger using the Bellingham station (where they board the train), and as one passenger using the Seattle station (where they get off the train).

King Street Station in Seattle was the busiest station in FY2016, with 440,000 passengers getting on or off Amtrak Cascades trains, compared to 439,000 in FY2015 (a 0.2% increase). This was nearly 53% of

all Washington on-offs. The second busiest Amtrak Cascades station was Portland's Union Station, with 387,000 passengers using it in FY2016 (a 2.5% decline from FY2015). Stations in Oregon City and Everett each served approximately 1,000 more passengers in FY2016, reflecting the highest percentage increases year-over-year, at 7.7% and 4.3%, respectively. Six of the 18 stations held steady, with no percentage changes in the number of passenger ons or offs during this fiscal year.

Total number of passengers getting on or off trains¹ at Amtrak Cascades stations declines 1.4% Fiscal year (July through June) 2015 and 2016

Station ²	FY2015	FY2016	Trend
Vancouver, B.C.	155,000	153,000	-1.3%
Bellingham	53,000	50,000	-5.7%
Mount Vernon	19,000	18,000	-5.3%
Stanwood	5,000	5,000	-
Everett	23,000	24,000	4.3%
Edmonds	22,000	22,000	-
Seattle	439,000	440,000	0.2%
Tukwila	29,000	29,000	-
Tacoma	89,000	86,000	-3.4%
Olympia	49,000	48,000	-2.0%
Centralia	20,000	20,000	-
Kelso	26,000	25,000	-3.8%
Vancouver, Wash.	72,000	71,000	-1.4%
Portland	397,000	387,000	-2.5%
Oregon City	13,000	14,000	7.7%
Salem	39,000	39,000	-
Albany	19,000	19,000	-
Eugene	51,000	49,000	-3.9%
Total³	1,520,000	1,499,000	-1.4%

Data source: WSDOT Rail Division.

Notes: 1 Measures the number of passengers moving through stations by counting the number of riders that get on or off the train at each station (rounded to nearest 1,000). 2 The stations are owned by various entities, primarily city governments and local transit agencies. WSDOT owns one station (Stanwood) and Amtrak owns two stations (Edmonds and Tacoma). 3 Includes RailPlus passengers, riders whose origin or destination was unknown, and passengers who deferred their trip to another day. These accounted for 28,000 passengers in FY2014 and 20,000 passengers in FY2015.

Station Stop Policy adopted June 1, 2016

Between October 2015 and May 2016, WSDOT and the Oregon Department of Transportation convened an advisory committee to develop a corridor-wide policy on adding, removing and skipping station stops along the Amtrak Cascades corridor. The policy and accompanying guidance document establishes a process and approach for proponents to outline the data and facts needed to determine the value and benefit of proposed station stop changes to the Amtrak Cascades corridor. Details are available at: www.wsdot.wa.gov/Rail/StationStopPolicy.htm.

Construction kicks off for new station in Tacoma

WSDOT celebrated the start of construction at the new Amtrak Cascades station in Tacoma on July 13, 2016—highlighting the largest of WSDOT's 20 rail capital improvement projects, set to open in fall of 2017.

The \$149.9 million Tacoma-Point Defiance Bypass project will create a new inland rail bypass in the Tacoma–Lakewood–DuPont area, addressing a major chokepoint in the current Amtrak Cascades route. While the existing waterfront route is scenic, its tight corners and single-track tunnels slow train speeds and cause congestion with other rail traffic. The new bypass, of which a key component is the new Tacoma station built along the new rail line, will contribute to significant time savings and improved reliability between Seattle and Portland. (Water views remain on routes north of Seattle).

State, city and congressional representatives celebrated the kickoff for the new station during the July 13 ceremony at the station site near the Tacoma Dome. Speakers included Secretary of Transportation Roger Millar and Tacoma Mayor Marilyn Strickland, as well as a representative from U.S. Senator Patty Murray's office and the chair of the citizen advisory committee. They highlighted the new station and passenger train improvements, and how these complement the larger transit-oriented development plans within Tacoma's Dome District.

The 10,000-square foot station will be a new structure that replaces an existing portion of the historic Freighthouse Square building. It is adjacent to Sound Transit's Sounder station and across the street from the Pierce Transit Tacoma Dome station. City officials and the citizen advisory committee worked closely with WSDOT to ensure the station reflects plans to make the area a vibrant transportation hub that includes retail and residential spaces, while honoring the area's historic significance.

WSDOT continues to make progress on its 20 federally funded passenger rail projects

As of June 30, 2016, WSDOT had seven passenger rail projects in construction and 13 projects completed. Work includes purchasing new locomotives, adding tracks to handle increased passenger train traffic, and upgrading tracks, signals and stations. More than 96% (\$767 million) of federal funding for these projects is from the American Recovery and Reinvestment Act of 2009.

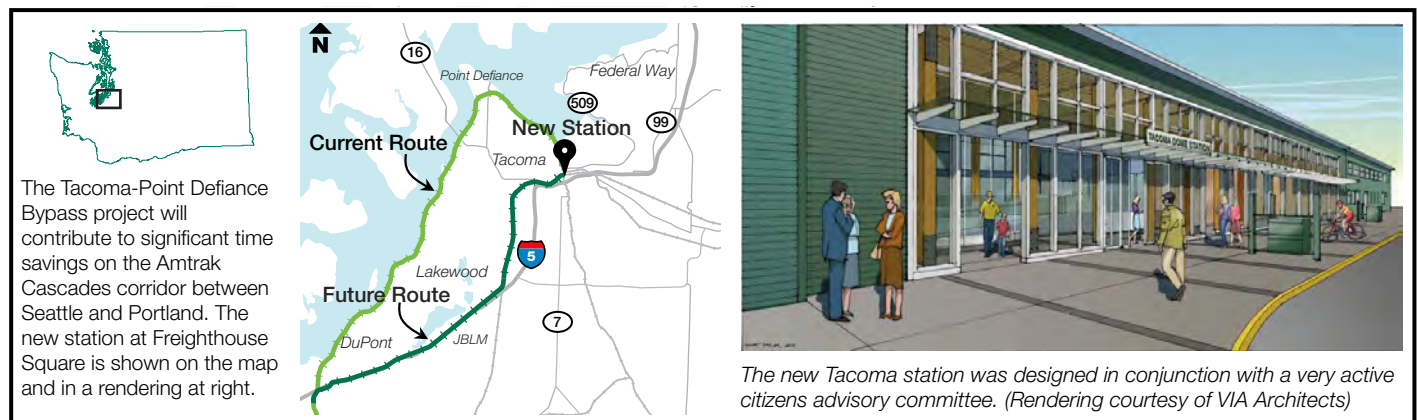
When the program is completed in 2017, passengers will benefit from two additional daily round trips between Seattle and Portland, Oregon, with an expected travel time reduction of 10 minutes. In addition, WSDOT, Amtrak and BNSF are committed to an average of 88% on-time performance for trains traveling from Portland to Seattle and Seattle to Vancouver, B.C. To view the interactive map of the federally funded rail projects, visit bit.ly/GNBrailmap.

The station design features large glass windows for a bright, welcoming lobby, as well as wooden columns, terrazzo flooring, and both sliding and vertical lift doors to create an indoor-outdoor public space.

Seattle-Everett high-speed rail project complete

WSDOT completed the last of six landslide mitigation sites along rail lines between Seattle and Everett during the fourth quarter of FY2016. The Corridor Reliability Supplemental Work project helped stabilize slopes and installed catchment walls—both of which lessen passenger train disruptions from coastal bluff landslides. To date, no landslides have reached the railroad tracks in the six sites that were addressed.

Contributors include Jason Biggs, Chris Dunster, Jeremy Jewkes, Barbara LaBoe, Janet Matkin, Brent Thompson, David Smelser and Erica Bramlet



Notable results

- *WSDOT teams responded to 14,923 incidents during the quarter, providing an estimated \$21 million in economic benefits*
- *Teams cleared incident scenes in an average of 11 minutes and 21 seconds, reducing traffic delay and risk of secondary incidents*

WSDOT achieves fastest incident clearance time

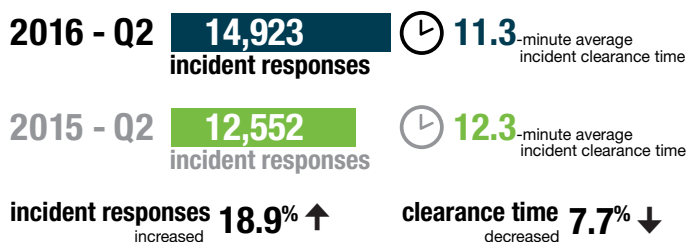
WSDOT's Incident Response teams responded to 14,923 incidents during the second quarter (April through June) of 2016. This averages to a WSDOT IR team responding to an incident scene about every nine minutes during the quarter. WSDOT responded to 2,371 more incidents—an 18.9% increase—in the second quarter of 2016 than during the same period in 2015.

WSDOT's IR teams cleared incidents in an average of 11 minutes and 21 seconds, one minute faster than the same quarter last year and the fastest time WSDOT has achieved to date. During this time, there was a 20.8% decrease in incidents lasting more than 90 minutes while incidents lasting 15-90 minutes or less than 15 minutes increased by 18.9% and 19.4%, respectively. The proportion of incidents which blocked at least one lane was 23.7% during the quarter compared to 26.3% last year.

WSDOT focuses on safety when clearing incidents, working to reduce incident-induced delay as well as the potential for secondary incidents to occur. Secondary incidents happen in the congestion resulting from a primary incident and may

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 \$9 million, funding about 47 full-time equivalent positions (approximately 80 trained drivers) and 62 dedicated vehicles. Teams are on-call 24/7 and actively patrol 493 centerline miles (about 32% of all urban centerline miles) of highway on major corridors around the state such as Interstate 5 or I-205 during peak traffic hours.

WSDOT responds to 18.9% more incidents while achieving fastest average clearance time to date
Second quarter (April through June) 2015 and 2016



Data source: Washington Incident Tracking System.

Notes: Data above only account for incidents to which an IR unit responded. IR data reported for the current quarter (Q2 2016) are considered preliminary. In the previous quarter (Q1 2016), WSDOT responded to 12,822 incidents, clearing them in an average of 12.3 minutes. These numbers have been confirmed and are now finalized.

be caused by distracted driving, unexpected slowdowns or debris in the roadway. The IR teams help alert drivers about incidents and clear the roadway to reduce the likelihood of secondary incidents. A table summarizing the IR program's performance and benefits for the quarter is on [p. 34](#).

WSDOT's assistance at incident scenes provided an estimated \$21 million in economic benefits during the second quarter of 2016 by reducing the impacts of incidents on drivers. These benefits are provided in two ways. First, by clearing incidents quickly, WSDOT reduces the time and fuel motorists waste in incident-induced traffic delay. About \$11.8 million of IR's economic benefits for the quarter are from reduced traffic delay. Second, by proactively managing traffic at incident scenes, WSDOT helps prevent secondary incidents. About \$9.2 million of IR's economic benefit results from preventing an estimated 2,835 secondary incidents and resulting delay. This figure is based on Federal Highway Administration data that there are 20% more secondary incidents on the highway system due to primary incidents. Based on WSDOT's budget for IR (see box at left), every \$1 spent on the program this quarter provided drivers roughly \$18.70 in economic benefit.

WSDOT's Incident Response prevents \$21 million in traffic delays and secondary incidents

April through June 2016; Incidents by duration; Times in minutes; Costs and benefits in millions of dollars

Incident duration	Number of incidents ¹	Percent blocking ²	Average roadway clearance time ³ (blocking only)	Average roadway clearance time ³ (all incidents)	Average incident clearance time ⁴ (all incidents)	Cost of incident-induced delay	Economic benefits from IR program ⁵
Less than 15 min.	11,754	15.8%	4.4	0.7	4.9	\$14.5	\$6.7
Between 15 and 90 min.	3,043	51.6%	24.4	12.6	29.1	\$25.0	\$11.0
Over 90 min.	126	86.5%	170.3	147.3	182.8	\$7.7	\$3.2
Total	14,923	23.7%	18.6	4.4	11.3	\$47.2	\$21.0
Percent change from second quarter 2015	↑ 18.9%	↓ 2.6%	↓ 7.6%	↓ 16.9%	↓ 7.7%	↑ 7.8%	↑ 8.6%

Data source: Washington Incident Tracking System.

Notes: Some numbers may not add up due to rounding. 1 Teams were unable to locate 746 of the 14,923 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 Roadway clearance time is the time between the IR team's first awareness of an incident (when a call comes in or the incident is spotted by a patrolling IR unit) and when all lanes are available for traffic flow. 4 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. 5 Estimated economic benefits include benefits from delay reduction and prevented secondary incidents. See [WSDOT's Handbook for Corridor Capacity Evaluation, pp. 40-42](#), for WSDOT's methods for calculating IR benefits.

WSDOT teams' proactive work reduces incident-related delay

Incident-induced traffic delay on state highways cost motorists an estimated \$47.2 million in wasted time and fuel during the second quarter of 2016. This is about \$3.4 million more than in the same quarter of 2015. Without WSDOT's assistance, this economic impact would have been roughly \$68.2 million (\$21.0 million in prevented delay and secondary incidents plus \$47.2 million in actual delay).

For more information on how WSDOT calculates these figures and all IR performance metrics, see [WSDOT's Handbook for Corridor Capacity Evaluation, pp. 40-42](#).

WSDOT teams respond to 126 over-90-minute incidents

WSDOT Incident Response units provided assistance at the scene of 126 incidents that lasted more than 90 minutes during the second quarter of 2016. This is 33 fewer incidents—roughly 20.8% less—than the same quarter in 2015. While these over-90-minute incidents accounted for less than 1% of all incidents, they resulted in 16.3% of all incident-related delay costs.

Seven of the 126 over-90-minute incidents took six hours or more to clear (referred to as extraordinary incidents). This is five less extraordinary incidents than the same quarter in 2015. The seven extraordinary incidents took an average of eight hours and 33 minutes to clear, accounting for about 3% of all incident-induced delay costs for the quarter.

The average clearance time for all over-90-minute incidents was about three hours and three minutes.



Incident Response customer comments

WSDOT IR teams give comment cards to drivers they help. Below are samples of the comments received from drivers WSDOT assisted during the second quarter of 2016.

- "I had a flat tire on I-90 and Heather saw me, pulled over and helped me replace the tire...Thank you!"
- "I could not have been more pleased with Leo's service. I have never used your services before and have been driving for 20 years. Leo was my hero that day."
- "Mark was so helpful. He was there before I could decide what steps to take for my flat tire accident."



New Incident Response trucks set to start serving Washington roads later this summer

Gov. Jay Inslee provided additional funding to WSDOT's IR program in the 2016 supplemental budget. The funds support 10 new IR trucks, which WSDOT expects to have on the road later this summer. This will allow WSDOT to respond to more incidents, clearing roads and helping drivers to further reduce impacts to traffic.

This is about two minutes faster than the same quarter in 2015. Excluding the seven extraordinary incidents, WSDOT's average clearance time for over-90-minute incidents was two hours and 43 minutes. Performance data reported in this article is from WSDOT's Washington Incident Tracking System, which tracks incidents to which a WSDOT IR team responded.

Contributors include Vince Fairhurst, Ida van Schalkwyk, Bradley Bobbitt and Sreenath Gangula

Notable results

- WSDOT corrected 10 fish passage barriers in 2015, improving fish access to 46 miles of potential upstream habitat
- To date, WSDOT has corrected 23 culverts applicable to the 2013 federal injunction, restoring access to 6.2% of blocked habitat

WSDOT improves access to 46 miles of fish habitat

WSDOT corrected 10 fish passage barriers statewide in 2015, restoring access to 46 miles of upstream habitat statewide. Five of these barriers were applicable to a March 2013 federal injunction that requires WSDOT to restore access to 90% of blocked habitat within the case area shown in the map below by 2030 (visit <http://www.wsdot.wa.gov/Projects/FishPassage/> for more information). Meanwhile, WSDOT also corrected five barriers outside the case area during 2015. This included three stand-alone fish passage projects, one emergency correction to a culvert that was damaged during a storm and a barrier that was upgraded to meet current standards as part of a larger transportation project.

WSDOT has corrected 301 fish passage barriers to date. These projects have restored access to approximately 1,000 miles of potential habitat statewide (this figure

is unchanged from what was reported previously in *Gray Notebook 58* as a result of a database correction which eliminated double counting of habitat restoration efforts). WSDOT started working collaboratively with the Washington State Department of Fish and Wildlife in 1991 to systematically identify and correct fish passage barriers that occur where highways intersect streams. Correcting barriers contributes to Gov. Jay Inslee's statewide goals for recovering Pacific salmon as part of his performance management system for the state, Results Washington (see [p. 9](#)).

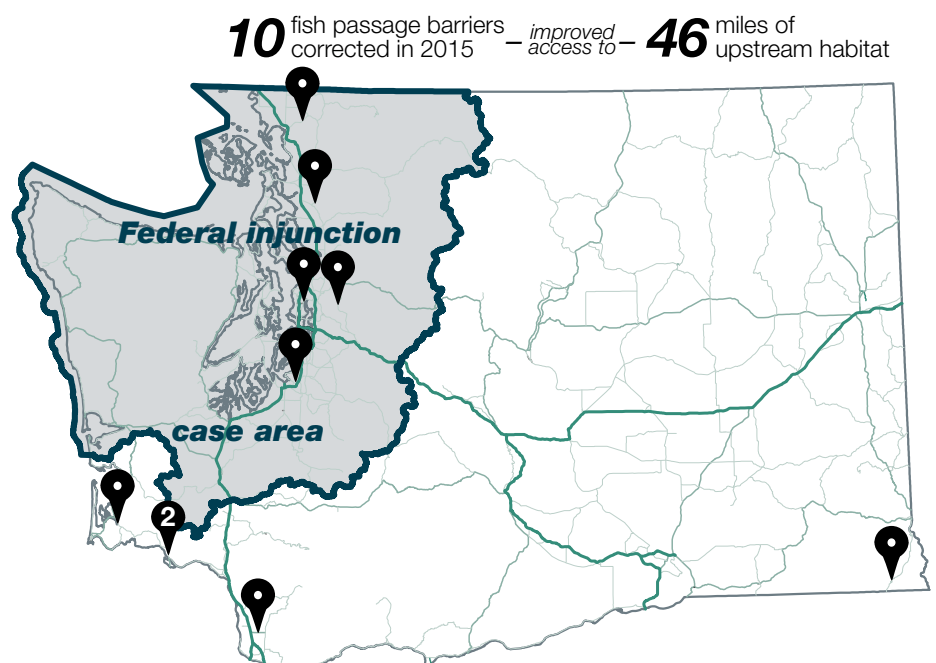
WSDOT corrects fish barriers with bridges and stream simulation culverts designed to provide conditions closer to a natural stream. These corrections take place as either stand-alone projects for high-priority barriers, within the limits of larger transportation projects, or as part of maintenance activities when limited work is needed to correct a barrier.

Public can explore WSDOT's fish passage work in online map

WSDOT's fish passage website and online interactive map provides information on WSDOT's fish passage program, annual progress reports, information on the federal culvert injunction and staff contacts.

The online map is updated annually with information on barrier type, potential habitat gain and photos for all documented WSDOT-owned barriers and completed fish passage projects around the state.

Visit <http://www.wsdot.wa.gov/Projects/FishPassage/> to explore the content.



Data source: WSDOT Environmental Services Office.

Notes: Five projects completed in 2015 were applicable to the federal injunction. Markers with numbers represent the site of multiple fish passage barrier corrections, all others represent one.

WSDOT makes progress to comply with injunction

WSDOT has corrected 23 fish passage barriers applicable to the March 2013 federal culvert injunction. These corrections have restored access to about 80 miles of previously blocked habitat or about 6% of blocked habitat in the injunction case area. Five of the 23 barriers were corrected by projects completed in 2015. WSDOT's database management also found four additional barrier corrections from previous years that had not been counted toward the injunction and are now included in the total.

WSDOT needs to correct approximately 450 barriers within the case area by 2030 in order to meet the injunction's requirement to restore fish access to 90% of the blocked habitat within the case area. This figure can change as information about WSDOT culverts is updated and as the agency completes corrections.

A barrier correction is applicable to the injunction if it corrects a culvert that is a documented barrier to salmon and/or steelhead in the case area. Some barrier corrections are not applicable because they are outside the case area. Additionally, other WSDOT projects may upgrade culverts that are not documented barriers as WSDOT brings any culverts in a project's limits up to current standards.

Legislature expands funding for WSDOT's fish passage work

The Legislature has authorized \$640.4 million for fish barrier correction projects during the next 15 years. This includes \$300 million from the 2015 Connecting Washington revenue package. This will allow WSDOT to correct roughly 125-135 barriers and improve access to 55-60% of potential habitat within the injunction area. WSDOT anticipates correcting additional barriers that fall within the footprint of other transportation projects and receiving additional funding for barrier correction in future years.

WSDOT partners with state and local agencies to benefit entire watershed

WSDOT worked with the Asotin Conservation District and the Salmon Recovery Funding Board in 2015 to replace the lowest barrier in the Rattlesnake Creek watershed at State Route 129 in Asotin County. Two fish passage barriers upstream of the SR 129 culvert were corrected using Family Forest and Fish Passage funding prior to WSDOT's project. This coordinated watershed approach to habitat improvements restored access to nine miles of habitat and surveys conducted after construction show



WSDOT's new culvert (right) on State Route 129 allows fish to access habitat upstream of the old barrier (left) on Rattlesnake Creek.

the project is already providing benefits to steelhead. WSDOT continues to seek opportunities to partner with other agencies on fish barrier correction projects.

WSDOT's high-priority fish passage projects use expedited process

WSDOT continues to employ an expedited process for Endangered Species Act compliance consultations called "programmatic consultation." WSDOT has agreements with the U.S. Fish and Wildlife Service and the National Marine Fisheries Service which fast-track ESA compliance consultations for projects that fit certain criteria. Five of the eight stand-alone fish passage projects WSDOT submitted to NMFS in 2015 were fast-tracked using programmatic consultation and were typically completed in one day. This time savings allows WSDOT to design and submit more fish passage projects each year.

WSDOT implements just-in-time training for fish passage projects

Members of WSDOT's Fish Passage team collaborated with other WSDOT environmental teams to deliver a multidisciplinary, just-in-time training in spring 2016 to WSDOT's construction project engineering offices throughout the state. The training provided WSDOT engineers and contractors with information relevant to fish passage barrier correction projects scheduled to be completed in 2016.

WSDOT has found that this kind of training imparts knowledge when it is needed, reducing the risk of knowledge loss over time. The trainings received positive feedback from participants and complements Gov. Inslee's Results Washington goal of efficient, effective, and accountable government.

Contributors include Damon Romero, Susan Cierebiej and Bradley Bobbitt

Environmental Approval of Local Agency Projects Annual Report

62

Notable results

- **WSDOT gave environmental approval to 96% (132 of 138) of local agency projects in fiscal year 2016, up from 68% (117 of 172) in FY2012**
- **WSDOT approved projects 30 days faster than those needing Federal Highway Administration approval on average**

WSDOT expedites review for more local projects

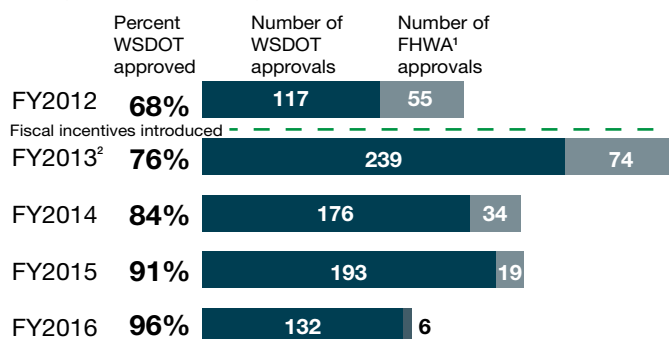
WSDOT provided environmental approval for 96% (132 of 138) of local agency projects in fiscal year 2016 (July 2015 through June 2016). This is an increase of 28% from when the project tracking method was updated in the baseline FY2012 when the agency provided environmental approval for 68% (117 of 172) of local agency projects. The remaining 4% of local projects in FY2016 involved public controversy or unusual circumstances requiring federal approval.

A May 2015 agreement with the Federal Highway Administration granted WSDOT authority to approve environmental documentation for local agency transportation projects, significantly streamlining the process for projects that will not adversely impact the environment.

WSDOT's ability to approve environmental documentation for local agencies saves an average of 30 days compared to those projects requiring FHWA approval. WSDOT's average approval time in FY2016 was 36 days, but can vary widely depending on circumstances. Since 2012, WSDOT has received environmental documentation for an average of

Percent of local agency projects getting WSDOT environmental approval steadily increasing

Fiscal years 2012 through 2016



Data source: WSDOT Local Programs.

Notes: The method for tracking these projects changed from FY2011 to FY2012, making FY2012 the baseline year for data. 1 FHWA = Federal Highway Administration. 2 In FY2013, WSDOT created new fiscal incentives for local agencies to deliver projects in a more timely manner, resulting in a spike in the number of projects.

209 local agency projects each year from cities, counties, public ports and tribes that receive funding from FHWA.

The City of Seattle's Yesler Street Bridge Replacement and Chelan County's Chiwawa Loop Road projects are recent examples of projects that benefitted from the expedited approval process. WSDOT was able to assist these local agencies by quickly obtaining the required environmental approvals to authorize construction funding.

For the Yesler Street Bridge Replacement project in downtown Seattle, WSDOT coordinated the necessary reviews and approvals with the Washington State Department of Archaeology & Historic Preservation, the Pioneer Square Preservation Board and the Seattle Department of Neighborhoods. Approval for the replacement of the historic bridge, a process that would normally take more than a year, was completed in a record-setting six months, which enabled the city to maintain its project schedule.



WSDOT coordinated an expedited approval process with three other agencies for the Yesler Street Bridge Replacement project in Seattle.

For the Chiwawa Loop Road Improvement Project in Chelan County, WSDOT coordinated Endangered Species Act consultations with the U.S. Fish & Wildlife Service and the National Marine Fisheries Service to ensure the project would minimize effects on ESA-listed species of fish and wildlife. By completing the review process internally, WSDOT saved the local agency 30 days.

Contributors include Bill Leonard, Jason Greer, Trent de Boer, Bradley Bobbitt and Erica Bramlet

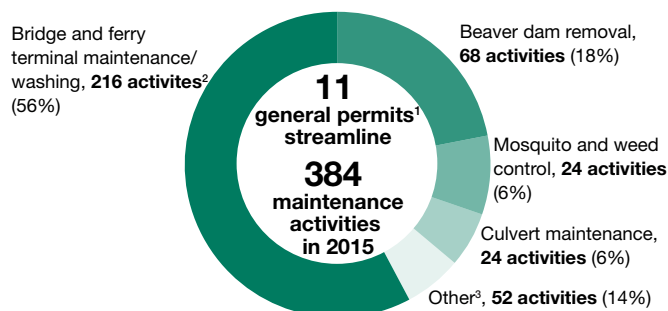
Notable results

- WSDOT saved approximately 4,600 hours of staff time in 2015 by using general permits to streamline 384 maintenance activities
- Bridge and ferry terminal maintenance and washing activities made up 56% of general permit usage in 2015

WSDOT uses 11 general permits, saving 4,600 hours

WSDOT saved an estimated 4,600 hours of WSDOT staff time in 2015 by using seven different general permits issued by the Washington State Department of Fish and Wildlife and four from the Washington State Department of Ecology. Each activity conducted under general permits has specific provisions WSDOT staff or contractors must implement to protect surrounding sensitive environments. Not having to apply for individual permits for each activity helps expedite the delivery of transportation projects and maintenance activities, while ensuring the agency continues to maintain its high environmental standards.

WSDOT saved four hours for every activity conducted under 10 of the 11 general permits used in 2015. The other permit, the National Pollution Discharge Elimination System permit, is issued by Ecology and saves WSDOT 40 hours for every bridge and ferry terminal washing activity. For maintenance activities that discharge wash water (and that meet permit conditions), WSDOT uses the NPDES permit in conjunction with a WDFW permit. In 2015, WSDOT used the NPDES permit for 77 activities compared to 32 in 2014, saving 3,080 hours of staff time.



Data source: WSDOT Environmental Services Office.

Notes: 1 In 2015, WSDOT used two permits for bridge and ferry terminal maintenance/washing, one for beaver dam removal, three for mosquito and weed control, one for culvert maintenance and four for other maintenance activities. 2 Seventy-seven of the 216 activities discharged wash water and used both the NPDES permit from Ecology and a WDFW permit. 3 "Other" maintenance activities in 2015 included channelized stream maintenance; maintenance and repair of fishway structures; debris removal from bridge structures; and removing, repairing and replacing piles in marine waters.

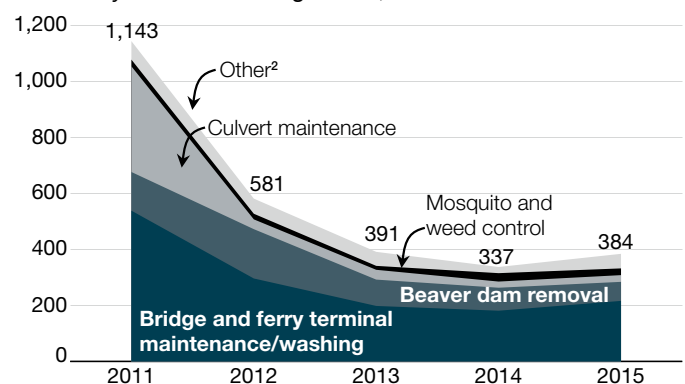
Aging bridges require more washing, higher permit usage

Use of general permits is dependent on maintenance needs in a particular year, weather conditions and the amount of dedicated funding to complete the work. Bridge and ferry terminal maintenance and washing permits are the most used of all general permit types, comprising 216 of 384 activities (56%) in 2015 (see chart at left), up from 54% in 2014. Activities covered by these general permits include cleaning, painting, bridge deck overlays, and replacing worn out components of bridges or ferry terminals.

Part of the 2015 increase in this type of permit usage can be attributed to more pre-inspection bridge washing to comply with federal inspection guidelines and to prolong the integrity and safety of the bridges. For more information on bridge maintenance refer to [p. 14](#), and for ferry preservation refer to [p. 23](#). As Washington state's infrastructure continues to age, general permits will help WSDOT keep up with growing maintenance needs in a more efficient manner.

Contributors include Gretchen Coker, Eric Wolin and Erica Bramlet

WSDOT general permit usage on the rise Calendar years 2011 through 2015; Number of activities¹



Data source: WSDOT Environmental Services Office.

Note: 1 Gray Notebook general permit data before 2014 was previously reported in terms of number of times permits were used. This graph has been updated for consistency to show number of activities. 2 "Other" 2011-2015 maintenance activities include channelized stream maintenance; maintenance and repair of fishway structures; debris removal from bridge structures; geotechnical test boring in freshwater; marine sediment test boring; and removing, repairing and replacing piles in marine waters.

Notable results

- *The number of trucks crossing the Canadian border into Washington grew 3.2% in 2015, continuing a steady upward trend since 2009*
- *Air cargo shipments in Washington state increased 10.4% between 2013 and 2014*
- *Interstate 5 near Tacoma continued to have the highest daily truck volume in the state with 15,793 trucks on average in 2015*
- *Waterborne freight in Washington state increased 6.3% between 2013 and 2014*

Washington now most trade-dependent state

On a per capita basis, Washington is the most trade-dependent state in the nation (followed by Texas and Louisiana) with total imports and exports valued at \$137.5 billion and gross business income for freight-dependent industry sectors valued at \$550.5 billion in 2015. This is up from Washington's third-place position in 2014.

WSDOT supports freight systems and freight-dependent industries by directly managing the state's highway system, ferry system, a short line railroad and several freight rail programs. WSDOT also provides policy analysis and planning coordination for the state's interests in all modes of the state's freight transportation system. The state's multimodal freight system extends beyond the network of highways and local roads, mainline and

short line railroads, and navigable waterways. It also includes the rail terminals, ports, air cargo facilities, weigh stations, border crossings and other infrastructure involved in the movement of goods and commerce.

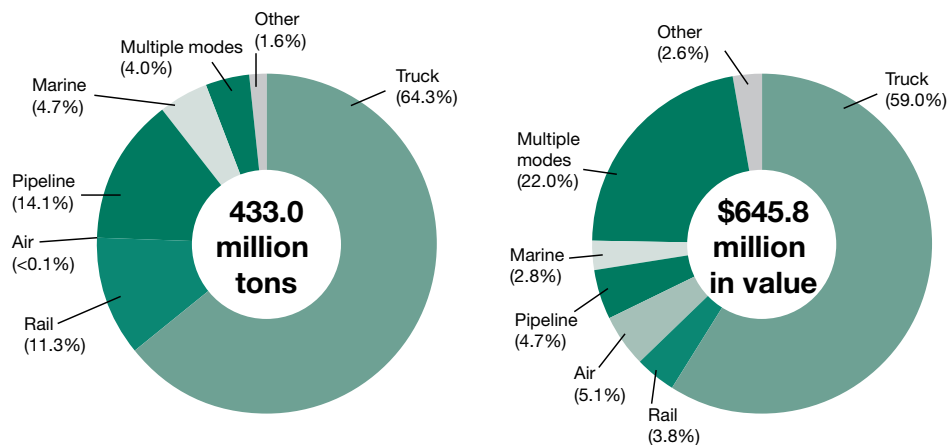
WSDOT's work on freight movement contributes to Goal 2: Prosperous economy in Results Washington, Gov. Jay Inslee's performance management effort, by improving travel and freight reliability on strategic corridors.

Trucks move the most freight by weight and value in Washington state

The majority of freight in Washington is moved by truck, whether measured by tonnage or value. When measured by tonnage, trucks moved 64.3% of all freight into, out of, within, and through Washington in 2015. By value, trucks moved 59.0% of all freight. These figures are comparable to 2012 when trucks moved 64.3% and 57.3% of freight by tonnage and value, respectively. Trucks tend to move

more freight shorter distances and support other freight modes such as rail, marine, pipeline and air by moving goods between modes. Trucks also move goods between the cargo's origin or destination and the primary mode (commonly referred to as first and last mile). For example, a truck carrying grain from a farm to a rail yard. Lower value bulk freight traveling greater distances (such as grain) are typically carried by rail, marine and pipeline; higher value freight (such as machinery and electronics) is primarily shipped by trucks, aircraft, and marine containerized freight.

Most freight moves by truck, pipeline or rail in Washington state 2015; Percentages determined by tons and value



Data source: Freight Analysis Framework Data, Federal Highway Administration.
Notes: Percentages may not add to 100 due to rounding.

Truck border crossings continue upward trend

South Sound has highest truck traffic

The south Puget Sound area saw estimated average daily truck volumes increase on Interstate 5 from 2014 to 2015. In Tacoma (milepost 131, see map below), where the state's highest daily truck traffic occurs, volume increased 3.7% from 15,226 to 15,793 trucks. In Olympia (milepost 107), truck volume increased 7.4% from 12,249 in 2014 to 13,158 in 2015. WSDOT's 2015 *Corridor Capacity Report* identifies I-5 as one of the key commute and economic corridors in the state.

On I-90, the average daily truck volume increased from 6,275 to 6,548 in North Bend (milepost 33) and from 3,413 to 3,495 in Vantage (milepost 136). The segment includes Snoqualmie Pass, one of the most travelled mountain passes by trucks in the world. On State Route 18, daily volume increased from 5,064 to 5,317 in Auburn (milepost 5) and from 3,689 to 3,853 in Snoqualmie (milepost 27).

Increases in truck traffic are due to a growing economy and reduced container port activity in Portland, Oregon, which has increased use of Washington's ports.

Number of trucks entering Washington from Canada up 3.2% from 2014

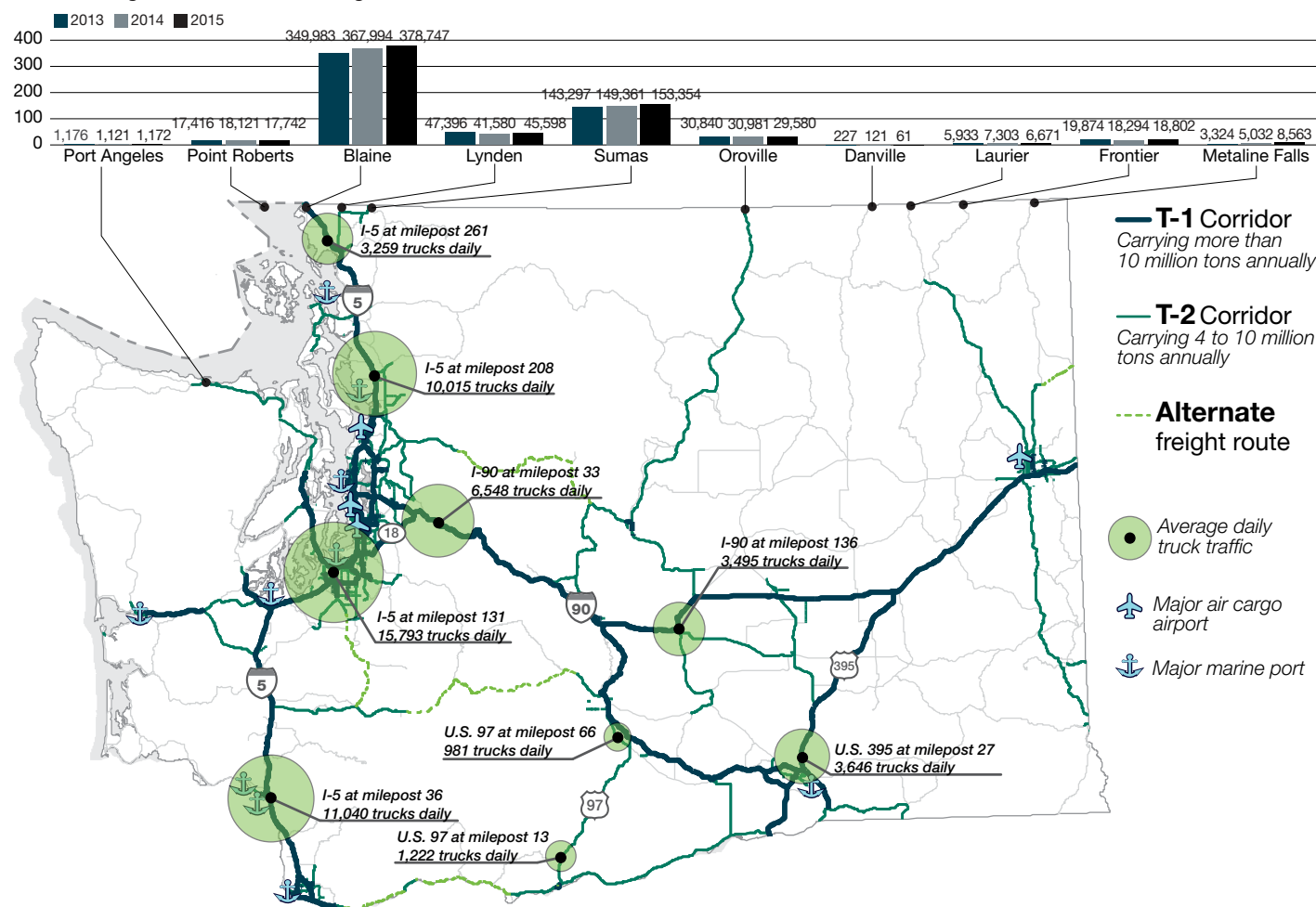
The number of trucks entering Washington from Canada increased 3.2%, from 639,908 in 2014 to 660,290 total truck crossings in 2015. This continues the upward trend of moderate annual increases observed since 2009.



Several projects are being funded through Connecting Washington to address truck mobility and port access issues, including \$1.9 billion of the \$3.0 billion SR 167/SR 509

Puget Sound Gateway, which will provide better connections to port facilities near Seattle and Tacoma.

Trucks entering Washington from Canada and truck volumes on state roadways continue upward trends
2013 through 2015 border crossings and 2015 truck volumes



Source: WSDOT Freight, Rail and Ports Office

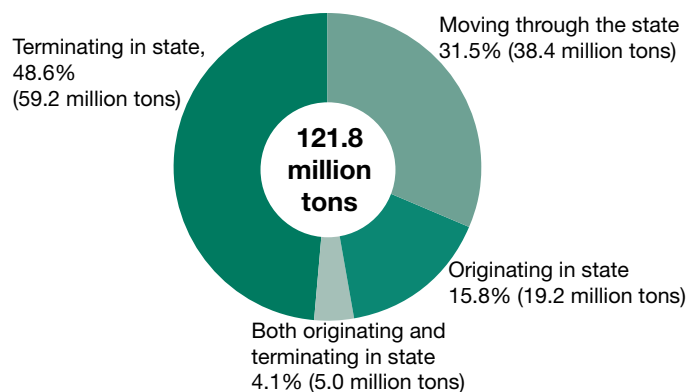
Waterborne and freight rail activity is up in Washington

The high volume border crossings at Blaine and Sumas carry 80.6% of total truck border crossings entering Washington from Canada. In 2015, 378,747 trucks entered Washington from Canada at the Blaine border crossing and 153,354 trucks entered at the Sumas border crossing.

Freight rail tonnage increases in 2014

Railroads in Washington state transported 121.8 million tons of freight in 2014, an increase of 13.6% from 2013 levels. Freight rail data for 2015 is not available. About half (48.6%) of freight moved by rail in Washington was shipped into the state and terminated here. This was a 28% increase from 2013 levels. Freight rail shipments moving through Washington (starting outside the state and not terminating here) accounted for 31.5% of total freight rail tonnage, a 4% increase between 2013 and 2014.

Most rail freight is traveling in Washington comes from outside the state and terminates in it 2014; Percent and tons shipped by origin and destination



Data source: WSDOT Freight, Rail and Ports Office, Surface Transportation Waybill Data.



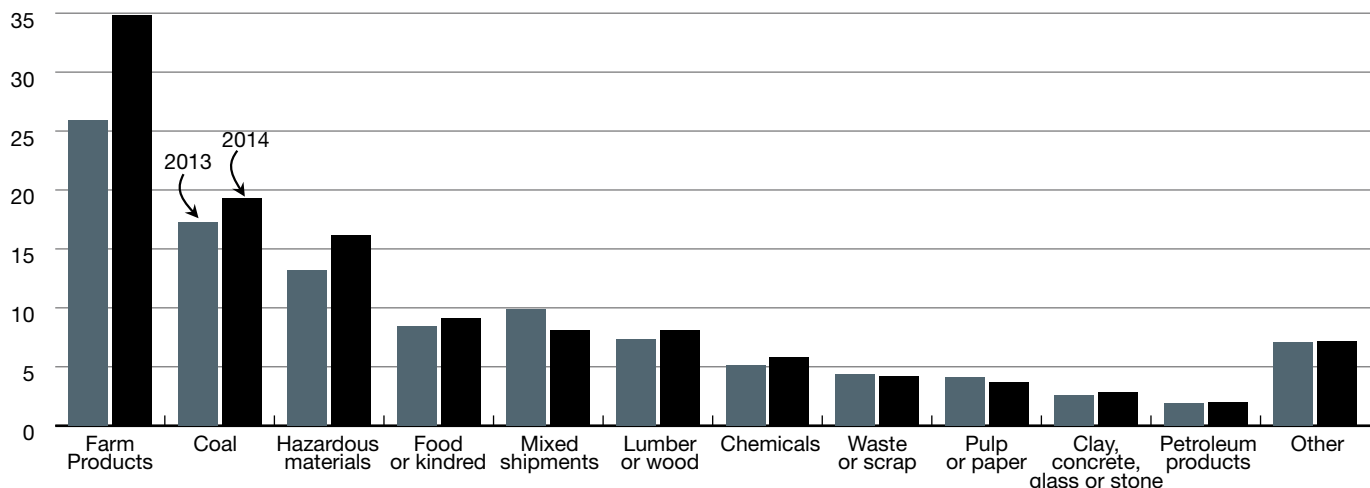
Rail carried 11.3% of all freight in 2015. BNSF Railway is the largest freight railroad operating in Washington state.

Farm products such as soybean, corn, and wheat are the largest commodities transported. There was a net increase of 8.9 million tons of farm products (34.3%) between 2013 and 2014, mostly due to an increase in soybean and corn shipments. Hazardous materials increased more than three million tons (23.3%) due to increased crude oil shipments by rail in the state. Coal traffic also increased two million tons (11.9%), rising to 19.3 million tons during 2014.

Waterborne freight shipments increase 6.3% in 2014

Washington's waterborne freight activity, measured in total tonnage, was 119.2 million tons in 2014. Waterborne freight data for 2015 is not available. This is a 6.3% increase from 2013 levels, when 112.2 million tons of waterborne freight

Freight rail carrying more farm products in Washington state, coal and hazardous materials also increasing 2013 and 2014; Commodities shipped by rail in millions of tons



Data source: WSDOT Freight, Rail and Ports Office, Surface Transportation Board Waybill Data.

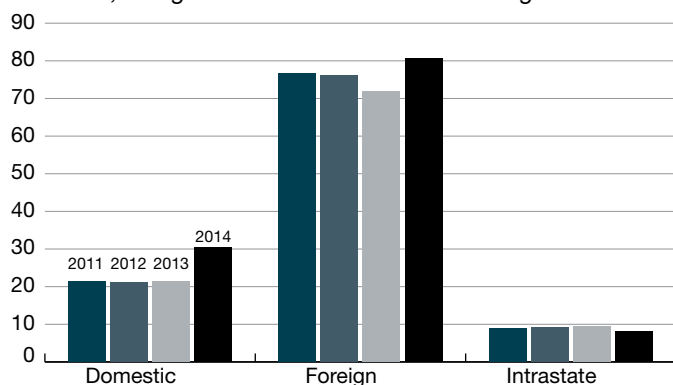
Notes: Freight rail data for 2015 was not available at the time of publication.

Washington airports handle increasing cargo volume

shipped in Washington. Waterborne freight is categorized as foreign, domestic or intrastate depending on both the origin and destination. In 2014, 67.5% of waterborne freight was foreign, 25.6% was domestic and the remaining 6.9% remained within Washington state. Key export commodities include food and food products; petroleum products; and lumber, logs, wood chips, and pulp.

Predominance of foreign waterborne freight in Washington state highlights role as global gateway

2011 through 2014; Waterborne tonnage in millions of tons; Domestic, foreign and intrastate waterborne freight



Data source: U.S. Army Corps of Engineers, Navigation Data Center.

Seattle and Tacoma are by far the largest marine ports in the state, handling most of the containerized freight. They handled 3.5 million 20-foot equivalent units of containerized freight in 2015. This is a 3.9% increase from 3.4 million TEUs in 2014 and is 1% higher than the five-year average. One TEU represents the freight in a 20-foot cargo container used by marine container ships. These containers carry many different kinds of freight and can come in different lengths, for example a 40-foot container would be equal to two TEUs.

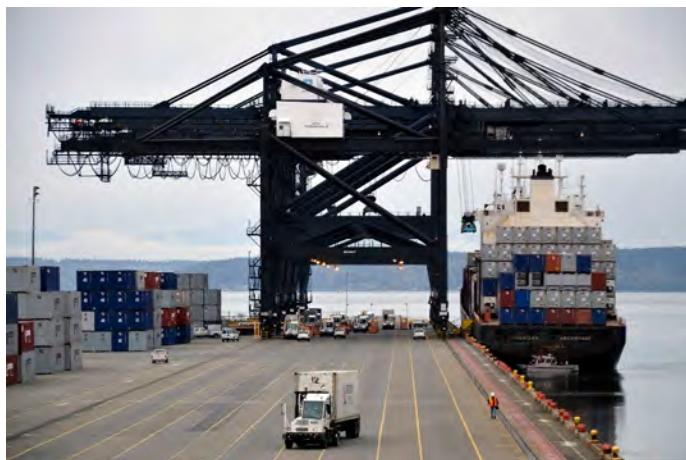
There are three commercially-navigable waterways serving Washington state: the Pacific Ocean, the Salish Sea, and the Columbia-Snake River System. The Pacific Ocean is used to move freight to and from overseas markets on a variety of ships and barges from ports along the U.S. coast (including in Alaska) and Hawaii. The Salish Sea includes Puget Sound and provides access for major ports in western Washington to the Pacific Ocean. The Columbia-Snake River system provides access for inland Washington ports to the Pacific Ocean.

Waterborne freight activity in Washington continues to mirror national trends in terms of growth. This is influenced

by a variety of factors, including the U.S. dollar exchange rate, grain prices, shipping line consolidation, and competition from Canadian and southwest U.S. ports.

Washington airports handle increasing cargo volume

Washington airports handled 1.53 million tons of cargo in 2014, measured in plane plus cargo weight as reported by the Federal Aviation Administration (federal data for 2015 is not yet available). This represents a 10.4% increase from 2013 air cargo levels of 1.38 million tons, and is the highest annual tonnage reported since 2009. This is primarily due to a 57.5% increase in total air cargo tonnage at Paine Field airport in Snohomish County from 84,000 tons in 2013 to 132,00 tons in 2014. However, Sea-Tac International Airport handled 51.5% of all air freight in Washington state in 2014.



Containerized freight is loaded onto a ship at the Port of Tacoma. Most waterborne freight in the state is going to or coming from foreign markets.

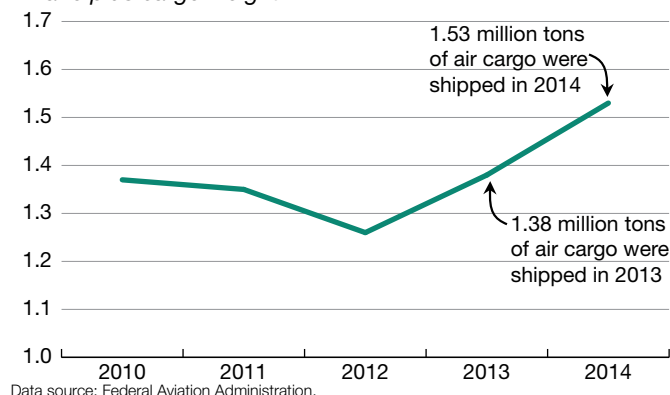
WSDOT merges divisions working on freight modes creating Rail, Freight, and Ports office

WSDOT merged its Freight Systems Division with its Rail Division in April 2016 into the Rail, Freight, and Ports Division. This change in the organization will provide greater support for freight stakeholders and public investments in the state's intermodal freight systems. WSDOT merged the offices to eliminate duplicate activities, consistently administer freight projects and agreements, pursue federal funds in a more coordinated way, and better plan for the future. To reflect this merger, this *Gray Notebook* article along with the Freight Rail Annual Report will now be titled the Freight Semi-Annual Report.

WSDOT working to address freight issues statewide

Total Washington air cargo tonnage increases

2010 through 2014; Tonnage measured in millions;
Plane plus cargo weight



Sea-Tac handled 332,636 metric tons of actual air cargo in 2015 (not including plane weight), up 12% from 327,240 metric tons in 2014. Sea-Tac Airport ranks 19th in terms of air cargo volume in North America, providing daily, non-stop service to 77 domestic and 19 international destinations and accounting for \$13.6 billion in international commodity trade. The top five commodities moved through Sea-Tac are cherries, seafood, aluminum alloy and graphite, aerospace components, and footwear parts.

High-value and time-sensitive goods often move through airports, which play a key role in supporting manufacturing, agriculture and service sectors in the state.

WSDOT economic analysis highlights benefits of freight rail in state

WSDOT conducted an economic impact analysis of investments in short line railroads in the state to better understand their economic benefits. This was part of a larger initiative at WSDOT to perform economic impact reviews on various types of multimodal transportation investments. WSDOT's analysis of the Central Washington Branch line rehabilitation project and the rail expansion investments at the Port of Walla Walla showed positive long-term impacts on total employment, population, gross domestic product, and personal income in areas where projects were funded.

WSDOT truck parking study underway

WSDOT is conducting a truck parking study to better understand the issues facing the trucking industry and to identify locations where the impacts are greatest.

The goal is to assess truck parking capacity and demand in Washington state. The study will include a survey of truck drivers (and other individuals in the trucking industry) and roundtable discussions to hear directly from stakeholders. WSDOT intends to complete the truck parking study in December 2016. This work supports Goal 5: Community engagement and Goal 2: Modal integration in WSDOT's strategic plan and will eventually be used to inform the update to the 2017 Washington Transportation Plan.



WSDOT's truck parking study will look at all types of truck parking including rest areas, private truck stops, weigh stations and other areas.

New opportunities lead WSDOT to update State Freight Plan

WSDOT is updating the State Freight Plan in 2016-2017 to meet new state and federal requirements, and to create eligibility for two new federal freight funding programs established by the Fixing America's Surface Transportation Act, a reauthorization of the Moving Ahead for Progress in the 21st Century Act.

Among other items, the plan will include: the new National Highway Freight Network which is designated to determine freight funding eligibility; the new National Multimodal Freight Network to inform freight transportation planning; an updated, fiscally-constrained, prioritized freight project list; and new freight performance measures. The State Freight Plan is scheduled to be completed in December 2017. To see the full version of the 2014 freight plan visit bit.ly/WSDOTfreightplan.

Contributors include Matthew Pahs, Wenjuan Zhao and Bradley Bobbitt

Notable results

- *WSDOT exceeded its 2016 goal of training 2,600 employees in Lean and as of June 30 has trained 3,213 employees*
- *Good To Go! pass process improvements eliminated a four-week delay for delivering passes to customers*

Lean reaches 46% of WSDOT's active workforce

WSDOT continues to train its employees in-house on Lean tools and practices. During the second quarter of 2016 (April through June), WSDOT's Lean practitioners provided basic Lean training to 550 WSDOT employees. WSDOT has exceeded its 2016 goal of having at least 2,600 employees trained through Intro to Lean (see box at right).

As of June 30, 3,213 active WSDOT employees have received introductory Lean training, representing 46% of the WSDOT workforce. Active employees excludes the number who were trained but have left the agency.

WSDOT continues to offer Lean problem solving training, first launched in September 2015. In the second quarter of 2016, 81 employees participated in the class, bringing the total to 198 trained active employees. The course better enables participants to evaluate the state of an issue, conduct a root cause analysis, and test and implement solutions.

WSDOT's Lean practitioners launched three new Lean improvement projects this quarter, bringing the total to 80 since 2012. The projects focused on the processes for ensuring employees have access to all programs and technologies on their first day at work; managing the intake of new work related to bridge and structures design; and the review process for engineering documents before they go out for bid. Results from some recently completed projects are highlighted in the table on [p. 45](#).

Good To Go! pass fulfillment process benefits from Lean

In late 2015, WSDOT's *Good To Go!* pass fulfillment process issues resulted in delays of up to four weeks between when a customer ordered a pass and when it was shipped to them. WSDOT operates four tolled facilities in Washington, which collect tolls using electronic



Strategic Plan Goal 4: ORGANIZATIONAL STRENGTH

Workforce Strategy – Implement various strategies that foster a safe, capable, engaged and valued workforce.

WSDOT has set calendar year 2016 goals for the total number of Lean process improvement projects, as well as training targets for two of the in-house Lean classes that WSDOT offers. See table below for progress toward these goals.

WSDOT's 2016 goals for Lean endeavors

Measure	As of June 2016	Goal for Nov 2016
Total Lean process improvement projects ¹	80	100
Employees trained through Intro to Lean ²	3,213	2,600
Employees trained through Problem Solving ²	198	500

Data source: WSDOT Lean Process Improvement Office.

Notes: 1 Includes new, in progress and completed projects.

2 In-house course offered by WSDOT.

transponders known as *Good To Go!* passes. WSDOT works with various vendors to fulfill customers' orders for these passes. An increase in sales exposed several flaws in the established processes for tracking inventory, ordering new passes and performing verification testing. Inadequate processes lead to a shortage of passes during peak sales, which was the main reason for the delays in fulfillment.

A team of WSDOT and vendor staff worked together to improve the process in January 2016. They developed a new pass tracking tool to revamp what is shared in a weekly report, including more detailed pass sales trend and forecast data plus new information to alert the team to low inventory. This timely information allows the team to more accurately forecast demand for passes, and to order them in advance to ensure the supply is sufficient. Another change the team made was testing a random sample of vendor-supplied passes, instead of testing 100% of passes. WSDOT also worked with the pass manufacturer to allow

Good To Go! pass procurement process improves

for partial shipments of orders, which leveled the flow without demanding significantly more inventory space.

The team cut eight steps out of their *Good To Go!* pass procurement process (from 32 to 24 steps), allowing staff to redeploy more than 57 hours every week to other toll management tasks (more than 2,900 hours redeployed annually).

The team ran a simulation using their new inventory tracking tool to see how it would perform under the

spike in orders experienced late in 2015. Under the old scenario, new passes were ordered October 20 and ready to be shipped to customers December 14. Under the new scenario, the passes would be ordered a month earlier, and ready to be distributed to customers six weeks earlier, completely eliminating the four-week delay experienced by customers late in 2015.

Contributors include Cassandra Parlee, Anna St. Martin, Michael Severance, Patrick Watson and Yvette Wixson

WSDOT's Lean projects improve delivery of time-sensitive information to the public

April through June 2016; Progress reported on select projects

Project, program	Changes to process	Measuring success	Results
COMPLETE: Increase timeliness for invoices from/to public transportation partners <i>Public Transportation Division</i>	<ul style="list-style-type: none"> Created invoice tracking sheet accessible to all division staff Clarified roles and responsibilities during the invoice review process Developed process to communicate information needs to customers and regularly report progress 	<p>In the past three months:</p> <ul style="list-style-type: none"> Properly submitted invoices sent to accounting division for payment within 20 days of receipt increased from 78% to 98% Average invoice turnaround time decreased 44% from 12 to 6.7 days 	<ul style="list-style-type: none"> 1,300 payments were received by customers on average 5.3 days sooner Improved performance reduced WSDOT's risk of paying interest on late invoices
COMPLETE: Reduce time to process geotechnical (geotech) files <i>Construction Division</i>	<ul style="list-style-type: none"> Added half-time team member to work on geotech file imaging/indexing Switched from 100% electronic imaging and indexing of geotechnical report files to a tiered approach, reducing unnecessary referencing Offered just-in-time processing of any files that were indexed at the Tier 1 level, thereby maintaining access to all records 	<p>In the past 12 months:</p> <ul style="list-style-type: none"> The time to process one box of geotech report files decreased 44%, from 110 hours to 62 hours on average Increased number of boxes processed from about 0.61 box per month (March 2015) for 1 FTE to 2.33 per month for 1.5 FTEs (March-May 2016). Box content varies; one box can contain multiple report files, or one report file can take up multiple boxes. 	<ul style="list-style-type: none"> Approximately 1,000 labor hours redeployed annually, processing four more boxes this year Only three requests for detailed indexing of Tier 1 files since January, which team completed in one to five business days The time required to eliminate the backlog of geotech report files reduced from 15.3 years to 6 years at the new pace and staffing level
COMPLETE: Good To Go! pass delivery <i>Toll Division</i>	<ul style="list-style-type: none"> Testing <i>Good To Go!</i> passes changed from testing 100% in each new shipment to a sample of passes Updating order and sales forecasts daily based on recent sales Coordinating with vendor to maintain manageable pass inventory levels Tracking tool helps evaluate trends to make timely decisions on orders 	<p>In the past six months:</p> <ul style="list-style-type: none"> Staff hours spent testing and ensuring a sufficient supply of passes reduced by 70% Number of steps in the process reduced by 25%, from 32 to 24 Decreased time between WSDOT placing an order for a batch of new passes to when those passes are available to customers by 58%, from 12 weeks to five weeks. 	<ul style="list-style-type: none"> Eliminated four-week delay for customers during future spikes in orders. Approximately 2,900 labor hours were redeployed annually to support other work in the division
COMPLETE: Increase timeliness of payment on rail invoices <i>Rail Division</i>	<ul style="list-style-type: none"> Combined two tracking documents into one Defined review process responsibilities, eliminating duplicative reviewing Delegated responsibility for review and approval tasks based on the value of the invoice being reviewed Created a visual management board to illustrate invoice status, help team manage workload and reduce effort in tracking down delayed invoices 	<p>In the past six months:</p> <ul style="list-style-type: none"> Improved timeliness of invoice reviews by 50%, from an average of 20.6 days to 10.3 days per invoice Doubled the percent of invoices paid in 14 days or less, from 33% to 66% Reduced estimated labor hours to review an invoice by 30%, from approximately 15 to 10.5 hours 	<ul style="list-style-type: none"> Customers receive 764 payments on average 10.3 days sooner Faster payment of invoices also accelerates WSDOT's reimbursement from the Federal Railroad Administration, freeing up state funds for other projects WSDOT staff redeployed approximately 3,570 labor hours to other rail project delivery tasks annually

Data sources: WSDOT Public Transportation, Rail, Toll, Development and Construction divisions and WSDOT Lean Process Improvement Office.

Notable results

- To date, WSDOT has completed 371 of 421 Nickel and TPA projects, with 87% on time and 91% on budget
- WSDOT advertised 65 out of 98 Pre-existing Funds projects on time during the fourth quarter of the 2015-2017 biennium

No additional Nickel, TPA projects finished in quarter

WSDOT did not complete any additional Nickel or Transportation Partnership Account projects during the fourth quarter of the 2015-2017 biennium (April through June 2016). WSDOT currently has 15 projects underway; see [p. 51](#) for details.

WSDOT has completed 371 of 421 Nickel and TPA projects since July 2003, with 87% on time and 91% on budget. The cost at completion for the 371 projects is \$6.46 billion, 1.9% less than the baseline cost of \$6.58 billion. Fifty projects have yet to be completed. These are included in the current transportation budget and have a total value of more than \$9.63 billion.

Nickel, TPA funding remains short of original 2003, 2005 projections

Fuel tax collections show that the revenue forecasts from 2003 and 2005, which were used to determine the 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 a result, reduced gasoline and diesel consumption leads to reduced tax revenue.

WSDOT completes 371 Nickel and TPA projects July 2003 through June 2016; Dollars in millions

Project status	Number of projects	Baseline cost at completion
Projects completed in earlier biennia that are <i>not</i> included in the current transportation budget	171	\$1,477.2
Projects completed that <i>are</i> included in the current transportation budget	200	\$5,107.0
Completed projects subtotal:	371	\$6,584.1
Projects included in the current transportation budget that are not yet complete	50	\$9,634.8
Total:	421	\$16,219.0

Data source: WSDOT Capital Program Development and Management.
Note: Numbers have been rounded.

— Goal for Nickel and TPA is 90%—

371 of 421 projects complete **87%** on time **91%** on budget

Data source: WSDOT Capital Program Development and Management.

Notes: Projects complete are cumulative since July 2003. A project is "on time" if it is operationally complete within the quarter planned in the last approved schedule, and "on budget" if the costs are within 5% of the last approved budget. The goal for both measures is 90% or higher.

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 came in 10.2% less than the original March 2003 projections. Four Nickel projects have been deferred indefinitely while other projects have continued past the original 10-year period.

Fuel tax funding from the 2005 TPA package is also coming up short of the original March 2005 projections. The original projection for the TPA account was \$4.9 billion over a 16-year period from 2005 through 2021. The current projections through 2021 are estimated to be \$4 billion, roughly \$1 billion less (18.4%) than the original 2005 projection. This revenue shortfall has caused nine TPA projects to be deferred indefinitely.

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

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Strategic Plan Goal 1:
STRATEGIC INVESTMENTS
Project Delivery – Deliver transportation projects that are on time and on budget.

WSDOT continues to deliver its Nickel and TPA program funded projects with a high rate of success. Of the total 371 projects completed to date, 87% have been on time and 91% have been on budget.

WSDOT has 50 Nickel, TPA projects yet to be complete

Highway construction performance summary shows about \$9.6 billion in projects remain to be completed
Current Legislative Evaluation and Accountability Program as of June 30, 2016; Dollars in millions

Combined Nickel and TPA programs		Number of projects	Value of program
Subtotal of completed projects ¹		371	\$6,584.1
<i>Projects completed in earlier biennia that are not included in the current transportation budget</i>		171	\$1,477.2
<i>Projects completed that are included in the current transportation budget</i>		200	\$5,107.0
Projects included in the current transportation budget but not yet complete		50	\$9,634.8
Total number of projects ² in improvement and preservation budget		421	\$16,219.0
Schedule and budget summary Nickel & TPA combined: Results of completed projects in the current Legislative Transportation Budget and prior budgets.			
	Completed in 2015-2017 biennium budget	Total in current legislative budget	Cumulative program
Number of projects completed	3	200	371
Percent completed early or on time	100%	87%	87%
Percent completed under or on budget	100%	92%	91%
Baseline cost at completion	\$417.2	\$5,107.0	\$6,584.1
Current cost at completion	\$412.1	\$4,994.4	\$6,460.9
Percent of total program over or under budget	1.2% under	2.2% under	1.9% under
Advertisement record: Results of projects entering into the construction phase or under construction, detailed on p. 51 .			
			Combined Nickel & TPA
Total current number of projects in construction phase as of June 30, 2016			15
Percent advertised early or on time			86%
Total number of projects advertised for construction in the 2015-2017 biennium to date (July 1, 2015 through June 30, 2017)			1
Percent advertised early or on time			100%
Projects to be advertised: Results of projects now being advertised for construction or planned to be advertised, detailed below.			
			Combined Nickel & TPA
Total projects being advertised for construction bids (July 1 through December 31, 2016)			1
Percent on target for advertisement on schedule or early			0%
Budget status for the 2015-2017 biennium:			WSDOT biennial budget
Budget amount for 2015-2017 biennium			\$1,836.1
Actual expenditures in 2015-2017 biennium to date (July 1, 2015 through June 30, 2016)			\$742.6
<i>Total 2003 Transportation Funding Package (Nickel) expenditures</i>			\$24.6
<i>Total 2005 Transportation Partnership Account expenditures</i>			\$435.5
<i>Total Pre-existing Funds expenditures³</i>			\$282.5

Data source: WSDOT Capital Program Development and Management.

Notes: Numbers have been rounded. 1 Cumulative projects completed from July 1, 2003 to June 30, 2016. 2 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 Bridges Seismic Retrofit). See [Gray Notebook 38, p. 55](#) for more details. 3 For full details of the Pre-existing Funds program, see [pp. 55-57](#).

No additional Nickel,TPA rail or ferry projects complete

WSDOT did not complete any new Legislative Evaluation and Accountability Program rail or ferry projects this quarter. WSDOT has used the 2003 and 2005 funding packages to complete 19 rail projects and 22 ferries projects since 2003. Approximately \$524.2 million in ferries projects were funded by the Nickel, TPA and

multimodal accounts. The multimodal account funded approximately \$103.3 million in rail projects. WSDOT advertised three multimodal account rail projects, with awards amounting to \$146.7 million. An additional new \$123 million ferry vessel, funded with Nickel cash and bond proceeds, is also currently under construction.

WSDOT finishes 12 Nickel rail projects since 2003

Current Legislative Evaluation and Accountability Program as of June 30, 2016; Dollars in millions

	2003 Nickel Package	2005 TPA Package	Combined Nickel & TPA
Schedule, scope, and budget summary: Completed LEAP projects			
Cumulative to date (July 1, 2003 through June 30, 2016)	12	7	19
Percent completed early or on time ¹	100%	100%	100%
Percent completed within scope ¹	100%	100%	100%
Percent completed under or on budget ¹	100%	100%	100%
Baseline cost at completion	\$72.6	\$41.0	\$103.3
Current cost at completion	\$72.6	\$41.0	\$103.3
Percent of total program on or under budget ¹	100%	100%	100%
Advertisement record: LEAP projects under construction or entering construction phase			
Cumulative to date (July 1, 2003 through June 30, 2016)	1	2	3
Total advertised	1	2	3
Percent advertised early or on time	100%	100%	100%
Total award amounts to date	\$119.6	\$27.1	\$146.7

Data source: WSDOT Capital Program Development and Management.

Notes: Numbers may not total 100% due to rounding. The rail projects are primarily delivered through master agreements with BNSF, which administers construction activities on the projects. The data above is unchanged from the previous quarter because no additional rail projects were completed.

1 Rail projects are commitments delivered by BNSF, Sound Transit, ports and operators. Master agreements between WSDOT and lead agencies become the documents that govern the delivery of the project including budget, scope and schedule. The administrative process allows for amendments enabling the projects to be delivered within the parameters of the new amended agreement (on time, and on budget).

WSDOT finishes 12 Nickel ferries projects since 2003

Current Legislative Evaluation and Accountability Program as of June 30, 2016; Dollars in millions

	2003 Nickel Package	2005 TPA Package	Combined Nickel & TPA
Schedule, scope, and budget summary: Completed LEAP projects¹			
Cumulative to date (July 1, 2003 through June 30, 2016)	12	10	22
Percent completed early or on time ²	100%	100%	100%
Percent completed within scope ²	100%	100%	100%
Percent completed under or on budget ²	100%	100%	100%
Baseline cost at completion	\$180.7	\$343.5	\$524.2
Current cost at completion	\$180.7	\$343.5	\$524.2
Percent of total program on or under budget ²	100%	100%	100%
Advertisement record: LEAP projects under construction or entering construction phase			
Cumulative to date (July 1, 2003 through June 30, 2016)	1	0	1
Percent advertised early or on time ²	100%	N/A	100%
Total award amounts to date	\$123.0	\$0	\$123.0

Data source: WSDOT Capital Program Development and Management.

Notes: Numbers may not total 100% due to rounding. 1 Ferries completed projects record includes two 144-car vessels: the Motor/Vessel *Samish*, which started service in June 2015, and the M/V *Tokitae*, which started service in June 2014. It also includes three 64-car vessels: the M/V *Chetzemoka*, which started service in November 2010, the M/V *Salish*, which started service in July 2011, and the M/V *Kennewick*, which started service in February 2012. 2 The Legislature funds Ferries' projects at a grouped-project or Budget Identification Number (BIN) level for terminals and vessels; however, the delivery of construction projects requires that each of these BIN groups be broken into sub-projects with specific scopes, budgets and schedules. The list of sub-projects is updated as the project progresses into the design phase and the budget and schedule are better defined. This process enables WSDOT to deliver the projects within the updated budget amounts and milestones (on time, and on budget).

No Nickel or TPA projects completed this quarter

WSDOT did not have any additional Nickel or Transportation Partnership Account projects completed in the fourth quarter of the 2015-2017 biennium (April through June 2016). In 2012, the Legislature added supplemental work to one TPA project after it was declared operationally complete in November 2010. An update on this project is provided, but it does not count as a new operationally complete TPA project.

SR 532/Davis Slough Bridge Replacement — Widening for Flood Prevention (TPA) Island/Snohomish Counties

This TPA subproject replaced a narrow bridge over Davis Slough that was built more than 60 years ago. In 2012, the Legislature added this subproject to the SR 532/Corridor Program after that project was declared operationally complete in November 2010.

The SR 532/Corridor Program featured mobility, safety, preservation, and environmental improvements for the critical SR 532 corridor that connects residents from Camano Island and Stanwood with the larger urban centers of Seattle and Everett. Work for this project included replacing the Mark W. Clark Memorial Bridge with a wider bridge; constructing new sidewalks, bike lanes, truck climbing lanes and turn lanes; repaving highway surfaces and enhancing safety features. The corridor program was completed in November 2010, one month ahead of the last approved schedule and was on budget with both the last approved and original 2005 budgets.

Subproject benefits: The new Davis Slough Bridge was built to withstand a major earthquake and has wide shoulders that can be used by pedestrians, bicyclists and disabled vehicles. The bridge was also built higher than before to protect against flooding.

Budget performance: The Davis Slough Bridge Replacement subproject was completed on budget (meaning costs at completion were within 5% of the last approved budget) at \$29.0 million, \$1.1 million more than the original budget of \$27.9 million. The 2012 Legislature allocated \$20.0 million for the majority of the subproject costs. The remaining funding came from a legislative proviso that allocated any savings from the overall SR 532/Corridor Program to be used for future flood prevention

Measuring operationally complete projects

Delivery performance of completed projects is measured against the last legislatively approved schedules and budgets in accordance with criteria established by the Legislature. For this quarter, it is the 2016 transportation budget. In addition to the projects' last approved budgets and schedules, original legislative budgets and schedules are included to show changes that may have occurred during design and construction phases.

Projects are "on time" if they are operationally complete within the quarter planned in the last approved schedule, and "on budget" if the costs are within 5% of the last approved budget.

Nickel and TPA budgets and schedules reset whenever changes are made in the last approved legislative budget. For information on previously completed Nickel and TPA projects, visit <http://www.wsdot.wa.gov/projects/completed>.

projects in the corridor. This combination fully funded the subproject and accommodated the cost increase.

Schedule performance: The subproject was completed in May 2016, one year and six months later than the original scheduled completion date of November 2014.

Highlights/challenges: Environmental permit submittal for the subproject was delayed due to right of way issues and difficulty in classifying the type of impacted wetlands, which led to a delayed advertisement date. The advertisement date was further postponed when Native American artifacts were uncovered. Additionally, project construction was set back due to unfavorable weather.

Contributors include Mike Ellis, Penny Haeger, Theresa Scott, Aaron Ward, Tricia Hasan and Joe Irwin



Travelers use the completed southern half of the Davis Slough Bridge while WSDOT crews work to complete the northern half in December 2015.

WSDOT trims Watch List to three projects

WSDOT added one project to its Watch List and removed two this quarter (April through June 2016). As of June 30, there were three projects remaining on the Watch List. See table below for this quarter's Watch List projects.

WSDOT maintains the Watch List to deliver on the agency's commitment to "No Surprises" reporting and continuously monitors its projects' performance to ensure issues affecting schedule or budget are brought to the attention of legislators, executives and the public. The Watch List provides information on issues that currently affect projects or have the potential to impact project schedules and budgets. The Watch List helps WSDOT track these projects, providing status reports, explaining the factors affecting delivery and what the agency is doing to address them. Projects are removed from the Watch List when these issues are resolved.

WSDOT's Watch List projects that have been reprioritized, deferred or delayed due to funding constraints are listed separately. This quarter there were no Watch List projects with funding constraint issues. See [Gray Notebook 51, p. 40](#), for a list of common issues



WSDOT crews work to repair US 12 after washouts and rockslides forced closure of the highway in December 2015.

that might put projects on the Watch List. To read more about the Watch List items, visit bit.ly/PDRArchive.

Future editions of the *Gray Notebook* will also report Watch List issues for projects funded by the Connecting Washington transportation package. For an overview of the 2015 revenue package, see [Gray Notebook 58, p. 9](#).

WSDOT's Watch List projects with schedule or budget concerns

Quarter ending June 30, 2016

Project (County)	Date added	Date removed	Watch List issue
US 12 Corridor – Emergency Washout Repair (Lewis) ^{1,2}	Apr-2016	Apr-2016	Project cost increased from \$5.2 million to \$8 million due to increased needs in fill material and a longer hauling distance. Stage 2 of the project began in spring 2016, and the project has been removed from the Watch List.
SR 3/Belfair Area – Widening and Safety Improvements (Mason)	Mar-2016		Heavy rainfall and a higher than expected water table caused three detention ponds to flood. The ponds are being redesigned, which may result in cost increases and project delays.
SR 112/Nordstrom Creek – Remove Fish Barrier (Clallam)	Mar-2016	May-2016	Project advertisement was delayed to September 2016 due to delays with acquiring a temporary construction easement. Construction may be delayed to 2017, and this project has been removed from the Watch List.
SR 161/24th St. East to Jovita – Add Lanes (Pierce)	Sep-2014		This project was operationally complete in August 2014 and is facing a potential cost increase pending a claim from the contractor.
SR 99/South King St. Vicinity to Roy St. – Viaduct Replacement (King)	Dec-2013		The tunnel boring machine resumed operations in late April 2016 after six weeks of planned inspections and maintenance. The Alaskan Way Viaduct was closed for approximately two weeks to allow the machine to pass beneath. The machine entered another planned maintenance stop at the end of June. As of July 2016, the project's contractor, Seattle Tunnel Partners, updated the projected tunnel opening date to early 2019. ³

Data sources: WSDOT Capital Program Development and Management and WSDOT Regions.

Notes: 1 This project has been added to the Watch List during the current quarter. 2 This project was originally added to the Watch List in December 2015 when severe storms caused washouts and landslides that closed the highway (see [Gray Notebook 60, p. 48](#)). Temporary repairs were completed and plans for permanent repairs were made, and the project was removed from the Watch List in December 2015. The project was added again in April 2016 due to emerging issues, and was removed the same month when issues were resolved as noted above. 3 The schedule for this project changes frequently, and WSDOT cannot verify the contractor's schedule.

Work on Nickel and TPA projects continues

Fifteen WSDOT projects in construction phase as of June 30, 2016

Nickel and Transportation Partnership Account projects; Costs estimated at completion; Dollars in millions

Project description Cumulative to date (County)	Fund Type	On-time advertised	Ad date	Contractor	Operationally complete date	Award amount
I-5 Concrete Rehabilitation Program (King) Multiple contractors continue to work on this project.	Nickel	√	Jul-2009	Multiple contractors	May-2023	\$9.8
SR 99/Alaskan Way Viaduct – Replacement (King) This project replaces an aging viaduct with a new viaduct on the south end and adds a tunnel in downtown Seattle. WSDOT is funding or leading 30 contracts or projects as part of the viaduct replacement effort. Active Nickel/TPA projects are shown below:						
• SR 99/South King Street Vicinity to Roy Street – Viaduct Replacement	Nickel/TPA	√	May-2010	Seattle Tunnel Partners	TBD	\$1,089.7
			Oct-2013	Guy F. Atkinson Construction	TBD	\$41.6
This subproject has several contract components; the bored tunnel, north and south access connections and associated work. The schedule for this project changes frequently and WSDOT cannot verify the contractor's schedule at this time.						
US 395/North Spokane Corridor (NSC) – Design and Right of Way – New Alignment (Spokane)	Nickel/TPA					
The US 395/North Spokane Corridor project is ongoing and several phases still require funding.						
I-5/Mellen Street Interchange to Grand Mound Interchange – Add Lanes (Thurston, Lewis)	TPA					
• I-5/Mellen Street to Blakeslee Junction – Add Lanes, Interchange Improvements	TPA	√	Mar-2012	Cascade Bridge	Sep-2016	\$21.6
The operationally complete date was delayed due to schedule adjustments needed for complex traffic revisions, demolitions, repairs and painting of nearby bridges.						
• I-5/Mellen Street Interchange – Interchange Improvements	TPA	√	Combined with project above for construction efficiencies.			
SR 502/I-5 to Battle Ground – Add Lanes – Stage 2 (Clark)	TPA	√	Jan-2014	Rotschy	Oct-2016	\$27.5
I-90/Concrete Rehabilitation						
• I-90/Oakes Avenue Interchange to Peoh Road Bridge Vicinity Westbound – Replace/Rehabilitate Concrete (Kittitas)	Nickel	√	Mar-2015	Midmountain Contractors	Nov-2016	\$10.6
SR 520/Bridge Replacement and HOV (King)						
• SR 520/I-5 to Medina – Evergreen Point Floating Bridge and Landings	TPA	√	Dec-2010	Kiewit-General, A Joint Venture	Jul-2017	\$586.6
An additional contract award for this project is pending.						
I-205/Mill Plain Interchange to Northeast 18th Street – Build Interchange – Stage 2 (Clark)	TPA	Late	Aug-2014	Cascade Bridge	Dec-2016	\$24.3
Advertisement was delayed to address practical design changes to the project.						
SR 3/Belfair Area – Widening and Safety Improvements (Mason)	TPA	Late	Apr-2015	Ceccanti	Nov-2016	\$10.3
Advertisement was delayed due to revised project limits, which affected right of way acquisition.						
SR 167/8th St. East Vicinity to South 277th St. Vicinity – Southbound Managed Lane (King, Pierce)	TPA	√	Aug-2014	Guy F. Atkinson Construction	Jun-2017	\$53.9
SR 167/SR 18 Interchange West-North Ramp North- East Ramp Overcrossing – Seismic Retrofit (Pierce)	TPA	√	Combined with project above for construction efficiencies.			
I-5/Tacoma HOV Improvements (Pierce)	Nickel/TPA					
• I-5/M Street to Portland Avenue – Add HOV Lanes	Nickel	√	Mar-2014	Mid-Mountain Contractors	Feb-2017	\$1.7
I-90/Snoqualmie Pass East – Hyak to Keechelus Dam – Corridor Improvement (Kittitas)	TPA					
• I-90/Snowshed to Keechelus Dam Phase 1C – Replace Snowshed and Add Lanes	TPA	Late	Apr-2011	Guy F. Atkinson Construction	Oct-2017	\$177.1
Advertisement was delayed to address fire and safety issues with the original snowshed design, resulting in long-term savings.						
SR 532/Pilchuck Creek Tributary – Fish Barrier (Snohomish)	TPA	√	Dec-2015	Faber Construction Corp.	Oct-2016	\$1.9
SR 16/Anderson Creek Tributary to Sinclair Inlet – Fish Barriers (Kitsap)	TPA	Late	Feb-2016	Scarsella Bros.	Oct-2016	\$4.4

TPA projects on time, on budget for 2015-2017 biennium

Biennial summary: Five projects completed in 2015-2017 biennium

Nickel and Transportation Partnership Account projects; Costs estimated at completion; Dollars in millions

Cumulative to date	Fund type	On-time advertised	On-time completed	Within scope	Baseline estimated cost	Current estimated cost	On budget completed
Current biennium reporting on capital project delivery							
2015-2017 biennium summary¹ This information is updated quarterly throughout the biennium.	0 Nickel 5 TPA	5 on time 0 late	5 on time 0 late	5	\$417.2	\$412.1	5 on budget 0 over budget
Earlier biennia reporting on capital project delivery							
2013-2015 biennium summary See Gray Notebook 58, p. 55 .	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 See Gray Notebook 50, p. 31 .	5 Nickel 36 ¹ TPA	31 ¹ on time 10 late	32 ¹ on time 9 late	41 ¹	\$1,485.5 ¹	\$1,459.6 ¹	37 ¹ on budget 4 over budget
2009-2011 biennium summary¹ See Gray Notebook 42, p. 45 .	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 See Gray Notebook 34, p. 58 .	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 See Gray Notebook 26, p. 5 .	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 See Gray Notebook 19, p. 5 .	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 In *Gray Notebooks* published before the 2009-2011 biennium, WSDOT used a project count of 391 combined Nickel and TPA projects for project completion data. In conjunction with the 2009-2011 biennium wrap-up, the tables were reorganized to present the completed information for the current project count of 421. In the revised count, several projects that were developed as part of larger programs, like bridge, rail, and roadside safety, were included in the new count though they had been completed earlier.

WSDOT reports seven change orders costing \$500,000 or more during the quarter

During the quarter ending June 30, 2016, WSDOT approved seven change orders of \$500,000 or more. These change orders totaled approximately \$42.9 million with the majority—\$39.7 million—addressing five change orders for the State Route 99 bored tunnel alternative design project, part of the Alaskan Way Viaduct replacement. WSDOT provided full compensation for additional time and work completed and interim compensation for costs incurred during the WSDOT-directed tunneling suspension for safety tests.

After an extensive review, which can involve subject matter experts, contract specialists, and other outside stakeholders, WSDOT must sometimes change 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 bit.ly/WSDOTchangeorders.

WSDOT delivers 119 Nickel highway projects since 2003

The performance summaries below and those on [p. 54](#) provide status reports on WSDOT's delivery of the Nickel and Transportation Partnership Account programs compared to the original legislative funding packages presented in the 2003 and 2005 Legislative Evaluation and Accountability Program lists.

The Legislature has approved changes to these funding packages and assigned funds to different projects since these two funding packages were created. As a result, the data listed below and on the next page show the original LEAP, which differs from the current legislative budgets on [pp. 47-48](#).

The 2003 and 2005 tables feature budget items including pre-construction and environmental studies that were in the original funding packages. The original LEAP tables do not include projects that cities, counties and tribes collaborate on with WSDOT to complete.

These tables show the total number of projects and the percentage of projects that are complete, underway, scheduled to start or affected by a legislatively approved change of project scope. They also give budget updates showing original planned budgets and the current planned or actual expenditure, breaking out programs by category: highways, ferries and rail.

WSDOT project delivery and budget update: Original 2003 Nickel Transportation Funding Package As of June 30, 2016; Dollars in millions

Project delivery update	Total program		Highways		Ferries		Rail	
	Number of projects	Percent of total	Number of projects	Percent of program	Number of projects	Percent of program	Number of projects	Percent of program
Project number and phase	156		127		5		24	
Completed projects	135	87%	119	94%	2	40%	14	58%
Total projects underway	8	5%	5	4%	2	40%	1	4%
<i>In pre-construction phase</i>	4		3		1		0	
<i>In construction phase</i>	4		2		1		1	
Projects starting in the future	1	1%	0	0%	0	0%	1	4%
Projects deferred or deleted from program	12	8%	3	2%	1	20%	8	33%
<i>Number of legislatively approved scope changes</i>	20		18		0		2	
<i>Pre-construction starts within six months</i>	0		0		0		0	
<i>Construction starts within six months</i>	0		0		0		0	

Data source: WSDOT Capital Program Development and Management.

Notes: Totals do not include projects that cities, counties and tribes collaborate on with WSDOT to complete. Percents may not add to 100 due to rounding.

Project budget update	Total program		Highways		Ferries		Rail	
	Budget	Percent of total	Budget	Percent of program	Budget	Percent of program	Budget	Percent of program
Total original legislative planned budget	\$3,887.5		\$3,380.1		\$297.9		\$209.5	
Original plan, 2003 through 2013-2015 biennium	\$3,887.5	100%	\$3,380.1	100%	\$297.9	100%	\$209.5	100%
Actual expenditures, 2003 through 2013-2015 biennium	\$4,093.7	105%	\$3,537.7	105%	\$423.2	142% ¹	\$132.8	63%
Original plan through 2015-2017 biennium	\$3,887.5	100%	\$3,380.1	100%	\$297.9	100%	\$209.5	100%
Current plan through 2015-2017 biennium	\$4,323.1	111% ¹	\$3,644.8	108% ¹	\$545.2	183% ¹	\$133.7	64%
Actual expenditures, 2003 through June 30, 2016	\$4,181.6	108% ¹	\$3,562.4	105% ¹	\$486.1	163% ¹	\$133.1	64%

Data source: WSDOT Capital Program Development and Management.

Notes: Expenditures are Nickel funds only. Totals do not include projects that cities, counties and tribes collaborate on with WSDOT to complete. ¹ The Legislature added funds for construction of a second 144-vehicle ferry for WSDOT Ferries and for highway construction during the first quarter (July through September) of the 2013-2015 biennium. These funds put WSDOT Ferries above its original funding level and will result in continued over-performance by this program.

WSDOT completes 193 TPA highway projects since 2005

WSDOT project delivery and budget update: Original 2005 Transportation Partnership Account

As of June 30, 2016; Dollars in millions

	Total program		Highways		Ferries		Rail	
Project delivery update	Number of projects	Percent of total	Number of projects	Percent of program	Number of projects	Percent of program	Number of projects	Percent of program
Project number and phase	248		229		4		15	
Completed projects	202	81%	193	84%	1	25%	8	53%
Total projects underway	26	12%	23	10%	0		3	20%
<i>In pre-construction phase</i>	9		8		0		1	
<i>In construction phase</i>	17		15		0		2	
Projects starting in the future	6	2%	2	1%	1	25%	3	20%
Projects deferred or deleted from program	15	6%	12	5%	2	50%	1	7%
<i>Number of legislatively approved scope changes</i>	23		23		0		0	
<i>Pre-construction starts within six months</i>	1		1		0		0	
<i>Construction starts within six months</i>	0		0		0		0	

Data source: WSDOT Capital Program Development and Management.

Notes: Totals do not include projects that cities, counties and tribes collaborate on with WSDOT to complete. Percents may not add to 100 due to rounding. Since the Transportation Partnership Account program was passed in 2005, the Legislature has approved changes to WSDOT Ferries' construction program so that the current budget does not match the original budget. Among the changes, TPA funding was provided for three 64-car ferries. For definitions about terminology used in Original LEAP, see [Gray Notebook 53, p. 40](#).

	Total program		Highways		Ferries		Rail	
Project budget update	Budget	Percent of total	Budget	Percent of program	Budget	Percent of program	Budget	Percent of program
Total original legislative planned budget	\$6,982.1		\$6,678.5		\$185.4		\$118.3	
Original plan, 2005 through 2013-2015 biennium	\$6,472.5	93%	\$6,218.0	93%	\$136.3	74%	\$118.3	100%
Actual expenditures, 2005 through 2013-2015 biennium	\$4,627.1	66%	\$4,476.3	67%	\$77.1	42%	\$73.7	62%
Original plan through 2015-2017 biennium	\$6,472.5	93%	\$6,218.0	93%	\$136.3	74%	\$118.3	100%
Current plan through 2015-2017 biennium	\$5,706.0	82%	\$5,548.6	83%	\$77.1	42%	\$80.4	68%
Actual expenditures, 2005 through June 30, 2016	\$5,065.1	73%	\$4,911.8	74%	\$77.1	42%	\$76.2	64%

Data source: WSDOT Capital Program Development and Management.

Notes: Expenditures are TPA funds only. Totals do not include projects that cities, counties and tribes collaborate on with WSDOT to complete. Since the Transportation Partnership Account program was passed in 2005, the Legislature has approved changes to WSDOT Ferries' construction program so that the current budget does not match the original budget.

WSDOT advertises 65 Pre-existing Funds projects

WSDOT advertised 65 of 98 Pre-existing Funds projects in the fourth quarter of the 2015-2017 biennium (April through June 2016).

Of the 98 total projects, five were advanced from future quarters, 36 were on time, three were emergent and 21 were late. Of the remaining PEF projects scheduled for advertisement this quarter, 17 were advertised in earlier quarters, 10 were delayed to a future quarter within the 2015-2017 biennium, five were deferred to a quarter outside the biennium and one project was deleted. See [pp. 56-57](#) for this quarter's PEF advertisements, and [Gray Notebook 51, p. 38](#) for full definitions of PEF terms.

WSDOT's current cost to complete the 226 PEF projects actually advertised through the fourth quarter of the 2015-2017 biennium is \$374.8 million, about \$43.9 million (13.3%) more than the original value of \$330.9 million.

Actual cost to complete project advertisements about \$43.9 million more than the original value

2015-2017 biennium (July 2015 through June 2017); Quarter ending June 30, 2016; Dollars in millions

	Number of projects	Original value	Current cost to complete
Total PEF advertisements planned for the 2015-2017 biennium	469	\$855.1	\$773.8
Planned advertisements through June 30, 2016	228	\$372.1	\$326.1
Actual advertisements through June 30, 2016	226	\$330.9	\$374.8

Data source: WSDOT Capital Program Development and Management.

WSDOT completes 226 Pre-existing Funds project advertisements so far during 2015-2017 biennium

Project status	Quarter ¹	Cumulative ²
Projects advanced ³	5	21
Projects advertised on time	36	167
Emergent projects advertised	3	10
Projects advertised late	21	28
Total projects advertised	65	226
Projects advertised early ⁴	17	19
Projects delayed within the biennium	10	41
Projects deferred out of the biennium	5	7
Projects deleted	1	1

Data source: WSDOT Capital Program Development and Management.

Notes: 1 Quarter refers to April through June 2016. 2 Cumulative refers to July 2015 through June 2017. 3 Advanced includes projects that were moved up from future quarters. 4 Early includes projects from the quarter that were advertised in an earlier quarter.

The current estimated cost to complete all 469 advertisements planned for the 2015-2017 biennium is \$773.8 million, about \$81.3 million (9.5%) less than the original value of \$855.1 million for these projects. Much of this reduction is due to the lower cost of oil (a primary ingredient in asphalt and chip seal paving), which has led to reduced costs on PEF paving projects.

Improvement and preservation cash flows less than projections

Cumulatively, WSDOT planned to have \$639.9 million in the combined improvement and preservation cash flow during the fourth quarter of the 2015-2017 biennium, but had \$570.4 million instead (approximately 10.9% less). This \$69.5 million variance was due to WSDOT basing initial improvement and preservation program allotments on historical averages for the quarter.

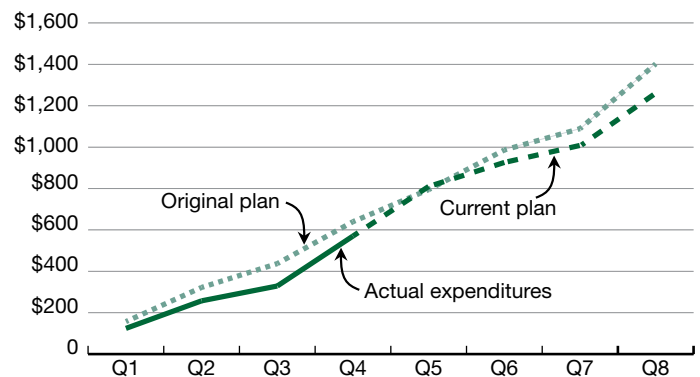
WSDOT is adjusting these original allotments and its actual expenditures during the 2015-2017 biennium to better reflect current spending plans.

WSDOT uses improvement program funds for projects that optimize highway capacity, enhance safety and reduce the environmental impact of construction projects. The preservation program includes pavement, bridges and other projects that maintain the structural integrity of the existing highway system.

Contributors include Mike Ellis and Joe Irwin

Cumulative Pre-existing Funds preservation and improvement combined cash flows lower than planned

2015-2017 biennium; Quarter ending June 30, 2016; Planned vs. actual expenditures; Dollars in millions



Data source: WSDOT Capital Program Development and Management.

Note: Q4 refers to the fourth quarter (April through June 2016) of the 2015-2017 biennium (July 2015 through June 2017).

WSDOT advertises 65 Pre-existing Funds projects

36 Pre-existing Funds projects advertised on time during quarter

April through June 2016

Advanced (5)	
I-405/Northbound Southeast 57th St. Vicinity - Variable Message Sign Replacement	SR 104/East of Balmoral Place Northeast to Kingston Ferry - Paving
SR 520/Westbound 124th Ave. Northeast Vicinity - Variable Message Sign Replacement	I-5/Kalama River Rd. Interchange - Illumination Rebuild
US 12/Oakville City Limits to Huntington St. Southwest - Safety Improvements	
On Time (36)	
I-90/Preston Interchange Vicinity - Guardrail	SR 4/Kandoll Rd. Vicinity to West Valley Creek Bridge - Chip Seal
SR 92/Pilchuck River - Chronic Environmental Deficiency	I-5/Northbound Cowlitz River Bridge to Koontz Rd. Vicinity - Paving
SR 153/Methow River Bridges - Deck Rehabilitation	I-5/Southbound Cowlitz River Bridge to Koontz Rd. Vicinity - Paving
SR 153/Methow River Bridges - Deck Rehabilitation 2	I-5/I-205 to North Fork Lewis River Bridge - Rehabilitate Pavement
SR 8/Winslow Drive Southwest to Vicinity US 101 - Safety Improvements	US 12/Salkum Vicinity to Corn Creek Bridge - Paving
SR 16/Tacoma Narrows Bridges to SR 3 - Paving	US 12/Chapman Rd. Vicinity to Coal Creek Bridge - Chip Seal
SR 112/West of West Twin River Bridge - Culvert Replacement	US 97/Biggs Rapids Bridge to Prairie Rd. Vicinity - Paving
SR 410/SR 167 to 181st St. - Paving	SR 500/NE 162nd Ave. to Leadbetter Rd. - Chip Seal
SR 4 Centerline Rumble Strips - Safety	SR 503/Lewis River (Yale) Bridge - Paving
SR 504 and 505 - Centerline Rumble Strips	SR 504/Kid Valley Rd. Vicinity to Johnston Ridge - Chip Seal
Southwest Region - Regionwide Basic Safety - Guardrail 2015-2017	SR 506/Ryderwood to I-5 - Chip Seal
Southwest Region - Intersection Safety Implementation Program	SR 240/Steptoe Roundabout Improvements
Southwest Region - Regionwide Curb Ramps - Americans with Disabilities Act Compliance	Eastern Region/US 2 and US 395 Intersection Improvements - Durable Striping and Signing
Southwest Region/Clark County Locations - High Friction Surfacing	Eastern Region - Regionwide Curve Warning Chevron Signing
Southwest Region - Regionwide Safety - Shoulder Rumble Strips Phase 1	SR 25/Spokane River Bridge - Navigation Light System Replacement
2015-2017 Southwest Region - Regionwide Basic Safety - Signing	I-90/North Wahl Rd. South Bridge - Deck Repair
SR 432/Kelso-Longview Area - Replace Lighting Circuits	I-90/BNSF Crossing North Bridge - Deck Repair
Southwest Region - Regionwide Curve Warning Signing Phase II	I-90/BNSF Crossing South Bridge - Deck Repair
Emergent (3)	
SR 8/Elma Safety Rest Area Sewer Lift Pumps - Olympic Region	SR 104/Lindvog Rd. to Washington Blvd. - ADA Improvements
I-5/Vicinity Milepost 88 Slide - Slope Stabilization	

Table continued on [p. 57](#)

WSDOT advertises 65 Pre-existing Funds projects

21 Pre-existing Funds projects advertised late during quarter

April through June 2016

Late (21)

I-5/Gee Creek Northbound RV Dump Station Rehabilitation	US 12/Old Naches Highway Vicinity to I-82 - Paving
Northwest Region Guardrail Installation (2015-2017)	SR 24/Vernita Rest Area - ADA Compliance
Northwest Region Intersection Safety Implementation (2015-2017)	I-82/Prosser Rest Area - ADA Compliance
I-90/Indian John Hill Rest Area Eastbound and Westbound - ADA Compliance	I-82/Selah Creek Rest Area Eastbound and Westbound - ADA Compliance
SR 92/Portage Ave. to Granite Ave. - Paving (City of Granite Falls Lead)	SR 18/Tiger Mountain Pass Vicinity - Glare Screen
North Central Region Strategic Pavement Preservation 2015-2017	SR 225/Benton City - ADA Compliance
US 2/97 Lower Sunnyslope Road - Access Control	SR 397/South Yew St. to South 10th Ave. - ADA Compliance
SR 3/North of Cokelet Lane to SR 303 - Paving	SR 397/S 10th Ave. to I-182 - ADA Compliance
SR 310/SR 3 to Weslon Place - Paving	SR 823/Yakima to Selah - Paving
SR 411/First Ave. Southwest to I-5 - Pavement Rehabilitation	Eastern Region Intersection Safety Implementation Program
SR 432/SR 4 to Industrial Way Vicinity - Paving	

Early (17)

US 101/Astoria-Megler Bridge Main Span - Substructure Painting	I-90/US 97 to Canyon Rd. Interchange Vicinity - Paving
Northwest Region Curve Warning Signs (2015-2017)	I-90/Canyon Rd. Interchange Vicinity to Stevens Rd. Vicinity - Paving
SR 17/Lind Coulee Bridge - Drainage Modifications	US 101/Swanson Creek - Remove Fish Barrier
I-182/US 395 South to SR 397 - Paving	I-90/Price Creek SnoPark Vicinity to Cabin Creek Vicinity Westbound - Paving
I-182/US 395 to SR 397 - ADA Compliance	SR 9/Bowen Rd. Vicinity to Sumas Ave. Vicinity - Rumble Strip Installation
US 395/West Kennewick Ave. to I-182 Bridge - Paving	SR 536/SR 20 Vicinity to Mount Vernon - Rumble Strip Installation
North Central Region 2015-2017 Communications Upgrade	SR 544/SR 539 to Everson - Rumble Strip Installation
I-82/Eastbound Lanes West of Yakitat Rd. Vicinity - Paving	SR 142/Klickitat River Bridge - Replace Bridge
I-82/I-90 Interchange Vicinity - Paving	

Delayed (10)

SR 302/North of East Victor Rd. - Culvert Replacement	I-82/1 Mile West of Benton City to I-182 Interchange Vicinity - Paving
SR 503/Padden Parkway - Intersection Improvements	SR 26/North Fork Palouse River Bridge - Special Repair
2015-2017 Wireless Communication	US 195/North Fork Palouse River Bridge - Replace Rail
Olympic Region - Intersection Safety Implementation Program 2015-2017	US 195/North Fork Palouse River Bridge - Special Repair
2015-2017 Olympic Region Centerline Rumble Strips - Install Rumble Strips	I-90/Schrag Westbound Safety Rest Area - RV Dump Station Rehabilitation

Deferred (5)

SR 153/Methow River Bridge Milepost 11.8 - Structural Rehabilitation	SR 153/Methow River Bridge MP 22.3 - Structural Rehabilitation
SR 153/Methow River Bridge MP 13.5 - Structural Rehabilitation	SR 532/Camano Island to Juniper Beach Rd. Vicinity - Rumble Strip Installation
SR 153/Methow River Bridge MP 15.5 - Structural Rehabilitation	

Deleted (1)

SR 11/Cook Rd. - Intersection Improvements
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Data source: WSDOT Capital Program Development and Management

Gray Notebook subject index, archives and acronym list online

Readers can access the *Gray Notebook* subject index online at <http://bit.ly/GNBsubjectindex>. *Gray Notebook* editions are available at <http://bit.ly/GNBarchives>, and WSDOT's transportation acronym guide can be viewed at <http://bit.ly/WSDOTacronyms>.

Understanding 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.

The charts below show the reporting periods for *Gray Notebook* 62. April through June 2016 is the second quarter of the calendar year (Q2 2016); the fourth quarter of the state's fiscal year (Q4 FY2016); and the third quarter of the federal fiscal year (Q3 FFY2016). It is also the fourth quarter of the 2015-2017 biennium, which follows the current budget set by the Washington State Legislature.

Calendar, fiscal and federal fiscal quarters

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
GNB 61			GNB 62			GNB 63					GNB 64
Q1 2016			Q2 2016			Q3 2016					Q4 2016
Q3 FY2016			Q4 FY2016			Q1 FY2017					Q2 FY2017
Q2 FFY2016			Q3 FFY2016			Q4 FFY2016					Q1 FFY2017

2015-2017 biennial quarters

Period	Quarter	Period	Quarter
Jul – Sep 2015	Q1	Jul – Sep 2016	Q5
Oct – Dec 2015	Q2	Oct – Dec 2016	Q6
Jan – Mar 2016	Q3	Jan – Mar 2017	Q7
Apr – Jun 2016	Q4	Apr – Jun 2017	Q8

Notes: A calendar year begins January 1 and ends December 31. Washington state's fiscal year begins July 1 and ends June 30. The federal fiscal year begins October 1 and ends September 30. Biennia begin July 1 and end two years later on June 30.

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The *Gray Notebook* is developed and produced by the small team at WSDOT's Office of Strategic Assessment and Performance Analysis, and articles feature bylines indicating key contributors from dozens of WSDOT programs.

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