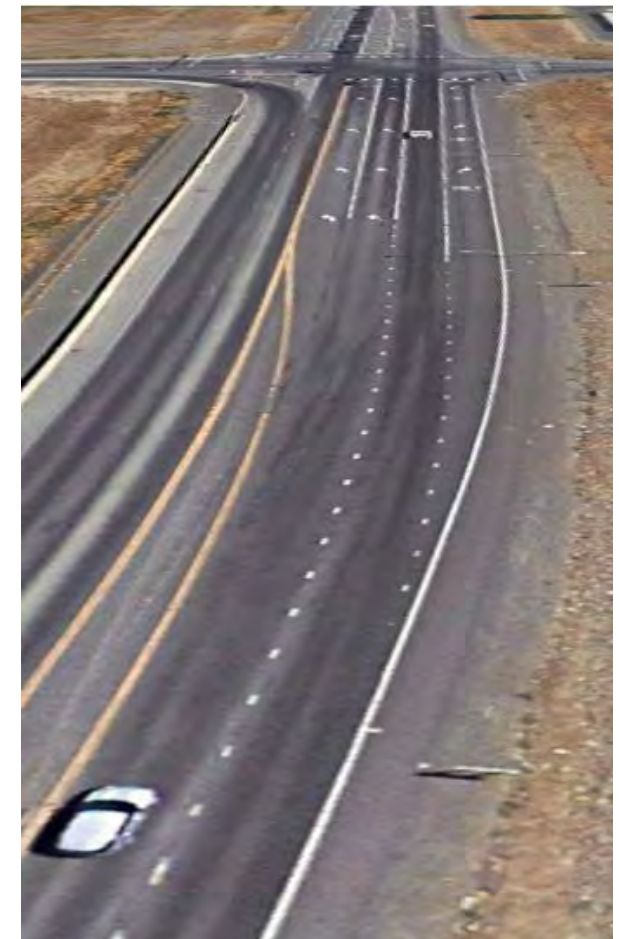
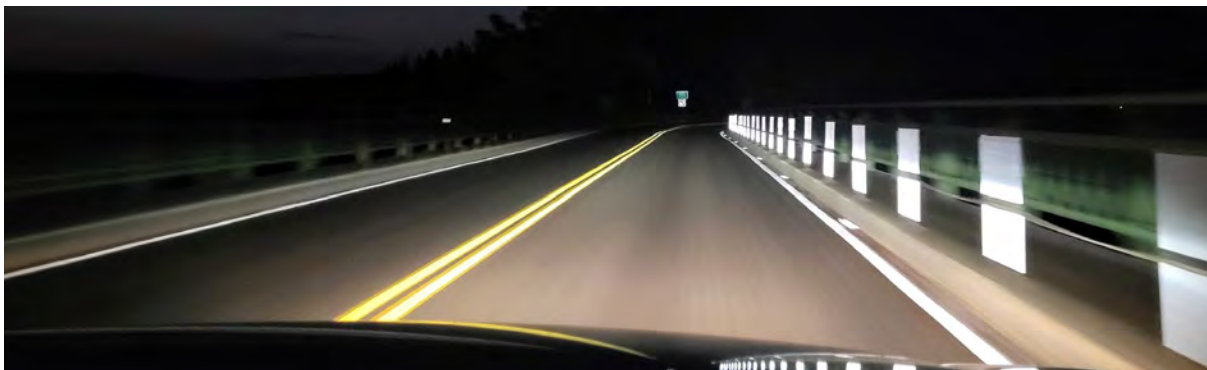


# TRANSPORTATION OPERATIONS

## 2021-2023 LOW COST ENHANCEMENT PROGRAM

### FINAL REPORT



# TABLE OF CONTENTS

<b>Definitions</b>	<b>3</b>	<b>Southwest Region</b>	<b>31</b>
<b>Overview</b>	<b>4</b>	All 2021-2023 Low Cost Enhancement Projects	31
<b>Northwest Region</b>	<b>6</b>	2021-2023 Introduction	33
All 2021-2023 Low Cost Enhancement Projects	6	2021-2023 Project Highlights	34
2021-2023 Introduction	11	<b>Eastern Region</b>	<b>39</b>
2021-2023 Project Highlights	12	All 2021-2023 Low Cost Enhancement Projects	39
<b>Olympic Region</b>	<b>16</b>	2021-2023 Introduction	40
All 2021-2023 Low Cost Enhancement Projects	16	2021-2023 Project Highlights	41
2021-2023 Introduction	20	<b>South Central Region</b>	<b>45</b>
2021-2023 Project Highlights	21	All 2021-2023 Low Cost Enhancement Projects	45
<b>North Central Region</b>	<b>25</b>	2021-2023 Introduction	47
All 2021-2023 Low Cost Enhancement Projects	25	2021-2023 Project Highlights	48
2021-2023 Introduction	27	<b>Appendix A Q3 Larger Capital Projects</b>	<b>52</b>
2021-2023 Project Highlights	28		



# DEFINITIONS

Category	Definition
Intersection	Project addresses crash trends, contributing factors, or mobility issues at an intersection.
Lane Departure	Project addresses engineering countermeasures associated with a vehicle leaving the lane. These may include high friction surface treatment (HFST), rumble strips, guardrails, and other treatments particular to a location.
Pedestrian/Bicycle	Project addresses identified crash risks or mobility issues for bicyclists or pedestrians.
Mobility	Project addresses mobility on the system; can include Intelligent Transportation System (ITS) projects.
Signs	Projects to implement Guide, Warning, Regulatory, or Low Clearance signs.
Pavement Markings	Project involves striping.
ITS spending	Intelligent Transportation System (ITS)-related projects.
Traffic Studies	Any research or traffic studies.
Project Design	Labor to design and scope projects.
Miscellaneous	Activities that don't fit in another category. Examples include: WSP aerial markings, Test sites, Tort claim investigations, illumination.
Low Cost Actions	Bundle of many small cost safety and mobility projects – usually \$5,000 or less – under one job number.

# PROGRAM OVERVIEW

Low-Cost Enhancement (LCE) projects are small, low-cost – usually less than \$100,000 – projects that can be quickly implemented to reduce crashes, reduce the potential for crashes, or improve mobility. LCEs quickly address emerging crash trends and mobility issues. These projects bring near-term relief to operational deficiencies and are often the first step in implementing incremental, long-term corridor strategies.

Because of their low cost and quick implementation, LCE projects are often very practical solutions to emerging needs. LCE projects may often postpone or lessen the need for larger capital projects.

LCE projects generally come in three sizes:

1. Small. Under \$5,000. Projects under \$5,000 are often bundled together under “Low-Cost Actions,” but they can also stand alone.
2. Medium. \$5,000 – \$50,000.
3. Large. Over \$50,000.

LCE projects originate when concerned citizens, elected officials, local agencies, or region staff identify a safety or mobility concern along a state highway. Region Transportation Office staff analyze the concern and decide to create an LCE project to address the concern.

Q3 expenditures include larger capital projects that are typically under 1 million

dollars. There are several Q3 projects highlighted in this report. A detailed list of all Q3 projects for the 2021-2023 biennium can be found in Appendix A, Q3 Larger Capital Projects.

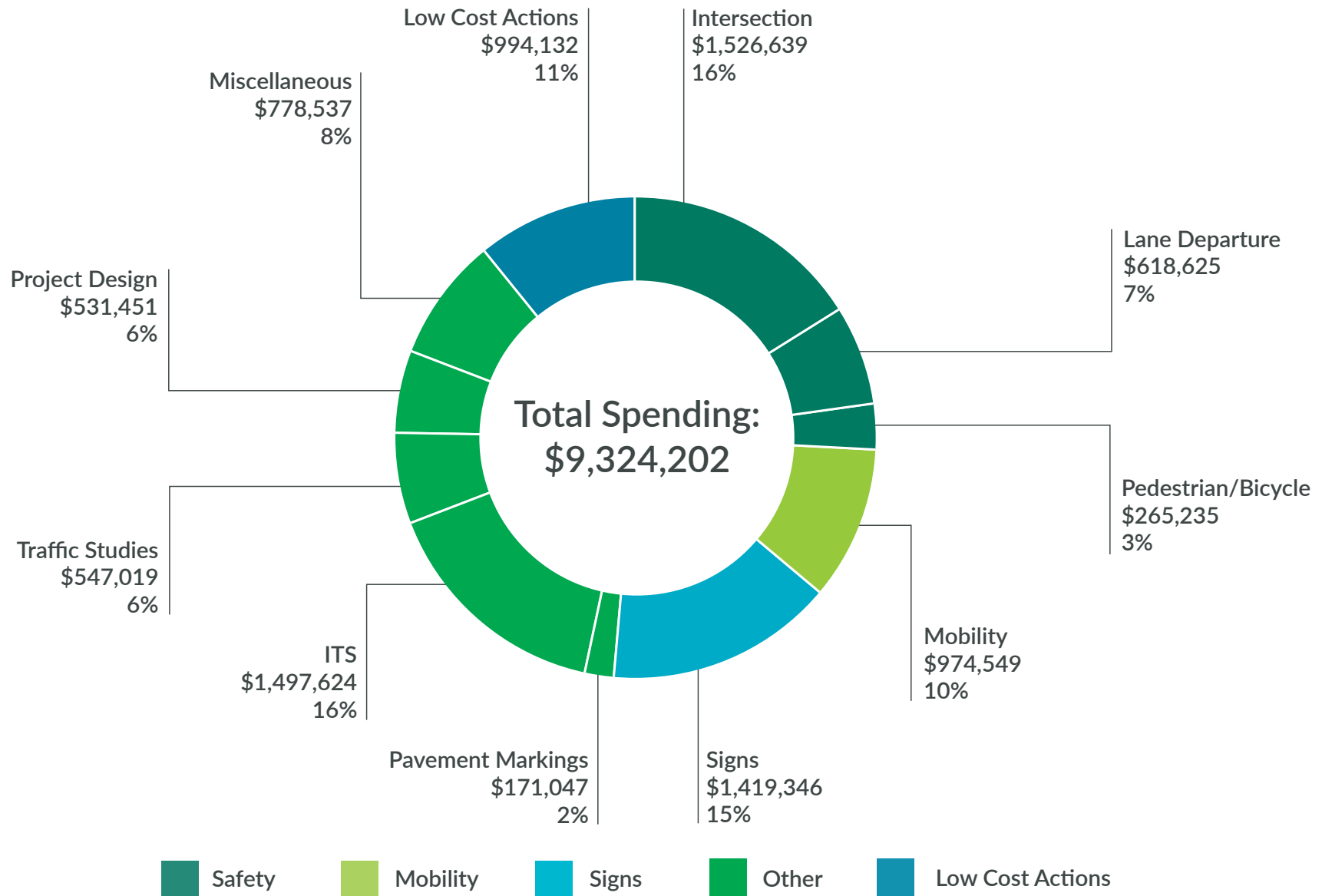
This report fulfills the requirements in ESHB 1125, Section 217 (1):

- \$6,000,000 of the motor vehicle account - state appropriation is provided

solely for low-cost enhancements. The department shall give priority to low-cost enhancement projects that improve safety or provide congestion relief. By December 15th of each odd-numbered year, the department shall provide a report to the legislature listing all low-cost enhancement projects completed in the prior fiscal biennium.

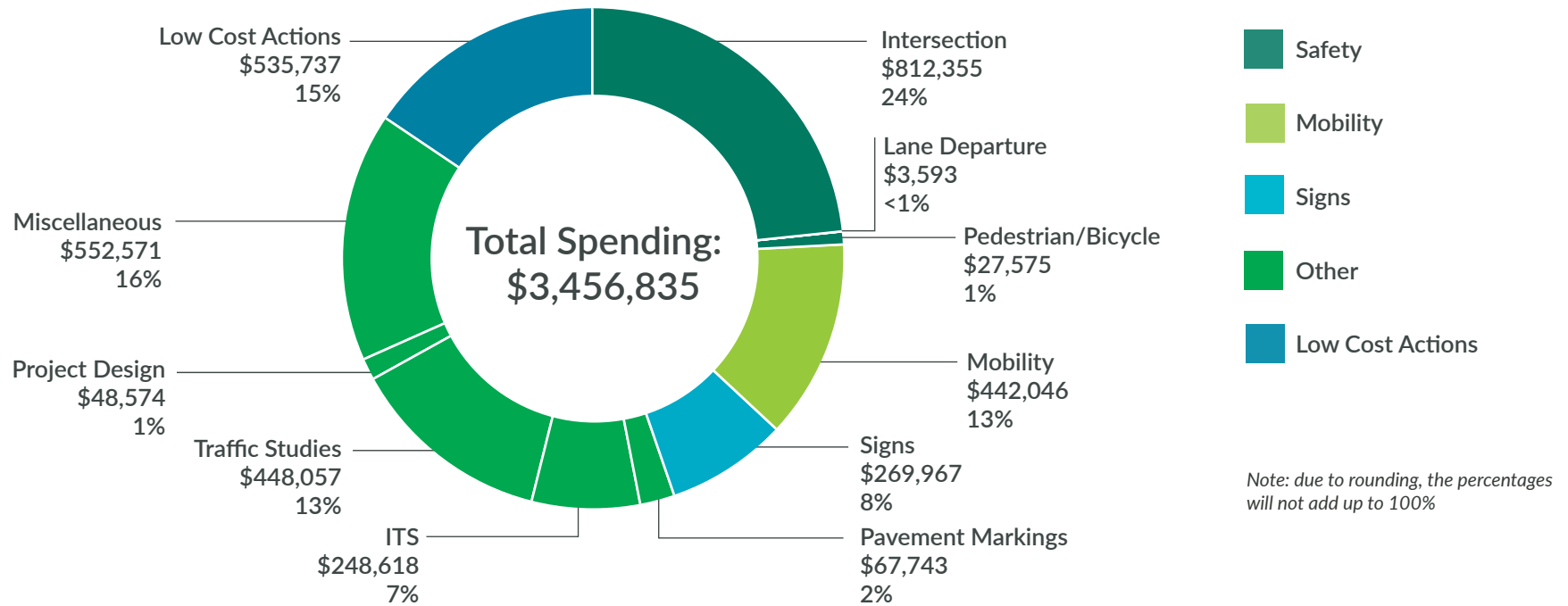


# Statewide Low Cost Enhancement Spending by Type of Project 2021-2023



# NORTHWEST REGION

## NWR: Low Cost Enhancement Spending by Type of Project – 2021-2023



## All 2021-2023 Low Cost Enhancement Projects

Project	Cost	Category
Regionwide Signal Improvements	\$566,853	Intersection
I-405 from Brickyard to SR 527 - Modify HOV Bypass Lane With Ramp Meters	\$430,000	Mobility
King Area Low Cost Actions	\$235,328	Low Cost Actions
Snohomish Area Low Cost Actions	\$171,042	Low Cost Actions
INRIX Signal Analytics Software	\$162,949	Traffic Studies
NWR and OR - Transportation Systems Management and Operations Implementation Plan	\$112,396	Traffic Studies
Camera Replacements - Regionwide	\$105,544	ITS spending



# NORTHWEST REGION

## All 2021-2023 Low Cost Enhancement Projects

Project	Cost	Category
Regionwide Pedestrian Signal Countdown Display	\$105,281	Intersection
Speed Limit Database	\$97,702	Miscellaneous
Maxtime Cards (signal systems controller software)	\$95,630	Miscellaneous
Mount Baker Area Low Cost Actions <ul style="list-style-type: none"> <li>Includes - SR20 at Sharpes Corner - Striping and Signing \$15,000</li> </ul>	\$95,369	Low Cost Actions
Traffic Management Center – SCADA Fire System Computer Replacement	\$87,865	Miscellaneous
I-90 Tunnel – SCADA Fire System Computer Replacement	\$81,585	Miscellaneous
Traffic Management Center – Big Screen Video Wall Replacement	\$79,893	Miscellaneous
SR 18 at Various Interchanges – Wrong Way Signs	\$61,941	Signs
Traffic Management Center – Radio Console	\$57,124	Miscellaneous
HOV/Multi Use Lane (MUL) Pooled Fund Study	\$50,000	Traffic Studies
Traffic Management Center – Pooled Fund Study	\$50,000	Traffic Studies
I-5 Express Lane Controller	\$46,240	ITS spending
I-90 in Rainier Valley – Camera Replacement	\$45,895	ITS spending
SR 20 Wrong Way Signing Phase 2	\$35,552	Signs
SR 167 NB to I-405 NB – "Ramp Meter On When Flashing" Signs	\$32,793	Signs
Environmental Investigation	\$32,386	Project Design
SR 516 in Covington – Corridor Study	\$27,838	Traffic Studies
Regionwide – Remove Hero/Reinstall Hov Signs	\$27,544	Signs
SR 20 at Deception Pass – Signing And Striping	\$27,214	Pavement Markings
SR 104 – Fiber To Edmonds City Hall	\$26,439	ITS spending
Mount Baker Area Low Cost Actions – Field Assessment	\$25,579	Low Cost Actions
Multiple Locations – Curve Warning Signs	\$22,176	Signs
SR 539 at Front St – Traffic Signal Cabinet Replacement	\$20,609	Intersection

# NORTHWEST REGION

## All 2021-2023 Low Cost Enhancement Projects

Project	Cost	Category
SR 203 at Morrison – Rectangular Rapid Flashing Beacon	\$17,191	Pedestrian/Bicycle
SR 539 at Main St – Traffic Signal Cabinet Replacement	\$16,910	Intersection
Traffic Management Center – Console Monitor Replacement	\$16,459	Miscellaneous
SR 20 Christianson Rd to I-5 – Striping For Wrong Way Prevention	\$15,981	Pavement Markings
Signal Maintenance Investigation	\$15,766	Project Design
I-5 Spokane St Onramp – Curve Warning Sign	\$15,718	Signs
I-5, I-90, SR 99 – Lumen Field Sign Project	\$14,685	Signs
SR 527 from 19th Dr SE to 180th – Install Cameras	\$14,027	ITS spending
SR 900 Corridor Study	\$12,922	Traffic Studies
SR 524 at Poplar – Illumination Service Modification	\$12,808	Miscellaneous
SR 20 at Pioneer Way– Flashing Yellow Arrow and Backplates	\$12,714	Intersection
I-5 SB at 220th – Snohomish Co Adaptive Signals Phase 2	\$12,580	Intersection
SR 522 EB at SR 9 – Guide Signs	\$12,365	Signs
Traffic Management Center – Video Wall Ethernet Switches	\$12,346	Miscellaneous
SR 18 at SR 516 EB and WB Ramps – Signal Head Backplates	\$11,762	Intersection
SR 519 in Covington Targeted Study – NW Traffic And Communications	\$11,243	Traffic Studies
SR 164 at SR 169 (Porter & Griffin) – Flashing Yellow Arrow	\$11,230	Intersection
SR 20 at Barrington Rd – Flashing Yellow Arrow and Backplates	\$10,892	Intersection
I-5 SB Offramp to 320th WB – No Right Turn Signs	\$10,807	Signs
SR 202 from Sammamish to Fall City – Corridor Study	\$10,727	Traffic Studies
Temporary "Your Speed Is" Sign Installation And Removal	\$10,422	Mobility
Miovision Equipment	\$9,982	Traffic Studies
SR 522 at 35th – Update Median	\$9,744	Intersection
SR 525 at Lighthouse Way – No Right Turn Blankout Sign	\$8,846	Intersection





# NORTHWEST REGION

## All 2021-2023 Low Cost Enhancement Projects

Project	Cost	Category
SR 202 at Tolt Hill – Centerline Stripe Treatment	\$8,681	Pavement Markings
SR 9 at SR 530 (W Burke Ave) – Restripe to Narrow Lanes	\$8,444	Pavement Markings
SR 164 at SR 169 (Porter & Griffin) – Install Emergency Vehicle Preemption Detectors and Cards	\$8,184	Intersection
I-5 NB Smokey Point Rest Area – No Parking Signs	\$8,011	Signs
SR 516 at 164th – Signal Head Backplates	\$7,230	Intersection
SR 20 at Goldie Rd – Flashing Yellow Arrow and Backplates	\$7,219	Intersection
I-5, SR 99, SR 104, SR 524 – Edmonds Creative District Signing	\$6,961	Signs
US 2 Corridor Safety Sign Replacements	\$6,511	Signs
Dayton Building Security Signing And Cameras	\$6,457	Miscellaneous
I-5 at 272nd St – Camera	\$4,926	ITS spending
King Area Low Cost Actions – Field Assessment	\$4,545	Low Cost Actions
SR 11 from Colony Creek to Chuckanut Crest Dr – Bicycle Warning Signs	\$4,515	Pedestrian/Bicycle
I-90 At SR 900 – Closed Circuit Television Cable Vault	\$4,253	ITS spending
SR 20 Wrong Way Signing Phase 3	\$4,216	Signs
SR 9 SB at SR 522 – Restripe	\$4,053	Pavement Markings
Snohomish Area Low Cost Actions – Field Assessment	\$3,875	Low Cost Actions
SR 202 from SR 203 to SE Fish Hatchery Rd – Bike/Pedestrian Caution Signing	\$3,716	Pedestrian/Bicycle
SR 599 at SR 99 – Reflective Delineators	\$3,593	Lane Departure
I-5 NB HOV Offramp to Broadway – Wrong Way	\$2,914	Signs
Tort Claim Investigations	\$2,429	Miscellaneous
SR 410 at Garret EB and WB – Flashing Yellow Arrow	\$2,408	Signs
SR 522 at Beach Dr & Ballinger Way – No Right on Red	\$2,299	Intersection
I-405 at SR 167 Ramp Meter – "Form Two Lanes" Sign	\$2,295	Signs
SR 104 Vic 47th Ave NE – Utility Pole Removal	\$2,271	Miscellaneous

# NORTHWEST REGION

## All 2021-2023 Low Cost Enhancement Projects

Project	Cost	Category
I-90 EB On-ramp from Newport Way – Bike Lane Channelization	\$2,154	Pedestrian/Bicycle
SR 20 Vic Swinomish & Higgins Slough – State Trooper Thomas Hendrickson Memorial Highway signs	\$1,899	Signs
SR 99 NB from Lincoln to Gibson – Business Access and Transit Lane	\$1,624	Mobility
SR 169 at SE Green Valley Rd and SE 383rd St/Enumclaw Franklin Rd SE – Intersection Restripe	\$1,448	Pavement Markings
SR 202 in Fall City – Accessibility Parking	\$1,132	Pavement Markings
SR 525 Langley Creative District Signing	\$850	Signs
SR 92 at Machias Rd – Active Warning Signs	\$714	ITS spending
SR 518 EB On-ramp from Des Moines Memorial Dr – Crosswalk and Ramp Striping	\$624	Pavement Markings
US 2 at Freylands Elementary – Active Warning Sign / Flashers	\$580	ITS spending
Material Lab Investigation	\$347	Project Design
Sign Bridge Replacement – Regionwide	\$322	Signs
SR 900 at 68th Ave SE – School Bus Stop Restripe	\$166	Pavement Markings
Utility Investigation	\$75	Project Design

# NORTHWEST REGION

## Introduction

The Northwest Region (NWR) Low-Cost Enhancement (LCE) program is generally delivered in two distinct ways. The first category includes projects that address:

- Emergent needs brought to our attention by the traveling public
- Issues that arise during the live operation of the highway system
- Expansion of the Intelligent Transportation Systems (ITS) to manage traffic actively
- Active transportation projects which provide added mobility to bikes and pedestrians

These projects are implemented as needed and allow the region to respond to the changing conditions of the roadway. This allows the region to resolve emergent issues on our state highway system as they arise. A typical example is when a new capital improvement project is opened, and an unforeseen issue with the roadway design is causing the traveling public mobility or safety issues. The region can often address or mitigate problems quickly through a modification to the striping, signing, or operation of the signal or ITS equipment initially installed by the project. A great example of this is the Sharpe's Corner roundabout project (p. 12).

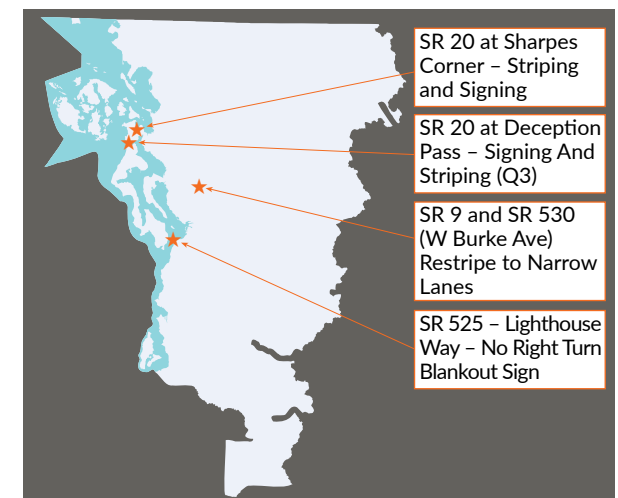
The second category of low-cost enhancements involves systematically reviewing and identifying safety or mobility issues in NWR's system through periodic highway reviews. The proactive monitoring

efforts by the region mitigate a demonstrated safety issue by looking at the crash data and determining an appropriate countermeasure. There are two ways in which the region accomplishes this: the Field Assessment (FA) Program and biennial priority programming efforts. The FA Program involves regional staff reviewing every mile of the state system on a seven-year rotating cycle, so engineers can proactively address issues. The biennial priority programming efforts involve lists generated by WSDOT to manage the locations with the highest safety improvement needs. Since WSDOT will no longer be generating lists for priority programming of capital safety projects, NWR expects in 2023-2025 that the regional safety program will be almost entirely dependent on the LCE program, making this program the primary way in which WSDOT can ensure the safety of the traveling public.

NWR is unique in the region for having many congested urban freeway facilities. The region uses the LCE program to constantly monitor, upgrade, and expand our ITS infrastructure. This generally consists of installing and enhancing existing ramp meter systems, operating the regional TMC, and ensuring roadside equipment, such as Variable Message Signs, function properly. The LCE program ensures that NWR can more efficiently manage and improve the flow of traffic in the most congested area of the state.

Finally, since the state's most densely populated urban centers exist in NWR, the

region is focused on addressing pedestrian and bicycle issues – primarily ensuring all road users have safe and reasonable access to our state highway system. This is important because highway pedestrian and bicycle facilities appropriate for the roadway context are significantly underdeveloped. The regional office has a team dedicated to reviewing pedestrian and bicycle needs that arise on NWR's system. This team delivers projects that include modifications to signing, striping, signal operations, and other roadway elements to address the active transportation needs of our system. NWR expects that the needs of all road users, including pedestrians, cyclists, and transit riders, will expand dramatically in the coming 2023-2025 biennium as needs are assessed as part of the Complete Streets initiative.



# NORTHWEST REGION

## 2021-2023 Project Highlights

### SR 20 AT SHARPES CORNER - STRIPING AND SIGNING

\$14,600

Completed late June 2021

SR 20 Jct. SR 20 Spur (Sharpes Corner Roundabout)

The Sharpes Corner roundabout was constructed in July 2018 to reduce congestion and improve safety at the previous signalized intersection. However, the location experienced an immediate and substantial increase in crashes in the years following the completion of the project. After reviewing the crash reports, NWR found an issue with the combination of 2-entering and 2-exiting lanes configuration on one of the roundabout legs, known as a “2x2” configuration, contributing to about 75 percent of the total increase in crashes.

The collisions typically involved drivers navigating from the east (Burlington) to the south (Deception Pass/Oak Harbor) and colliding with traffic traveling from the west (Anacortes) to the east (Burlington). Most of these collisions were sideswipe-type crashes that were low in severity, most often only resulting in property damage; however, every collision resulted in lane closure of the circulating lane of the roundabout, resulting in long delays and queuing for the entire intersection.

To mitigate this issue, NWR re-channelized the circulating lane and westbound approach to the roundabout, reducing the

west-to-south lanes from 2 to 1 and reducing the number of conflict points. By simplifying the number of entering/exit lanes, the new configuration allows drivers to judge gaps more effectively and eliminates the need for them to navigate both entering and exiting traffic simultaneously.

The new configuration brought the safety performance of the roundabout back to the rates that the original 2017 analysis predicted. The overall collision rate was reduced from over 45 crashes per year to just 3.4, with an estimated societal cost savings of over \$2.3M per year.



*Before: Sharpes Corner roundabout with two eastbound entering lanes and two southbound exiting lanes (2x2 configuration).*



*After: Southbound exit leg reduced to a single lane, with subsequent upstream channelization changes.*



# NORTHWEST REGION

## 2021-2023 Project Highlights

### SR 9 AND SR 530 (W BURKE AVE) RESTRIPE TO NARROW LANES

\$8,444

Completed October 2022

City of Arlington/Snohomish County

The intersection of SR 9 and SR 530 (W Burke Avenue) faced a significant challenge, with traffic experiencing prolonged delays when entering SR 9. To ease congestion and enhance safety, the City of Arlington requested that this intersection, which uses stop signs to control traffic, be transitioned to traffic signals. However, lacking funding for a signal or other major improvements, NWR instead implemented several low-cost modifications to address the issues.

The region narrowed the lanes at the intersection to 10 feet to encourage lower approach speeds and, thereby, calmer traffic conditions. They also added a 2-foot buffer strip on both sides of the pocket turn (refuge) lane, aiming to alleviate driver stress and increase their use of this lane.

Further enhancements to the intersection's layout included repositioning the stop bar closer to the intersection and introducing a right-turn island on SR 530 (W Burke Avenue). To improve delineation and visibility, the region added hachures and chevrons to the buffer strip and islands, ensuring better guidance for drivers navigating through the intersection. These changes collectively aimed to facilitate smoother traffic flow and

reduce delays, particularly by preventing signal queues from obstructing the nearby SR 530 (W Burke Avenue) intersection.

These changes resulted in several benefits. The adjusted signal timing at the intersection of SR 9 and SR 530 (Division Street) prevented signal queues from obstructing the flow at the intersection. The combination of lane narrowing, a reduction in intersection area, and enhanced visual cues reduced vehicle approach speeds, enhancing safety. Furthermore, this design refinement translated into an improved intersection capacity, facilitating the safe travel of vehicles through narrower gaps.

The incorporation of buffer strips on both sides of the left-turn refuge lane augmented its usage by drivers, which increased overall capacity and mitigated potential conflicts. Additionally, the buffer strip on the centerline played a role in diminishing the likelihood of crashes from opposite directions.

This comprehensive LCE initiative effectively tackled the challenge of traffic congestion and safety concerns at the SR 9 and SR 530 (W Burke Avenue) intersection. Through deliberate adjustments in design, signal

timing, and lane configuration, the project has resulted in reduced delays, as well as slower vehicle speeds that contribute to enhanced safety for all road users, including pedestrians.



Before: Traffic and striping conditions



After: Traffic and striping conditions

# NORTHWEST REGION

## 2021-2023 Project Highlights

### SR 525 - LIGHTHOUSE WAY - NO RIGHT TURN BLANKOUT SIGN

\$8,846

Completed May 2022

SR 525 Lighthouse Way - Mukilteo Ferry Vicinity

The reconstruction of the SR 525 and Lighthouse Way intersection was a pivotal component of the new Mukilteo ferry terminal project, strategically located near both the Mukilteo Ferry and Lighthouse Park. The design featured distinct traffic management elements, with the northbound right lane designated for ferry storage purposes, while the left lane was channelized as a thru/right option for general purpose traffic. A “No Right on Red” sign was installed on the mast arm as part of the project.

Initially, the east leg crosswalk functioned concurrently with the northbound and southbound general-purpose lanes at the intersection. However, pedestrians using the crosswalk were often blocked from sight by the standing queue of ferry vehicles waiting for boat arrival. This sight issue created a potential conflict for drivers turning right from the northbound thru/right option lane. Ferry lane traffic often spills through the intersection, which only added to the visual blockage for right-turning drivers.

The region realized that there will often be a standing ferry queue in the right lane. NWR reprogrammed the signal controller to have

the east leg crosswalk run exclusively. They replaced static signing on the mast with a “No Right Turn” blank out sign for the northbound approach that is activated when a pedestrian calls the east leg crosswalk. The blank out sign is much more visible and reinforces the turn restriction to protect pedestrians in the crosswalk.

The addition of this large lighted sign strongly messages the right turn restriction at an unusual intersection layout, bringing greater awareness to both drivers and pedestrians. The decision to run the east leg crosswalk exclusively also addresses safety concerns by separating it from the vehicle movement and the potential of conflict from north and south permissive turns.



Before: Lighthouse Way with static signing.



After: Lighthouse Way with Lighted blank out sign.

# NORTHWEST REGION

## 2021-2023 Project Highlights

### SR 20 AT DECEPTION PASS - SIGNING AND STRIPING

Completed November 2022

SR 20 Deception Pass Vicinity

\$27,214

Located at the north end of Whidbey Island, the Deception Pass bridge connects the island to the mainland. The bridge rail, comprised of bollards and steel wire, provided separation from the 11-foot travel lane and the 4-foot pedestrian walkway (with no shoulder in between). The rail frequently required repair by bridge maintenance crews because of regular vehicle impacts.

In the last ten years, the bridge required \$172,000 to repair and maintain the pedestrian rail that was initially installed for \$41,000 in 1993. At some locations along the bridge, the bollards had broken off so often that it was difficult for maintenance to properly secure the post to the sidewalk because of the repeated damage to the concrete. Bridge maintenance and pedestrians were primarily affected by this problem. In the aftermath of the vehicle impacts, bridge maintenance crews had to set up traffic control to repair the pedestrian bollards, which caused regular slowdowns in traffic flow, and expended a great deal of time and money. When the pedestrian rail was not in place, there was no physical barrier between vehicles and pedestrians along the bridge.

WSDOT implemented a low-cost enhancement (LCE) project to reduce vehicle

speeds and increase the visibility of the pedestrian bollards along the rail. WSDOT reduced the speed limit from 30 mph to 25 mph and installed a new 8-inch wide edge line, 20-inch wide barrier centerline, and transverse rumble strips leading to the bridge entrances. WSDOT also installed a new 4-inch edge line along the bridge and taped reflective strips to the pedestrian bollards. The striping, signing, and reflective tape will help reduce speeds prior to and along the bridge, and increase the pedestrian bollards' visibility along the bridge rail. The reduced speeds will provide enhanced safety for vehicles and pedestrians who visit this high-volume recreational area. The increased visibility and reduced speed will also be beneficial in lowering fixed object crashes, leading to fewer maintenance repairs and future cost savings.



View of the bridge entrance before the project was installed.



New 4" plastic edge line and reflective tape on bollards.



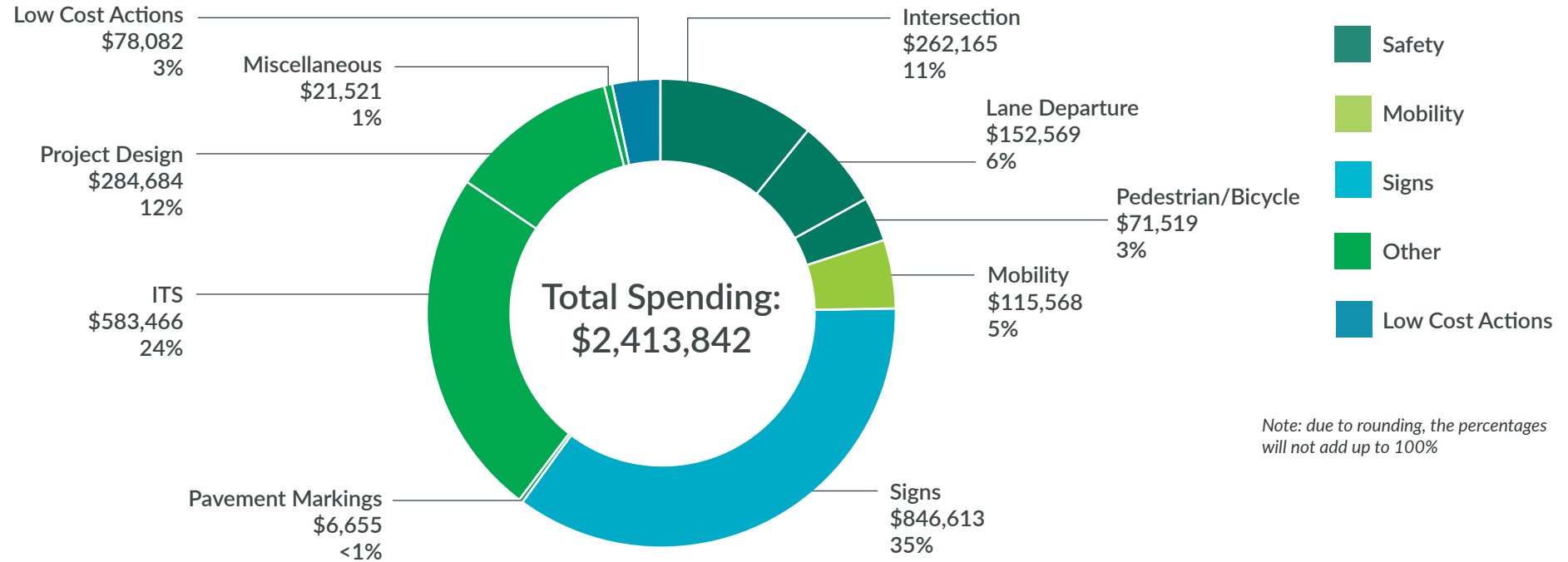
New 20" centerline, 8" edge line, and new transverse rumble strips leading to the bridge.



Night photo showing increased visibility.

# OLYMPIC REGION

## OR: Low Cost Enhancement Spending by Type of Project – 2021-2023



## All 2021-2023 Low Cost Enhancement Projects

Project	Cost	Category
SR 7 – Pedestrian Signal Design	\$284,684	Project Design
Regionwide Sign Crew	\$256,202	Signs
Minor Enhancement – Warning Signs	\$143,224	Signs
Minor Enhancement – Intersections	\$141,015	Intersection
Minor Enhancement – Regulatory Signs	\$138,410	Signs



# OLYMPIC REGION

## All 2021-2023 Low Cost Enhancement Projects

Project	Cost	Category
Minor Enhancements – Guide Signs	\$134,041	Signs
SR 16 Microwave Link Connection	\$124,043	ITS spending
Minor Enhancement – Miscellaneous	\$78,082	Low Cost Actions
I-5 at 56th – Ramp Meter	\$62,296	Mobility
SR 8 at SR 108 – Highway Advisory Radio	\$61,192	ITS spending
Regionwide Signal Improvements	\$60,954	Intersection
SR 3 from Equestrian Dr to Big Valley Rd NE – Closed Circuit Television	\$56,854	ITS spending
I-5 at 48th – Camera	\$53,692	ITS spending
I-705 & I-5 at SR 7 Ramp – Curve Warning Signs	\$49,115	Lane Departure
SR 105 from Old Westport Rd to Fillmore Rd – Shoulder Rumble Strips	\$43,095	Lane Departure
SR 16 – Tacoma Narrows Bridge Cameras	\$39,986	ITS spending
I-5 at Scatter Creek – Highway Advisory Radio Upgrade	\$39,869	ITS spending
I-5 at 84th St – Traffic Data Station	\$38,918	ITS spending
SR 3 at SR 104 – Cameras	\$37,877	ITS spending
SR 16 WB at Union – Ramp Meter Detection	\$35,473	Mobility
Minor Enhancement – Lane Departure	\$32,506	Lane Departure
I-5 at 96th – Camera	\$31,317	ITS spending
I-5 in Lacey – Camera Upgrade	\$31,011	ITS spending
SR 161 at 8th and 24th – Camera	\$28,874	ITS spending
I-5 in Olympia – Camera Upgrade	\$25,865	ITS spending
I-705 Just South of SR 509 / 21st St – Overhead Guide Sign	\$25,582	Signs
US 101 in Aberdeen – Span Wire Signing Removal	\$24,124	Signs
Minor Enhancement – Pedestrian/Bicyclist	\$23,036	Pedestrian/ Bicycle

# OLYMPIC REGION

## All 2021-2023 Low Cost Enhancement Projects

Project	Cost	Category
US 166 in Rockwell – Curb Ramp	\$22,000	Pedestrian/ Bicycle
SR 16 EB – Toll Plaza Overhead Sign	\$21,341	Signs
SR 7 at SR 512 – Overhead Sign Replacement	\$20,930	Signs
I-5 NB Off-Ramp to I-705 – Chevron Warning Signs	\$20,695	Lane Departure
SR 512 Ramp – Guide Sign Update at Portland Ave	\$18,900	Signs
SR 16 – Toll Plaza Sign Replacement for Pay Kiosk	\$18,781	Signs
I-5 at SR 510 (Marvin Rd) – Ramp Meter Improvements	\$17,799	Mobility
SR 410 at 211th – Flashing Yellow Arrow	\$16,053	Intersection
US 12 at Devonshire Rd – Signing Improvements	\$15,308	Signs
SR 512 Ramp – Guide Sign Update at Canyon Rd	\$12,336	Signs
SR 3 at Scenic Dr – Closed Circuit Television	\$11,664	ITS spending
SR 16 EB – HOV Exit Signing from Union to I-5	\$11,599	Signs
US 161 at 132nd Ave E – Signal Upgrade	\$11,045	Intersection
SR 7 – Unsignalized Crosswalk Enhancements	\$10,667	Pedestrian/ Bicycle
SR 166 at Sidney Ave – Audible Pedestrian Buttons	\$10,271	Pedestrian/ Bicycle
SR 510 in Lacey – Signal Improvement	\$8,363	Intersection
WSP Aerial Surveillance Marker	\$8,180	Miscellaneous
I-5 Exit 105B Off Ramp Port of Olympia – Supplemental Signal Display	\$7,071	Intersection
SR 510 at Mullen Rd – Intersection Signing Improvements	\$6,985	Intersection
I-5 at 54th NB Ramps – Left Turn Striping	\$6,655	Pavement Markings
SR 507 at 346th S – Warning Signs	\$6,294	Intersection
SR 161 from Pierce Co to Meridian Ave E – Sign Modifications	\$5,836	Signs
SR 162 at Emery Ave – Rectangular Rapid Flashing Beacons	\$5,545	Pedestrian/ Bicycle

# OLYMPIC REGION

## All 2021-2023 Low Cost Enhancement Projects

Project	Cost	Category
SR 16 EB & I-5 NB - Curve Warning Signs	\$4,556	Lane Departure
SR 410 Park Street - Supplemental Signal Display	\$4,386	Intersection
US 101 at Blue Mountain Rd / Corer Grocery - Illumination	\$4,341	Miscellaneous
US 101 in Port Angeles - Speed Limit Reduction	\$2,602	Lane Departure
I-5 at Carpenter Rd - Variable Message Sign Design	\$2,304	ITS spending

# OLYMPIC REGION

## Introduction

The Low-Cost Enhancement (LCE) program plays a pivotal role in assisting the Olympic Region (OR) staff in tackling safety and operational challenges while devising solutions to ensure the smooth flow of multimodal traffic, facilitating the seamless movement of people to their respective destinations across the region. The Olympic Region encompasses a wide range of geographical landscapes and growing urban locations, serving a diverse population. It is comprised of numerous dispersed cities and towns that anchor the region's economy and communities.

OR Transportation Operations staff is actively engaged in the operation and management of the state highway system within the urban hubs of Tacoma and Olympia and beyond. Increasingly, the need for enhanced traffic management strategies has grown across various population centers scattered throughout the region. This includes areas such as Aberdeen/Hoquiam and the coastal communities, Port Angeles and other gateways to national lands, the rapidly expanding Kitsap Peninsula communities, and all points in between.

A significant focus of the LCE program in the 2021-2023 biennium was the modernization of legacy traffic signal systems and Intelligent Transportation Systems (ITS) infrastructure. The modernization integrated new

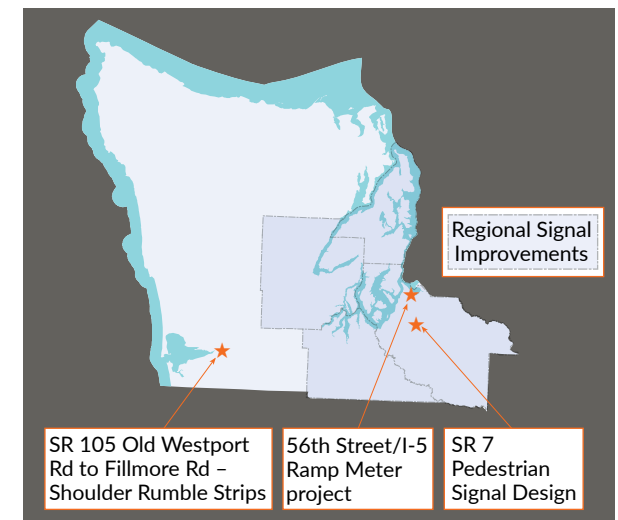
capabilities to accommodate multiple modes of transportation and deployed systems to fill gaps in the region's ITS coverage. These initiatives have substantially improved the region's capacity to monitor traffic conditions, respond to emergencies, and facilitate effective communication with both the transportation system and its users across the entire region.

Additional components of the OR LCE program originated from data-driven solutions addressing systemic issues, such as implementing lane departure measures like rumble strips or installing curve warning signage. The region also responded to emerging needs identified by the region's monitoring efforts and engagement with the community. The Olympic Region staff continued to receive a substantial volume of comments and change requests from the community, many of which arose as a result of the post-pandemic resurgence in traffic and the distinctive challenges that these rapidly expanding communities faced.

In preparation for the integration of the Complete Streets program and the reorientation of the region's Field Assessment to identify emerging challenges, the Olympic Region has successfully finalized its inaugural Transportation Systems Management and Operations (TSMO) Implementation Plan. In conjunction with other targeted needs

assessments and planning initiatives, this TSMO Implementation Plan serves as a guiding framework for prioritizing the region's future endeavors in the maintenance and operation of the transportation system.

The region's primary focus integrates safety enhancement, reliability, travel options, and event management. With the support of LCE and transportation operations funding, the Olympic Region is well-equipped to systematically address a range of projects aimed at improving intersection safety, promoting multimodal access, and optimizing signal/ITS operations. All the while, the region remains committed to addressing the concerns of the region's constituents and proactively responding to evolving needs.



# OLYMPIC REGION

## 2021-2023 Project Highlights

### SR 105 OLD WESTPORT RD TO FILLMORE RD - SHOULDER RUMBLE STRIPS

\$43,095

October 2021

SR 105 from MP 38 to MP 47

The Olympic Region Field Assessment Program identified a nine-mile stretch of SR 105 between Aberdeen and Westport as having a history of roadway departure crashes. Lane departure crashes are a Target Zero Priority crash type identified in the Washington State Strategic Highway Safety Plan. There are a number of cost-effective measures that can increase the likelihood that drivers stay on track, including enhanced signing and delineation, wider edge lines, and rumble strips.

Further investigation by WSDOT Traffic Operations staff also revealed that shoulder widths and depths supported the installation of shoulder rumble strips, a proven safety countermeasure recommended by the Federal Highway Administration for reducing run-off-the-road crash types. Meanwhile, the National Cooperative Highway Research Program (NCHRP) was reaching out to various state DOTs for help in a research problem regarding this countermeasure. Their study sought how to optimize the design of rumble strips to minimize a common complaint received by DOTs: exterior noise nuisance from rumble strips – while

maintaining effective vibration and noise interior to the vehicle to alert the driver of their lane departure. Exterior noise can impact wildlife, as well as the quality of life of local residents. Prior research indicated that changing the indentation pattern to a sinusoidal geometry would help limit noise and overcome this challenge – this modified design is nicknamed “mumble strips.”

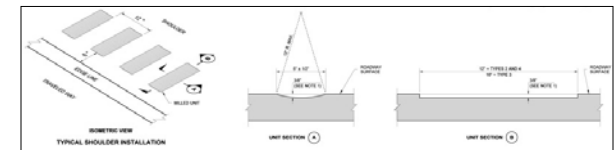
Olympic Region worked with the NCHRP investigators and a private company to install 20 different rumble strip designs along SR 105 as well as a standard WSDOT layout using cylindrical geometry. The private company used specialized equipment to install the entirety of the test segments over the course of a day, and Olympic Region Maintenance crews provided traffic control and cleanup support.

After conducting tests and concluding their study, NCHRP has determined the best parameters for use when installing sinusoidal rumble strips to minimize exterior noise while still providing the safety benefit of this cost-effective countermeasure.

This research is pending formal publication.



A third party quickly installed the ‘mumble strips’ in a mobile operation using specialized equipment that allows them to configure nearly any type of sinusoidal design



The typical WSDOT rumble strip design uses a cylindrical geometry with a number of options for different conditions



A sinusoidal mumble strip can reduce ambient noise while still alerting drivers of imminent lane departure

# OLYMPIC REGION

## 2021-2023 Project Highlights

### SR 7 PEDESTRIAN SIGNAL DESIGN

Spring/Summer 2023

SR 7 (Pacific Highway) from SR 507 to SR 512

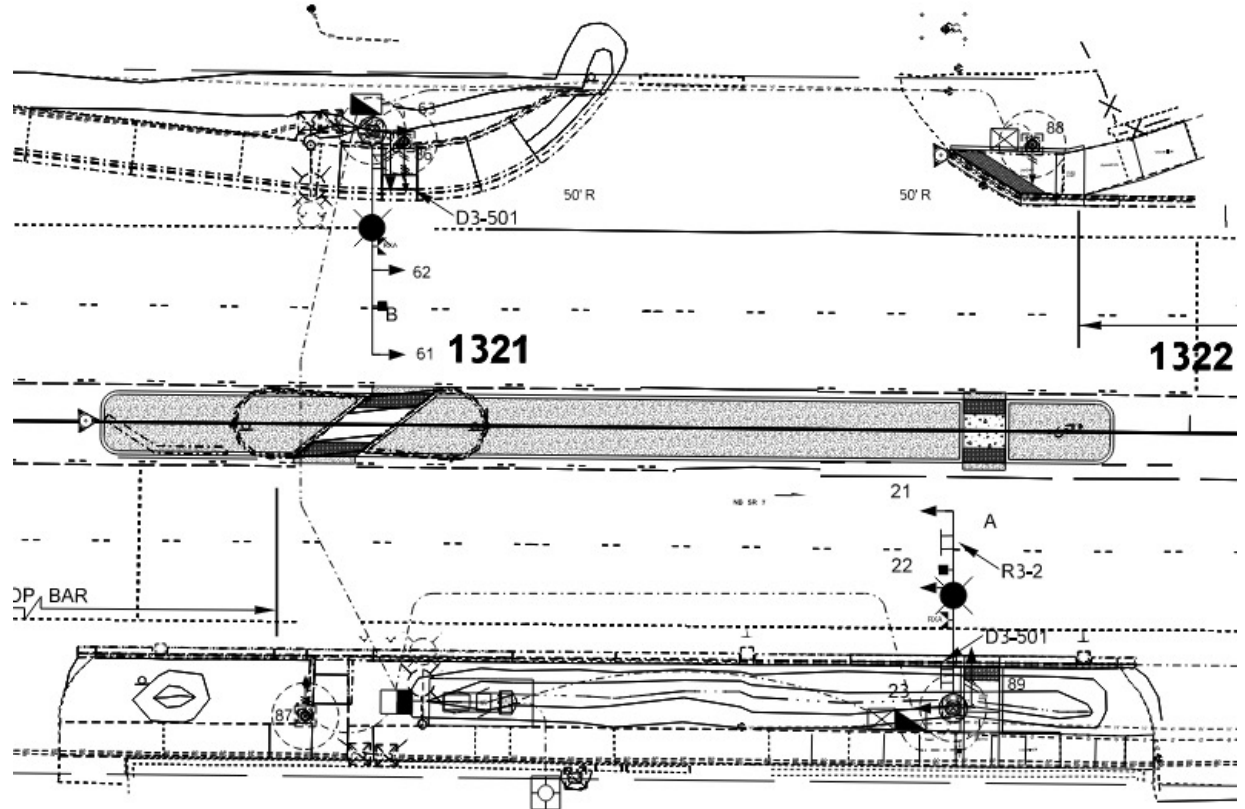
**\$284,684**

The SR 7 corridor is experiencing rapid growth. Anticipating enhanced bus service from future Pierce Transit projects, denser development in unincorporated Pierce County, and increased use of pedestrian facilities, Olympic Region applied for a Pedestrian & Bicyclist Program grant in May 2022. The region used LCE funds to expedite design so that grant funds could be immediately used to construct pedestrian traffic signals at 11 existing enhanced pedestrian crossings along the SR 7 corridor in the following biennium. Many existing enhanced crossing locations already make effective use of refuge medians, access management, advance stop bars, and other measures such as push button-activated beacons to increase safety. However, the proposed improvements will provide additional turn restrictions and more crossing locations to keep pace with the changing context of the corridor.

The corridor experienced multiple fatal crashes across the Summer of 2022, including both vehicle-vehicle and vehicle-cyclist crashes, at or near locations already marked for turn restrictions and crosswalks. This prompted the region to accelerate the

timeline for improvements, as well as issue additional requests for funding. This included additional support from the Washington State Legislature for more funds to address

emergent transportation challenges. The Legislature provided the construction funding, and the improvements already under design will go out for bid in 2024.



# OLYMPIC REGION

## 2021-2023 Project Highlights

### REGIONWIDE SIGNAL IMPROVEMENTS

\$60,954

21-23 Biennium

29 Signalized Intersection Locations throughout Olympic Region

A common barrier to improving operations at older traffic signals can be dated infrastructure. This infrastructure often is not equipped to facilitate enhancements to improve pedestrian mobility, make use of better turn phases and timings, give transit priority, or deploy other simple solutions to safety and mobility issues.

Using LCE funds, Olympic Region addressed comprehensive signal enhancements at 29 locations throughout the region in the 2021-23 biennium. A crucial aspect was the need for coordination with local partners, including cities, counties, and transit agencies, to ensure seamless integration with adjacent systems in the local street network. Upgrading one signal controller often necessitated updates at adjacent signal locations to maintain communication compatibility.

The upgrades included traffic signal controllers, ethernet switches, modems, and other equipment aimed at improving the functionality of a small corridor. The goal was to modernize these signals and enhance their operations to benefit the larger transportation system and, consequently, the traveling public.

One notable opportunity emerged with the City of Lakewood to address operational issues at the I-5/Bridgeport Way interchange. There were a number of close calls and left-turn crashes at the northbound ramp terminal intersection. Some of these resulted in fixed-object crashes, frequently impacting signal poles, the signal cabinet, and other

equipment. WSDOT worked with the City of Lakewood to replace multiple signal controllers at the connected signals along Bridgeport Way, which allowed for a flashing yellow left-turn arrow to be installed at the northbound ramp signal. Since installation, the rate of left-turn collisions and equipment knockdowns has decreased.



*This left turn phase was modified to improve safety and reduce the likelihood of knockdowns of the equipment in the foreground.*

# OLYMPIC REGION

## 2021-2023 Project Highlights

### 56TH STREET TO NORTHBOUND I-5 RAMP METERS

December 2022

#### I-5 Northbound on-ramps from South 56th Street in Tacoma

Q3: \$389,124

Recurring congestion on the northbound stretch of I-5, particularly near the SR 16 and I-705 interchanges in Tacoma, created operational challenges for the roadway, especially during peak hours, special events, ongoing construction, and traffic-impacting incidents. The older interchange design at 56th Street (the nearest upstream interchange) had become a focal point of these issues, worsened by drivers exploiting the collector/distributor lane to bypass queues in the right-most freeway lanes. This behavior not only flouted existing regulations but also disrupted traffic flow.

To address these issues and enhance safety, the region implemented ramp metering. This served multiple purposes. First, systemwide ramp metering can reduce collisions by 30% in an area. Second, the broader objective of ramp metering was to improve overall traffic management in the Tacoma area. These systems operate in real-time, responding to the ever-changing conditions on the highway and ramps. By maintaining consistent gaps between vehicles and preventing a flood of vehicles onto the highway simultaneously, ramp meters improved predictability for travelers. They facilitate smoother merging,

ultimately reducing collisions and enhancing overall travel times for everyone. Third, it enforced expected traffic flow behavior by discouraging the misuse of the collector/distributor lane, which was already prohibited but lacked effective enforcement. Signage alone was insufficient, necessitating the dynamic control offered by ramp meters to curtail this behavior.

Incorporating ramp meters at locations like 56th Street was not part of a mega-project but rather made possible through traffic operations funding. The investment in ramp metering was justified by its potential to fulfill larger goals and deliver additional benefits, such as improved efficiency, fewer crashes, and a more compliant traffic environment.



After: 56th street traffic meter in use.

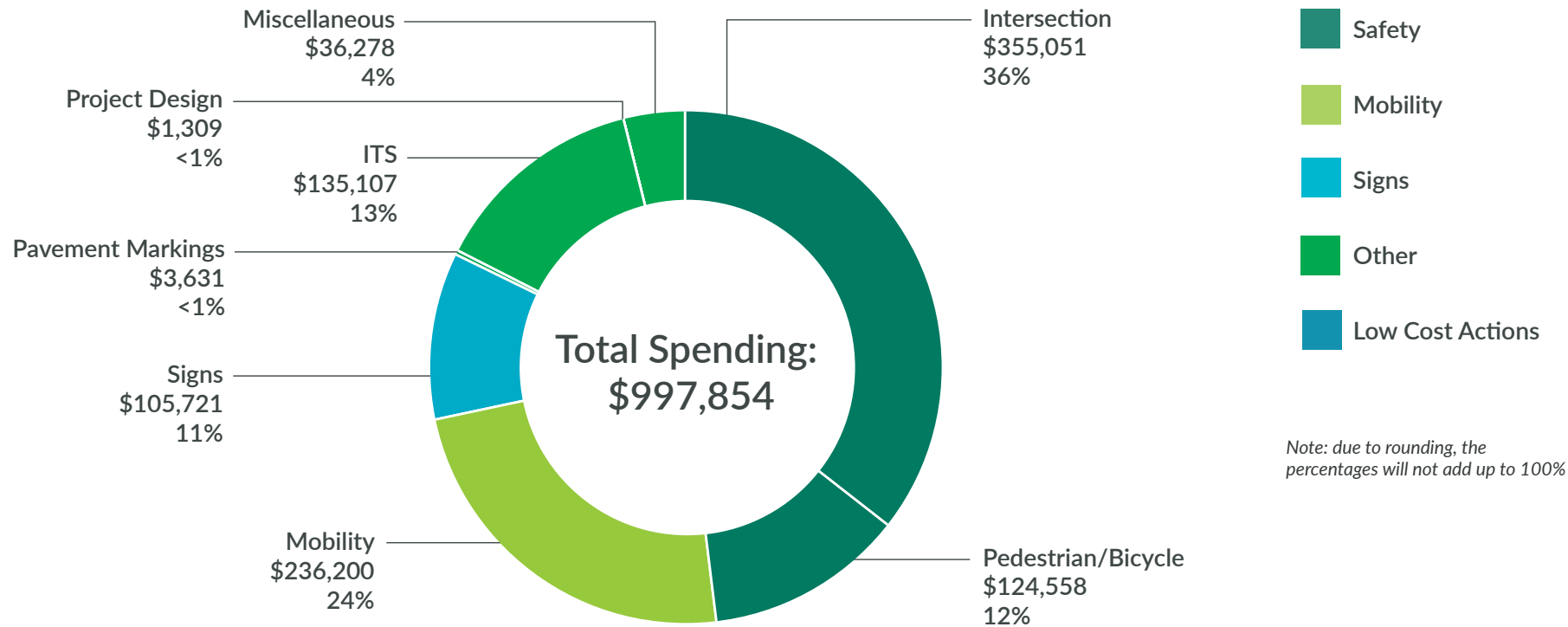


After: New meter signage to prompt motorists of upcoming meter in use.



# NORTH CENTRAL REGION

## NCR: Low Cost Enhancement Spending by Type of Project – 2021-2023



## All 2021-2023 Low Cost Enhancement Projects

Project	Cost	Category
SR 285 in Wenatchee – Conduit & Fiber Optic Cable	\$153,202	Mobility
SR 283 at 9 NW – Intersection Illumination	\$127,937	Intersection
US 97A in Chelan – ADA & Pedestrian Crossing Upgrades	\$102,747	Pedestrian/Bicycle
SR 17 at Randolph Rd – Flashing Beacon System	\$97,845	Intersection
ITS, Radio, and Camera Upgrade – Columbia Basin	\$93,417	ITS spending
SR 28 at Martin Rd – Intersection Improvements and Left Turn Channelization	\$85,178	Intersection
US 2 in Leavenworth – Conduit & Fiber Optic Cable	\$82,998	Mobility

# NORTH CENTRAL REGION

## All 2021-2023 Low Cost Enhancement Projects

Project	Cost	Category
Area 1 Signing	\$42,217	Signs
Miscellaneous Traffic Operations	\$36,278	Miscellaneous
SR 28 in Quincy – Radios For Signals And Cameras	\$32,270	ITS spending
SR 17 at Rd M – Left-turn Channelization and Left Turn Acceleration Lane	\$25,467	Intersection
Area 3 Signing	\$22,828	Signs
US 28 at 1st Ave SE – Right Turn Only Restriction	\$12,344	Pedestrian/Bicycle
US 2 Leavenworth to SR 2 & SR 172 to W NE – Signing Changes	\$11,407	Signs
Area 2 Signing	\$9,691	Signs
US 2 in Coulee City – Camera Radio Link	\$9,420	ITS spending
US 97A at Euclid Ave – Rectangular Rapid Flashing Beacon System	\$7,741	Pedestrian/Bicycle
SR 150 at Columbia/Johnson – Signal Operations	\$7,449	Intersection
SR 28 from SR 283 to MP 79 – Signing Changes	\$7,069	Signs
US 2 at Butcher Creek Rd – Radius Paving	\$4,028	Intersection
SR 97 from SR 2 to Azwell Rd – Signing Changes	\$4,019	Signs
Field Assessment Signing Projects	\$3,689	Signs
US 2, SR 171, SR 172, and SR 173 – Durable Marker Changes	\$3,631	Pavement Markings
SR 28 at Batterman Rd – Intersection Improvements	\$3,178	Intersection
Area 4 Signing	\$3,090	Signs
US 97A in Entiat – Crosswalk	\$1,726	Pedestrian/Bicycle
SR 17 from Route Start through Randolph Rd – Signing	\$1,711	Signs
US 97A at Wooden Ave – Signal Operations Improvement	\$1,580	Intersection
SR 215 at Oak Street – Rectangular Rapid Flashing Beacon	\$1,309	Project Design
US 2 at Stevens Pass Summit – Two Way Turn Lane	\$1,307	Intersection
US 2 at River Bend Dr – Flashing Yellow Arrow	\$1,082	Intersection

# NORTH CENTRAL REGION

## Introduction

During the 2021-23 biennium, North Central Region (NCR) used LCE funding to implement an array of enhancements within the regional transportation system. These projects frequently encompassed minor widening and restriping to introduce left turn lane channelization, augmenting pedestrian crossing locations with flashing beacons, and modernizing signals and communications systems with current technology. These initiatives enhanced safety and improved traffic flow at signalized intersections.

The region used LCE funding to develop productive collaborations with other programs within WSDOT, as well as local agencies. This collaborative approach helped the region take on larger-scale safety and mobility projects for pedestrians, cyclists, freight, and passenger vehicles. The region also responded to public requests for alterations such as speed limit adjustments, new signing, updated striping, or other minor operational refinements. LCE funding emerged as a pivotal resource for these modest projects, offering a swift and targeted response to public needs.

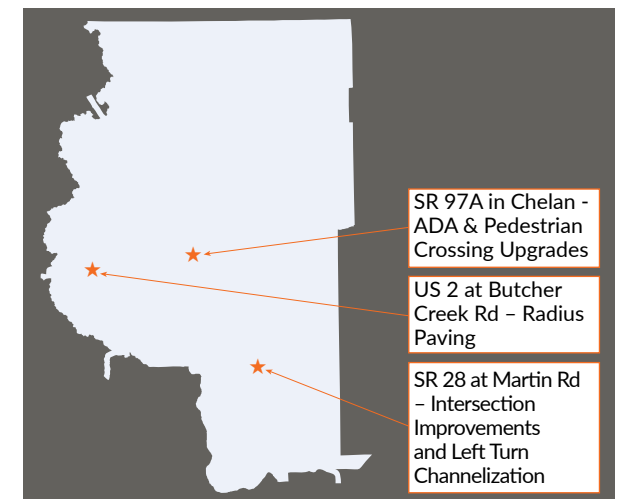
NCR anticipates a similar use of LCE funds in the 2023-25 timeframe, with a particular focus on pedestrian and cyclist projects to align with Complete Streets initiatives within local communities.

The enhancements made possible by LCE funding are low-cost and frequently yield substantial advantages by addressing needs before they escalate into major concerns within the transportation system. The flexibility and rapid response time associated with low-cost enhancement projects enabled NCR to deliver cost-effective, innovative solutions.

One challenge NCR has encountered pertains to the long-term maintenance obligations associated with any addition to the existing transportation system. Despite these challenges, the North Central Region remains committed to maintaining the personnel and funding resources essential for the sustained upkeep of improvements and the overall safety of the traffic system users.

The use of LCE funds served a dual purpose. LCE projects contributed to the expansion

of the system by incorporating items such as cameras and message boards, which enriched system capabilities. However, this expansion also introduced the challenge of maintaining an ever-growing inventory. Simultaneously, these projects successfully addressed long-standing maintenance issues, resulting in improved efficiency in system maintenance efforts. NCR appreciates the multifaceted approach that ensures effective resource allocation and system enhancement while acknowledging the ongoing responsibility of maintaining these valuable additions.



# NORTH CENTRAL REGION

## 2021-2023 Project Highlights

### SR 28 AT MARTIN RD - INTERSECTION IMPROVEMENTS AND LEFT TURN CHANNELIZATION \$85,178

August 2023

SR 28 MP 44.57 (Martin Rd)

North Central Region (NCR) Traffic Operations identified operational challenges at the Martin Rd intersection on SR 28, located west of Ephrata, during the region's comprehensive route review of a segment of SR 28 segment under the Field Assessment program.

The Field Assessment team identified that the existing operational concerns posed potential safety hazards to drivers at this location. NCR, Washington State Patrol (WSP), and WSDOT Maintenance personnel conducted collaborative route reviews, along with an assessment of crash data specific to this intersection. These analyses indicated a need to address conflict points and enhance driver safety.

To address these issues, NCR undertook a proactive approach. Leveraging Maintenance staff, equipment, and private contractors, the region initiated a low-cost safety enhancement project. The approach encompassed minor widening and re-striping SR 28 to establish channelization for an eastbound left turn lane.

This safety enhancement project yielded significant improvements. The newly established eastbound left turn lane reduced conflict points related to turning movements,

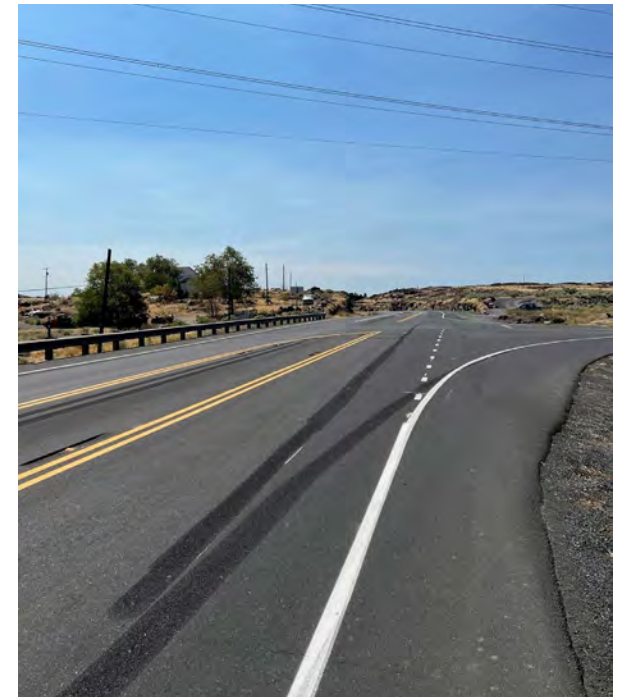
effectively segregating turning traffic from through movement. This strategic traffic management measure directly contributed to enhanced driver safety and reduced potential collision risks.

Beyond immediate safety enhancements, this project also aligns with broader objectives of

promoting safe and efficient transportation systems. By strategically addressing conflict points, NCR not only addressed driver safety issues, but also facilitated smoother traffic flow.



After: Minor Widening and Restriping.



After: Minor Widening and Restriping.

# NORTH CENTRAL REGION

## 2021-2023 Project Highlights

### SR 97A IN CHELAN - ADA & PEDESTRIAN CROSSING UPGRADES

\$102,747

May - June 2023

Chelan

North Central Region (NCR) Traffic Operations flagged the pedestrian crossing on SR 97A in Chelan as a concern for pedestrian safety. This issue was especially pronounced given the steady increase in pedestrian traffic, a situation intensified during the bustling summer months due to the influx of tourists to the area.

Pedestrians traveling through the neighborhood south of SR 97A rely on this crossing to access the pedestrian facility leading to the lakeside park and downtown Chelan. The escalating pedestrian volume heightened the potential for conflicts with motor vehicles.

To address this safety concern, NCR Transportation Operations undertook a collaborative effort. WSDOT Maintenance took the lead in installing crosswalk delineation while a private contractor constructed an ADA-compliant pedestrian ramp.

By implementing these enhancements, NCR established a designated crossing point, reducing ambiguity for both pedestrians and motorists. The installation of an ADA-compliant ramp further improved accessibility for all pedestrians, including those with mobility challenges.

These interventions not only address the immediate issues, but also align with larger goals of promoting pedestrian safety and accessibility. The improved crossing and enhanced sidewalk infrastructure support compliance with ADA regulations, ensuring equitable access for all road users. Additionally, the mitigation of conflicts between pedestrians and vehicles positively contributes to the overall traffic flow and safety in the area.



*Ramp connection to pedestrian crossing during construction.*



*After view of the crosswalk and pedestrian ramp connection.*

# NORTH CENTRAL REGION

## 2021-2023 Project Highlights

### US 2 AT BUTCHER CREEK RD - RADIUS PAVING

May 2023

#### US 2 MP 82.15 Forest service Rd-6910/Butcher Creek Rd

On US 2 at MP 82.15, the access point for Forest Service Rd-6910, also known as Butcher Creek Rd, was positioned on the inner side of a curve on US 2, an area with a speed limit of 60 mph. The approach also provided access to US 2 for the local volunteer fire station. The limited sight distance in this stretch posed challenges for users trying to safely enter and exit the highway via this access point.

In response to these concerns, North Central Region's (NCR's) Transportation Operations team took proactive measures. Partnering with the region's maintenance staff, they designed and implemented grading and paving work to enhance the approach, which extended the approach and reduced its curvature. After these changes, vehicles could transition onto a paved asphalt approach (previously a dirt road), enabling them time and space to accelerate to highway speeds. Additionally, this modification provided space for vehicles to decelerate when exiting the highway onto Butcher Creek Rd.

The enhancements undertaken by NCR directly addressed the concerns of users struggling with the limited access point. The improved approach facilitates smoother entry to and exit from the highway.

By addressing this specific access point, NCR contributed to the overall functionality of the highway, supported compliance with safety standards, and promoted a safer travel environment for all road users, aligning with the region's commitment to long-term transportation safety.

\$4,028



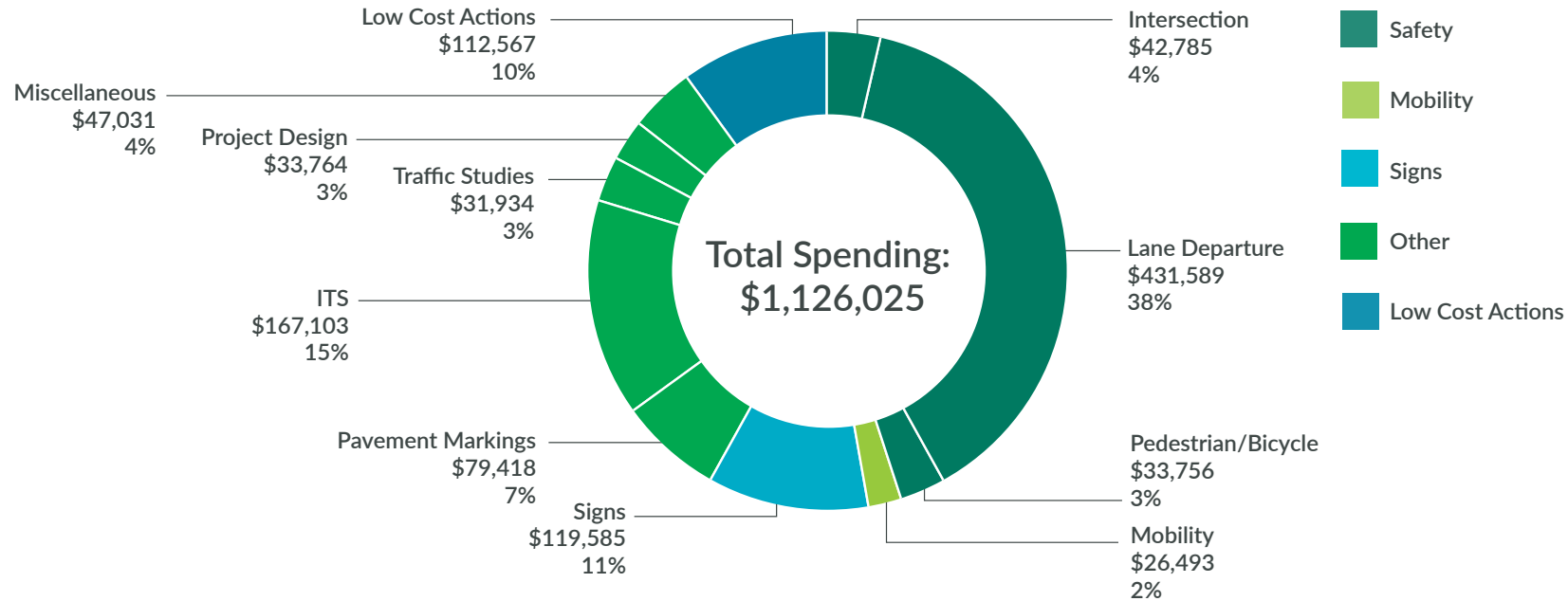
*New longer approach apron*



*Improved radius and approach apron.*

# SOUTHWEST REGION

## SWR: Low Cost Enhancement Spending by Type of Project – 2021-2023



## All 2021-2023 Low Cost Enhancement Projects

Project	Cost	Category
I-5 in Woodland – Guardrail project	\$372,274	Lane Departure
Low Cost Actions	\$112,567	Low Cost Actions
Regionwide – Regionwide Delineation Markings	\$79,418	Pavement Markings
ITS Expenditures Network Management	\$58,857	ITS spending
SR 14 Courtney & Old Hwy 8 – Left Turn Lane Survey/Design	\$33,764	Project Design
Regionwide – Remote Power Managers for ITS Field Devices	\$33,714	ITS spending
SR 14 at Tunnels 1-7 – Low Clearance Signing For Tunnel Heights and Advance Signs	\$32,489	Signs
SR 14 Courtney & Old Hwy 8 Intersection Improvement	\$27,340	Intersection
Portable "Your Speed Is" Signs	\$26,644	Signs
Traffic Studies	\$22,974	Traffic Studies
SR 14 vic Cape Horn – "Your Speed Is" Sign	\$19,897	Lane Departure
SR 500 at Robinson Rd – Curves Improvements	\$19,218	Lane Departure

# SOUTHWEST REGION

## All 2021-2023 Low Cost Enhancement Projects

Project	Cost	Category
SR 505 in Toledo – Traffic Calming	\$18,887	Pedestrian/ Bicycle
ITS Expenditures Signal Operations	\$15,802	ITS spending
SR 500 Camas Robinson Rd Vic – Signing and Pavement Markings	\$15,465	Signs
SR 14 in Washougal – Roundabout Enhancements	\$15,445	Intersection
Steve Phase 2 Grant Match	\$14,000	Mobility
US 12 from Randle to Packwood – Deer/Elk Warning Signs	\$13,766	Signs
SR 14 in Murdock – Speed Limit Revision Signing	\$12,666	Signs
SR 432 at Washington Way – Signal Revision	\$12,493	Mobility
SR 142 in Lyle – Community Speed & Pedestrian Study Request - Signing & Striping Plan	\$11,471	Signs
I-5 at State Line – Bridge Data Station	\$11,272	ITS spending
Regionwide Satellite Phones for Traffic Mgmt Center and Emergency Operations Center	\$10,943	Miscellaneous
I-205 at Burton Rd – Radar Data Station	\$10,438	ITS spending
I-5 & SR 411/SR 504 SB Off-ramp – Detection Upgrade	\$10,227	ITS spending
Miovision Scout Explore Collection Unit	\$9,986	Miscellaneous
Armadillo Radar Traffic Counters	\$9,153	Miscellaneous
WSP Aerial Surveillance Markings	\$8,995	Miscellaneous
Miovision Scout Collection Units	\$8,960	Traffic Studies
SR 14 at Wind River Rd – Signing	\$8,959	Lane Departure
Agreements and Environmental Labor	\$7,954	Miscellaneous
SR 4 in Stella – Speed Limit Revision	\$7,084	Signs
Regionwide Video Server Upgrade	\$7,069	ITS spending
I-5 at C-Street – Wrong Way Arrows and Signing Countermeasures	\$6,949	ITS spending
US 12 in Packwood – Pan, Tilt, Zoom Camera	\$6,594	ITS spending
I-5 Exit 82 at Harrison Street Interchange – Camera Improvements	\$6,181	ITS spending
SR 500 from 65th St to 199th St – Vegetation Removal Traffic Control	\$6,123	Lane Departure
SR 500 at NE 15th Ave WB Off-Ramp – Install Wavetronix Detection for Bicycles	\$5,621	Pedestrian/ Bicycle
SR 100 at Discovery Trail – Pedestrian Improvement	\$5,358	Pedestrian/ Bicycle
SR 503 at Rudy Ross Rd – Curve Enhancements	\$4,082	Lane Departure
SR 503 at 179th Street – Pedestrian Enhancement	\$3,890	Pedestrian/ Bicycle
SR 503 in Community of Chelatchie at Northeast 419th Circle – Curve Signing	\$1,037	Lane Departure



# SOUTHWEST REGION

## Introduction

The Southwest Region (SWR) Traffic successfully implemented numerous Low-Cost Enhancement projects across the region, including 70 small projects valued below \$5,000 (Low-Cost Actions) and 23 larger projects exceeding \$5,000. Additionally, the region implemented various infrastructure upgrades.

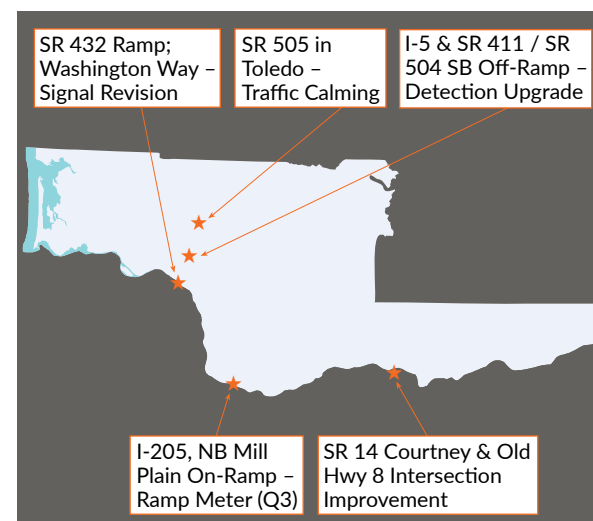
The majority of the smaller-scale projects involved the installation of additional signs to provide advance warnings at intersections and curves. For example, in collaboration with Maintenance, the SWR Transportation Operations Office completed twelve advance warning signs for “School Bus Stop Ahead,” “Left Turning Vehicles Ahead,” and “Advance Intersection.” These signs included road name plaques strategically placed at curves and intersections with challenging sight distances, particularly on state routes 411, 508, 141, 503, 504, 14, 6, 505, US 12, and I-5.

In furthering pedestrian safety efforts, SWR undertook several projects to enhance pedestrian safety in rural communities. Notably, the region established an area of reduced speed near the Lyle Trailhead, accompanied by pedestrian crossing improvements, at the intersection of Spokane Ave and SR 142.

In addition to managing traffic operations, SWR recognized the significance of community well-being, particularly for individuals with mental health challenges. Through the LCE program, SWR Traffic responded to a specific concern about incidents of pedestrians jumping off the I-5 33rd St bridge. In response, the region installed a National Alliance on Mental Illness (NAMI) sign, offering support for pedestrians dealing with acute mental health issues and encouraging them to seek assistance. In anticipation of bolstering safety measures, SWR is actively working on installing a protective fence along this bridge.

Regarding projects exceeding \$5,000, SWR Traffic allocated \$23,000 of LCE funds for conducting comprehensive traffic studies across the region, encompassing the I-5 corridor and intersections undergoing rapid development. Several large-scale projects also centered on enhancing roads with curves concentrated in more remote parts of the area, thus increasing transportation costs. Additionally, SWR acquired long-range cameras to improve visual monitoring in real-time at the I-5 Harrison Ave exit. Furthermore, the region procured radar equipment to facilitate both temporary and permanent traffic speed studies, and also made server upgrades to bolster video-related operations.

SWR Traffic has assembled a list of potential projects to prepare for future LCE funding. These projects encompass diverse enhancements, including designing compact roundabouts, implementing dynamic curve signing, widening shoulders, and redesigning signal timing, among others. Although the funding required for these potential projects ranges from \$30,000 to \$10 million, surpassing available LCE funds, SWR remains committed to making incremental improvements while awaiting larger-scale construction initiatives. Finally, SWR aims to sustain its endeavors in responding to constituents’ concerns, focusing on enhancing safety and improving operational deficiencies.



# SOUTHWEST REGION

## 2021-2023 Project Highlights

### SR 14 COURTNEY & OLD HWY 8 INTERSECTION IMPROVEMENT

\$27,340

4/21/2021 - 9/1/2021

SR 14 MP 69.72 & 70.91

SWR focused resources on two intersections that were experiencing a series of crashes. Specifically, at Courtney Rd, three crashes occurred within a span of 12 months. These incidents involved vehicles waiting to turn left from eastbound SR 14 onto Courtney Rd. In each occurrence, a following vehicle rear-ended the stationary waiting vehicle. Similarly, at Old Hwy 8, a recurring pattern of seven crashes unfolded over a period of five years. These incidents were all attributed to the same issue of left-turning vehicle queues. The resulting crashes included four vehicles swerving across the centerline to avoid rear-end crashes, two vehicles rear-ending left-turning vehicles, and one vehicle veering onto the right shoulder to avoid rear-ending the turning vehicles. Two of these crashes resulted in serious injuries.

The impact of these issues extended to all travelers using SR 14 while passing through Skamania/Klickitat Counties. The effect was pronounced, particularly among Underwood, Bingen, and Lyle residents. Southwest Region promptly responded by implementing advanced warning signs at the identified intersections to address these concerns. These signs included a single “Left Turning

Vehicles Ahead” sign, accompanied by Gated Side Road Symbols and supplementary Crossroad Name Signs. Concurrently, the region took proactive measures to enhance turning safety. The passing zone at Courtney Rd was effectively closed in both directions, bolstering the security of turning maneuvers. Similarly, at Old Hwy 8, strategic relocation of the stop bar closer to the SR 14 intersection improved sight lines for vehicles entering SR 14.

In tandem with these immediate measures, SWR executed a comprehensive scoping process (*SR 14 Courtney & Old Hwy 8 - Left Turn Lane Survey/Design*, \$33,764) aimed at identifying potential future Left Turn Lanes for both intersections, subject to funding. Introducing such lanes would serve as designated spaces for turning vehicles to queue, ensuring an uninterrupted flow for vehicles proceeding straight. This proactive approach seeks to prevent future incidents of the nature described above.

The additional signage serves a twofold purpose: alerting unfamiliar travelers to approaching intersections and apprising them of potential turning scenarios. By extending advance notice, these measures

provide travelers with ample time to adapt to changing traffic conditions. Simultaneously, the planned Left Turn Lanes offer enhanced safety for turning vehicles by removing them from the flow of traffic. The prospective decrease in serious crashes holds significant implications for local commerce, given that SR 14 is a crucial direct route to the Tri-Cities Industry and Southeast Washington Agriculture and includes seven direct interstate crossings. The scoping conducted during this biennium is poised to expedite the implementation of the Left Turn Lanes if funding is available.



*New Signage approaching Courtney Road Intersection.*

# SOUTHWEST REGION

## 2021-2023 Project Highlights

### SR 505 IN TOLEDO - TRAFFIC CALMING

June 14 - 30, 2023

SR 505 MP 6.73

**\$18,887**

The City of Toledo raised concerns about pedestrian safety at an uncontrolled intersection: an intersection without a stop sign or signal. There were reports of vehicles failing to yield to pedestrians at designated crosswalks and worries about speeding trucks and tourist safety throughout the corridor. The City advocated for transforming the intersection to stop-controlled and requested a three-way stop at Ramsey Way and 2nd Street. Additionally, they requested an extension or reduction of the existing 25 mph speed limit.

The community of Toledo, including the city council, actively engaged with WSDOT to collaborate on identifying areas needing enhancements. A resident living near Ash St also highlighted the safety issues students face using that crosswalk during the school year, affecting the Toledo School District.

In response to these concerns, SWR Traffic implemented a range of improvements. These enhancements included the addition of new striping between Front St and 3rd St, the reconfiguration of signage from Front St to Jackson Highway, upgrades to existing crosswalk markings at Ash St, Silver St, 2nd St,

and Front St, as well as the implementation of centerline curbing to facilitate the placement of in-street pedestrian signage at the existing crosswalks.

These improvements centered around enhancing visual cues for drivers, leading to reduced speeds. As drivers approach these intersections, the altered signage and striping create a perception of narrower travel lanes, contributing to speed moderation. Extensive research and crash modification factors have consistently indicated that such traffic calming enhancements can effectively decrease speeds. Moreover, the presence of centerline signing near crosswalks has demonstrated improvements in pedestrians' yielding compliance within those crosswalks. It's noteworthy that WSDOT typically doesn't deploy such measures on state highways with speed limits exceeding 35 mph.

This project builds on previous LCE efforts at the intersection of SR 505 and 2nd St by extending improvements to other marked crossings at Ash St, Sliver St, and Front St. These endeavors significantly enhance pedestrian safety through innovative strategies, even along a rural arterial that is

used heavily by larger trucks. SWR seamlessly integrated contemporary signing and curbing materials, drawing from research findings and collaborating with suppliers. Furthermore, ongoing communication with the city has laid the groundwork for future safety enhancements, such as possibly procuring its own dynamic feedback signs.



*Deer admiring the added white edge line striping, parking delineation, and centerline pedestrian crossing signs.*

# SOUTHWEST REGION

## 2021-2023 Project Highlights

### SIGNAL DETECTION UPGRADE PROJECTS

\$22,720

Projects: I-5 & SR 411/ SR 504 SB Off-Ramp - Detection Upgrade - November 2021- \$10,227  
SR 432 & Washington Way - Signal Revision - July 2022 - \$12,493

Project locations: SR 411 MP 13.44, Huntington Ave N & I-5 Southbound Ramps  
SR 432 MP 4.46, Industrial Way & Washington Way

Southwest Region (SWR) collaborates closely with partner agencies and local jurisdictions. Often, the project planning, design, and construction process flows smoothly, resulting in minimal disruptions to the traveling public and utilities, sometimes even going unnoticed. However, in 2021, two distinct project locations experienced disruptions to WSDOT's existing traffic signals, leading to operational challenges and delays for motorists.

In the first, a local trail project introduced a raised traffic island at the junction of State Route 411 and Huntington Ave N, as well as at the I-5 southbound ramp terminal (MP 13.44). For the second, State Route 432 at Industrial Way and Washington Way (MP 4.46) experienced railroad crossing repairs adjacent to a signalized intersection. During these projects, the signals were unable to detect traffic at the lights with the normal in-ground detection loops.

Unfortunately, the local agency projects did not account for these disruptions and faced challenges in promptly addressing the operational issues that arose. This created

substantial impacts on local freight and regional routes. Southwest Region Traffic responded by identifying and prioritizing funds to rectify the affected signal systems, seeking to reinstate operations at a pivotal regional access point to I-5, crucial for a significant portion of Washington's freight industry. The overarching objective was to minimize delays and reestablish reliability.

WSDOT procured and implemented replacement detection for each affected approach to remedy the malfunctioning signal detection. Integrating aboveground Wavetronix radar sensors effectively restored signal detection capabilities, reinstating a smooth level of service for motorists navigating the intersection.



Wavetronix detection installed for SR 411 eastbound traffic approaching the I-5 southbound ramp terminal.

# SOUTHWEST REGION

## 2021-2023 Project Highlights

### SIGNAL DETECTION UPGRADE PROJECTS (CONTINUED)

Notably, Wavetronix radar detection has become a standard practice in the region to track traffic congestion. This technology offers advantages over in-pavement loops or above-ground video detection, providing flexibility and reliability in traffic signal operation and maintenance. Unlike the previous methods that necessitated traffic control and lane closures to address detection issues, radar detection allows WSDOT technicians to troubleshoot or adjust detection away from the traveled path, addressing motorist and worker safety while maintaining traffic flow. Moreover, radar detection demonstrates reliability in detecting motorcyclists and bicyclists, offering a proven solution that accurately collects data on all road users. Additionally, the radar technology exhibits consistent performance even under various weather conditions.

Swift and effective restoration of signal operations benefitted all road users. The intersection regained full operational capacity by replacing the temporarily disabled in ground detection systems and restoring signal functionality, reducing delays for freight

carriers, commuters, and regional travelers. Introducing the new detection system ensured routine and dependable detection with minimal maintenance impact, ensuring long-term adaptability and reliability.



*Wavetronix detection being installed on SR 432 at Industrial Way & Washington Way.*

# SOUTHWEST REGION

## 2021-2023 Project Highlights

### I-5 AND I-205 – RAMP METERS, MAST ARMS, SIGNALS, AND CAMERAS

Q3: \$586,526

Construction began in October 2021 and ended in January 2022

I-205 MP 28.30 to 28.87

Prior to this project, the Mill Plain Blvd ramp leading to Interstate 205 operated as an uncontrolled braided ramp that fed directly onto northbound I-205. During peak hours, the ramp would allow groups of vehicles to enter the already congested highway, with an average daily traffic (ADT) of 52,000. This uncontrolled braided ramp approach contributed to heightened congestion and gridlock at the merge point. Daily commuters and other drivers traversing I-205 through Vancouver and Clark County, particularly during peak travel times, felt the impact of the platoons of vehicles and resulting congestion.

The region planned a ramp meter installation on the I-205 northbound on-ramp from Mill Plain Blvd to reduce congestion duration, enhance travel time predictability, bolster vehicular throughput, and increase travel speeds on the mainline. The goals were quantifiable through existing detection data on I-205 and performance studies conducted before and after the implementation.

This system encompasses an overhead mast arm, ramp signal, electrical service, signage, cameras, detection equipment, conduits,

striping, fiber optic communications, and related peripherals essential for its operation. The adaptive ramp meter system actively responded to changing conditions on the mainline throughout the day. SWR's Traffic Management System (TMC) operators actively monitor the responsive system and make adjustments when required.

Since the implementation of the Mill Plain ramp meter in 2022, travel times through the corridor have improved by roughly 16%, and the speed has increased by 3 mph during peak times of the day (1:00 pm to 6:30 pm). The lowest average speed increased by 5 mph from 2018 (40 mph) to 2022 (45 mph). This enhancement increased travel time reliability for motorists using this section of I-205 and contributed to overall road safety.

In 2018, the northbound I-205 corridor carried an average of 1,565 vehicles per hour per lane (VPHPL), with an average travel time of 96 seconds and an average travel speed of 48 mph. Following the ramp meter installation in 2022, the corridor accommodated similar volumes as in 2018 at 1,523 VPHPL. However, the associated travel time decreased to 81 seconds (15%),

and the average speed increased to 51 mph. The lowest average speed during the peak hours increased by 5 mph in 2022. The overall increase in average travel speeds led to a minor decrease in the number of vehicles passing through because there were larger gaps between vehicles.



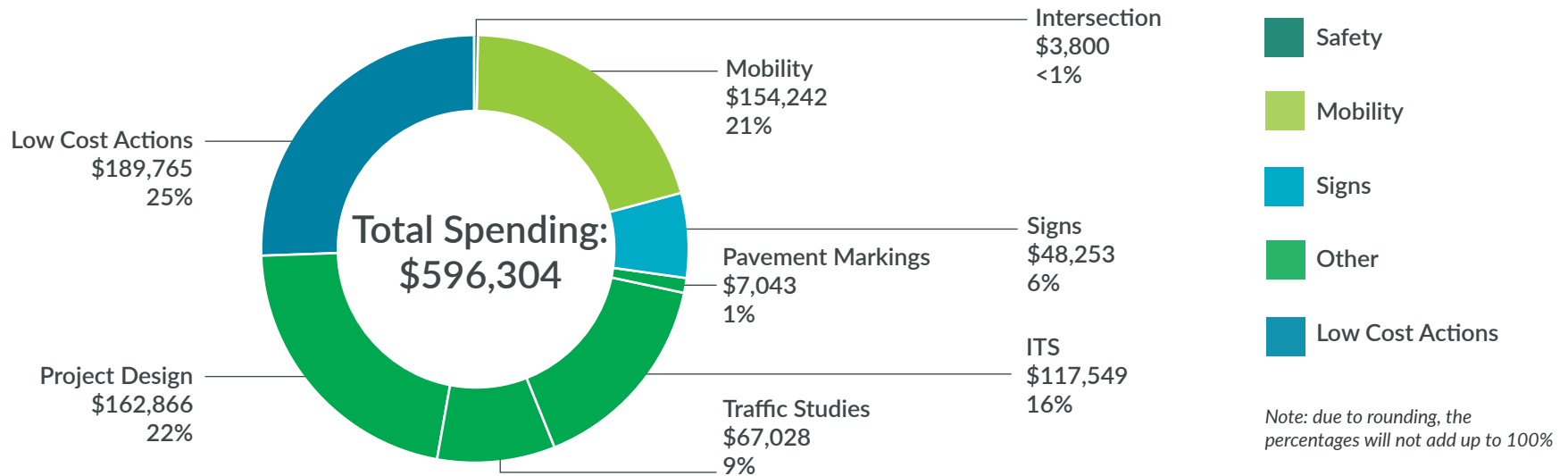
*Before Traffic Control Meter.*



*After Meter Installation.*

# EASTERN REGION

## ER: Low Cost Enhancement Spending by Type of Project – 2021-2023



## All 2021-2023 Low Cost Enhancement Projects

Project	Cost	First Category	Second Category
I-90 at US 2 – Garden Springs Ramp Meter Design	\$154,242	Mobility	
Low Cost Actions – Spokane Area <ul style="list-style-type: none"> <li>Includes – US 2 &amp; SR 20 at Newport – Signing and Striping Update \$6000</li> <li>Includes – US 2 Newport – New Pedestrian Crossing Signs \$3,700</li> <li>Includes – I-90 Sprague Ave Interchange WB On-Ramp – Signing and Delineation \$6761</li> </ul>	Low Cost Actions	Pavement Markings	
Signal Communication System Additions – Regionwide	\$61,320	ITS spending	
Field Assessment 2021-2023 Projects	\$51,118	Signs	Intersection
Miovision Software Renewal	\$44,964	ITS spending	
Spokane Area Wrong Way Study	\$39,240	Traffic Studies	
Low Cost Actions – Colville Area	\$38,842	Low Cost Actions	
Low Cost Actions – Colfax Area	\$30,797	Low Cost Actions	
Low Cost Actions – Davenport Area	\$21,130	Low Cost Actions	
SR 290 – Road Safety Audit	\$20,772	Traffic Studies	
US 395 at Old Hwy 12 Mile Rd – Left Turn Channelization Design	\$8,624	Project Design	
I-90 Walnut Ramp Meter – Closed Circuit Television Cameras	\$7,393	ITS spending	
I-90 Eastbound Freya and Custer On Ramps – Freeway Access Revision Report	\$7,016	Traffic Studies	
Fairchild Air Force Base at Rambo Road – Main Gate Project	\$6,679	Pavement Markings	Signs
Q-Free Controller & Software	\$3,871	ITS spending	

# EASTERN REGION

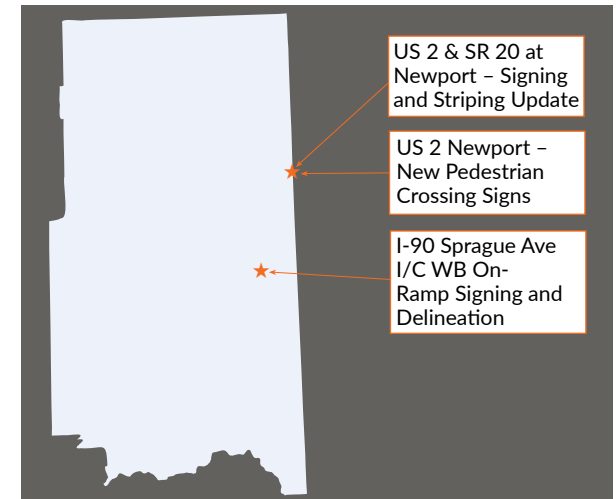
## Introduction

The Eastern Region (ER) uses a data-driven approach to address emergent safety concerns, combining routine safety analyses with timely response to constituent input. This methodology ensures efficient use of Low-Cost Enhancement (LCE) funds, delivering cost-effective solutions for maximum community impact. Without LCE funds, pressing safety issues would have to wait on capital improvement or preservation allocations.

Routine reviews through the Field Assessment program are the most common vehicle for identifying safety deficiencies on Eastern Region highways. Through those efforts, the region addresses many small LCE projects, ranging from curve warning sign updates to speed limit modifications that support the changing needs of the communities. During the reconstruction of the main gate at Fairchild Air Force Base, LCE funds allowed the Eastern Region to support base detour operations. LCE funds also

helped supplement work on the I-90 ramp meters, which have a proven track record of reducing congestion and crashes. Data collection is also critical to decision-making when addressing safety and congestion concerns. LCE dollars help the Eastern Region deploy data collection devices to further their data-driven approach.

While the Eastern Region continues to execute LCE projects, it is anticipated that the purchasing power of LCE funds will continue to diminish due to inflation. Additionally, Maintenance staffing shortages have limited the ability of the region to execute projects in-house. Since the statutory dollar limits for contracting work have not been adjusted for inflation since the early 2000's, contracting work that cannot be completed in-house is also becoming more difficult to execute. The Eastern Region remains hopeful that these issues will be addressed in the future so that the LCE program can continue to deliver projects of value to our communities.





# EASTERN REGION

## 2021-2023 Project Highlights

### US 2 NEWPORT - NEW PEDESTRIAN CROSSING SIGNS

\$3,700

May 11, 2022 to July 21, 2022

US 2 (4th Street) at Washington Ave (2 Couplet)

The US 2 (4th Street) at Washington Ave (2 Couplet) pedestrian crossing in Newport plays a critical role in facilitating safe travel from the business area on Washington Ave to the Pend Oreille County Museum and the City Visitor Center.

Significant concerns arose when the City of Newport received reports of near misses involving pedestrians crossing US 2 (4th St) in the designated crosswalk. This particular crosswalk marked the first pedestrian crossing point encountered by eastbound US 2 motorists in Newport. Notably, pedestrian facilities such as sidewalks were absent on the eastbound side of the highway up until this juncture, leaving drivers unaware of the potential for pedestrians.

Prompted by these concerns, the City formally requested pedestrian crossing signs for the marked crosswalk from WSDOT. In response, the region installed Advance Pedestrian Ahead signs and Pedestrian Crossing Diagonal Arrow signs.

For drivers on US 2, these newly introduced signs provided an early notice of pedestrians and clearly indicated the upcoming pedestrian crossing location. This targeted signage significantly improved the overall crossing condition for pedestrians.



*Before: Approaching pedestrian crossing before signing installed.*



*After: New pedestrian signing installed*

# EASTERN REGION

## 2021-2023 Project Highlights

### US 2 & SR 20 AT NEWPORT – SIGNING AND STRIPING UPDATE

\$6,000

July 15, 2022 to October 17, 2022

Intersection of Walnut St and Washington Ave in Newport

Ongoing operational issues at the US 2 (Couplet) and SR 20 Intersection in Newport (Walnut St and Washington Ave) prompted a focused evaluation by the Eastern Region (ER). The two-lane left turn movement from westbound US 2 to southbound constituted a non-controlled free-flow movement. Concurrently, challenges emerged from vehicles on eastbound SR 20, which failed to wait for suitable gaps in traffic before proceeding to cross US 2.

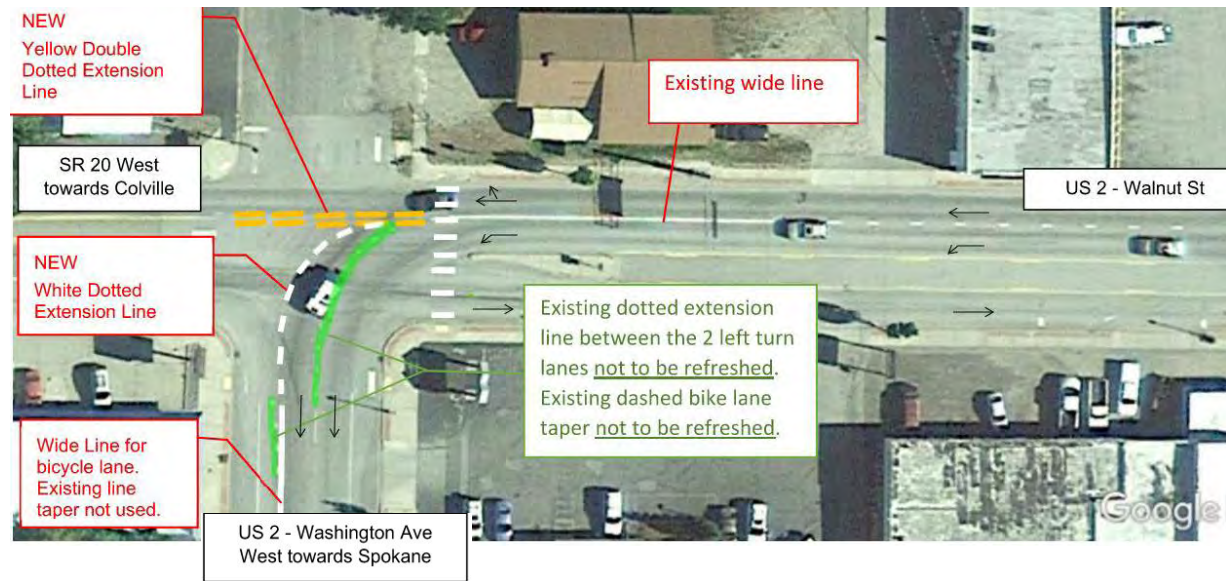
These issues related to the two-lane left turn movement from westbound US 2 to southbound US 2 Couplet. Longer vehicles navigating this turn faced concerns of off-tracking: when a vehicle makes a turn, and its rear wheels do not follow the same path as its front wheel. This led to encroachment into the adjacent lane. The painted dotted extension line demarcating turn lanes was also not optimal. Compounding matters, there were multiple options for traffic in the right lane of westbound US 2 as they approached the intersection: turn left to continue south on US 2 Couplet, proceed straight to head west on SR 20, or turn right to head north on Washington Ave. The left lane was designated exclusively for left turns. Eastbound SR 20

drivers were often surprised by the presence of a two-lane left turn movement from westbound US 2.

In response, ER rerouted all continuing US 2 traffic into the left lane for the turn. The southbound portion of US 2 Couplet beyond the intersection is configured as a two-lane one-way roadway. Consequently, left-turning traffic could conveniently enter either southbound lane post-turn, creating additional turning space for longer vehicles.



Before: Aerial of intersection striping and lane movement designations.



After: Aerial showing new lane movement designations and left-turn guide line striping.

# EASTERN REGION

## 2021-2023 Project Highlights

### US 2 & SR 20 AT NEWPORT - SIGNING AND STRIPING UPDATE (CONTINUED)

The region also implemented signing changes to direct US 2 westbound traffic into the left lane and steer SR 20 traffic into the right lane. To guide turning traffic, the region added a new wide-dotted extension line. Positioned as a right-edge turning traffic guideline, this marking provides clearer guidance to drivers. Plans for a subsequent project involve upgrading this painted line to a grooved plastic line. Additional adjustments were made to signing at the point where SR 20 enters the intersection.

The impact of these changes was twofold. First, the region successfully addressed concerns surrounding the encroachment of longer vehicles in the two-lane left-turn movement from westbound US 2. Secondly, for SR 20 traffic entering the intersection, the change alleviated the surprise element stemming from the existence of two left-turn lanes, thereby improving gap judgment. Beyond rectifying immediate issues, these improvements realigned driver expectations and facilitated smoother navigation through the unique layout of the intersection.



*Before: Striping and Signing*



*After: Striping and Signing*

# EASTERN REGION

## 2021-2023 Project Highlights

### I-90 SPRAGUE AVE I/C WB ON-RAMP SIGNING AND DELINEATION

Signing - March 2, 2023 to May 8, 2023

Delineation - March 2, 2023 to Present

I-90 Sprague Ave Interchange WB On-Ramp (Exit 285)

\$6,761

The I-90 Sprague Ave Interchange WB On-Ramp (Exit 285) emerged as an area of concern due to the high frequency of crashes recorded over the past five years. A total of 35 crashes occurred in the second curve of the on-ramp, resulting in two fatalities, eight injuries, and 25 instances of property damage. Notably, six of these crashes involved motorcycles, including the two fatal incidents. The on-ramp, comprising two lanes, features a pair of curves furnished with reverse curve warning signs and advisory speed signs. The second curve, elevated above the I-90 mainline, presented a distinctive challenge whereby motorcycle riders colliding with the concrete barrier faced ejection over the barrier onto the highway below. Moreover, the delineation on the existing barrier had deteriorated considerably.

Prompted by the most recent motorcycle fatality, the region undertook a comprehensive review of the on-ramp. This included new ball-banking for the curves and a strategic alteration of warning signage. Specifically, the region replaced the existing Reverse Curve Left/40 MPH warning signs with Curve Left/35 MPH and Curve

Right/35 MPH warning signs. In response to motorcycle barrier crashes, staff research uncovered a successful approach employed elsewhere in the US: the delineation of barriers with a continuous wide yellow band. Drawing inspiration from this concept, ER designed a 2-foot tall, wide yellow band on the face of the barrier within the second curve. Additionally, new delineations are set to be placed atop the barrier within the curve. At present, the region is waiting on Maintenance staff to complete these tasks.

These enhancements have two key effects. First, the improved warning signage guides motorists to lower travel speeds through the curves. Second, the refined barrier delineation within the second curve assumes a crucial role in providing enhanced guidance, particularly during hours of darkness. The introduction of a continuous wide yellow band on the barrier's face elevates awareness and guidance throughout the curve. Consequently, drivers navigating the on-ramp curves are poised to benefit from heightened awareness, translating to safer maneuvers and a subsequent reduction in crashes.



Before: Curve 1



Before: Curve 2



After: Curve 1



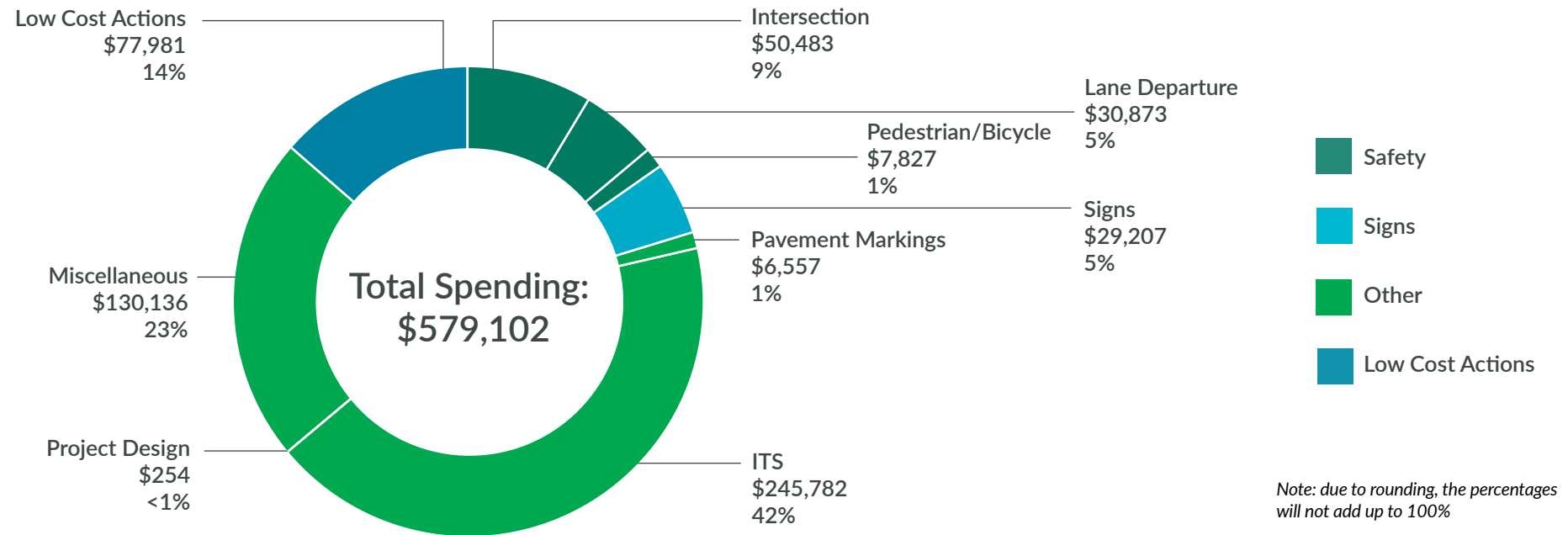
After: Curve 2



After: 2-foot tall, wide yellow band on the face of the barrier within Curve 2

# SOUTH CENTRAL REGION

## SCR: Low Cost Enhancement Spending by Type of Project – 2021-2023



## All 2021-2023 Low Cost Enhancement Projects

Project	Cost	Category
Low Cost Enhancement Design	\$109,320	Miscellaneous
I-90 in Rockdale - ITS Power Engine Construction	\$75,181	ITS spending
I-90 Hyak To Dodge Ridge - Microwave Communication Link	\$70,053	ITS spending
Region Wide Analog Camera Enhancement	\$59,568	ITS spending
Minor Field Modifications - Regionwide	\$43,636	Low Cost Actions
I-82 at Gap Rd - Compact Roundabout Design	\$39,122	Intersection

# SOUTH CENTRAL REGION

## All 2021-2023 Low Cost Enhancement Projects

Project	Cost	Category
Work Zone Radar Feedback Signs	\$36,839	ITS spending
Regionwide Low Cost Actions	\$34,345	Low Cost Actions
SR 12, SR 14, SR 261 – Rumble Strips	\$30,873	Lane Departure
Traffic Management Center Video Upgrade	\$20,816	Miscellaneous
Minor Signing Modifications – Regionwide	\$19,774	Signs
Open Range Alignment – Regionwide	\$9,433	Signs
I-90 North Bend & I-182 Pasco – Cameras	\$9,243	Intersection
SR 906 Active Transportation Delineation - Snoqualmie Pass	\$7,827	Pedestrian/ Bicycle
SR 24 at University – Lane Utilization Improvements	\$6,557	Pavement Markings
Field Equipment Improvements For Digital Video – Regionwide	\$4,141	ITS spending
US 12 NB at 1st St EB – Onramp Modifications	\$2,118	Intersection
SR 125 at Birch St – Right In / Right Out Study	\$254	Project Design

# SOUTH CENTRAL REGION

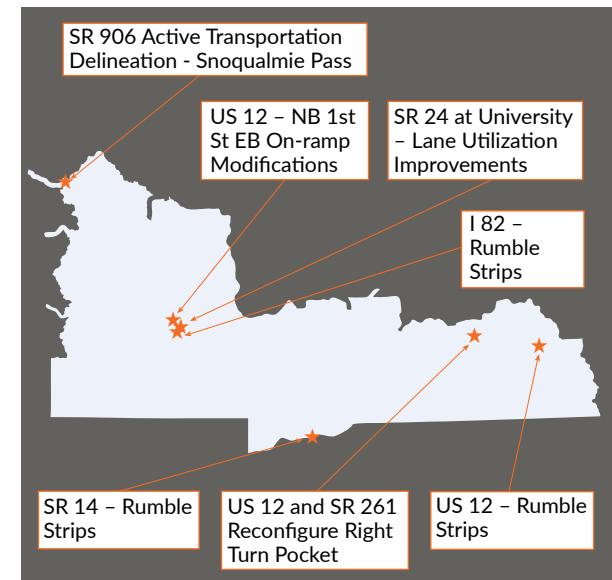
## Introduction

South Central Region (SCR) covers a diverse landscape from the most active recreationally and commercially used mountain pass in the state to the quiet rolling hills of the Palouse. Through the successful implementation of the LCE program, SCR has undertaken numerous projects across the region's transportation modes. The LCE program facilitates swift and effective project execution, including emergent needs to improve safety. Additionally, the region works hard with partners from other public agencies and private contractors to get the highest benefit from LCE funding. This holistic approach and the region's active public engagement efforts have ensured that SCR's transportation improvements align with local community needs and targeted improvements.

During the 2021-2023 biennium, SCR used the LCE program to substantially improve the region's Intelligent Transportation Systems (ITS) by installing and upgrading communication links and field equipment

improvements for digital video throughout the region. These advancements have allowed the Washington State Department of Transportation (WSDOT) to remain updated on real-time conditions and seamlessly communicate with WSDOT Maintenance and the Washington State Patrol, thus keeping the traveling public well-informed about critical conditions and estimated travel times.

In the 2023-25 biennium, SCR will continue to grow its partnerships with other organizations and communities. During this next biennium, one focus will be to evaluate the weekend traffic impacts along the I-90 corridor in the Easton to Cle Elum vicinity. SCR will also evaluate all uncontrolled pedestrian crosswalks within the region and determine whether additional enhancements should be implemented. Further east, SCR will use LCE funding to enhance pedestrian crosswalks in the town of Asotin near Asotin Schools, reducing pedestrian exposure to vehicle traffic.



# SOUTH CENTRAL REGION

## 2021-2023 Project Highlights

### SR 24 AT UNIVERSITY - LANE UTILIZATION IMPROVEMENTS

\$6,557

August 2021 - October 2021

SR 24 1.08-1.25 East Bound

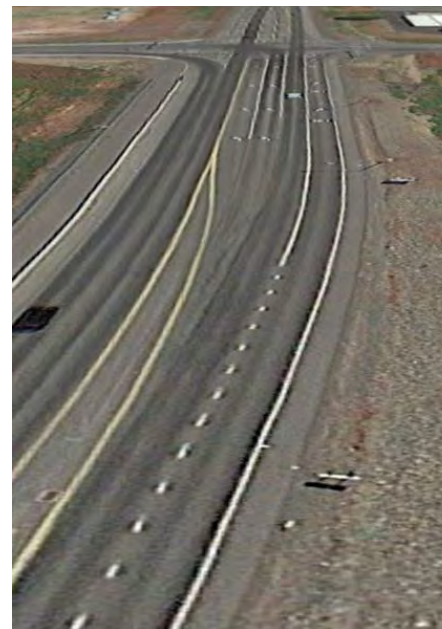
In the eastbound direction of SR 24, two lanes led up to the signalized intersection at University Parkway/Riverside Rd. The right lane functioned as an exclusive right-turn lane, while the left lane served as both a through lane and extended to include two left-turn lanes. An analysis by SCR found that, strikingly, 98% of the traffic volume occupied the left lane, leaving only a 2% in the right lane. This resulted in a prolonged line of vehicles primarily in the left lane.

To improve traffic flow, the region adopted a strategic approach. The right lane, which previously allowed only right turns, was repurposed into a through lane. Correspondingly, the left lane was exclusively designated for left turns. This transformation involved the removal and restriping of 400 feet of lane lines, complemented by the addition of a wide dashed line for the right turn pocket created additional right lane relief. The region also updated three signs relating to lane usage and designation were also updated, giving travelers notice of upcoming lane expectations.

After these alterations, the intersection's traffic flow underwent a substantial improvement. The change resulted in a remarkable 77% reduction in traffic volume in the left lane. Through traffic was now allowed to flow in the right lane or decide to merge into a right turn pocket reducing conflicts. Furthermore, the extension length of the right turn pocket allowed time for commercial trucks to transition from the travel lane and decelerate to execute their turns safely.

The significance of this project extended beyond immediate improvements. The SR 24 corridor has experienced a consistent rise in volume over recent years. In the previous lane configuration, drivers often used the vacant right lane to maneuver past slower-moving

or stationary traffic. This practice, however, has been mitigated by the more balanced traffic distribution achieved through this project. Notably, the need for speed enforcement by the Washington State Patrol at this location has diminished due to the more even distribution of traffic.



*Before: Original configuration with the left lane as the thru lane and dual left turn lanes and right lane ending as a right turn only.*



*After: New lane configuration with the right lane as the thru lane and right turn pocket. The left lane ends with dual left turn lanes.*



# SOUTH CENTRAL REGION

## 2021-2023 Project Highlights

### SR 906 ACTIVE TRANSPORTATION DELINEATION - SNOQUALMIE PASS

\$7,827

February 2022 - October 2022

SR 906 0.00-1.50

This particular segment of SR 906 featured 12-foot lanes in both directions, shoulders ranging from seven to 36 feet wide, and two interchanges with I-90. The area boasts adjoining ski slopes during winter and downhill mountain biking activities in the summer. Several small businesses line the roadway, including sandwich/coffee shops, restaurants, a hotel, multi-use spaces, and a WSDOT rest stop.

The expansive shoulders accommodated parking for cars, buses, and commercial vehicles. These shoulders were also used by various transportation modes, creating a complex web of conflicts affecting all roadway users navigating this stretch of SR 906.

The region considered a range of options to establish delineations for motorized vehicles, parking zones, and pathways. Eventually, they implemented paint lines demarcating 11-foot

lanes, parallel parking areas, buffer spaces, and a shared-use path from milepost 0.00 to 0.50. For the remaining corridor (MP .50-1.50), they painted 11-foot lanes and 8-foot bike lanes, including an interchange area.

This configuration distinctly enhanced the roadway experience for pedestrians, bicyclists, and vehicles. Pedestrians and bicyclists now have dedicated pathways, reducing the likelihood of incidents involving motorized vehicles. Vehicles, on the other hand, are afforded clear lanes for travel and designated parking spaces.

As the SR 906 corridor continues its growth, the implementation of clear and well-defined roadway features becomes increasingly crucial. This initiative played a pivotal role in improving user navigation through the area for multiple roadway users by reducing the potential for conflicts with vehicles.

# SOUTH CENTRAL REGION

## 2021-2023 Project Highlights

### US 12 NB AT 1ST ST EB - ONRAMP MODIFICATIONS

\$2,118

December 2021 - May 2022  
US 12 202.50

This project aimed to enhance safety by introducing additional warning measures within an advised 20 MPH curve for the on-ramp from US 12 North 1st Street to I-82 Eastbound. This on-ramp had a higher-than-usual frequency of crashes occurring within the curve. This challenge was compounded by the presence of a bridge abutment, shielded by a jersey barrier, on the outer edge of the curve.

SCR expanded the dimensions of the advisory speed sign, increasing its visibility and ensuring that drivers received clear information about the recommended speed for negotiating the curve. Additionally, the region strategically positioned extra guideposts along the outer perimeter of the curve. This measure aimed to provide improved visual guidance, aiding drivers as they navigated the on-ramp.

Furthermore, a large arrow post received a layer of yellow sheathing, enhancing its visibility and reinforcing directional cues for motorists. Complementing these steps, the region installed an additional section of concrete to fortify protective measures, particularly in proximity to the curve.

SCR placed a lateral clearance marker at the barrier's termination point to create a comprehensive visual reference. This marker served as a clear demarcation for drivers, facilitating better perception and informed decision-making. As an added enhancement, supplementary yellow Linear Delineation System (LDS) markers were integrated into the barrier, further improving its visibility.

These measures were primarily intended to reduce the incidence of crashes on the on-ramp. This comprehensive approach not only addresses actual crashes but also mitigates near misses, which may often go unnoticed in traditional data sources.



Before: Existing signage and warning devices.



After: Upgraded signage and warning devices.

# SOUTH CENTRAL REGION

## 2021-2023 Project Highlights

### US12, SR 14, SR 261 - RUMBLE STRIPS

April 2022 - May 2022

#### US 12 and SR 261 Reconfigure Right Turn Pocket

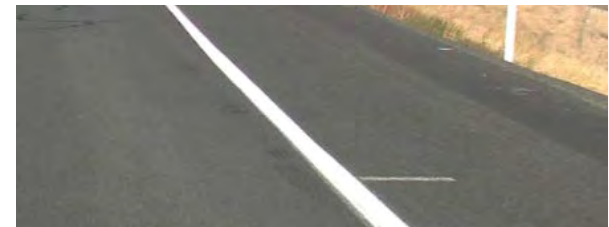
\$30,873

Westbound US 12 traffic approaching SR 261 had a history of taking the left turn wide and following the right turn lane. These instances resulted in guardrail crashes on the opposite side of the intersection. Crash analysis showed these crashes occurred when there was poor lighting or fog and either rain, frost, or snow on the roadway. Vehicles that followed the curve signs and guideposts only because they could not see roadway markings were driving into the right turn lane, following signs until it was too late to maneuver back into the through lane.

South Central Region (SCR) shortened the right turn pocket to address this issue, establishing a right turn prior to the right turn pocket. The

region also added rumble strips at the start of the turn and to the right turn pocket striping. The rumble strips give auditory and physical reinforcement of the lane edges to drivers during inclement weather.

When constructing this project, South Central Region combined the efforts of several other projects that needed the specialty work of rumble strip installation and striping removal. This action led to cost savings and alleviated the expenses associated with sending a contractor to these remote locations for relatively minor projects. The following is a description of the other projects that South Central Region additionally completed.



Before: Original paint line before new paint and rumble strips.



After: New rumble strips and proposed paint line.

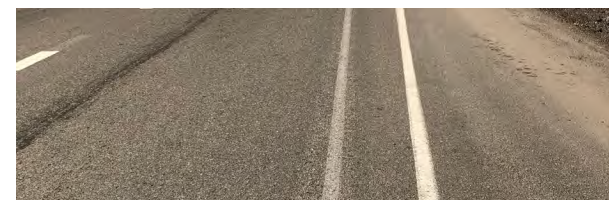
### I 82 - MP 37, SR 14 - MP 180, AND US 12 - MP 413

Persistent paint line remnants remained at these locations, resulting from the application of alternative configurations. Furthermore, South Central Region (SCR) had to install rumble strips at the locations where the region had previously removed them on SR 14 and US 12 to support the travel lane modifications.

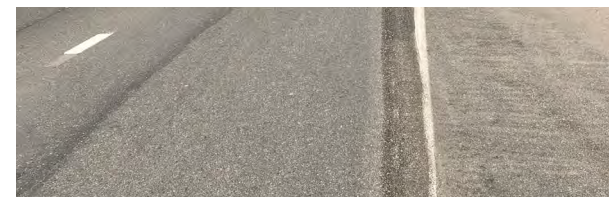
To address the needs, SCR engaged a contractor to remove the old paint lines using

hydro-blasting and then to install rumble strips. WSDOT Maintenance was pivotal in providing traffic control necessary for restriping efforts.

The anticipated outcome of these actions is enhanced traffic safety for the traveling public, reducing the likelihood of vehicles veering off roadways or crossing centerlines.



Before: Paint line from previous contract.



After: Removed paint line.

# APPENDIX A Q3 LARGER CAPITAL PROJECTS

REGION	TITLE	COST
NWR	I-5 – HOV meters at NB NE 50th St, NB at Michigan St, and NB at Swift Ave.	\$40,883
	SR 99 – Aurora Bridge ITS	\$31,661
	Regionwide Loop Mapping	\$25,636
	SR 527 and SR 96 – Adaptive Signal Project	\$23,290
	Rainier Ave to EB I-90 – HOV meter	\$18,692
	I-90/Highpoint to SR 18 – Fiber Extension design	\$1,323
OR	SR 410 in Sumner – ITS and congestion management	\$900,000
	56th Street to Northbound I-5 Ramp Meters	\$389,124
	SR 512 EB at Steele Street – Upgrade ITS Power Service Cabinet	\$7,940
	SR 512/I-5 to SR 7 – ITS and Congestion Management	\$7,483
NCR	US 2 in Leavenworth – ITS Conduit for Fiber Optic Cable	\$250,000
	SR 28 at Rock Island – Variable Message Sign	\$197,488
	SR 28 vic Quincy – Variable Message Sign	\$195,766
	SR 285 vic Wenatchee – ITS Conduit for Future Fiber	\$142,108
SWR	I-5 and I-205 – Ramp Meters, Mast Arms, Signals, and Cameras	\$586,526
	I-205 SB Mill Plain On-Ramp – Ramp Meters, Mast Arms, Signals, and Cameras	\$434,135
	Arterial Corridors – Enhance ATMS capabilities at intersections	\$121,373
ER	I-90 – Freeway/Arterial Integrated Corridor Management 2019-2021	\$785,931
	ER TMC Relocation – Design	\$70,671
	I-90 – Freeway/Arterial Integrated Corridor Management 2021-2023	\$37,077
SCR	I-90/SR 18 Interchange Vicinity Eastbound - Variable Message System	\$493,034
	I-182/Argent Road Vicinity Eastbound - Variable Message System	\$402,551
HQ	Truck Parking Grant	\$139,594

**Title VI Notice to Public:** It is the Washington State Department of Transportation's (WSDOT) policy to assure that no person shall, on the grounds of race, color, national origin, as provided by Title VI of the Civil Rights Act of 1964, be excluded from participation in, be denied the benefits of, or be otherwise discriminated against under any of its programs and activities. Any person who believes his/her Title VI protection has been violated, may file a complaint with WSDOT's Office of Equity and Civil Rights (OECR). For additional information regarding Title VI complaint procedures and/or information regarding our non-discrimination obligations, please contact OECR's Title VI Coordinator at (360) 705-7090.

**Americans with Disabilities Act (ADA) Information:** This material can be made available in an alternate format by emailing the Office of Equity and Civil Rights at [wslotada@wsdot.wa.gov](mailto:wslotada@wsdot.wa.gov) or by calling toll free, 855-362-4ADA(4232). Persons who are deaf or hard of hearing may make a request by calling the Washington State Relay at 711.

**FOR MORE INFORMATION, CONTACT:**

**Dina Swires**

TRAFFIC PROGRAM DEVELOPMENT AND PERFORMANCE MANAGER, TRANSPORTATION OPERATIONS

206-276-5763

[Dina.Swires@wsdot.wa.gov](mailto:Dina.Swires@wsdot.wa.gov)

