Oregon
Kate Brown, Governor

Oregon Transportation Commission
Office of the Director, MS 11
355 Capitol St NE
Salem, OR 97301-3871

DATE: November 3, 2022

TO: Oregon Transportation Commission

FROM: Kristopher W. Strickler
Director

SUBJECT: **Agenda Item D2** – OR 217 Auxiliary Lanes Construction Update

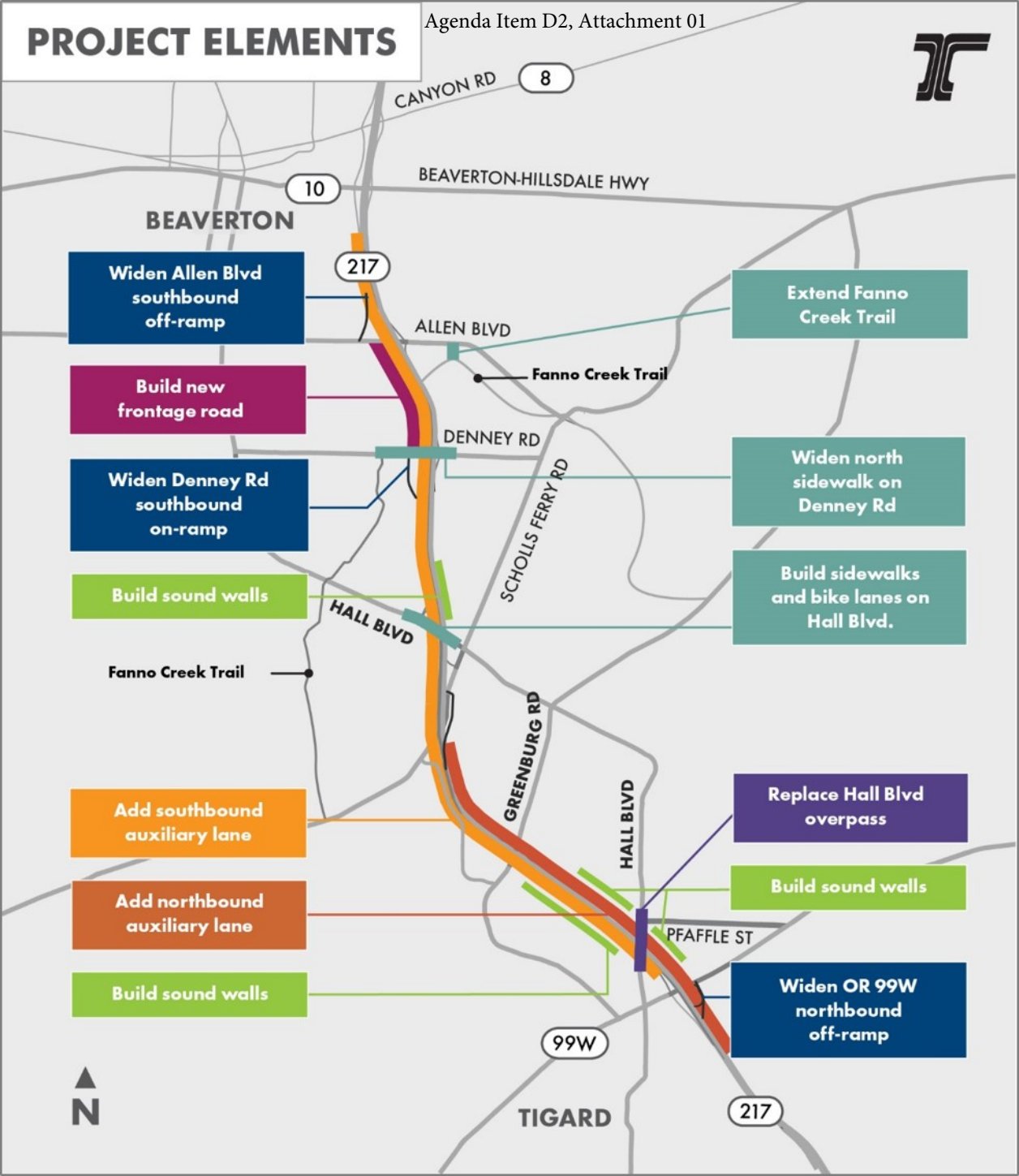
Requested Action:
Receive an update on the Oregon Highway 217 (OR 217) Auxiliary Lanes Project.

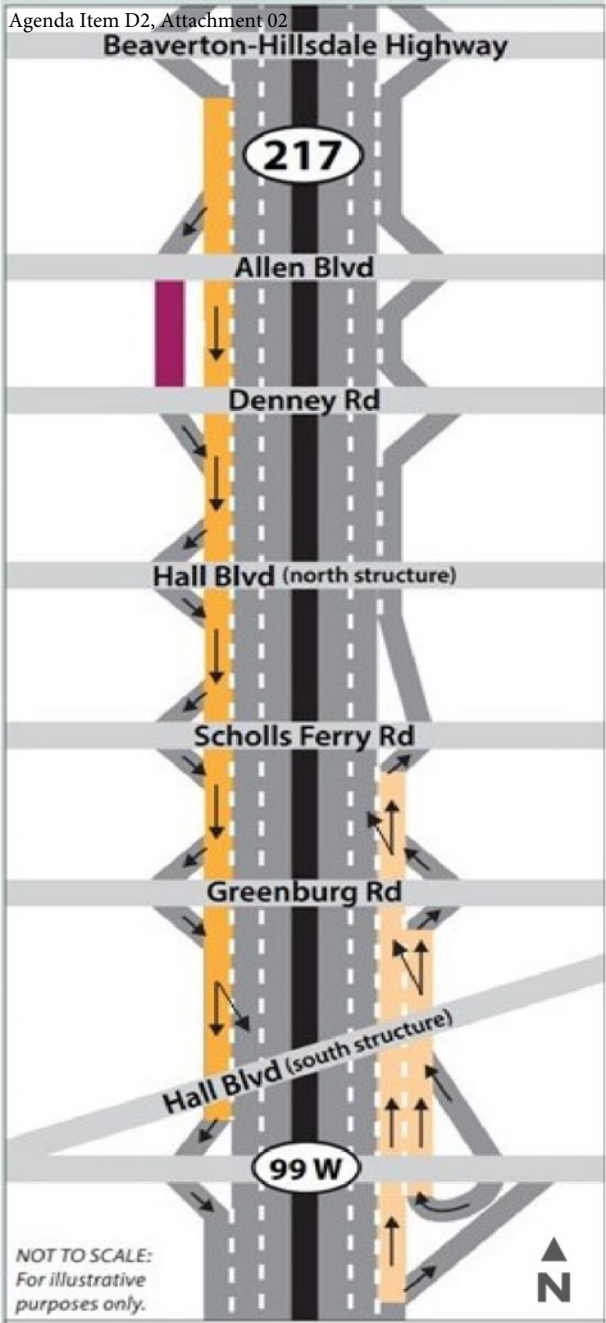
Background:
The OR 217 Project (Key #18841, OR217: OR10 – OR99W) congestion relief project is being delivered by Region 1 as part of ODOT's Urban Mobility Strategy. The project is primarily funded by the "Keep Oregon Moving" (HB 2017) investment program which accounts for $98M of the $158M total project budget. Construction began in January of 2022 and will continue through 2025.

OR 217 is currently identified as one of the most congested highways in the State with over six hours of congestion in the Northbound direction and nearly ten hours of congestion in the Southbound direction per day. The very closely spaced interchanges are the main contributing factor to congestion, high crash rates for the 120,000 daily trips it serves. The OR 217 Auxiliary Lanes Project will improve the flow of traffic and decrease conflicts and crashes by adding auxiliary lanes in both directions. In addition, the project is improving the surrounding bike/ped network, widening ramps and installing sound walls.

Extensive public outreach was used early in project development to help inform the project design through canvassing, neighborhood & business association meetings, frequent web updates, emails, mailings, open houses, webinars and community events. That extensive community engagement will continue throughout the project to keep residents and highway users informed of the several significant closures that will occur throughout the project.

Attachments:
- Attachment 1 – Project Elements Map
- Attachment 2 – Auxiliary Lanes Graphic
- Attachment 3 – Excerpt from 2020 Traffic Performance Report for OR 217 Corridor


PROJECT ELEMENTS
CANYON RD
8
10
BEAVERTON-HILLSDALE HWY
BEAVERTON
217
Widen Allen Blvd southbound off-ramp
ALLEN BLVD
Extend Fanno Creek Trail
Fanno Creek Trail
Build new frontage road
DENNEY RD
Widen Denney Rd southbound on-ramp
SCHOLLS FERRY RD
Widen north sidewalk on Denney Rd
Build sound walls
HALL BLVD
Build sidewalks and bike lanes on Hall Blvd.
Fanno Creek Trail
GREENBURG RD
HALL BLVD
Add southbound auxiliary lane
Replace Hall Blvd overpass
Add northbound auxiliary lane
Build sound walls
PFAFFLE ST
Build sound walls
Widen OR 99W northbound off-ramp
99W
N
TIGARD
217


Beaverton-Hillsdale Highway
217
Allen Blvd
Denney Rd
Hall Blvd (north structure)
Scholls Ferry Rd
Greenburg Rd
Hall Blvd (south structure)
99 W
NOT TO SCALE:
For illustrative
purposes only.
N
LEGEND
Southbound auxiliary lane
Northbound auxiliary lane
New frontage road

Oregon Department of Transportation

Portland Region

2020
Traffic Performance Report

Oregon Department of Transportation: Region 1
December 2021

Oregon Department of Transportation

Rian Windsheimer, Region 1 Manager

Chris Ford, Policy and Development Manager

Kristen Stallman, Major Projects Manager

Sandra Hikari, Senior Transportation Planner

Scott Turnoy, Principal Transportation Planner

Kerrie Franey, Associate Transportation Planner

Chi Mai, Transportation System Analysis Engineer

Katherine Bell, Senior Transportation Engineer

Natalie Liljenwall, Air Quality Program Coordinator

Jacob Hagen, Major Projects Intern

Consultant Team

John Bosket, Project Manager, DKS

Mike Mauch, DKS

Amanda Deering, DKS

Maggie Lin, DKS

Oregon Department of Transportation

Portland Region 2020 Traffic Performance Report

Oregon Department of Transportation
Region 1

TABLE OF CONTENTS

Overview

Purpose of this report

This 2020 Traffic Performance Report provides information on the health of the region's freeway system. It continues a baseline for long-term monitoring that will enable Oregon Department of Transportation (ODOT) to better understand the urban traffic mobility conditions of the freeway system.

Changes in the federal requirements for transportation planning, shrinking transportation revenues and new big data sources create a need to develop benchmarks for on-going performance monitoring.

ODOT manages the freeway system for safe, efficient and reliable operations. ODOT focuses on improvements at key locations to address congestion and safety hot spots. Improvements are guided by Oregon Highway Plan Policy 1G.1, which prioritizes the preservation and improvement of existing system functionality over additional freeway capacity or new facilities.

Advancements in traffic data collection methods have enabled ODOT to systematically collect, store, evaluate and monitor traffic conditions on all of its freeway corridors in the metro area. By monitoring key transportation performance indicators, ODOT can identify problems and effectively manage the system to better enable the movement of people, goods and services.

Measuring Performance

Key traffic performance areas that relate to urban mobility:

Congestion and bottlenecks

- Hours of congestion
- Vehicle hours of delay
- Travel time
- Speeds
- Recurring bottlenecks

Reliability

- AM, Mid-day, PM

Safety

- Frequency of crashes and non-crash incidents
- Crashes and non-crash incidents by time of day and type

Performance measures indicate the variety of **CHALLENGES** facing the region's freeway system:

ALL CORRIDORS EXPERIENCE SEVERE CONGESTION THROUGHOUT THE DAY

LACK OF TRAVEL TIME RELIABILITY on **ALL CORRIDORS**

Improved data

The 2020 report focuses on data to illustrate the performance of the freeeway system in 2019.

A few changes that were made from the 2018 Traffic Performance Report are:

- New data sources were used for the empirical freeway travel-time and speeds. The 2018 report utilized commercial HERE data while the 2020 report uses commercial INRIX XD data. More details on changes in the 2020 Traffic Performance Report can be found in the glossary.
- New refined data sources were used to more accurately capture freeway corridors within Region 1, slightly changing corridor lengths compared to the 2018 report.
- The 2020 report includes a new analysis of freeway Greenhouse Gas Emissions and potential reductions if operations improved.

TIME PERIODS REPORTED

TRAVEL TIME, SPEED AND RELIABILITY indicators are reported for the AM peak, Mid-day, and PM peak periods.

These time periods include enough time to capture the current peak periods and account for future growth into shoulder peak periods to allow for tracking of congestion.

Corridor-level management

ODOT implements cost-effective operational improvements that reduce crashes and delay, increase reliability and relieve congestion at recurring bottlenecks on the freeway system.

- ODOT Corridor Bottleneck Operations Study (CBOS) projects are cost-effective improvements, such as auxiliary lanes, to address safety and operations problems at specific, localized bottlenecks.
- ODOT's RealTime strategy is a toolbox of active traffic management technologies, designed to improve safety and reliability by providing variable advisory speed, queue warning, ramp metering and traveler information to manage congestion.
- The Transportation Management and Operations Center (TMOC) Program provides a single, regional point of contact for around-the-clock monitoring of transportation system operations and coordination of transportation related communications and services. TMOC specially trained personnel monitor freeway corridors and work in partnership with law enforcement, fire rescue and medical teams, and tow operators to provide safe and efficient traffic flow around an incident.

There are six freeway corridors in Region 1:

OR 217 Corridor Dashboard

Introduction

OR 217 serves as a connection between US 26 (Sunset Highway) and I-5. OR 217 is approximately 7.0 miles in length. It connects the cities of Tualatin, Tigard, Beaverton and Hillsboro.

OR 217 has nine closely spaced interchanges, which contribute to conflicts between entering and exiting traffic, particularly during peak commute times. To address these conflicts, ODOT has planned a series of auxiliary lanes for the corridor to improve safety and operations in merging and weaving areas.

Recent/Current Improvements

Auxiliary lanes

The following project on I-5 helped alleviate congestion and queuing that would spill onto OR 217:

- I-5 SB: Lower Boones Ferry Road to I-205 Exit (completed in 2018, complementing the Carman Drive to Lower Boones Ferry Road auxiliary lane completed in 2012).

Road Treatments

- US 26 WB: High Friction Surface Treatment to address road departure crashes on the OR 217 NB to US 26 WB Connection (2021)

Upcoming Improvements

Auxiliary lanes

- OR 217 SB: auxiliary lane extension from Beaverton-Hillsdale Highway to OR 99W with a collector-distributor road from Allen Boulevard to Denney Road (expected 2022)
- OR 217 NB: auxiliary lane extension from OR 99W to Scholls-Ferry Road (expected 2022)

FREIGHT MOBILITY

Because of the hazardous material restriction on US 26 at the Vista Ridge Tunnel, OR 217 is the west side connector for US 26 to I-5 SB. Trucks account for approximately 4% of the daily traffic volume on OR 217 with an average of about 4,200 to 4,300 trucks per day. The top value commodities transported on OR 217 are prepared foodstuffs, fats and oils, motorized and other vehicles, and electronic and other electrical equipment and components. The top tonnage commodities transported include gravel and crushed stone, wood products, and nonmetallic mineral products.

OR 217 corridor highlights

Traffic

OR 217 is a congested corridor with persistent congestion in the AM and PM peak periods. On an average weekday in 2019, the daily vehicle miles traveled in the northbound direction was 163,000 and in the southbound direction was 174,000.

In the northbound direction, the weekday daily average for hours of congestion was 6.0 hours and the daily weekday vehicle hours of delay was 1,400. In the westbound direction, the weekday daily average for hours of congestion was 9.75 hours and the daily weekday vehicle hours of delay was 1,700.

Congestion and bottlenecks

Free-flow speed is calculated to be 60 mph with a free-flow travel time of seven minutes for both NB and SB.

OR 217 has the lowest PM peak speed when looking at both directions of travel. In the NB and SB directions, the average PM peak travel time is 13 minutes in 2019, almost double free-flow travel time.

Only two bottlenecks occur in the NB direction of OR 217 and both overlap for more than three miles. An AM peak bottleneck forms at Allen and extends to the I-5 merge.

A slightly shorter in queue length bottleneck occurs in the PM peak and forms at Denney Road and also ends at the I-5 merge.

The SB direction has twice as many bottlenecks with most occurring only during peak periods. For example, an AM peak bottleneck from OR 99W to Walker creates congestion on over half the corridor while two PM peak bottlenecks exist near the US 26 interchange and I-5 interchange. A bottleneck between Hall Boulevard and Walker Road persists for over 7 hours in the mid-day and PM peaks.

Reliability

Reliability on OR 217 is an issue in both the AM and PM peak periods. When calculating the reliable travel time (the average travel time combined with the buffer time needed to ensure on-time arrival), the AM peak period reliable travel time is more than double free-flow travel time and the PM peak period reliable travel time is nearly triple free-flow travel time. Reliable travel time is consistently better in the NB direction than in the SB direction, although motorists traveling along any portion of the corridor must allot extra time to esnure they reach their destination on-time.

Calculating Reliable Travel Time on OR 217

Distance: 7.0 miles
Free-flow Travel Time: 7.1 minutes

Worst Case: OR 217 SB during 2019 PM Peak

	Average Travel Time	13 minutes
+	Buffer Travel Time	7 minutes
=	Reliable Travel Time	20 minutes

Safety

More crashes occur on OR 217 SB than NB. Crashes by time of day are concentrated during AM and PM peak periods, when travel is the most unreliable. The majority of the total crashes on OR 217 are rear-end (81 percent) and side-swipe/overtaking (13 percent), which are typical of congested conditions. The most frequent non-crash incidents on OR 217 are disabled vehicles and hazardous debris.

OR 217 Corridor Dashboard

Oregon Department of Transportation

Daily Vehicle Miles Traveled (DVMT)

OR 217 has a low DVMT compared to other corridors partially due to the short length of the corridor. DVMT is similar in both the NB and SB directions.

OR 217 NB	372,000
OR 217 SB	359,000

Daily Vehicle Hours Delay (DVHD)

OR 217 has low DVHD due to the short length of the corridor. As with the Hours of Congestion, DVHD is worse in the SB direction than in the NB direction.

OR 217 NB	1,350
OR 217 SB	1,690

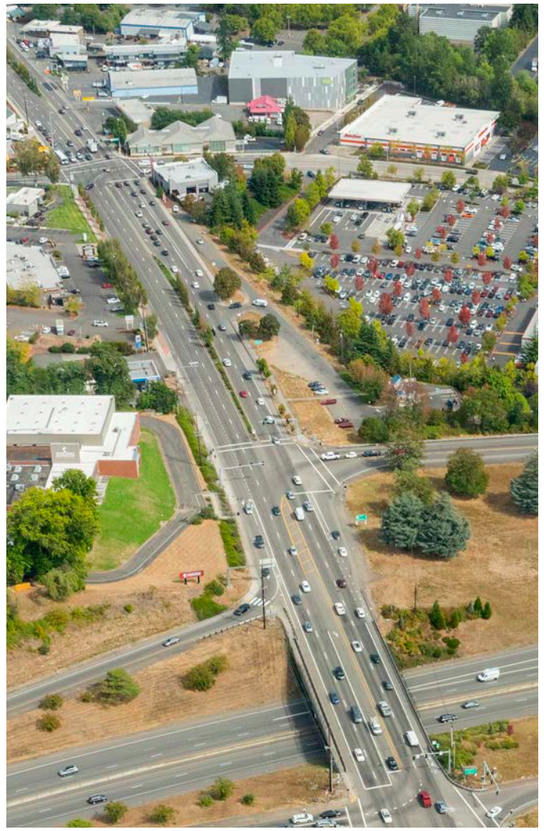
Hours of Congestion (HOC)

OR 217 has high HOC, particularly in the SB direction, due to multiple lengthy bottlenecks.

OR 217 NB	6.00
OR 217 SB	9.75

Peak Period Speed

OR 217 has one of the slowest average AM Peak speeds in the region. On average, the SB direction is slower than the NB direction, apart from very similar PM Peak speeds. In the PM Peak, speeds are nearly half of free-flow speed, indicating severe congestion in both directions.



Speed *(in mph)*					
	Year	Free-flow	AM peak	Mid-day	PM peak
OR 217 NB	2019	59.5	41.2	53.4	31.3
OR 217 SB	2019		37.4	44.8	31.9

Reliability

Peak Period Travel Times and Buffer Time

AM
AM travel time and buffer time indicate a high level of congestion in both directions of OR 217, with a reliable travel time more than double free-flow travel time. The SB direction has a slightly longer travel time and buffer time than in the NB direction.

Mid-day
Mid-day travel time improved from the AM Peak in both directions. A long buffer time in the SB direction and slightly elevated average travel time result in a reliable travel time nearly double free-flow travel time.

PM
PM travel time and buffer time indicate congestion in both directions of the corridor. An average travel time nearly double free-flow travel time and buffer times similar to free-flow travel time result in reliable travel time in both directions approaching triple free-flow travel time.

Travel time *(in minutes)*											
	Year	Free-flow	AM peak			Mid-day			PM peak		
			Average	Buffer [A]	Total [B]	Average	Buffer [A]	Total [B]	Average	Buffer [A]	Total [B]
OR 217 NB	2019	7.1	10.2	4.9	15.1	7.9	1.5	9.4	13.4	6.1	19.5
OR 217 SB	2019		11.2	6.0	17.3	9.4	4.6	13.9	13.2	7.1	20.2

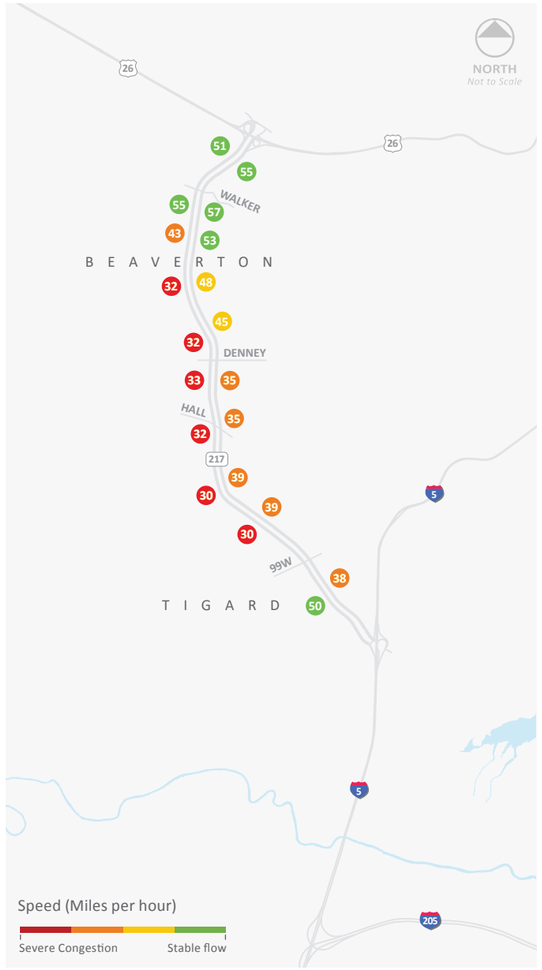
A. Buffer time is the extra time (or time cushion) that travelers should add to their average travel time to ensure on-time arrival.

B. Total or reliable travel time is the addition of average travel time with buffer travel time. This is the time travelers should allot for on-time arrival at their destination in 19 out of 20 weekdays (95 percent of the time).

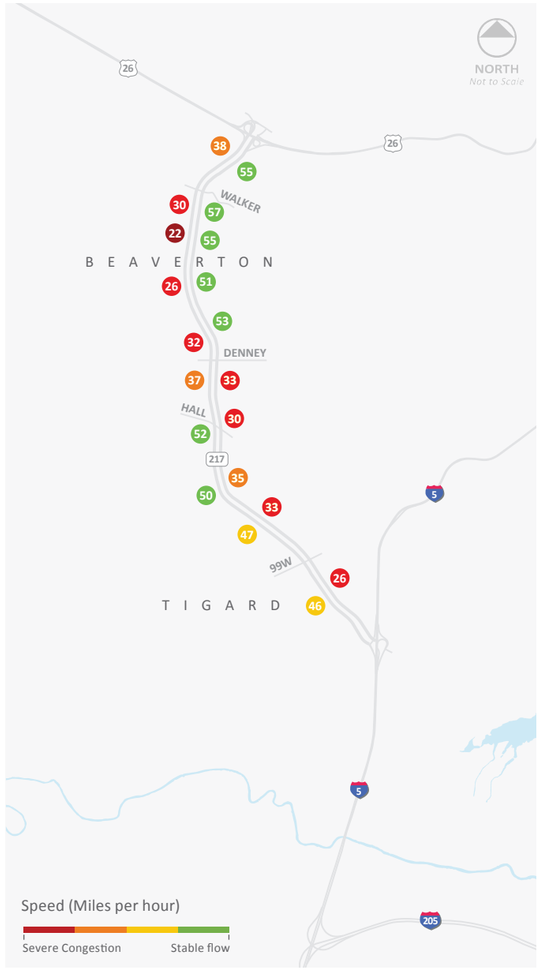
OR 217 Corridor Dashboard

2019 average speed (mph)

AM weekday
7:00 a.m. to 9:00 a.m.
Source: INRIX data



PM weekday
4:00 p.m. to 6:00 p.m.
Source: INRIX data



AM WEEKDAY

SB direction slows from OR 99W to Beaverton-Hillsdale Highway.

NB direction slows from Denney Road to I-5.

PM WEEKDAY

SB direction slows in two general areas: Hall Boulevard to US 26 and I-5 to 72nd Avenue.

NB direction slows from Denney Road to I-5.

OR 217 bottlenecks

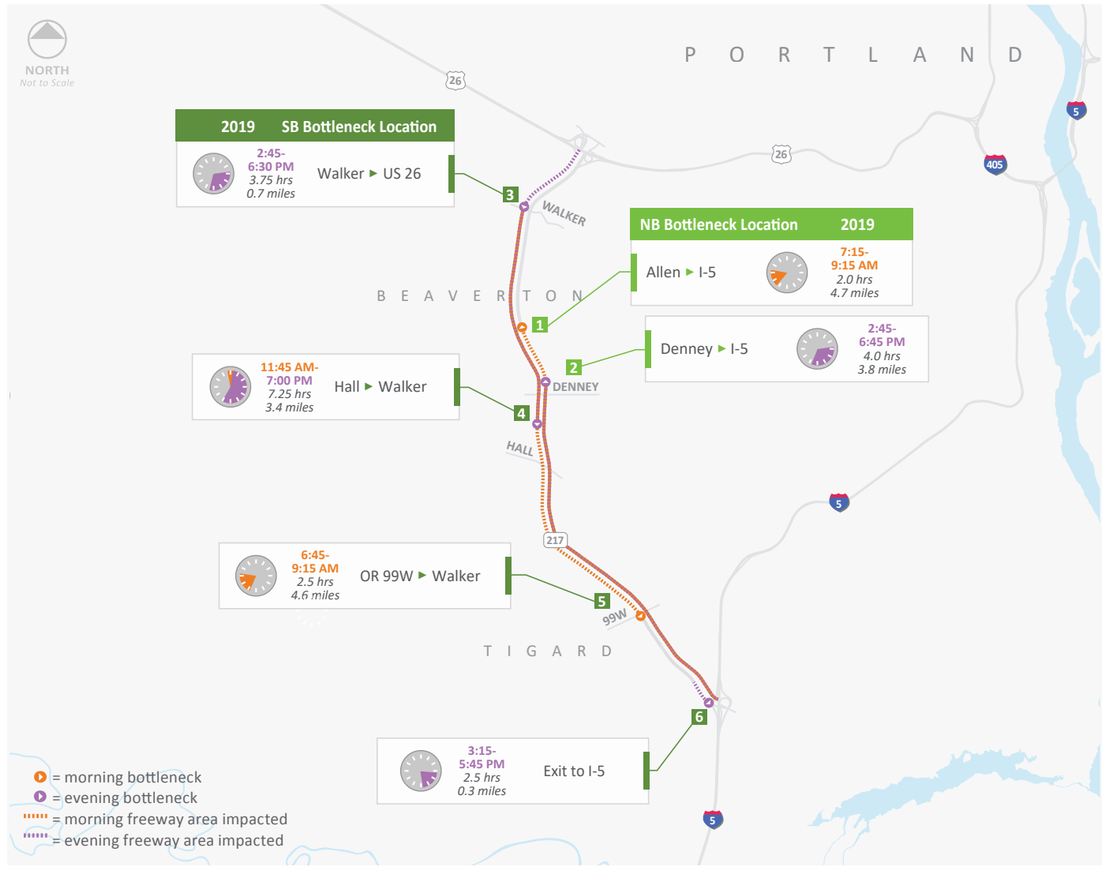
OR 217 connects US 26 and I-5 as well as serves the cities of Beaverton and Tigard. OR 217 is congested in most locations at some point during the day, with many bottlenecks feeding into one another.

The NB corridor between Denney Road and I-5 is backed up in both the AM and PM peak as motorists travel to and through Beaverton. The bottleneck extends to Allen during the AM.

In the SB direction, the worst bottleneck is between Walker Road and Hall Boulevard due to weaving and high traffic near the Beaverton-Hillsdale Highway on- and off-ramp. Additional PM bottlenecks occur after the US 26 merge and before the I-5 merge. An AM bottleneck occurs between OR 99W and Walker.

How to Read a Bottleneck Map
Bottlenecks are labeled first by their "head," or location where the congestion begins to clear, and then by their "tail," or the distance congestion extends behind the "head".
Bottlenecks may have different queue lengths for peak periods and often overlap with each other during peak periods.

Duration of bottlenecks
2019
Source: INRIX data

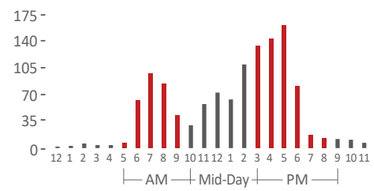


OR 217 Corridor Dashboard

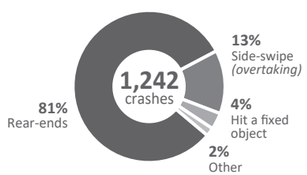
OR 217 safety

OR 217 had approximately 1,200 crashes in the five-year study period. The vast majority of crashes were rear-end and side-swipe (overtaking) crashes, which mainly occur in the PM peak period. These types of crashes are typically the result of congestion. SPIS sites were identified based on crash frequency, crash rate and crash severity. There were three top 10 percent 2018 SPIS sites along the corridor.

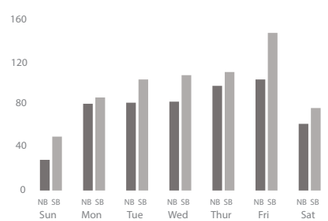
Total crashes by time of day
2015-2019
Source: ODOT



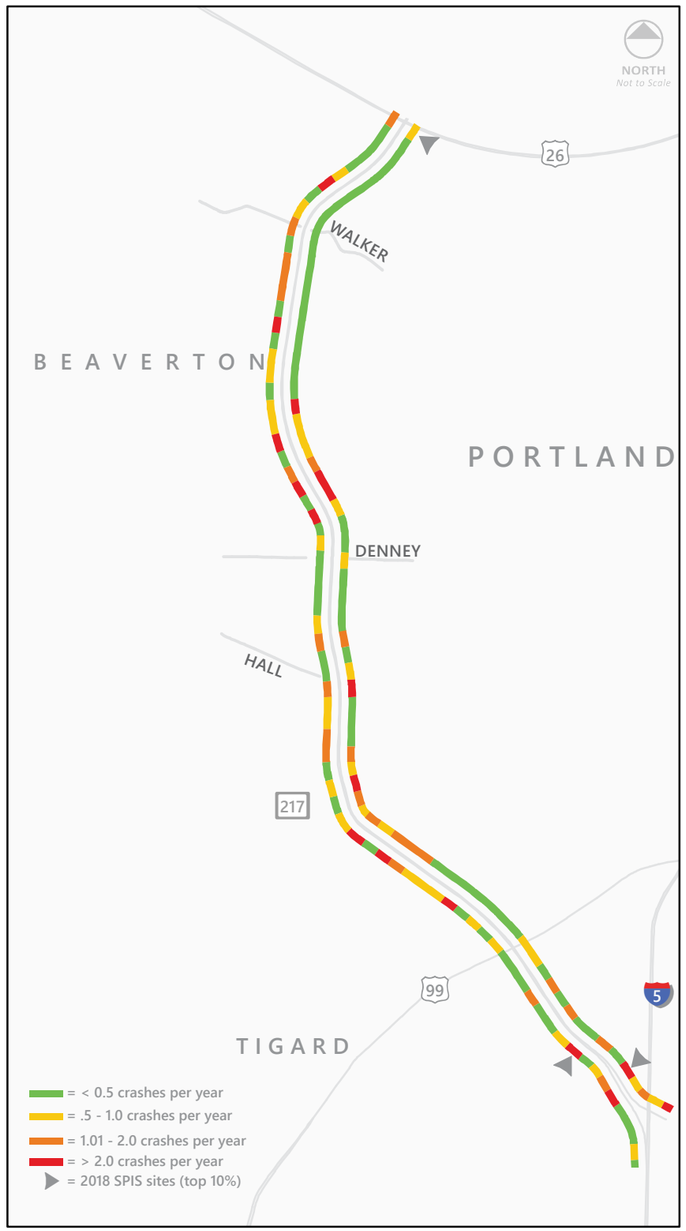
Type of crashes
2015-2019
Source: ODOT



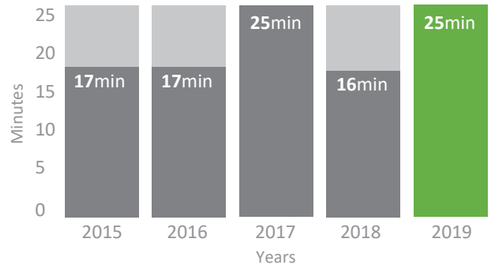
Total crashes by day of the week
2015-2019
Source: ODOT



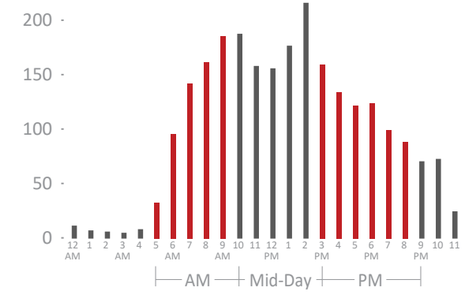
Crash frequency per 10th of a mile
2015-2019
Source: ODOT



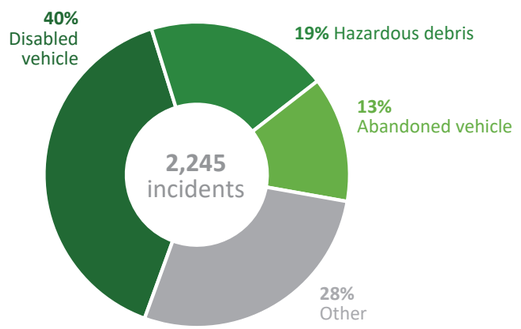
Incidents (non-crash) clearance times
2015-2019
Source: ODOT



Incident (non-crash) frequency by time of day
2015-2019, total incidents by time of day
Source: ODOT



Incidents (non-crash) by type
2015-2019
Source: ODOT



The average time to clear an incident on OR 217 is approximately 25 minutes. The top-left graph shows clearance times in minutes from 2015 through 2019. The response time for an incident depends on the nature of the incident. Non-crash incident hot-spots include the OR 217/ I-5 interchange and the interchange with US 26.

More cars on the road correlate to more incidents. There is a higher number of incidents happening in the AM and mid-day peak period, exacerbating congestion in the corridor.

Disabled vehicle incidents account for 40 percent of non-crash incidents on OR 217, followed by hazardous debris (19%) and abandoned vehicles (13%).