



I-5 ROSE QUARTER IMPROVEMENT PROJECT



COST TO COMPLETE

JANUARY
2020

Americans with Disabilities Act (ADA) Information Materials can be provided in alternative formats: large print, Braille, cassette tape, or on computer disk for people with disabilities by calling the Office of Civil Rights (OCR) at (503) 986-4350. Persons who are deaf or hard of hearing may contact OCR through the Oregon Relay Service at 7-1-1.

ODOT ensures full compliance with Title VI of the Civil Rights Act of 1964 by prohibiting discrimination against any person on the basis of race, color, national origin, disability, or sex in the provision of benefits and services resulting from its federally assisted programs and activities. For questions regarding ODOT's Title VI Program, you may contact the Department's Title VI Coordinator at (503) 986-4350.

¿Habla usted español? Podemos proporcionar la información de esta publicación en español, por favor llame al 503-731-4128.

Если вы хотите, чтобы информация об этом проекте была переведена на русский язык, пожалуйста, звоните по телефону (503) 731-4128.

이 프로젝트에 관한 한국어로 된 자료 신청방법 전화: (503) 731-4128.

如果您想了解这个项目翻译成简体中文的相关信息，请致电 (503) 731-4128.

Nếu quý vị muốn thông tin về dự án này được dịch sang tiếng Việt, xin gọi 503-731-4128

TABLE OF CONTENTS

Purpose of the Cost to Complete Report	5
Executive Summary	6
Project Overview	6
Project Planning, History and Community Engagement.....	7
Project Cost.....	9
1 Project Definition	12
1.1 Project Purpose.....	12
1.2 Project Description	12
1.3 Project Location	12
1.4 Project Needs and Benefits	13
1.5 Project Planning, History and Community Engagement.....	13
1.6 Project Delivery Method.....	14
1.7 Environmental Review Process	15
1.8 Disadvantaged Business Enterprise (DBE) and Workforce Program.....	16
2 Project Design Progression and Features	17
2.1 Design Progression Since HB 2017.....	17
2.2 Project Design Features	17
3 Risk and Schedule Analysis	34
3.1 Project Risk and Mitigation Strategy	34
3.2 Project Schedule	35
3.3 Independent Cost Estimating Process.....	35
4 Construction Sequencing	37
4.1 Proposed Project.....	37
5 Cost Progression	39
5.1 Initial Project Funding (HB 2017)	39
5.2 Updated Project Estimate since HB 2017 – Factors Affecting Cost.....	39
5.3 Project Cost Descriptions.....	42
5.4 Inflation Effect of Delays	45
6 Equity by Design	46
6.1 Equity During Design	46
6.2 Equity During Construction	46

FIGURES

Figure 0-1 I-5 Rose Quarter Improvement Project Mainline.....	5
Figure 0-2 Proposed Auxiliary Lanes and Shoulders 6	
Figure 1-1 Project Area Map.....	12
Figure 1-2 CM/GC Delivery Method	15
Figure 2-1 Proposed Project -- All Design Features 17	
Figure 2-2 Project Area Map – I-5 Mainline Improvements	19
Figure 2-3 Existing and Proposed Mainline Improvements	20
Figure 2-4 Proposed Bridge Improvements along I-5	21
Figure 2-5 Preliminary Mainline Wall Locations.....	22
Figure 2-6 Project Area Map – Highway Covers	24
Figure 2-7 Project Area Map – Clackamas Pedestrian and Bicycle Crossing	28
Figure 2-8 Project Area Map – Multimodal Local Street Improvements.....	30
Figure 2-9 Enlarged Project Area Map – Local Street Improvements	31
Figure 2-10 Shared Use Path Concept – N Williams Avenue between NE Weidler Street and N Broadway	32
Figure 3-1 Programmatic Project Schedule	35
Figure 3-2 Estimating Milestones	35
Figure 4-1 Zonal Sequencing for Proposed Project 37	
Figure 4-2 Construction Sequencing Schedule for Proposed Project	38
Figure 5-1 Delayed-Related Inflation Curve	45

TABLES

Table 0- 1 Change to Estimated Project Cost from HB 2017	10
Table 2-1 Major Design Progression Elements and Project Design Features	18
Table 5-1 HB 2017 and Current Base Estimate Cost Elements	41
Table 5-2 Cost By Design Feature- millions (2025 Dollars).....	42

APPENDICES

Appendix A – Proposed Project
Appendix B – Construction Sequencing for Proposed Project
Appendix C – Summary of Community Engagement

LIST OF ACRONYMS

A&E	Architectural and Engineering (Design Consultant)	I-84	Interstate 84
CAC	Community Advisory Committee	IE	Independent Estimator
CC2035 Plan	Central City 2035 Plan	IGA	Intergovernmental Agreement
CE	Construction Engineering	ITS	Intelligent Transportation Systems
City	City of Portland	MP	Milepost
CM/GC	Construction Manager/General Contractor	NB	Northbound
CRCP	Continuously Reinforced Concrete Pavement	NEPA	National Environmental Policy Act
CTC	Cost to Complete	NFPA	National Fire Protection Association
DBE	Disadvantaged Business Enterprise	ODOT	Oregon Department of Transportation
EA	Environmental Assessment	OTC	Oregon Transportation Commission
EAC	Executive Advisory Committee	PE	Preliminary Engineering
EB	Eastbound	PPS	Portland Public Schools
EIS	Environmental Impact Statement	ROW	Right of Way
EWP	Early Work Packages	SAC	Stakeholder Advisory Committee
FHWA	Federal Highway Administration	SB	Southbound
FLS	Fire and Life Safety	TBD	To Be Determined
GMP	Guaranteed Maximum Price	UPRR	Union Pacific Railroad
HB 2017	House Bill 2017 Keep Oregon Moving	VE	Value Engineering
I-405	Interstate 405	VMS	Variable Message Signs
I-5	Interstate 5	WB	Westbound



[Page intentionally left blank]

PURPOSE OF THE COST TO COMPLETE REPORT

With the passage of House Bill 2017 (HB 2017), the Oregon Legislature (herein, State Legislature) made a significant investment to improve the transportation infrastructure within the State of Oregon (State). HB 2017 statutorily directs construction and dedicates funding to the I-5 Rose Quarter Improvement Project (Project) as part of a suite of investments to reduce congestion and improve operations in the Portland metro region, and to add vitality to the statewide economy.

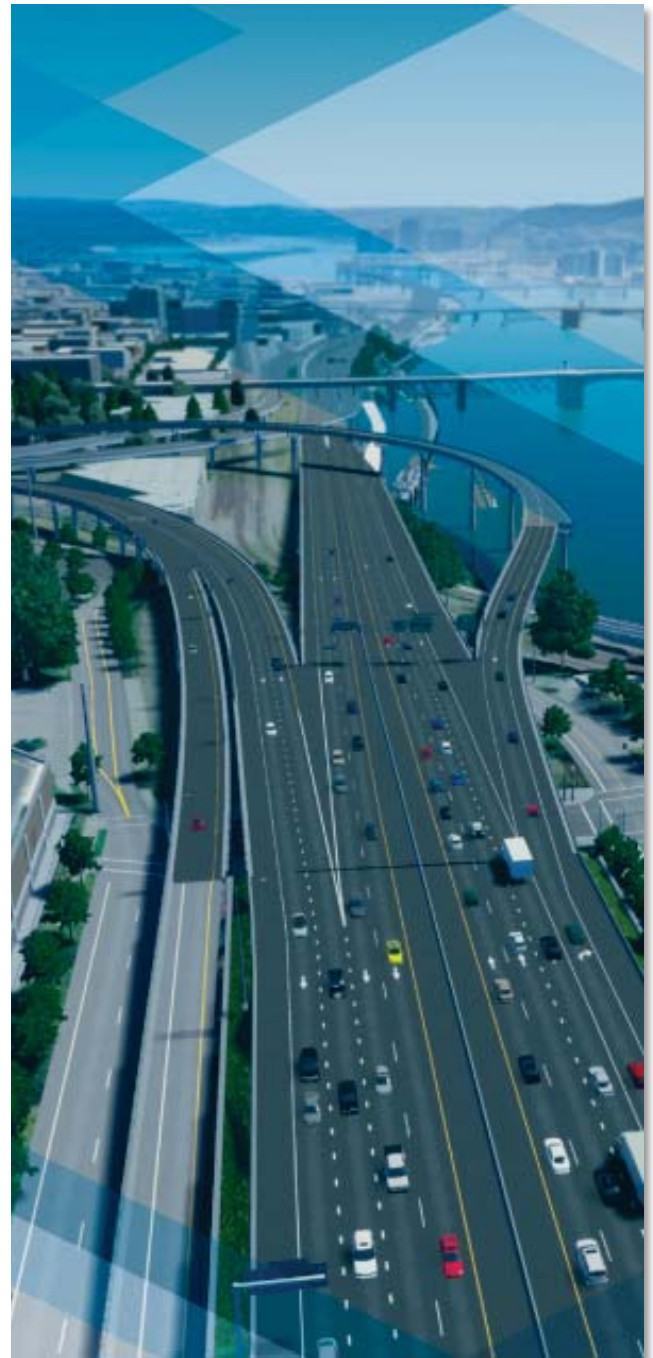
Central to the effective implementation of HB 2017, the Oregon Department of Transportation (ODOT) is committed to effectively delivering programs and projects in an accountable, transparent, and efficient manner. To meet this goal, and the requirements set forth in Section 27c of HB 2017, the Oregon Transportation Commission (OTC) and ODOT have conducted a study to deliver a report to the Joint Committee on Transportation by February 1, 2020, documenting the estimated cost required to complete the I-5 Rose Quarter Improvement Project. Section 27c of HB 2017 states:

SECTION 27c. The Oregon Transportation Commission shall conduct a study and make a report on its findings to the Joint Committee on Transportation established under section 26 of this 2017 Act and to the appropriate fiscal and policy committees or interim committees of the Legislative Assembly as follows:

(2) No later than February 1, 2020, the costs to complete the Interstate 5 Rose Quarter Project.

This Cost to Complete (CTC) report documents the approach and plan to deliver the Project within a projected cost and schedule, and describes the Project's design features, constructability, and the selected delivery method. This CTC report documents the Project's scope assumptions as part of the current cost estimate.

Figure 0-1 I-5 Rose Quarter Improvement Project Mainline



EXECUTIVE SUMMARY

PROJECT OVERVIEW

A PROJECT OF STATEWIDE SIGNIFICANCE

Interstate 5 (I-5) is the main north-south route moving people and goods and connecting population centers across the West Coast of the United States from Mexico to Canada. In the Portland region between Interstate 84 (I-84) and Interstate 405 (I-405), I-5 carries some of the highest number of vehicles in the State and is critical for truck freight and businesses moving goods, commuters traveling to and from Portland, and locals traveling within the region. This segment of I-5 experiences the State's highest crash rate on an urban interstate and is the single worst traffic bottleneck in the State. These impacts contribute to degraded travel reliability on I-5 through the Portland region, and produce further statewide effects. Within this segment of I-5, travel times are increasing for all commuters with over 12 hours of congestion each day. This segment of I-5 is also the worst truck freight bottleneck in the State, and the 28th worst truck freight bottleneck in the nation, affecting the regional and statewide economy.

PROJECT PURPOSE

The purpose of the Project is to improve the safety and operations on I-5 between I-405 and I-84, and within the I-5 Broadway/Weidler interchange. In support of this purpose, the Project will improve local connectivity and multimodal access in the vicinity of the Broadway/Weidler interchange, and improve multimodal connections between neighborhoods located to the east and west of I-5.ⁱ

PROJECT NEEDS AND BENEFITS

The Project addresses the following needs and provides the following benefits:

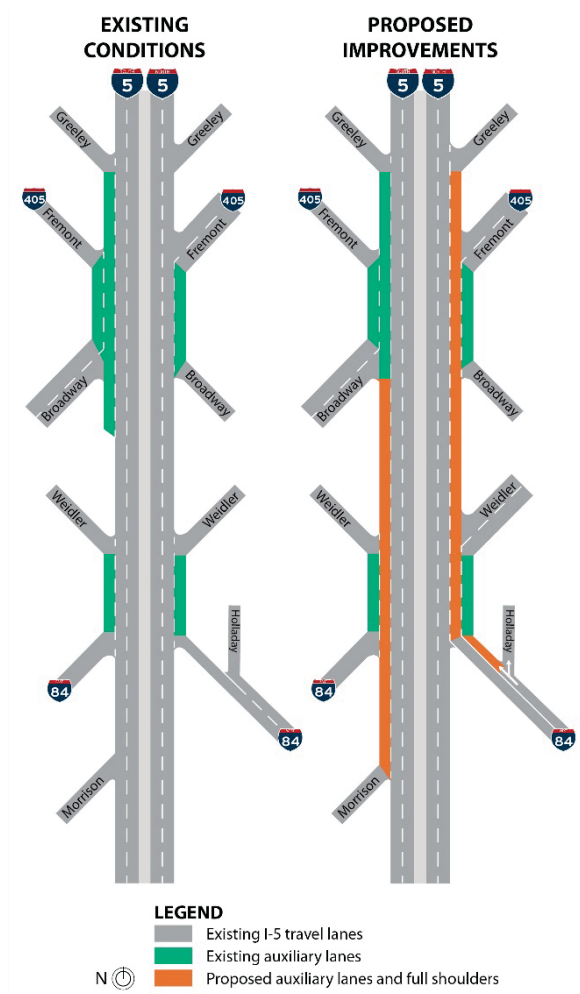
I-5 safety and congestion – The segment of I-5 between I-405 and I-84 incurs 3.5 times more crashes than the statewide average and has some of the highest traffic volumes in the state (12 hours of congestion each day). The Project's auxiliary lanes and wider safety shoulders will reduce frequent crashes and save drivers nearly 2.5 million hours of vehicle delay each year.

Travel reliability – As congestion and safety issues increase, travel reliability on the transportation

network decreases. On I-5 between I-84 and I-405, reliability has decreased during most hours of the day. Project improvements will reduce the number of crashes and alleviate congestion, which will improve travel reliability for all modes and freight.

Economic opportunities – The Portland metro area and the entire State will benefit from the safety and operational improvements of the Project as the economy depends heavily on freight movement. The Project will also be a catalyst for near-term job creation and future redevelopment in the area. The Project will maximize opportunities for minority-owned and small businesses and will seek to hire from a diverse workforce program, with the goal of generating economic opportunities for underrepresented communities.

Figure 0-2 Proposed Auxiliary Lanes and Shoulders



Multimodal enhancements – Some of the existing pedestrian and bicycle facilities in the Project area expose users to navigational challenges, such as crossing freeway on- or off-ramps. Changes to the local street system and the addition of highway covers will reduce conflict points between vehicles and pedestrians, people riding bicycles, or people rolling in the Project area. Changes to overcrossings will enhance walking and bicycling comfort.

Broadway/Weidler interchange operations – The complexity and congestion at the I-5 Broadway/Weidler interchange creates navigation challenges for vehicles, transit, pedestrians, and bicyclists. The Project will simplify the configuration of the interchange, easing navigation for all modes of travel.

PROJECT SCOPE ASSUMPTIONS

The Project is at a preliminary level of design (approximately a 15 percent design level) and assumes the following key features:

- **A new auxiliary lane in each direction on I-5 between I-84 and I-405** to support merging and improved connections between interchanges in an area where three interstates come together
- **Wider safety shoulders** in each direction on I-5 between I-84 and I-405 to provide space for disabled vehicles to move out of traffic and allow emergency vehicles to respond more quickly
- **Highway covers over I-5** that replace and structurally upgrade existing overpasses and create public space
- **Local street multimodal improvements**
- **A new east-west crossing** to connect NE Hancock Street with N Dixon Street
- **A new bicycle and pedestrian bridge** from Clackamas Street to the Rose Quarter entertainment area

These features are consistent with adopted regional and local land use and transportation plans. See the Project Planning, History and Community Engagement section in this Executive Summary for more information.

REDUCING CONGESTION AND IMPROVING TRAVEL SAFETY

The new auxiliary lanes will connect on-ramps directly to the next off-ramp on I-5. As an example, about 99 percent of the vehicles that merge onto I-5 heading south from the Fremont Bridge (I-405) during the evening peak hour period are exiting at the three exits within the Project area – the Broadway, I-84 and Morrison Bridge exits. The addition of an auxiliary lane will allow drivers to make these trips without merging into the two through lanes on I-5 before exiting. This will reduce rear-end and sideswipe crashes, both of which are major causes of delay.

Adding safety shoulders will also help reduce the number of sideswipe and rear-end crashes and reduce delays caused by those crashes. The new shoulders will also provide a place for vehicles in crashes to move safely off the roadway and safer and quicker access for emergency service vehicles to reach emergencies within or beyond the Rose Quarter area.

The Project's assumed multimodal improvements will provide enhanced separation for pedestrians and bicyclists from vehicles on the local street network. The Project assumes new multiuse paths and a pedestrian-and-bicycle-only bridge across I-5 connecting NE Clackamas Street and the Rose Quarter entertainment area.

PROJECT PLANNING, HISTORY AND COMMUNITY ENGAGEMENT

Decades of planning and partnership by ODOT and the City of Portland (City) have occurred to address the safety and operational needs on I-5 and within the Broadway/Weidler interchange through the Rose Quarter. Beginning in the late 1980s, ODOT developed several studies, including the I-5: Greeley-N. Banfield Study (1987) and Modified Concept (1990-96), the Portland/Vancouver I-5 Trade Corridor Study (1999), the I-5/I-405 Freeway Loop Study (2005), and the ODOT/City Practical Design Workshop (2007) to evaluate transportation infrastructure design options.

ODOT and the City reached agreement on a practically designed set of concepts through the 2010-2012 N/NE Quadrant Plan and I-5 Broadway/Weidler Facility Plan effort. Together with a 30-member Stakeholder Advisory Committee (SAC), ODOT and the City evaluated more than 70

design concepts and narrowed the scope of freeway improvements to accommodate and incorporate modifications to the local system in line with the City's land use planning goals. During the 2010-2012 planning effort, ODOT and the City engaged with more than 2,800 individuals and held 19 SAC meetings, 14 subcommittee meetings, 4 open houses, and more than 85 community briefings and walking tours. In 2012, the Portland City Council and OTC adopted the plans and the recommended design concept, which are now reflected as the Project.

The Project design concept is included in adopted Portland regional land use and transportation plans. The Metro Council (the Portland region's metropolitan planning organization) and the Joint Policy Advisory Committee on Transportation (which makes recommendations to the Metro Council) adopted the proposed Project as part of the Regional Transportation Plan in 2014 and again in 2018. Portland City Council adopted the proposed Project into the Central City 2035 Plan (CC2035 Plan) and the Transportation System Plan in June 2018.

Beginning in 2017, as required by the National Environmental Policy Act (NEPA) and consistent with federal regulations, ODOT and the Federal Highway Administration (FHWA) conducted the Environmental Assessment (EA) process for the Project and published the Project's EA on February 15, 2019 for a 45-day public review and comment. The EA conducted an in-depth evaluation of the benefits and impacts of two alternatives: one in which the Project would move forward as planned (the Build Alternative), and one in which the Project would not be built (the No-Build Alternative). This CTC report reflects the cost estimate for the Build Alternative as described in the EA. This is an informational report to describe the costs of the Build Alternative and does not represent a final NEPA decision nor presume a defined outcome of the NEPA process.

As discussed in greater detail below, this report reflects a 15 percent level of planning and design development and assumes no deviation from the current EA level of review. FHWA will make a final decision regarding the level of NEPA review and concur on the selected Project alternative; to date, no final decision has been made.

During the Project's EA phase, ODOT emphasized engaging the historically impacted communities of

color in the Project area. Engagement activities included interviews with Black Portlanders, work with a 14-member Community Liaisons Group to inform outreach, Project presentations at more than 100 events and community gatherings, 9 public events with more than 280 attendees, community walking and biking tours, door-to-door outreach with more than 60 businesses, updates via the Project website and newsletters, and a 45-day public review and comment period on the draft EA.

The Project team continues to intentionally listen, inform, engage, and empower the historically impacted African American community, the primary community displaced by past public and private development decisions in the Project vicinity, as well as other communities of color. Transparent, inclusive engagement will continue to be a central feature of the Project throughout design and construction.

DISADVANTAGED BUSINESS ENTERPRISE (DBE) AND WORKFORCE PROGRAM

ODOT and the City have collaboratively engaged the Disadvantaged Business Enterprise (DBE) community and prioritized a DBE and Workforce program. Goals of the program include identifying new and innovative ways to engage DBE firms, increasing workforce capacity, and informing and preparing prospective bidders in an effort to increase economic benefit among local firms and workers.

EQUITY BY DESIGN

Equity has been an integral component of early Project design, and will continue to be throughout all design phases and construction. Equity is significant in informing design decisions and direction. Throughout Project delivery, the Project team will intentionally listen, inform, and engage communities of color, especially the historically impacted African American communities. These principles relate to design decisions as well as how the Project team conducts community engagement. The Project team will use an iterative community engagement approach to inform design decisions so the Project reflects community values.

PROJECT COST

The Project cost estimate is described below and includes the 2017 preliminary cost estimate, an updated cost estimate, and the factors affecting the cost change.

PRELIMINARY COST ESTIMATE (2017)

Prior to, and during the development of HB 2017, ODOT prepared a preliminary Project cost estimate. This preliminary cost estimate was developed prior to a defined delivery schedule and was reflective of construction costs in the most current dollar value at the time, in 2017 dollars. This preliminary cost estimate ranged from \$450 million to \$500 million in 2017 dollars.

Within HB 2017, the State Legislature statutorily directed \$30 million annually beginning in 2022 and directed the OTC to submit a cost to complete report further detailing the total estimated Project cost.

UPDATED PROJECT ESTIMATE SINCE HB 2017 – FACTORS AFFECTING COST

Since 2017, the Project team has further developed the design and refined the cost estimate to reflect the anticipated year of construction, new standards, and information learned during the EA process. Based on the current Project delivery schedule, main construction is expected to begin in 2023 with anticipated completion by 2027. Changes in cost from the preliminary 2017 estimate to the cost estimate presented in this CTC report are attributable to the effects of updated code and tax requirements, design progression, technical analysis, and inflation on construction and engineering costs.

Inflation – The 2017 preliminary cost estimate was developed prior to the Project’s inclusion within HB 2017 and reflected a construction cost with the best known information and most current dollar value at the time. Inflation was not included in the 2017 preliminary estimate as a construction schedule had not yet been defined for the Project. Since the HB 2017 estimate, inflation has been incorporated into the current Project estimate.

By accounting for the average annual inflation rate, between 3.0 percent and 3.5 percent, and carrying this inflation rate through to 2025 (the midpoint of construction), the Project’s base estimate increases by \$130 million to \$147 million based on inflation.

Fire and Life Safety (FLS) protection – Fire and Life Safety (FLS) systems for the highway covers are now required to include active components, and a more responsive system overall. This results from revisions to, and incorporation of, the National Fire Protection Association (NFPA) code and the need to adhere to FHWA requirements to allow hazardous cargo movement along I-5. The \$18 million to \$25 million for the highway cover FLS systems are incorporated in the current Project cost.

Technical analysis and design progression –

Since 2017, the Project team has refined Project design assumptions through both the EA process and by advancing the Project’s design into preliminary engineering. The new factors affecting cost include the following:

- Additional right-of-way (ROW), including easements, needed to accommodate safe and efficient construction access and staging
- Reimbursable utility requirements that are better defined as a result of ongoing discussions with utility providers
- Increased length of retaining walls based on recently obtained ground elevation survey data
- The addition of sound walls adjacent to sensitive noise receptors
- Use of continuously reinforced concrete pavement (CRCP) along I-5 instead of asphalt (CRCP has a higher initial cost but a significantly lower long-term maintenance cost)

Cost refinements – As part of this cost estimate, the Project team has incorporated more than a dozen cost reduction measures that continue to improve safety and modal performance. ODOT will continue ongoing value engineering (VE) efforts during design to include added contractor input and other opportunities to further reduce the overall Project cost. ODOT also anticipates revenue from the sale of surplus property at the conclusion of Project construction. Estimates of the surplus value will be developed as part of the transition from design to construction by 2023.

Table 0-1 compares the preliminary 2017 cost estimate to a range of current Project costs. The range is reflective of the following factors:

Low End of Range (\$715 million)

- Assumed annual inflation rate of 3 percent from 2017 to 2025
- Less variability in quantity and unit price assumptions
- Higher potential for VE – the process used to analyze and determine cost savings solutions – with the Construction Manager/General Contractor (CM/GC), when selected to join the team

Upper End of Range (\$795 million)

- Assumed annual inflation rate of 3.5 percent from 2017 to 2025
- More variability in quantity and unit price assumptions
- More limited VE opportunities with the CM/GC, when selected to join the team

Table 0- 1 Change to Estimated Project Cost from HB 2017

Year of Dollars	Preliminary Cost Estimate (2017)	Base Estimate Range (2025)
TOTAL	\$450.0 - \$500.0	\$715.0 to \$795.0
INFLATION	\$0.0	\$130.0 to \$147.0
RIGHT-OF-WAY	\$6.0	\$42.0 to \$52.3
UTILITY REIMBURSEMENT	\$0.0	\$7.6
PRELIMINARY ENGINEERING	\$64.0 to \$71.0	\$74.2 to \$81.0
CONSTRUCTION	\$380.0 to \$423.0	\$461.2 to \$507.1

All values are in millions

It is important to note that the current Project cost estimate reflects a design that is 15 percent complete, and requires continued, extensive public engagement to inform design refinement and Project decisions. The base Project cost presented in this report is estimated at a 70th percentile. This means

that there is a 70 percent probability that the final Project cost will be within, or less than, this range for the current Project scope and schedule.

Delay to the Project delivery schedule will result in cost impacts, including the effect of inflation. For example, a three-year delay would result in an additional \$66.3 million (3.0 percent inflation) to \$86.4 million (3.5 percent inflation) in delay-related inflation cost. See Section 5.4 for more information on the inflation effect of delays.

COST AND RISK MANAGEMENT THROUGH THE CM/GC DELIVERY METHOD

ODOT selected the Construction Manager / General Contractor (CM/GC) delivery model to effectively manage the Project's technical complexities, community interests, desire to accelerate schedule, VE process, and need for innovation. This model allows ODOT to contract directly with a CM/GC early during the design process on the basis of qualifications, experience, expertise, and price, rather than selecting based solely on the lowest bid. Engaging the prime contractor during early design allows ODOT to receive valuable constructability input throughout the life of the design that can be used to positively impact the Project's technical complexities, schedule acceleration, need for innovation and overall Project cost savings. Further, ODOT expects the selected CM/GC to collaboratively participate in extensive community engagement to determine solutions that address critical Project issues such as:

- Implementing complex construction staging of highway covers over the highly traveled I-5
- Improvement of several I-5 bridges to accommodate extending the auxiliary lanes and adding full shoulders
- Maintaining mobility on I-5, and accommodating access to regional entertainment and recreation facilities, Portland Streetcar, light rail, and other multimodal users in the Project area
- Continual and extensive engagement with the community

ODOT will benefit from the CM/GC's input during design regarding constructability and specific means and methods, and from their participation in risk assessment analysis. These methods and this approach will help to accelerate the Project schedule,

reduce long-term Project cost, and support successful contract negotiations.

The Project team has implemented a rigorous process to assess the Project's risk profile. The Project team will continue to actively identify, mitigate and manage risk throughout design and construction. Pending direction from the OTC on the Project's environmental review process and FHWA's NEPA decision, ODOT will procure a CM/GC to join the Project team.

ADAPTING TO AFFORDABILITY

ODOT recognizes the potential need to phase the Project given currently available funding. ODOT will seek additional funding and capitalize on the innovation and expertise of the CM/GC to help identify cost saving solutions that continue to provide benefit to the traveling public.

The funding priorities of HB 2017 are focused on reducing congestion in the Portland metropolitan area for commuters and truck freight and improving safety along I-5 between I-84 and I-405.

ODOT will continue to identify and seek additional federal, state, and local funding and partnership opportunities.

ADDITIONAL REQUESTS

Some stakeholders have requested expanded highway covers to accommodate a wider range of uses including, but not limited to, multistory buildings. As these requests are beyond the current Project scope and are not yet sufficiently defined, any costs of design, engineering, and construction of expanded covers are not contemplated in this CTC report. Preliminary estimates suggest a range of \$200 million to \$500 million of additional cost to design and build

expanded covers, depending on the required length and strength of the covers. Much of the cost is attributed to providing the structural capacity to accommodate the weight of the buildings.

To maintain the Project's current delivery schedule and begin main construction in 2023, a final decision regarding the expanded highway covers must be made no later than June 2020. The potential for expanding the scope of the highway covers will require community engagement and input and support from stakeholders.

Stakeholders also requested additional technical analysis of the Project, including preparing an Environmental Impact Statement (EIS), as well as the development of an advisory group to guide the Project and an independent evaluation of the highway covers. The Project team anticipates direction from the OTC to address these issues.

COST VALIDATION

ODOT has engaged an independent estimator (IE) to validate Project costs through the development of a production-based estimate that accounts for constructability, access, work sequencing, and market conditions. Additionally, ODOT has selected an owner's representative team to collaboratively provide program management leadership to support successful Project delivery, including cost estimating services.

The owner's representative has prepared an independent estimate to compare to, and validate, the IE's estimate. The IE's and owner's representative's estimates will be compared to the CM/GC's estimate at future pricing milestones once the CM/GC has joined the Project. This process will aid ODOT in negotiating a fair and reasonable price for work.



1 PROJECT DEFINITION

1.1 PROJECT PURPOSE

The purpose of the I-5 Rose Quarter Improvement Project (Project) is to improve the safety and operations on Interstate (I-5) between Interstate 405 (I-405) and Interstate 84 (I-84), and within the I-5 Broadway/Weidler interchange. In support of this purpose, the Project will improve local connectivity and multimodal access in the vicinity of the Broadway/Weidler interchange and improve multimodal connections between neighborhoods located to the east and west of I-5. ⁱⁱ

1.2 PROJECT DESCRIPTION

The Project adds auxiliary lanes and shoulders to reduce congestion and improve safety and operations on I-5, the West Coast's principal north-south freeway, and will improve the local street network. The Project will smooth traffic flow on I-5 between I-84 and I-405, where three interstates intersect to form one of the biggest traffic bottlenecks in Oregon. The Project will also improve community connections with redesigned overpasses and reconnected neighborhood streets, enhance public spaces, and promote economic development opportunities. Developed by the Oregon Department of Transportation (ODOT) in partnership with the City of Portland (City), the Project's transportation improvements will allow the City to implement its development goals for the north/northeast area and realize the key elements of the City's Central City 2035 Plan (CC2035 Plan).

In the 1950s and 1960s, urban renewal and the construction of I-5, the Veterans Memorial Coliseum, the Rose Quarter, the Moda Center, Portland Public Schools Blanchard site, Legacy Emanuel Medical Center and other public and private developments divided and displaced North Portland communities. This also disproportionately impacted communities of color, especially African American communities. With support from the City, ODOT is increasing opportunities for a diverse workforce, and is providing economic benefits for, and intentionally engaging with, the African American community and other communities of color.

1.3 PROJECT LOCATION

The Project is located in Portland, Oregon, along the 1.7-mile segment of I-5 between I-405 to the north

Figure 1-1 Project Area Map



(milepost [MP] 303.2), inclusive of the Greeley exit ramp connection, and the Morrison Bridge exit (US 26 and 99E) to the south (MP 301.4).

The Project also includes the interchanges between: (1) I-5 and I-84 and (2) I-5 and NE Broadway and NE Weidler Streets (the Broadway/Weidler interchange), and the surrounding transportation network, from approximately NE Hancock Street to the north, N Benton Avenue to the west, NE Multnomah Street to the south, and NE Second Avenue to the east. Section 2 of this report provides further detail regarding the Project's design features and scope assumptions.

1.4 PROJECT NEEDS AND BENEFITS

I-5 is the main north-south route moving people and goods and connecting population centers across the West Coast of the United States from Mexico to Canada. In the Portland region between I-84 and I-405, I-5 carries some of the highest number of vehicles in the State and is critical for truck freight and businesses moving goods, commuters traveling to and from Portland, and locals traveling within the region. This segment of I-5 experiences the State's highest crash rate on an urban interstate and is the single worst traffic bottleneck in the State. These impacts contribute to degraded travel reliability on I-5 through the Portland region, and are producing further statewide effects. Within this segment of I-5, travel times are increasing for all commuters with over 12 hours of congestion each day. This segment of I-5 is also the worst truck freight bottleneck in the State, and the 28th worst truck freight bottleneck in the nation, affecting the statewide economy. The Project addresses these needs and provides the following benefits:

I-5 safety and congestion – The segment on I-5 between I-405 and I-84 incurs 3.5 times more crashes than the statewide average and some of the highest traffic volumes in the State (12 hours of congestion each day). The Project's auxiliary lanes and wider safety shoulders will reduce frequent crashes and save drivers nearly 2.5 million hours of vehicle delay each year.

The new auxiliary lanes connect on-ramps directly to the next off-ramp on I-5. As an example, about 99 percent of the vehicles that merge onto I-5 heading south from the Fremont Bridge (I-405) during the evening peak hour period are exiting at the three exits within the Project area – the Broadway, I-84 and Morrison Bridge exits. The addition of an auxiliary lane will allow drivers to make these trips without merging into the two through lanes on I-5 before exiting. This will reduce rear-end and sideswipe crashes, both of which are major causes of delay.

Travel reliability – As congestion and safety issues increase, travel reliability on the transportation network decreases. On I-5 between I-84 and I-405, reliability has decreased during most hours of the day. Project improvements will reduce frequent crashes and alleviate congestion which will improve travel reliability for all modes and freight.

Economic opportunities – The Portland metro area and the entire State will benefit from the safety and operational improvements of the Project as the economy depends heavily on freight movement. The Project will also be a catalyst for near-term job creation and future redevelopment in the area. The Project will maximize opportunities for minority-owned and small businesses and will seek to hire from a diverse workforce program, with the goal of generating economic opportunities for underrepresented communities.

Multimodal enhancements – Some of the existing pedestrian and bicycle facilities in the Project area expose users to navigational challenges, such as crossing freeway on- or off-ramps. Changes to the local street system and the addition of highway covers will reduce conflict points between vehicles and pedestrians, people riding bicycles, or people rolling in the Project area. Changes to overcrossings will enhance walking and bicycling comfort.

Broadway/Weidler interchange operations – The complexity and congestion at the I-5 Broadway/Weidler interchange creates navigation challenges for vehicles, transit, pedestrians, and bicyclists. The Project will simplify the configuration of the interchange, easing navigation for all modes of travel.

1.5 PROJECT PLANNING, HISTORY AND COMMUNITY ENGAGEMENT

ODOT and the City have conducted decades of planning and partnership to address the safety and operational needs on I-5 and within the Broadway/Weidler interchange through the Rose Quarter. Beginning in the late 1980's, ODOT developed several studies, including the I-5: the Greeley-N. Banfield Study (1987) and Modified Concept (1990-96), the Portland/Vancouver I-5 Trade Corridor Study (1999), the I-5/I-405 Freeway Loop Study (2005), and the ODOT/City Practical Design Workshop (2007) to evaluate transportation infrastructure design options in this area.

ODOT and the City reached agreement on a practically designed set of concepts through the 2010-2012 N/NE Quadrant Plan and I-5 Broadway/Weidler Facility Plan effort. Together with a 30-member Stakeholder Advisory Committee (SAC), ODOT and the City evaluated more than 70 design concepts and narrowed the scope of freeway improvements to accommodate and incorporate

modifications to the local system in line with the City's land use planning goals. During the 2010-2012 planning effort, ODOT and the City engaged with more than 2,800 individuals and held 19 SAC meetings, 14 subcommittee meetings, 4 open houses, and more than 85 community briefings and walking tours. In 2012, the Portland City Council and the OTC adopted the plans and the recommended design concept, which are now reflected as the Project.

The Project design concept is included in adopted Portland regional land use and transportation plans. The Metro Council (the Portland region's metropolitan planning organization) and the Joint Policy Advisory Committee on Transportation (which makes recommendations to the Metro Council) adopted the proposed Project as part of the Regional Transportation Plan in 2014 and again in 2018. Portland City Council adopted the proposed Project into the CC2035 Plan and the Transportation System Plan in June 2018.

Beginning in 2017, as required by the National Environmental Policy Act (NEPA) and consistent with federal regulations, ODOT and the Federal Highway Administration (FHWA) conducted the Environmental Assessment (EA) process for the Project and published the Project's EA on February 15, 2019 for a 45-day public review and comment. The EA conducted an in-depth evaluation of the benefits and impacts of two alternatives: one in which the Project would move forward as planned (the Build Alternative), and one in which the Project would not be built (the No-Build Alternative). This Cost to Complete (CTC) report reflects the cost estimate for the Build Alternative as described in the EA. This is an informational report to describe the costs of the Build Alternative and does not represent a final NEPA decision nor presume a defined outcome of the NEPA process.

As discussed in greater detail below, this report reflects a 15 percent level of planning and design development and assumes no deviation from the current EA level of review. The FHWA will make a final decision regarding the level of NEPA review and concur on the selected Project alternative; to date, no final decision has been made.

During the Project's EA phase, ODOT emphasized engaging the historically impacted communities of color in the Project area. Engagement activities

included interviews with Black Portlanders, work with a 14-member Community Liaisons Group to inform outreach, Project presentations at more than 100 events and community gatherings, 9 public events with more than 280 attendees, community walking and biking tours, door-to-door outreach with more than 60 businesses, updates via the Project website and newsletters, and a 45-day public review and comment period on the draft EA.

The Project team continues to intentionally listen, inform, engage, and empower the historically impacted African American community, the primary community displaced by past public and private development decisions in the Project vicinity, as well as other communities of color. Transparent, inclusive engagement will continue to be a central feature of the Project throughout design and construction.

The Project's continued public engagement strategy includes the following planned activities over the next year:

- Formation of a Community Advisory Committee (CAC) through an open application process, to advise ODOT and the City regarding design aspects, meaningful engagement, and equitable Project outcomes
- Discussion groups with communities of color including the African American community, and with people displaced from the Project area including Native American communities
- Direct outreach to businesses, churches and religious organizations with ties to African American communities and other communities of color
- Pop-up kiosks and tabling at community events
- Hosting open houses or interactive public events, online open houses and questionnaires, and design charrettes to gain broad input on design
- Community tours of the Project area
- Interviews and presentations with community groups
- Distributing information regularly about Project progress via website, fact sheets, and videos

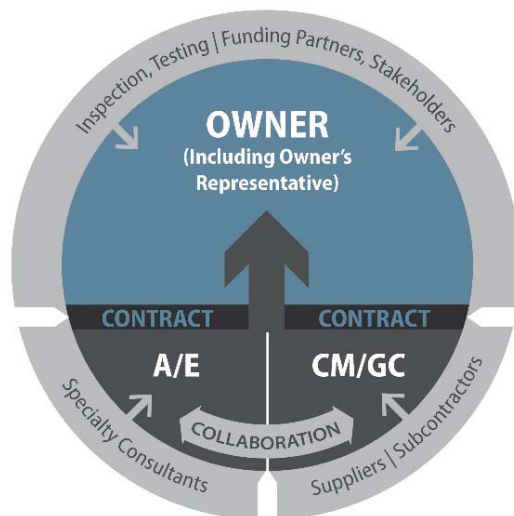
1.6 PROJECT DELIVERY METHOD

ODOT most commonly delivers its capital projects using the Design-Bid-Build delivery method which is based on the lowest responsive contractor bid. ODOT selected the Construction Manager / General

Contractor (CM/GC) delivery model to effectively manage the Project's technical complexities, community interests, desire to accelerate schedule, VE process, and need for innovation. This model allows ODOT to contract directly with a CM/GC early during the design process on the basis of qualifications, experience, expertise, and price, rather than selecting based solely on the lowest bid. The CM/GC delivery model is commonly referred to as a best value method. ODOT expects the selected CM/GC to collaboratively participate in extensive community engagement to determine solutions that address critical Project issues, such as:

- Implementing complex construction staging of the highway covers over highly traveled I-5
- Improvement of several I-5 bridges to accommodate extending the auxiliary lanes and adding full shoulders
- Maintaining mobility on I-5, and accommodating access to regional entertainment and recreation facilities and multimodal users in the Project area
- Continual and extensive engagement with the community

Figure 1-2 CM/GC Delivery Method



The CM/GC project delivery method allows ODOT to contract directly with an architectural and engineering (A/E) design consultant, and directly with a prime contractor early during the design process. Engaging the prime contractor during early design allows ODOT to receive valuable constructability input throughout the life of the design that can be used to positively impact the Project's technical complexities, schedule acceleration, need for innovation and

overall Project cost savings. The CM/GC delivery model also allows the prime contractor to incorporate means and methods into the design, participate in risk assessment analysis, and effectively assign risk. In addition to helping to accelerate the Project schedule and reduce overall Project cost, this method and approach supports the successful negotiation of a Guaranteed Maximum Price (GMP). Successful GMP negotiation is based on the scope and schedule that is collectively defined by ODOT and its owner's representative, the A&E design consultant, and the prime contractor, which allows the Project to move into the construction phase.

The CM/GC project delivery method supports the productive collaboration of the A&E design consultant with its own specialty design subconsultants, while the CM/GC is able to simultaneously interface with its suppliers and subcontractors. Further, the A&E design consultant, the CM/GC, and the owner team (integrated members of ODOT and the owner's representative) are also able to productively collaborate with each other, specifically regarding constructability and construction sequencing to build the Project. To effectively advance the Project's design with constructability in mind, the owner's representative, the A&E design consultant, and the CM/GC must be positioned to collaborate, especially while early phases of work are being constructed by the CM/GC.

1.7 ENVIRONMENTAL REVIEW PROCESS

Beginning in 2017, as required by the NEPA and consistent with federal regulations, ODOT and the FHWA conducted the EA process for the Project and published the Project's EA on February 15, 2019 for a 45-day public review and comment. The EA conducted an in-depth evaluation of the benefits and impacts of two alternatives: one in which the Project would move forward as planned (the Build Alternative), and one in which the Project would not be built (the No-Build Alternative).

The EA has provided the public, businesses, interest groups, and agencies at all levels of government an opportunity to understand the Project's benefits and impacts. The EA also provides transportation officials with information that will allow them to make informed decisions about the Project that balance engineering and transportation needs with social, economic, and natural environmental factors, such as noise, air quality, and traffic patterns. ⁱⁱⁱ

The EA's 45-day comment period concluded on April 1, 2019. Nearly 2,000 comments were received during the comment period. Frequently mentioned topics and themes include:

- Design/function of the highway covers over I-5
- Public process, including the selection of the Project for funding and alternatives considered
- Public health, including air quality and noise effects
- Climate change
- Traffic volumes and safety
- Transit operations
- Grades and locations of bicycle and pedestrian facilities
- Effects to minority and historically marginalized communities
- Construction impacts and effects
- Consistency with local land use plans
- Level of environmental documentation

ODOT is consulting with the FHWA to determine next steps of the environmental review process and to develop a NEPA decision document. The Project team has been intentional about using the public's comments and the NEPA decision document to inform design decisions and direction.

This is an informational report to describe the costs of the Build Alternative and does not represent a final NEPA decision nor presume a defined outcome of the NEPA process.

1.8 DISADVANTAGED BUSINESS ENTERPRISE (DBE) AND WORKFORCE PROGRAM

ODOT and the City have made a collaborative effort to engage the Disadvantaged Business Enterprise (DBE) community as a central component of the Project's outreach efforts. After consulting with leaders in the African American community during the Project's NEPA phase, ODOT and the City prioritized the implementation of the DBE and Workforce program as critical to contributing to the success of the Project. Goals of the DBE and Workforce program include identifying new and innovative ways to engage DBE firms, and workforce training opportunities during the Project's forthcoming construction phase. Additional areas of emphasis include providing technical assistance for DBE firms, increasing the available pool of DBEs and workers, and identifying subcontracting areas and strategies that generate wealth among local firms and workers.



2 PROJECT DESIGN PROGRESSION AND FEATURES

2.1 DESIGN PROGRESSION SINCE HB 2017

In 2017, ODOT prepared a preliminary cost estimate to inform HB 2017. This preliminary cost estimate was based on the Project design concept from the I-5 Broadway/Weidler Facility Plan. Since 2017, new regulations have been introduced and the Project team has refined conceptual design assumptions. The current cost estimate reflects newly enacted regulations since 2017 and ongoing design development related to the information and feedback gathered during the EA process as well as ongoing partner input. Updated engineering analysis since 2017 includes newly gathered technical information. Table 2-1 (on the following page) describes some of the major design refinements from conceptual design to the current 15 percent design.

2.2 PROJECT DESIGN FEATURES

The Project estimate presented in this CTC report provides operational and safety improvements along the I-5 corridor through the Rose Quarter, as well as space for wide sidewalks, separated bicycle lanes, roads, and new community spaces within the historic Albina neighborhood. Figure 2-1 illustrates the proposed Project design features. The current design is consistent with the Build Alternative as evaluated in Project's EA and supporting EA technical reports, and the recommended design concept from prior planning efforts and documents, including the 2010-2012 N/NE Quadrant Plan and I-5 Broadway/Weidler Facility Plan. As design progresses, environmental mitigation requirements as defined in the approved NEPA document will be incorporated into the Project in collaboration with the Project partners and the community. See Section 1.7 for a description of the environmental review process.

ODOT will continue to work with regional partners on the financial investment that is necessary to consider and implement specific Project features, including multimodal improvements. These improvements will benefit the region and support the City in realizing the goals set forth in the City's CC2035 Plan.

The Project includes design features distinguished by primary modal users in the following four categories: I-5 mainline improvements, highway covers, the Clackamas Pedestrian and Bicycle Crossing, and multimodal local street improvements.

Figure 2-1 Proposed Project - All Design Features



Table 2-1 Major Design Progression Elements and Project Design Features

DESIGN PROGRESSION ELEMENTS <i>Refinements from conceptual design to the current 15 percent design</i>	PROJECT DESIGN FEATURES <i>Brief descriptions of categories and corresponding sections</i>
<div data-bbox="152 373 203 422"></div> I-5 Mainline <ul style="list-style-type: none"> Lowered the I-5 mainline to reduce impacts to the local street network based on new highway cover construction Refined alignments at I-5 interchanges with I-405 and I-84 to improve safety and traffic operations 	<div data-bbox="841 380 1000 411">Section 2.2.1</div> <p>In the current Project estimate, I-5 mainline improvements include the construction of auxiliary lanes and full shoulders between I-84 to the south and I-405 to the north, in both the northbound (NB) and southbound (SB) directions.</p>
<div data-bbox="152 657 203 705"></div> Highway Covers <ul style="list-style-type: none"> Refined the north highway cover to create a flatter street profile which increases visibility for drivers on top of the cover and improves pedestrian and bicycle access and safety Refined the local street design, consistent with other planned City transportation improvements on N/NE Broadway and N/NE Weidler Street Incorporated Fire and Life Safety (FLS) systems for the highway covers to include active components, and a more responsive system overall (these changes result from revisions to, and incorporation of, the National Fire Protection Association [NFPA] code and the need to adhere to FHWA requirements to allow hazardous cargo movement along I-5) 	<div data-bbox="841 663 1000 695">Section 2.2.2</div> <p>The current Project estimate includes highway covers over the I-5 freeway that would replace existing structures, and would add seismic stability for all modes of travel. The open covers concept is consistent with the EA and would provide space for wide sidewalks, separated bicycle lanes, and roads, and an opportunity for new community spaces.</p>
<div data-bbox="152 1251 203 1299"></div> Clackamas Pedestrian and Bicycle Crossing <ul style="list-style-type: none"> Improved the grade and reduced the need for multiple switchbacks 	<div data-bbox="841 1257 1000 1289">Section 2.2.3</div> <p>The current cost estimate includes the Clackamas Pedestrian and Bicycle Crossing over I-5. This pedestrian-and-bicycle-only bridge would connect NE Clackamas Street near NE 2nd Avenue to the N Williams Avenue/N Ramsay Way/N Wheeler Avenue area to create a safer travel experience for people who walk and bike.</p>
<div data-bbox="152 1608 203 1656"></div> Multimodal Local Street Improvements <ul style="list-style-type: none"> Refined the multiuse path between the new NE Hancock Street/N Dixon Street connection and N Broadway Added a new access pathway between NE Flint Avenue and NE Vancouver Avenue which may serve as a future multiuse path 	<div data-bbox="841 1614 1000 1646">Section 2.2.4</div> <p>The Project's current cost estimate assumes multimodal improvements in the Broadway/Weidler interchange area that are intended to provide a strong pedestrian and bicycle circulation network. These improvements promote pedestrian and bicycle activity by creating safe and convenient access to local destinations and transit facilities.</p>

2.2.1 I-5 MAINLINE IMPROVEMENTS



INTRODUCTION

As part of the cost estimate presented in this report, the I-5 mainline improvements include the construction of auxiliary lanes and full shoulders between I-84 and I-405 in both the NB and SB directions, and new highway covers. These include:

- The new portion of the SB auxiliary lane and full shoulders that will extend between the Broadway exit and Morrison Bridge exit, resulting in a continuous auxiliary lane from N Greeley Avenue to the Morrison Bridge and the SE Portland/Oregon Museum of Science and Industry (OMSI) exit ramp
- Adding a new NB auxiliary lane and full shoulders from the I-84 westbound (WB) to I-5 NB entrance ramp to the N Greeley Avenue exit ramp
- Placing new I-5 concrete pavement for better life-cycle performance

The Broadway/Weidler interchange improvements address connections between I-5, the interchange, and the local street network, including:

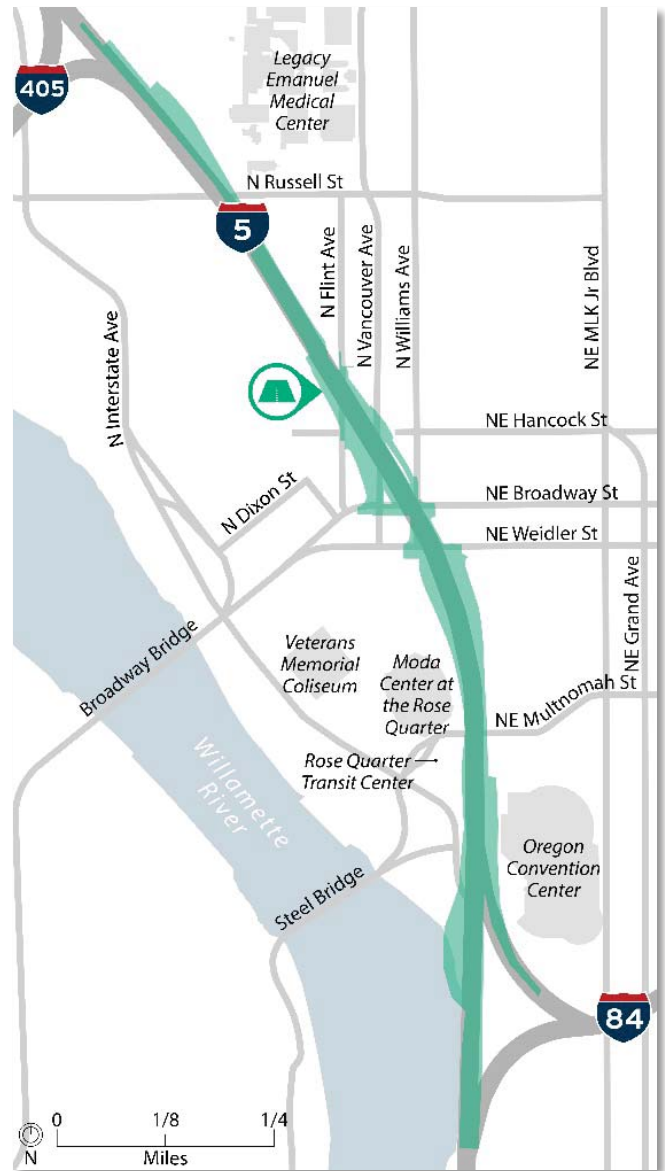
- Relocating the I-5 SB entrance ramp from N Wheeler Avenue to NE Weidler Street
- Improving the I-5 NB to the NE Weidler Street exit ramp

Design features for the I-5 mainline improvements are listed below and are described in the following subsections.

I-5 Mainline Design Features

- Auxiliary Lanes and Shoulders
- Freeway On/Off-ramps
- Bridges
- Retaining Walls
- Pavement
- Freeway Illumination
- Intelligent Transportation Systems
- Traffic Signals
- Stormwater/Hydraulics
- Right-of-way (ROW)
- Utilities

Figure 2-2 Project Area Map – I-5 Mainline Improvements



AUXILIARY LANES AND SHOULDERS

The Project adds auxiliary lanes and shoulders to reduce congestion and improve safety on I-5, the West Coast's principal north-south freeway, and proposes to reconstruct several new interchange ramps (Figure 2-3). New ramp-to-ramp lanes (auxiliary lanes) along I-5 are estimated to save approximately 2.5 million hours of vehicle delay each year and reduce crashes up to 50 percent.^{iv} Adding safety shoulders will also help reduce the number of sideswipe and rear-end crashes and reduce delays caused by those crashes.

Auxiliary Lanes

The Project's proposed auxiliary lane improvements provide a direct connection from one interchange ramp to the next, allowing vehicles to transition from one ramp to the next without having to merge into through traffic. These improvements serve to reduce bottleneck congestion, and improve highway safety and operations. The Project's auxiliary lane improvements also provide additional time and space for safer merging.

Shoulders

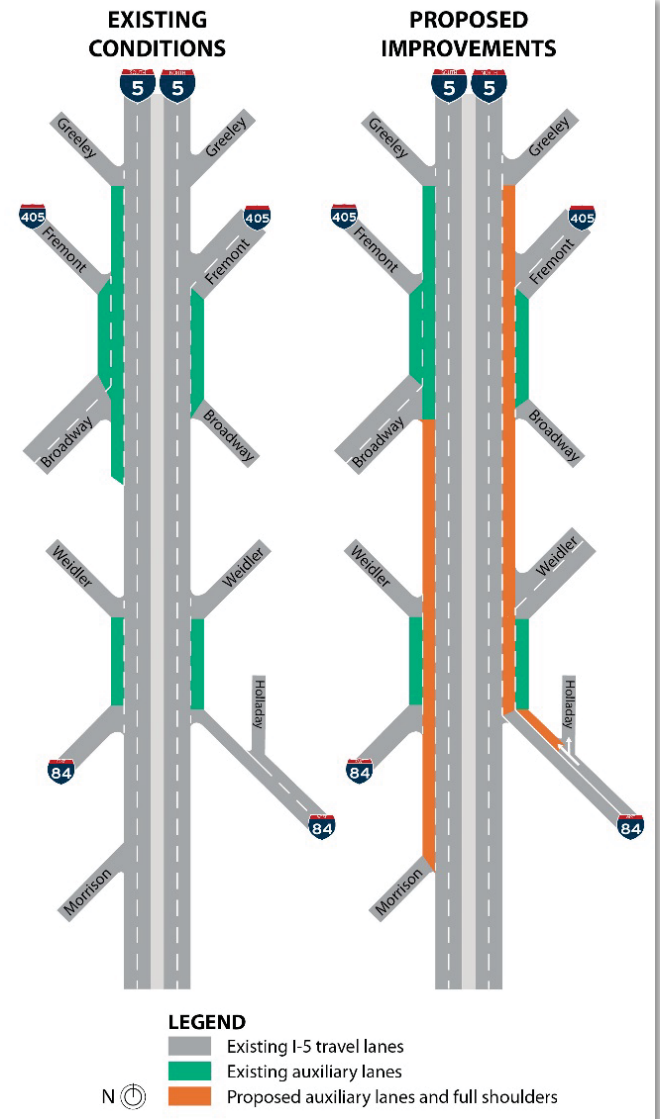
The proposed shoulder design includes continuous right-side and left-side shoulders that will create space for disabled vehicles to move out of through traffic, and allow emergency vehicles to respond more quickly to emergencies within or beyond the Rose Quarter area, thus increasing safety and improving operations on the highway.

FREEWAY ON/OFF-RAMPS

The Project estimate documented in this report includes the following ramp improvements:

- Reconstructing the existing N/NE Broadway and NE Weidler Street interchange ramps
- Relocating the I-5 SB on-ramp for NE Wheeler Avenue to NE Weidler Street
- Realigning the I-5 NB to NE Weidler Street exit ramp
- Realigning the I-5 NB to I-405 SB exit ramp

Figure 2-3 Existing and Proposed Mainline Improvements



BRIDGES

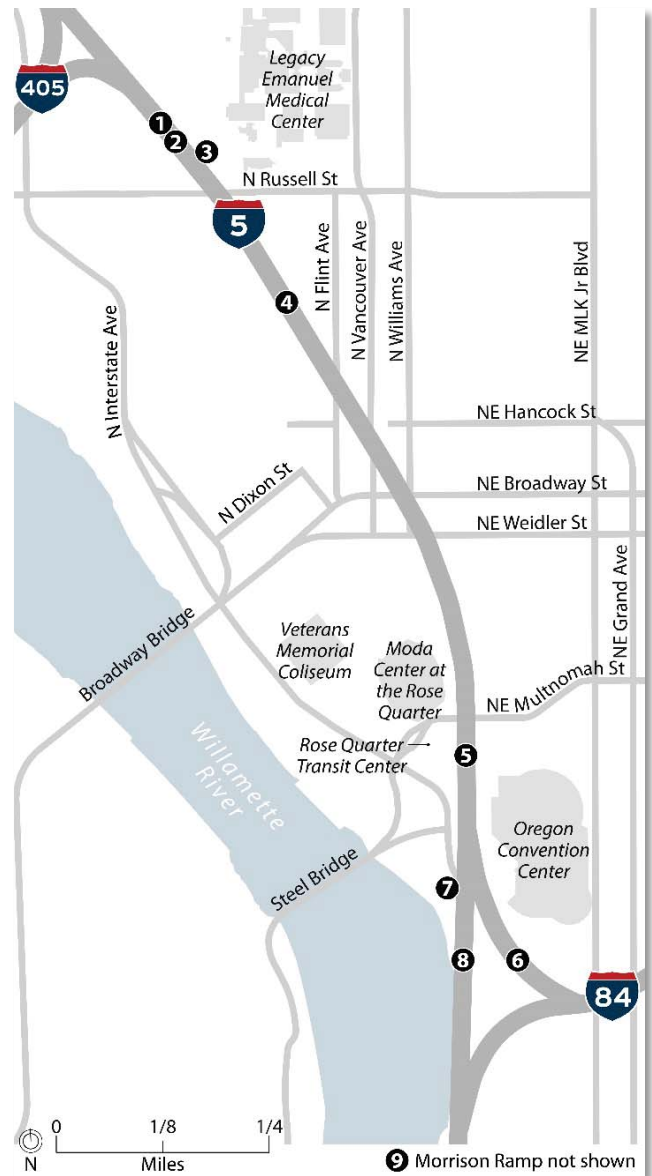
The Project's current cost estimate assumes that the following existing bridges will be improved to structurally support the addition of auxiliary lanes and shoulders.

1	Bridge No. 16358, NB Hwy 1 to N Greeley Avenue over City Streets, milepost (MP) 302.98
2	Bridge No. N8958A, Fremont Viaduct, Hwy 1 NB, MP 302.99
3	Bridge No. 08958E Hwy 1 NB to Hwy 61 SB over E Fremont Interchange, MP 303.02
4	Bridge No. 08782A, Eliot School Viaduct, Hwy 1, MP302.65
5	Bridge No 08583, Hwy 1 over NE Hassalo Street and NE Holladay Street, MP 301.99
6	Bridge No. H8588A, Hwy 2 WB MP 0.24
7	Bridge No. 08588C, Hwy 1 SB to Hwy 2 eastbound (EB) over Hwy 1 and connections (Banfield Interchange), MP 301.65
8	Bridge No. S8588E, Hwy 1 SB over Union Pacific Railroad (UPRR), MP 301.70
9	Bridge No. R8588E, Hwy 1 SB #7 to SE Morrison Street (Morrison Interchange), MP 301.81

Mainline Bridge Considerations

Existing load ratings indicate that some structural bridge crossbeams may require strengthening to satisfy permit vehicle load requirements. The Project currently assumes that three bridges may be affected. These bridges are 08588C Highway 1 SB to Highway 2 EB over Highway 1 and connector (Banfield Interchange), 08782A Eliot Viaduct, and N8958A Fremont Viaduct Highway 1 NB. Project improvements include strengthening these existing structural crossbeams only if the addition of auxiliary lanes and shoulders causes greater stress than what currently exists.

Figure 2-4 Proposed Bridge Improvements along I-5

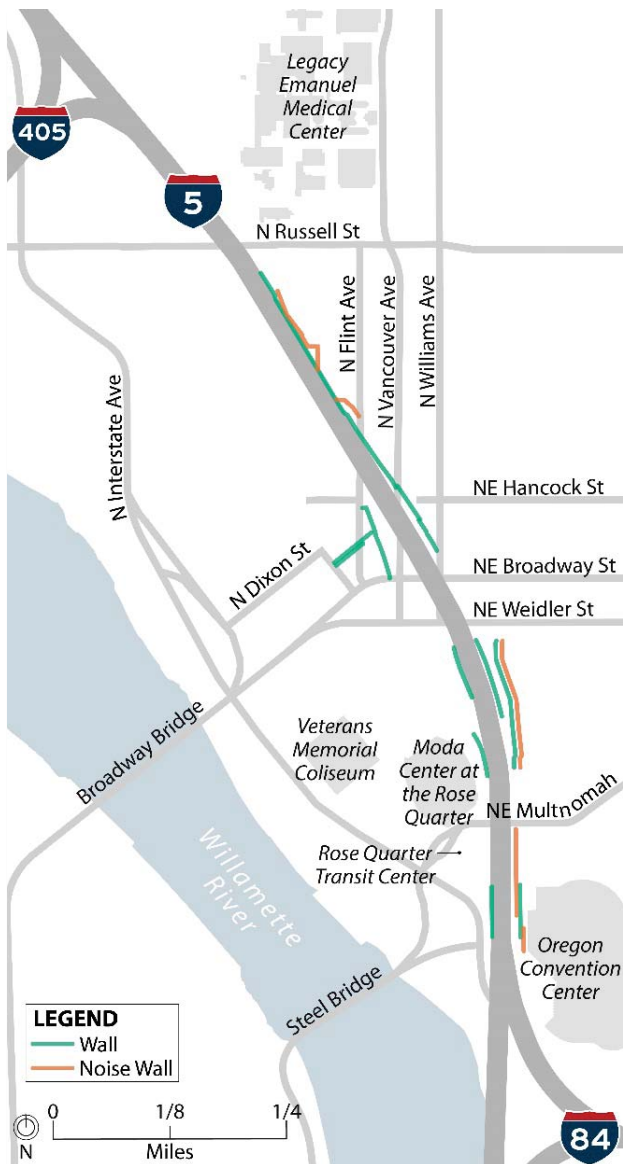


RETAINING WALLS

Retaining wall construction along the I-5 mainline within existing ODOT right-of-way (ROW) is needed to provide room for the NB and SB auxiliary lanes, as well as accommodate improved on- and off-ramps. As part of the Project's current cost estimate and design assumptions, wall types have been selected based on available preliminary data which includes ground conditions, ROW, constructability, and functionality. Wall types may be modified to provide time and cost savings as design advances, and once a CM/GC is selected.

Figure 2-5 shows preliminary wall locations.

Figure 2-5 Preliminary Mainline Wall Locations



PAVEMENT

The Project's current cost estimate assumes that the existing roadway section will be constructed with new continuously reinforced concrete pavement (CRCP). CRCP has a lower long-term maintenance cost than asphalt because of its reduced maintenance frequency and longer overall service life. Use of CRCP also results in improved safety for construction and maintenance staff, as well as less exposure of the traveling public to work zones.

FREEWAY ILLUMINATION

The Project cost estimate assumes the existing freeway and ramp illumination system will be replaced with new illumination service cabinets, conduit, wiring, cobra-head style luminaires, street light poles, and foundations. As design concepts continue to be refined, a detailed lighting analysis will be performed to evaluate light levels for the interchange areas and freeway mainline to meet current code and safety requirements.

INTELLIGENT TRANSPORTATION SYSTEMS (ITS)

The Project's current cost estimate includes an opportunity to install a fiber optic trunk line along the I-5 mainline through the Project area that would provide additional redundancy to the regional Intelligent Transportation Systems (ITS) network. It would also provide a readily accessible connection point for future ITS devices. This assumption will be refined as design advances, and as coordination between ODOT and the City occurs. This installation would provide valuable enhancement to the City's communications infrastructure in the form of redundancy and update of critical communications systems.

TRAFFIC SIGNALS

The current Project estimate assumes that traffic signals will be designed so they meet the maintaining agency's standards and that interconnect on local streets will be designed to meet the City's standards. As design progresses, ODOT will continue to coordinate with the City on key features such as traffic signals.

STORMWATER/HYDRAULICS

Stormwater

The Project's current cost estimate provides new stormwater treatment facilities for the affected contributing area. The majority of the existing area does not meet current stormwater treatment requirements. Water quality treatment will be provided onsite, or by treating an equivalent offsite impervious area. The Project's conceptual stormwater management plan proposes providing three water quality facilities along the highway and within ODOT ROW to meet the Project's stormwater management requirements.

Hydraulics

The current Project estimate includes both temporary and permanent foundations below the Willamette River Ordinary High Water and 100-year floodplain. Additional analysis and certification will be required for any modifications to the floodplain during future design phases.

RIGHT OF WAY (ROW)

The existing I-5 corridor is a highly developed, urbanized area, with extensive development and limited existing freeway. Within the mainline footprint, there are several parcels adjacent to I-5 that will be affected by Project improvements. No homes will be displaced.

As part of the Project's current design progression and estimate in this report, several new and replacement retaining walls are proposed along the I-5 mainline segment of the Project to minimize potential ROW acquisition.

The current Project estimate assumes costs to procure permanent and temporary easements where necessary, especially where coordination with the UPRR is required.

As it reaches the completion of preliminary design, the Project will refine ROW assumptions and needs.

UTILITIES

Existing overhead power transmission lines, gas lines, sewer lines, and street utility poles present staging and construction conflicts, some of which involve retaining wall and noise wall improvements. These conflicts require substantial coordination to preserve the utility and to support Project construction. In addition, existing light rail overhead catenary wires will require temporary and permanent accommodations.

Subsurface Utility Engineering (SUE) exploration and mapping activities will be performed as part of the Project to locate potential conflicts between utilities and new Project elements. These activities will aid in developing avoidance protection or mitigation measures that limit impacts.



2.2.2 HIGHWAY COVERS



INTRODUCTION

The Project estimate presented in this report assumes two highway covers: a north cover and a south cover that connect the local street network, and span over I-5. ODOT has approached the design of the covers to provide space for wide sidewalks, separated bicycle lanes, roads, and new community spaces. The covers would include seismic upgrades, making the structures much more resilient than the current bridges in the event of an earthquake.

The current Project construction sequencing plan assumes that the south cover, the north cover, and the mainline improvements would be constructed at approximately the same time.

Coordination will also occur with FHWA, the City and other stakeholders for the highway covers. Design features for the highway covers are listed below and are described in the following subsections.

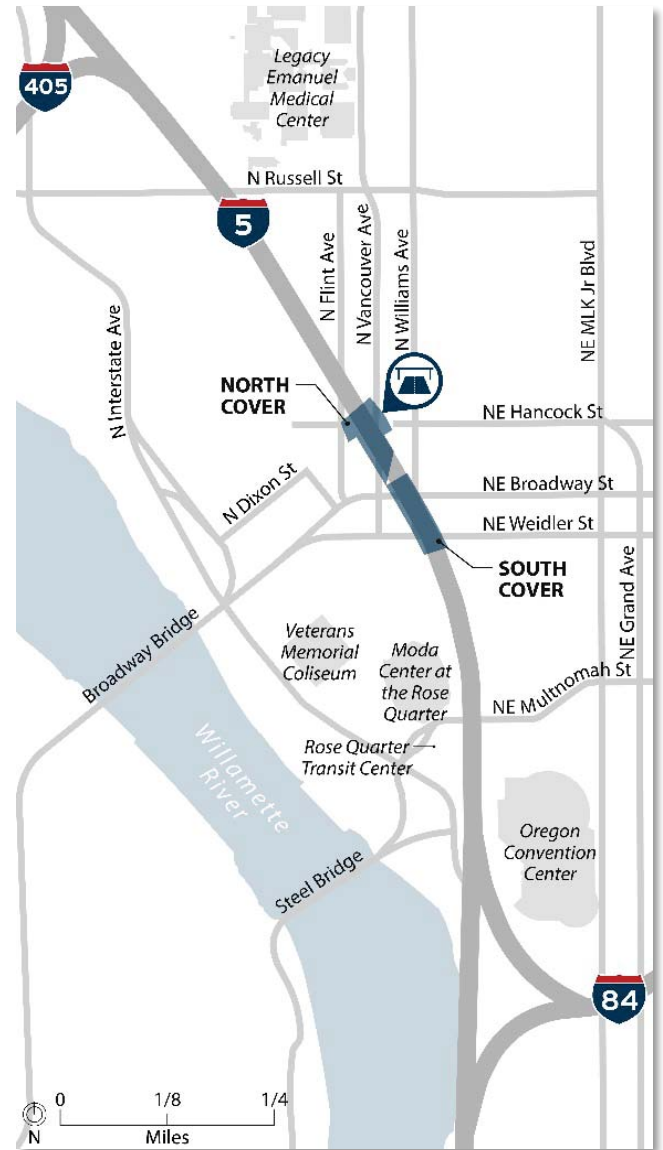
Highway Cover Design Features

- Retaining Walls
- Bridges
- Urban Design
- Intelligent Transportation Systems
- Fire and Life Safety
- Pavement
- North and South Cover Local Street Network
- Stormwater
- Right-of-way
- Utilities

RETAINING WALLS

Within the highway cover footprint of the Project, retaining walls have been identified to support adding the NB and SB auxiliary lanes along the mainline.

Figure 2-6 Project Area Map – Highway Covers



BRIDGES

As part of the cost estimate presented in this report, the Project's highway covers are bridges that span the I-5 mainline. The design of the cover bridges will meet greater structural and seismic ratings than what currently exists, and will include local street improvements and urban design elements. The highway cover structures include the following:

- Bridge No. to be determined (TBD), North Highway Cover (N Vancouver and NE Hancock over Highway 1), MP C302.40
- Bridge No. TBD, South Highway Cover (N Williams, NE Broadway, and NE Weidler over Highway 1), MP C302.33

PAVEMENT

The highway covers will be paved with concrete and the local streets will be paved with asphalt.

URBAN DESIGN

The Project's current design remains consistent with the I-5 Broadway/Weidler Facility Plan, which maintains two separate highway covers, but will have slight shape variations and structural capacities to enable urban design treatments adjacent to the local road alignments. The current design and cost estimate are based on an open cover concept that includes public open spaces. The goal of the current open cover concept is to blend the landscape and uses within the Project area, both on and off the cover structures, with the adjacent urban area in its current and possible future form.

Landscaping

The highway covers will create opportunities to increase the number of street trees, increase the tree canopy in the City, and provide a streetscape with a preferred theme. The benefits of urban street trees include increased safety in walking environments, visual screening, noise reduction, and reduction in the urban heat island effect.

Historic and Cultural Exhibits, Displays and Murals

Within the new highway cover spaces, and along the walkways created by the Project, there is an opportunity to incorporate exhibits, displays, or

murals that are historically relevant and significant to the surrounding community. Selection of exhibits, displays, and murals could be a community-driven process.

Safety

The highway covers create more space for wider sidewalks, bicycle lanes, and pedestrian connections to larger transit stops. The covers allow for landscape areas and street trees, which buffer pedestrians from auto traffic on the local roads and the highway below.

INTELLIGENT TRANSPORTATION SYSTEMS (ITS)

The approach for ITS systems is consistent with the approach for ITS systems described as part of the I-5 mainline improvements in Section 2.2.1 of this report.

FIRE AND LIFE SAFETY (FLS)

FLS systems are assumed as part of the cost estimate presented in this report. FLS systems for the highway covers now include active components, and a more responsive system overall. These changes result from revisions to, and incorporation of, the NFPA code and the need to adhere to FHWA requirements to allow hazardous cargo movement along I-5.

FLS systems are required to satisfy code requirements for the safe egress of people and structural protection during events. Preliminary FLS analyses indicate that these system requirements include the following:

- Early detection
- Early notification
- Median wall exits
- Fire-resistant cover board
- Water-based fixed fire-fighting system
- Other required components

Additional FLS analyses will be completed as the design for the highway covers progresses. All preliminary FLS features and systems are working assumptions until an Authority Having Jurisdiction is appointed and provides authoritative FLS direction for the Project.

Variable Message Signs (VMS)

As part of the FLS systems, variable message signs (VMS) signs are assumed as part of the cost estimate presented in this CTC report. VMS will be installed to actively manage traffic demand and facilitate incident response operations through the I-5 NE Broadway/NE Weidler Street interchange at the following locations:

- SB
 - VMS on I-405 NB before its interchange with I-5 SB
 - VMS on I-5 SB before the north cover
 - ITS sign over each lane on I-5 SB at the portal of the north cover (these will display symbols to direct drivers to change lanes when a lane is closed or blocked)
- NB
 - VMS on I-84 WB before its interchange with I-5 NB
 - VMS on I-5 NB before the south cover
 - ITS sign over each lane on I-5 NB at the portal of the south cover (these will display symbols to direct drivers to change lanes when a lane is closed or blocked)

NORTH AND SOUTH COVERS LOCAL STREET NETWORK

The north and south covers include the City's local street network within the Broadway/Weidler interchange area. The current Project estimate assumes that this network includes Portland Streetcar (Streetcar) on NE Broadway and NE Weidler Street, as well as several north-south and east-west bus lines (TriMet), and one express bus service between the Lloyd District and Vancouver, Washington (C-Tran). These areas exclude the I-5 mainline.

As part of the cost estimate in this report, design elements for the local street network for the north and south covers include:

- Removal of the existing overcrossing structures at NE Weidler Street, N/NE Broadway, and N Williams Avenue, and replacement with a single highway cover structure over I-5
- Removal and replacement of the existing N Vancouver Avenue overcrossing structure with a second highway cover over I-5, including a new roadway crossing at N Hancock Street and

N Dixon Street between N William Avenue and N Wheeler Avenue

- Removal of the existing overcrossing structure at N Flint Avenue
- Upgrades to existing pedestrian and bicycle facilities, including a new center median pedestrian and bicycle path on N Williams Avenue between NE Weidler Street and N/NE Broadway
- Reconstruction of NE Weidler Street and N/NE Broadway with upgraded pedestrian and bicycle facilities, matching the City's reorganized cross section of NE Weidler Street and N/NE Broadway at the east and west ends of the Project

Portland Streetcar

As part of the Project team's efforts to effectively assess and inform design decisions for the transit network within the City, Streetcar and TriMet have been actively participating in design. The local street network within the area of the north and south highway covers includes operation of Streetcar on N/NE Broadway and N/NE Weidler Street. In its final configuration, Streetcar would operate in the same alignment as what currently exists on N/NE Broadway and N/NE Weidler Street.

Key assumptions for Streetcar service include:

- Streetcar stations will not be relocated with the Project
- Continued coordination with Streetcar and the City is necessary to maintain operations during construction.

Refer to Section 4 for a description of current Streetcar operation assumptions and options during construction.

TriMet

The south and north highway covers include several bus lines that operate on N Vancouver Avenue, N Williams Avenue, NE Broadway and N/NE Weidler Street, and NE Multnomah Street. Impacted bus stops will be replaced at, or near, their existing locations. Coordination of design details with C-Tran and TriMet will continue throughout design of the Project. Refer to Section 4 for a description of current TriMet operation assumptions and options at the Rose Quarter transit station during construction.

STORMWATER

The Project estimate presented in this report includes stormwater treatment for the local street network that is within the footprint of the highway covers, and within ODOT ROW and City ROW in the Project area.

The conceptual stormwater plan, within the City's storm-only system, is to provide water quality treatment within stormwater planters or basins that are located within the furnishing/landscaping zone, and adjacent to the roadway. Other opportunities within the Project basin area may exist outside of the street landscape buffer zone. Those opportunities will be analyzed as the Project progresses and discussions with the City's Bureau of Environmental Services are conducted.

RIGHT OF WAY (ROW)

The Project's current ROW considerations within the footprint of the highway covers are consistent with the ROW assumptions that were developed during prior planning as part of the I-5 Broadway/Weidler Facility Plan and the NEPA phase of the Project. The current Project estimate assumes the use of retaining walls to avoid or minimize potential ROW impacts. Additional ROW investigation, including permanent parking impacts, property access, and temporary construction impacts, will be evaluated as part of the Project's future design development. No homes will be displaced.

UTILITIES

The local street utility system within the highway cover footprint accommodates both subsurface, street-level, and overhead utilities including sewer lines, gas, water, communications, and power. As part of cost estimate presented in this report, the Project approach includes close coordination with utility providers to maintain continued service, and to reconnect utilities that will be relocated due to construction impacts.



2.2.3 CLACKAMAS PEDESTRIAN AND BICYCLE CROSSING



INTRODUCTION

The Project estimate presented in this report includes construction of the Clackamas Pedestrian and Bicycle Crossing over the I-5 mainline. The Clackamas Pedestrian and Bicycle Crossing over I-5 originates from a coordinated effort between ODOT and the City to involve the community by creating a dedicated path and safe travel experience for people who walk and bike.

This bridge would also connect to the City's larger pedestrian and bicycle network. As assumed in the cost estimate presented in this report, this bridge would connect NE Clackamas Street near NE 2nd Avenue to the N Williams Avenue/N Ramsay Way /N Wheeler Avenue area.

Coordination will also occur with FHWA, the City and other stakeholders for the Clackamas Pedestrian and Bicycle Crossing. Design features for the Clackamas Pedestrian and Bicycle Crossing are listed below and are described in the following subsections.

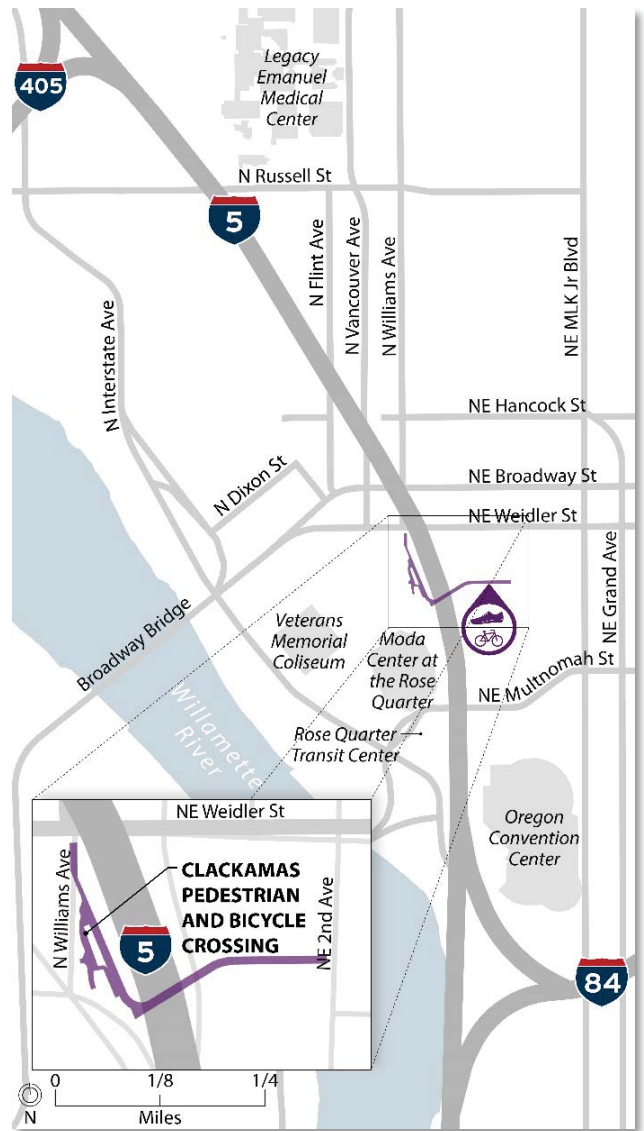
Clackamas Pedestrian and Bicycle Crossing Design Features

- Bridge
- Retaining Walls
- Pedestrian and Bicycle Paths
- Urban Design
- Right-of-way
- Illumination

BRIDGE

The Clackamas Pedestrian and Bicycle Crossing provides a connection for pedestrians and bicycles from NE Clackamas Street on the east side of I-5 to the Moda Center area, and N Williams Avenue on the west. The current cost estimate assumes a cast-in-place concrete structure which allows for an aesthetic and affordable bridge solution. Protective railing and fencing are currently assumed as part of the bridge's design to protect pedestrians and bicyclists while using the bridge.

Figure 2-7 Project Area Map – Clackamas Pedestrian and Bicycle Crossing



RETAINING WALLS

Retaining wall construction is assumed as part of the estimate presented in this report for the Clackamas Pedestrian and Bicycle Crossing. The approach for identifying and selecting wall types is consistent with the approach described in Section 2.2.1 of this report.

PEDESTRIAN AND BICYCLE PATHS

As part of the shared effort between ODOT and the City to improve the City's multimodal facilities, the Project cost estimate assumes construction of the Clackamas Pedestrian and Bicycle Crossing. This connection is part of a long-term vision for enhancing pedestrian and bicycle access, including an alternate crossing of I-5. Within the City's infrastructure, bikeways are intended to provide safe, direct, seamless, and efficient bicycle travel through, and across, districts. They are designed to accommodate large volumes of bicyclists and minimize delays by emphasizing the movement of bicycles.

The Project's proposed active transportation network improvements emphasize safety and direct connections to destinations whenever possible. These improvements are intended to provide the shortest and safest path for people walking and bicycling through the district, and are also intended to minimize multimodal conflicts. Further investigation and development of design assumptions will occur as Project design advances in coordination with FHWA, the City, stakeholders, and the community.

URBAN DESIGN

The Project's cost estimate assumes treatment for the Clackamas Pedestrian and Bicycle Crossing consistent with a broader Project-wide urban design vision.

RIGHT OF WAY (ROW)

East of I-5, permanent ROW acquisition for the new Clackamas Pedestrian and Bicycle Crossing is assumed in addition to temporary construction easements for construction of the proposed facilities. No homes will be displaced.

ILLUMINATION

Interagency coordination between ODOT and the City is required to ensure that illumination design meets local and federal standards and provides optimal, safe lighting that properly illuminates pedestrians and bicyclists for user safety.



2.2.4 MULTIMODAL LOCAL STREET IMPROVEMENTS



INTRODUCTION

Consistent with the City's I-5 Broadway/Weidler Facility Plan, the Project estimate presented in this report prioritizes multimodal facilities according to the following: walking, transit, and biking. Multimodal features support a more connected community by creating a safe travel environment within the Rose Quarter and Albina communities.

The multimodal improvements presented in this report are intended to provide a strong pedestrian circulation network that promotes pedestrian activity by creating safe and convenient access to local destinations and transit facilities, including improved pedestrian and bicycle access to transit (Streetcar, TriMet bus, and TriMet MAX lines).

Proposed Project improvements to the active transportation network improvements emphasize safety and direct connections to destinations wherever possible. They are intended to provide the shortest and safest path for people walking and bicycling, and are also intended to minimize multimodal conflicts. The current design of pedestrian and bicycle paths will continue to evolve as the Project design advances.

Multimodal and local street design features are listed below and are described in the following subsections.

Multimodal Local Street Design Features

- Local Street Network
- Pedestrian and Bicycle Paths
- Traffic Signals
- Local Street Illumination
- Pavement
- Retaining Walls
- Stormwater
- Right-of-way
- Utilities

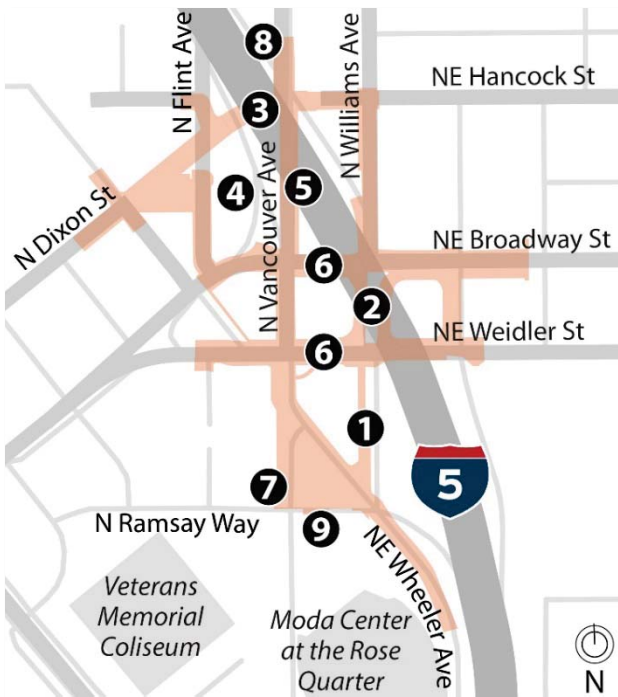
Figure 2-8 Project Area Map – Multimodal Local Street Improvements



LOCAL STREET NETWORK

In partnership with the City, the Project's transportation improvements allow the City to implement the development goals for the north/northeast area and realize the key elements of the CC2035 Plan. Multimodal improvements are intended to provide a strong pedestrian circulation network and would improve community connections through redesigned overpasses and reconnected neighborhood streets, enhanced public spaces, and promotion of economic development opportunities.

Figure 2-9 Enlarged Project Area Map – Local Street Improvements



1	Modifying N Williams Avenue between N Ramsay Way and NE Weidler Street for pedestrians, bicycles, local access, and public transit (bus) use only
2	Revising N Williams Avenue between NE Weidler Street and NE Broadway to a two-way street (two NB lanes and two SB lanes) with an approximate 36-foot-wide median multiuse facility for pedestrian and bicyclists
3	Extending NE Hancock Street west, connecting it to N Dixon Street on the N Vancouver Avenue/N Hancock Street highway cover, providing a new east/west connection to pedestrians, bicycles and vehicles; removing N Flint Avenue (and structure) between N Tillamook Street and NE Broadway
4	Adding a new multiuse path connecting the new Hancock-Dixon road crossing to the intersection of N Flint Avenue and NE Broadway
5	Reconnecting N Vancouver Avenue between NE Hancock Street and NE Broadway
6	Upgrading existing bicycle and pedestrian facilities on NE Broadway and NE Weidler Street within the Project area with wider, separated bicycle lanes
7	Adding a new multiuse path (shared use/bidirectional sidewalk-level bicycle lane with separated sidewalk) on NE Wheeler Avenue between N Ramsay Way and NE Multnomah Street
8	Adding a new access pathway between NE Flint Avenue and NE Vancouver Avenue, which may serve as a future multiuse path as considered in the I-5 Broadway/Weidler Facility Plan
9	Providing local street modifications to improve Moda Center event management due to I-5 SB on-ramp relocation

The current Project cost estimate also assumes the following multimodal improvements:

- Construction of the Clackamas Pedestrian and Bicycle Crossing, a new bridge over I-5 connecting N Ramsay Way on the west and NE Clackamas Street (see Section 2.2.3 above)

PEDESTRIAN AND BICYCLE PATHS

The Project's proposed improvements to the active transportation network emphasize safe and direct connections to destinations whenever possible. These improvements are intended to provide the shortest and safest path for people walking and bicycling, and are intended to minimize multimodal conflicts. They are designed to accommodate large volumes of bicyclists and minimize delays by emphasizing the movement of bicycles.

In conjunction with the City, as the Project design advances, the Project will develop furnishing zones, frontage zones, buffers, pedestrian and bicycle widths, pedestrian and bicycle mixing zones at intersection crosswalks, and transit.

As discussed in Section 2.2.3 of this report, the Clackamas Pedestrian and Bicycle Crossing is also assumed as part of the Project's improvements to the local street network. This bridge is for pedestrians and bicycles only and would cross over I-5, connecting N Ramsay Way on the west and NE Clackamas Street on the east.

Design Improvements for Pedestrian and Bicycle Paths

The Project assumes the following pedestrian and bicycle improvements within the local street network:

- Protected bicycle lanes on NE Broadway and NE Weidler Street from N Wheeler Avenue to N 1st Avenue, creating a safer bicycling environment for east-west travel through the Project area
- Safer connections for north-south bicycle travel by providing a direct, seamless, and efficient bicycle route between N Williams Avenue/NE Hancock Street and destinations to the south including the Steel Bridge (these connections include a continuous, dedicated right-side running bike lane on N Vancouver Avenue from NE Hancock Street to NE Weidler Street to accommodate the removal of N Flint Avenue; currently, buses and bicycles

Figure 2-10 Shared Use Path Concept – N Williams Avenue between NE Weidler Street and N Broadway



share a lane between NE Broadway Street and NE Weidler Street)

- Retained existing on-street bicycle circulation with enhanced treatments and refined intersection solutions
- A refined NE Hancock Street/N Dixon Street overcrossing with a lower grade to facilitate accessibility between N Broadway and NE Hancock Street/N Dixon Street

TRAFFIC SIGNALS

The Project will design traffic signals to meet the maintaining agency's standards. Although the City's standards for traffic signals are in general alignment with ODOT's standards, there are some key differences that will affect cost and other early design development factors, including ROW, geotechnical needs, and operations. As design progresses, close coordination will continue to occur with the City on key design features such as traffic signals. Coordination will also occur with FHWA for proposed bicycle signals on N/NE Broadway and on NE Weidler Street.

As part of the current Project, it is understood that the City will mostly own, operate, and maintain traffic signals and interconnect on local streets after the Project is constructed. As the design advances, assumptions for traffic signal ownership will be refined.

LOCAL STREET ILLUMINATION

The Project would impact several styles of existing local street luminaires, thus requiring coordination and reinstallation.

Safe User Experience

To ensure that the local street illumination design meets local and federal standards and provides safe, optimal lighting for the new or reconstructed roadways, and also meets contracting requirements, ODOT, FHWA, and the City will need to engage in interagency coordination. Project design will consider proper illumination for pedestrians and bicyclists as directly related to user safety for all users. Primary illumination coordination items for the Project include:

- Illumination methodology analysis and targets
- Illumination equipment
- Special provisions and specifications
- Luminaire placement
- Illumination quality and color

PAVEMENT

It is assumed that the existing, full-depth pavement will be removed and reconstructed on all impacted streets where new street grades are required. For portions of the existing roadway that are immediately adjacent to, or paralleling, local streets, existing travel lanes will include a grind and inlay rather than full-depth pavement reconstruction. Future Project design efforts will include detailed pavement design, including conducting field explorations and traffic analysis, in coordination with FHWA, the City, stakeholders, and the community.

RETAINING WALLS

As part of the cost estimate provided in this report, retaining wall types for the local street network have been identified based on City standards and available preliminary data which includes ground conditions, ROW, available space, constructability, and functional application. As design advances, and once a CM/GC is selected, wall types may be modified.

STORMWATER

Stormwater treatment for the roadways within City's ROW on local streets will follow the same approach that is identified for the highway cover area in Section 2.2.2 of this report.

RIGHT OF WAY (ROW)

ROW impacts within the local street network west of I-5 primarily will include temporary construction easements, but there will also be some permanent acquisition. No homes will be displaced.

East of I-5, permanent ROW acquisition for the new Clackamas Pedestrian and Bicycle Crossing is assumed, in addition to temporary construction easements for construction of the proposed facilities. Current ROW design assumptions are consistent with the assumed ROW needs developed during the NEPA phase of the Project.

UTILITIES

There are a number of existing utilities along local city streets that require utility conflict identification, protection, and relocation strategies.

3 RISK AND SCHEDULE ANALYSIS

Active risk management supports the Project team in anticipating, tracking, managing, assigning ownership and collaboratively mitigating risks that could impact Project cost and schedule. ODOT is using risk analysis to focus efforts on areas that pose the greatest opportunity to affect the Project.

3.1 PROJECT RISK AND MITIGATION STRATEGY

The Project is early in design (approximately 15 percent) and the final 30 percent design is currently expected by summer 2021. There is a high likelihood that new risks will be identified and managed as design progresses.

Based on collaborative risk workshops the Project has conducted to date with ODOT, FHWA, the City, the A&E design consultant, the IE, and the owner's representative, the Project team is actively tracking and working to mitigate risks. The following subsections categorize and discuss the risks.

The Project team is employing several strategies for risk mitigation, including:

- **Risk workshops** held at the 15 percent, 30 percent, 60 percent, and 90 percent design milestones. The primary purpose of these risk workshops is to evaluate and refine Project risks with up-to-date information, add and retire discrete risks based on design progression and understanding, and develop mitigation strategies to alleviate or minimize the effects of risk.
- **VE workshops** held at the 30 percent and the 60 percent design milestones to evaluate and employ potential ideas and innovative solutions that ultimately reduce overall Project cost and risk exposure.
- **Risk management meetings** held on an ongoing basis to facilitate a continual focus on real-time risk tracking and mitigation, instead of considering risk only at design milestone and formal review periods.

The CM/GC delivery method allows the Project team to capitalize on early contractor input during the design phase, which reduces overall Project risk by supporting a buildable design. The CM/GC's

anticipated constructability input will help to incorporate suggested or selected means and methods into the Project design that avoid or reduce risk and result in buy-in from the contractor before beginning work.

3.1.1 QUANTITATIVE RISK ASSESSMENT

The owner team is using quantitative risk assessment and simulation exercises to identify and quantify discrete risks that may occur, and the associated potential impacts on the Project's overall cost and schedule. By identifying discrete risks, the management team is better equipped to mitigate risks to control cost, establish total Project cost earlier, and avoid surprises during later stages of the Project.

3.1.2 RISK CONTROL AND MONITORING

Early risk identification and mitigation serves to avoid or minimize notable redesign costs. In addition to daily awareness of risk mitigation, the Project team meets bimonthly in risk-focused meetings to review the risk register. In these meetings, key Project personnel review up-to-date risks, discuss any mitigation that has occurred during the last period, and assign new risk items when applicable. All identified Project risks are captured on the risk register, whether identified through a formal work session, in bimonthly risk-focused meetings, or through during day-to-day discussions. Risks are discussed regularly to verify that the Project incorporates mitigation strategies.

Risk categories for Project tracking, management and mitigation include:

- Construction
- Contracting and procurement
- Design
- Environmental/hydraulics
- Management and funding
- Right-of-way
- Structures and geotechnical
- Utilities

3.2 PROJECT SCHEDULE

The Project is on a trajectory to transition from the NEPA phase into the design phase. The design phase is expected to continue until the end of 2022. During this phase, it is anticipated that the CM/GC will be brought onto the Project team and will perform several early work packages (EWPs) beginning in the summer or fall of 2021. This will help condense the overall Project schedule by accomplishing early work to clear the path for future work on the Project. EWPs

could include utility relocations, building/structure demolition for site preparation, and other similar operations.

The CM/GC is expected to begin construction of EWPs in 2021 and main construction in 2023, continuing through 2027, assuming no changes in direction from the OTC. The ultimate phasing of the Project will be informed by input from the CM/GC.

Figure 3-1 Programmatic Project Schedule



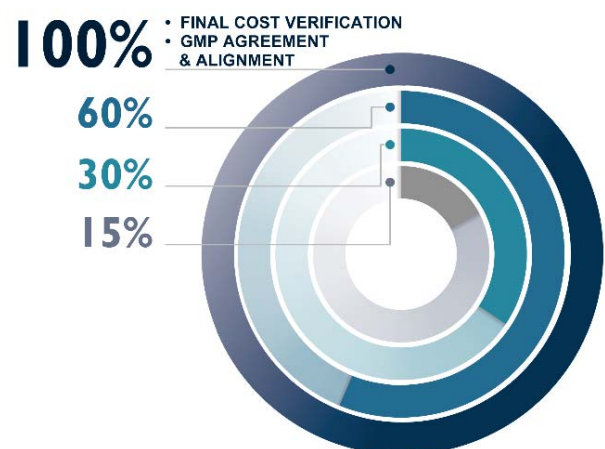
House Bill 2017 Milestones Source: I-5 Rose Quarter Improvement Project - Project Review Workshop Final Report

- 1 **Dec 2019:** Status Report to Legislature (*Complete*)
- 2 **Feb 2020:** Report to Joint Committee - Cost to Complete
- 3 **Jan 2022:** HB 2017 Funding Begins

3.3 INDEPENDENT COST ESTIMATING PROCESS

The Project's cost estimating process is structured to develop, assess, and reconcile three independent estimates from the IE, owner's representative and CM/GC at each design milestone (Figure 3-2). These estimates are production-based, meaning they reflect independently measured quantities of labor hours, and units of material and equipment, and also capture contractor access and constructability. They further account for actual market-based pricing from material suppliers and subcontractors. ODOT's use of production-based estimates is expected to enhance realistic Project estimating and support reaching a fair and reasonable GMP for the Project.

Figure 3-2 Estimating Milestones



The assumed CM/GC fee percentage and rates for bonds and insurance have been estimated based on recent project experience from the IE, the owner's representative, and ODOT. The current IE and owner's representative estimates were then reconciled to confirm that there were no known scope gaps or differences in the Project phasing approach.

Going forward, at the conclusion of each estimating milestone, the CM/GC and the IE will submit their estimates to the owner team. Neither the CM/GC nor the IE will be privy to the other's estimate. The owner team will compare the CM/GC, the IE, and the owner team estimates, and generate a comparison table that is used to help reconcile the differences.

Potential reconciliation items include:

- Reviewing quantities to verify that all estimates use the same quantities
- Verifying that all labor and equipment rates are accurately updated across the estimates
- Verifying that subcontractor quotes are accurately updated across the estimates
- Reviewing temporary access items to verify that the same general assumptions for approaching the work are incorporated into the estimates
- Reviewing overall scope to verify that the CM/GC, the IE, and the owner team agree on the scope of work that is being priced



4 CONSTRUCTION SEQUENCING

Construction sequencing conveys the general approach to building the Project. This captures the associated schedule, work planning and duration of construction activities. Sequencing for the proposed Project is described below.

4.1 PROPOSED PROJECT

Once onboard, the CM/GC will define a preferred construction sequencing plan. For the purposes of cost estimating, the Project team assumed a reasonable approach to construction sequencing based on the seven zones used for design development. Figure 4-1 shows the construction sequencing by zone, and Figure 4-2 shows the anticipated construction schedule by zone.

The longest path of work – called the critical path – is currently assumed to occur (1) through the foundation work for the north and the south covers, (2) through the mainline improvements within the area of the north and the south covers, and (3) through the City street improvements on and around N Dixon Street.

ODOT's intent is to maintain as many open lanes as is possible on I-5 during construction but the Project may need to periodically use limited closures for efficiency and worker and public safety. To accomplish this in the area of the covers, work will be staged to accommodate traffic. As currently assumed, the cover foundation work will be installed first. Once the outer foundations are installed, the outside portions of the freeway can be excavated, and new lanes can be added adjacent to each of the outer foundations.

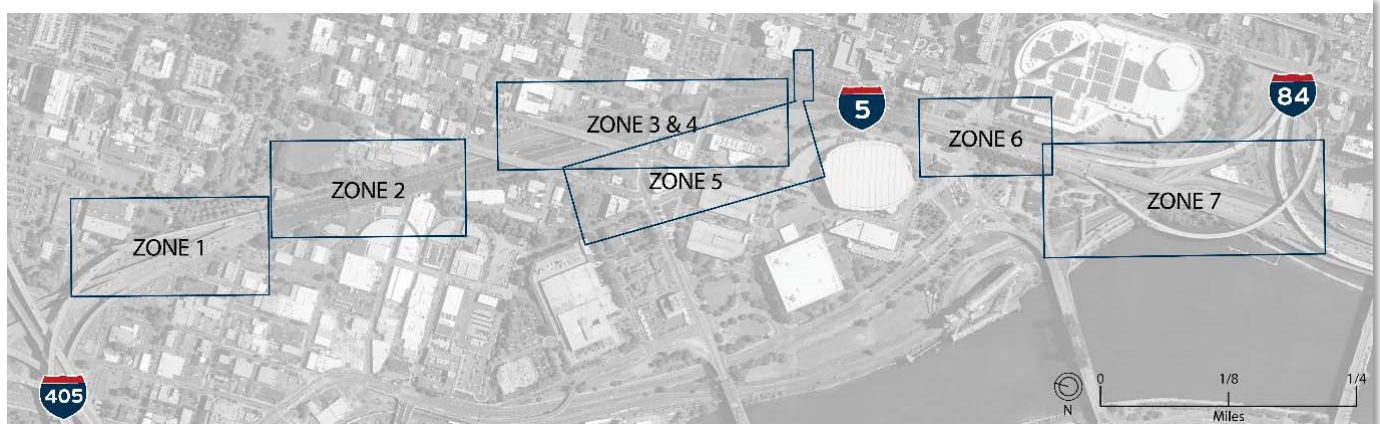
By creating this new space for traffic to occupy, the outside lanes can be used to temporarily manage traffic while the inside lanes are lowered to match the grade of the new outside lanes. During this stage, the interior highway cover foundations will also be constructed. Once this work is completed, construction of local street improvements will begin.

In addition, several Project features will require careful planning to minimize disruption and impacts to various stakeholders within the Project limits. Major stakeholders include Streetcar, TriMet, Moda Center, and Portland Public Schools (PPS), given the proximity of Harriet Tubman Middle School.

As part of the Project estimate presented in this report, the Project assumes that Streetcar tracks will be temporarily removed as part of the Broadway/Weidler interchange demolition to allow for construction of the new south cover. It is currently assumed that Streetcar operation through the Project will be switched to a bus bridge for approximately two to three years. As design progresses, the Project team will also explore implementing a temporary Streetcar track. For the purposes of this report, a bus bridge has been selected because, at this early stage of design, it is expected to be the most cost-efficient solution.

In addition to coordinating with Streetcar, the Project team is working with TriMet to develop an understanding of TriMet's bus service and light rail system. This coordinated effort will promote creative problem solving that could result in time and cost savings while minimizing disruption to transit services. One example would be installing a shoofly

Figure 4-1 Zonal Sequencing for Proposed Project



track, which would allow TriMet's light rail operations to bypass adjacent work at the Rose Quarter transit station while Project work is progressing. A shoofly track would not avoid all impacts to TriMet service, but would allow for the majority of the complex work to occur while TriMet's operations are minimally impacted.

The Moda Center will continue to operate throughout the Project duration. As part of traffic planning, in-depth staging plans are under development to accommodate the Moda Center event schedule as optimally as practicable. It will be imperative to create space to accommodate local street traffic during construction to mitigate inefficiencies in work that would otherwise impact the local street construction progress.

The Harriet Tubman Middle School is located near I-5. As part of the Project, a series of retaining walls and sound walls is proposed directly to the west of the school.

Retaining wall and sound wall work that is planned to occur directly in front of the school will be coordinated directly with PPS. This construction sequencing schedule assumes that I-5 work immediately adjacent to Harriet Tubman Middle School will occur outside of instructional hours. As a result, the wall construction adjacent to the school is assumed to occur over several years.

Figure 4-2 Construction Sequencing Schedule for Proposed Project



5 COST PROGRESSION

5.1 INITIAL PROJECT FUNDING (HB 2017)

Prior to, and during development of HB 2017, ODOT prepared a preliminary Project cost estimate. This preliminary cost estimate was developed prior to a defined delivery schedule and was reflective of construction costs in the most current dollar value at the time, in 2017 dollars. This preliminary cost estimate ranged from \$450 million to \$500 million in 2017 dollars.

Within HB 2017, the Oregon Legislature (herein, State Legislature) statutorily directed \$30 million annually beginning in 2022, and directed the OTC to submit a cost to complete report further detailing the total estimated Project costs.

5.2 UPDATED PROJECT ESTIMATE SINCE HB 2017 – FACTORS AFFECTING COST

Since 2017, the Project team has further developed the design and refined the cost estimate to reflect the anticipated year of construction, new standards, and information learned during the EA process. Based on the current Project delivery schedule, main construction is expected to begin in 2023 with anticipated completion by 2027. Changes in cost from the preliminary 2017 estimate to the cost estimate presented in this CTC report are attributable to the effects of updated code and tax requirements, design progression, technical analysis, and inflation on construction and engineering costs.

Inflation – The 2017 preliminary cost estimate was developed prior to the Project's inclusion within HB 2017 and reflected a construction cost with the best known information and most current dollar value at the time. Inflation was not included in the 2017 preliminary estimate as a construction schedule had not yet been defined for the Project. Since the HB 2017 estimate, inflation has been incorporated into the current Project estimate.

By accounting for the average annual inflation rate, between 3.0 percent and 3.5 percent, and carrying this through to 2025 (the midpoint of construction), the Project's base estimate increases by \$130 million to \$147 million based on inflation.

Fire and Life Safety (FLS) protection – Fire and Life Safety (FLS) systems for the highway covers are now required to include active components, and a more responsive system overall. This results from revisions to, and incorporation of, the NFPA code and the need to adhere to FHWA requirements to allow hazardous cargo movement along I-5. The \$18 million to \$25 million for the highway cover FLS systems are incorporated in the current Project cost.

Technical analysis and design progression – Since 2017, the Project team refined Project design assumptions through both the EA process and by advancing the Project's design into preliminary engineering. The new factors affecting cost include the following:

- Additional ROW, including easements, is needed to accommodate safe and efficient construction access and staging
- Reimbursable utility requirements that are better defined as a result of ongoing discussions with utility providers
- Increased length of retaining walls based on recently obtained ground elevation survey data
- The addition of sound walls adjacent to sensitive noise receptors
- Use of continuously reinforced concrete pavement (CRCP) along I-5 instead of asphalt (CRCP has a higher initial cost but a significantly lower long-term maintenance cost)

Cost refinements – As part of this cost estimate, the Project team has incorporated more than a dozen cost reduction measures that continue to improve safety and modal performance. ODOT will continue ongoing value engineering (VE) efforts during design to include added contractor input and other opportunities to further reduce the overall Project cost. ODOT also anticipates revenue from the sale of surplus property at the conclusion of Project construction. Estimates of the surplus value will be developed as part of the transition from design to construction by 2023.

Table 5-1 compares the preliminary 2017 cost estimate to a range of current Project costs. The range is reflective of the following factors:

Low End of Range (\$715 million)

- Assumed annual inflation rate of 3 percent from 2017 to 2025
- Less variability in quantity and unit price assumptions
- Higher potential for VE – the process used to analyze and determine cost savings solutions – with the CM/GC, when selected to join the team

Upper End of Range (\$795 million)

- Assumed annual inflation rate of 3.5 percent from 2017 to 2025
- More variability in quantity and unit price assumptions
- More limited VE opportunities with the CM/GC, when selected to join the team



Table 5-1 HB 2017 and Current Base Estimate Cost Elements

PROJECT COST SUMMARY



KEY FACTORS AFFECTING COST

- Inflation to adjust from 2017 to 2025 (midpoint of construction)
- Competitive labor market cost
- Added gross receipts tax
- Increased roadwork to enhance accessibility
- Increased structures costs to reflect constructability and market conditions
- FLS code revisions for highway covers
- Design progression, including:
 - Additional ROW
 - Reimbursable utility requirements
 - Retaining wall limits
 - Addition of sound walls
 - Assumed concrete paving on I-5

Description of Cost Change	All values in millions Year of Dollars	Preliminary Cost Estimate (2017)	Base Estimate Range (2025)
TOTAL		\$450.0 to 500.0	\$715.0 to \$795.0
INFLATION			
Updates the 2017 preliminary estimate that had no construction schedule by adding inflation into the current Project estimate. Assuming an annual inflation rate between 3.0% and 3.5% from 2017 to 2025 (midpoint of construction), the Project's base estimate would increase by \$130 million to \$147 million based on inflation.		\$0.0	\$130.0 to \$147.0
RIGHT OF WAY (ROW)			
Incorporates NEPA ROW report findings including additional properties identified for acquisition to accommodate construction access and staging needs. Includes ROW contingency, but does not account for ROW surplus proceeds upon future sale.		\$6.0	\$42.0 to \$52.3
UTILITY REIMBURSEMENT			
Identifies utilities to be reimbursed from ongoing project discussions with utility providers and incorporates NEPA Utility Report findings with cost inflated from 2017 to 2022 (estimated year of expenditure).		\$0	\$7.6
PRELIMINARY ENGINEERING			
Amount for preliminary engineering (PE) changed from 20% (2017) to 15% (current) of construction pay items. Due to the increase in construction cost and inflation, assumed PE costs have increased and include design phase intergovernmental agreements (IGA) and ODOT, owner's representative, A&E design consultant, and IE costs. PE costs include applicable gross receipts taxes.		\$64.0 to \$71.0	\$74.2 to \$81.0
CONSTRUCTION			
Captures: (1) increase in bid item work, (2) roadwork increases due to increased volume of contaminated soils that need to be removed and I-5 paving change from asphalt to concrete, (3) increased extent of structures and retaining walls and addition of sound walls, (4) contingency to capture market conditions, construction variability and unknown conditions, (5) construction engineering (CE), calculated at 15% of contractor cost, and (6) added construction phase IGA's. Construction costs include applicable gross receipts taxes.		\$380.0 to \$423.0	\$461.2 to \$507.1

5.3 PROJECT COST DESCRIPTIONS

5.3.1 COST COMPONENT DESCRIPTIONS

The updated cost estimate presented in this report captures inflation to the anticipated midpoint of construction in 2025 dollars, as well as design refinements since the NEPA public comment period closed on April 1, 2019. Total Project cost is composed of the following components:

- **Contractor cost** is the cost for the contractor to furnish labor, materials, equipment, and subcontractors to perform the work. Contractor cost is composed of the following components and is calculated as follows:

Contractor cost is calculated as $\{[direct\ cost + indirect\ cost] \times fee\} + bonds/insurance$

- **Direct costs** are the cost of the work, primarily conveyed as bid items, of the contractor's labor, materials, equipment, subcontractor costs, and trucking required to build the Project
- **Indirect costs** are also referred to as general conditions, and represent the cost of the contractor's field oversight staff (project manager, safety manager, quality manager, superintendents, etc.), field office, support staff and negotiated risk allowance
- **Bonds and insurance** generally account for 2 percent to 4 percent of total construction contract value. Project bonds potentially include performance and maintenance/warranty. Project insurance may include general liability, marine (in-water work), worker's compensation, professional liability, contractor carried insurance program, builder's risk and railroad protective
- **Fee** applies only to the direct costs (cost of work) and indirect costs (general conditions). The fee covers home office overhead costs including accounting, legal, taxes, office equipment, staff relocation/mobilization, Project cost estimating, etc. It also provides a fair and reasonable profit for the CM/GC. The recent fee range for U.S. heavy highway civil projects is 6 percent to 14 percent.

- **Preliminary engineering (PE) costs** are the Project team costs to design the Project, and for ODOT, the owner's representative, the A&E design consultant, the IE, and Project partners to collaboratively provide input, oversight and quality

assurance of the design process via intergovernmental agreements (IGAs)

- **CE costs** are the Project team costs to collaboratively oversee and inspect construction, provide quality assurance and administer the CM/GC contract for ODOT, the owner's representative, the A&E design consultant, and ODOT partners, via IGAs
- **Utility reimbursements** are the costs of reimbursing utilities (when applicable) for relocation of their utilities as part of the work
- **ROW** are the costs to purchase properties and pay for temporary construction easements necessary for staging and access necessary for building the Project

5.3.2 COST BY DESIGN FEATURE

The Project includes design features that are distinguished by primary modal users in the following four categories: I-5 mainline improvements, highway covers, the Clackamas Pedestrian and Bicycle Crossing, and multimodal local street improvements. See Section 2 for descriptions of design features in each category.

Table 5-2 summarizes a range of costs for each design feature category in 2025 dollars. The low end of the range assumes 3 percent inflation and the upper end of the range assumes 3.5 percent inflation from 2017 to 2025.

Table 5-2 Cost By Design Feature- millions (2025 Dollars)

PROJECT FEATURES	COST RANGE
I-5 Mainline	\$397.8 to \$442.4
Highway Covers	\$257.3 to \$286.0
Local Street Improvements	\$44.2 to \$49.1
Clackamas Pedestrian and Bicycle Crossing	\$15.7 to \$17.5
TOTAL	\$715.0 to \$795.0

5.3.3 RESPONSE TO STAKEHOLDER INTERESTS AND REQUESTS

To date, the Project team has received stakeholder input and/or the following requests to refine the preliminary design to address specific concerns:

- Revised the north cover structure type in response to stakeholder interests to achieve a lower profile for pedestrian and bicycle needs and to reduce the grade of the Hancock-Dixon connection, estimated at \$55.9 million
- Project-wide urban design and aesthetic treatments to meet Project partner and stakeholder expectations, estimated at \$22.2 million
- Enhanced active transportation features along NE Broadway and NE Weidler Street, estimated at \$2.6 million
- Revised traffic circulation to support Moda Center event access, estimated at \$1.2 million
- Revised retaining wall to support a new pedestrian path from N Flint Avenue to N Vancouver Avenue, estimated at \$1.2 million

5.3.4 CONTINGENCY AND BID ITEM VARIABILITY

Contingency represents money carried by ODOT to address possible future events or circumstances that cannot be predicted with certainty and is budgeted as a percentage of construction cost during the early stages of design. As the design advances toward completion, ODOT will use a probability-based contingency amount informed by the Project's unique risk profile. At this early 15 percent level of design, substantial work remains to complete design. There is a strong likelihood that unexpected conditions will be encountered and require resolution. These conditions, whether already identified as potential impacts or completely unknown at this time, need to be anticipated in general terms and quantified as a percentage of the total construction cost.

At the current level of design, the Project team has estimated work quantities that have been validated or refined and priced by professional cost estimators. The quantities are preliminary and not yet based on detailed designs. The expectation as design advances is that quantities will grow as additional details are known. To properly account for the potential for quantity growth, each bid item includes a variability component ranging from +0 percent to +20 percent. The variability factor assigned to each bid

item depends on several factors, including confidence in the quantity estimate, progression of design for the individual item, past experience of team members in seeing quantity growth in certain work types, and work type (i.e. underground versus above ground structure work).

5.3.5 FHWA MAJOR PROJECT COST ESTIMATE REVIEW

The Project is designated by FHWA as a major project, valued at over \$500M and requiring federal assistance. One of the requirements for FHWA-designated major projects is to perform a Project cost estimate review with FHWA. ^v ODOT will use this CTC report to reflect the cost of the Build Alternative per FHWA guidelines. Additional cost estimate reviews with FHWA may be needed to support the preparation of a future financial plan to fulfill FHWA's major project requirements.

5.3.6 ADAPTING TO AFFORDABILITY

ODOT recognizes the potential need to phase the Project given currently available funding. ODOT will seek additional funding and capitalize on the innovation and expertise of the CM/GC to help identify cost saving solutions that continue to provide benefit to the traveling public.

The funding priorities of HB 2017 are focused on reducing congestion in the Portland metropolitan area for commuters and truck freight and improving safety along I-5 between I-84 and I-405.

ODOT will continue to identify and seek additional federal, state, and local funding and partnership opportunities.

5.3.7 ADDITIONAL REQUESTS

Some stakeholders have requested expanded highway covers to accommodate a wider range of uses including, but not limited to, multistory buildings. As these requests are beyond the current Project scope and are not yet sufficiently defined, any costs of design, engineering, and construction of expanded covers are not contemplated in this CTC report. Preliminary estimates suggest a range of \$200 million to \$500 million of additional cost to design and build expanded covers, depending on the required length and strength of the covers. Much of the cost is attributed to providing the structural capacity to accommodate the weight of the buildings.

To maintain the Project's current delivery schedule and begin main construction in 2023, a final decision regarding the expanded highway covers must be made no later than June 2020. The potential for expanding the scope of the highway covers will require community engagement and input and support from stakeholders.

Stakeholders also requested additional technical analysis of the Project, including preparing an Environmental Impact Statement (EIS), as well as the development of an advisory group to guide the Project and an independent evaluation of the highway covers. The Project team anticipates direction from the OTC to address these issues.

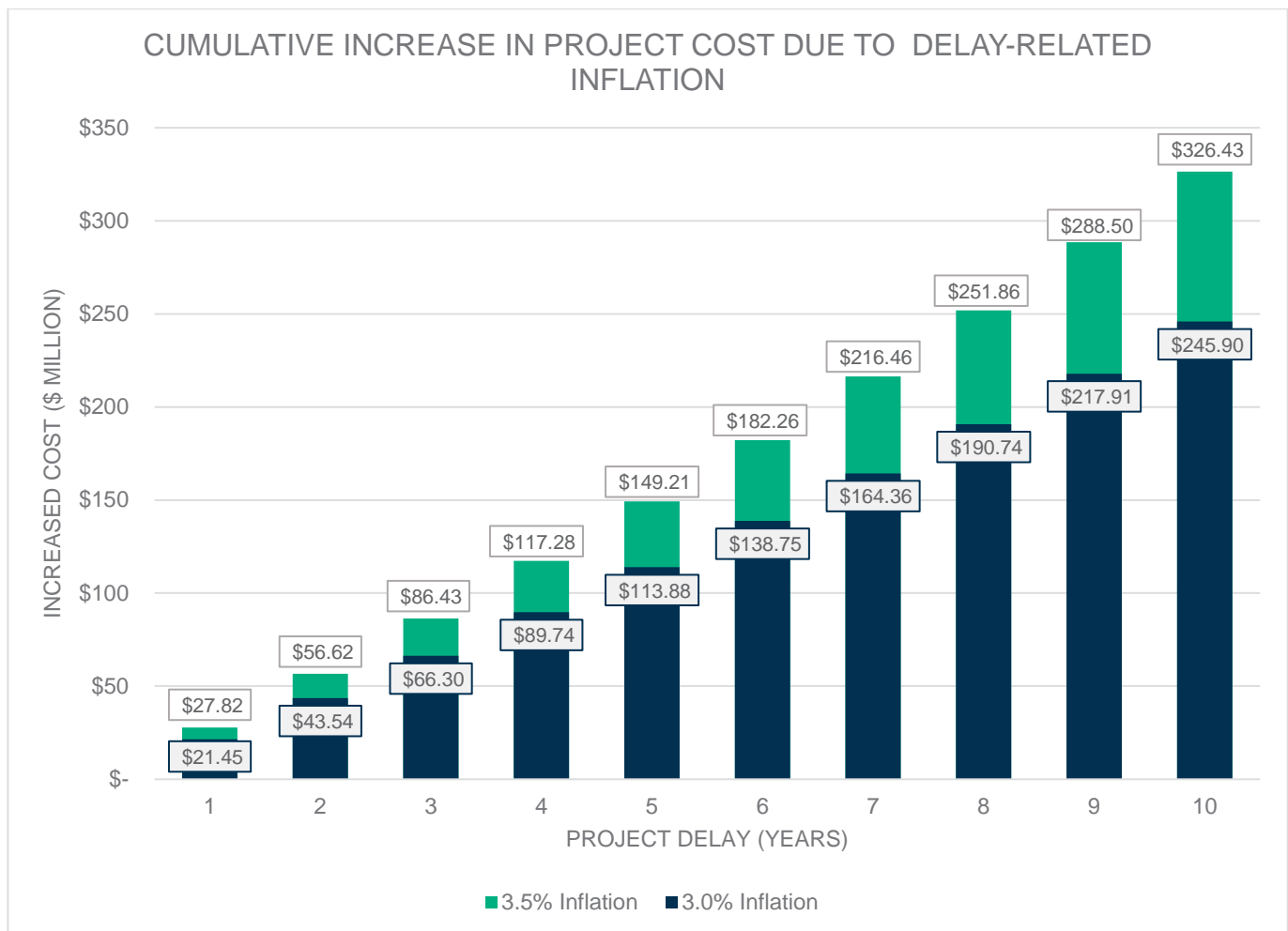


5.4 INFLATION EFFECT OF DELAYS

The base Project cost presented in this report is estimated to range from \$715 million to \$795 million in year 2025 dollars at a 70th percentile. This means that there is a 70 percent probability that the final Project cost will be within, or less than, this range for the current Project scope. Figure 5-1 summarizes the cost impact from inflation if the Project incurs delays, with a range of inflation from 3.0 percent to 3.5 percent.

This cost estimate assumes the current Project schedule based on completion of the Project's EA. If the Project is required to undertake an EIS, the Project would be delayed by approximately three years. A three-year delay would incur an additional \$66.3 million (3.0 percent inflation) to \$86.4 million (3.5 percent inflation) in delay-related inflation cost, plus an additional \$10 million to \$15 million for the cost to prepare and deliver the EIS.

Figure 5-1 Delayed-Related Inflation Curve



6 EQUITY BY DESIGN

6.1 EQUITY DURING DESIGN

Equity has been an integral component of early Project design, and will continue to be throughout all design phases and construction. Equity is significant in informing design decisions and direction. Throughout Project delivery, the team will intentionally listen, inform, and engage communities of color, especially historically impacted African American communities. These principles relate to design decisions as well as how the Project team conducts community engagement. The Project team will use an iterative community engagement approach to inform design decisions so the Project reflects community values.

Specifically, the Project team will incorporate equity into the design of each of the corridor's areas by considering:

- Potential benefits of cultural context for communities of color, especially the African American community
- Safety and connectivity for all modes of travel
- Air quality and health
- Youth and elderly
- Community connections
- People who rent
- People who depend on walking, biking, and transit as their modes of transportation
- Affordable housing
- Historic buildings and districts
- Economic benefit to the immediate and surrounding communities

The owner team will provide design oversight of the A&E design consultant's work as related to the following components of the Project, each of which will integrate equity by design into daily work:

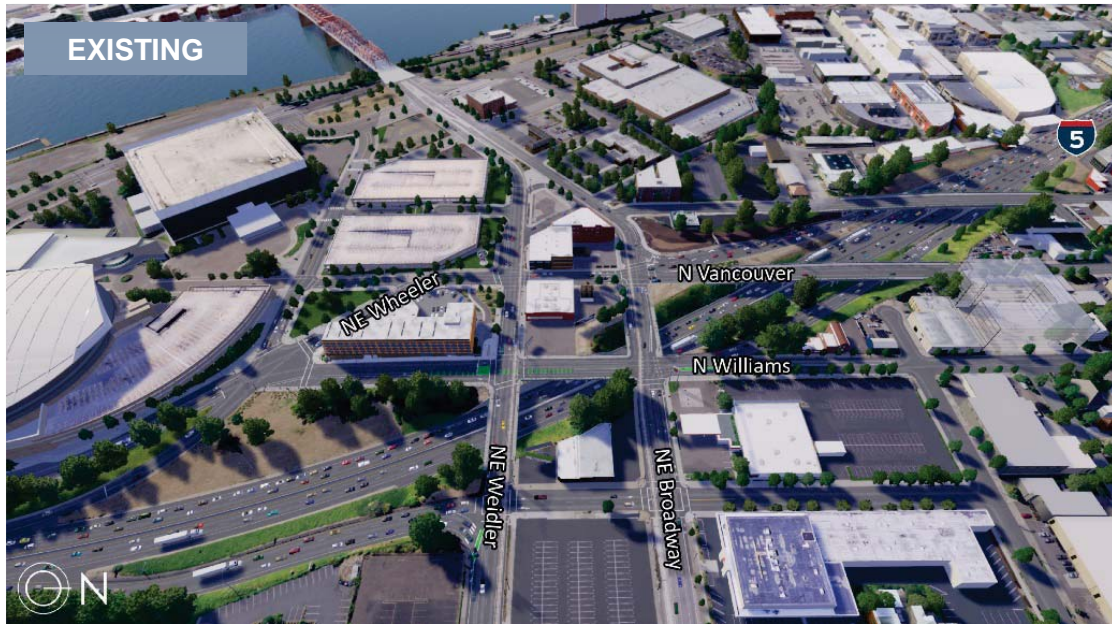
- Survey and ROW Engineering Support
- Environmental Support Services
- Geotechnical Design Support
- Pavement Design Support
- Hydraulics and Stormwater Design Support
- Highway Design Support
- Bridge and Structures Design Support
- Traffic Engineering and Management Support
- Roadside Development Support
- Railroad Coordination

6.2 EQUITY DURING CONSTRUCTION

Equity will remain a central focus of the Project throughout construction. The Project's DBE and Workforce program is a direct outcome of consulting with leaders in the African American community during the Project's NEPA phase. The DBE and Workforce program will provide workforce training opportunities during construction, and will include technical assistance for DBE firms, increasing the available pool of DBEs and workers, and identifying subcontracting areas and strategies that generate wealth among local firms and workers. The selected CM/GC is expected to implement a subcontracting plan that meets or exceeds the Project's established DBE and Workforce goals.



Appendix A – Proposed Project

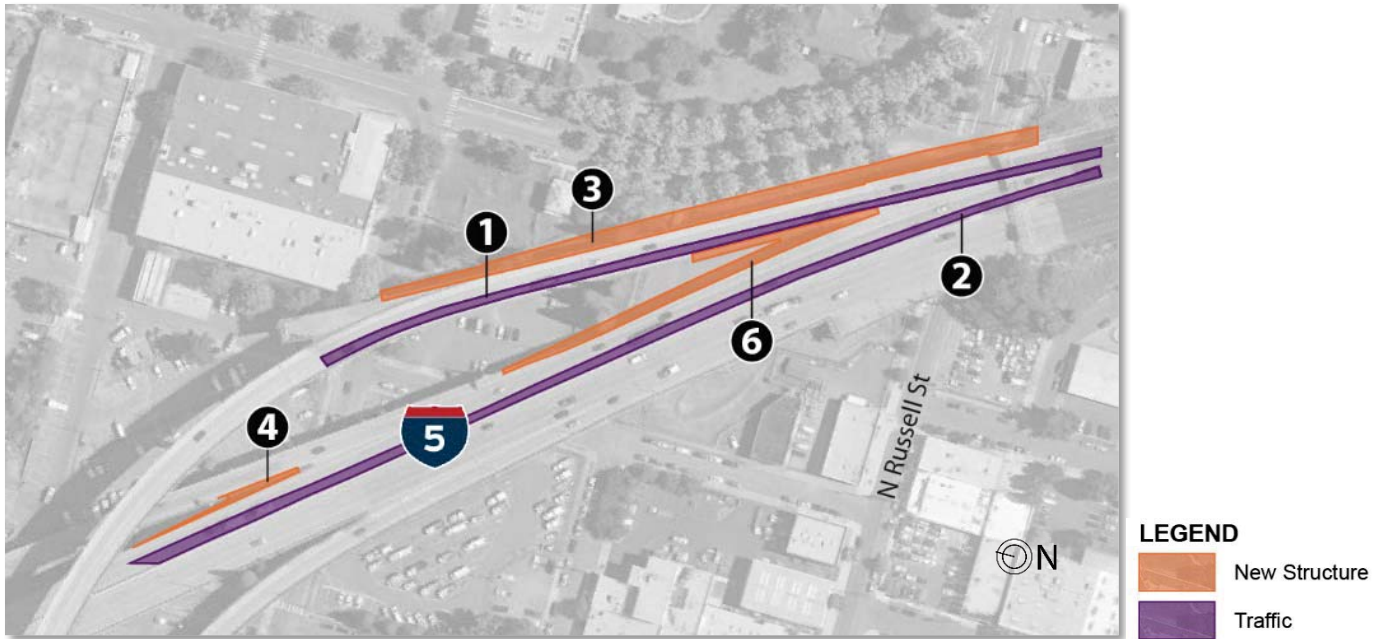


PROPOSED PROJECT

- ❶ New upgraded pedestrian and bicycle paths in the area of Broadway/Weidler and Vancouver/Williams
- ❷ Covers over the highway where bridges cross over I-5
- ❸ Improved pedestrian and bicycle access to transit
- ❹ A direct road connection over I-5 between N Hancock St and N Dixon Street
- ❺ New shoulders and ramp-to-ramp lanes (auxiliary lanes) along I-5 between I-84 and I-405
- ❻ New pedestrian-and-bicycle-only bridge over I-5

Appendix B – Construction Sequencing for Proposed Project

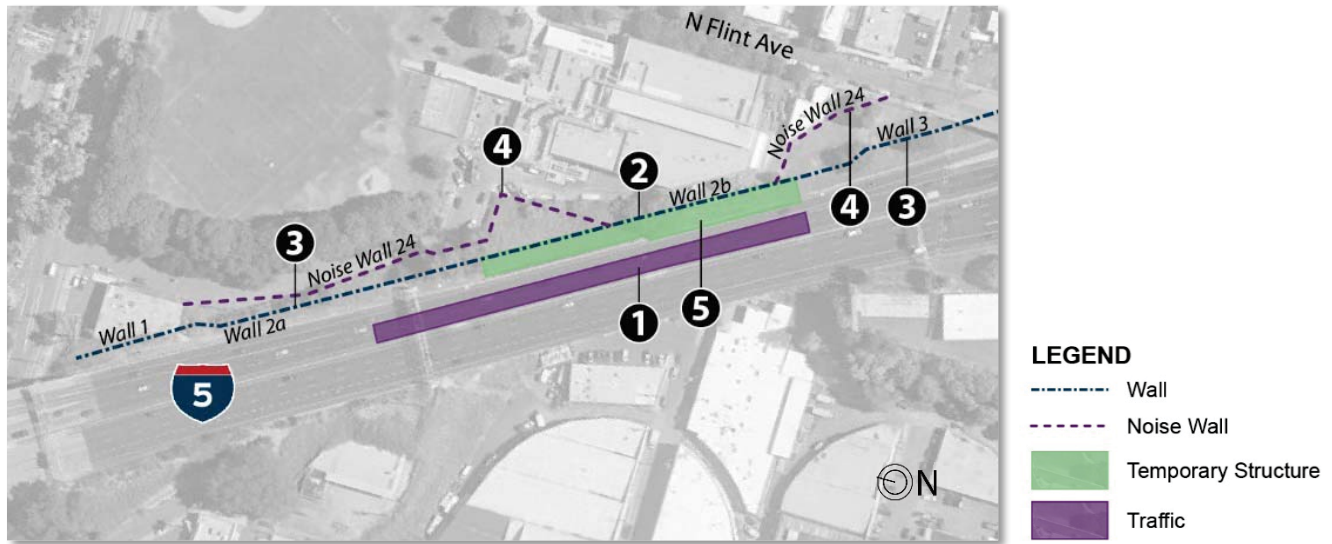
Zone 1 – Late 2025 to Mid-2027



CONSTRUCTION SEQUENCE

Items shown in blue italics are not graphically displayed

- ❶ Shift traffic on I-405 ramp to the west
- ❷ Shift traffic on NB I-5 to the west (toward median)
- ❸ Construct I-405 ramp foundations and widen deck
- ❹ Construct gore area at Greeley ramp
- ❺ *Shift I-405 ramp traffic to the new widened deck (east side)*
- ❻ Construct gore area between I-405 exit and Greeley exit



CONSTRUCTION SEQUENCE

- 1 Shift traffic on NB I-5 to the west (toward median)
- 2 Construct temporary access bridge and Eliot wall in front of Harriet Tubman Middle School, followed by a sound wall on top of the retaining wall
- 3 Construct walls adjacent to Eliot wall
- 4 Construct sound walls adjacent to Eliot sound wall
- 5 Rebuild temporary access and construct Eliot viaduct

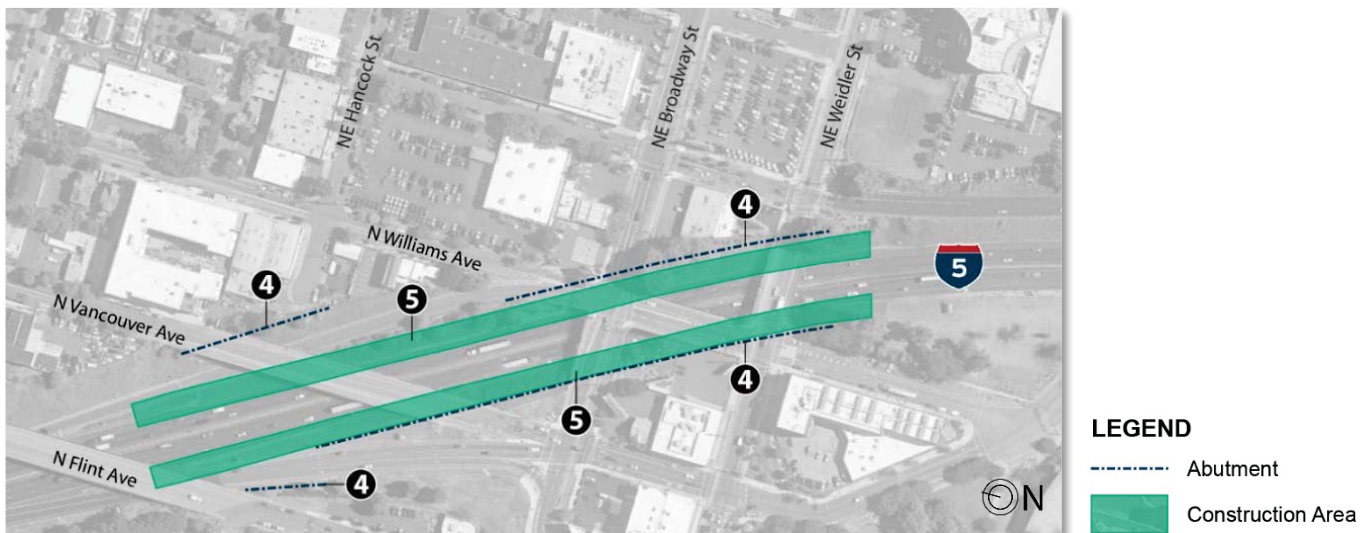
Zones 3 and 4, Phase 1 – Early 2023 and Late 2027



CONSTRUCTION SEQUENCE

- 1 Build temporary Broadway/Weidler shoofly bridges
- 2 Shift traffic on northbound and southbound I-5 toward median
- 3 Demolish Williams, Broadway, and Weidler bridges

Zones 3 and 4, Phase 1 continued – Early 2023 to Late 2027



CONSTRUCTION SEQUENCE

- 4 Construct south and north cover abutment walls
- 5 Excavate and lower outside of freeway

Zones 3 and 4, Phase 2 – Early 2023 to 2027



CONSTRUCTION SEQUENCE

- ⑥ Reroute I-5 traffic to outside lanes
- ⑦ Lower inside lanes for I-5 and construct interior cover piers

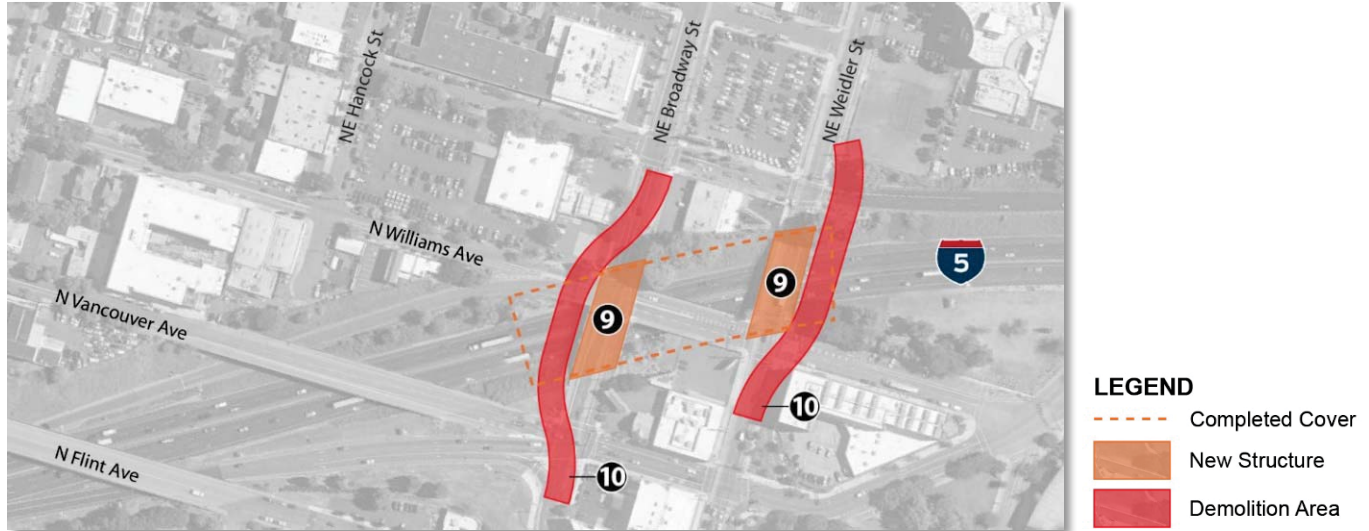
Zones 3 and 4, Phase 2 continued – Early 2023 to late 2027



CONSTRUCTION SEQUENCE

- ⑧ Construct cover decks

Zones 3 and 4, Phase 2 continued – Early 2023 to Late 2027



CONSTRUCTION SEQUENCE

- ⑨ Shift Broadway/Weidler traffic to permanent locations
- ⑩ Remove Broadway/Weidler shoofly bridges

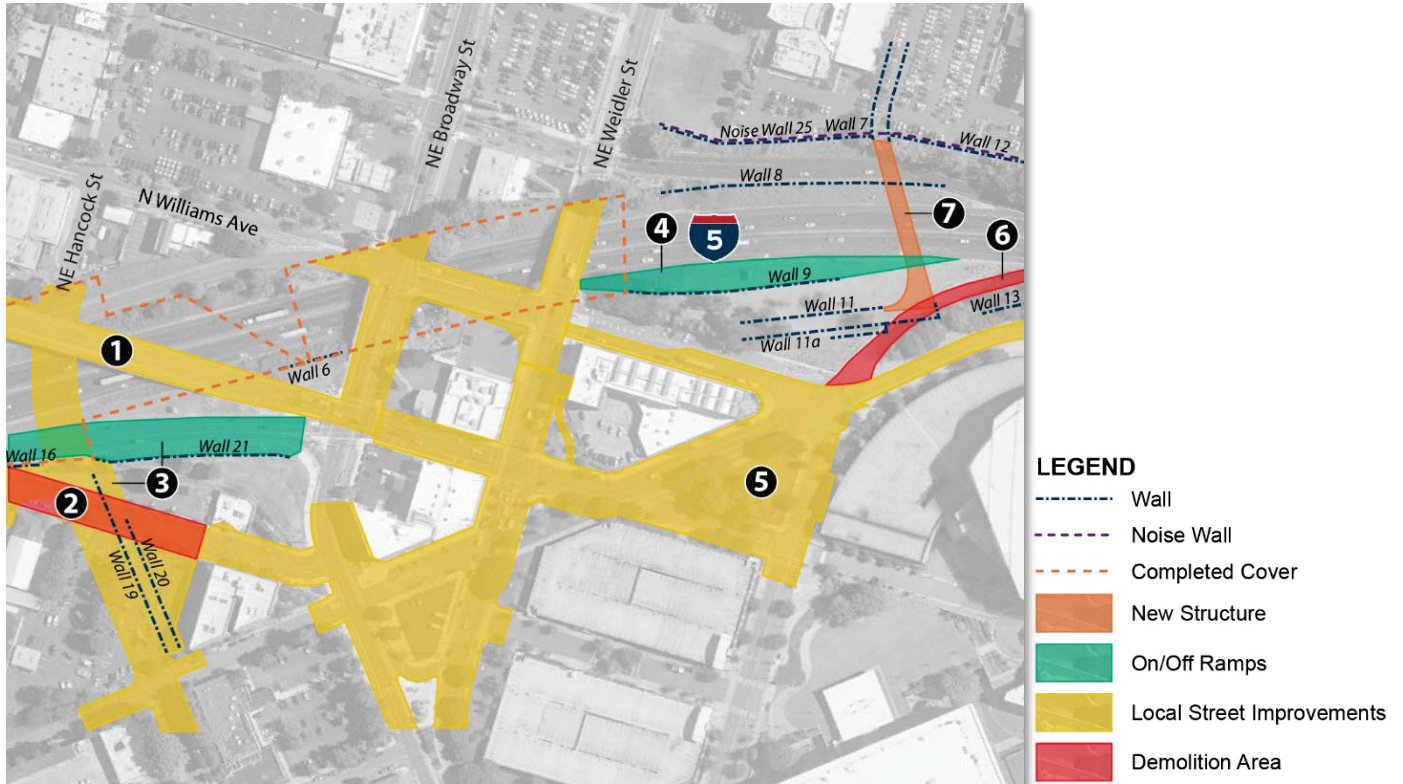
Zones 3 and 4, Phase 2 continued – Early 2023 to Late 2027



CONSTRUCTION SEQUENCE

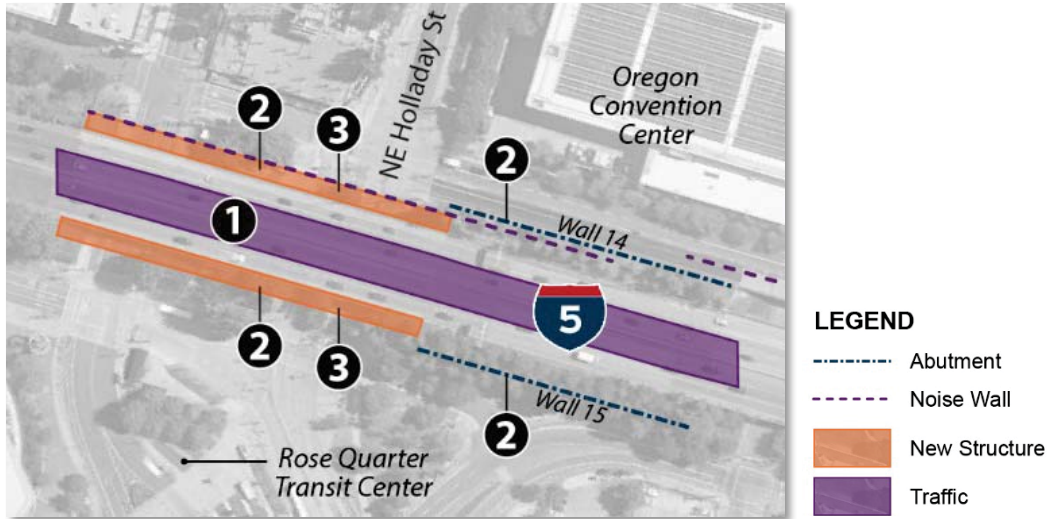
- ⑪ Construct remaining portions of south cover where temporary bridges were located

Zone 5 – Late 2025 to Late 2027



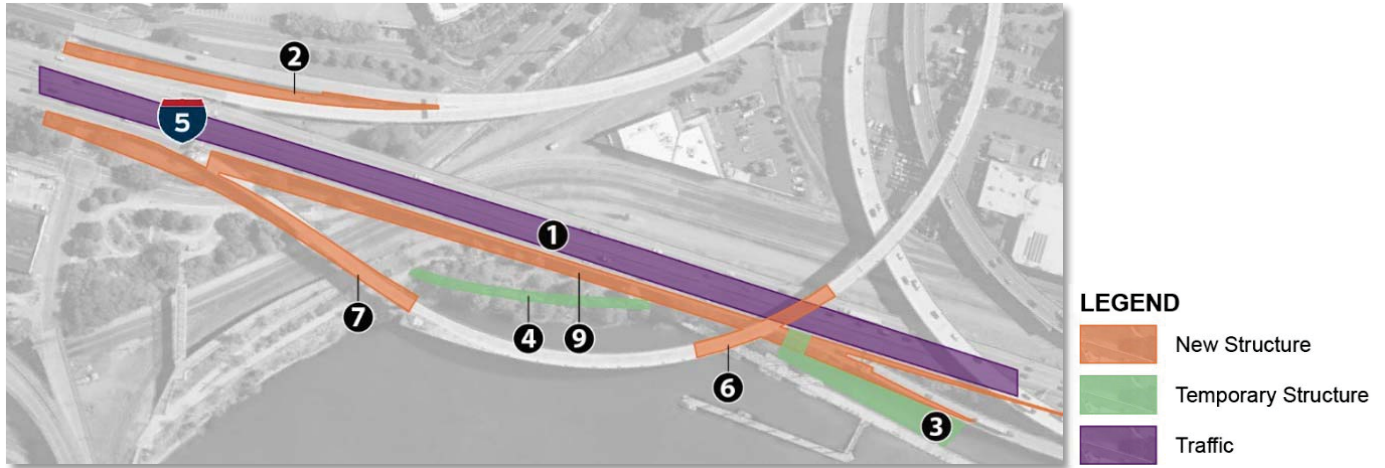
CONSTRUCTION SEQUENCE

- ❶ Direct and locate Vancouver Avenue traffic on cover
- ❷ Demolish existing Flint Avenue
- ❸ Construct Dixon Avenue and new off-ramp from I-5
- ❹ Construct new on-ramp to I-5 SB
- ❺ Construct City street improvements around the Moda Center (including green egg concept)
- ❻ Demolish existing I-5 southbound on-ramp
- ❼ Construct Clackamas Pedestrian and Bicycle Crossing



CONSTRUCTION SEQUENCE

- ❶ Shift I-5 traffic toward median
- ❷ Construct I-5 bridge improvements and adjacent retaining walls (*Note: I-84 ramp to NE 1st Avenue will be closed to accommodate retaining wall work, and will require coordination with the Moda Center*)
- ❸ During bridge improvements, construct pier between TriMet tracks using techniques that accelerate the construction



CONSTRUCTION SEQUENCE

Items shown in blue italics are not graphically displayed

- ❶ Shift traffic on I-5 toward median
- ❷ Construct I-84 to northbound I-5 ramp
- ❸ Construct work bridge at Morrison off-ramp gore
- ❹ Relocate land portion of esplanade
- ❺ *Shut down I-5 SB ramp to I-84 EB ramp*
- ❻ Demolish and replace two spans of I-84 ramp over I-5
- ❼ Demolish and widen I-84 ramp
- ❽ *Reopen I-5 SB to I-84 SB ramp*
- ❾ Construct I-5 southbound auxiliary lane to Morrison ramp
- ❿ *Remove work bridge*
- ⓫ *Relocate land-based esplanade back to original location*

Appendix C – Summary of Community Engagement

Date	Community group or event	Organization or group type
12/15/2016 - 2/9/2017	Environmental Justice Interviews	Environmental Justice
1/5/2017	Identity Clark County Business Leaders Summit Presentation	Business Association
1/18/2017	Lloyd EcoDistrict Briefing	Sustainability Organization
2/28/2017	Portland Planning and Sustainability Committee Workshop	City Committee
3/7/2017	Regional Transportation Council (RTC) Board Briefing	Transportation Committee
3/9/2017	City of Portland Directors Briefing	City of Portland
5/3/2017	Portland Streetcar Board Briefing	City Committee
9/7/2017	Go Lloyd Briefing	Transportation Management Associations
9/12/2017	Project Open House #1	General Public
9/26/2017	Community Liaisons Meeting #1	Project Community Liaisons Group
9/28/2017	Neighborhood and Community Forum	General Public
10/7/2017	Community Walk and Bike Ride	General Public
11/2/2017	Lloyd District Community Association Committee Briefing	Business Association
11/27/2017	Boise Neighborhood Association Land Use and Transportation Committee Briefing	Neighborhood Association
12/7/2017	Briefing with Pastor Hennessee of Vancouver Avenue First Baptist Church	Environmental Justice
12/11/2017	Albina Vision Trust Briefing	Environmental Justice
12/11/2017	Portland Public School Staff Meeting – Site Visit	Portland Public School District
12/12/2017	Portland Business Alliance Land Use and Transportation Committee Briefing	Business Association
12/13/2017	Portland Public School Staff Meeting	Portland Public School District
1/3/2018	The Street Trust Staff Briefing	Active Transportation Organization
3/1/2018	Portland Public Schools Staff Briefing	Portland Public Schools
3/7/2018	Community Liaisons Meeting #2	Project Community Liaisons Group
3/14/2018	Albina Vision Trust Staff and Organizers Briefing	Environmental Justice
3/19/2018	Design Week Portland Presentation	Design Community
3/20/2018	Local Church Pastors Breakfast	Environmental Justice
3/21/2018	Central Eastside Industrial Council	Business Association
4/9/2018	Eliot Neighborhood Association Briefing	Neighborhood Association
4/12/2018	Irvington Neighborhood Association Committee Briefing	Neighborhood Association
4/17/2018	Urban Design Panel Presentation: American Institute of Architects (AIA), American Planning Association (APA), American Society of Landscape Architects (ASLA)	Design Community
4/19/2018	Williams Vancouver Business Association Briefing	Business Association
4/25/2018	Bike Farm Staff Meeting	Local Bike Community
4/25/2018	ODOT Traffic Engineering Forum	State Transportation Agency

Date	Community group or event	Organization or group type
5/21/2018	Community Liaisons Meeting #3	Project Community Liaisons Group
6/6/2018	What's Happening in Our Streets? Black Community Outreach Event	Environmental Justice
6/14/2018	Juneteenth – Event Tabling	N/NE Community
6/24/2018	Good in the Hood - Tabling	N/NE Community
6/26/2018	Bike Farm Community Presentation	Local Bike Community
June/July 2018	Business Canvassing	Local Businesses
7/17/2018	Portland Pedestrian Advisory Committee Briefing	City Committee
7/19/2018	Metro Joint Policy Advisory Committee on Transportation Briefing	Regional Agency
7/22/2018	Sunday Parkways – Event Tabling	General Public
8/31/2018	Metro Planning Leadership Meeting	Regional Agency
10/1/2018	Soul District Business Association Briefing	Business Association
10/23/2018	Portland Public Schools Planning Staff Briefing	School District
10/26/2018	DBE Outreach Industry Forum #1 (Design Phase)	DBE Firms
11/13/2018	Portland Bike Advisory Committee Presentation	City Committee
11/27/2018	Community Liaisons Meeting #4	Project Community Liaisons Group
12/3/2018	ODOT Region 1 ACT	State Transportation Agency
12/6/2018	Go Lloyd Briefing	Transportation Management Associations
12/6/2018	National Association of Minority Contractors	Environmental Justice
12/14/2018	Industry Forum and Certification Workshop	DBE Firms
1/30/2019	Portland Trailblazers Tabling	General Public
2/5/2019	Metro Council Work Session	Regional Agency
2/15/2019 - 4/1/2019	Online Open House	General Public
2/19/2019	Portland Pedestrian Advisory Committee	City Committee
2/21/2019	Metro Joint Policy Advisory Committee	Regional Agency
2/22/2019	American Council of Engineering Companies Partnering Conference	Professional Organization
2/25/2019	ODOT Region 1 ACT	State Transportation Agency
2/25/2019	Portland Public Schools Staff Meeting – EA Briefing	Portland Public Schools
2/25/2019	Boise Neighborhood Association	Neighborhood Association
3/7/2019	Portland Design Commission	City Committee
3/7/2019	Project Open House	General Public
3/11/2019	Portland Historic Landmarks	City Committee
3/11/2019	N/NE Pastors Breakfast	Environmental Justice
3/11/2019	Eliot Neighborhood Association	Neighborhood Association
3/12/2019	Project Public Hearing	General Public
3/14/2019	Portland Streetcar Board and CAC	Transportation Agency
3/14/2019	Irvington Neighborhood Association	Neighborhood Association

Date	Community group or event	Organization or group type
3/14/2019	Madrona Studios	Housing
3/18/2019	Green Dreams: Portland Parks Foundation Panel with Albina Vision & WSDOT	Planning and Design Community
3/19/2019	Portland Public School Board	General Public
3/21/2019	Go Lloyd Open House	Transportation Management Associations
3/26/2019	Portland Planning and Sustainability Commission	City Committee
4/9/2019	Meet the Primes Networking Event	DBE Firms
4/23/2019	DBE/OJT COAC Meet and Greet	DBE Firms
5/20/2019	DBE/OJT COAC Meeting	DBE Firms
6/5/2019	Society of American Military Engineers (SAME) Meet the Primes/Meet the Chiefs	Design Community
6/15/2019	Juneteenth Celebration - Tabling	N/NE Community
6/22/2019	Good in the Hood Multicultural Festival - Tabling	N/NE Community
7/22/2019	Industry Forum	DBE Firms
8/10/2019	Alberta Street Fair - Tabling	N/NE Community
8/25/2019	Green Loop Sunday Parkways - Tabling	N/NE Community
9/22/2019	NE Sunday Parkways - Tabling	N/NE Community
12/17/2019	Oregon Transportation Commission – Project Overview	Oregon Transportation Commission

ENDNOTES

ⁱ Federal Highway Administration and ODOT, *Project Environmental Assessment*, 2

ⁱⁱ Federal Highway Administration and ODOT, *Project Environmental Assessment*, 2

ⁱⁱⁱ Federal Highway Administration and ODOT, *Project Environmental Assessment*, Report Statement (Cover)

^{iv} ODOT, *Highlights from HB 2017, Transportation Investments*

^v <https://www.fhwa.dot.gov/majorprojects/defined.cfm>