

# TRANSIT SUPPLEMENTAL TECHNICAL REPORT

Oregon Department of Transportation  
August 15, 2022



*This page is intentionally left blank.*

## Contents

Executive Summary .....	1
1.0 Introduction .....	3
2.0 Build Alternative Design Changes .....	3
2.1 Design Process .....	3
2.2 Project Area .....	6
2.3 I-5 Mainline Improvements Changes.....	8
2.4 Highway Cover Changes.....	8
2.5 Related Local System Multimodal Improvements Changes .....	10
3.0 Regulatory Framework.....	13
4.0 Methodology and Data Sources.....	14
4.1 Area of Potential Impact.....	14
4.2 Resource Identification and Data Sources.....	14
4.3 Future year (2045) No-Build Alternative .....	15
5.0 Affected Environment .....	15
5.1 Transit generators.....	15
5.2 Transit routes.....	15
5.2.1 Bus Line 4- Fessenden .....	16
5.2.2 Bus Line 6- Martin Luther King Jr. Boulevard .....	17
5.2.3 Bus Line 8- Jackson Park/NE 15th Avenue .....	17
5.2.4 Bus Line 17- Holgate/Broadway .....	17
5.2.5 Bus Line 24- Fremont/NW 18 <sup>th</sup> .....	17
5.2.6 Bus Line 35- Macadam/Greeley .....	17
5.2.7 Bus Line 44- Capitol Highway/Mocks Crest.....	18
5.2.8 Bus Line 77- Broadway/Halsey .....	18
5.2.9 Bus Line 85- Swan Island .....	18
5.2.10 MAX Light Rail Blue Line .....	18
5.2.11 MAX Light Rail Green Line .....	18
5.2.12 MAX Light Rail Red Line .....	19
5.2.13 Portland Streetcar “A” and “B” Loops.....	19



5.2.14	LIFT Paratransit .....	19
5.3	Transit Stops and Rider activity .....	19
5.4	Transit planning designations .....	22
6.0	Environmental Consequences .....	22
6.1	No-Build Alternative .....	22
6.2	Revised Build Alternative .....	22
6.2.1	Short Term (Construction Impacts) .....	22
6.2.2	Long-Term and Operational Direct Impacts .....	23
6.2.3	Indirect Impacts .....	26
6.2.4	Cumulative Effects .....	26
6.3	Conclusion .....	27
7.0	Avoidance, Minimization, and Mitigation Measures .....	27
8.0	Preparers .....	28
9.0	References .....	28

## Tables

Table 1	Route Ridership Comparison .....	20
Table 2	Fall of 2019 Transit Stops and Ridership Activity .....	21
Table 3	Future (2045) Conditions- Streetcar Travel Time (Minutes) N/NE Broadway and N/NE Weidler Street between NE Grand Avenue and East Side of the Broadway Bridge .....	24
Table 4	Future (2045) Bus Travel Time (minutes) .....	26

## Figures

Figure 1	Hybrid 3 Highway Cover Design Concept .....	5
Figure 2	Previous and Current Project Area .....	7
Figure 3	Building Parameters on the Cover .....	9
Figure 4	Major Local System Multimodal Design Changes .....	12
Figure 5	Transit in the API .....	16



---

# Executive Summary

This technical report supplements the 2019 Transit Technical Report (ODOT 2019) with an evaluation of the transit impacts of the Revised Build Alternative. The analysis focuses on how the updated highway cover design construction and long-term operation would impact transit activity on local streets in the Area of Potential Impact (API).

There are inconsequential changes in the regulatory framework from what was analyzed in the 2019 Transit Technical Report. Updated transit ridership information shows that the Coronavirus Pandemic caused a sharp decrease in transit ridership from 2017 to 2020. TriMet leadership anticipates that ridership will rebound within the next five years. The construction of the Revised Build Alternative would still require the removal of all existing I-5 overcrossings in the API, replacing them with a larger and more connected street network. Construction of the relocated southbound offramp on N Williams Avenue would cause closure of N Williams Avenue between N Wheeler Avenue and NE Weidler Street for the duration of construction, which would cause rerouting and delays of bus routes 4 and 44. Construction duration is expected to be longer under the Revised Build Alternative than under the Build Alternative.

The Revised Build Alternative would require modification or relocation of the bus route 17 N Broadway at N Vancouver Avenue bus stop (Stop ID 627) to accommodate the Broadway/Weidler/Williams cover. Stop modifications would include improved facilities and lighting.

No Build Alternative is similar to that described in the 2019 Transit Technical Report and would have similar impacts that those described in the 2019 Transit Technical Report with the exception of the transit travel times.

Streetcar and bus travel times were evaluated using updated Vissim model results for the No-Build Alternative and Revised Build Alternatives. Vissim models for the 2045 No-Build Alternative and 2045 Revised Build Alternative models have been refined to provide a more comprehensive local street and bike network and reflect a greater increase in bicycle mode share within Central City as described in the City of Portland's Central City 2035 Comprehensive Plan. As a result, this Transit Supplemental Technical Report compares updated 2045 No-Build Alternative travel time results with Revised Build Alternative results, but there are no direct comparisons to the Build Alternative as this model was not updated. The updated travel times results in the No-Build Alternative differ from those reported in the 2019 Transit Technical report.

Under the Revised Build Alternative, eastbound streetcar travel times would be slower compared to the No-Build Alternative and westbound streetcar travel times would be shorter compared to No-Build Alternative travel times. Under the Revised Build Alternative, AM peak

---

period bus travel times would generally be shorter in the southbound and westbound routes compared to the No-Build Alternative, while bus travel times would be higher on northbound and eastbound bus routes compared to the No-Build Alternative. During the PM peak hours, westbound routes would experience shorter travel times compared to the No-Build Alternative while northbound, southbound and eastbound routes would experience longer travel times when compared to those in the No-Build Alternative.

---

# 1.0 INTRODUCTION

The I-5 Rose Quarter Improvement Project (Project) Environmental Assessment (EA) was released in February 2019. The Federal Highway Administration (FHWA) published a Finding of No Significant Impact (FONSI) and Revised EA (REA) for the Build Alternative on November 6, 2020. Since the issuance of the FONSI, the Oregon Department of Transportation (ODOT) has made changes to the design of the proposed Build Alternative to create a Revised Build Alternative and re-evaluated the changes in the context of the FONSI/REA. At the conclusion of the re-evaluation, FHWA and ODOT agreed that the design changes require additional analyses beyond what was presented in the REA, and FHWA rescinded the FONSI on January 18, 2022. This technical report supplements the 2019 Transit Technical Report (ODOT 2019) with an evaluation of the transit impacts of the Revised Build Alternative compared to the No-Build Alternative and Build Alternative.

## 2.0 BUILD ALTERNATIVE DESIGN CHANGES

Changes to the Build Alternative include modification to the highway cover design and changes associated with advancements in other elements of the project design, some of which require expansion of the Project Area. This section describes the highway cover design changes and design changes that resulted from advancements in project engineering. The evaluation of these changes is presented in Section 6.2 of this supplemental technical report.

### 2.1 DESIGN PROCESS

Through 2021, ODOT facilitated an Independent Highway Cover Assessment, as directed by the Oregon Transportation Commission, that engaged the Project’s advisory committees and community members in a series of collaborative workshops to explore the design opportunities for the highway cover. The purpose of the Independent Highway Cover Assessment was to understand stakeholder goals and objectives within the Project Area, generate potential highway cover scenarios, and assess the impacts and benefits of these scenarios. The Independent Highway Cover Assessment team worked directly with local community members from the historic Albina neighborhood to understand how the highway cover design concepts might best serve the historic Albina community. The Project’s Historic Albina Advisory Board (HAAB), Executive Steering Committee (ESC) and the Community Oversight Advisory Board (COAC) also provided input as part of the Independent Highway Cover Assessment process. These sessions explored potential opportunities for economic development in the Albina community and the highway cover design concepts.

---

In July 2021, Oregon Governor Brown convened a series of meetings with Project stakeholders and community organizations to discuss the design concepts developed in the Independent Highway Cover Assessment. In August 2021, the HAAB—as supported by the ESC and the COAC, and through the Governor-led process—recommended “Hybrid 3” as the preferred highway cover design concept (Figure 1). The Hybrid 3 highway cover design concept represents a proposed community solution to maximize developable space on a single highway cover. The Hybrid 3 highway cover design concept maintains the commitment for the Project to create opportunities for the local community to grow wealth through business ownership and long-term career prospects through the Project’s Disadvantaged Business Enterprise and workforce program. Following the community and stakeholder recommendations, in September 2021, the Oregon Transportation Commission directed ODOT to advance further evaluation of the Hybrid 3 highway cover design concept, with conditions related to the Project’s funding process and other technical analyses.

In January 2022, Governor Brown entered into a Letter of Agreement with the City of Portland, Metro, and Multnomah County that demonstrated their shared understanding and collective support for the Hybrid 3 concept as part of the Project. The Letter of Agreement specifically highlights the desire to connect the Lower Albina neighborhood, create buildable space, and enhance wealth-generating opportunities for the community, while simultaneously addressing the area’s transportation needs. Additionally, the Letter of Agreement supports the development of a process to define the future development vision for what could ultimately be built on top of the highway cover upon Project completion – this process is referred to as a Community Framework Agreement. The Letter of Agreement states that the City of Portland will lead a Community Framework Agreement process and that it should be between the City of Portland, ODOT, other state agencies and local jurisdictions as necessary, with the participation of organizations that represent the Albina community and Black residents. Any future real estate or open space development on top of the cover would require executing long-term air rights and lease agreements, and that any such actions or decisions are subject at all times to applicable local, state, and federal laws including but not limited to land use and NEPA processes.

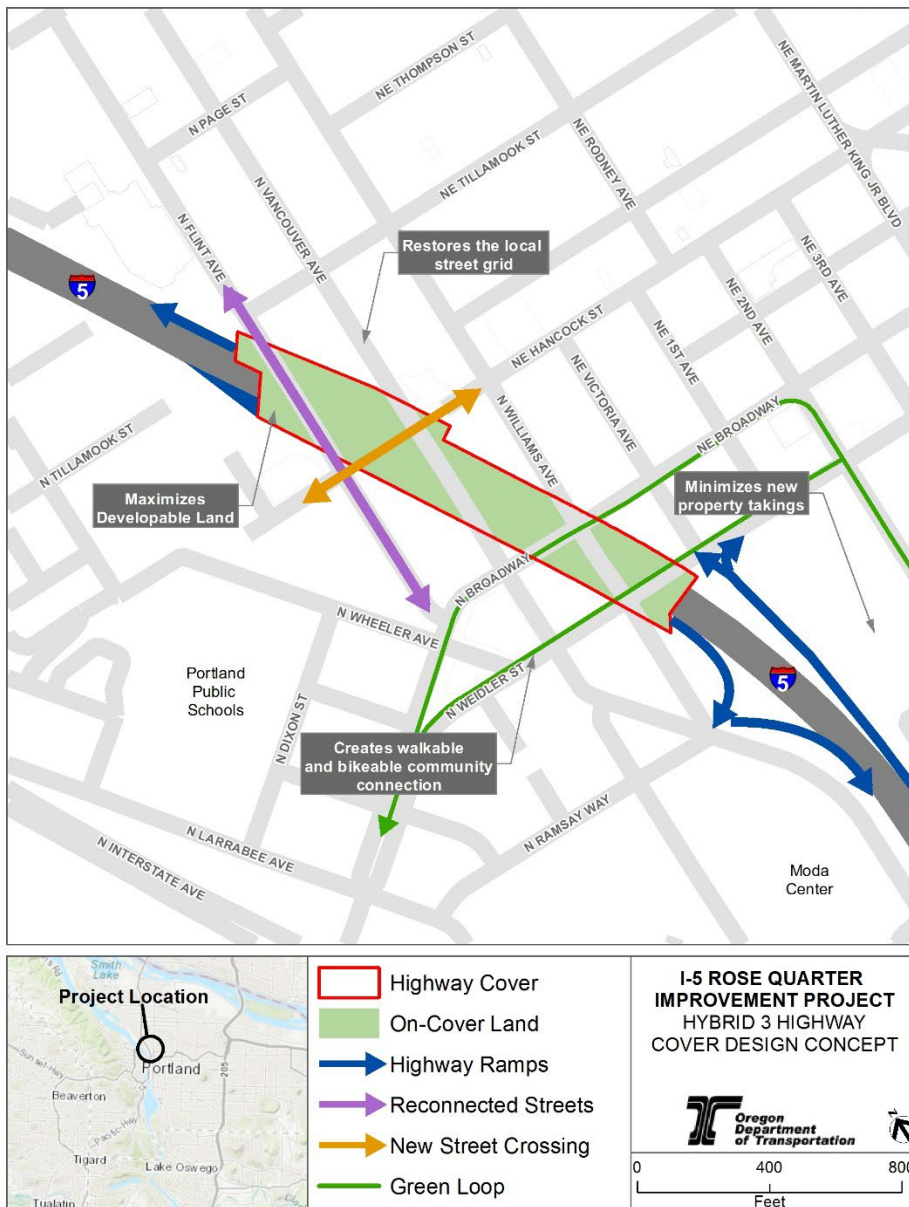
In June 2022, ODOT and the City of Portland executed an Intergovernmental Agreement (IGA), building upon the January 2022 Letter of Agreement. The IGA further states that the City will lead the future highway cover land use, programming and development processes and development of a Community Framework Agreement, in consultation with the ODOT to ensure the highway, local streets and resulting land parcels within the Project are coordinated. As such, ODOT would construct the highway cover as part of the Project and the City of Portland would lead the process to define what is ultimately built on the new land created by the Project’s highway cover. In the IGA, both ODOT and the City agreed that ODOT will retain ownership of



the highway cover structure and the new developable area created on the highway cover structure upon Project completion.

The sections below describe the highway cover design changes and the design changes that resulted from advancements in project engineering and are incorporated into the Revised Build Alternative.

Figure 1 Hybrid 3 Highway Cover Design Concept



---

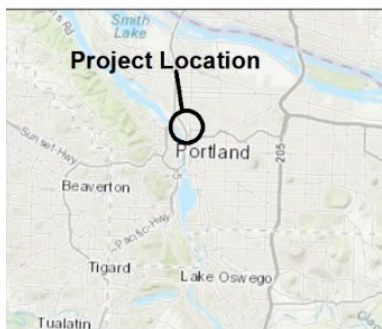
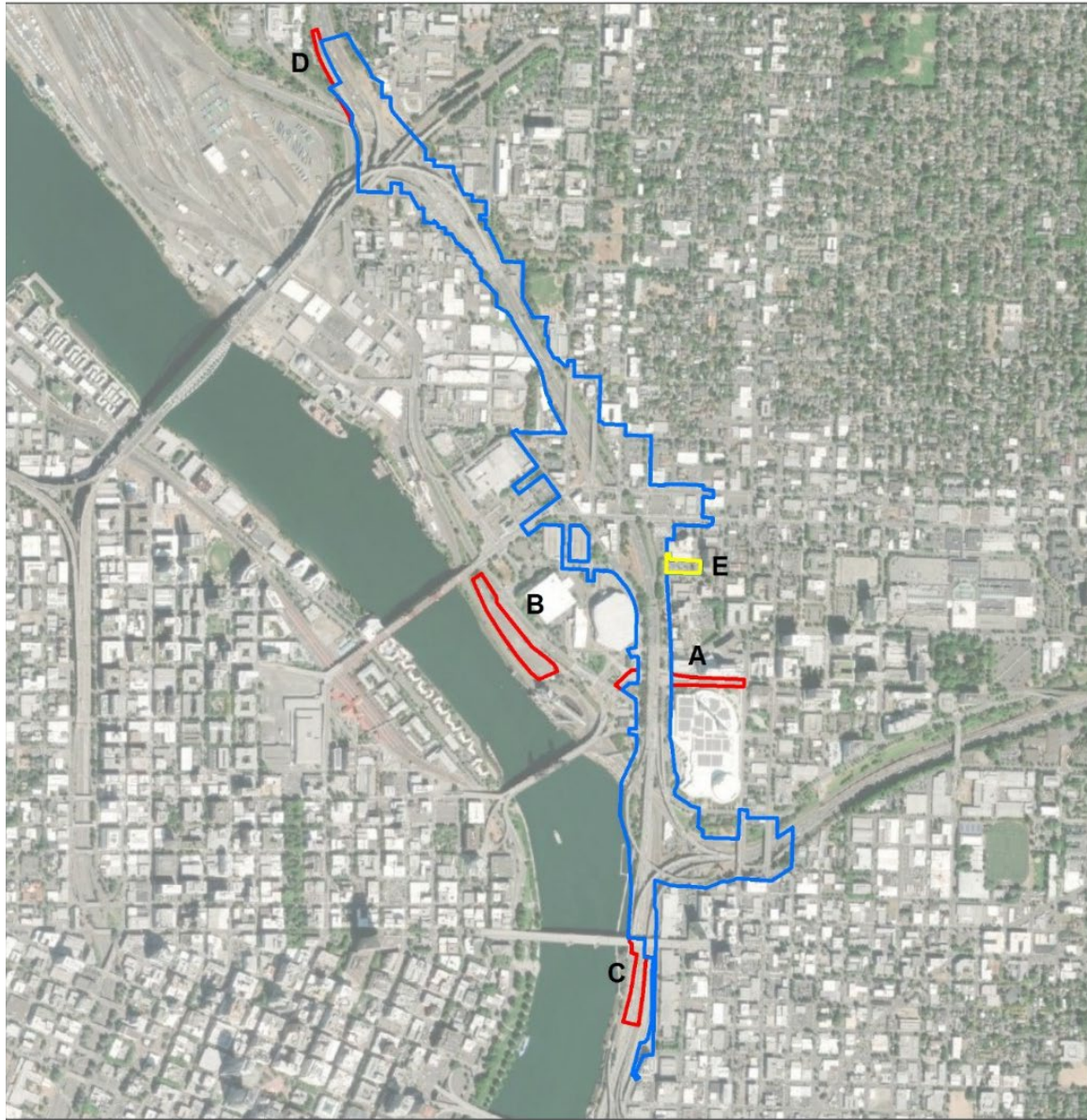
This section describes the highway cover design changes and design changes that resulted from advancements in project engineering and are incorporated into the Revised Build Alternative.

## 2.2 PROJECT AREA

The Project Area is defined as the area within which improvements are proposed, including where permanent modifications to adjacent parcels may occur and where potential temporary impacts from construction activities could result. As Project design information advanced, some changes required expansion of the Project Area presented in the REA and FONSI, and in one location the Project Area was reduced (Figure 2). In total, approximately 8.7 acres would be added to the Project Area. The changes are as follows, with letter references to the areas shown in Figure 2:

- A: Utility conflicts with Light Rail Transit (LRT) along NE Holladay Street between N Interstate Avenue and NE Martin Luther King Jr. Boulevard required expanding the Project Area by 1.9 acres to include additional overhead utility relocations (label A in Figure 2).
- B: An existing parking lot (known as Aegean Lot) south of N Interstate Avenue and the Broadway Bridge may be used for contractor staging during construction and is added to the Project Area (label B, Figure 2). ODOT identified this 4.3-acre construction staging area for contractor use based on its location, size, and suitability recognizing that, because of the urban setting and high-density land development in the construction area, it would be difficult for a construction contractor to find the space needed near or next to the project work areas for equipment staging, material storage, and the required co-location space for the contractor/construction personnel. This location meets all of the Project requirements: large level open space, proximity to the project work areas, and access for staging/storage of materials and equipment. Any materials stored in the area and site runoff would be subject to the same regulations as required throughout the project site.
- C: The southern end of the Project Area is expanded by 2.4 acres to include the portion of I-5 south of the Burnside Bridge proposed for a retrofit of the existing bridge rail, restriping the existing freeway, and installation of new guide signs (label C, Figure 2).
- D: At the northernmost end of the Project Area, a 1.1-acre area of ODOT right of way along the I-5 shoulders is now included in the Project Area for fiber optic conduit (label D, Figure 2).E: In one location, the Project Area was reduced by 1.0 acre. A parking lot west of the intersection of NE Clackamas Street and NE 2<sup>nd</sup> Avenue is no longer needed for the Project due to the removal of the Clackamas Bicycle and Pedestrian Crossing (label E, Figure 2).

Figure 2 Previous and Current Project Area.



- FONSI Build Alternative
- Revised Build Alternative Additional Area
- Reduced Project Area

**I-5 ROSE QUARTER  
IMPROVEMENT PROJECT  
PROJECT AREA**



0 0.25 0.5 Miles



---

## 2.3 I-5 MAINLINE IMPROVEMENTS CHANGES

The Build Alternative included relocation of the I-5 southbound on-ramp at N Wheeler Avenue to N/NE Weidler Street at N Williams Avenue via the new Weidler/Broadway/Ramsay highway cover, construction of auxiliary lanes and full shoulders (12 feet in width) on I-5 between I-405 and I-84 in both directions, and associated improvements to I-5 through the Project Area. The Revised Build Alternative includes the following changes to those elements of the Build Alternative:

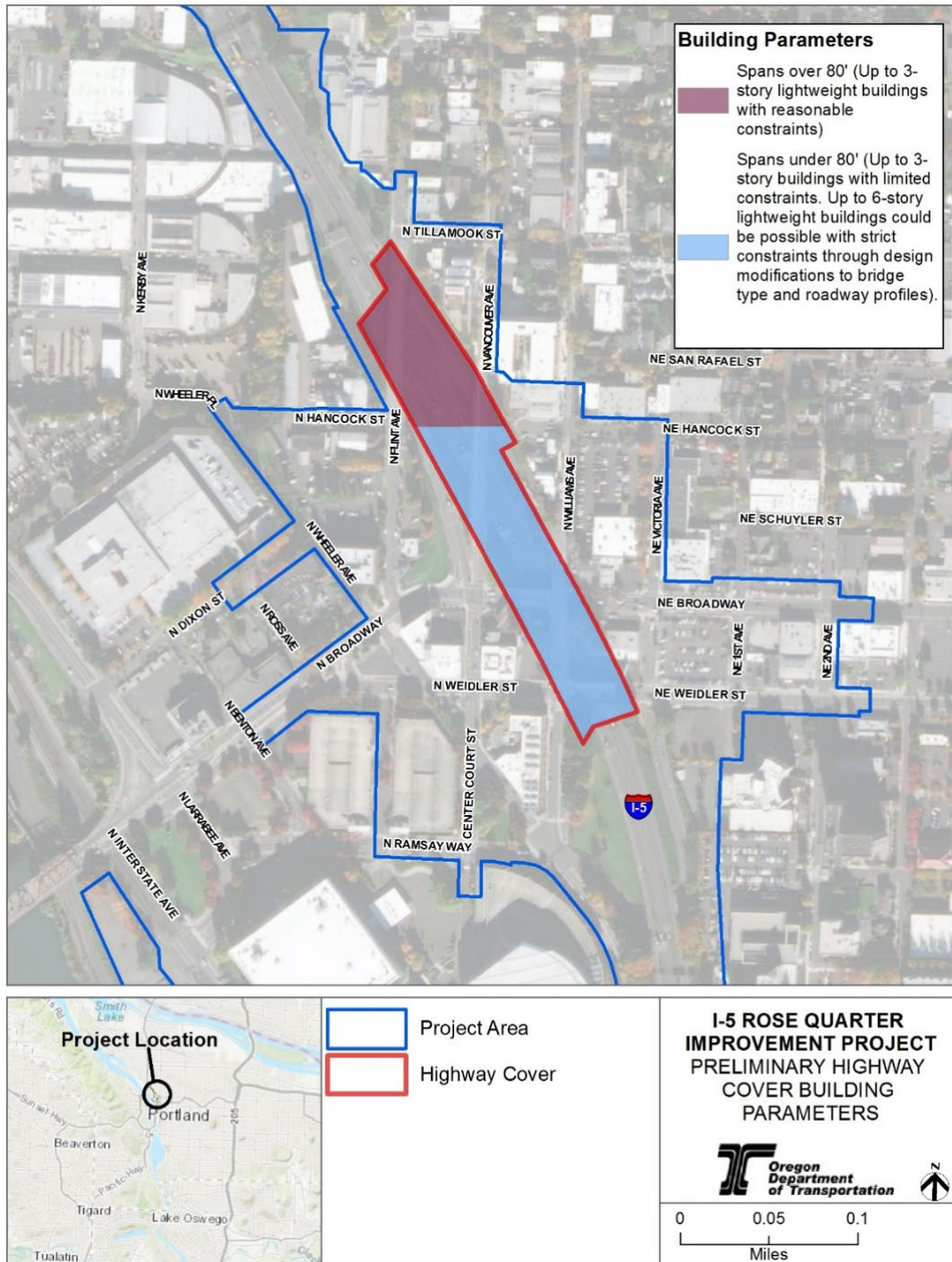
- Move the I-5 southbound exit ramp termini from N Broadway to N Williams Avenue at NE Wheeler Avenue.
- Reduce the freeway median shoulder through the entire Project Area, from 12 feet to 8 feet (4 to 5 feet within highway cover). The outside shoulder width of 12 feet remains unchanged.
- Relocate Noise Wall 24 from N Commercial Avenue near Harriet Tubman Middle School to attach to Walls 1 and 2 along the east edge of I-5.
- Keep the I-5 southbound entrance ramp from NE Wheeler Avenue/N Williams Avenue/N Ramsay Way on the existing alignment rather than relocate it to parallel N Williams Avenue.
- On I-5 south of the Burnside Bridge: retrofit existing bridge rail, restripe freeway in both the northbound and southbound directions, and install new guide signs on an existing sign structure in the southbound direction.

## 2.4 HIGHWAY COVER CHANGES

The Build Alternative included the construction of two highway cover structures over I-5 for roadway crossings and other purposes. The Revised Build Alternative, based on Hybrid 3 (see Figure 1), includes the following changes to the highway covers:

- Provide one continuous highway cover over I-5 rather than separate covers at the existing N Flint Avenue, NE Weidler Street, NE Broadway, N Williams Avenue, and the N Vancouver Avenue overcrossings.
- Expand the limits of the highway cover by approximately 35 feet to the west, and approximately 400 feet to the north.
- Design and construct the highway cover to accommodate multi-story buildings. Due to span length and site constraints, design would constrain building size, location, type, and use on portions of the cover (Figure 3). Generally, buildings up to three stories could be accommodated throughout the highway cover. Buildings of up to six stories could be accommodated where span lengths are shorter than 80 feet with strict design constraints.

Figure 3 Building Parameters on the Cover



Future development on the highway cover would follow a community process according to the City-led Community Framework Agreement, as described in Section 2.1. ODOT anticipates this process could continue past completion of cover construction.

---

As part of the Project, ODOT anticipates programming interim uses on the highway cover for the time period between Project completion and when the City-led development process would be implemented. Upon Project completion, the added surface space created by the highway cover over I-5 could provide an opportunity for new and modern bicycle facilities, making the area more connected, walkable and bike friendly. It could also provide opportunity for various potential types of public spaces, to be precisely determined during the Project’s final design phase and through robust community engagement, consisting of one or more of the following types of uses:

- Landscaped areas for active and passive recreation and/or to provide a buffer, backdrop and visual comfort, such as gardens, lawns or planter beds.
- Plazas and hardscaped open space for active and passive recreation, such as courts, plazas, splash pads, picnic areas, and community gathering spaces.
- Interpretive signage, historical markers, landmarks and other areas of historical recognition and narrative such as art pieces and other historical signage/kiosks and pavement focused on the historic Albina community.
- Temporary and lightweight vertical features to support episodic, mobile commercial activities such as a food market shed, eating pavilion, food carts, or picnic venues.

These features may be removed upon implementation of the development determined by the community process or may be incorporated into that development.

## 2.5 RELATED LOCAL SYSTEM MULTIMODAL IMPROVEMENTS CHANGES

The Build Alternative included construction of a new bicycle and pedestrian bridge over I-5 at NE Clackamas Street and other local street improvements. The Revised Build Alternative includes the following changes to these improvements to accommodate the Hybrid 3 design concept and related changes in traffic patterns (see Figure 4 below):

- Remove the Clackamas Bicycle and Pedestrian Crossing from the Build Alternative.
- Construct wider sidewalks and bike lanes at sidewalk level and physically separated from the roadway with a curb and provide protected bike signal phases at multiple intersections along NE Broadway and NE Weidler Street.
- Connect N Flint Avenue across I-5 from NE Tillamook Street to N Hancock Street and terminate it at N Broadway.
- Remove the NE Hancock Street overcrossing of I-5 from N Williams Avenue to N Dixon Street as proposed in the Build Alternative. NE Hancock Street would be extended across I-5

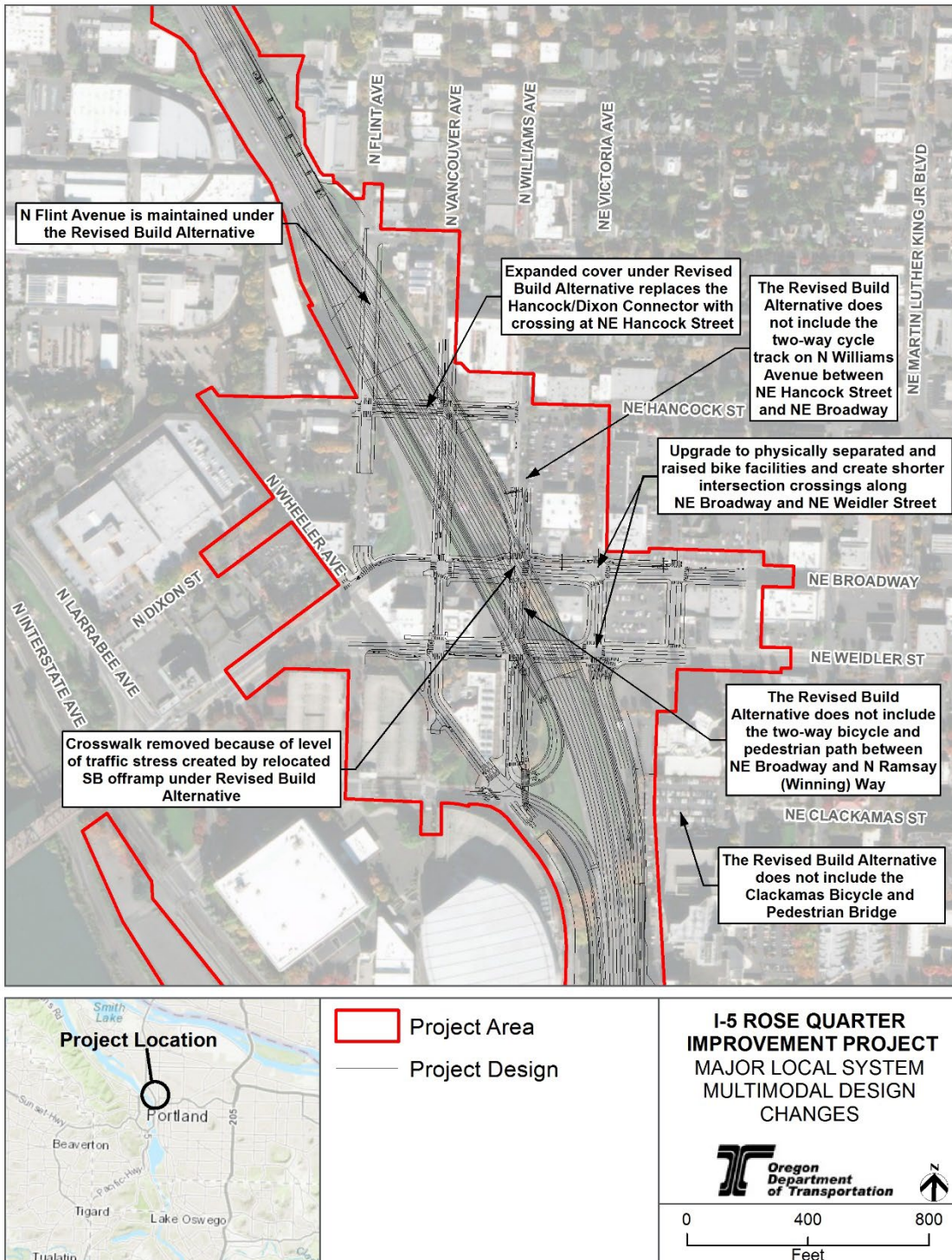
---

and reconnect to NE Hancock Street west of N Flint Avenue as part of the expanded highway cover.

- Remove the two-way cycle track on N Williams Avenue between NE Hancock Street and NE Broadway and a two-way bicycle and pedestrian path between NE Broadway and N Ramsay Way from the design and instead convert the on-road bike lane to a protected bike lane, with a transition to the existing on-road bike lane south at or near NE Hancock Street.
- Close the crosswalk across NE Broadway on the west side of N Williams Avenue and the crosswalk across N Williams north of N Weidler Street.



Figure 4 Major Local System Multimodal Design Changes





---

## 3.0 REGULATORY FRAMEWORK

The majority of the regulatory framework is the same as was evaluated in the 2019 Transit Technical Report including the following sources:

- 2010 ADA Standards for Accessible Design
- Intermodal Surface Transportation Efficiency Act of 1991
- Transportation Equity Act for the 21st Century (TEA-21) of 1998
- Safe Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (SAFETEA-LU) of 2005
- Moving Ahead for Progress in the 21st Century Act (MAP-21) of 2012 (ODOT 2012)
- Highway Design Manual (ODOT 2012)
- Oregon Transportation Plan (OTP) (ODOT 2007)
- Oregon Public Transportation Plan (OPTP) (ODOT 2018); Oregon Highway Plan (OHP) (ODOT 1999)
- North/Central Service Enhancement Plan (TriMet 2016)
- Go Lloyd
- American Association of State Highway and Transportation Officials (AASHTO) guidelines
- National Association of City Transportation Officials Urban Street Design Guide (NACTO 2018).

The only updates to relevant policy reported in 2019 Transit Technical Report were to the Policy on Geometric Design of Highways and Streets 6<sup>th</sup> edition, which was updated to the 7<sup>th</sup> edition in 2018 (AASHTO 2011). The City of Portland Transportation System Plan (TSP) (City of Portland 2020), ODOT Statewide Transportation Improvement Program (STIP) (ODOT 2020), and the 2014 Metro Regional Transportation Plan (RTP) which was updated in 2018 (Metro 2018). There are no major changes in the Policy on Geometric Design of Highways and Streets 7<sup>th</sup> edition or ODOT STIP that would influence the Project.

The 2018 City of Portland Transportation System Plan (TSP) evaluated in the 2019 Transit Technical Report was updated in March of 2020 (City of Portland 2020). There are three additional projects in the updated TSP within the Project API that were not reported in the 2019 Transit Technical Report:

- Project 40131 - Alternatives analysis, public outreach, planning, design, engineering, and construction for future streetcar extension from Central City to Hollywood Town Center via either Sandy Blvd or Broadway/Weidler.

- 
- Project 40130 - Public outreach, planning, design, engineering, and construction for future streetcar extension from Lloyd District to NE Portland.
  - Project 20196 - Adjust streetcar track alignment, reconfigure lanes, and modify signals to reduce bus and streetcar delay due to freeway on-ramp queue at NE Grand & I-84.

The 2019 Transit Technical Report mentioned the following transit related projects in the 2014 RTP that are within or adjacent to the API: Rose Quarter junction track and intersection improvements (including possible grade separation and bike accommodation), Rose Quarter Transit Center Reconstruction, streetcar extension to Hollywood via Sandy Boulevard or Broadway/Weidler, and streetcar extension from Lloyd to NE Portland, none of which were on Metro’s financially constrained project list<sup>1</sup>. The 2018 Metro RTP includes the following projects related to transit in the API, both of which are on the financially constrained project list:

- Project 11102 - Extend streetcar along NE Broadway/Weidler corridor to Hollywood Town Center.
- Project 10921 - Address transit bottleneck at the Steel Bridge and Rose Quarter.

## 4.0 METHODOLOGY AND DATA SOURCES

The methodology in this Transit Supplemental Technical Report is the same as described in the 2019 Transit Technical Report.

### 4.1 AREA OF POTENTIAL IMPACT

The API is the same as the Project Area as shown in Figure 2.

### 4.2 RESOURCE IDENTIFICATION AND DATA SOURCES

In this Transit Supplemental Technical Report, the affected environment is updated with the most recent available transit data. Bus, streetcar, and light rail routing; route- and stop-level ridership; and transit stop features are updated with the most recent TriMet data (TriMet 2021). Major pedestrian and bicycle access routes to transit are based on the analysis completed for the Active Transportation Supplemental Technical Report. Consideration of major transit user generators and destinations are updated with increased building capacity on the expanded cover of the Revised Build Alternative. Vissim models for the 2045 No-Build Alternative and 2045 Revised Build Alternative models have been refined to provide a more comprehensive local street and bike network and reflect a greater increase in bicycle mode

---

<sup>1</sup> The financially constrained project list provides eligibility for state and federal funding.

---

share within Central City as described in the City of Portland’s Central City 2035 Comprehensive Plan. As a result, this Transit Supplemental Technical Report compares updated 2045 No-Build Alternative travel time results with Revised Build Alternative results, but there are no direct comparisons to the Build Alternative as this model was not updated. Also, the 2045 No-Build Alternative transit travel time results may differ from those documented in the 2019 Transit Technical Report. Similar to the 2019 Transit Technical Report, the cumulative impacts analysis in this supplemental report considers the Project’s impacts combined with other past, present, and reasonably foreseeable future actions that would result in environmental impacts in the Project Area.

### 4.3 FUTURE YEAR (2045) NO-BUILD ALTERNATIVE

Like the 2019 Transit Technical Report, the future No-Build Alternative is evaluated by the qualitative description of anticipated transit benefits and impacts of the No-Build Alternative by 2045. This Transit Supplemental Technical Report uses updated existing conditions and updates to the City of Portland TSP to identify updated funded and planned transit service enhancements and infrastructure projects in the API that change the analysis of the No-Build Alternative.

## 5.0 AFFECTED ENVIRONMENT

This section updates information related to existing transit infrastructure, routes, stops, and ridership reported in the 2019 Transit Technical Report. The major transit generators and transit routes evaluated in this supplemental report are the similar to what was evaluated in 2019 Transit Technical Report. Changes to the transit routes are detailed in Section 5.2. Transit ridership is updated with fall 2019 data to compare to fall 2017 ridership because overall transit ridership on all routes sharply dropped in 2020 due to the Coronavirus Pandemic.

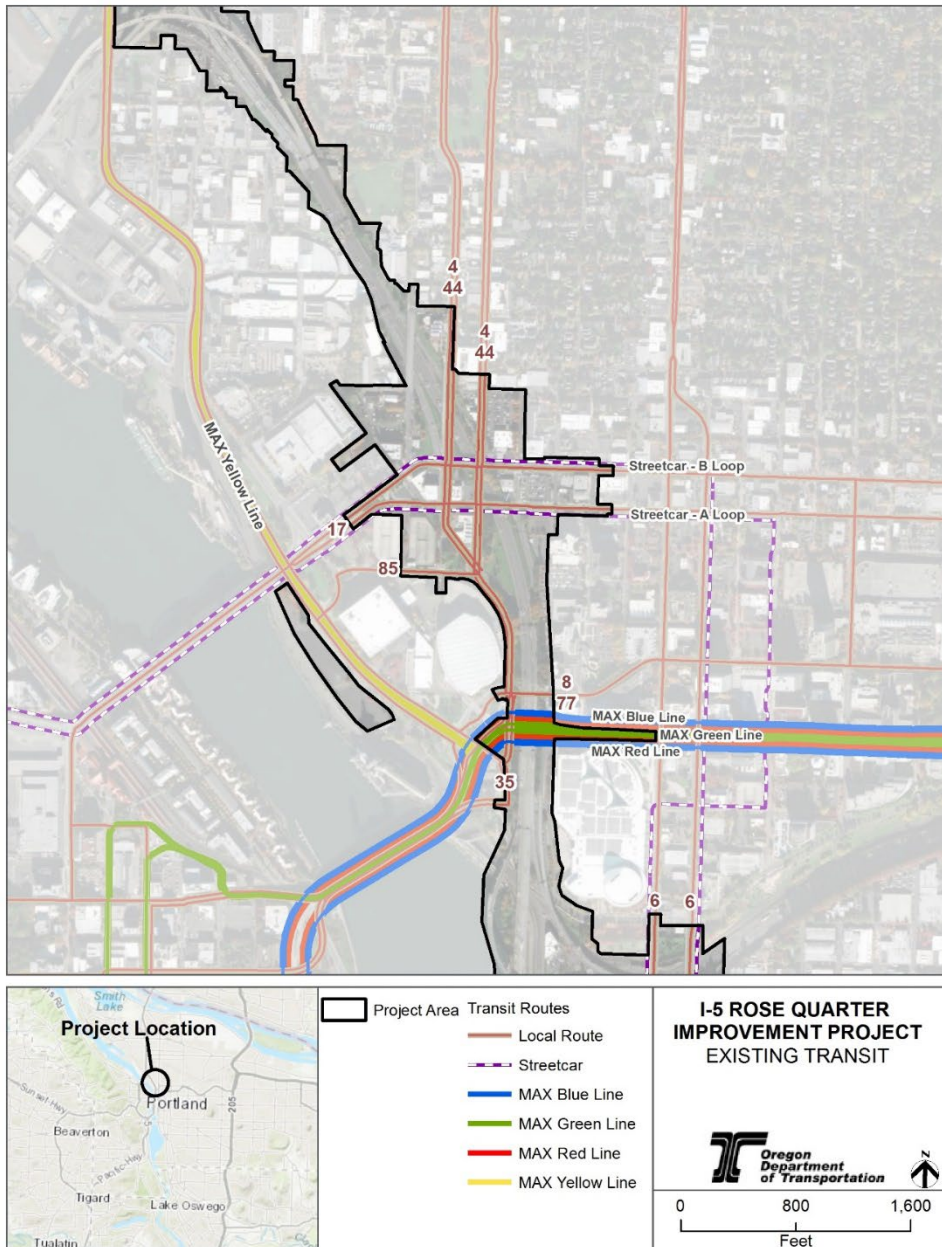
### 5.1 TRANSIT GENERATORS

Transit generators are the same as reported in the 2019 Transit Technical Report.

### 5.2 TRANSIT ROUTES

TriMet operates several fixed-route bus and rail lines within the API, while the City of Portland provides streetcar service. The transit routes evaluated in this supplemental report are similar to those evaluated in 2019 Transit Technical Report. There have been changes to these routes since the 2019 Transit Technical Report as detailed below. Transit routes within the study area are presented in Figure 5 below.

Figure 5 Transit in the API



### 5.2.1 Bus Line 4- Fessenden

Bus line 4 travels between Downtown Portland and St. Johns via the Steel Bridge, Rose Quarter Transit Center, N Williams Avenue, and N Fessenden Street. Within the API, the line follows N Williams Avenue (formerly NE Wheeler Avenue) and the Williams/Vancouver couplet. This line no longer travels to Gresham as reported in the 2019 Transit Technical Report. Line 4 is a

---

designated Frequent Service line that served approximately 6,890 riders on an average weekday in the fall of 2019.

### 5.2.2 Bus Line 6- Martin Luther King Jr. Boulevard

---

Bus line 6 travels between Downtown Portland and Hayden Island via the Hawthorne Bridge, NE/SE Martin Luther King Jr. Boulevard, N Vancouver Avenue, and I-5. Within the API, southbound buses use NE Martin Luther King Jr. Boulevard, while northbound buses use NE Grand Avenue. This line terminates on Hayden Island and no longer travels to Vancouver, Washington as reported in the 2019 Transit Technical Report. Line 6 is a designated Frequent Service line that served approximately 6,380 riders on an average weekday in the fall of 2019.

### 5.2.3 Bus Line 8- Jackson Park/NE 15th Avenue

---

Bus line 8 has not changed since the writing of the 2019 Transit Technical Report. This route travels between the Oregon Health and Sciences University campus and NE Portland via SW Sam Jackson Park Road, Downtown Portland, the Steel Bridge, Rose Quarter Transit Center, NE 15th Avenue, and NE Dekum Street. Within the API, the line follows N Williams Avenue (formerly NE Wheeler Avenue) and NE Multnomah Street. Line 8 is a designated Frequent Service line that served approximately 5,860 riders on an average weekday in the fall of 2019.

### 5.2.4 Bus Line 17- Holgate/Broadway

---

Bus line 17 travels between Outer Southeast Portland and NE Portland via SE Holgate Boulevard, Downtown Portland, the Broadway Bridge, the Broadway/Weidler couplet, NE 24th Avenue, and NE 27th Avenue. Within the API, the line travels eastbound on N/NE Weidler Street and westbound via N/NE Broadway. Line 17 served approximately 6,500 riders on an average weekday in the fall of 2019.

### 5.2.5 Bus Line 24- Fremont/NW 18<sup>th</sup>

---

Bus line 24 connects service between Gateway Transit Center, Legacy Emanuel Hospital and Providence Park along NE 102<sup>nd</sup> Avenue, NE Halsey Street, NE 92<sup>nd</sup> Avenue, N/NE Fremont Street, N Williams/N Vancouver Avenue, N Kerby Avenue, the Fremont bridge, NW Thurman Street, and NW 18th/19<sup>th</sup>Avenues. Within the API, the line travels on the Fremont Bridge interchange, N Kerby Avenue and N Russel Street. Line 24, now Line 24-Fremont/NW 18th served approximately 1,280 riders on an average weekday in the fall of 2019.

### 5.2.6 Bus Line 35- Macadam/Greeley

---

Bus line 35 travels between Oregon City and the University of Portland via Oregon 43, Lake Oswego, Downtown Portland, the Steel Bridge, Rose Quarter Transit Center, N Greeley Avenue and N Willis Street. Within the API, the line follows N Interstate Avenue and passes beneath the



---

Broadway Bridge. Line 35 served approximately 3,750 riders on an average weekday in the fall of 2019.

### 5.2.7 Bus Line 44- Capitol Highway/Mocks Crest

---

Bus line 44 travels between Portland Community College (Sylvania campus) and St. Johns via SW Capitol Highway, SW Barbur Boulevard, Downtown Portland, the Steel Bridge, Rose Quarter Transit Center, Williams, N Willamette Boulevard, and N Lombard Street. Within the API, the line follows N Williams Avenue (formerly NE Wheeler Avenue) and the Williams/Vancouver couplet. Line 44 served approximately 4,940 riders on an average weekday in the fall of 2019.

### 5.2.8 Bus Line 77- Broadway/Halsey

---

Bus line 77 travels between Northwest Portland and Troutdale via NW 21st Avenue, the NW Everett/Glisan couplet, the Steel Bridge, Rose Quarter Transit Center, NE Broadway, and NE Halsey Street. Within the API, the line follows N Williams Avenue (formerly NE Wheeler Avenue) and N/NE Multnomah Street. Line 77 served approximately 5,610 riders on an average weekday in the fall of 2019.

### 5.2.9 Bus Line 85- Swan Island

---

Bus line 85 provides weekday service between Rose Quarter Transit Center and Swan Island via N Interstate Avenue, N Greeley Avenue, and N Going Street. Within the API, the line follows N Interstate Avenue, N Ramsay Way, and N Williams Avenue (formerly NE Wheeler Avenue). Line 85 served approximately 450 riders on an average weekday in the fall of 2019.

### 5.2.10 MAX Light Rail Blue Line

---

The Metropolitan Area Express (MAX) Blue Line is a light rail corridor linking Hillsboro and Gresham via Beaverton, Downtown Portland, NE Portland, and several transit centers along its path. Within the API, the line parallels NE Holladay Street. The MAX Blue, Green, and Red Lines all share the same light rail tracks within the API (see Figure 5). The Blue Line is a designated Frequent Service line that served approximately 53,920 riders on an average weekday in the fall of 2019.

### 5.2.11 MAX Light Rail Green Line

---

The MAX Green Line is a light rail corridor linking Downtown Portland and Clackamas Town Center via NE and SE Portland and serving several transit centers along its path. Within the API, the line parallels NE Holladay Street. The Green Line is a designated Frequent Service line that served approximately 20,940 riders on an average weekday in the fall of 2019.

---

### 5.2.12 MAX Light Rail Red Line

---

The MAX Red Line is a light rail corridor linking Hillsboro and Portland International Airport via Beaverton, Downtown Portland, NE Portland, and several transit centers along its path. Within the API, the line parallels NE Holladay Street. The Red Line is a designated Frequent Service line that served approximately 21,830 riders on an average weekday in the fall of 2019.

### 5.2.13 Portland Streetcar “A” and “B” Loops

---

The Portland Streetcar follows a loop linking several districts in Portland’s central core, including Downtown Portland, the Pearl District, Lloyd, Central Eastside Industrial District, and South Waterfront. The “A” Loop travels clockwise, while the “B” Loop travels counterclockwise. Within the API, the streetcar alignment follows the Broadway/Weidler couplet and the Martin Luther King Jr./Grand couplet. Combined, the “A” and “B” loops served approximately 5,717 riders on an average weekday in fall of 2019. Both loops provide service every 15 minutes during business hours and every 20 minutes in the evenings and on the weekends.

### 5.2.14 LIFT Paratransit

---

TriMet’s complimentary paratransit program is called LIFT. It is a shared-ride, “door-to-door”/“curb-to-curb”, public transportation service for people with disabilities that prevent them from using TriMet’s regular bus and MAX light rail service for some or all of their trips. LIFT service operates during the same hours and covers the same geographic area as regular TriMet service. LIFT service covers all locations that are within three-quarters of a mile of TriMet’s bus, MAX Light Rail, and also within the TriMet service area.

## 5.3 TRANSIT STOPS AND RIDER ACTIVITY

Table 1 summarizes ridership change between 2017 and 2019 and shows variation in ridership across the routes. The average decrease in ridership across all routes in the API between fall of 2017 and fall of 2020 was 64.8%, so comparison with fall of 2019 was used for more traditional ridership data (2020a).

Table 1 Route Ridership Comparison

Route	2017 Ridership	2019 Ridership	Difference	Percent Difference
4-Division/Fessenden	16,500	6,890 <sup>2</sup>	-9,610	-58.2%
6-Martin Luther King Jr. Boulevard	5,600	6,380	780	13.9%
8-Jackson Park/NE 15th Avenue	6,210	5,860	-350	-5.6%
17-Holgate/Broadway	6,160	6,500	340	5.5%
35-Macadam/Greeley	3,730	3,750	20	0.5%
44-Capitol Highway/Mocks Crest	4,680	4,940	260	5.6%
77-Broadway/Halsey	5,300	5,610	310	5.9%
85-Swan Island	450	450	0	0%
MAX Blue Line	55,890	53,920	-1,970	-2.0%
MAX Green Line	21,360	20,940	-420	4.2%
MAX Red Line	20,950	21,830	880	4.2%
Portland Streetcar "A" and "B" Loops	6,900	5717	-1,183	-17.2%

Source TriMet 2019a

All transit stops are the same as evaluated in the 2019 Transit Technical Report. Table 2 below shows stop-level ridership for all stops in the API<sup>3</sup>. Similar to route-level ridership, stop ridership fluctuated across transit stops in the API from 2017 to 2019.

<sup>2</sup> Route 4 no longer travels to Gresham so cannot be compared directly to 2017 ridership.

<sup>3</sup> Table 2 includes all of the same stops evaluated in the 2019 Transit Technical Report, with the exception of streetcar-stop ridership due to lack of available updated 2019 data.



Table 2 Fall of 2019 Transit Stops and Ridership Activity

STOP ID	STOP LOCATION	LINE(S) SERVED	STOP DIRECTION	STOP POSITION	AVERAGE WEEKDAY ALIGHTINGS	TOTAL BOARDINGS/ALIGHTINGS	AVERAGE MONTHLY LIFTS
611	N Broadway & N Benton Avenue	17	Eastbound	Farside	17	24	3
627	N Broadway & N Vancouver Avenue	17	Westbound	Nearside	31	47	31
633	NE Broadway & NE 2 <sup>nd</sup> Avenue	17	Westbound	Nearside	10	26	11
6008	N Vancouver Avenue & N Tillamook Street	4, 44	Southbound	Nearside	17	48	2
6009	N Vancouver Avenue & N Weidler Street	4, 44	Southbound	Nearside	78	112	36
6220	N/NE Weidler Street & N Williams Avenue	17	Eastbound	Nearside	27	57	36
6232	NE Weidler Street & NE 2 <sup>nd</sup> Avenue	17	Eastbound	Nearside	22	31	16
6357	N Williams Avenue & N/NE Broadway	4, 44	Northbound	Farside	37	87	11
11480	N Williams Avenue & N/NE Weidler Street	4, 44	Northbound	Nearside	52	93	34
12374	N Broadway & N Benton Avenue	17	Westbound	Nearside	9	26	6
1097*	Rose Quarter Transit Center (bus stop)	4, 44	Northbound	N/A	105	926	147
2592*	Rose Quarter Transit Center (bus stop)	4, 8, 44, 77, 85	Southbound	N/A	1,059	1,677	255
11814*	N Interstate Avenue & Rose Quarter Transit Center	35	Northbound	Nearside	34	135	3
11817*	N/NE Multnomah Street & Rose Quarter Transit Center	8, 77	Eastbound	Nearside	291	496	129
8340/ 8377*	Rose Quarter Transit Center MAX Station**	MAX Blue, Red, Green	Eastbound/ Westbound	N/A	3,686	7,329	0

Source: TriMet, 2019b. Notes: N/A = Not applicable

\* Transit stop is part of the Rose Quarter Transit Center.

\*\* Does not include "Interstate/Rose Quarter" MAX station (served by MAX Yellow Line), as this station is located outside of the Area of Potential Impact.

---

## 5.4 TRANSIT PLANNING DESIGNATIONS

The 2018 Transportation System Plan (TSP) evaluated in the 2019 Transit Technical Report was updated in March of 2020 (ODOT 2020). There are no changes of Transit Planning Designations<sup>4</sup> within the API from what was reported in the 2019 Transit Technical Report.

# 6.0 ENVIRONMENTAL CONSEQUENCES

## 6.1 NO-BUILD ALTERNATIVE

The No-Build Alternative is similar to what was described in the 2019 Transit Technical Report. TriMet is already operating at 90% pre-pandemic service levels and expects ridership to rebound to 90% of pre-pandemic levels within the next five years despite the sharp drop in ridership from 2017 to 2020. Updates to the ODOT STIP, City of Portland TSP, and Metro RTP as described in Section 3.0 do not change impacts under the No-Build Alternative that were reported in the 2019 Transit Technical Report. No-Build Streetcar and Bus travel times results have been updated based on updated Vissim models (See Table 3 and Table 4). Vissim models for the 2045 No-Build Alternative and 2045 Revised Build Alternative models have been refined to provide a more comprehensive local street and bike network and reflect a greater increase in bicycle mode share within Central City as described in the City of Portland's Central City 2035 Comprehensive Plan. Therefore, No-Build Alternative travel times may differ from those included in the 2019 Transit Technical Report.

## 6.2 REVISED BUILD ALTERNATIVE

This section describes the direct, indirect, and cumulative impacts of the Revised Build Alternative compared to the No-Build Alternative.

### 6.2.1 Short Term (Construction Impacts)

---

The short-term impacts evaluated in this supplemental report would be those that occur during the construction phase of the Project. While some project elements in the I-5 Rose Quarter are changing due to design changes, construction impacts of the Revised Build Alternative would be mostly the same as the Build Alternative as reported in the 2019 Transit Technical Report. Two exceptions would be the closure of N Williams Avenue and the overall duration of construction. The construction of the Revised Build Alternative would still require the temporary removal and reconstruction of all existing I-5 overcrossings in the Project Area and various short-term shutdowns and interruptions of the Rose Quarter Transit Center.

---

<sup>4</sup> Transit Planning Designations are classifications given to streets based on the frequency, reliability, and level of service of the routes that service them.

---

N Williams Avenue between N Wheeler Avenue and NE Weidler Street would be closed for the majority of the highway cover construction. The complete closure of N Williams Avenue during construction of the new highway cover and the relocation the southbound offramp on N Williams Avenue would have a greater impact to bus routes 4 and 44 during construction compared to the Build Alternative. These two lines would also be affected by a detour required for N Vancouver Avenue; however, the durations of these closures would be similar for both the Revised Build and Build Alternatives. Extended detours would lead to higher delays in bus routes 4 and 44 through the duration of construction. Existing bus stops (Stop ID 6220 at N/NE Weidler Street & N Williams Avenue servicing route 17 and Stop ID 11480 at N Williams Avenue at N/NE Weidler Street servicing routes 4 and 44) would be relocated during construction. Specific detouring and routing of routes 4 and 44 during construction would be determined by TriMet. There is a possibility that other stops in the API may be impacted during construction depending on TriMet’s detouring decisions. To minimize bus routes delays, the design team will coordinate with the City and TriMet to evaluate potential signal timing adjustments or dedicated transit lanes along detour routes during final design. The duration of the highway cover construction is expected to increase under the Revised Build Alternative due to the increases and adjustments to the highway cover limits and relocation of the southbound exit ramp. The duration of impacts to bus routes and TriMet operations discussed in this section and in the 2019 Transit Technical Report will increase under the Revised Build Alternative.

Impacts to LIFT services would be varied depending on the origin and destination of the rider. Generally, LIFT riders with origins or destinations in the API could expect short delays during the construction of the project.

### 6.2.2 Long-Term and Operational Direct Impacts

---

Direct transit impacts under the Revised Build Alternative as compared to the No-Build Alternative and Build Alternatives would include the following:

#### Transit Stops

Modification (or relocation) of the bus route 17 N Broadway at N Vancouver Avenue bus stop (Stop ID 627) to accommodate the Broadway/Weidler/Williams cover. The result of the stop modification/relocation would be mitigated because the updated stop location would include upgraded stop facilities and lighting. This impact under the Revised Build Alternative would be in addition to the three impacted stops<sup>5</sup> under the Build Alternative as identified in the 2019 Transit Technical Report. The Revised Build Alternative would impact more bus stops than the

---

<sup>5</sup> The stops impacted under both the Build and Revised Build Alternative are N Vancouver Avenue at N Weidler Street (Stop ID 6009), N/NE Weidler Street at N Williams Avenue (Stop ID 6220), and N Williams Avenue at N/NE Weidler Street (Stop ID 11480).

No-Build Alternative (which would see no changes to stops) due to the construction of the new highway cover.

**LIFT Services**

LIFT operates as a “door-to-door” or “curb-to-curb” service, therefore impacts to travel time of the service would be similar to the general traffic impacts of the project. Project intersections would operate at acceptable Level of Service (LOS) with the exception of N Broadway and N Victoria Avenue which would operate at LOS E in the AM peak hour (8-9 AM), per Synchro analysis results, and at LOS E in the PM peak hour (4-5 PM), per Vissim results. .

**Streetcar Travel Time**

VISSIM<sup>6</sup> modeling of Portland Streetcar travel times along N/NE Broadway and N/NE Weidler Street between NE Grand Avenue and the east side of the Broadway Bridge were updated for the No-Build and Revised Build Alternative. The results of the streetcar performance modeling are shown in Table 3 below, which compares the streetcar travel times of the future (2045) Revised Build Alternative and No-Build Alternative. The Revised Build Alternative would include a third westbound lane on NE Broadway between NE Victoria Avenue and N Williams Avenue to accommodate traffic connecting to the northbound onramp at N Williams Avenue. Westbound streetcar travel times would be shorter during AM and PM peak hours under the Revised Build Alternative compared to the No-Build Alternative due to the addition of a third westbound lane. Under the Revised Build Alternative, eastbound Streetcar travel times in the AM and PM peak hours would be longer compared to those in the No-Build Alternative with travel time increases ranging from 20 to 46 seconds.

Table 3 Future (2045) Conditions- Streetcar Travel Time (Minutes) N/NE Broadway and N/NE Weidler Street between NE Grand Avenue and East Side of the Broadway Bridge

Route	7-8 AM		8-9 AM		4-5 PM		5-6 PM	
	No Build	Revised Build	No Build	Revised Build	No Build	Revised Build	No Build	Revised Build
WB Streetcar	4.1	3.7	4.3	3.7	4.4	4.3	5.0	4.5
EB Streetcar	3.3	3.7	3.2	3.9	4.7	5.1	5.7	6.1

**Bus Travel Time**

Three bus lines traverse the cover area of the API. Lines 4 and 44 travel on N Williams Avenue and N Vancouver Avenue between N/NE Multnomah Street and NE Russell Street within the

<sup>6</sup> VISSIM 10 is a widely used, behavior-based multi-purpose traffic microsimulation program.

---

API. Line 17 travels westbound on N/NE Broadway and eastbound on N/NE Weidler Street from NE Grand Avenue to N Larrabee Avenue. Bus travel times were updated based on the VISSIM simulations for the No-Build and Revised Build Alternatives. Table 4 below shows the estimated bus travel times of the future (2045) Revised Build and No-Build Alternatives.

During the AM peak period, bus travel times in the Revised Build Alternative would be shorter than those in the No-Build Alternative for the southbound and westbound bus routes. Travel times under the Revised Build Alternative for buses 4 and 44 northbound and bus 17 eastbound routes would be longer compared to the No-Build Alternative travel times. Increases in travel time in the AM peak hours range from 19 to 35 seconds. The relocation of the I-5 southbound exit ramp terminal to N Williams Avenue would increase traffic on the northbound direction. This change in travel pattern would require balancing signal timing at the intersection of N Williams Avenue and Weidler Street to accommodate eastbound and higher northbound traffic volumes increasing delays in the eastbound direction. Also, the intersection of N Williams Avenue at Hancock Street in the Revised Build Alternative would increase travel time as it would be signalized. In the No-Build Alternative this intersection is unsignalized and northbound traffic is not required to stop at Hancock Street. By comparison, the Build Alternative in the evaluation documented in the 2019 Transit Report would also result in longer bus travel times in all bus routes in the AM peak hours with travel times 6 seconds to over a minute longer compared to the No-Build Alternative results.

During the PM peak period, bus travel times for bus routes 4 and 44 northbound and southbound under the Revised Build Alternative would be longer than those in the No-Build Alternative. Similarly, to the AM results, during the PM peak periods higher traffic volumes would be traveling on northbound N Williams Avenue due to relocation of the I-5 southbound exit ramp increasing the travel times of bus routes along N Williams Avenue. In the southbound direction, in order to accommodate a protected bike lane on N Vancouver Avenue between N Broadway and NE Weidler Street in the Revised Build Alternative, the existing shared bus/bicycle lane may be removed and replaced with a bicycle-only lane. Buses would travel in the general-purpose traffic lane. This proposed modification will require further discussion with the City and TriMet. Bus 17 eastbound route would also experience longer travel times during the PM peak hour compared to the No-Build Alternative. Increases in the bus travel time range from 6 to 42 seconds in the PM peak hours. Under the Revised Build Alternative, westbound PM peak hour travel times for bus route 17 would be shorter, approximately 10 to 20 seconds shorter, than those in the No-Build Alternative. The 2019 Transit report concluded that the Build Alternative would result in shorter bus travel times in the eastbound direction PM peak hours and shorter travel times in the southbound direction in the 5-6 p.m. peak hour. Northbound bus route would experience a slightly longer travel time of approximately 6-12 seconds longer in the PM peak hour. Westbound bus route would result in the same or slightly longer travel time, 6 seconds longer.

Table 4 Future (2045) Bus Travel Time (minutes) <sup>7</sup>

Route	7-8 AM		8-9 AM		4-5 PM		5-6 PM	
	No Build	Revised Build	No Build	Revised Build	No Build	Revised Build	No Build	Revised Build
Bus 4 and 44 NB	3.5	4.1	3.5	4.0	3.6	4.2	3.7	4.4
Bus 4 and 44 SB	3.4	2.9	4.0	2.8	2.8	3.2	2.9	3.2
Bus 17 WB	4.3	3.4	5.1	3.7	4.7	4.6	4.9	4.6
Bus 17 EB	3.0	3.6	3.3	3.6	3.9	4.1	4.6	4.7

The 2019 Transit Technical Report identified longer bus travel times for most routes under the Build Alternative with the exception of southbound in the 5-6 PM peak hour and eastbound in both PM peak hours when compared to the 2019 Transit Technical Report No-Build Alternative results.

### 6.2.3 Indirect Impacts

All indirect impacts identified for the Build Alternative as reported in the 2019 Transit Technical Report would also apply to the Revised Build Alternative. Additionally, the increased building capacity on the cover under the Revised Build Alternative has potential to produce new transit generators (housing and potentially transit-oriented development) that could increase transit ridership in the API compared to the Build and No-Build Alternatives.

### 6.2.4 Cumulative Effects

The cumulative transit impacts of past and future actions, combined with the Project, would include the following:

- Long construction periods (coupled with circuitous bus detour routes) could temporarily suppress transit ridership due to passenger inconvenience.
- Improved transit access, more transit service (new routes and additional frequency) and increasing population within the API could contribute to overall longer-term ridership gains.
- The revised Build Alternative may limit Enhanced Transit Corridor Plans within the API; however, implementation of future Enhanced Transit Corridor Plans within the API could potentially result in improvements on transit operations.
- Increasing population within the API and new development on the highway cover could contribute to overall longer-term ridership gains.

<sup>7</sup> Bus travel times for routes 4 and 44 were modeled on N Williams Avenue (NB) and N Vancouver Avenue (SB) between N/NE Multnomah Street and NE Hancock Street. Bus travel times for route 17 were modeled on N/NE Broadway (WB) and N/NE Weidler Street (EB) from NE Grand Avenue to N Larrabee Avenue.

---

## 6.3 CONCLUSION

The analysis from this report has shown that the Revised Build Alternative would:

- Close N Williams Avenue between N Wheeler Avenue and NE Weidler Street for the majority of construction, which would cause rerouting and delays of bus routes 4 and 44.
- Extend the duration of construction which would increase delays to transit service in the API.
- Modify or relocate the bus route 17 N Broadway at N Vancouver Avenue bus stop (Stop ID 627) to accommodate the highway cover. Stop modifications would include improved facilities and lighting.
- Provide additional building capacity on the highway cover, which could produce new transit generators and increase transit ridership in the API.
- Result in shorter streetcar travel times in the westbound direction compared to the No-Build Alternative and longer streetcar travel times in the eastbound direction compared to the No-Build Alternative.
- Result in shorter bus travel times in the southbound and westbound routes during the AM peak period compared to the No-Build Alternative and longer travel times in the northbound and eastbound routes. During the PM peak period, Revised Build Alternative bus travel times would be shorter in the westbound direction and would be longer in the northbound, southbound and eastbound routes compared to the No-Build Alternative.

## 7.0 AVOIDANCE, MINIMIZATION, AND MITIGATION MEASURES

Mitigation measures would be the same as reported in the 2019 Transit Technical Report.

## 8.0 PREPARERS

NAME	DISCIPLINE	EDUCATION	YEARS OF EXPERIENCE
<b>Garrett Augustyn</b>	Planner	<ul style="list-style-type: none"> <li>• M.S.</li> </ul>	2
<b>Jennifer Hughes</b>	Land Use	<ul style="list-style-type: none"> <li>• Bachelor of Science, Physical Geography</li> <li>• Master of Urban and Regional Planning</li> </ul>	20
<b>Marcela Rodriguez</b>	Transportation Engineering	<ul style="list-style-type: none"> <li>• Bachelor of Science, Civil Engineering</li> <li>• Master of Science, Civil Engineering</li> </ul>	17

## 9.0 REFERENCES

- Association of State Highway and Transportation Officials (AASHTO). 2011. A Policy on Geometric Design of Highways and Streets. Accessed February, 2022.
- National Association of City Transportation Officials (NACTO). 2018. Urban Street Design Guide. Available <https://nacto.org/publication/urban-street-design-guide/>. Accessed: January, 2022.
- City of Portland. 2020. Transportation System Plan (TSP). Available: [https://www.portland.gov/sites/default/files/2020-05/appendix-a.tsp\\_03.06.2020.pdf](https://www.portland.gov/sites/default/files/2020-05/appendix-a.tsp_03.06.2020.pdf). Accessed: January, 2022.
- Metro. 2018. Regional Transportation Plan. Appendices A and B- Constrained Project List. Available: [https://trimet.org/about/pdf/route/2020fall/route\\_ridership\\_report\\_\(sorted\\_by\\_route\)\\_weekday.pdf](https://trimet.org/about/pdf/route/2020fall/route_ridership_report_(sorted_by_route)_weekday.pdf). Accessed January, 2022.
- ODOT. 1999. Oregon Highway Plan. Available: <https://www.oregon.gov/odot/Planning/Documents/OHP.pdf>. Accessed December, 2021.
- ODOT. 2007. Oregon Transportation Plan. Adopted September 20, 2006. Available: <https://www.oregon.gov/odot/planning/pages/plans.aspx>. Accessed December, 2021.
- ODOT. 2012. ODOT Highway Design Manual. Available: <https://www.oregon.gov/odot/Engineering/Pages/Hwy-Design-Manual.aspx>. Accessed December, 2021.
- ODOT. 2018. Oregon Public Transportation Plan (OPTP). Available: <https://www.oregon.gov/ODOT/Planning/Documents/OPTP-OTC-Draft-2018.pdf>. Accessed December, 2021.
- ODOT. 2019. Revised Environmental Assessment I-5 Rose Quarter Improvement Project Transit Technical Report.



---

ODOT. 2020. Statewide Transportation Improvement Program. Available: [https://www.oregon.gov/odot/STIP/Documents/OnlineSTIP\\_Public.pdf](https://www.oregon.gov/odot/STIP/Documents/OnlineSTIP_Public.pdf). Accessed January, 2022).

Rogoway. 2021. Oregon Insight: TriMet ridership inches up, but will take ‘several years’ to recover from pandemic. Oregon Live. Available: <https://www.oregonlive.com/business/2021/06/oregon-insight-trimet-ridership-inches-up-but-will-take-several-years-to-recover-from-pandemic.html>. Accessed February, 2022.

TriMet. 2016. The North/Central Service Enhancement Plan. Available: <https://trimet.org/future/pdf/north-central-final-report.pdf>. Accessed December, 2021.

TriMet. 2019a. Fall 2019 Route Ridership Report. Available: [https://trimet.org/about/pdf/route/2019fall/route\\_ridership\\_report\\_\(sorted\\_by\\_route\)\\_weekday.pdf](https://trimet.org/about/pdf/route/2019fall/route_ridership_report_(sorted_by_route)_weekday.pdf) Accessed August, 2022.

TriMet. 2019b. TriMet Passenger Census-Fall 2019 All Day Ons and Offs by Route and Stop Weekdays. Available: [https://trimet.org/about/pdf/census/2019fall/stop\\_level\\_passenger\\_census\\_sorted\\_by\\_location\\_id\\_\(weekday\).pdf](https://trimet.org/about/pdf/census/2019fall/stop_level_passenger_census_sorted_by_location_id_(weekday).pdf) Accessed August, 2022.

TriMet. 2020. Fall 2020 Service Restoration. Available: <https://trimet.org/alerts/service-change/2020fall/index.htm> Accessed February, 2022.

TriMet. 2020a Fall 2020 Route Ridership Report. Available: [https://trimet.org/about/pdf/route/2020fall/route\\_ridership\\_report\\_\(sorted\\_by\\_route\)\\_weekday.pdf](https://trimet.org/about/pdf/route/2020fall/route_ridership_report_(sorted_by_route)_weekday.pdf). Accessed February, 2022.

TriMet. 2020b Trimet Passenger Census-Fall 2020 All Day Ons and Offs by Route and Stop Weekdays. Available: [https://trimet.org/about/pdf/census/2020fall/route\\_stop\\_level\\_passenger\\_census\\_report\\_\(weekday\).pdf](https://trimet.org/about/pdf/census/2020fall/route_stop_level_passenger_census_report_(weekday).pdf). Accessed February, 2022.

TriMet. 2022. February 2022 Monthly Performance Report. Available: <https://trimet.org/about/pdf/2022/Feb%202022%20MPR.pdf>