REVISED TRANSIT SUPPLEMENTAL TECHNICAL REPORT

Oregon Department of Transportation

December 7, 2023

This page is intentionally left blank.

Contents

I-5 ROSE QUARTER IMPROVEMENT PROJECT

Tables

Figures

Executive Summary

This technical report **presents revisions to the 2022 Transit Supplemental Technical Report, which supplemented** the 2019 Transit Technical Report (ODOT 2019) with an evaluation of the transit impacts of the Revised Build Alternative**. New text inserted since the 2022 Transit Supplemental Technical Report is shown in bold text.** The analysis focuses on how the updated highway cover construction and long-term operation would impact transit activity on local streets in the Area of Potential Impact (API). **Revisions to the 2022 Transit Supplemental Technical Report are based on comments on the I-5 Rose Quarter Improvement Project Supplemental Environmental Assessment and subsequent refinements to the project design**.

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 **3 to 6** 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 **exit ramp** on N Williams Avenue **requires expansion of the highway cover through the N/ NE Weidler Street and N Williams Avenue intersection. To build the ramp and the extended highway cover**, closure of N Williams Avenue between N Wheeler Avenue and NE Weidler Street for the duration of **the highway cover** construction **is anticipated**, 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, **Stop ID 627 (**N Broadway at N Vancouver Avenue) to accommodate the **highway cover**. **Also, under the Revised Build Alternative a consolidation of two bus stops on Routes 4 and 44, Stop ID 11480 (N Williams Avenue and N/ NE Weidler Street) and Stop ID 6357 (N Williams Avenue and N Broadway), is proposed to a single stop on N Williams Avenue between NE Weidler Street and N Broadway.** Stop modifications would include improved facilities and lighting.

The No-Build Alternative is similar to that described in the 2019 Transit Technical Report and would have similar impacts **to** 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 bicycle 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, **streetcar travel times would be shorter in the AM peak hours in the westbound direction and slightly longer (within 25 seconds) in the eastbound direction compared to the No-Build Alternative travel times. In the PM peak hours, both eastbound** 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 **northbound and** westbound routes compared to the No-Build Alternative, while bus travel times would be **longer in the** eastbound bus routes compared to the No-Build Alternative. **Travel times in the southbound direction would generally be shorter except in the 2-way Wheeler during the 8-9 AM peak hour**. During the PM peak hours, **eastbound and** westbound routes would experience shorter travel times compared to the No-Build Alternative while southbound **route** would experience longer travel times when compared to those in the No-Build Alternative. **Northbound route would experience similar or slightly longer travel time (less than 20 seconds longer) during the PM peak hours.**

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. **ODOT prepared a Transportation Safety Supplemental Technical Report, which was published with the I-5 Rose Quarter Improvement Project Supplemental Environmental Assessment (SEA) on November 15, 2022. In response to public comments received on the SEA, ODOT refined the design of the Revised Build Alternative. This Revised Transportation Safety Supplemental Technical Report reflects changes to the evaluation of the Transportation Safety impacts based on those design refinements, which are described below in Section 2.0. All updated information is shown in bold text.**

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 **and comments on the SEA**. 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 **partner** 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 **partners** 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 **partner** 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.

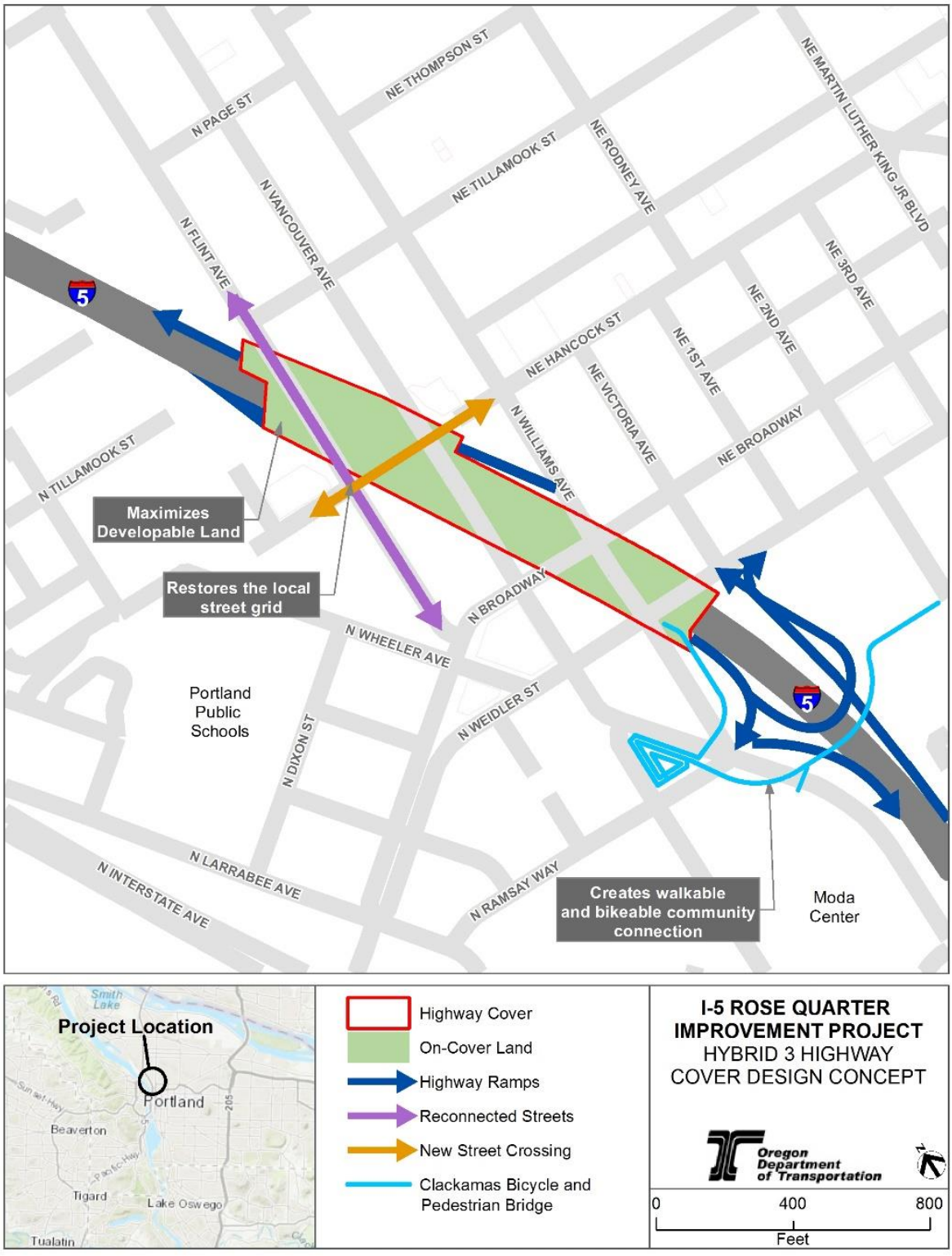
In January 2022, Governor Brown entered into a Letter of Agreement with the City of Portland, Metro, and Multnomah County that demonstrated their shared understanding and collective support for the Hybrid 3 concept as part of the Project. The Letter of Agreement specifically highlights the desire to 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.

FHWA and ODOT released the I-5 Rose Quarter Improvement SEA on November 15, 2022. In response to comments on the SEA, ODOT refined the design of the Revised Build Alternative. The sections below describe the highway cover design changes and the design changes that resulted from advancements in project engineering and **comments on the SEA and** are incorporated into the Revised Build Alternative.

Figure 1 Hybrid 3 Highway Cover Design Concept **with Ramp Reconfiguration**

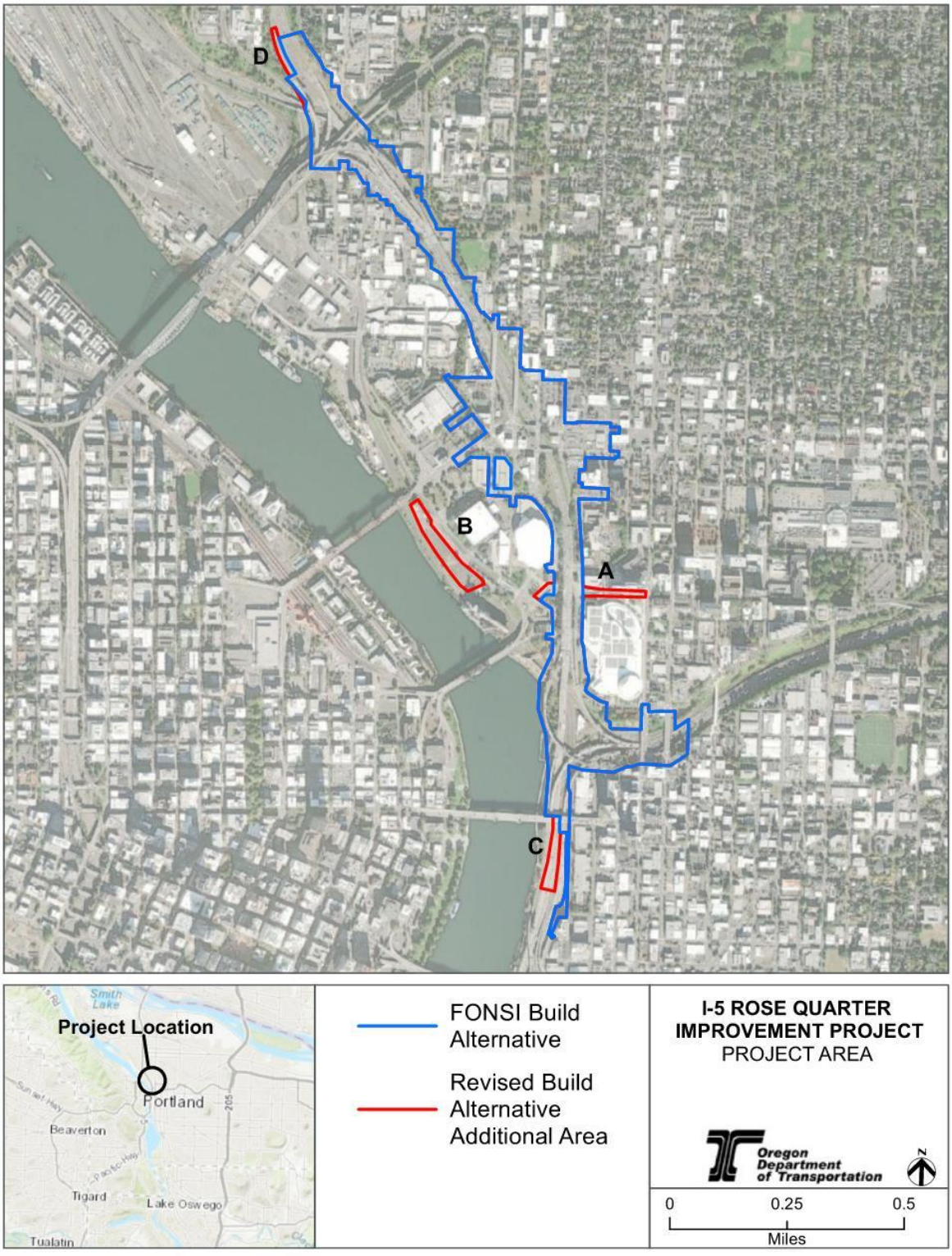


2.2 PROJECT AREA

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. 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).

Figure 2 Previous and Current Project Area.

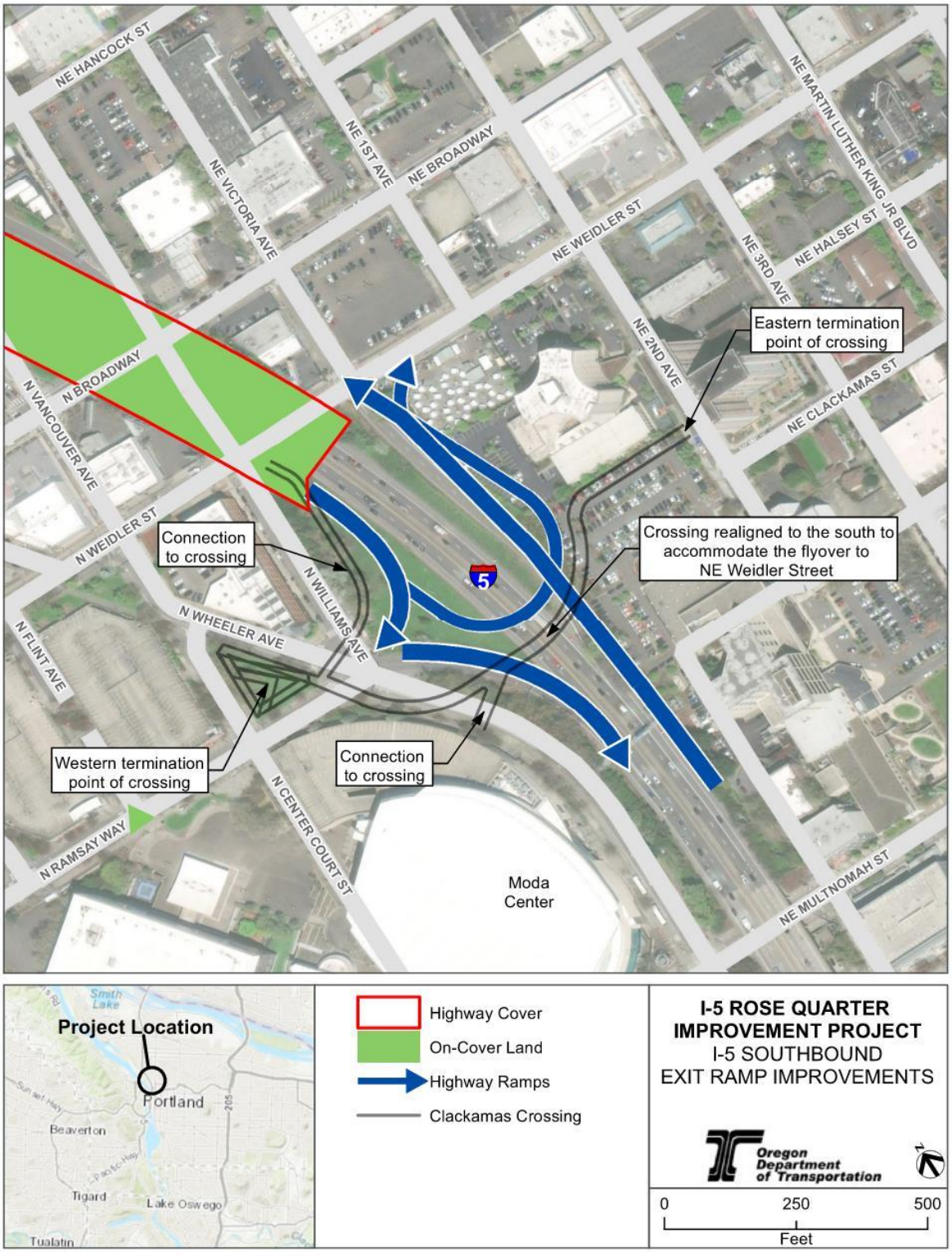


2.3 I-5 MAINLINE IMPROVEMENTS CHANGES

The Build Alternative included relocation of the I-5 southbound **entrance** 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 Wheeler Avenue/ N Williams Avenue/N Ramsay Way (westbound) **and NE Weidler Street (eastbound). The exit ramp would divide westbound traffic from eastbound traffic as seen in Figure 3, with a single lane connection at N Wheeler Avenue/ N Williams Avenue/ N Ramsay Way and single lane bridge (flyover) over I-5 to connect with NE Weidler Street.**
- 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 **N** 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.

Figure 3 I-5 SB Exit Ramp: Traffic Splitting Eastbound from Westbound Traffic

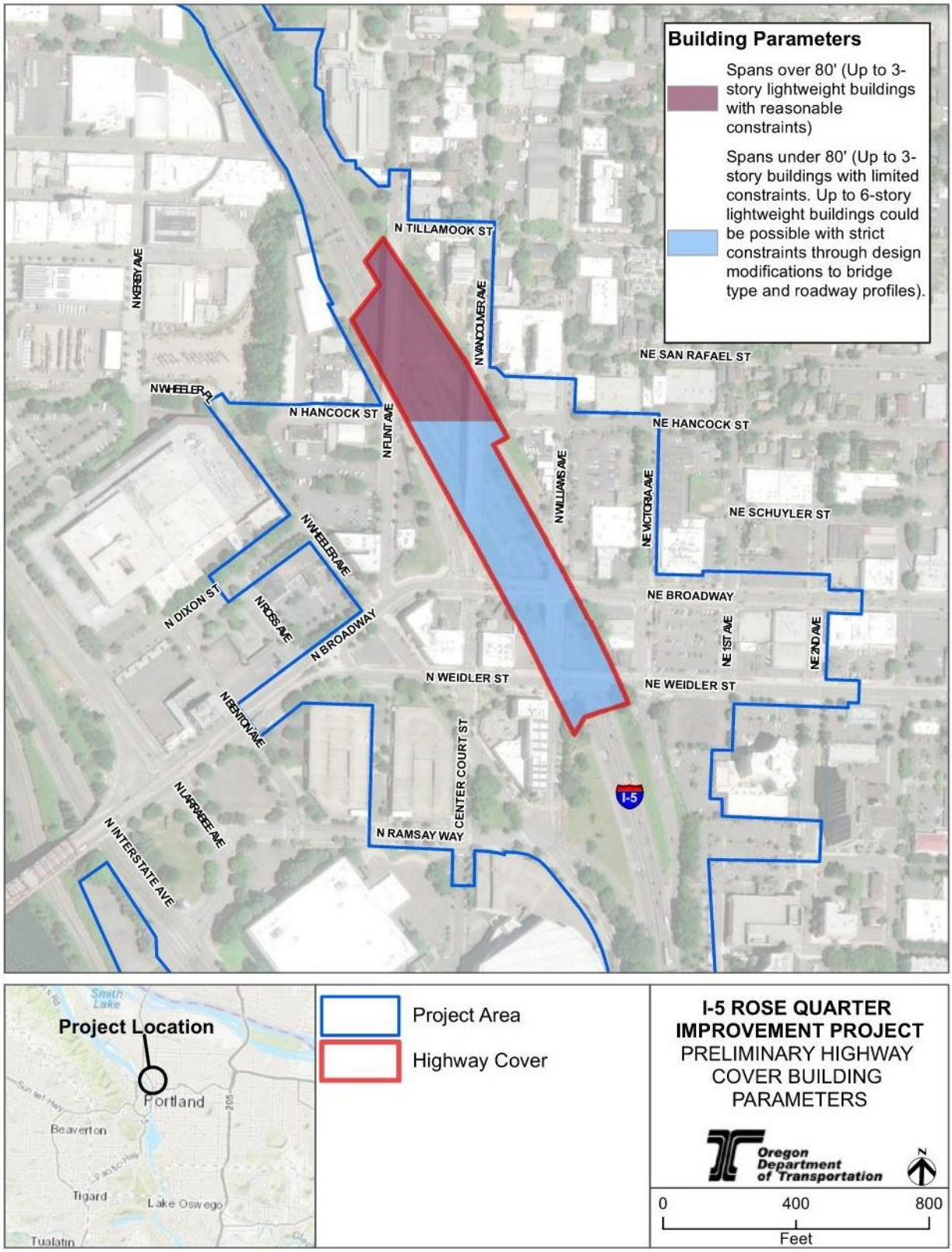


2.4 HIGHWAY COVER CHANGES

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 4). 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 4 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 **accessible,** active, and passi**ve** recreation and/or to provide a buffer, backdrop and visual comfort, such as gardens, lawns or planter beds.
- **Accessible** plazas and hardscaped open space for active and passive recreation, such as courts, plazas, splash pads, picnic areas, and community gathering spaces.
- **Accessible** 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 **accessible** food market shed, eating pavilion, food carts, or picnic venues.

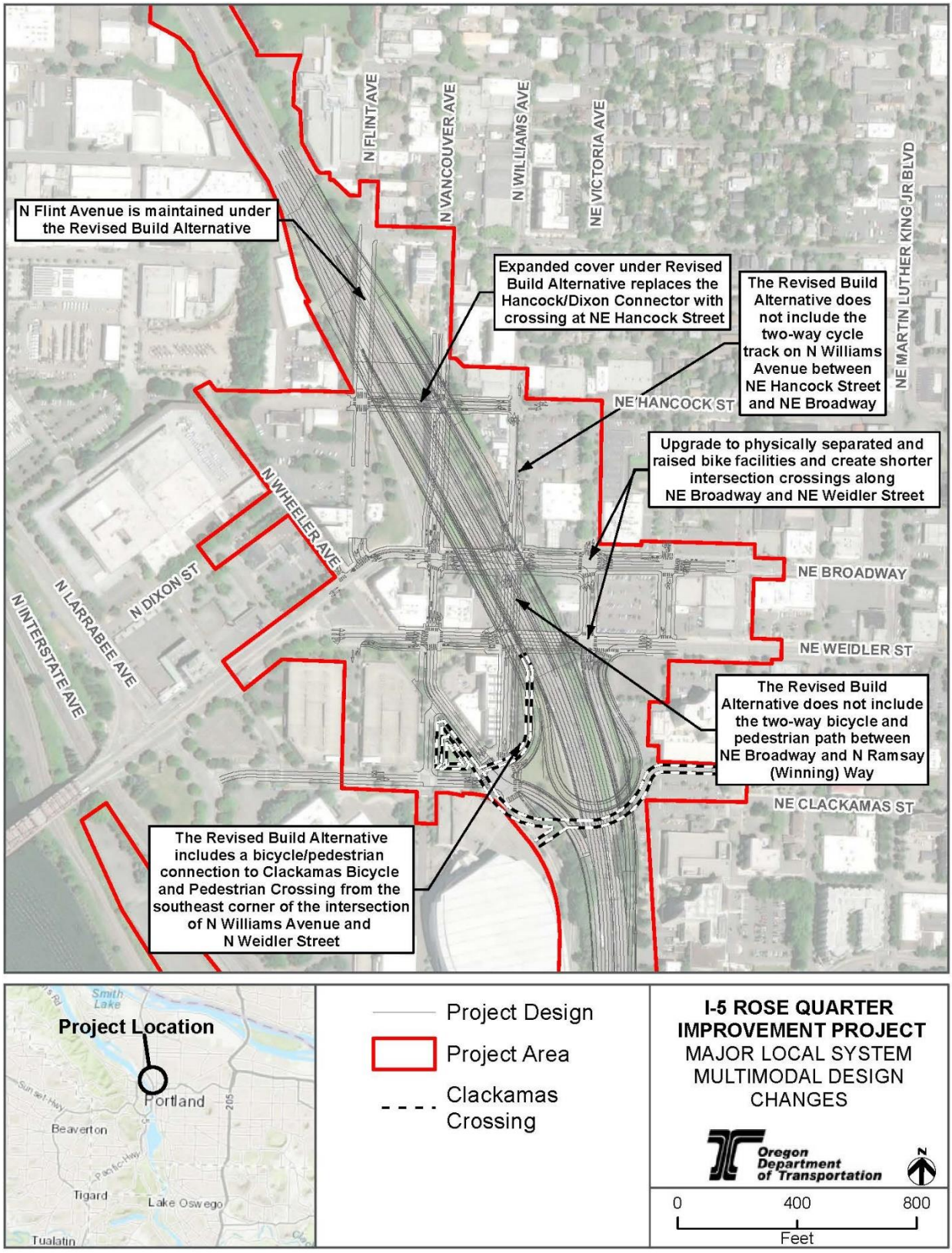
These features may be removed upon implementation of the development determined by the community process or may be incorporated into that development.

2.5 RELATED LOCAL SYSTEM MULTIMODAL IMPROVEMENTS CHANGES

The Revised Build Alternative includes the following changes to local system multimodal improvements to accommodate the Hybrid 3 design concept and subsequent design refinements (see Figure 5 below):

- **Construct** the **accessible** Clackamas Bicycle and Pedestrian Crossing **(a.k.a. Clackamas Crossing):**
  - **Realign the crossing to the south to accommodate the flyover to NE Weidler Street**
  - **Relocate the western termination point of the crossing to the triangle of land framed by N Center Court Street, NE Wheeler Avenue, and N Ramsay Way.**
  - **Provide the following connections to the crossing (to be confirmed in the final design phase):**
    - **From the southeast corner of the intersection of N Williams Avenue and N Weidler Street that spans over N Wheeler Avenue and connects to the crossing, and**
    - **From the Garden Garage, which is attached to the Moda Center**
  - 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. **Permitted traffic modes and roadway profile to be determined during design.**
- 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 at or near NE Hancock Street (to be confirmed in the final design phase).

Figure 5 Major Local System Multimodal Design Changes

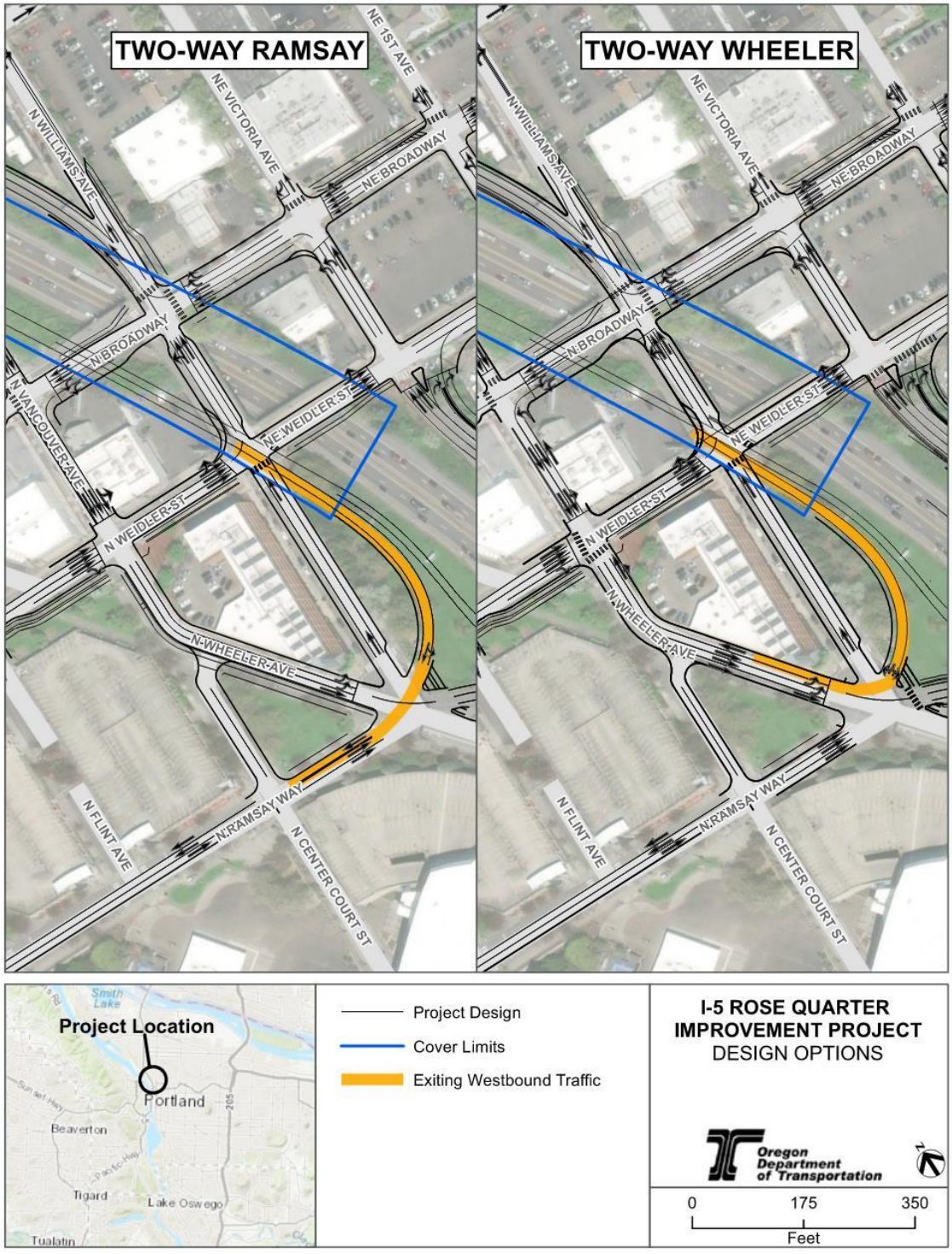


To accommodate I-5 southbound traffic exiting at N Wheeler Avenue/ N Williams Avenue/ N Ramsay Way, ODOT is considering two design options, both of which are evaluated in this report (Figure 6):

- **2-way Ramsay Design Option - Convert N Ramsay Way between N Center Court Street and NE Wheeler Avenue from an eastbound one-way facility to a two-way facility.**
- **2-way Wheeler Design Option - Construct a new northbound travel lane on NE Wheeler Avenue between N Broadway and N Ramsay Way and maintain the three existing southbound travel lanes between N Weidler Street and N Ramsay Way.**

Both design options also include a left turn movement from the I-5 southbound exit ramp to southbound N Williams Avenue. This movement was previously accommodated via N Wheeler Avenue/ N Vancouver Avenue between N Broadway and N Ramsay Way.

Figure 6 Design Options for I-5 SB Exit Ramp: Traffic Heading West



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 **2023**)
- Oregon Transportation Plan (OTP) (ODOT **2023**)
- Oregon Public Transportation Plan (OPTP) (ODOT 2018); Oregon Highway Plan (OHP) (ODOT 1999)
- North/Central Service Enhancement Plan (TriMet 2016)
- Go Lloyd, **Annual Report 2019 Go Lloyd (Go Lloyd, 2020) – Lloyd District Transportation Management Association report on transportation mode split 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 6th edition, which was updated to the 7th 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 7th 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 **entrance** 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 bicycle 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[1]. 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.

1 The financially constrained project list provides eligibility for state and federal funding.

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 **were** updated with the **2019** TriMet data (TriMet **2019**) to reflect pre-pandemic ridership levels. **Changes in ridership in more recent years were investigated (including Fall 2020 and Spring 2023) concluding that ridership continues to be at lower levels than those in Pre-pandemic years. Therefore, section 5.2 ridership descriptions are based on 2019 Ridership reflecting more traditional ridership levels**. 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 bicycle 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. 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 similar to what was evaluated in **the** 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.

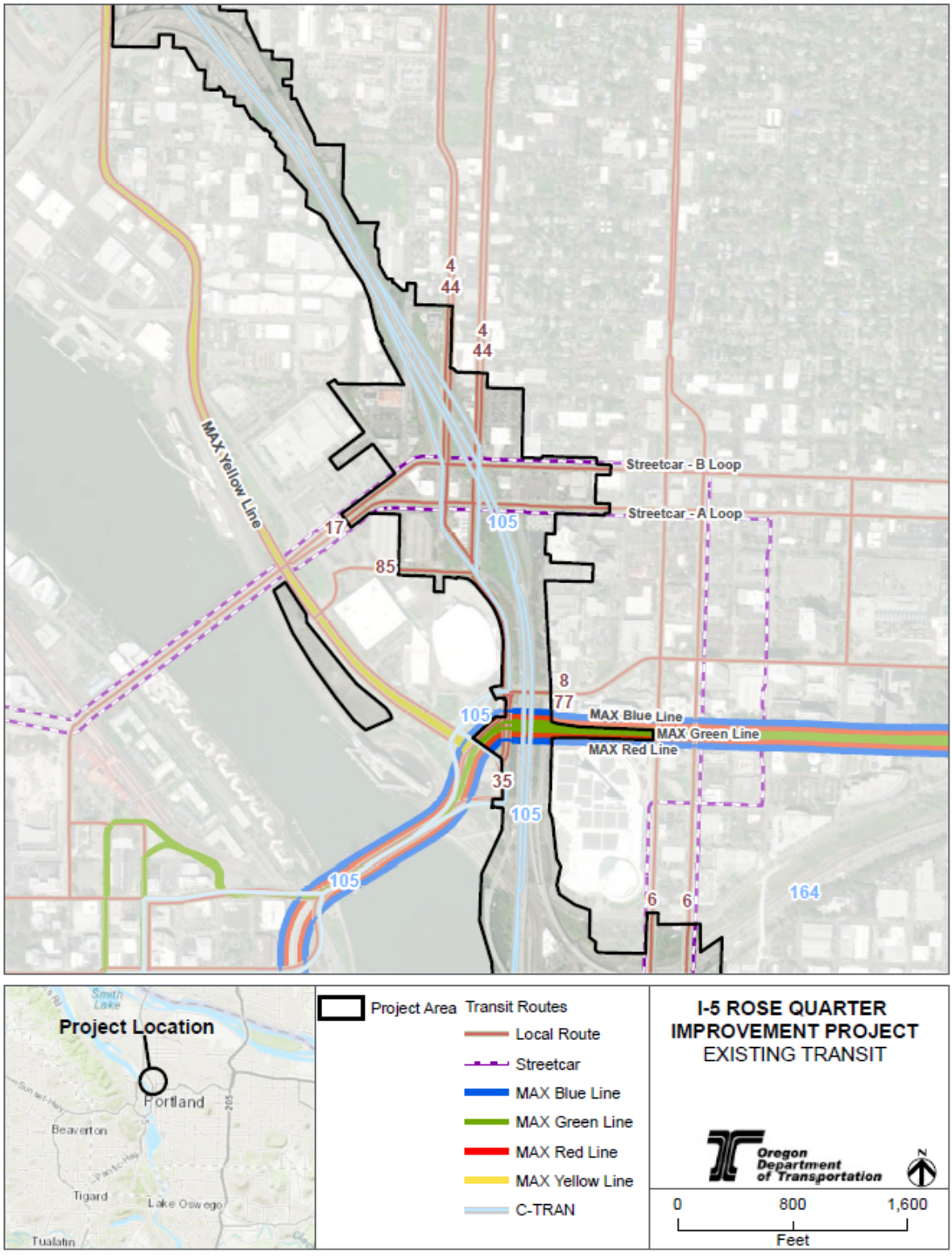
5.1 TRANSIT GENERATORS

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 7 below.

Figure 7 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 18th

Bus line 24 connects service between Gateway Transit Center, Legacy Emanuel Hospital and Providence Park along NE 102nd Avenue, NE Halsey Street, NE 92nd Avenue, N/NE Fremont Street, N Williams/ N Vancouver Avenue, N Kerby Avenue, the Fremont Bridge, NW Thurman Street, and NW 18th/ 19thAvenues. Within the API, the line travels on the Fremont Bridge

interchange, N Kerby Avenue and N Russel Street. Line 24, now Line 24-Freemont/ 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 7). 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.

5.2.15 C-TRAN Routes 105/ 105x

C-TRAN routes 105/ 105x connect Salmon Creek Park and Ride in Vancouver with downtown Portland. C-TRAN routes vary depending on the time of the day and also bus drivers may adjust the route depending on traffic conditions. Generally, within the API, the southbound routes to Portland in the AM hours exit at the I-5 southbound exit ramp to N Broadway and travel to the Steel Bridge via N Wheeler Avenue/ N Vancouver Avenue. Northbound routes to Vancouver in the PM hours travel from Steel Bridge connecting to N Williams Avenue and entering I-5 northbound at the N Broadway entrance ramp.

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 percent, 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[2]	-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	-2,**060**	-**3.7**%
MAX Green Line	21,360	20,940	-420	**-2.0**%
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[3]. Similar to route-level ridership, stop ridership fluctuated across transit stops in the API from 2017 to 2019.

[2] Route 4 no longer travels to Gresham so cannot be compared directly to 2017 ridership.

[3] 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	**Average Weekday** Boardings **and** 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 2nd 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 2nd 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[4] 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. **In the Spring of 2023, TriMet is operating at 80 percent of pre-pandemic service levels and ridership has recovered to 60 percent of pre-pandemic levels (TriMet 2023a). Ridership is expected to increase as TriMet fully restores service guided by the Forward Together (TriMet 2023b) service concept over the next 3-6 years.** 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 bicycle 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

[4] *Transit Planning Designations are classifications given to streets based on the frequency, reliability, and level of service of the routes that service them.*

reconstruction of all existing I-5 overcrossings in the Project Area and various short-term shutdowns and interruptions of the Rose Quarter Transit Center.

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 **of** the southbound **exit ramp** 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/ 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) **is anticipated** of the bus route 17, **Stop ID 627** (N Broadway/ N Vancouver Avenue) to accommodate the Weidler/ Broadway/ Ramsay cover. The stop modification/ relocation would include upgraded stop facilities and lighting. **In addition, consolidation of two bus stops on Routes 4 and 44, Stop ID 11480 (N Williams Avenue/ N/NE Weidler Street) and Stop ID 6357 (N Williams Avenue/ N Broadway), is proposed to a single stop on N Williams Avenue between NE Weidler Street and N Broadway. These** impacts

under the Revised Build Alternative would be in addition to the **other two** impacted stops[5] under the Build Alternative as identified in the 2019 Transit Technical Report. The Revised Build Alternative would impact more bus stops than the No-Build Alternative (which would see no changes to stops) due to the construction of the new highway cover. **The proposed consolidation of bus stops on N Williams Avenue would require additional design refinements and further coordination with TriMet before implementation**. **No transit stop changes are proposed, or long-term impacts are anticipated for MAX lines within the API.**

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 Wheeler** Avenue**/ N Williams Avenue/ N Ramsay Way** which would operate at LOS E in **both** the AM peak hour (8-9 AM) **and** PM peak hour (4-5 PM), per **Synchro analysis results.** Per Vissim results**, this same intersection would operate at LOS D or better in all peak hours.**

Streetcar Travel Time

VISSIM[6] 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. **To assess impacts due to the changes in local street circulation, Vissim streetcar travel time results were obtained for each design option, the 2-way Ramsay and the 2-way Wheeler.** The results of the streetcar performance modeling are shown in Table 3 below, which compares the future (2045) streetcar travel times of the **No-Build Alternative and both design options of the Revised Build Alternative.** Westbound streetcar travel times would be shorter during AM and PM peak hours under the Revised Build Alternative **in both options** compared to the No-Build Alternative due to the addition of a third **through** westbound lane **at the intersection of N/NE Broadway/ N Williams Avenue**. **Through design refinements in coordination with the City and TriMet, it will be investigated whether this third lane can be removed from the proposed cross-section.** Under the Revised Build Alternative, eastbound Streetcar travel times in the **AM peak period would be longer and within 20 to 25 seconds of the 2045 No-Build travel times** and PM peak hours would be **shorter compared** to those in the No-Build Alternative with travel time **reductions** ranging from **1 to 2 minutes**.

*[5] The **two** stops impacted under both the Build and Revised Build Alternative are N Vancouver Avenue at N Weidler Street (Stop ID 6009**) and** N/NE Weidler Street at N Williams Avenue (Stop ID 6220)..*

[6] VISSIM 10 is a widely used, behavior-based multi-purpose traffic microsimulation program.

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

	7-8 AM			8-9 AM			4-5 PM			5-6 PM		
Route	No-Build	Revised Build 2-way Ramsay	Revised Build 2-way Wheeler	No-Build	Revised Build 2-way Ramsay	Revised Build 2-way Wheeler	No-Build	Revised Build 2-way Ramsay	Revised Build 2-way Wheeler	No-Build	Revised Build 2-way Ramsay	Revised Build 2-way Wheeler
WB Streetcar	4.1	3.5	**3.5**	4.3	**3.6**	**3.7**	4.4	**3.9**	**3.9**	5.0	**4.0**	**4.0**
EB Streetcar	3.3	3.7	**3.7**	3.2	**3.6**	**3.6**	4.7	**3.8**	**3.7**	5.7	**3.8**	**3.8**

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 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 **most of the** AM peak period, bus travel times in the Revised Build Alternative **in both design options** would be shorter than those in the No-Build Alternative for the **northbound, and** westbound bus routes. **The southbound route travel times would also be generally shorter in all peak hours except during the 7-8 AM peak hour in the 2-way Wheeler Design Option.** Travel times under the Revised Build Alternative **in both design options for** bus 17 eastbound routes would be longer compared to the No-Build Alternative travel times. Increases in travel time in the AM peak hours **would** range from **20 to 30** seconds.

During the PM peak period, bus travel times for bus routes 4 and 44 northbound **would experience travel times within 20 seconds of those in the No-Build Alternative. Bus travel times on the southbound routes** under the Revised Build Alternative **in both design options** would be longer bicycle**, with up to 20 seconds longer in the 2-way Ramsay and up to 50 seconds longer in the 2-way Wheeler Design Option compared to those in the No-Build Alternative**. In the southbound direction, **the relocation of the I-5 southbound exit ramp to the N Wheeler Avenue/ N Williams Avenue/ N Ramsay Way intersection adds an additional signal phase to accommodate the ramp traffic and reduces the green time for southbound N Wheeler Avenue traffic, increasing the overall bus travel time in both design options. Under the 2-way Wheeler Design Option, additional delay results from the reduction of green time for the southbound movement on N Vancouver Avenue to accommodate the northbound phase at N Broadway intersection. The 2-way Wheeler Design Option also removes the**

southbound bus-only lane between N Broadway and NE Weidler Street, and buses would be traveling on general purpose lanes in order to accommodate both a protected bicycle lane and a northbound lane on N Vancouver Avenue. This proposed modification will require further discussion with the City and TriMet during **design refinements**. Under the Revised Build Alternative **in both design options, eastbound and** westbound PM peak hour travel times for bus route 17 would be shorter, approximately 10 seconds **to up to a minute** shorter, than those in the No-Build Alternative. **Differences in eastbound travel times between 2-way Ramsay Design Option and 2-way Wheeler Design Option in the PM peak hours may be associated with different signal timing at the intersection of N Broadway and N Larrabee Avenue, which under the 2-way Ramsay Design Option would provide less green** time **for eastbound traffic in order to accommodate higher northbound left turn traffic volumes.**

Table 4 Future (2045) Bus Travel Time (minutes) [7]

	7-8 AM			8-9 AM			4-5 PM			5-6 PM		
Route	No-Build	Revised Build 2-way Ramsay	Revised Build 2-way Wheeler	No-Build	Revised Build 2-way Ramsay	Revised Build 2-way Wheeler	No-Build	Revised Build 2-way Ramsay	Revised Build 2-way Wheeler	No-Build	Revised Build 2-way Ramsay	Revised Build 2-way Wheeler
Bus 4 and 44 NB	3.5	**2.7**	**2.7**	3.5	**2.8**	**2.8**	3.6	**3.6**	**3.5**	3.7	**4.0**	**3.7**
Bus 4 and 44 SB	3.4	**3.3**	**3.5**	4.0	**3.4**	**3.5**	2.8	**3.1**	**3.6**	2.9	**3.1**	**3.7**
Bus 17 WB	4.3	**3.4**	**3.4**	5.1	**3.7**	**3.8**	4.7	**4.0**	**4.1**	4.9	**4.0**	**4.1**
Bus 17 EB	3.0	**3.1**	**3.2**	3.3	**3.6**	**3.8**	3.9	**3.8**	**3.7**	4.6	**4.5**	**3.9**

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.

7 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.

6.2.4 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 **or permanently** 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.
- **Alternatively, less transit service (fewer routes and lower frequency) could contribute overall longer-term ridership loss.**
- 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.

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, **Stop ID 627 (**N Broadway at N Vancouver Avenue) to accommodate the highway cover **and consolidate bus stops on N Williams Avenue for routes 4 and 44, stops ID 11480 (N Williams Avenue and N Weidler Street) and Stop ID 6357 (N Williams Avenue and N Broadway).** 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 **in both AM and PM peak hours. Result in shorter streetcar travel time in the eastbound direction in the PM peak hour** and longer streetcar travel times in the eastbound direction **in the AM peak hours** compared to the No-Build Alternative.
- Result in shorter bus travel times in the **northbound** and westbound routes during the AM peak period compared to the No-Build Alternative and longer travel times in eastbound

routes. **Routes in the southbound direction would be generally shorter except in the 2-way Wheeler Design Option during the 8-9 AM peak hour.** During the PM peak period, Revised Build Alternative bus travel times would be shorter in the **eastbound and** westbound **directions** and would be longer southbound routes compared to the No-Build Alternative. **In the northbound direction, route travel times would be similar or longer in duration 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
Garrett Augustyn	Planner	• M.S.	2
Jennifer Hughes	Land Use	• Bachelor of Science, Physical Geography • Master of Urban and Regional Planning	20
Marcela Rodriguez	Transportation Engineering	• Bachelor of Science, Civil Engineering • Master of Science, Civil Engineering	19

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. Accessed: January, 2022.

Go Lloyd. 2020. Annual Report 2019. Available https://static1.squarespace.com/static/54652e5ee4b07f2a5a1a5725/t/5e824083e43b8c45af05bbe4/1585594514527/Go_Lloyd_2019_Annual_Report.pdf. Accessed October, 2023

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. 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. Accessed January, 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 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 Accessed August, 2022.

TriMet. 2020a Fall 2020 Route Ridership Report. Available: 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. Accessed February, 2022.

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

TriMet 2023a Spring 2023 Ridership Estimated Weekly Boarding Rides Graph. Available: https://trimet.org/about/performance.htm#ridership. Accessed August 2023.

TriMet 2023b Forward Together Service Concept Available: https://trimet.org/forward/ Accessed August 2023