Revised Active Transportation Access Options Memorandum

Project:	Earthquake Ready Burnside Bridge NEPA
Date:	Friday, April 22, 2022
To:	Megan Neill, Multnomah County – Project Manager
From:	Steve Drahota, HDR – Project Manager Jeff Heilman, Parametrix – NEPA Lead

1 Introduction

In support of the Supplemental Draft Environmental Impact Statement (SDEIS) for the Earthquake Ready Burnside Bridge (EQRB) Project, this supplemental technical memorandum has been prepared to evaluate the impacts of potential design refinements to the Preferred Alternative on the Active Transportation Network (ATN) Connections to the bridge within the project's Area of Potential Impact (API). The intent of the design modifications is to reduce the overall cost and improve the affordability of the EQRB Project. This technical memorandum is a supplement to the Draft EIS technical reports and as such does not repeat all of the information in those reports, but instead focuses on the impacts of the design modification options, how they compare to each other, and how they compare to the version of the Preferred Alternative that was evaluated in the *EQRB Draft Environmental Impact Statement* (Multnomah County 2021b).

Much of the information included in the Draft EIS and Draft EIS technical reports, including project location, purpose, relevant regulations, analysis methodology and affected environment, is incorporated by reference because it has not changed, except where noted in this technical memorandum.

2 Project Alternatives

This technical memorandum evaluates potential design refinements to the Draft EIS Preferred Alternative. All of the Project Alternatives evaluated in the Draft EIS are summarized in Chapter 2 of the Draft EIS and described in detail in the *EQRB Description of Alternatives Report* (Multnomah County 2021a). Briefly, the Draft EIS evaluated a No-Build Alternative and four Build Alternatives. One of the Build Alternatives, the Long-span Alternative, was identified as the Preferred Alternative. The potential refinements evaluated in this technical memorandum are collectively referred to as the "Refined Long-span Alternative (Four-lane Version)" or the "Refined Long-span." The Refined Long-span includes Project elements that were studied in the Draft EIS but have been modified as well as new options that were not studied in the Draft EIS. These refinements and new options are intended to provide lower cost and, in some cases, lower impact designs and ideas that could be adopted to reduce the cost of the Draft EIS Preferred Alternative while still achieving seismic resiliency. The potential design refinements, and how they differ from the Draft EIS Long-span Alternative, are described below.

- Bridge width – The total width of the bridge over the river would be approximately 82 to 93 feet (the range varies depending on the bridge type and segment). For comparison, the Draft EIS Replacement Alternatives were approximately 110 to 120 feet wide over the river. The refined bridge width would accommodate approximately 78 feet for vehicle lanes, bike lanes, and pedestrians, which is comparable to the existing bridge.
    - The refined bridge design would accommodate four vehicle lanes (rather than five as evaluated in the Draft EIS). The following lane configuration options are being evaluated:
        - Lane Option 1 (Balanced) – Two westbound lanes (general-purpose) plus two eastbound lanes (one general-purpose and one bus-only lane)
        - Lane Option 2 (Eastbound Focus) – One westbound lane (general-purpose) plus three eastbound lanes (two general-purpose and one bus only)
        - Lane Option 3 (Reversible Lane) – One westbound lane (general-purpose) plus two eastbound lanes (one general-purpose and one bus-only) plus one reversible lane (westbound AM peak and eastbound PM peak)
        - Lane Option 4 (General Purpose with Bus Priority) – Two westbound general-purpose lanes plus two eastbound general-purpose lanes, plus bus priority access (e.g., queue bypass) at each end of the bridge.
    - The width of the vehicle lanes would be, at minimum, 10 feet and could vary depending on how the total bridge width is allocated between the different modes.
    - The total clear width of the bicycle lanes and pedestrian sidewalks, when summing the two sides of the bridge, could range from approximately 28 feet to 34 feet. This is wider than the existing bridge but up to 13 feet narrower than what was proposed in the Draft EIS for the replacement alternatives. Physical barriers between vehicle lanes and the bicycle lanes are proposed and are in addition to the above dimensions.
    - The refined bridge would allow narrower in-water piers, due to less weight needing to be transferred to the in-water supports.
- Other design refinements being evaluated:
    - West approach – The SDEIS evaluates a refined girder bridge type for the approach over the west channel of the river, Tom McCall Waterfront Park, and Naito Parkway. Compared to the cable-stayed and tied-arch options evaluated in the Draft EIS, this option would not only reduce costs but also avoid an adverse effect to the Skidmore/Old Town National Historic Landmark District. It would have two sets of columns in Tom McCall Waterfront Park compared to just one with the Draft EIS tied-arch option and five with the existing bridge.
    - East approach – The SDEIS evaluates a potential span length change for the east approach tied-arch option that would minimize the risks and reduce costs associated with placing a pier and foundation in the geologic hazard zone that extends from the river to about E 2nd Avenue. The refined tied-arch option would be about 720 to 820 feet long and approximately 150 feet tall (the Draft EIS Long-span Alternative was the same height and 740 feet long). The Refined Long-span Alternative would place the eastern pier of the tied-arch span either on the east side of 2nd Avenue (Option 1) or just west of 2nd Avenue (Option 2). Increasing

the length of the tied-arch span would also reduce the length and depth of the subsequent girder span to the east.

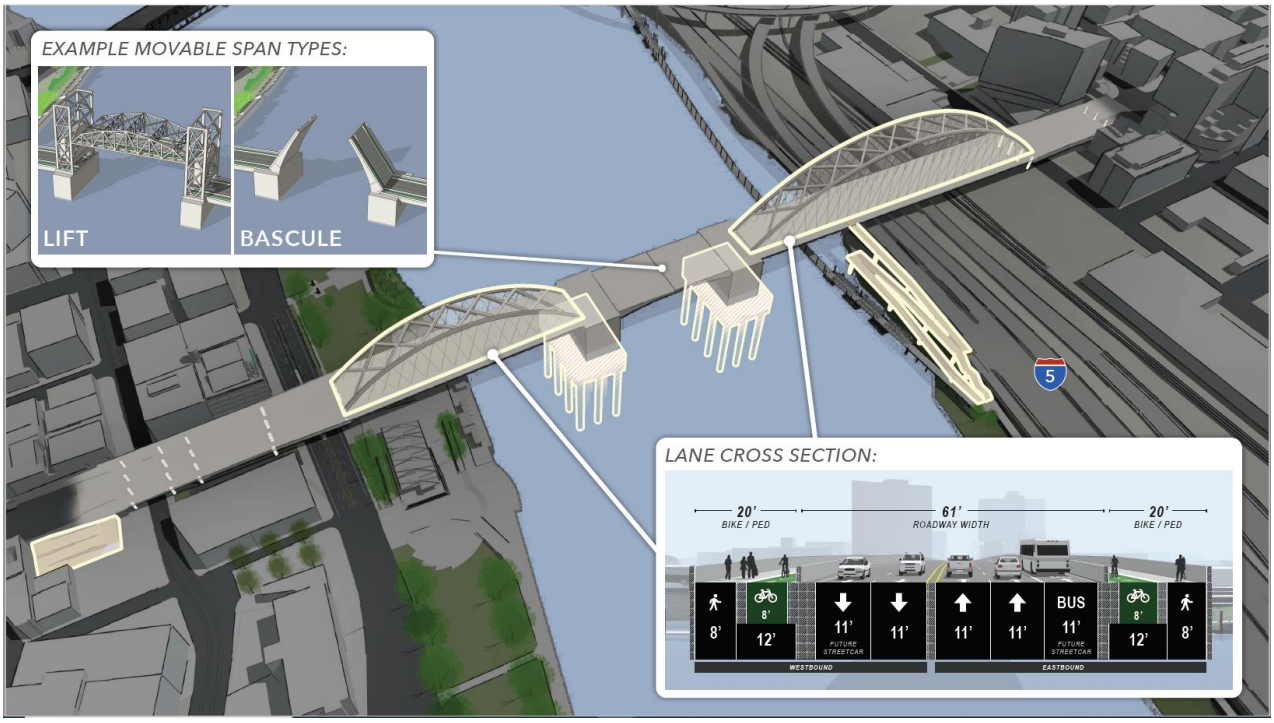
- Americans with Disabilities Act (ADA) access – This memorandum evaluates a refined approach for providing direct ADA access between the bridge and the Vera Katz Eastbank Esplanade (Eastbank Esplanade), as well as between the bridge and W 1st Avenue and the Skidmore Fountain MAX station. The Draft EIS evaluated multiple ramp, stair, and elevator (for the East Approach) options for these locations. This SDEIS expands the range of options to include:
  - A combination of stairs and elevators on the West Approach to the Skidmore Fountain MAX, located on both sides of the bridge.
  - A street network sidewalk improvement on the West Approach to the Skidmore Fountain MAX combined with any of the other ADA connections.
  - No connection on the West Approach except the street network sidewalk improvements. The bus stop relocation and the potential Skidmore Fountain MAX station closure would substantially reduce the purpose of a stair, ramp or elevator connection to 1st Avenue at this location. There is a possibility that the stairs would, therefore, not be replaced. In that case, the ADA, pedestrian, and bicycle access from the bridge to 1st Avenue would be via improved sidewalks connecting the west end of the bridge at 2nd Avenue to 1st Avenue just one block east.
  - No connection on the East Approach to the Vera Katz Eastbank Esplanade. Ramps, or any other pedestrian, bicycle, or ADA connection to the Esplanade, could be implemented as an independent project (with independent purpose) that may or may not occur simultaneous with the EQRB project; therefore, it is possible that the EQRB Project itself would not provide any direct connection to the Esplanade.

  These facilities would be sized to provide pedestrian and bicycle access, inclusive of space and details compliant with ADA guidelines. The selection of the ADA connection option will not be made until the final design phase. The County acknowledges that the implementation of elevators comes with a commitment to maintain their serviceability, which could include frequent cleanings, maintenance activities, and security needs. If stairs and elevators are selected in the final design phase, the County will seek a combined elevator and stairway solution with an appropriate number of cabs that provides enhanced operating speeds from the deck surface to the facilities below, security and surveillance systems that link to the County's bridge operators, enhanced ventilation systems and/or open-air cabs, and a design that fits with the character of the bridge and its context. In addition, the County also commits to:
  - Continue exploring creative solutions to mitigate some of the safety, maintenance, reliability concerns inherent to elevators. This could include elevator operating times that align to the anticipated demands. It could also include mitigation measures such as increased notification signage at the Burnside and other bridges when one of the Burnside Bridge elevators are temporarily closed for servicing or repairs.

- Continue conducting outreach with the Project's ADA stakeholders and forming an ADA working group to provide a forum to discuss their needs and preferences as the design evolves.
- Continue coordinating with the City to ensure that if funds are identified for a variation on one of the existing connections evaluated, such as a ramp facility that extends beyond the concepts included within this memorandum, the Project design would not preclude adding it as either a future separate project or through a NEPA Re-evaluation. Future ramp concepts to the Eastbank Esplanade could be similar to the ramp option evaluated in the Draft EIS or could involve added structural supports in the Willamette River which, when compared to the Draft EIS concept, could result in greater in-water impacts and potentially a greater visual change. A NEPA Re-evaluation is required by FHWA to demonstrate that the proposed change would not result in new significant impacts not previously disclosed in a Draft or Supplemental Draft EIS. Depending on mitigation associated with a future ramp, there could also be a need to amend the Record of Decision to update mitigation commitments.

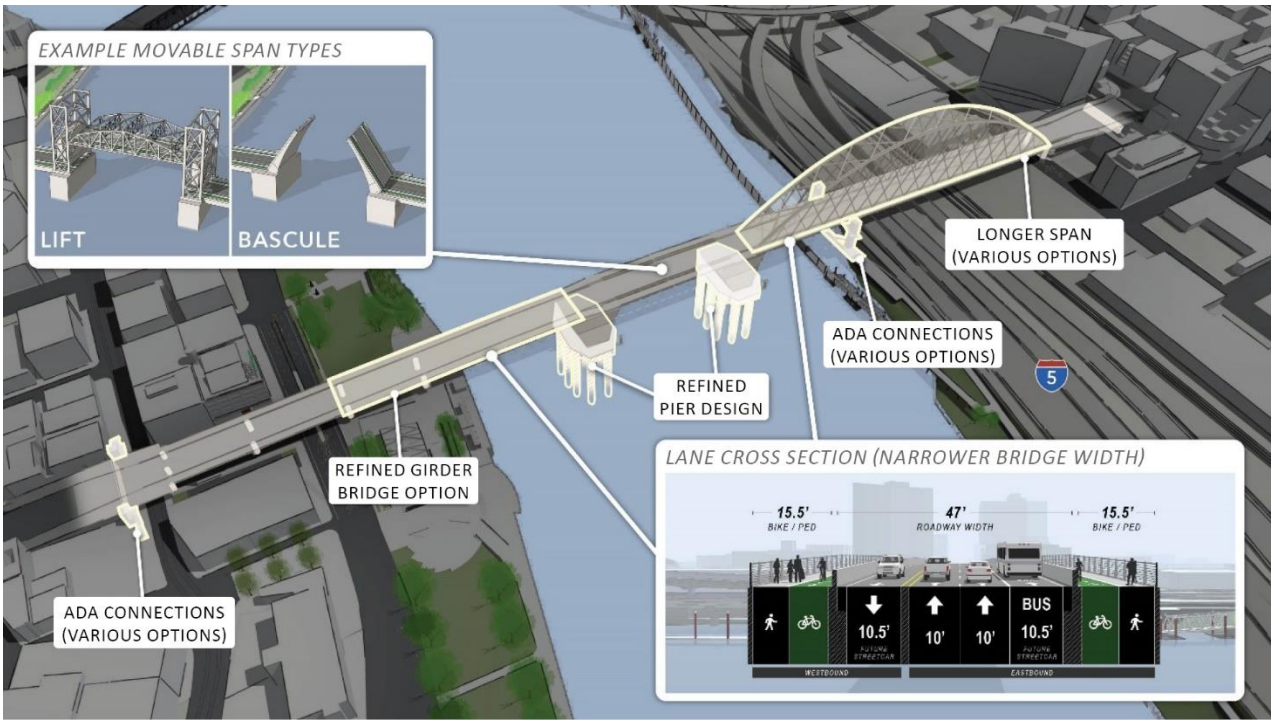
Figure 2 highlights the elements of the Draft EIS Long-span Alternative that have been modified to create the Refined Long-span Alternative, as described above. Figure 1 shows the Draft EIS Long-span Alternative and Figure 2 shows the Refined Long-span Alternative. Both figures include the tied-arch option for the east approach and the bascule option for the center movable span, but the east span could also be a cable-stayed bridge and the movable span could be a vertical lift bridge. For the west approach, the Draft EIS Long-span Alternative shows the tied-arch option while the Refined Long-span Alternative shows the refined girder bridge. The Refined Long-span Alternative image shows just one of the four possible lane configuration options being studied. All four configuration options, as well as many more graphics of the Refined Long-span Alternative, and how it compares to the Draft EIS Long-span Alternative, can be found in Chapter 2 of the *EQRB Supplemental Draft Environmental Impact Statement* (Multnomah County 2022a). Figure 2 also shows just one of the possible ways to allocate the bridge width between vehicle lanes, bicycle lanes and sidewalks; the total width of the bicycle and pedestrian facilities could range from approximately 28 to 34 feet.

Figure 1. Draft EIS Long-Span Alternative



Note: The Draft EIS Long-span Alternative included multiple bridge types for both the east and west approach. This figure shows only the tied arch option.

Figure 2. Refined Long-Span Alternative (Note: East Approach Tied Arch Shown; Cable Stayed Similar)



Notes: The Refined Long-span Alternative evaluated in this SDEIS includes both cable-stayed and tied arch options for the east span. This figure shows only the tied arch option. The Draft EIS studied, and SDEIS further studies, a bascule option and vertical lift option for the center movable span. The inset shows both options but the main figure shows the bascule option. This figure also shows just one of the lane configuration options considered in the SDEIS.

- Construction assumptions:
  - Construction duration – The expected duration of project construction is 4.5 to 5.5 years, dependent upon the design option. See Table 1 for more information regarding construction impact extent and closure timeframes.
  - Construction area – Compared to the Draft EIS Long-span Alternative, the main refinement is that the construction area would be smaller for the west approach south of the bridge, including a smaller area within Tom McCall Waterfront Park south of the bridge,
  - Construction access and staging – The construction access and staging is expected to be the same as that described in the Draft EIS.
  - Vegetation – The Refined Long-span Alternative would remove slightly fewer trees and vegetation impacts than the Draft EIS Long-span Alternative, primarily within Tom McCall Waterfront Park south of the bridge.
  - In-water work activity – The in-water work would be similar to that described in the Draft EIS, except that the replacement bridge in-water foundations would consist of a perched footing cap and a group of drilled shafts. Whereas the Draft EIS discussed the use of cofferdams to isolate in-water work, the Refined Long-span Alternative proposes to use a temporary caisson lowered to an elevation about mid-height of the water column to construct footing caps, avoiding additional disturbance of the riverbed that would be needed for a cofferdam. Additionally, the existing Pier 4 would be fully removed, Pier 1 would be partially removed below the mudline and Piers 2 and 3 removed to below the mudline. Existing in-water piles would be removed, subject to the design option advanced.
  - Temporary freeway, rail, street, and trail closures – Temporary closures are expected to be the same as those described in the Draft EIS.
  - Access for pedestrians and vehicles to businesses, residences, and public services – Access is expected to be the same as that described in the Draft EIS.
  - On-street parking impacts – On-street parking impacts are expected to be the same as those described in the Draft EIS.
  - Property acquisitions and relocations – Property acquisitions and relocations are similar to those listed in the Draft EIS, except that they have been modified to reflect a narrower set of bridge design options.
  - Temporary use of Governor Tom McCall Waterfront Park – The park area that would be temporarily closed for construction has changed since the Draft EIS. On the north side of the bridge, the closure area has been reduced to avoid removing ten cherry trees and a berm that are part of the Japanese American Historical Plaza; this change would apply to all of the build alternatives. On the south side of the bridge, the park closure area has also been reduced to include only the area north of the Tom McCall Waterfront Park trellis; this revision applies only to the Refined Long-span Alternative.

Table 1. Construction Impacts, Closure Extents, and Timeframes by Build Alternative

Facility Impacted	Draft EIS Long-Span Alternative	Refined Long-Span Alternative
Tom McCall Waterfront Park	4.5-year closure within boundary of potential construction impacts	Same; Smaller closure area south of the bridge
Willamette River Greenway Trail	Portion of trail within Waterfront Park closed for same duration as park; detours in place for construction duration	Same
Japanese American Historical Plaza	Southern portion of plaza would be closed for same duration as Tom McCall Waterfront Park	Same
Ankeny Plaza Structure	Closure for duration of construction but no impacts to Ankeny Plaza structure	Same
Bill Naito Legacy Fountain	No closure of fountain and associated hardscape	Same
Vera Katz Eastbank Esplanade	18 months (this could extend to 3.5 to 4.5 years if project builds ramps rather than elevators and stairs for the ADA/bicycle/pedestrian connection); detours in place for construction duration	Same
Burnside Skatepark	4 months full closure	Same
River Crossing on Burnside Street	4- to 5-year closure	Same
Saturday Market Location	4.5-year closure or use of alternative location	Same
Skidmore Fountain MAX Station	Approximately 5 weeks	Same
Navigation Channel/Willamette River Water Trail	Intermittent closures; 2 to 10 closures; each closure up to 3 weeks	Same
Overall Construction Duration	**4.5 to 5.5 years**	**Same**

This technical memorandum describes the range of ATN connection options being considered near the west and east ends of the future Burnside Bridge. The access options can be paired with any of the bridge alternatives or types. As such, the Preferred Alternative and bridge type decisions can be made independently of these access options, and the access option decisions can be made independently of the bridge alternative or bridge type decisions.

The connection options evaluated in this memorandum would not be the only way for bicyclists and pedestrians to access the bridge. Primary access for active transportation at each bridge end is already included as a fundamental aspect of every bridge alternative. These options are to provide additional and more direct access to/from perpendicular facilities that pass under the bridge near each end. Near the east end, access would be to the Eastbank Esplanade, which passes under the bridge approximately 500 feet from the eastern abutment. Near the west end,

access would be to 1st Avenue which passes under the bridge approximately 200 feet from the western abutment to the Skidmore Max station.

This memorandum is a revised version of the memorandum that was prepared for the Draft EIS. It has been updated to include the refined options developed for the SDEIS as well as new analysis and information generated since the Draft EIS. Rather than discuss the environmental impacts of the different options across all of the technical reports, the information is collected here in this document so that stakeholders can better understand the tradeoffs between the different access options.

3 Eastbank Esplanade Active Transportation Access Options

3.1 Existing Eastbank Esplanade Access

With the existing bridge, a stairway connects the southern sidewalk on the Burnside Bridge to the Eastbank Esplanade approximately 50 vertical feet below it. The stairway is primarily for pedestrians because it is not ADA-accessible and requires bicyclists to carry their bikes up or down the stairs. There is no existing connection between the Eastbank Esplanade and the bridge's northern (westbound) sidewalk and bike lane. There is ADA and bicycle access to the bridge approximately 500 feet east of the top of these stairs.

3.2 Eastbank Esplanade Access Options

While the range of potential access configurations and designs is extensive, the range of reasonable alternatives can be organized into four fundamental options. These four options capture the range of potential impacts and benefits, augmented with the Project's approach as part of the SDEIS design option modifications:

1. Stairs and Elevator on North and South Sides of the Bridge
2. Stairs and Elevator on South Side of the Bridge Only with a Signalized Mid-Block Crossing Connecting the North and South Sidewalks and Bike Lanes
3. Ramps on North and South Sides of the Bridge and Stairs on South Side
4. Ramp and Stairs on South Side Only with a Signalized Mid-Block Crossing Connecting the North and South Sidewalks and Bike Lanes

This section provides a description, conceptual design information, and construction assumptions for each option. Using this information, a preliminary impacts and performance assessment is provided in Section 3.3. See Attachment 1 for all figures referenced below. It should be noted that for all options, access will not be designed to meet the seismic design criteria developed for the bridge itself. As such, none of the options should be considered seismically resilient nor usable following a major seismic event. Instead, it should be assumed that in a Cascadia Subduction Zone event, any of these active transportation options would displace laterally along the bridge (towards the river) by up to 20 feet and may fail

catastrophically. Furthermore, all of the connection options must be structurally independent from the bridge so as to not impact its seismic performance.

3.2.1 Option 1: Stairs and Elevator on North and South Sides of the Bridge

3.2.1.1 OPTION DESCRIPTION

This option extends the Eastbank Esplanade spur, which leads to stairs and elevators on either side of the bridge (Figure 3). Placed along and under the Burnside Bridge and over the river, this concept would provide ADA-compliant facilities to bicycle and pedestrian users on the bridge travelling in either the west or east directions. On the south side, the existing stairway would be removed and a new stairs and elevator system would be constructed. On the north side, a single-span ramp from the south stairs would extend under the bridge, connecting to a new stairway and elevator on the north side of the bridge. Each stairs/elevator system would be constructed on separate, deep foundation supports.

To reduce natural resource impacts, an alternative stairway/elevator concept could be constructed as shown in Figure 4. In this case, the existing concrete platform supporting the stairway would need to be retrofitted for the loads of an elevator and linear stairs (similar to the existing stairway). A similar concept could be used for the system on the north side of the bridge, with a single-span bridge connecting the two.

Regardless of the concept selected, the stairway and access bridge would include top, bottom, and intermediate viewpoint landings. Additionally, the stairway widths would include enough space for a “bicycle gutter,” allowing bicyclists to ascend easier than a conventional stairway.

3.2.1.2 PERMANENT IMPACTS

The following design assumptions are incorporated with this concept, noting that information is based on the slightly more conservative option shown in Figure 3:

- **Permanent new fill in the river/floodplain.** This option requires new fill in the river/floodplain beyond what is already needed to construct the Burnside Bridge. As shown in Figure 3, the anticipated footprint includes 3,200 cubic yards (CY) of fill (with half placed on either side of the bridge). The entirety of this volume would be in shallow water habitat. See Table 2 for a comparison of fill volume estimates for the options.
- **No additional permanent physical impacts to the Eastbank Esplanade floating bridge.**
- **Permanent physical impacts to the Eastbank Esplanade at-grade (on-land) sections.** For the more conservative option shown in Figure 3, the only impact to the at-grade section is where the stairs/elevator accessway connects to the existing walkway. There could be localized reconstruction to support the connection. If the concept depicted in Figure 4 is constructed, the existing concrete stairway platform would need to be retrofitted for the elevator loads and reconfigured widths.
- **No long-term impacts to ped/bike use of the Eastbank Esplanade.** Instead, these improvements enhance the connection by providing the most direct ADA-accessible route from the Eastbank Esplanade to the Burnside Bridge that bicyclists could also utilize.

- **Long-term impacts to ped/bike operations and reliability or user safety on the access facility.** Due to the size and speed of elevators, there are likely to be times, especially during peak periods, in which the use of elevators could take longer than traversing the ramp options. Furthermore, there could be periods in which elevator servicing, cleaning, and maintenance activities may require short-term service outages. There may also be some users that elect to avoid using an elevator due to a perception of safety and personal comfort. This includes the potential for short-term conflicts with others in the pedestrian space around the elevator entryways. Compared to ramps, outdoor public elevators are generally less reliable due to the risk by vandalism, mechanical/electrical issues, and weather-dependent breakdowns. These issues have the potential to occur while being occupied.

3.2.1.3 TEMPORARY IMPACTS

The following construction assumptions are incorporated with this concept, noting that information is based on the slightly more conservative option shown in Figure 3:

- **Temporary fill and removal (riprap) in the river/floodplain.** This option requires approximately an additional 600 CY of fill (for the option foundations) and 5,000 CY of riprap removal in the river/floodplain beyond what is already needed to construct the Burnside Bridge.
- **No added temporary physical impacts to the Eastbank Esplanade floating bridge, nor removal of floating dock piles**.
- **No temporary physical impacts to the Eastbank Esplanade at-grade (on-land) sections.**
- **No extension of or work outside the in-water work window beyond what is already needed to construct the Burnside Bridge**.
- **No additional temporary closure duration of the floating section beyond what is already needed for the construction of the Burnside Bridge.**

3.2.2 Option 2: Stairs and Elevator on the South Side of the Bridge Only with a Signalized Mid-block Crossing Connecting the North and South Sidewalks and Bike Lanes

3.2.2.1 OPTION DESCRIPTION

Like the previous option, this one has stairs and an elevator on the south side of the Burnside Bridge, but instead of having stairs and an elevator on the north side, it adds a mid-block, red-light traffic-signalized, bicycle/pedestrian crossing (Figure 4). The mid-block crossing requires all motorized vehicles to stop, allowing bicyclists and pedestrians to cross the from the eastbound bicycle lane and sidewalk to the westbound bicycle lane and sidewalk on the north side of the bridge. To separate the queueing of bicycles and pedestrians waiting to cross the bridge from continuously flowing east-west bicycle traffic, belvederes would be constructed on either side of the bridge for storage space.

At a minimum, this traffic signal, and its stop bar locations, would be coordinated with the traffic signals for the movable span (just west of the mid-block crossing) to avoid overlapping queues. Attempts would also be made to time the signal with Martin Luther King, Jr. Boulevard, Grand Avenue, NW 2nd Avenue, NW 3rd Avenue, and other nearby signals, as deemed necessary. Westbound traffic would be stopped east of the mid-span crossing when the bicycle/pedestrian traffic signal is activated. This location coincides with the stop location when the bridge is raised. When the bicycle/pedestrian mid-block crossing is activated, eastbound traffic would stop west of the movable span. Similar to the stop location on the east side of the river, the west stop location also coincides with the stop location when the bridge is raised. This would likely require widening the bicycle and pedestrian facility to reduce/avoid conflicts between people waiting to cross north/south and bicyclists travelling east/west.

3.2.2.2 PERMANENT IMPACTS

The following design assumptions are incorporated with this concept, noting that information is based on the option shown in Figure 4:

- **Permanent new fill in the river/floodplain.** This option requires new fill in the river/floodplain beyond what is already needed to construct the Burnside Bridge. As shown in Figure 4, the anticipated footprint includes 1,600 CY of fill (with all placed on the south side of the bridge). The entirety of this volume would be in shallow water habitat.
- **No additional permanent physical impacts to the Eastbank Esplanade floating bridge**.
- **Permanent physical impacts to the Eastbank Esplanade at-grade (on-land) sections.** The only impact to the at-grade section is where the stairs/elevator accessway connects to existing walkway. There could be localized reconstruction to support the connection. The existing concrete stairway platform would need to be retrofitted for the elevator loads and reconfigured widths.
- **No long-term impacts to ped/bike use of the Eastbank Esplanade**. Instead, these improvements enhance the connection by providing the most direct ADA-accessible route from the Eastbank Esplanade to the Burnside Bridge that bicyclists could also utilize without crossing under the bridge.
- **Long-term impacts to ped/bike operations and reliability, or user safety on the access facility.** Due to the size and speed of elevators, there are likely to be times, especially during peak seasons, in which the use of elevators could take longer than traversing the ramp options. Furthermore, there could be periods in which elevator servicing, cleaning, and maintenance activities may require short-term service outages. There may also be some users that elect to avoid using an elevator due to a perception of safety and personal comfort. This includes the potential for short-term conflicts with others in the pedestrian space around the elevator entryways. Compared to ramps, outdoor public elevators are generally less reliable due to the risk by vandalism, mechanical/electrical issues, and weather-dependent breakdowns. These issues have the potential to occur while being occupied. Additionally, the introduction of mid-block crossings creates conflict zones between bicycle users travelling along the bridge and bicyclists and pedestrians using the

mid-block crossing. Finally, although there is a signal, some concern by ADA groups has been raised about pedestrian safety within mid-block crossings.

- **Limitations on how frequently the mid-block traffic signal would stop traffic.** In order to minimize delays to westbound traffic, the red-light traffic signal would be coordinated with the signal at E Martin Luther King Junior Boulevard. The red-light traffic signal is assumed to have an approximately 70 second cycle length, which provides sufficient green time between pedestrian phases, incurs minimal delay to motor vehicle traffic, and has 95 percent queuing that fits within available space between signals to the west and east.

3.2.2.3 TEMPORARY IMPACTS

The following construction assumptions are incorporated with this concept, noting that information is based on the option shown in Figure 4:

- **Temporary fill and removal (riprap) in the river/floodplain.** This option requires approximately an additional 600 CY of fill (for the option foundations) and 2,600 CY of riprap removal in the river/floodplain beyond what is already needed to construct the Burnside Bridge.
- **No additional temporary physical impacts to the Eastbank Esplanade floating bridge nor removal of floating dock piles and dock storage.**
- **No temporary physical impacts to the Eastbank Esplanade at-grade (on-land) sections**.
- **No extension of or work outside the in-water work window beyond what is already needed to construct the Burnside Bridge**.
- **No additional temporary closure duration of the floating section**.

3.2.3 Option 3: Ramps on North and South Sides of the Bridge and Stairs on South Side

3.2.3.1 OPTION DESCRIPTION

This option reconstructs the Eastbank Esplanade spur as a separate bridge structure supported by a series of new, deep foundation supports (Figure 5). Placed generally perpendicular to and extending under the Burnside Bridge, this concept would provide ADA-compliant facilities to bicycle and pedestrian users on the bridge travelling in either the westbound or eastbound directions. A variety of layouts are possible, including switchback ramps perpendicular to the bridge as shown on Figure 5, as well as longitudinal ramps, spiral ramps or elliptical ramps that extend further into the river. For the switchback option studied in detail, the north ramp would include an undercrossing of the Burnside Bridge that ties into the south ramp. The south ramp would include stairs at the south end to bypass one switchback. All ramps and stairs would be on structure, and most of its construction would likely be adjacent to or over shallow water habitat.

3.2.3.2 PERMANENT IMPACTS

The following design assumptions are incorporated with this concept, noting that information is based on the option shown in Figure 5:

- **Permanent new fill in the river/floodplain.** This option requires new fill in the river/floodplain beyond what is already needed to construct the Burnside Bridge. The anticipated footprint includes 19,200 CY of fill (with roughly half placed on either side of the bridge). Roughly 80 percent of this volume would be in shallow water habitat.
- **No permanent physical impacts to the Eastbank Esplanade floating bridge.** The floating portions of the Eastbank Esplanade would be reconstructed in-kind or re-installed at its original positions following the construction of the access ramp.
- **No permanent physical impacts to the Eastbank Esplanade at-grade (on-land) sections.** The at-grade portions of the Eastbank Esplanade would be reconstructed in-kind following the construction of the access ramp.
- **No long-term impacts to ped/bike use of the Eastbank Esplanade.** It would be reconstructed in-kind following the construction of the access ramp. These improvements enhance the connection by providing an ADA-accessible route from the Eastbank Esplanade to the Burnside Bridge that bicyclists could also utilize.
- **Long-term impacts to ped/bike operations and reliability, or user safety on the access facility.** Because of the approximately 50-foot change in elevation between the Burnside bridge deck and the Eastbank Esplanade, a ramp structure would need to be over 1000 feet in length (assuming a continual 5 percent grade). Although common to most ramp facilities, the extended length for ramps at this location could create conflicts between experienced bicyclists, recreational users, and pedestrians compared to other locations in the city.

3.2.3.3 TEMPORARY IMPACTS

The following construction assumptions are incorporated with this concept, noting that information is based on the option shown in Figure 5 and Figure 6:

- **Temporary fill and removal (riprap) in the river/floodplain.** This option requires approximately an additional 1,000 CY of fill (for the temporary work bridge foundations) and 23,000 CY of riprap removal in the river/floodplain beyond what is already needed to construct the Burnside Bridge.
- **Temporary physical impacts to the Eastbank Esplanade floating bridge, including the removal of floating dock piles and dock storage.** There are temporary impacts to the floating sections of the Eastbank Esplanade beyond what is already needed to construct the Burnside Bridge. As shown in Figure 6, the ramp construction includes the removal and re-installation of the floating bridge section outlined in light blue. Storage areas for the removed sections would be as shown in the light blue shaded area north of the bridge.
- **Temporary physical impacts to the Eastbank Esplanade at-grade (on-land) sections.** There are permanent impacts to the at-grade and on-land sections of the Eastbank Esplanade beyond what is already needed to construct the Burnside Bridge. This includes the removal and replacement of the floating bridge section outlined in dark blue on Figure 6.
- **No extension of or work outside the in-water work window beyond what is already needed to construct the Burnside Bridge.**

- **Additional temporary closure duration of the floating section beyond what is already needed for the construction of the Burnside Bridge.** This option would require an additional 2 to 3 years of continual temporary closure of the Eastbank Esplanade beyond what is already needed to construct the Burnside Bridge. In effect, this access option would require the Eastbank Esplanade to be closed for the entirety of the bridge's construction duration.

3.2.4 Option 4: Ramp and Stairs on South Side Only with a Signalized Mid-block Crossing Connecting the North and South Sidewalks and Bike Lanes

3.2.4.1 OPTION DESCRIPTION

This option is the same as Option 3, but it adds a mid-block, red-light traffic-signalized, bicycle/pedestrian crossing at the Eastbank Esplanade instead of a north ramp and undercrossing (Figure 7).

The mid-block crossing requires all motorized vehicles to stop, allowing bicyclists and pedestrians to cross the street and access the westbound bicycle lane and sidewalk on the north side of the bridge. To separate the queueing of bicycles and pedestrians waiting to cross the bridge from continuously flowing east-west bicycle traffic, belvederes would be constructed on either side of the bridge for storage space.

This traffic signal, and its stop bar locations, would be coordinated with the traffic signals for the movable span (just west of the mid-block crossing) to avoid overlapping queues. Westbound traffic would be stopped east of the mid-span crossing when the bicycle/pedestrian traffic signal is activated. This location coincides with the stop location when the bridge is raised. When the bicycle/pedestrian mid-block crossing is activated, eastbound traffic would stop west of the movable span. Like the stop location on the east side of the river, the west stop location coincides with the stop location when the bridge is raised. This could require widening the bicycle and pedestrian facility to reduce/avoid conflicts between people waiting to cross north/south and bicyclists travelling east/west.

3.2.4.2 PERMANENT IMPACTS

The following design assumptions are incorporated with this concept, noting that information is based on the option shown in Figure 7:

- **Permanent new fill in the river/floodplain.** This option requires new fill in the river/floodplain beyond what is already needed to construct the Burnside Bridge. As shown in Figure 7, the anticipated footprint includes 19,200 CY of fill (placed entirely on the south side of the bridge). Roughly 70 percent of this volume would be in shallow water habitat.
- **No permanent physical impacts to the Eastbank Esplanade floating bridge.** The floating portions of the Eastbank Esplanade would be reconstructed in-kind or re-installed at its original positions following the construction of the access ramp.
- **No permanent physical impacts to the Eastbank Esplanade at-grade (on-land) sections.** The at-grade portions of the Eastbank Esplanade would be reconstructed in-kind following the construction of the access ramp.

- **No long-term impacts to ped/bike use of the Eastbank Esplanade, including bicycle operations and safety.** It would be reconstructed in-kind following the construction of the access ramp. These improvements enhance the connection by providing an ADA-accessible route from the Eastbank Esplanade to the Burnside Bridge that bicyclists could also utilize.
- **Long-term impacts to ped/bike operations and reliability or user safety on the access facility.** Because of the approximately 50-foot change in elevation between the Burnside bridge deck and the Eastbank Esplanade, a ramp structure would need to be over 1000 feet in length (assuming a continual 5 percent grade). Although common to most ramp facilities, the extended length for ramps at this location could create conflicts between experienced bicyclists, recreational users, and pedestrians compared to other locations in the city. Additionally, the introduction of mid-block crossings creates conflict zones between bicycle users travelling along the bridge with the mid-block crossing users travelling perpendicular to it. Finally, although there is a signal, some concern has been raised about pedestrian safety within mid-block crossings.
- **Limitations on how frequently the mid-block traffic signal would stop traffic.** In order to minimize delays to westbound traffic, the red-light traffic signal would be coordinated with the signal at E Martin Luther King Junior Boulevard. The red-light traffic signal is assumed to have an approximately 70 second cycle length, which provides sufficient green time between pedestrian phases, incurs minimal delay to motor vehicle traffic, and has 95 percent queuing that fits within available space between signals to the west and east.

3.2.4.3 TEMPORARY IMPACTS

The following construction assumptions are incorporated with this concept, noting that information is based on the option shown in Figure 7:

- **Temporary fill and removal (riprap) in the river/floodplain.** This option requires approximately an additional 1,000 CY of fill (for the temporary work bridge foundations) and 23,000 CY of rip rap removal in the river/floodplain beyond what is already needed to construct the Burnside Bridge.
- **Temporary physical impacts to the Eastbank Esplanade floating bridge, including the removal of floating dock piles and dock storage.** There are temporary impacts to the floating sections of the Eastbank Esplanade beyond what is already needed to construct the Burnside Bridge. As shown in Figure 6, this includes the removal and re-installation of the floating bridge section outlined in light blue. Storage areas for the removed sections would be as shown in the light blue shaded area north of the bridge.
- **Temporary physical impacts to the Eastbank Esplanade at-grade (on-land) sections.** There are permanent impacts to the at-grade and on-land sections of the Eastbank Esplanade beyond what is already needed to construct the Burnside Bridge. As shown in Figure 6, this includes the removal and replacement of the floating bridge section outlined in dark blue.
- **No extension of or work outside the in-water work window beyond what is already needed to construct the Burnside Bridge.**

- **Additional temporary closure duration of the floating section.** This option would require an additional 2 to 3 years of continual temporary closure of the Eastbank Esplanade beyond what is already needed to construct the Burnside Bridge. In effect, this access option would require the Eastbank Esplanade to be closed for the entirety of the bridge's construction duration.

3.2.5 Additional Options Dismissed from Consideration

The Project dismissed an option that would have created two-way (i.e., westbound and eastbound) bicycle lanes on the Burnside Bridge located on the south side of the bridge. This would have eliminated the need for bicyclists to travel from the Eastbank Esplanade to the westbound bicycle lane on north side of the bridge. However, it did not address desires for a similar connection for pedestrians between the Eastbank Esplanade and the north side of the bridge. This option also did not fit in the building-constrained segments of the bridge that are west of SW 1st Avenue and east of SE 2nd Avenue.

The Project has dismissed any options that would not provide a connection (either directly or with a mid-block, red-light traffic-signal protected crossing) to both the eastbound and westbound sidewalks and bikes lane on the Burnside Bridge. To provide access to only the eastbound facilities would have had the potential to induce wrong-way riding and conflicts with pedestrians or illegal crossings of the roadway to access the opposite side. It would also conflict with the City's design requirements for a Major City Bikeway designation.

3.3 Impacts and Performance Assessment

Some aspects of performance are described above in Section 3.2. This section describes additional relevant impacts and performance of the reasonable options for improving access between the future bridge and the Eastbank Esplanade.

3.3.1 Active Transportation Travel Times

Travel times for elevators and ramps are calculated for each connection type and are provided below. It should be noted that travel time alone cannot predict the use of the facility type because subjective characteristics such as perceived user safety, visibility, user volumes, and operating reliability may influence the decision to use each connection type. As these influencing factors are highly variable, travel times independent of these parameters are provided.

- **Ramps:** Approximately 5 minutes to travel from the bridge deck to the at-grade landing portion of the Eastbank Esplanade (or vice versa) using a 1000' switchback ramp. This duration is based on a commonly used pedestrian rate of 3.3 feet/second, although the uphill travel would likely result in a longer duration.
- **Elevators (working condition):** Approximately 1.5 to 2 minutes (including wait time) to travel from the bridge deck to the Eastbank Esplanade (or vice versa).This duration is based on measured times from multiple elevators of similar height in the Portland area.
- **Elevators (during repairs, assuming travel to the other):** Approximately 10.5 to 11 minutes (including wait time) to travel from the bridge deck to the Eastbank Esplanade. This duration is based on an out-of-direction travel of approximately 1200 feet, a wait

time of approximately 3 minutes to cross Burnside Street at Martin Luther King, Jr. Boulevard, and the standard 1.5-to-2-minute elevator operating time. During these events, advanced signage at adjacent bridges would be provided to allow users to take alternative routes ahead of reaching the bridge.

3.3.2 Hydraulics/Flooding

The Draft EIS hydraulic impact analysis qualitatively compares the proposed geometry of each reasonable option against the existing condition, focusing on the elements (such as lateral surface area in the floodplain and openings between columns) that affect how flow would move around piers and footings and the potential for hydraulic changes that could impact scour or base flood elevation. (Following the public comment period on the SDEIS, the bridge design will be advanced, detailed hydraulic modeling of the channel will be conducted, and results will be documented in a technical hydraulic design report that could support a no-rise certification.)

The proposed permanent designs for improving access between the future bridge and the Eastbank Esplanade would involve excavation of contaminated soils and placement of fill within the floodplain in the form of structural shafts and would aim to avoid or minimize widening of the embankment. Permanent impacts resulting from the placement of structural support shafts include the potential to increase base flood elevations, increase contraction scour by constricting flows and narrowing the channel area, as well as increase local or pier scour when the capacity of the flow to erode and transport sediments is larger than the capacity to replace the sediments. The sum of these scours, or the total scour, has the potential to mobilize contaminated sediments when compared to the No-Build Alternative.

Table 2 provides a comparison of fill volume estimates for the options.

Table 2. Summary of Temporary and Permanent In-water Impacts

Eastbank Options	Permanent Fill	Temporary Fill
1. Stairs/Elevator North and South Sides	3,200 CY (half on each side of bridge, all in shallow water habitat)	600 CY fill, 5,000 CY riprap removal
2. Stairs/Elevator South Side Only (Mid-block Crossing)	1,600 CY (all placed south of bridge in SWH)	600 CY fill, 2,600 CY of riprap removal
3. Ramps on North and South Sides	19,200 CY (roughly half on each side of bridge, ~80% in SWH)	1,000 CY fill, 23,000 CY of riprap removal
4. Ramps on South Side Only (Mid-block Crossing)	19,200 CY (placed on south side of bridge, ~70% in SWH)	1,000 CY fill, 23,000 CY of riprap removal

CY (cubic yard)

Temporary construction of the options would involve the excavation and removal of contaminated soils and riprap in the main channel of the river, along the embankment, and in the riparian areas. In-water work to construct the ramp could include the use of cofferdams and a seal course, pile driving, and the placement of the support shafts. These activities would temporarily increase the potential for contraction scour and mobilization of contaminated sediments in the near-shore area during construction, in an area where previous scour effects have been noted.

Table 3 summarizes the potential hydraulic impacts. The impacts are expressed in relative terms based on the lowest to highest impact among the options.

Table 3. Summary of Temporary and Permanent Hydraulic Impacts

Eastbank Options	Permanent Fill	Temporary Fill	Additional Considerations
1. Stairs/Elevator North and South Sides	Medium amount of fill in floodplain Medium expected increase in scour	Medium amount of disturbed sediment	Would place 3 additional shafts in the regulatory floodway of the river in the vicinity of previously identified riverbed scouring.
2. Stairs/Elevator South Side Only (Mid-block Crossing)	Lowest amount of fill in floodplain Least expected increase in scour	Lowest amount of disturbed sediment	Would place no shafts below the ordinary high-water level and regulatory floodway of the channel.
3. Ramps on North and South Sides	Highest amount of fill in floodplain Highest expected increase in scour	Highest amount of disturbed sediment	Would place at least 7 shafts below the ordinary high-water level of the channel and regulated floodway and 15 shafts within the floodplain.
4. Ramps on South Side Only (Mid-block Crossing)	Similar to Option 3	Similar to Option 3	Similar to Option 3.

CY (cubic yard)

3.3.3 Aquatic Habitat and Fish

Aquatic habitat and fish impacts consider how the changes from the potential options would affect the existing aquatic species and their habitat within the Willamette River. This analysis is a high-level summary of the resources that would be affected by constructing the access options. For a more detailed analysis of how impacts affect aquatic species, refer to the *EQRB Vegetation, Wildlife, and Aquatic Species Technical Report* (Multnomah County 2021).

All access options described above would result in both temporary and permanent impacts below ordinary high water, affecting aquatic species. Several fish species listed under the Endangered Species Act (ESA) are present in the Willamette River, using the area for migration, rearing, and feeding habitat during all life stages. In addition to the presence of shallow water habitat, the Lower Willamette River has been designated as critical habitat for several ESA-listed salmonids. Permanent fill within the river associated with all access options presented in this memo would cause a direct loss of habitat, including designated critical habitat. Construction activities to place the proposed structures that would result in permanent fill could temporarily affect fish and their habitat through a reduction of water quality, hydroacoustic impacts, and through degradation and reduction of available habitat.

Temporary removal of riprap in the river can increase turbidity which affects aquatic species in several ways including direct mortality, increased potential for gill tissue damage, physiological stress, behavior changes, and habitat impacts. Best management practices (BMPs) would be implemented to minimize the extent and duration of turbidity, including the establishment of a temporary mixing zone for turbidity whereby turbidity may temporarily exceed ambient levels

and will require regular water quality monitoring during construction activities. An Erosion and Sediment Control Plan would be developed for the Project that outlines measures to be taken before and during construction to prevent sediment from accumulating and discharging in the river. In addition to increases in turbidity, construction activities involved with temporary fill and removal in the river affect the amount of available habitat for fish and other aquatic species. Turbidity levels associated with the Project are not anticipated to reach levels that would result in direct mortality or gill damage to fish; however, physiological stress and behavior changes such as temporary avoidance are likely.

Shallow water habitat is defined as 20 feet below the ordinary low water mark up to the ordinary high-water mark. Shallow water habitat is important to migrating and rearing salmonids because it provides refuge from high flows found in deeper waters and provides rearing and feeding habitat for juveniles. There are 3.4 acres of shallow water habitat within the Project Area, which includes the access area. Fill and removal associated with the proposed access options would create additional impacts to the remaining shallow water habitat in the Project Area, which has already been degraded over time due to previous development. Fill placed within shallow water habitat would cause a direct permanent loss of habitat for aquatic species, including ESA-listed salmonids, other resident fish, and macroinvertebrates. This could lead to increased difficulties during juvenile migration due to a lack of refuge and feeding areas.

Floating dock piles would be temporarily removed and reinstalled with Options 3 and 4 described above. Removal of existing piles in the river could result in temporary increases in turbidity, resulting in behavioral responses in fish such as temporary avoidance of the area, and temporary unavailability of habitat. The floating dock piles would be replaced after construction of access foundations are complete, which would entail pile driving. Pile driving creates underwater noise, called hydroacoustic impacts, which can affect fish in several ways. Hydroacoustic impacts can alter behavior in fish, result in physical injury, or direct mortality. When the floating dock piles are reinstalled, pile driving would occur, potentially impacting fish. BMPs will be implemented to minimize the likelihood of impacts, including installing pile using a vibratory hammer (rather than an impact hammer) and use of a bubble curtain during all impact pile driving. In addition, all pile driving will be performed during the approved in-water work window for pile driving (July 10 – October 15), which coincides with the lowest presence of ESA-listed species in the Lower Willamette River.

Option 2 has the least amount of proposed permanent fill and temporary fill and would have the least impact on fish and aquatic habitat, followed by Option 1. Options 3 and 4 have the same amount of proposed permanent and temporary fill, but Option 3 would result in approximately 10 percent more of permanent fill placed within shallow water habitat. Option 3 would have the largest impact on both aquatic species and habitat.

3.3.4 Vegetation

Vegetation removal can impact the surrounding environment as well as terrestrial and aquatic species. Temporary clearing of vegetation is proposed for construction staging and access for all access options. The existing vegetation near the proposed access construction areas is limited and highly disturbed. Riparian vegetation in the proposed access area is comprised

mostly of herbaceous vegetation and tree seedlings. The majority of the riparian vegetation is comprised of invasive plant species such as Himalayan blackberry, however, some native species such as Douglas' spiraea are present. Few large trees are present, other than a row of street trees that lines the east side of the Eastbank Esplanade.

Options 3 and 4 would result in the removal of approximately 20 trees south of the existing bridge, just east of the Eastbank Esplanade Path. Options 1 and 2 would not require removal of these trees or any additional vegetation that isn't already proposed for removal associated with the construction of the build alternatives. Impacts associated with vegetation removal include a reduction of habitat and foraging resources for birds and wildlife. Upon construction completion, vegetation would be restored with a variety of native plant species. Some project elements will require the removal of vegetation and will not allow for restoration in the same area due to installation of structures. Losses of riparian vegetation can impact birds and wildlife through a reduction in habitat connectivity and food resources. Riparian vegetation can also help control erosion of banks, and if vegetation is removed, it could have an effect on water quality due to sediment entering the water column, thereby affecting fish and other aquatic species. In areas where vegetation currently exists that will be removed and is unable to be replaced, mitigation for permanent vegetation loss will occur within the Lower Willamette River (outside of the Project Area) or through the purchase of mitigation bank credits.

3.3.5 Parks (Eastbank Esplanade)

Impacts to the Eastbank Esplanade from the access options are focused on the duration and extent of temporary closure of and permanent changes to the Eastbank Esplanade.

Both options with stairs and an elevator would not require additional temporary closure duration of the floating portion of the Eastbank Esplanade compared to the 18 months needed to construct the Long-span Alternative without a Temporary Bridge (total of 18 months made up of several shorter intermittent closures). Both options with ramps would require an additional 2 to 3 years of closure for construction, meaning it would be closed for the full duration of bridge construction.

Both options with stairs and an elevator would not require additional physical impacts to the Eastbank Esplanade compared to those identified with the Long-span Alternative without a Temporary Bridge. Both options with ramps would require additional impacts including removal and replacement of the floating bridge leading down from the at grade section to the floating section of the Eastbank Esplanade.

3.3.6 Visual Impacts

Visual and aesthetics impacts consider how the changes from the potential options would affect the existing built and natural landscape and which viewer groups would be affected. This analysis builds from the principles, the descriptions of the existing environment and user groups included in the *EQRB Visual Resources Technical Report* (Multnomah County 2021).

Option 2 (stairs and elevator on the south side only) would have a similar form to the existing stairs on the south side of the bridge and would not contrast with the visual character of the Eastbank Esplanade. Option 1, which adds stairs and elevator to the north side of the bridge,

would also be similar in form to the existing stairs but with a larger footprint. Both options would require a foundation structure in the river itself, although this structure would be about twice as large with Option 1 compared to Option 2. This added structure in the river would adversely affect the views from the Eastbank Esplanade, although substantially less than the impact with the ramp options (see below).

Option 4 (ramp on the south side only) or Option 3 (ramps on both sides of the bridge) with switchbacks or spirals from the bridge deck to the Eastbank Esplanade would create a much greater footprint than the existing conditions or than Options 1 and 2. This greater footprint would remove up to 20 existing trees on the east bank, greatly affecting the visual character, especially as viewed from the Eastbank Esplanade or the eastbound bridge sidewalk. The fact that there are few trees along the Eastbank Esplanade bestows each tree as a contribution to the visual character of the bank, providing shade and a sense of natural harmony to viewers.

The height and scale of the ramp structure(s) (Options 3 and 4) would alter views from the Eastbank Esplanade and from the west side of the river looking east. The greatest impact would be with Option 3 (ramps on both sides of the bridge). In addition, the ramps would require foundations located in the river and on the shoreline, which would further alter views from the Eastbank Esplanade. The in-river foundations for the ramp options would be 6 to 12 times larger in volume than the structures supporting the stairs and elevator(s) with Options 1 and 2, respectively.

Travelers are the closest viewers. Vehicular travelers are minimally affected by the structure due to their rate of travel, but pedestrian and bicycle travelers would view the structure for a longer duration. The structure will be seen by neighbors on the Eastbank Esplanade and Tom McCall Waterfront Park (Waterfront Park). The increased footprint of the ramp structure(s) (Options 3 and 4) increases the distance from which they would be seen and the duration of time they would be seen.

The added structure of the ramps and their support columns would detract from the natural aesthetics of the river. While the visual effects of the ramp options would be substantial for specific views, as noted above, the quality of the visual change for some views would depend in part on the detailed design of the ramp structures, including their compatibility with the Eastbank Esplanade and the Burnside Bridge. Blocking views to the freeway to the east may be seen as a beneficial impact. Another potential benefit of ramps would be added views and visual experiences for pedestrians and bicyclists on the ramps.

For any of the options, but for the ramp options in particular, final design should consider how to maximize aesthetic experience for all users approaching, on, and under the bridge by considering opportunities related to scale, forms and materials, viewing, wayfinding, transitions to and from public spaces, lighting/shade/shadows, and activating areas for public use.

Ramp design concepts proposed by others include building the ramps on structures over and in the river rather than on the bank. This would likely result in removing many fewer trees but would also be expected to cause higher impacts to river views from the shoreline as well as from the Eastbank Esplanade.

4 West End Active Transportation Access Options

4.1 Existing Westside Access to 1st Avenue

With the existing bridge, direct access to 1st Avenue below the bridge is via a set of stairs on each side of the bridge that extends down to the sidewalk on the west side of 1st Avenue approximately 20 vertical feet below it. The stairway is primarily for pedestrians because it is not ADA-accessible and requires bicyclists to carry their bikes up or down the stairs.

4.2 Options for Westside Access to 1st Avenue

There are five options being considered to provide this access in the future:

1. In-Kind Stairs and New Elevators on the North and South Sides
2. In-Kind Stairs on North Side; New Ramp (Saturday Market Admin Site) and Stairs on South Side
3. In-Kind Stairs on North Side; New Ramp (Saturday Market Admin Site) and Stairs on South Side with Mid-block Crossing
4. In-Kind Stairs on North Side; New Ramp (Mercy Corps Parking Site) and Stairs on South Side
5. In-Kind Stairs on North Side; New ramp (Mercy Corps Parking Site) and Stairs on South Side with Mid-block Crossing

The following design features apply to all of the options as noted above:

- All options include an improved sidewalk reconstruction from the Burnside Bridge to 1st Avenue (See Figure 3), which includes:
    - Sidewalk, intersection ramps, and signal upgrades along the north side of Burnside Street to 2nd Avenue, the east side of 2nd Avenue extending to Couch Street, and along the south side of Couch Street extending to 1st Avenue
    - Sidewalk, intersection ramps, and signal upgrades along the south side of Burnside Street to 2nd Avenue, the east side of 2nd Avenue extending to Ankeny Street, and along the north side of Ankeny Street extending to 1st Avenue
- All layouts include a street-level sidewalk connection between 1st Avenue and Naito Parkway along the north face of the Mercy Corps building so that all users can access the ramp and stairs from either street.
- All ramp layouts reduce the amount of natural light under the Burnside Bridge between 1st Avenue and Naito Parkway.
- All layouts for Options 4 and 5 require acquisition of the entire surface-level parking lot between the Burnside Bridge and the Mercy Corps building. This parking could potentially be replaced under the bridge that is currently leased by the University of Oregon from the City of Portland.

- All layouts for Options 4 and 5 would require relocation of existing stormwater planter facilities in this parking lot. The new stormwater facilities would likely be vaults placed nearby, under the Burnside Bridge.
- All options can be constructed within the anticipated overall construction duration.
- All options have equivalent temporary impacts to operations at TriMet's Skidmore Fountain MAX station.
- The primary intent of the proposed elevators and stairs between the bridge and 1st Avenue is to provide direct ADA and pedestrian access between the existing westbound bus stop on the bridge and the existing Skidmore Fountain MAX station directly under the bridge. TriMet, however, is studying a proposal to close the Skidmore Fountain MAX station (TriMet Board of Directors, 2019) and is also considering moving the westbound bus stop off the bridge to between NW 2nd and NW 3rd Avenues. If either or both changes occur, then the need and rationale for direct ADA and pedestrian access at this location would be greatly diminished. Should TriMet decide to eliminate the bus stop and/or the station prior to EQRB construction, then the project may not build any of the five West Approach ADA connection options described above. In that case, the most direct ADA and pedestrian access between the bridge and 1st Avenue would be one block west of the proposed elevator location via the sidewalks on 2nd Avenue and either NW Couch or SW Ankeny Streets.

The sections below provide design information and construction assumptions, when applicable, unique to each option. See Attachment 1 for all figures referenced below.

4.2.1 Option 1: In-Kind Stairs and New Elevators on North and South Sides

For this connection option, the stairway on the north side of the bridge to the Skidmore Fountain MAX station would be replaced with a new stairway and elevator (Figure 8). The stairs and elevator would be designed to comply with requirements for being within the Skidmore/Old Town Historic District. Combined with the sidewalk improvements circling the block, including W Burnside Street, NW 2nd Avenue, and NW Couch Street (see the blue path in Figure 10), ADA access would be provided to the Skidmore Fountain MAX station and 1st Avenue.

Further, for this connection option, the stairway on the south side of the bridge to the Skidmore Fountain MAX station would be replaced with a new stairway and elevator (Figure 8). The stairs and elevator would be designed to comply with requirements for being within the Skidmore/Old Town Historic District. Combined with the sidewalk improvements circling the block, including W Burnside Street, SW 2nd Avenue, and SW Ankeny Street (see the pink path in Figure 10), ADA access would be provided to the Skidmore Fountain MAX station and 1st Avenue.

It should be noted that if TriMet decides to remove the Skidmore Fountain MAX station in the future, stairs and elevators may no longer be needed.

4.2.2 Option 2: In-Kind Stairs on North Side; New Ramp (Saturday Market Admin Site) and Stairs on South Side

For this connection option, the stairway on the north side of the bridge to the Skidmore Fountain MAX station would be replaced with a new stairway (Figure 8). Along with the stairway, the sidewalk improvements circling the block, including W Burnside Street, NW 2nd Avenue, and

NW Couch Street (see the blue path in Figure 10), would provide the ADA access from the bridge to the Skidmore Fountain MAX station and 1st Avenue.

Further, for this connection option, the stairway on the south side of the bridge to the Skidmore Fountain MAX station would be replaced with a new stairway and a ramp just west of 1st Avenue in the current Saturday Market Admin site (Figure 9). Several layouts are being considered that have different switchback orientations and stair locations, but all fit into the same approximate footprint as previously identified in the technical reports. Concerns have been expressed that this ramp uses part of a current parking lot that could be better used as redevelopment space in the future. There are also questions whether the ramp should be oriented to serve the Skidmore Fountain MAX station or re-oriented towards Naito Parkway and Waterfront Park.

4.2.3 Option 3: In-Kind Stairs on North Side; New Ramp (Saturday Market Admin Site) and Stairs on South Side with Mid-block Crossing

This connection option is similar to the previous option (i.e., In-Kind Stairs on North Side; New Ramp (Saturday Market Admin Site) and Stairs on South Side), but it adds a mid-block, traffic-signalized, bicycle/pedestrian crossing of the Burnside Bridge near 1st Avenue. This crossing provides a shorter-distance ADA route for north side pedestrians than the proposed route that goes around the block or uses the crosswalk at 2nd Avenue to access 1st Avenue and the Skidmore Fountain MAX station (see the red path in Figure 10). This crossing reduces the travel distance by approximately 200-feet to 300-feet. This crossing would need to be tied into the nearby traffic signals on W Burnside Street. This traffic signal is assumed to have an approximately 90 second cycle length, which provides sufficient green time between pedestrian phases, incurs minimal delay to traffic, and has 95 percent queuing that fits within available space between signals to the west and east.

The mid-block red-light crossing requires all motorized vehicles to stop, allowing bicyclists and pedestrians to cross the street from the eastbound bicycle lane and sidewalk to the westbound bicycle lane and sidewalk on the north side of the bridge. Due to the buildings constraining the bicycle/pedestrian space, the queueing of bicycles and pedestrians waiting to cross the bridge could result in conflicts with bicycle/pedestrian users traversing east-west on the bridge.

At a minimum, this traffic signal, and its stop bar locations, would be coordinated with the traffic signals for the movable span (just west of the mid-block crossing) to avoid overlapping queues. Attempts would also be made to time the signal with Martin Luther King, Jr. Boulevard, Grand Avenue, NW 2nd Avenue, NW 3rd Avenue, and other nearby signals, as deemed necessary. Westbound traffic would be stopped east of the mid-span crossing when the bicycle/pedestrian traffic signal is activated. This location coincides with the stop location when the bridge is raised. When the bicycle/pedestrian mid-block crossing is activated, eastbound traffic would stop west of the movable span. Similar to the stop location on the east side of the river, the west stop location also coincides with the stop location when the bridge is raised.

There are a few issues with this crossing that cannot be mitigated:

- This crossing would have a cross slope of 4.2 percent, which is steeper than the desired 2 percent maximum for ADA circulation routes.
- The cross section in this area is constrained by buildings, so there is limited or no space to widen the bicycle and pedestrian facility to reduce/avoid conflicts between people waiting to cross north/south and bicyclists travelling east/west.
- Although there is a signal, some concern has been raised about pedestrian safety within mid-block crossings.

4.2.4 Option 4: In-Kind Stairs on North Side; New Ramp (Mercy Corps Parking Site) and Stairs on South Side

For this connection option, the stairway on the north side of the bridge to the Skidmore Fountain MAX station would be replaced with a new stairway (Figure 8). Along with the stairway, the sidewalk improvements circling the block, including W Burnside Street, NW 2nd Avenue, and NW Couch Street (see the blue path in Figure 10), would provide the ADA access from the bridge to the Skidmore Fountain MAX station and 1st Avenue.

Further, for this connection option, the stairway on the south side of the bridge to the Skidmore Fountain MAX station would be replaced with a new stairway and a ramp just west of 1st Avenue in the current Mercy Corps Parking site. Multiple layouts are being considered, as follows:

- The first layout uses a 4.75 percent grade ramp that ties into 1st Avenue. It includes extending the Burnside Bridge supports on both sides of 1st Avenue to allow the ramp to span over the MAX tracks. It has limited space to fit stairs (except potentially under the bridge at Naito Parkway) (Figure 11). An alternative to this layout uses a steeper 7.5 percent grade ramp to avoid crossing the MAX tracks. It more easily fits stairs into Naito Parkway at the east end of the switchback.
- A second layout uses a steeper 7.5 percent grade ramp to tie into Naito Parkway with stairs at 1st Avenue. It includes a span over Naito Parkway that would place ramp foundation supports in the Naito Parkway median and/or in the west edge of Waterfront Park (Figure 12). This layout has the greatest potential impact to Naito Parkway and/or Waterfront Park and could require one-way closures of Naito Parkway for up to three months during construction.

4.2.5 Option 5: In-Kind Stairs on North Side; New Ramp (Mercy Corps Parking Site) and Stairs on South Side with Mid-block Crossing

This connection option is the same as the previous option (i.e., In-Kind Stairs on North Side; New Ramp (Mercy Corps Parking Site) and Stairs on South Side), but it adds a mid-block, traffic-signalized, bicycle/pedestrian crossing of the Burnside Bridge near 1st Avenue. This crossing provides a shorter-distance ADA route for north side pedestrians than the proposed route that goes around the block or uses the crosswalk at 2nd Avenue to access 1st Avenue and the Skidmore Fountain MAX station (see the red path in Figure 10). This crossing reduces the travel distance by approximately 200-feet to 300-feet. This crossing would need to be tied into the nearby traffic signals on West Burnside Street. This traffic signal is assumed to have an

approximately 90 second cycle length, which provides sufficient green time between pedestrian phases, incurs minimal delay to traffic, and has 95 percent queuing that fits within available space between signals to the west and east.

The mid-block crossing requires all motorized vehicles to stop, allowing bicyclists and pedestrians to cross the street from the eastbound bicycle lane and sidewalk to the westbound bicycle lane and sidewalk on the north side of the bridge. Due to the buildings constraining the bicycle/pedestrian space, the queueing of bicycles and pedestrians waiting to cross the bridge could result in conflicts with bicycle/pedestrian users traversing east-west on the bridge.

At a minimum, this traffic signal, and its stop bar locations, would be coordinated with the traffic signals for the movable span (just west of the mid-block crossing) to avoid overlapping queues. Attempts would also be made to time the signal with Martin Luther King, Jr. Boulevard, Grand Avenue, NW 2nd Avenue, NW 3rd Avenue, and other nearby signals, as deemed necessary. Westbound traffic would be stopped east of the mid-span crossing when the bicycle/pedestrian traffic signal is activated. This location coincides with the stop location when the bridge is raised. When the bicycle/pedestrian mid-block crossing is activated, eastbound traffic would stop west of the movable span. Similar to the stop location on the east side of the river, the west stop location also coincides with the stop location when the bridge is raised.

There are a few issues with this crossing that cannot be mitigated:

- This crossing would have a cross slope of 4.2 percent, which is steeper than the desired 2 percent maximum for ADA circulation routes.
- The cross section in this area is constrained by buildings, so there is limited or no space to widen the bicycle and pedestrian facility to reduce/avoid conflicts between people waiting to cross north/south and bicyclists travelling east/west.
- The introduction of mid-block crossings creates conflict zones between bicycle users travelling along the bridge with the mid-block crossing users travelling perpendicular to it.
- Although there is a signal, some concern has been raised about pedestrian safety within mid-block crossings.

4.2.6 Other Options Dismissed from Consideration

A ramp option from the north side of the bridge was dismissed due to many conflicts with doors, trees, overhead catenary system poles, sidewalk circulation and concerns about safety.

Several ramp, stairway, and elevator options were considered to provide a direct connection between the Burnside Bridge and Waterfront Park. All these options were dismissed based on impacts to Waterfront Park functions and events, and a lack of support from local stakeholders.

4.3 Impacts and Performance Assessment

This section describes the relevant impacts and performance of the reasonable options for improving access between the future bridge and 1st Avenue on the west side.

4.3.1 Compatibility with City Land Use/Re-development Plans

The areas that would be affected under any of the options are all within the Skidmore/Old Town Historic District, the Central City 2035 Plan, and are designated with the Central Employment base zone and Comprehensive Plan designation and a Design overlay zone. Impacts generally consider whether the proposed use is consistent with the applicable designations and plans and whether the options are differentiated from the bridge alternatives in the Draft EIS based on these factors.

Options 1, 2, and 3 for westside access to 1st Avenue all present the same general future land use as considered for the bridge alternatives in the Draft EIS. The Portland Saturday Market Administration building is described in the Draft EIS as a permanent acquisition with a new transportation-related permanent structure, which is the same scenario under these three options. This site is also identified as a location with potential for redevelopment by its inclusion in the Buildable Lands Inventory. Use of this location for a ramp structure limits the employment and housing potential of the site. Any of these options would be required to meet standards in the Central City 2035 Plan and Design Standards.

Options 4 and 5 for westside access to 1st Avenue differ from all of the bridge alternatives in the Draft EIS because both Option 4 or 5 would require a permanent acquisition and structure, where the bridge alternatives only required a temporary construction easement on this property. However, the land use compatibility is similar for all five options because the applicable standards are the same. In addition, the second potential layout for Option 5 would require permanent impacts in Waterfront Park that would be in addition to those already considered for the bridge alternatives.

Regardless of the connection option selected during the final design phase, the remaining property will by available by its owner as a potential redevelopment site. This redevelopment is a strategic objective of the Skidmore/Old Town Historic District.

This page is intentionally left blank.

Attachment 1. Figures

Eastbank Esplanade Access Options

Figure 3. Stairs and Elevator on North and South Sides of the Bridge

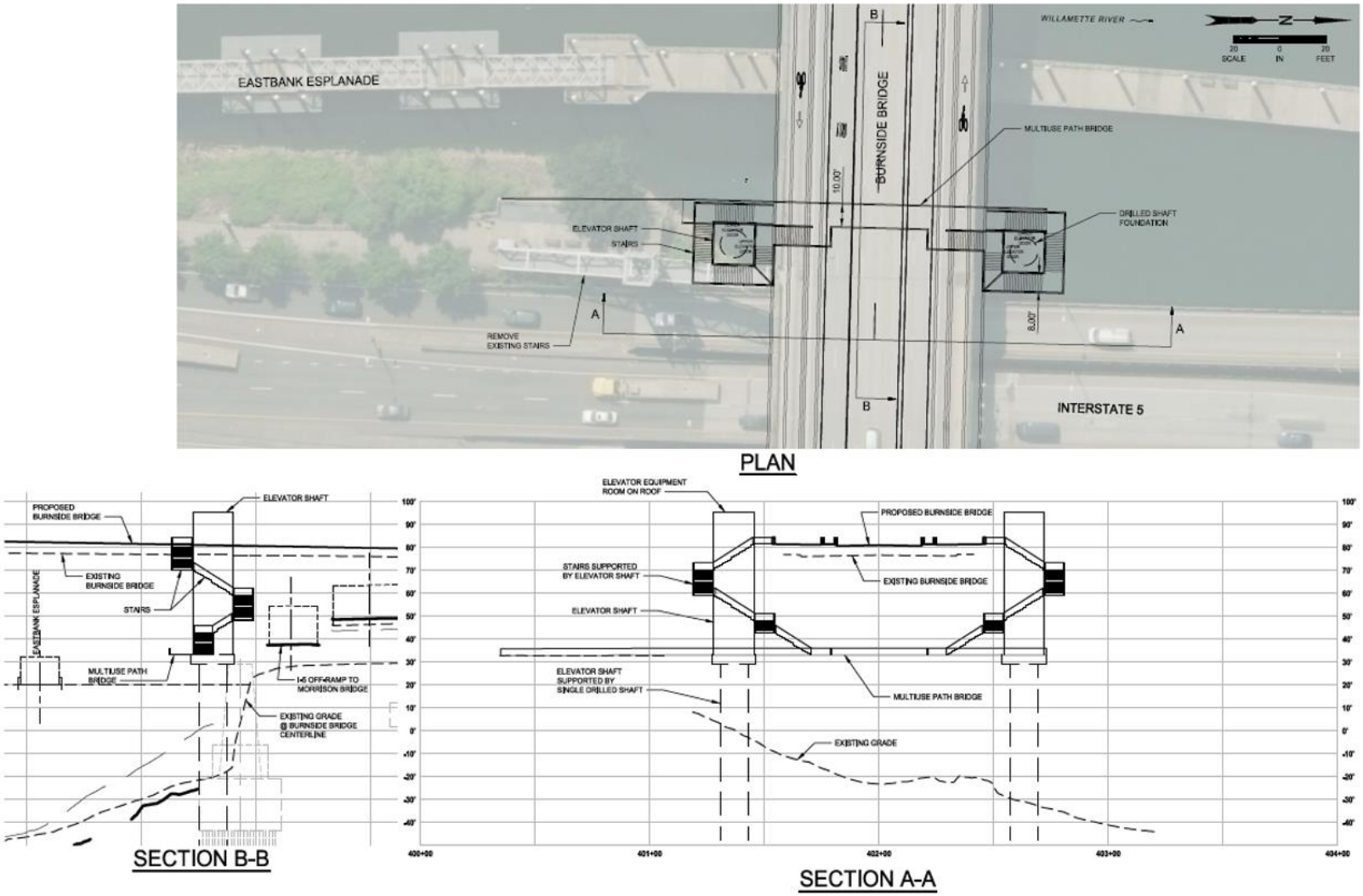


Figure 4. Stairs and Elevator on South Side of the Bridge Only with a Signalized Mid-block Crossing Connecting the North and South Sidewalks and Bike Lanes

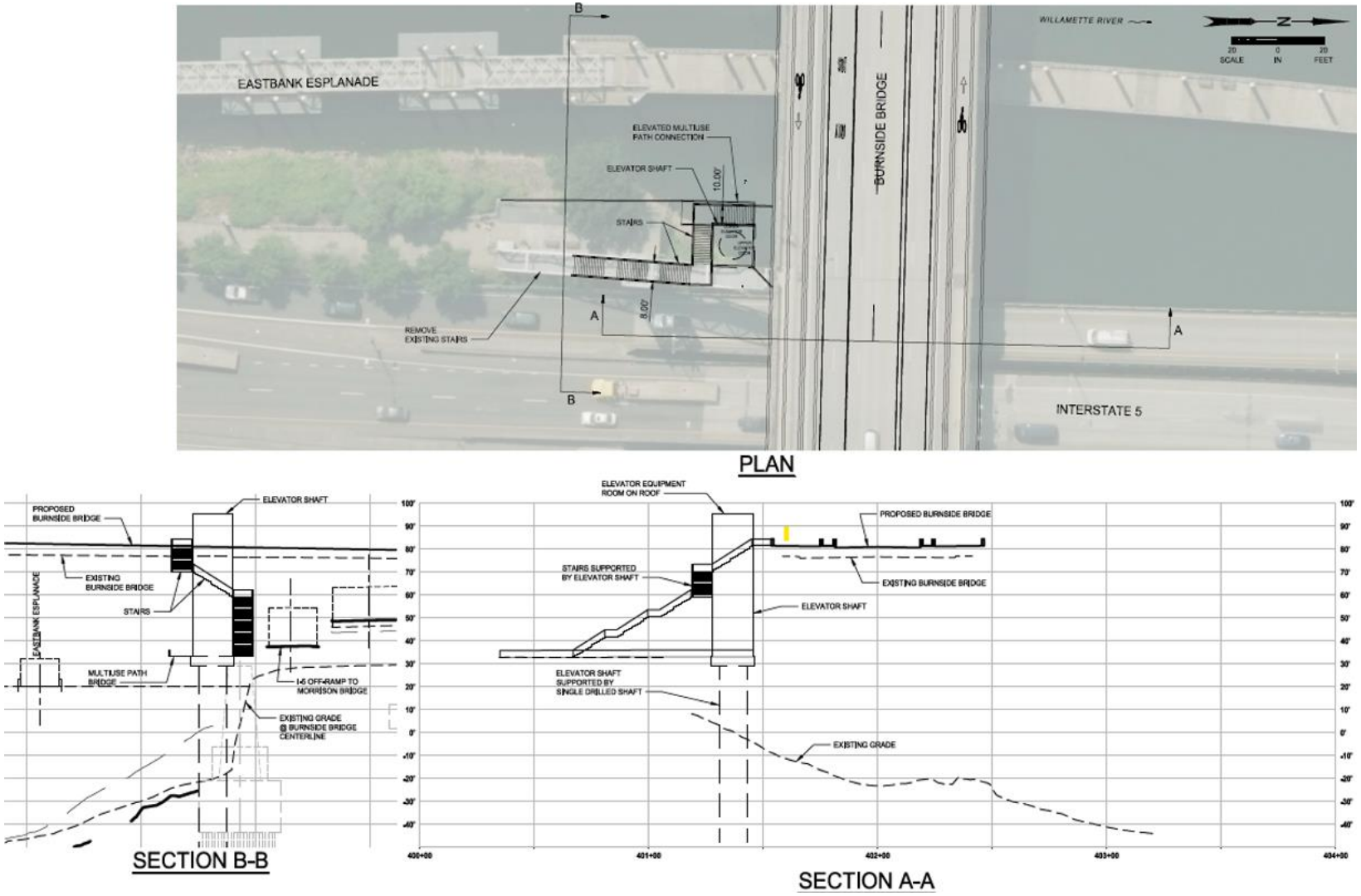


Figure 5. Ramps on North and South Sides of the Bridge and Stairs on South Side

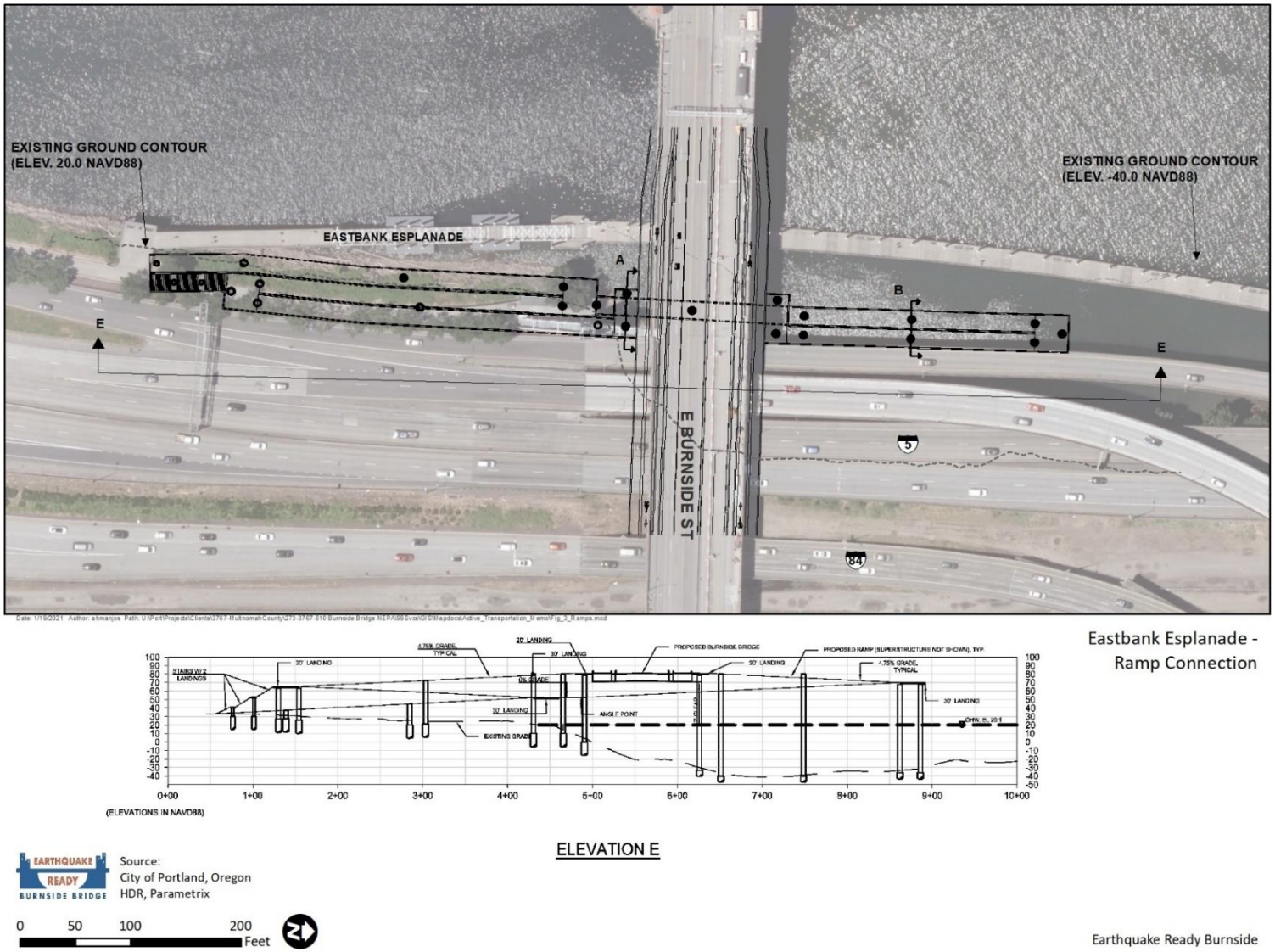
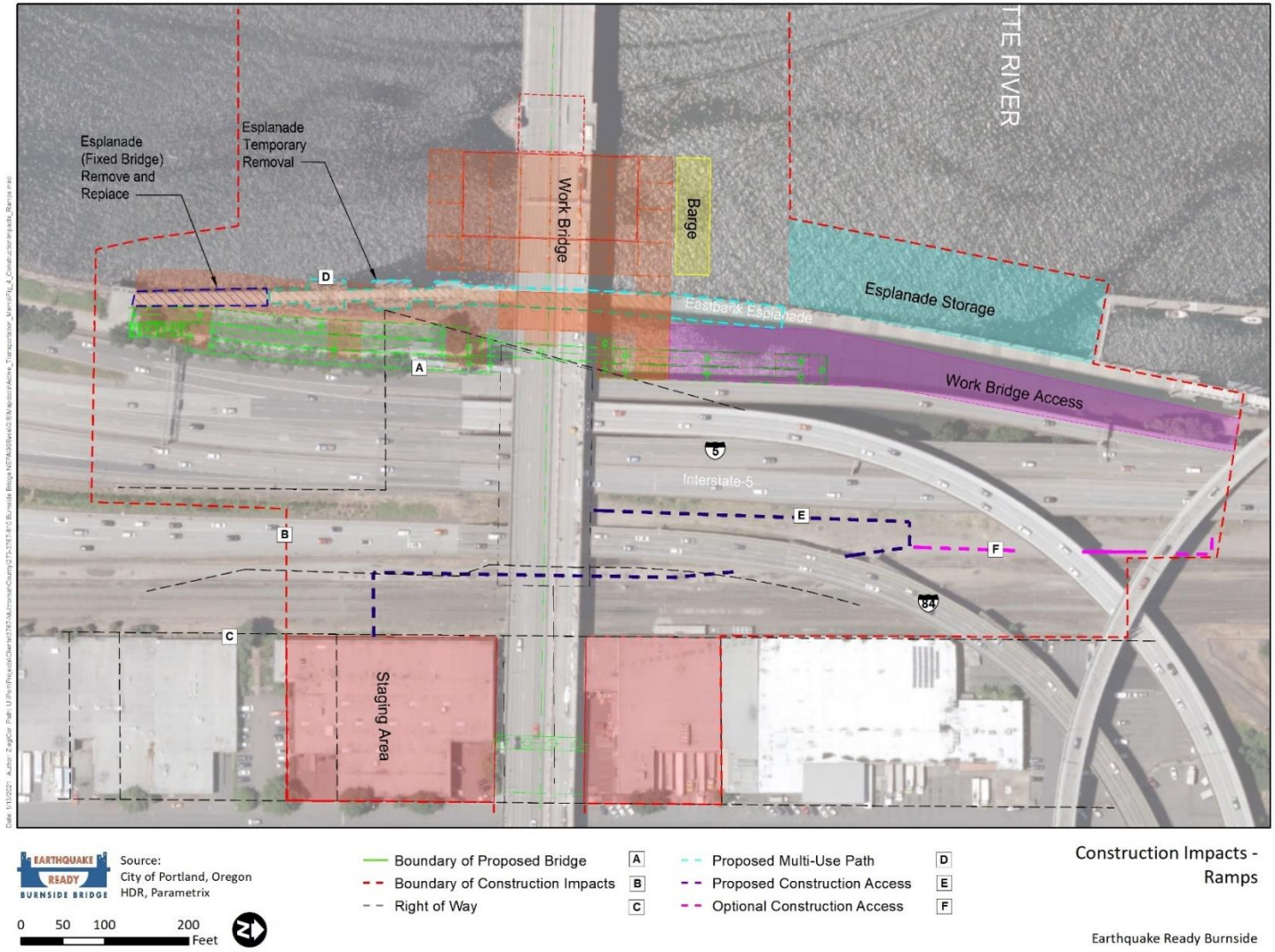
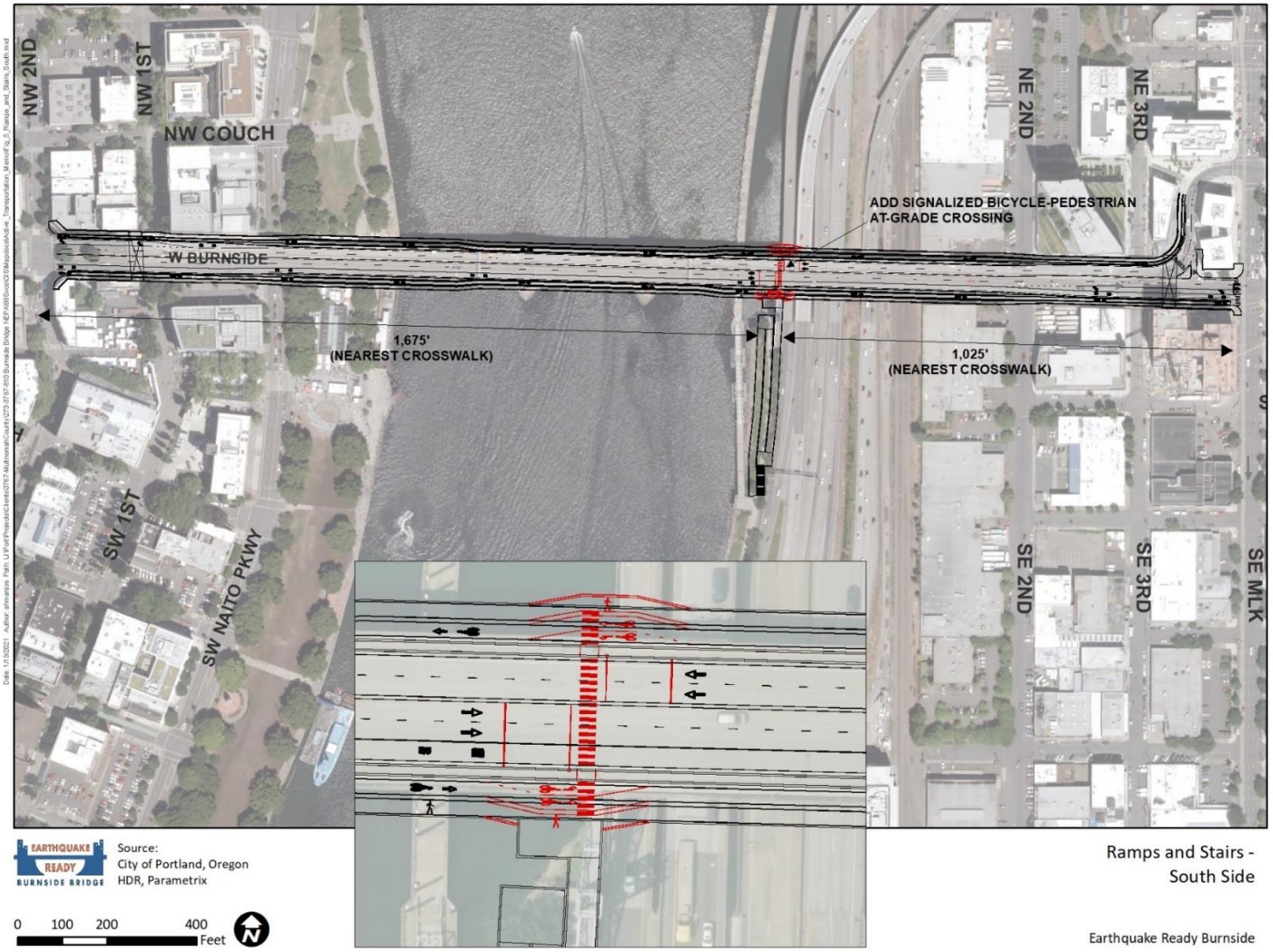


Figure 6. Construction Impacts for Ramps on North and South Sides of the Bridge and Stairs on South Side



Note: Similar for ramp and stairs on south side only except limits of permanent construction shown in green is reduced to only the south side of the bridge.

Figure 7. Ramp and Stairs on South Side Only with a Signalized Mid-block Crossing Connecting the North and South Sidewalks and Bike Lanes



Westside Access to 1st Avenue Options

Figure 8. In-Kind Stairs plus Elevators on North and South Sides

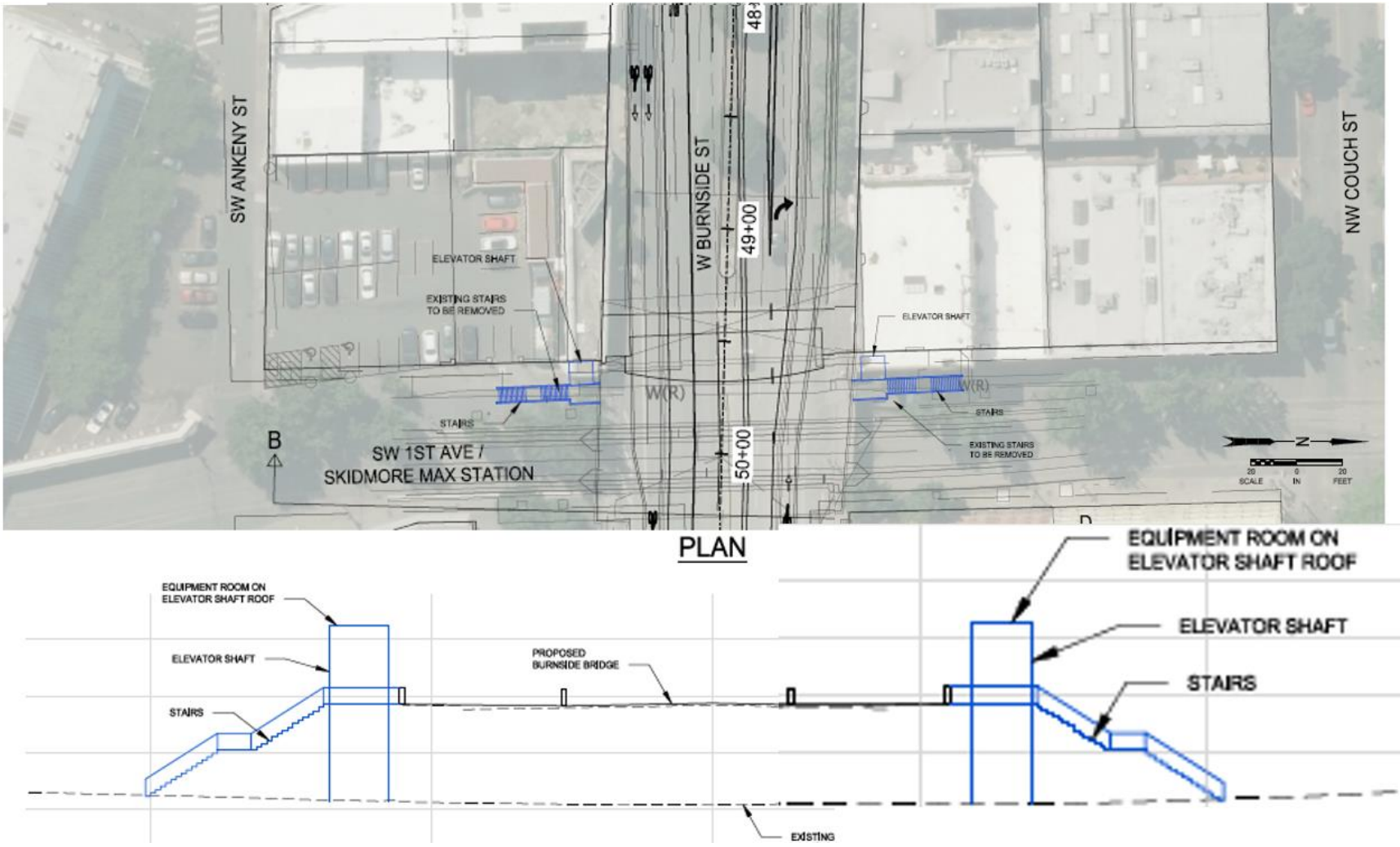


Figure 9. In-Kind Stairs on North Side; New Ramp (Saturday Market Admin Site) and Stairs on South Side

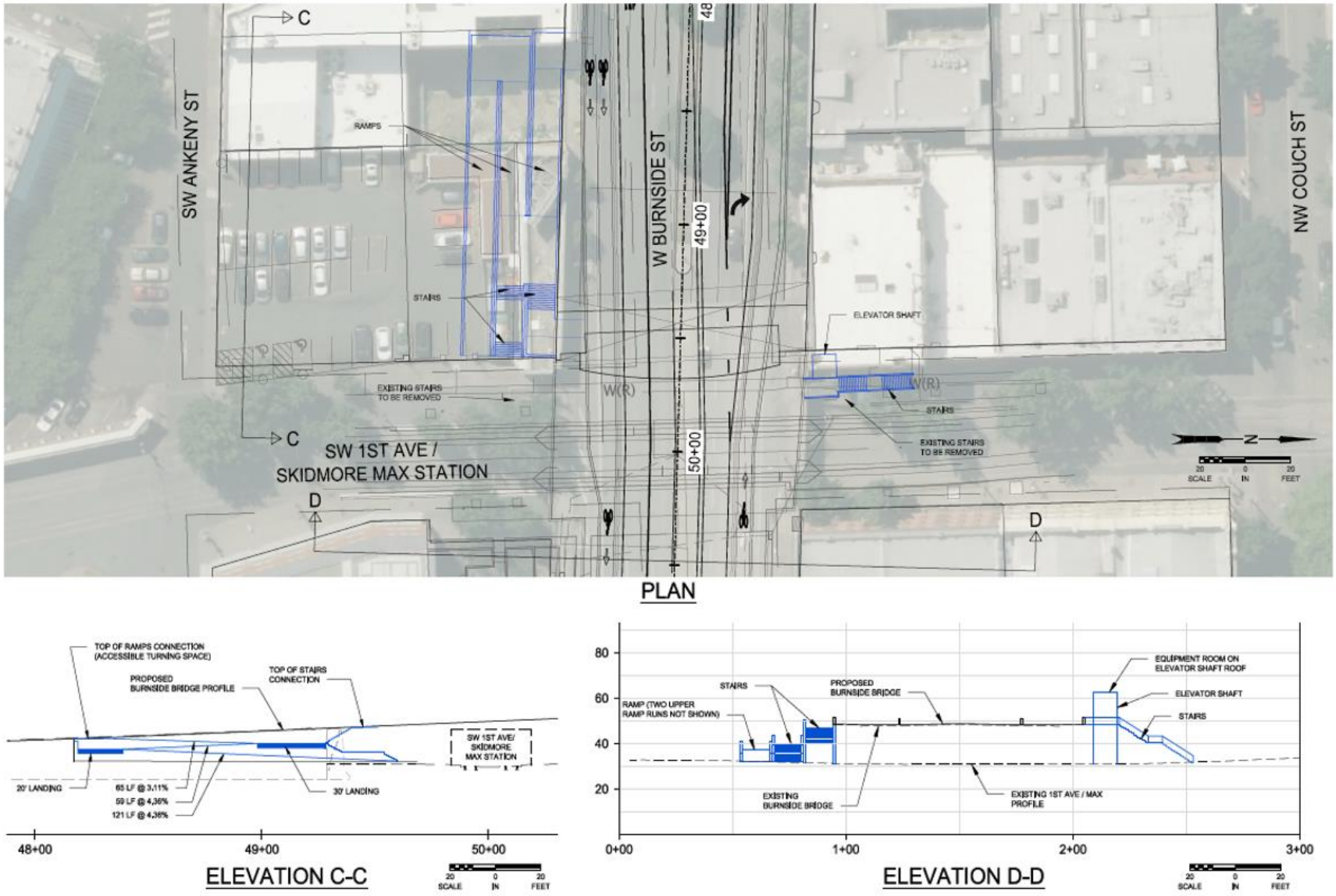
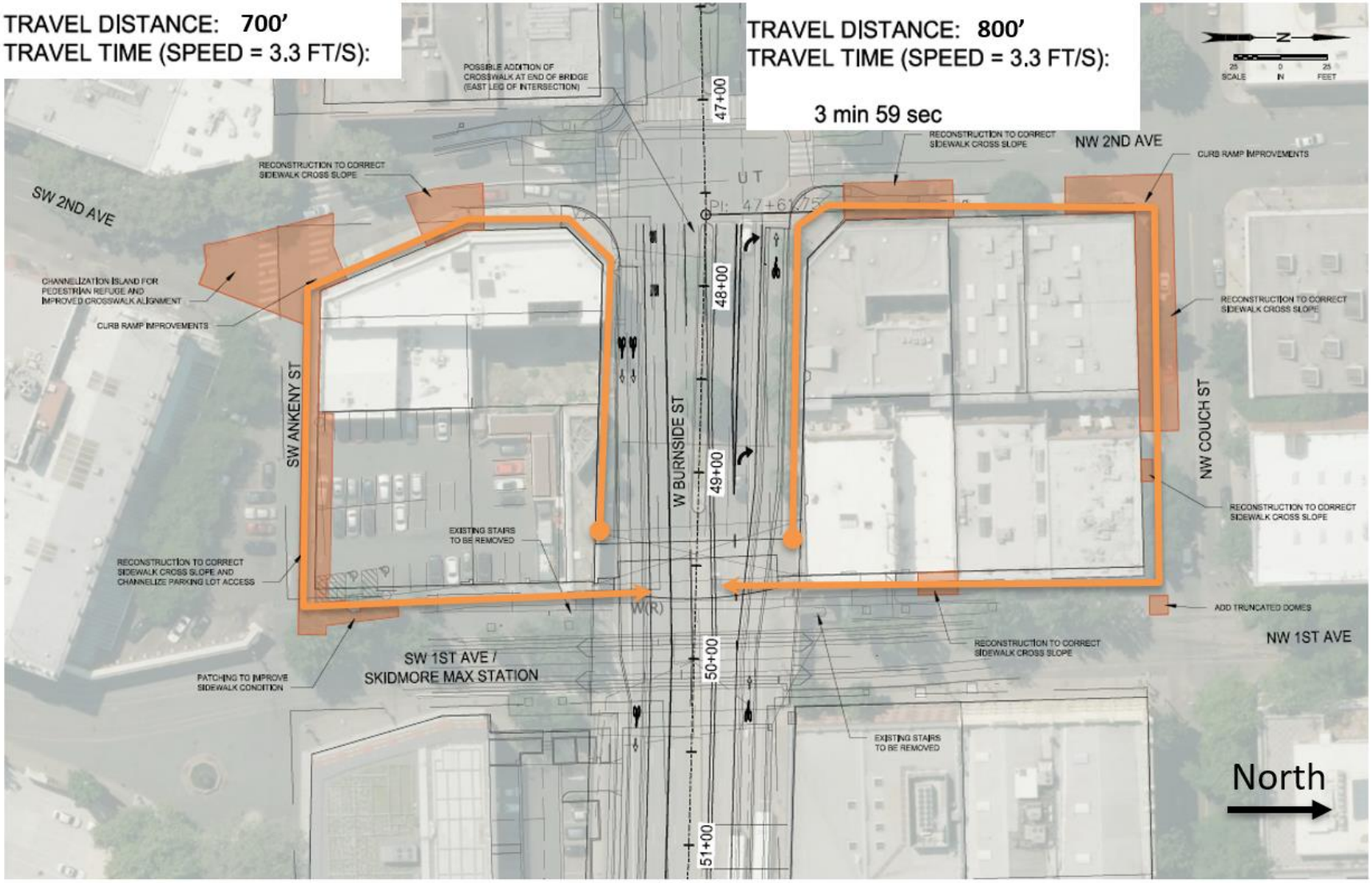


Figure 10. Sidewalk Improvement Routes from North Sidewalk (Point A) to Skidmore Foundation MAX Station (Point B)



PLAN

Figure 11. In-Kind Stairs on North Side; New Ramp (Mercy Corps Parking Site) and Stairs on South Side (Layout 1)

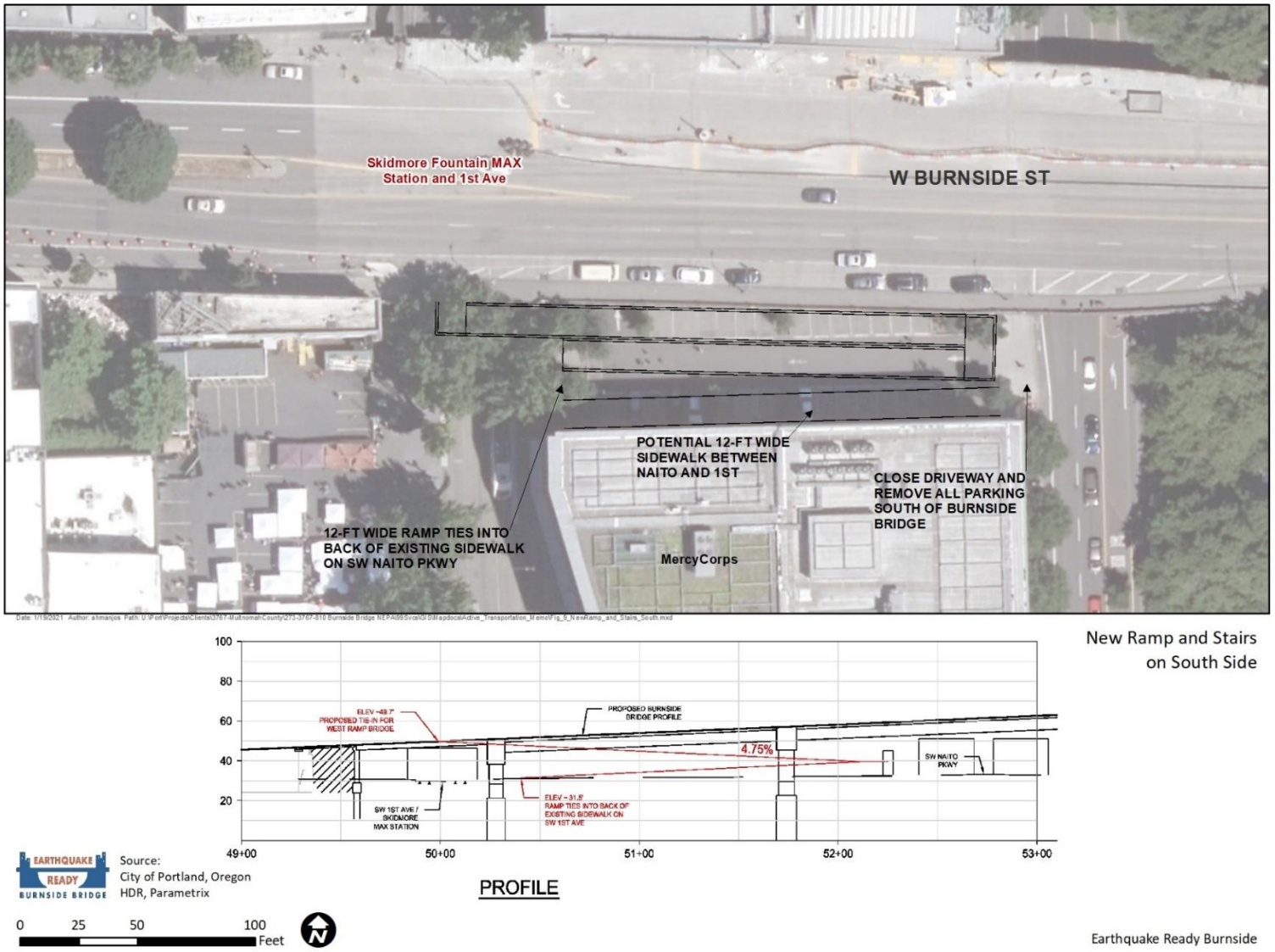


Figure 12. In-Kind Stairs on North Side; New Ramp (Mercy Corps Parking Site) and Stairs on South Side (Layout 2)