

October 2021

## IBR Preliminary List of Design Options

In 2011, a Final EIS and Record of Decision for the prior work on the program was published. In the years subsequent to that decision, the baseline conditions, regulatory and policy context, and community priorities have changed, including:

- Regional, state, and local equity policies and priorities
- Regional, state, and local climate goals and priorities
- Oregon tolling/congestion pricing programs being studied
- Demographics along the I-5 corridor and nearby neighborhoods
- COVID-19 impacts on transportation
- Environmental regulations
- Expanded transit service in the corridor (i.e., VINE BRT and bus-on-shoulder on I-5 in Vancouver)
- Current Regional Transportation Plans and City Comprehensive Plans
- Updates to USACE, USCG and FAA requirements
- Land use policies, planned development, and zoning changes
- Federal transit funding requirements
- Freight/industrial activity

To address these changes, the IBR program collaborated with lead Federal agencies (FHWA and FTA) and partner agencies to identify how these changes affected prior assumptions, data analysis, designs, anticipated impacts and benefits, as well as mitigation for adverse impacts. Building on past work, the program in collaboration with agency partners developed high-level design options to respond to changes while incorporating current regional values and priorities into the IBR Solution. Input on these design options will be gathered through a variety of community engagement strategies. The design options pertain to the following program areas:

- Hayden Island and Marine Drive interchanges including the North Portland Harbor bridge
- Bridge Crossing over the Columbia and Alignment
- Downtown Vancouver
- Vancouver Interchanges
- Transit
- Active transportation improvements

The design options will continue to be developed during the fall of 2021 to show more detail including local street connections and access to multi-use paths, ramps, and transit options. This fall, the program is sharing the design options with the community and is gathering feedback to inform the decision-making process. Following engagement with advisory groups, steering groups and the community, additional refinements, details, or options may be developed as needed to address feedback. Screening criteria are being developed

and aligned with the IBR Desired Outcomes. The criteria will help narrow the design options, which are being informed by multiple sources including:

- Original Purpose & Need and Vision & Values
- Feedback from the community and agencies around transportation problems and values
- Program climate framework
- Program equity framework developed by the Equity Advisory Group
- Community Values and Priorities informed by the Community Advisory Group
- Partner agency engagement and input
- Technical expertise
- Broad community engagement efforts

During November and December 2021, the design options will be evaluated using the screening criteria. Recommendations and decisions will be made through discussions with the program, partner agencies, lead Federal agencies, and the Bi-State Legislative Committee. Ultimately, these options will be woven together into the multimodal draft IBR Solution. Once the draft IBR solution is identified, the program will advance that solution into the detailed environmental review process in spring 2022.

## NORTH PORTLAND HARBOR BRIDGE

Since previous studies, the North Portland Harbor bridge has aged another 10 years and it is no longer cost-effective to rehabilitate it. Replacing it will improve seismic resiliency throughout the entire program area and on I-5. Additional work will be done to identify impacts and considerations of replacing this bridge.

**Equity considerations:** Unclear at this stage.

**Climate considerations:** Replacement bridge will be designed with current and future river conditions in mind, and it will integrate as appropriate with the overall plan for transit and active transportation.

## BRIDGE CROSSING OVER THE COLUMBIA RIVER AND ALIGNMENT OPTIONS

**Summary:** Initial options for the river crossing will look at the horizontal alignment and configuration of the bridge. The program will work through additional considerations like bridge height and bridge type in the future. Combinations of options being considered include configurations with two separate bridges, a single stacked bridge and alignments that include a curved alignment and a straight alignment. These configurations separate vehicles, high-capacity transit, and the multi-use path in various ways. Some of these options are easier to construct than others, and some result in a smaller footprint over the river. The modeling and screening process will help identify additional tradeoffs to consider when analyzing the options.

**Equity considerations:** All options provide dedicated transit guideway and dedicated wide multiuse path to create appealing and effective transit and active transportation opportunities. Exposure to noise – of particular importance to pedestrians who are blind or visually impaired and rely heavily on sound to navigate – could differ between the options. Options may also carry different implications in terms of displacement or other impacts to houseless populations living in the area.

**Climate considerations:** All options provide dedicated transit guideway and dedicated multi-use path space to create appealing and effective transit and active transportation opportunities. Current and future river conditions are taken into consideration.

**Figure 1:** The 2013 LPA alignment option has two bridges and a curved alignment, with highway lanes on the top level and transit and a multi-use path on the bottom level.

- **Technical considerations:** This option provides a narrowed footprint, with the transit and multi-use path under the highway (in comparison with all modes on one level). The curved alignment connects the new bridge to the existing North Portland Harbor bridge and the existing highway corridor in Vancouver.

**Figure 1. 2013 LPA option**

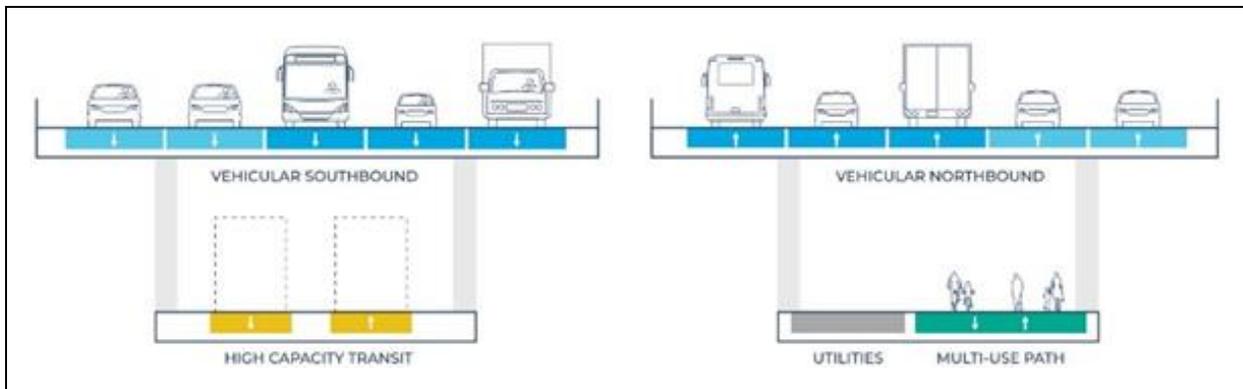


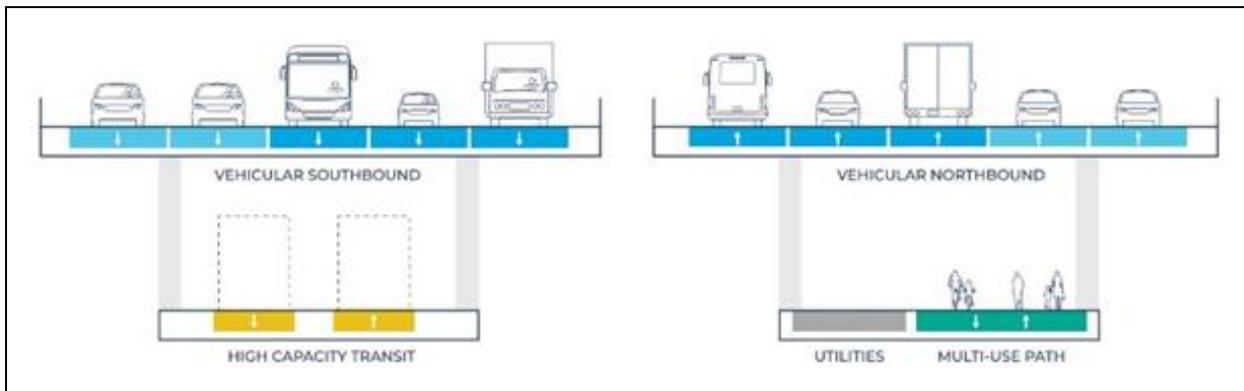
Figure 2. 2013 LPA option, continued



**Figure 2:** The straight alignment option removes the curve as much as possible while maintaining the two bridge/two-level highway over the transit/multi-use path configuration shown in Figure 2.

- **Technical considerations:** The straight alignment is west of the Interstate 5 (I-5) corridor on Hayden Island. This alignment makes the likely North Portland Harbor bridge replacement less complex. A straight alignment is less complex to construct than a curving structure.

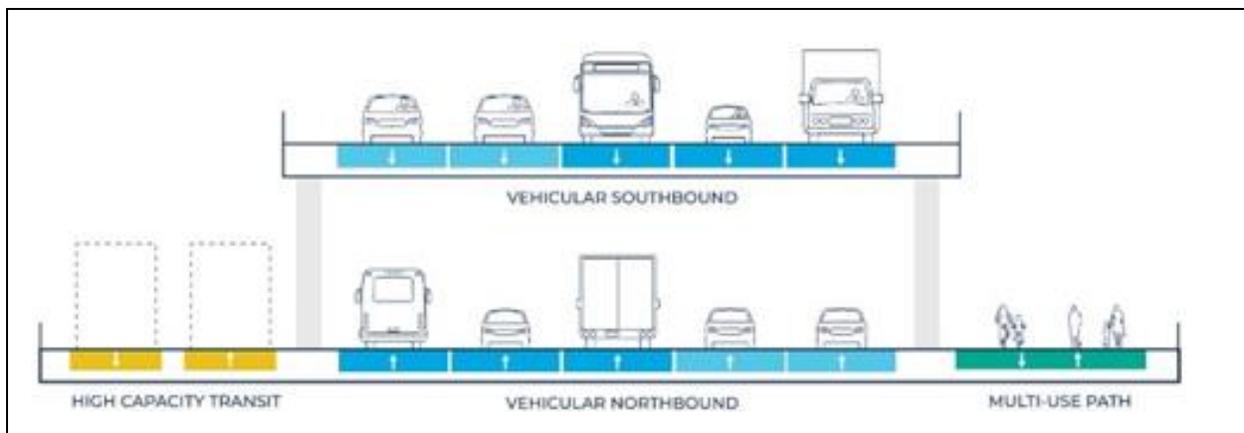
### Figure 3. Straight alignment option



**Figure 3:** The stacked alignment option consolidates all elements into one bridge, with southbound highway lanes on top of northbound highway lanes. Transit and the multi-use path would be on the lower level on each side of the bridge.

- **Technical considerations:** This one-bridge solution would have a smaller footprint over the river and reduce the number of foundations in the water compared to the other options, thus minimizing impacts to the natural environment and surrounding areas.

### Figure 4. Stacked alignment option



## DOWNTOWN VANCOUVER OPTIONS

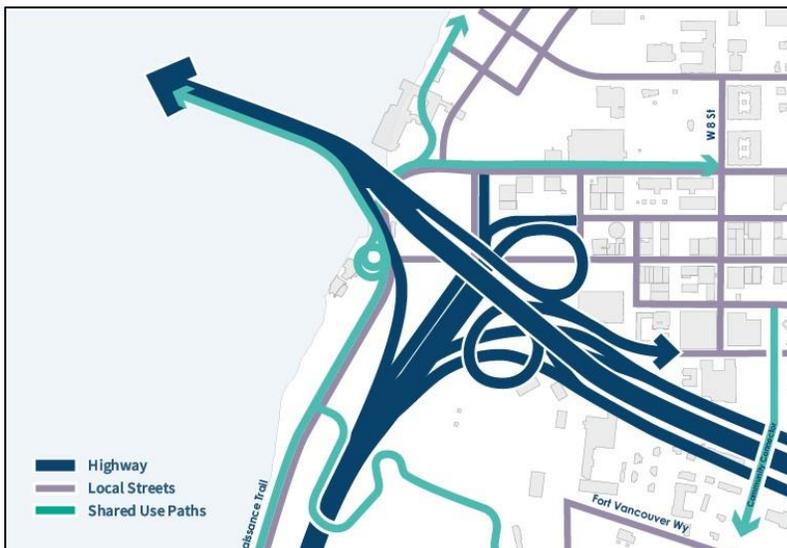
**Summary:** Preliminary design options in this location consider the alignment and configuration for the downtown and State Route 14 interchange. These options consider ways to connect downtown into a higher I-5 corridor (necessary for bridge replacement options), connect local roadways under I-5, extend Main Street connections under I-5, and connect pedestrian paths from local streets to the river crossing. Additional analysis is needed to identify how to connect from downtown into the river crossing options being considered. The modeling and screening process will help identify additional tradeoffs to consider when analyzing the options.

**Equity considerations:** Downtown Vancouver has a high proportion of low-income households, people with disabilities, and zero-vehicle households, underscoring the importance of convenient access to transit and active transportation options. East-west connectivity, as emphasized by the EAG, is improved. Options may carry different implications in terms of displacement or other impacts to houseless populations living in the area.

**Climate considerations:** All design options land the transit and multi-use path in downtown Vancouver creating walkable access to these transportation options.

**Figure 4:** The interchange option based on the 2013 LPA reconstructs all ramp connections that are currently available and connects the ramps to the higher I-5 corridor. Local roads are extended under the I-5 corridor to extend Main Street and extend the east-west connections under the bridge. The path connects the river crossing to Columbia Street. This configuration is possible with either the curved or the straight alignment river crossing option.

**Figure 5. 2013 LPA option**



**Figure 5:** The stacked river crossing alignment over the river results in modified geometry for several ramps. Additional studies are needed to determine if C Street ramps to I-5 can be incorporated into the design.

- **Technical considerations:** The one-bridge solution requires a consistent bridge width across the water. Near land, the interchange can influence the structure width to accommodate ramps, but this location is farther north than it would be with the two-bridge configuration. Removing some ramps and reconfiguring others is required to fit within the bridge constraints.

### Figure 6. Option with stacked river crossing alignment



## VANCOUVER INTERCHANGE OPTION

**Summary:** The preliminary design option at the Mill Plain and Fourth Plain exits reconstructs the interchanges with braided ramps and auxiliary lanes at Mill Plain and Fourth Plain and replaces overpasses at other locations along I-5 leading up to the river. The option being considered will incorporate other improvements that require additional engagement, such as improvements to connect bike and pedestrian access across I-5. Additional work is needed after screening and into the design phase to look more closely at intersection improvements at Mill Plan and Fourth Plain.

**Equity considerations:** All designs will improve pedestrian and bike pathways to support east to west travel (as emphasized by the EAG) and access to transit. Important destinations for equity priority communities include the Vancouver Community Library, the VA, Clark College, Hudson’s Bay High School (a Title I school), and the Washington State School for the Blind. The Rose Village neighborhood (directly east of I-5 and south of SR-500) has a high proportion of multiple equity priority communities, including over half of households living below 200% of the federal poverty level.<sup>1</sup> Options may carry different implications in terms of displacement or other impacts to houseless populations living in the area.

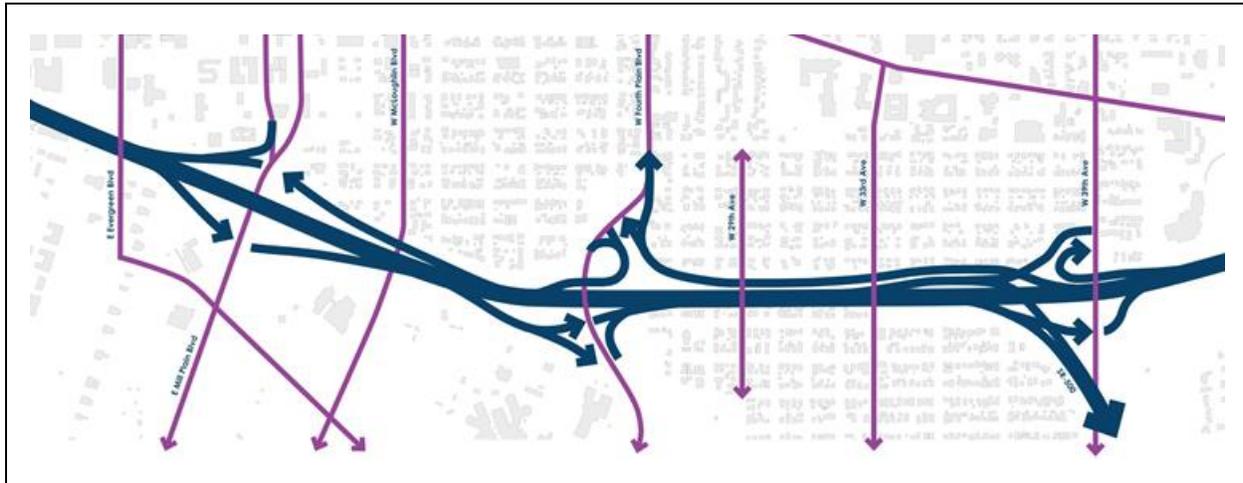
**Climate considerations:** All designs will improve pedestrian and bike pathways to support east to west travel and access to transit.

**Figure 6:** The IBR program will reconstruct the interchanges at Mill Plain and Fourth Plain and will replace the crossing structures at Evergreen, 29th, and 33rd. Highway improvements include braided ramps and auxiliary lanes between closely spaced interchanges. Pedestrian and bike improvements will be incorporated into each bridge crossing I-5, streets under I-5, and a lid near Evergreen Road. As the project progresses into design phases, alternative intersection treatments will be considered at Mill Plain and Fourth Plain. These elements will be refined during the screening process and design.

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<sup>1</sup> This is the threshold for the IBR program’s definition of a low-income household.

**Figure 7. Vancouver interchange option**



## HAYDEN ISLAND AND MARINE DRIVE INTERCHANGES OPTIONS

**Summary:** Design options being considered for roadway and interchange configurations include improvements to Marine Drive and a partial interchange, no interchange, or a full interchange on Hayden Island. The below drawings show high-level graphic representations of a variety of concepts being considered with small variations to local roadway connections. These options identify ways to access Hayden Island through Marine Drive if access from I-5 is not on the island and identify ways to connect local streets under I-5. Additional engagement is needed to determine details for connecting multi-use paths, with the intention to connect to the 40-mile loop trail.

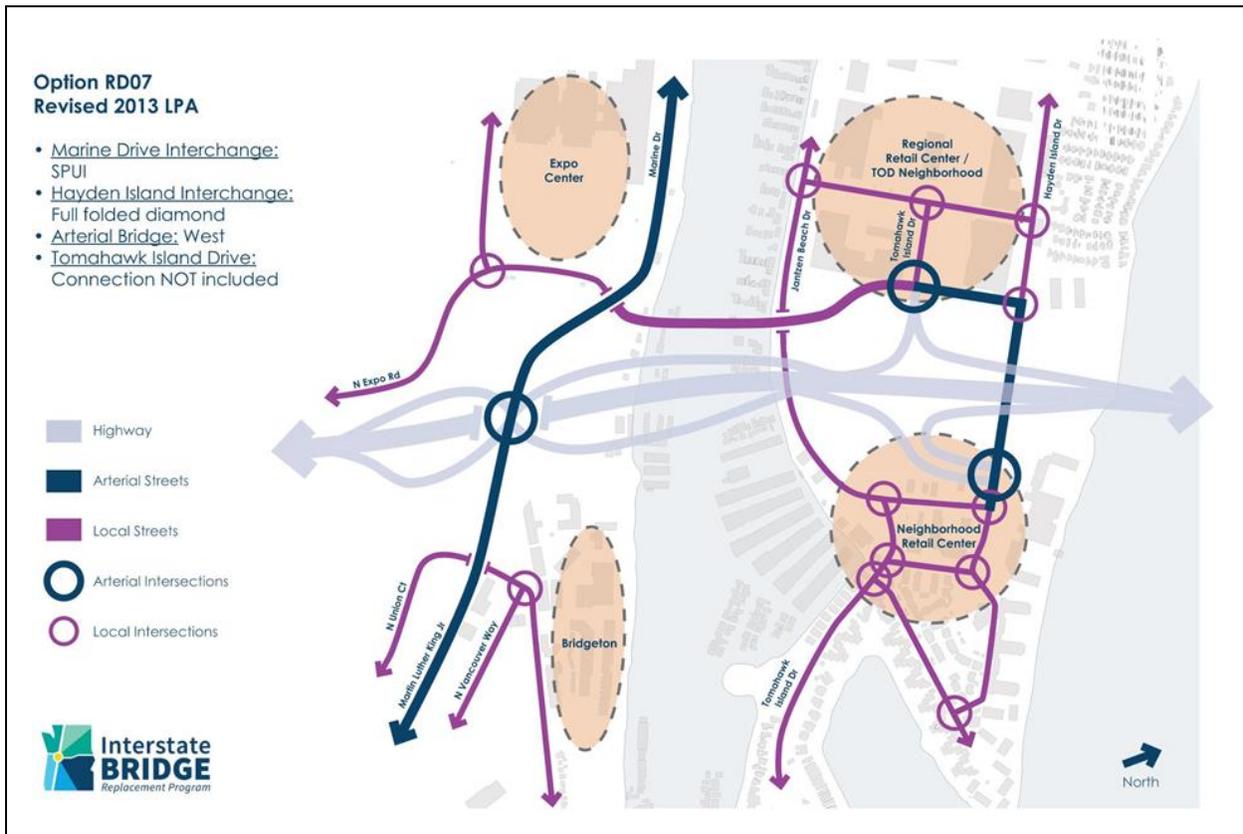
**Equity considerations:** A significant number of retail and service industry jobs are located in this area. In terms of residents, Hayden Island has a high proportion of older adults and people with disabilities. All design options improve east-west connectivity, as emphasized by the Equity Advisory Group. A smaller footprint may result in more opportunities for ancillary development. Options may carry different implications in terms of displacement or other impacts to houseless populations living in the area that have not yet been determined.

**Climate considerations:** All design options strive to 1) improve access, safety and comfort for people walking and biking; 2) increase access and connection to transit options; and 3) foster walkable neighborhoods.

**Figure 7:** Full interchange configurations were included in the 2013 LPA. This configuration includes complete interchanges on both Hayden Island and Marine Drive. The multi-use path connects the river-crossing bridge to the 40-mile loop trail, with connections on Hayden Island. Local streets are reconnected under I-5 with some variations, including a third crossing under I-5 for Tomahawk Island Drive and an arterial bridge connecting Hayden Island to Expo Road. Roadway infrastructure is farther west in comparison with the LPA to replace the North Portland Harbor bridge. Note the graphic in Figure 7 is a sample and other options are also under consideration.

### Figure 8. Full-interchange option

This shows a high-level graphic representation of a variety of concepts being considered with small variations to local roadway connections.

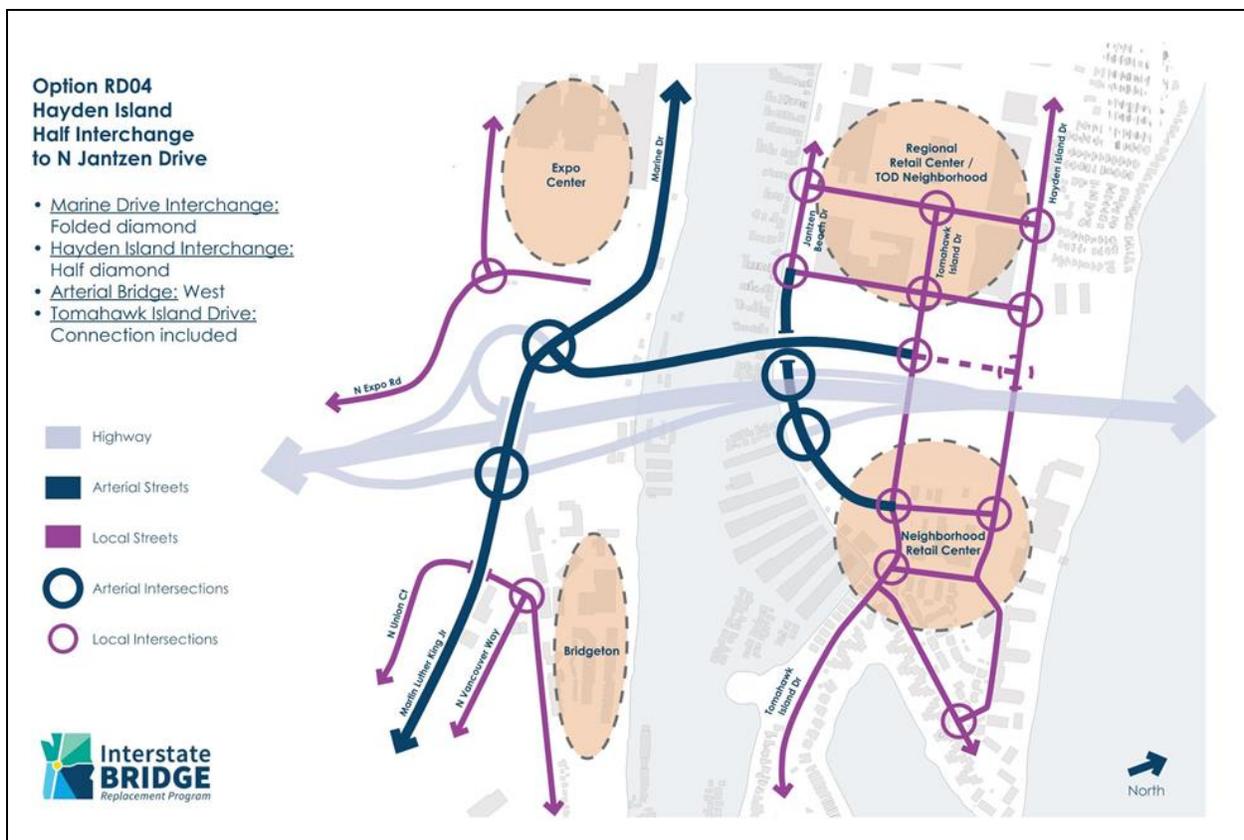


**Figure 8:** The partial interchange configurations provide ramps to/from the north to Hayden Island. A complete interchange at Marine Drive with access to/from the south is provided through the Marine Drive interchange and an arterial bridge connection between Marine Drive and Hayden Island. The multi-use path connects the river-crossing bridge to the 40-mile loop trail with connections on Hayden Island. Local streets are reconnected under I-5, including a third crossing under I-5 for Tomahawk Island Drive.

- **Technical considerations:** This configuration reduces the overall width, footprint, and associated impacts of the infrastructure improvements across North Portland Harbor and Hayden Island.

### Figure 9. Partial-interchange option

This shows a high-level graphic representation of a variety of concepts being considered with small variations to local roadway connections.

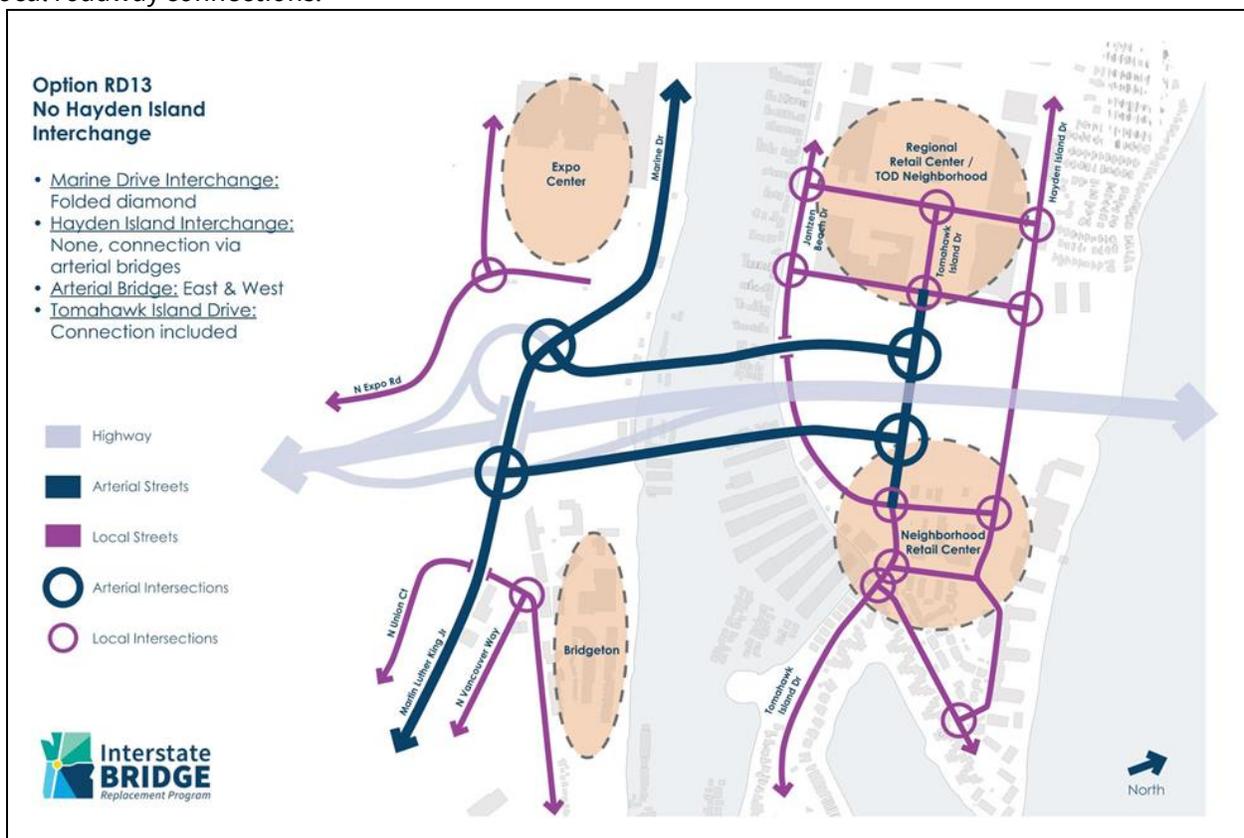


**Figure 9:** The no-interchange configurations provide a complete interchange on Marine Drive and access to Hayden Island through the Marine Drive interchange and arterial bridges.

- **Technical considerations:** This configuration minimizes the overall width, footprint, and associated impacts of the infrastructure improvements across North Portland Harbor and Hayden Island.

### Figure 10. No-interchange option

This shows a high-level graphic representation of a variety of concepts being considered with small variations to local roadway connections.



## TRANSIT OPTIONS

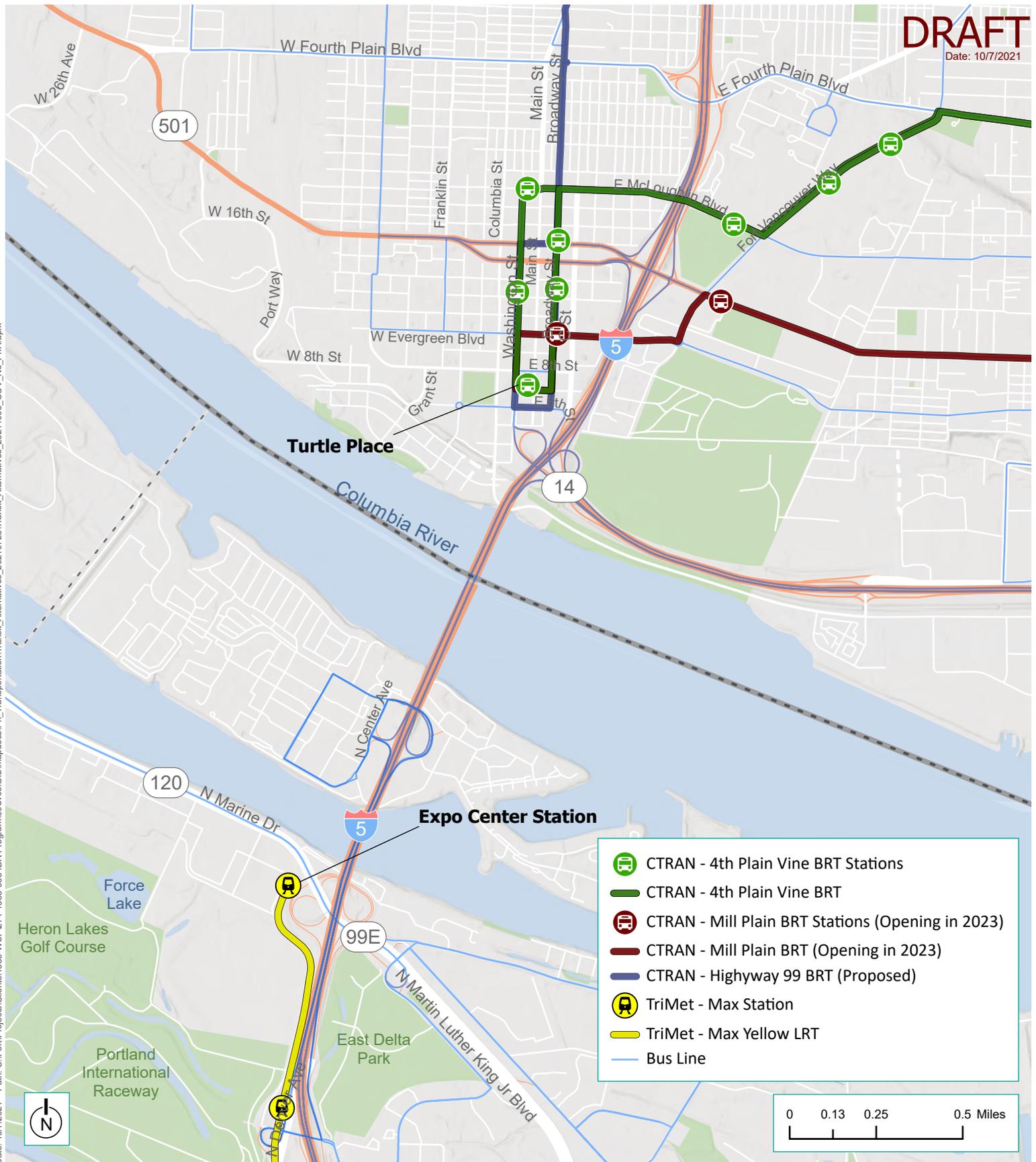
Transit options will have a unique set of data and analysis to inform decision making and support the data-driven process to identify how each transit option performs. The below measures will evaluate transit performance of the representative transit alignment options.

| EVALUATION MEASURE   | ALTERNATIVE SNAPSHOT |
|--|----------------------|
|  Ridership  |                      |
|  Transit Boardings                                  |                      |
|  Corridor Transit Trips                             |                      |
|  I-5 Columbia River crossings                       |                      |
|  Station Mode of Access                             |                      |
|  Park and Ride Demand                               |                      |
|  Market Analysis                                    |                      |
|  Transit Travel Time                               |                      |
|  Capital Costs                                    |                      |
|  Operating and Maintenance Costs                  |                      |
|  Climate Resiliency                               |                      |
|  Proximity to HCT for Equity Priority Communities |                      |
|  Mobility for Equity Priority Communities         |                      |
|  Potential Property Impacts                       |                      |

**Summary:** Current preliminary transit options include various representative HCT alignments that expand transit service. These options extend both bus rapid transit and/or light rail from their current area of service to stations on Hayden Island and Vancouver. This list also includes an option with Express Bus.

**Equity considerations:** Station locations, mobility improvements, and property impacts are all key considerations in the development of transit options.

**Climate considerations:** All options increase transit choices for interstate travel in the program area.



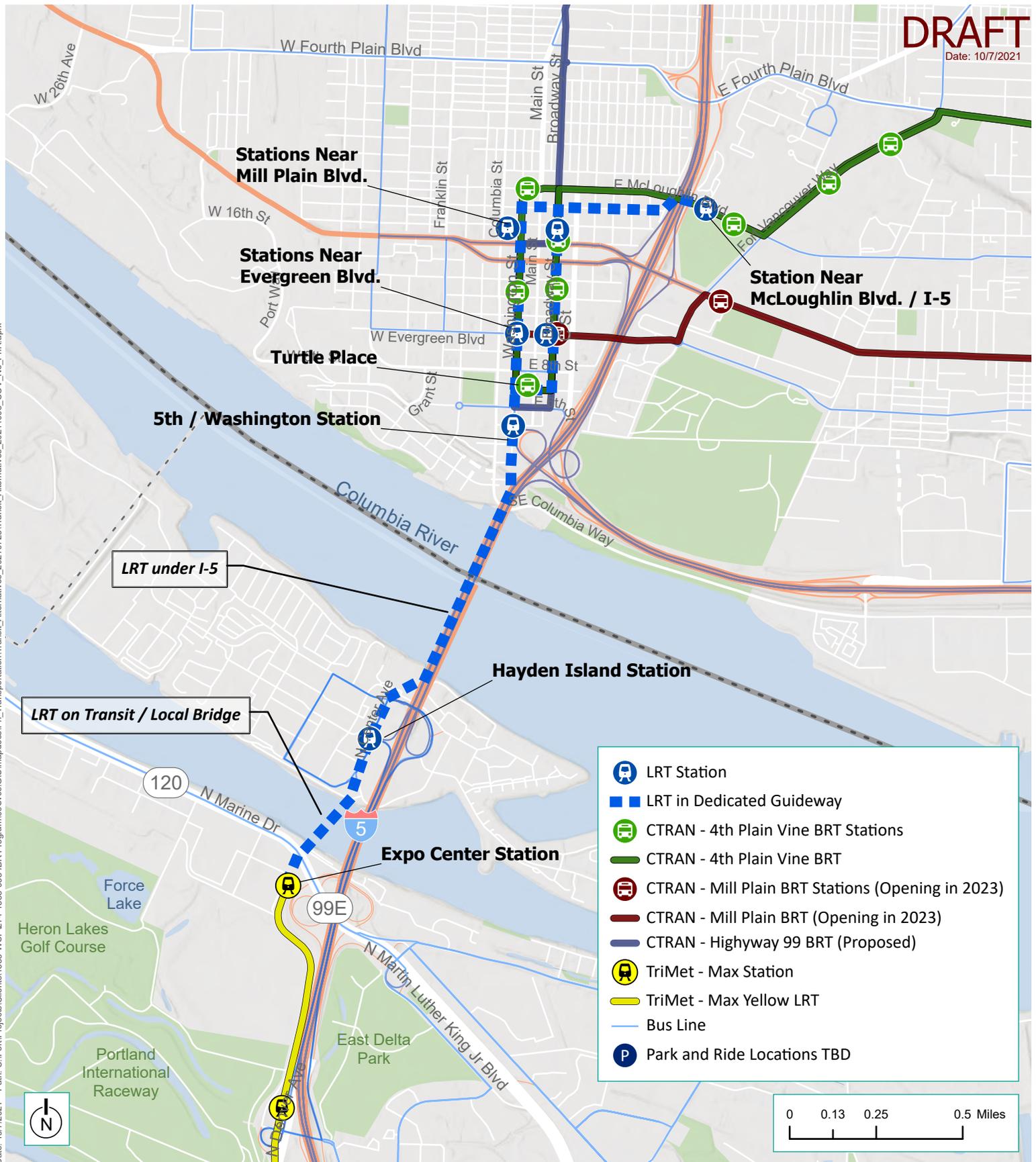
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Source: ODOT, WSDOT, ESRI, Mapbox, OpenStreetMap

# B 2045 Transit Project in the ROD

2045 IBR Model with RTP / MTP that includes CRC LPA

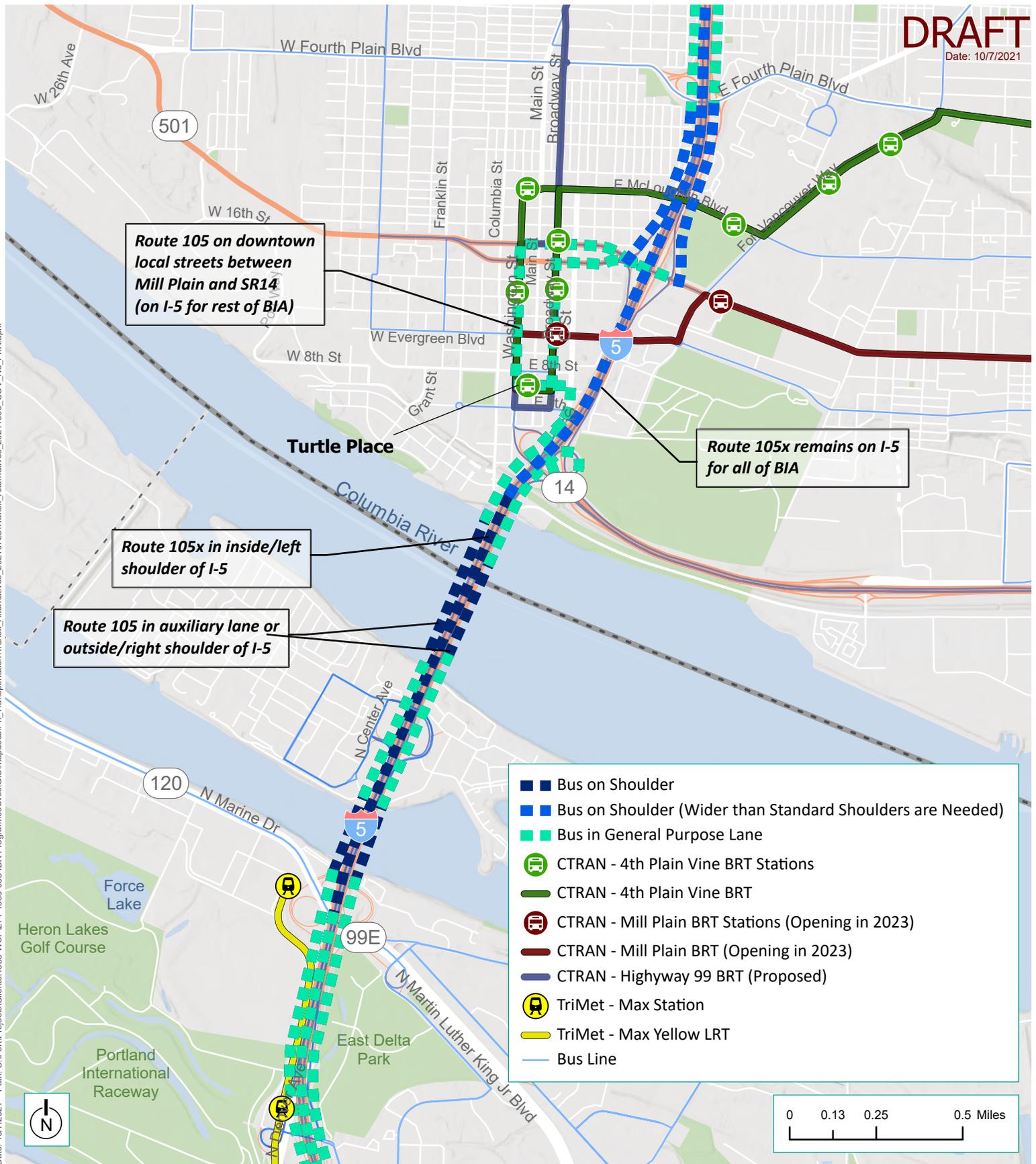
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Source: ODOT, WSDOT, ESRI, Mapbox, OpenStreetMap

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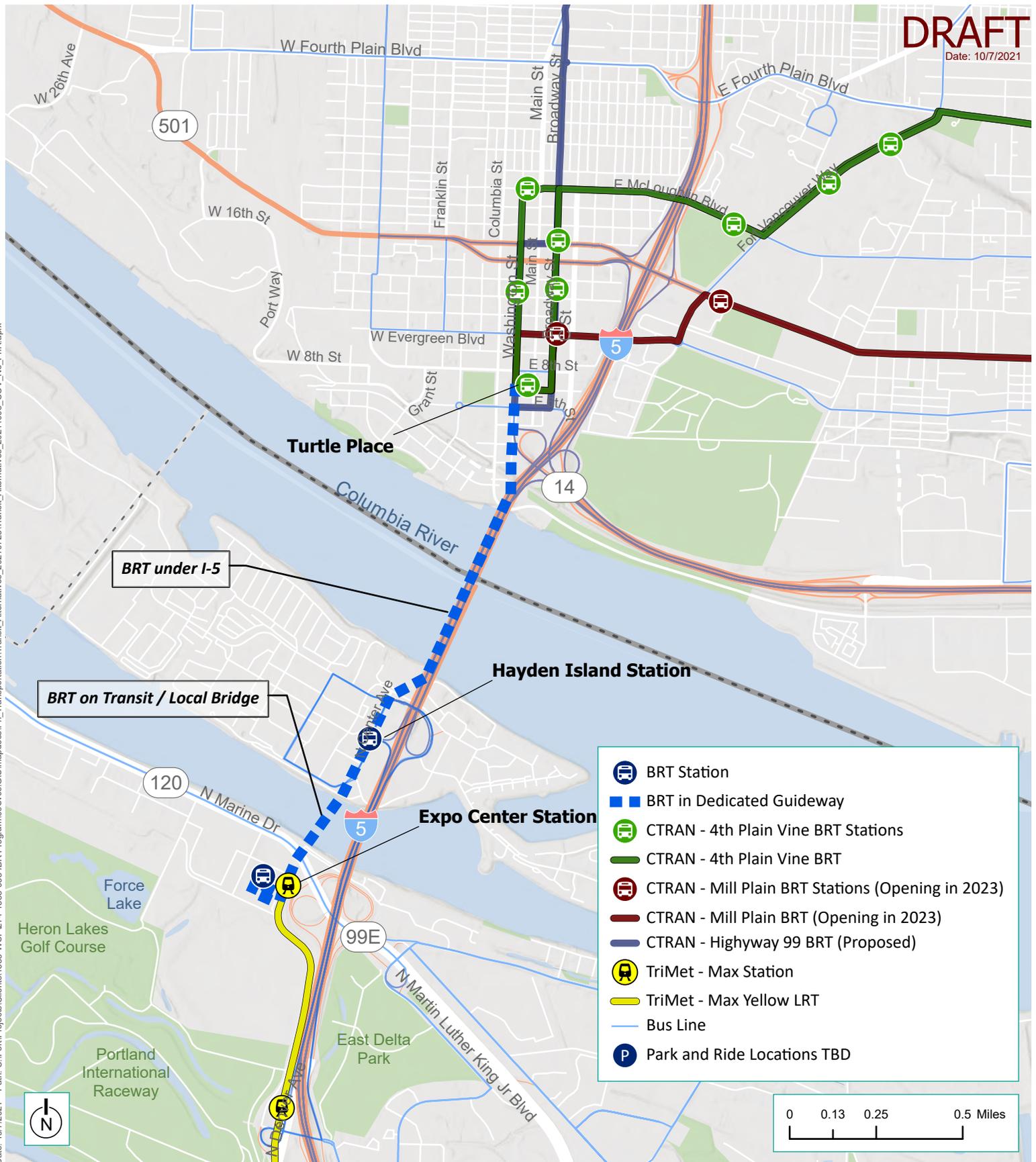


Source: ODOT, WSDOT, ESRI, Mapbox, OpenStreetMap

# D Dedicated BRT Turtle to Expo

Dedicated BRT Connection - Extend Vine(s) from Turtle Place to Expo Center

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Date: 10/7/2021



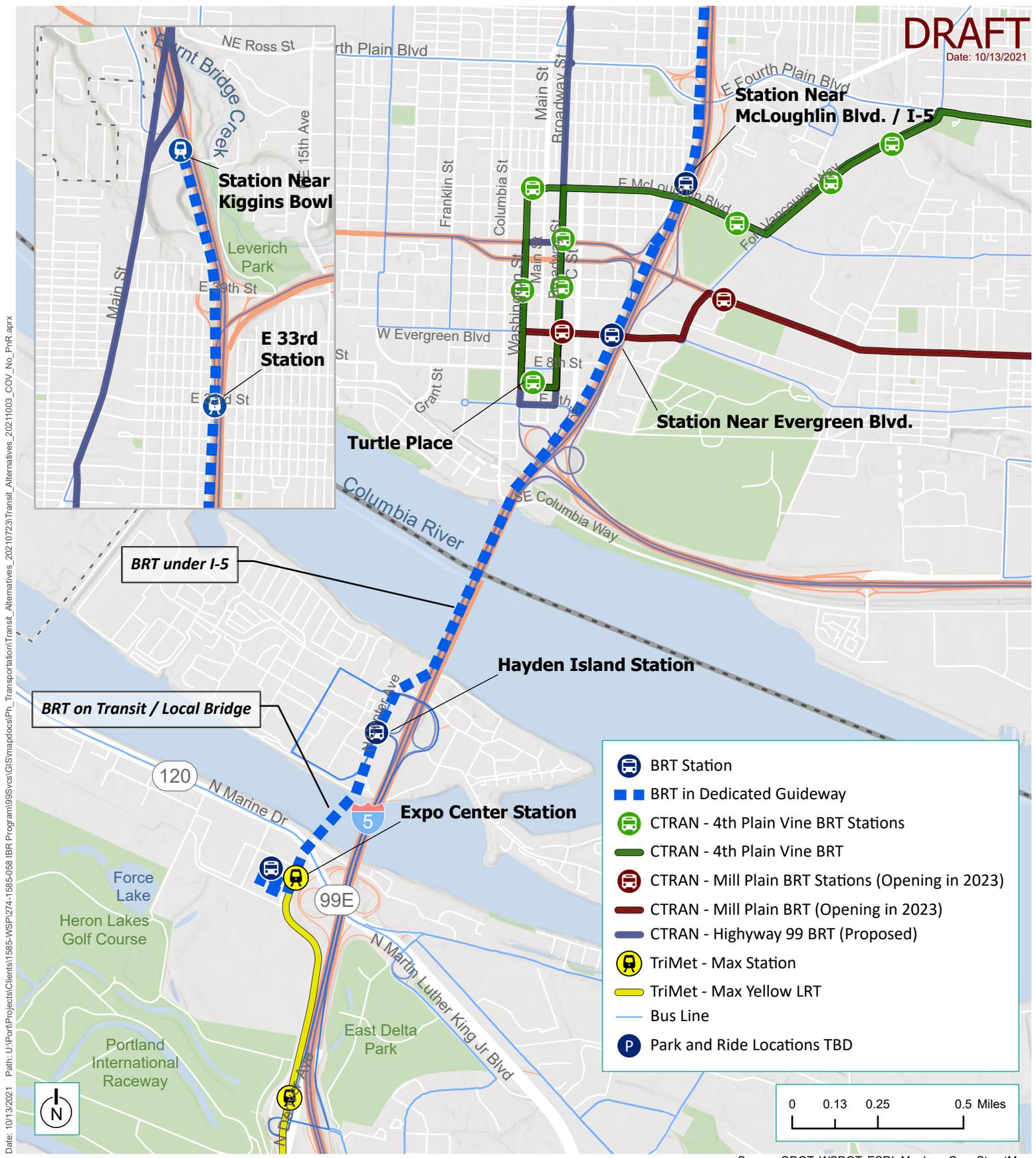
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Source: ODOT, WSDOT, ESRI, Mapbox, OpenStreetMap

# E Dedicated BRT Hugging I-5

Dedicated BRT Connection - Kiggins Bowl to Expo Center on an I-5 Adjacent Dedicated Guideway (West Side of I-5)

**DRAFT**  
Date: 10/13/2021



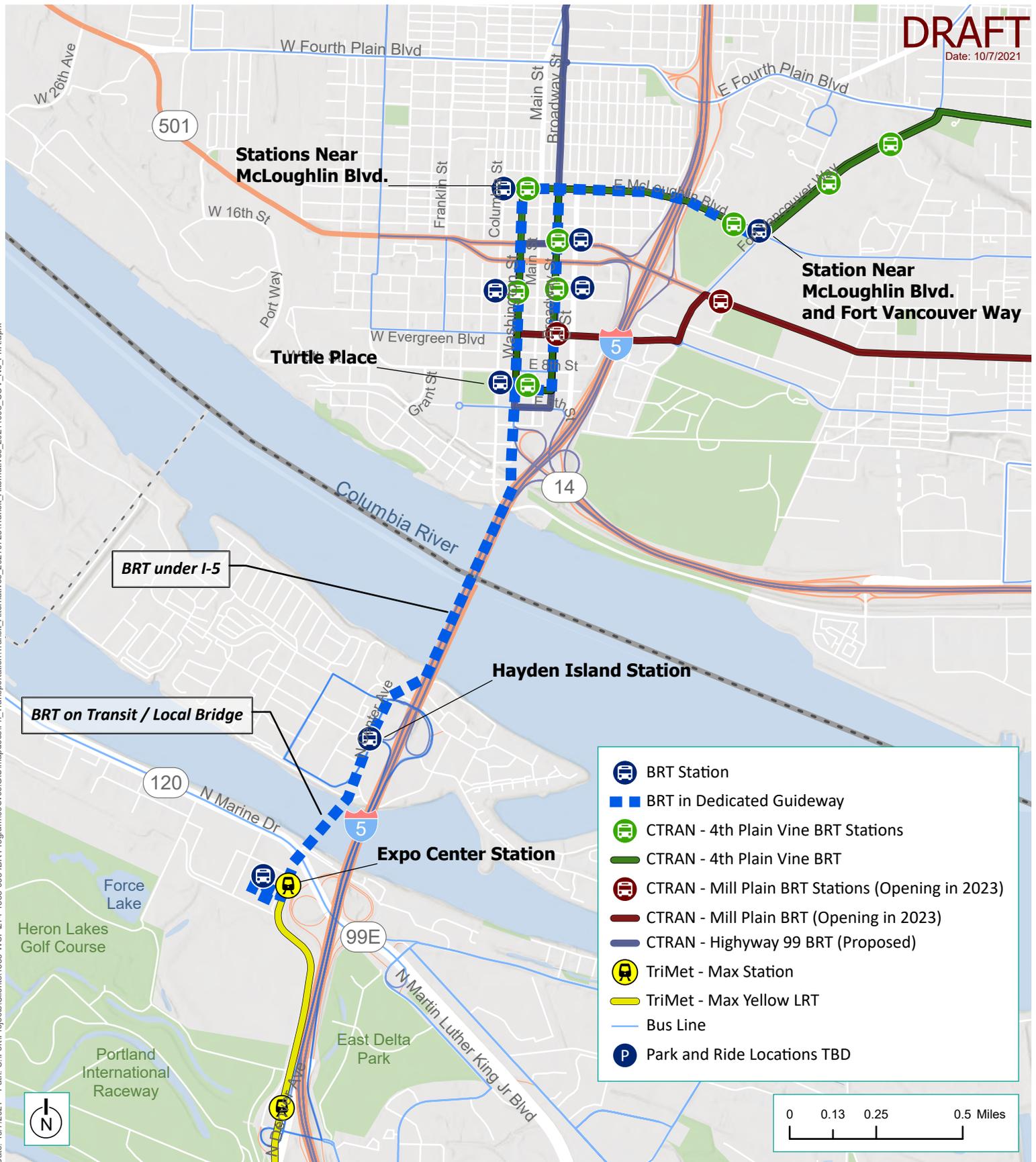
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Source: ODOT, WSDOT, ESRI, Mapbox, OpenStreetMap

# F Dedicated BRT through the CBD

Dedicated BRT Connection - McLoughlin/I-5 to Expo Center in a  
Dedicated Guideway on the 2013 Transit Alignment

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Date: 10/7/2021



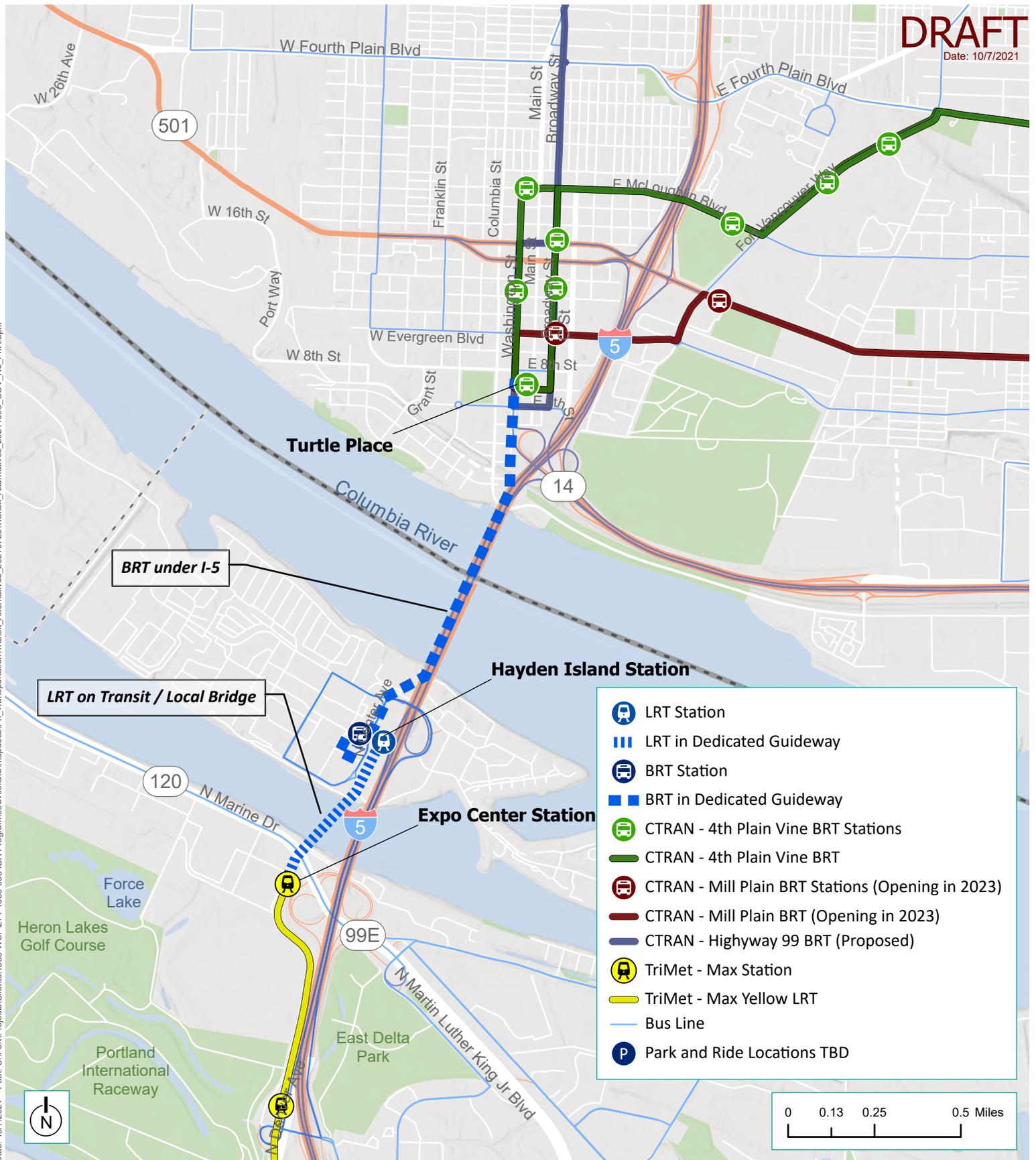
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Source: ODOT, WSDOT, ESRI, Mapbox, OpenStreetMap

# G Dedicated BRT and LRT to Hayden Island

Hybrid Option - Extend Vine(s) BRT to Hayden Island, Extend MAX Yellow Line to Hayden Island

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Date: 10/7/2021



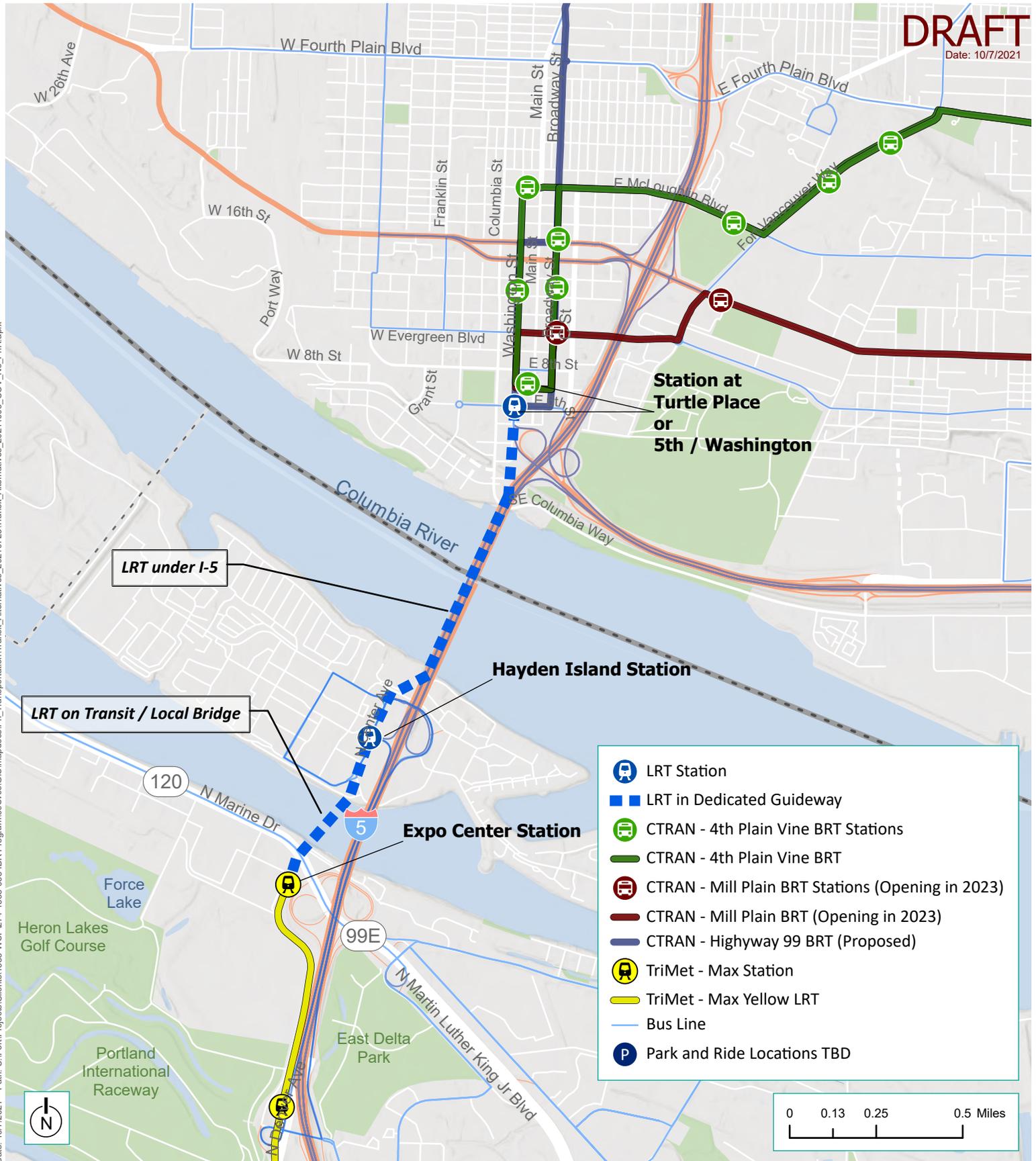
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Source: ODOT, WSDOT, ESRI, Mapbox, OpenStreetMap

# LRT One Station in Vancouver

LRT Extension from Expo Center to Hayden Island to a Single Station with Terminus in Vancouver

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Date: 10/7/2021



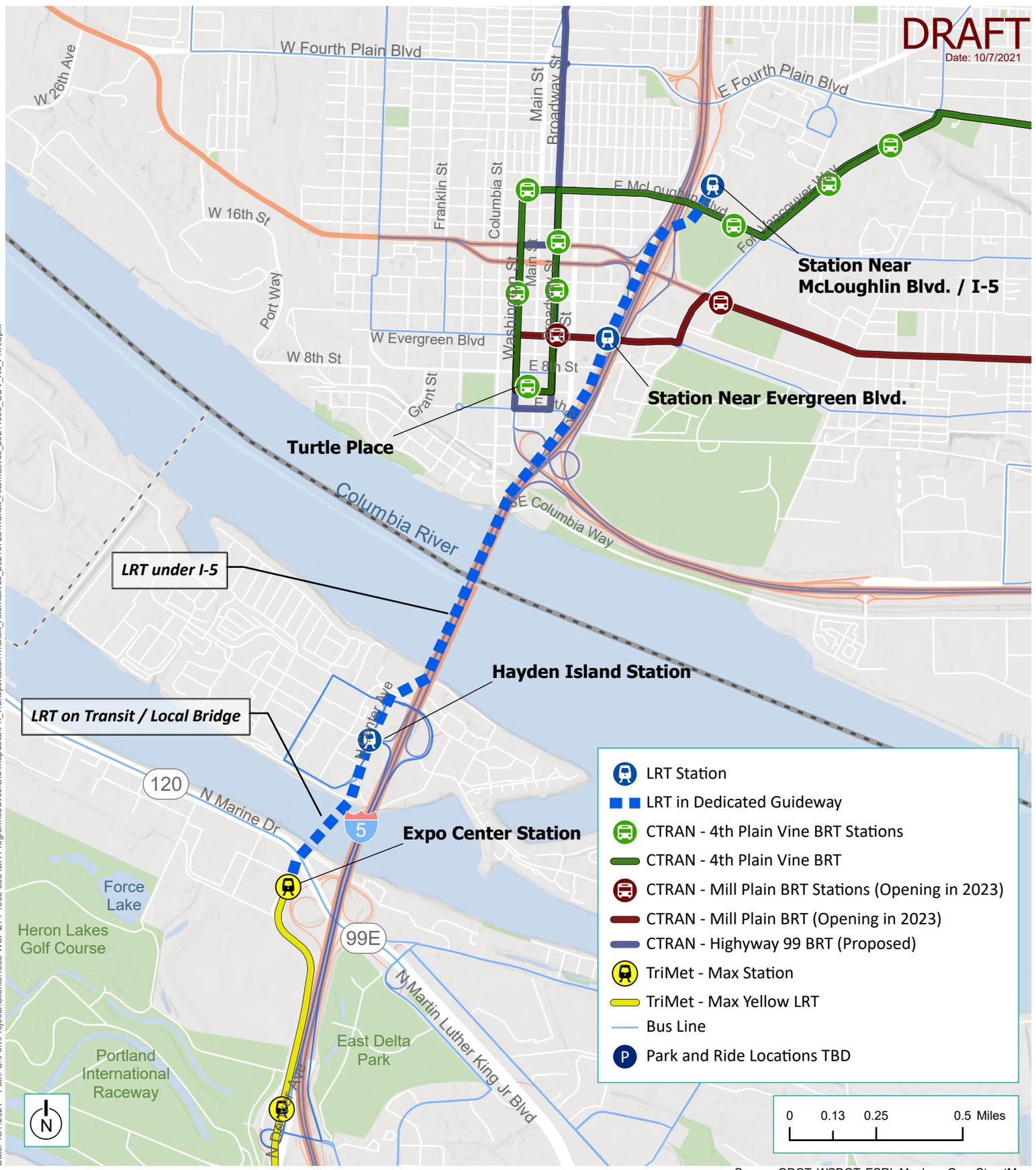
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Source: ODOT, WSDOT, ESRI, Mapbox, OpenStreetMap

# I LRT Hugging I-5 to near McLoughlin

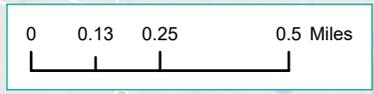
LRT Extension from Expo Center to a Terminus near McLoughlin/I-5 on an I-5 Adjacent Alignment (Center/West Side of I-5)

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- LRT Station
- LRT in Dedicated Guideway
- CTRAN - 4th Plain Vine BRT Stations
- CTRAN - 4th Plain Vine BRT
- CTRAN - Mill Plain BRT Stations (Opening in 2023)
- CTRAN - Mill Plain BRT (Opening in 2023)
- CTRAN - Highway 99 BRT (Proposed)
- TriMet - Max Station
- TriMet - Max Yellow LRT
- Bus Line
- Park and Ride Locations TBD



Source: ODOT, WSDOT, ESRI, Mapbox, OpenStreetMap

# J LRT Hugging I-5 to Kiggins Bowl

LRT Extension from Expo Center to a Terminus near Kiggins Bowl on an I-5 Adjacent Alignment (Center / West Side of I-5)

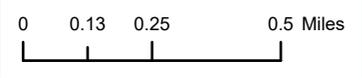
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- LRT Station
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Source: ODOT, WSDOT, ESRI, Mapbox, OpenStreetMap