

# Memorandum

June 17, 2008

**TO:** Columbia River Crossing Task Force  
**FROM:** CRC Pedestrian and Bicycle Advisory Committee (PBAC)  
**SUBJECT:** PBAC Recommendations for World Class Pedestrian and Bicycle Facilities



## **Purpose of this Memorandum**

The Locally Preferred Alternative (LPA) for the Columbia River Crossing project, to be selected by the project's sponsoring agencies this summer, will focus on three key decisions: 1) replace or supplement the existing Interstate Bridges, 2) provide bus rapid transit or light rail transit across the Columbia River, and 3) the location of the high capacity transit line's terminus in Vancouver.

This memorandum serves to provide recommendations from the Pedestrian and Bicycle Advisory Committee (PBAC) regarding pedestrian and bicycle facilities associated with the decision of replacing or supplementing the existing bridges and the PBAC's definition of and requirement for "world class" facilities. This memorandum also describes tasks the PBAC plans to undertake after the LPA, which sets the general framework for actual project design, has been chosen. Presented within this memorandum are points of consensus reached within the PBAC. Neither support nor opposition by the PBAC to issues outside the scope of this memorandum should be assumed.

## **Composition of the Pedestrian and Bicycle Advisory Committee**

The PBAC is composed of representatives from municipal, county and state public agencies; citizen advisory committees; neighborhood associations; and pedestrian and bicycle advocacy groups (see attachment for a list of the PBAC members). Staff members of the Columbia River Crossing support the PBAC. All PBAC meetings are open to the public. The PBAC, which has met 13 times so far, will continue to provide input on pedestrian and bicycle related project elements after the LPA is selected and to be explored during preparation of the project's Final Environmental Impact Statement (FEIS).

## **Pedestrian and Bicycle Considerations in the DEIS, LPA, and FEIS**

Pedestrian and bicycle facilities are part of the Columbia River Crossing project's Purpose and Need statement. This means that any build alternative must address the problems for pedestrian and bicycle conditions described in the Purpose and Need statement.

The Draft Environmental Impact Statement (DEIS), released on May 2, 2008, presents analysis of pedestrian and bicycle conditions associated with build alternatives that assumed single pathways at least 16 feet in width over the Columbia River (emphasis added). The multi-modal elements (transit, highway, pedestrian, bicycle, etc.) for each of the build alternatives analyzed in the DEIS were based on standard design practices. This assisted in packaging the multi-modal elements into complete alternatives that could be evaluated and compared in the DEIS and to enable the project's sponsors to focus on the three key decisions needed as a part of the LPA.

While the DEIS evaluated the environmental impacts associated with pedestrian and bicycle pathways at least 16 feet wide across the Columbia River, the DEIS included flexibility for design refinements. For example, many of the PBAC's recommendations through the spring of 2008 were referenced in the DEIS, and while not all were included in the full environmental analysis, they will be further explored after the adoption of the LPA and during the preparation of the FEIS. This is consistent with how several other multi-modal elements, that while not key for making an LPA decision, were considered in the DEIS, e.g., number of auxiliary lanes across the Columbia River, specific designs for each of the six interchanges, transit alignment choices on Hayden Island and in Vancouver, and tolling rates.

### **The Replacement Bridge Would Offer Best Pedestrian and Bicycle Opportunities**

The PBAC has come to a consensus that the replacement bridge alternative would offer the best opportunities for walking and bicycling in the project area. Compared to the supplemental bridge alternative, the replacement bridge option would provide the most direct and safe routes for pedestrians and bicyclists between Vancouver, Hayden Island, and North Portland. It would also enable provision of a “world-class” facility (see discussion below).

According to the DEIS, the replacement bridge alternative would include a multi-use pathway west of and adjacent to the transit guideway. The pathway would be continuous and above-grade from approximately Sixth Street in Vancouver to just north of Marine Drive, then pass under Marine Drive and connect to the Expo Center. The pathway could separate pedestrian and bicycle traffic.

The replacement bridge alternative would provide access to Vancouver via a ramp to a roadway in the downtown area. A second connection in Vancouver, closer to the Columbia River, would provide access (with an elevator) to waterfront attractions and the multi-use path along the shore. On Hayden Island, the pathway would be accessible via an elevator and stairs located at the high-capacity transit station. In addition, stairs at the north and south ends of the island could be provided to link the interstate facility to waterfront trails.

At the Marine Drive interchange, the multi-use path would have access to the Expo Center transit station and to the 40 Mile Loop trail pathway running along North Portland Harbor. Additional connections to Delta Park and bicycle routes along Union Court and Martin Luther King Jr. Boulevard would be maintained and improved with off-street facilities, ramps and stairs. Pedestrians and bicyclists would be able to cross North Portland Harbor on a new pathway along the high-capacity transit guideway on the west side of I-5.

### **The I-5 Bridge Must Include a “World-Class” Pedestrian and Bicycle Facility**

The PBAC, after extensive study of current multi-modal issues, existing and planned pedestrian and bicycle routes, physical and geographic conditions, projected land use changes, and forecast pedestrian and bicycle demands, has determined that the Columbia River Crossing must provide “world-class” pedestrian and bicycle facilities. To meet this standard, the I-5 bridge must:

- Think forward by designing pedestrian and bicycle facilities that accommodate demands for the next 50 plus years and that offer flexibility for reconfiguration as needs change over time
- Provide a safe and comfortable experience for a variety of users, including pedestrians, persons with disabilities, seniors, families with children, recreational trail users, tourists, roller-skaters, and well as bicyclists of varying skill levels traveling at a range of speeds. This is best achieved by maximizing accessibility and limiting opportunities for conflict through:
  - Universal design
  - Ample width for all users to travel in both directions and pass one another
  - Separation between more vulnerable users traveling at slow speeds and users traveling at significantly higher speeds (this is especially important given the grades required to span the Columbia River)
  - Good visibility and sight lines
  - Minimal changes in elevation and steepness of grade
  - Provide wide negotiation room, signage and pavement markings to alert users to potential conflict points
- Link communities and regionally significant trail networks on both sides of the Columbia River and the North Portland Harbor, including in Vancouver, on Hayden Island, and near Marine Drive. This should be achieved by providing connections at bridgeheads to existing and planned trails and street networks that are convenient, logical, easy to find and navigate, and that limit out of direction travel and changes in grade.

- Promote healthy and active living by providing inviting opportunities to incorporate physical activity into daily lives, including how people transport themselves
- Celebrate and elevate the importance of multi-modal transportation in the region by increasing the visibility of people walking and bicycling in the project area
- Offer a high quality experience by providing attractive and functional features such as lighting, seating, wayfinding signs, and art
- Provide a facility dedicated to regional trail users, complete with rest and scenic viewing areas, that serves as the regional trail connection between Washington and Oregon identified in trail plans
- Commit to sustainability and quality urban design and landscaping

The following describes the PBAC's recommendation for the replacement bridge's "world-class" pedestrian and bicycle facility:

- The overall pathway on the western bridge (adjacent to the transit guideway) must provide separation between recreational users and higher speed bicycle users. To provide this separation, a 12-foot wide regional trail should be provided adjacent to, and to the west of, a pair of six-foot wide bicycle lanes (see attached rendering). These recommended widths are exclusive of potentially needed shy distances, i.e., free and clear of poles and other obstructions to enable safe pedestrian and bicycle movement (a summary of agency standards for multiuse paths, sidewalks and bike lanes is attached).

The regional trail would accommodate pedestrians, persons with disabilities, seniors, families with children, tourists, roller-skaters, and recreational bicycle riders. The adjacent bicycle lanes would be used by bicycle commuters and other faster-moving bicyclists. The regional trail would be at a slightly higher level than the bicycle lanes, but bicyclists in the bicycle lanes would be able to access the trail. Different paving treatments and/or patterns should differentiate the regional trail and the bicycle lanes.

- In addition to the combined regional trail and bicycle lanes on the western bridge, an eight-foot wide sidewalk should be provided on the eastern bridge (the bridge that would serve the northbound traffic lanes) across both the Columbia River and the North Portland Harbor. The sidewalk across the North Portland Harbor would touch down on Hayden Island and use surface street sidewalks to connect to the sidewalk across the Columbia River.

While this facility would primarily serve pedestrians, accommodations should be provided for the occasional recreational bicyclist, e.g., wheel gutters (narrow ramps alongside stairs for rolling a bicycle while climbing stairs). It is understood that for physical and environmental reasons connecting this eastern sidewalk directly with the Vancouver shore would be challenging and most likely would require routing it westerly under the replacement bridge to tie in with the western multi-use pathway above the shore.

- Additional access points, discussed as possibilities in the Draft EIS, should be provided to make the river crossing paths connect more directly to parks and recreational trails. Some examples of these facilities are the Columbia River Waterfront Trail in Vancouver, the river adjacent areas on Hayden Island, and the 40 Mile Loop in Oregon.
- Viewpoints or "belvederes" should be provided at locations along both the regional trail on the western bridge and the sidewalk on the eastern bridge. These features would also function as rest areas for pathway users.

The PBAC recognizes that the Portland-Vancouver metropolitan area has experienced exponential growth in walking and bicycling trips over the years and that any bridge improvement project must not only meet existing and latent pedestrian and bicycle demands, but also must accommodate pedestrian and bicycle traffic anticipated over the next 50 plus years. Based on pedestrian and bicycle forecasts developed for the Columbia River Crossing, the PBAC is confident that the facilities described above would offer a sustainable, long-term solution to accommodate expected users for years to come .

### **PBAC's Next Steps**

The PBAC plans to spend the summer and fall of 2008 conducting several tasks, including:

- Providing recommendations for project area pathway and sidewalk designs, including walkway and bikeway separation treatments and barriers
- Studying and suggesting pathway and sidewalk connections near Marine Drive/Bridgeton/Expo Center, Hayden Island, and Vancouver, including ramps, elevators and stairs
- Recommending pedestrian and bicycle treatments within each of the project's six interchange areas (Marine Drive, Hayden Island, SR 14/City Center, Mill Plain, Fourth Plain, and 39<sup>th</sup> Street/SR 500/Main Street)
- Providing input on pedestrian and bicycle design for the affected local streets (e.g., Vancouver's high-capacity transit streets determined after the LPA) and transit stations, including provisions for bicycle parking

In addition, the PBAC will continue to refine its list of pedestrian and bicycle considerations regarding design, safety, connections, and quality of experience (see attachment).

### **Attachments**

- CRC Pedestrian and Bicycle Advisory Committee Membership
- PBAC Proposed Pedestrian and Bicycle System for Replacement Bridge
- PBAC Recommended Pathway Artist Rendering
- Potential Pedestrian and Bicycle Design Guidelines
- Pedestrian and Bicycle Facilities in Portland and Vancouver
- Pedestrian and Bicycle Bridge Pathways around the World
- Summary of Agency Standards for Multiuse Paths, Sidewalks and Bike Lanes

/DJP



## **Pedestrian and Bicycle Advisory Committee Membership**

Membership current as of June 5, 2008

April Bertelsen, City of Portland

Todd Boulanger, City of Vancouver

Kyle Brown, Steps to a Healthier Clark County

Coalition for a Livable Future - *inactive*

Basil Christopher, Oregon Department of Transportation

Seanette Corkill, Arnada Neighborhood Association

Bob Cromwell, National Park Service

Debbie Elven-Snyder, C-TRAN

Emily Gardner, Bicycle Transportation Alliance

Roger Geller, City of Portland

Lisa Goorjian, City of Vancouver

Joe Greulich, Clark County Bicycle Advisory Committee

Rod Merrick, Portland Pedestrian Advisory Committee

Paula Reeves, Washington State Department of Transportation

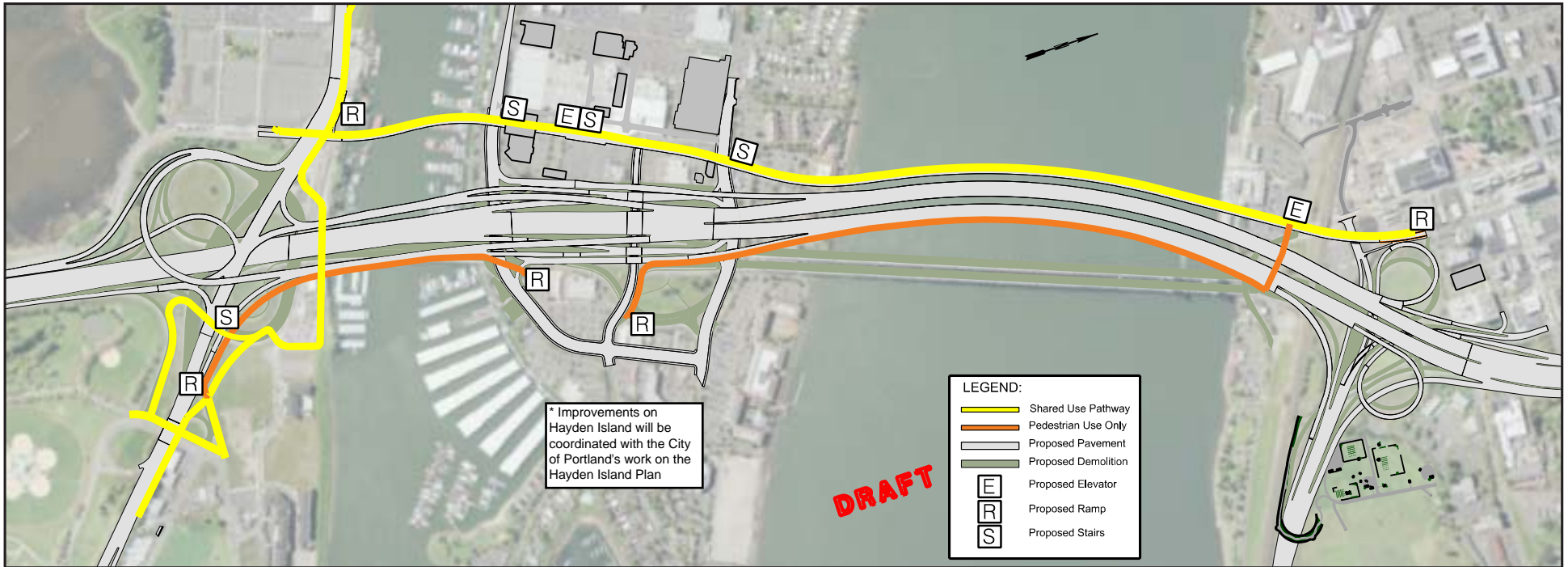
Shayna Rehberg, Portland Bicycle Advisory Committee

Karl Rohde, Bicycle Transportation Alliance

Walter Valenta, Bridgeton Neighborhood Association

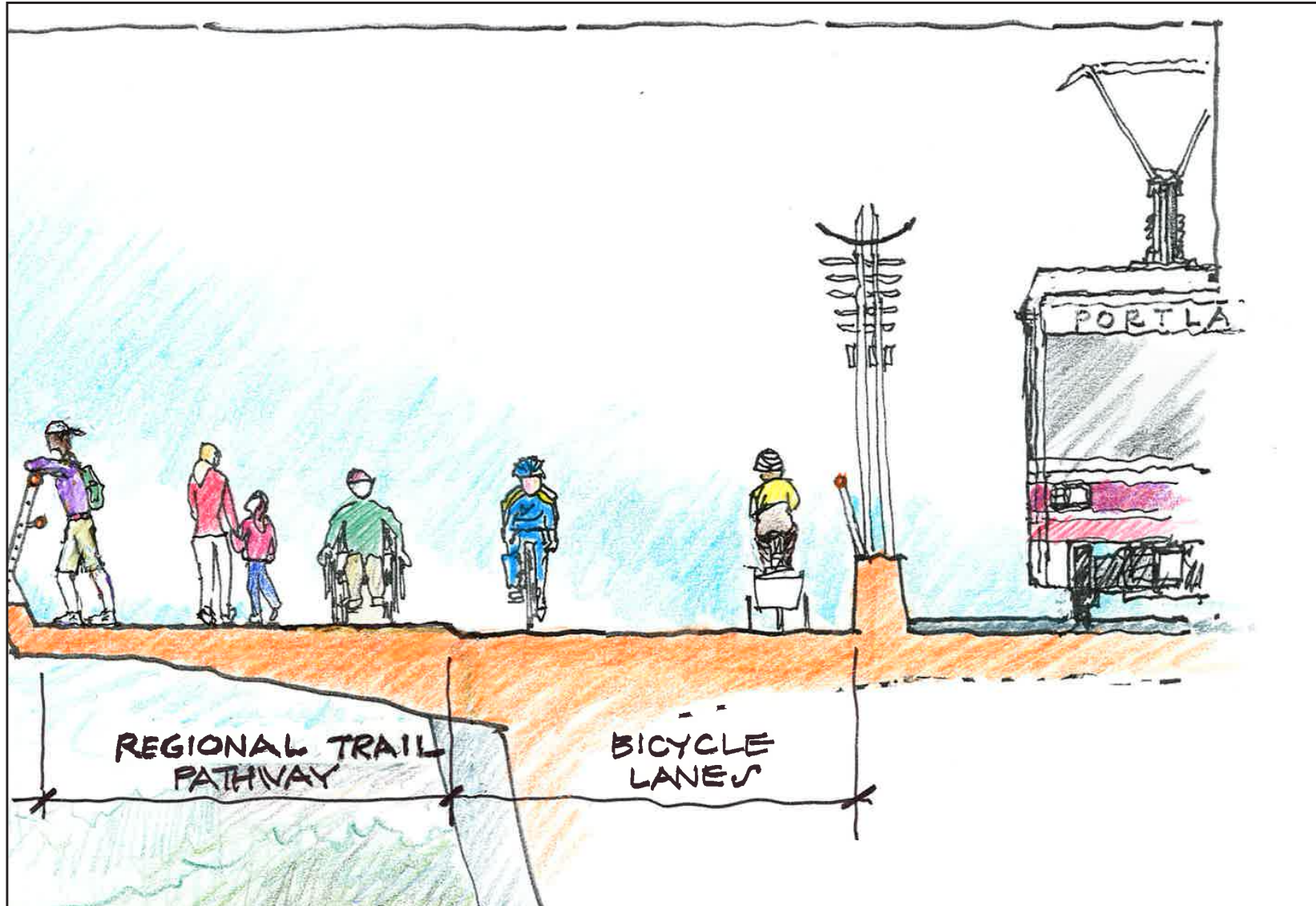


# PBAC Proposed Pedestrian and Bicycle System for Replacement Bridge





# Pedestrian and Bicycle Advisory Committee Recommended Pathway on West Side of West Replacement Bridge (Looking North)



Artist Rendering



## **Potential Pedestrian and Bicycle Design Guidelines for the I-5 Columbia River Crossing**

### **Introduction**

The Columbia River Crossing's Problem Definition states, "Bicycle and pedestrian facilities for crossing the Columbia River in the I-5 Bridge Influence Area are not designed to promote non-motorized access and connectivity across the river." This document serves to provide parameters for consideration of a future bridge facility in terms of pathway design, bicycle and pedestrian safety, improved connections to the local and regional network and to create a high quality riding and walking experience between Portland and Vancouver.

### **Design**

- Pathways
  - Located on either side of the bridge or on both sides
  - Shared use or separated
  - Width; increase path width on steeper grades
  - Gentle grades ( $\leq 5\%$ ) and cross-slopes ( $\leq 2\%$ )
  - Sight distances on curves
  - Large turning radii on downgrades and curves
  - Overhead clearance
  - Constructed using non-skid surfaces
  - Utility, drainage grates and expansion joint placement
- Scenic views – (Mt. Hood, Columbia River, Hayden Island, Vancouver)
- Planned for future capacity

### **Safety**

- Modal separation
  - Minimize exposure of pedestrians and bicyclists to vehicles and transit
  - Separation of pedestrians and bicyclists
  - Separation of "commuter" bicyclists and "recreational" bicyclists
- Physical separation features
  - Grade separated paths
  - Barriers – vehicular, transit and water
  - Noise mitigation
  - Minimize exposure to vehicle exhaust
  - Protection from debris/"kick-up"/splatter/bird droppings
  - Wind, rain and headlight glare protection



- Personal safety
  - Lighting
  - Security cameras and phones
  - “Eyes on the street”
- Emergency response/maintenance vehicle access

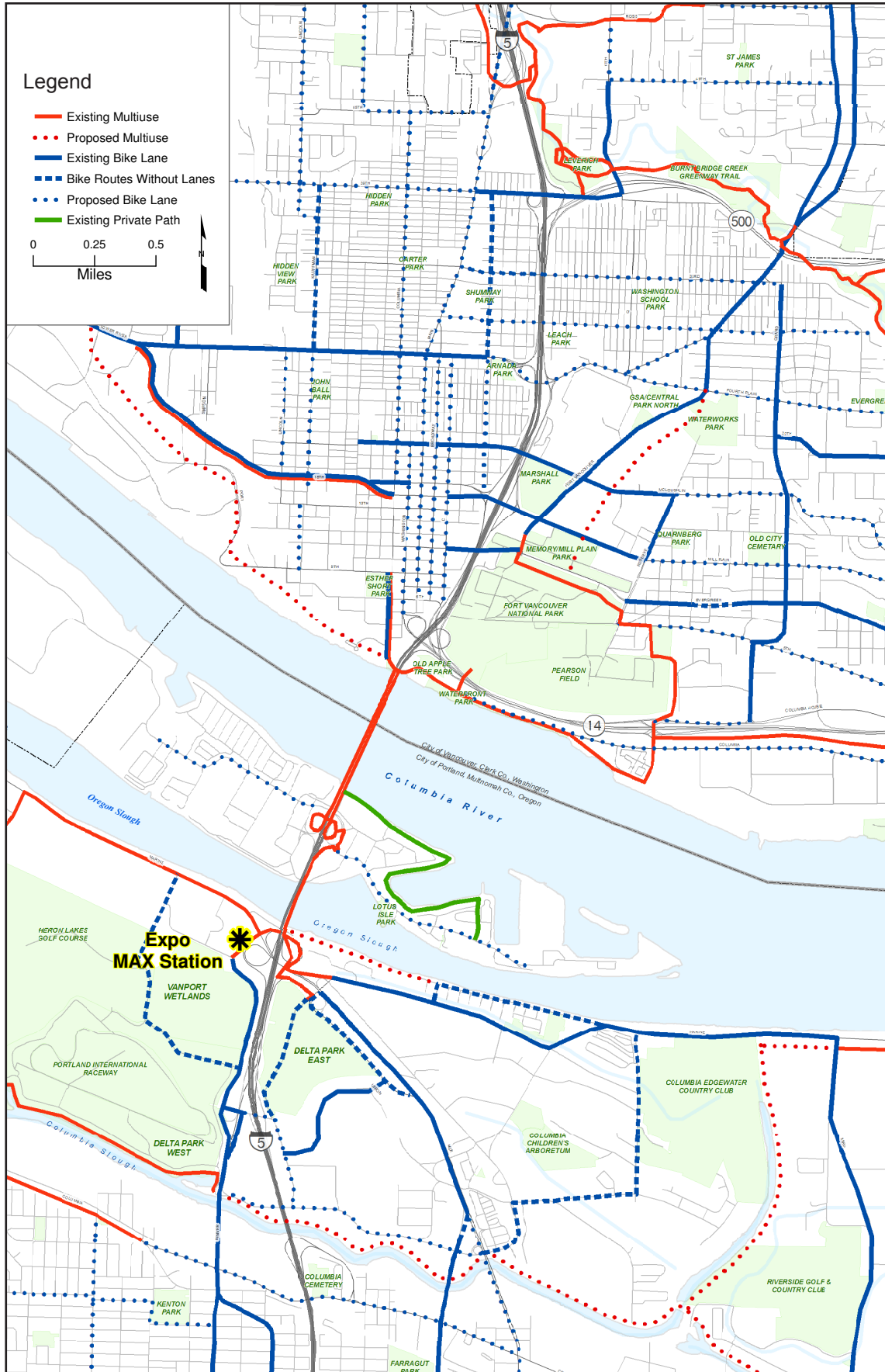
### **Connections**

- Connection to existing pedestrian/bicycle facilities – (Portland, Vancouver, transit stops, activity centers)
- Provide straight and direct connections – minimize time to cross river and make connections
- Way-finding and directional signage
- Improvement of existing trails/paths in the BIA
- Travel time across the future facility should not exceed the time to cross today

### **Quality of Experience**

- Amenities – (restrooms, benches, trash cans, info kiosks, public art, end of trip and park & ride facilities, etc.)
- Bridge aesthetics
  - Architectural detailing and quality of build materials
  - Lighting and landscaping

# Pedestrian and Bicycle Facilities in Portland and Vancouver





# Pedestrian and Bicycle Bridge Pathways Around the World

## Shared Pedestrian and Bicycle Paths



**Tacoma Narrows Bridge**  
Tacoma, WA  
10' shared-use path (1)  
Total 10'



**Golden Gate Bridge**  
San Francisco, CA  
10' shared-use path (1 full-time)  
10' (5' clear) bike path (weekend)  
1' raised above roadway  
Total 10' (15' weekend)



**Carquinez Bridge**  
Vallejo, CA  
12' shared-use path (1)  
Total 12'



**New Bay Bridge**  
SF/Oakland, CA  
15.5' shared-used path (1)  
7.5' belvederes (2)  
Total 15.5'



**Cooper River Bridge**  
Charleston, SC  
12' shared-use path (1)  
Total 12'

## Separated Pedestrian and Bicycle Paths



**Pflugler Bridge**  
Austin, TX  
10' bi-directional bike path (1)  
5' sidewalks (2)  
15' observation deck  
Total: 20'



**Willemsbrug**  
Rotterdam, Netherlands  
6' sidewalks (2)  
6' bike lanes (2)  
Total: 24'



**Eramusbrug**  
Rotterdam, Netherlands  
6' sidewalks (2)  
6' bike lanes (2)  
Total: 24'



**Stone Arch Bridge**  
Minneapolis, MN  
Bi-directional bike path (1)  
Sidewalks (2)  
Total: 24'



**I-80 Ped/Bike Bridge**  
Berkeley, CA  
8' bi-directional bike path (1)  
5' sidewalk (1)  
Total: 13'

# Columbia River CROSSING

## Summary of Agency Standards for Multiuse Paths, Sidewalks and Bike Lanes

### Multiuse path

| Agency            | Minimum width  | Desirable width  | Separation  | Reference |
|-------------------|--|--|---|-----------|
| WSDOT             | 14 feet: (2)-10-(2)  | 16 feet: (2)-12-(2) or (1)-14-(1)<br>Use a 12-14 foot pathway when maintenance vehicles use the path as an access road for utilities or when there will be substantial use by bicyclists, joggers, skaters and pedestrians | Min. 2 feet to traffic barrier                          | 1         |
| ODOT              | 14 feet, (2)-10-(2)  | 16 feet: (3)-10-(3) or (2)-12-(2)<br>12-foot wide path in areas with high mixed-use  | 5 feet shy distance when adjacent to roadway or barrier | 2         |
| City of Vancouver | 12 feet  | 18-20 feet which includes a 6- to 8-foot border  |   | 3         |
| City of Portland  | 14 feet clear of obstructions for a two-way path: (2)-10-(2) | 16 feet clear of obstructions for two-way path: (2)-12-(2)   |   | 4         |

### Sidewalk

| Agency            | Minimum width  | Desirable width   | Separation   | Reference |
|-------------------|--|---|--|-----------|
| WSDOT             | 5 feet   | 6 feet  |  | 1         |
| ODOT              | 5 feet<br>6 feet adjacent to motor vehicle lane<br>6 feet on bridges                                 | 6 feet plus 3-5 feet of planting strip<br>7 feet on bridges   | 2 foot shy from shoulder high barriers or walls (in addition)<br>1 foot shy when adjacent to fills (in addition) | 2         |
| City of Vancouver | pedestrian zone width: 4-6 feet, depending on street classification                                  | Frontage plus furnishing zone width: 3.5-8, depending on street classification  |  | 3         |
| City of Portland  | 8 feet clear of obstructions (6 feet through pedestrian zone plus 2 feet furnishings zone/curb zone) | 12 feet clear of obstructions (6 feet through pedestrian zone plus 2.5 feet furnishings zone/curb zone plus 1.5 feet frontage zone adjacent to bridge rail) |  | 5         |

### Bike lane

| Agency            | Minimum width   | Desirable width | Separation | Reference |
|-------------------|---|-----------------|------------|-----------|
| WSDOT             | 4 feet (no curb)<br>5 feet (against curb, guardrail or barrier)               | 5 feet          |            | 1         |
| ODOT              | 4 feet (when physically limited)<br>5 feet against curb, guardrail or parking | 6 feet          |            | 2         |
| City of Vancouver | 5 feet  | 6 feet          |            | 6         |
| City of Portland  | 5 feet  | 6.5 feet        |            | 4         |

### Definition of terms

**Minimum width:** The smallest pathway width allowable under the standard without a design exception.

**Desirable width:** The default width for new construction as suggested by the standard. This width is to be used in all cases except when circumstances call for the adoption of the minimum width or a design exception.

**Separation:** The default width for new construction as suggested by the standard. This width is to be used in all cases except when circumstances call for the adoption of the minimum width or a design exception.

### References

1. Chapters 1020 & 1025 - WSDOT Design Manual (2006)
2. Oregon Bicycle and Pedestrian Plan (1995)
3. Southeast Vancouver Neighborhood Traffic Management Plan (2002)
4. City of Portland Bicycle Master Plan (1998)
5. Portland Pedestrian Design Guide (1998)
6. City of Vancouver Standard Plan Number T29-43 (2007)

# Columbia River CROSSING

## Summary of Agency Standards for Multiuse Path Grade, Curve Radius and Clearance Standards

| Grade  |   |           |
|--------|---|-----------|
| Agency | Maximum grade   | Reference |
| WSDOT  | 5% , minimize length of segments with grades over 5%<br>2% grade for sustained climbing sections longer than 800'   | 1         |
| ODOT   | 5% - steeper grades allowed for up to 500'  | 2         |
| AASHTO | 5% - steeper grades allowed according to:<br>5-6% for up to 800 ft<br>7% for up to 400 ft<br>8% for up to 300 ft<br>9% for up to 200 ft<br>10% for up to 100 ft<br>11+% for up to 50 ft | 3         |

| Curve Radius |   |           |
|--------------|---|-----------|
| Agency       | Minimum radius  | Reference |
| WSDOT        | Open country, urban setting: 90 feet<br>Downgrades > 4% & 500 feet: 260 feet  | 1         |
| ODOT         | As short as needed to accommodate design vehicles   | 2         |
| AASHTO       | Design speed of 12 mph: 36 feet<br>Design speed of 20 mph: 100 feet<br>Design speed of 25 mph: 156 feet<br>Design speed of 30 mph: 225 feet | 3         |

| Clearance |                                     |                 |           |
|-----------|-------------------------------------|-----------------|-----------|
| Agency    | Minimum height                      | Standard height | Reference |
| WSDOT     | 10 feet. 8 feet, with justification | 10 feet         | 1         |
| ODOT      | 8 feet                              | 10 feet         | 2         |
| AASHTO    | 8 feet                              | 10 feet         | 3         |

| Cross slope |          |         |           |
|-------------|----------|---------|-----------|
| Agency      | Standard | Maximum | Reference |
| WSDOT       | 2%       | 2%      | 1         |
| ODOT        | 2%       |         | 2         |
| AASHTO      | 2%       | 3%      | 3         |

### Definition of terms

**Minimum height:** The smallest clearance allowable under the standard without a design exception.

**Desirable height:** The clearance suggested by the standard that meets almost all general requirements

**Maximum grade:** The sustained rise or drop in slope of the path

**Minimum radius:** The sharpest curve allowed under the standard for the given design speed

### References

1. Chapters 1020 & 1025 - WSDOT Design Manual (2006)
2. Oregon Bicycle and Pedestrian Plan (1995)
3. AASHTO Guide for the Development of Bicycle Facilities (1999)