



# Portland, Oregon

Climate-Friendly Infrastructure:

Tilikum Crossing, *Bridge of the People*

A White House Climate Action Champions Case Study

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## **Executive Summary**

The City of Portland's 2015 Climate Action Plan is a strategy to put the city on a path to achieve an 80 percent reduction in greenhouse gas emissions compared to 1990 levels. As part of that plan, the City has worked to provide low-carbon transportation systems for the community.

In September, 2015, Portland welcomed the construction of its newest bridge, Tilikum Crossing, *Bridge of the People*, that connects residential neighborhoods to the downtown core. The Tilikum is the first new river crossing in Portland in more than 40 years.

For decades, Portland has emphasized high-quality road, rail, bridge, bike lane and sidewalk projects. These projects enhance neighborhoods, support businesses and shape the city. As a first-of-its-kind bridge, Tilikum Crossing continues this tradition of excellence. In concrete and steel, it expresses the values that are central to Portland, dedicated to serving public transit, pedestrians and bicyclists.

The bridge itself represents a link between the east and west sides of the Willamette River and completes the "innovation quadrant" formed by the Central Eastside Industrial district and the education and research hubs of Portland State University and Oregon Health Sciences University.

Because the new bridge only allows pedestrians, bikers, light rail, street car and buses, it will help encourage and facilitate desirable commuter traffic that helps reduce carbon emissions. Tilikum Crossing carries the Portland Streetcar, the Orange Line light rail, TriMet buses and cyclists and pedestrians.

TriMet is the regional transit authority and lead agency for the Orange Line and Tilikum Crossing. The City of Portland is one of 14 funding partners that supported the project.

## **Climate Action Champion**

In 1993, Portland was the first city in the United States to create a local action plan for cutting carbon. Since then, the City of Portland and Multnomah County have collaborated to produce updated climate plans that help guide the design and implementation of City and County efforts to reduce carbon emissions. Since 1990, total local carbon emissions have declined by 14 percent while 75,000 more jobs were added to the economy and the population grew by 31 percent. The 2015 Climate Action Plan outlines the actions the City and County will take in the next five years to keep Portland on the path of reducing local carbon emissions. With support from 20 agency partners, Portland's 2015 Climate Action Plan is a strategy to put the city on a path to achieve an 80 percent reduction in greenhouse gas emissions, compared to 1990 levels.

Tilikum Crossing is one part of the larger, \$1.5 billion Portland-Milwaukie Light Rail Transit Project, also known as the "MAX Orange Line." Tilikum Crossing makes it even easier for residents throughout the region to get to important destinations like Portland State University, Oregon Health Sciences University, the Central Eastside District and Oregon Museum of Science and Industry. Thanks to Tilikum Crossing,

residents also have new and improved connections to existing, state-of-the-art transportation infrastructure such as the Portland Aerial Tram, the Gibbs Street Pedestrian Bridge, the Eastside Esplanade and over 319 miles of bikeways throughout the city.

### **Project Spotlight 1: Triple-Bottom Line Benefits**

The MAX Orange Line is intended to bring economic, environmental and social benefits to the Portland metropolitan region. These benefits include more travel choices, economic development, environmental leadership, active transportation connections, road and freight movement improvements, redevelopment, and public art.

**Travelers have more choices.** The Orange Line and Tilikum Crossing will reduce travel time between Clackamas County (home to several bedroom communities southeast of downtown Portland) 40 percent by 2030. The Orange Line has added ten MAX stations as well as the landmark Tilikum Crossing bridge.

**Local businesses grow.** The project is responsible for 14,000 jobs, including 5,300 construction jobs (as of October 2015). Five hundred and sixty-four firms have worked on the project, of which 134 are owned by women or people of color. Eighty percent of the firms that have worked on the Orange Line light rail project are based in Oregon.

**Stormwater management and renewable energy are incorporated from the beginning.** The project features 286 bioswales to capture and filter 1.8 million square feet of stormwater, eight green roofs and 28 solar installations. The project allocated \$4 million for environmental mitigation and habitat improvement from North Portland to Clackamas County.

**Investments in active transportation connections are prioritized.** The project invested \$65 million in bike and pedestrian facilities connecting people to the Orange Line and Tilikum Crossing. Over 10 miles of sidewalks and almost eight miles of bikeways were built or replaced. The project added 446 bike parking spaces including two secure “Bike & Rides.”

**Freight mobility and road improvements keep industrial employment vibrant.** The project invested \$40 million in roadway improvements, including major enhancements to freight mobility.

**Project catalyzes redevelopment.** Over 480,000 square feet of research and education space at Oregon Health Sciences University, Portland State University and the Oregon Museum of Science and Industry is made more accessible by this transit loop. Two new mixed-use developments are planned for two station areas in Southeast Portland.

**Public art on display.** Twenty-six artists contributed to 25 public art projects, 88 art elements and 57 poems that are incorporated into the Orange Line, making this project a significant community statement. In addition, the design, finish and materials of the Tilikum Crossing make the span itself a visually arresting and artful public infrastructure project.

### **Project Spotlight 2: Commitment to Sustainability**

TriMet's commitment to sustainability was reflected throughout the conception, planning, design, construction, and operation of the system.

TriMet hosted an early project workshop with VIA Architects to integrate triple-bottom-line principles (which assign equal importance to social, environmental and financial considerations) into the light rail project. The result was 28 sustainability strategies that would be supported and tracked throughout project design, construction and operation. In addition to these, hundreds more were added as the project moved forward.

**The Possibilities Project.** During the project design phase TriMet formed a diverse team of creative design professionals to expand the urban design work, explore opportunities for development, and identify new sustainability practices and renewable energy partnerships. This effort was called the Possibilities Project. It embraced the needs of the community, positioned residents to leverage the new line for their own goals and led to many of the sustainability actions undertaken during the project, including connections to neighborhoods, planting patterns, solar energy, and electric vehicle charging stations.

**Minimizing pollution.** The project selected materials to minimize the possibility of paint toxins falling into the Willamette River. For example, transit bridge structures were built with unpainted concrete and the main body of Tilikum Crossing is unpainted concrete flanked by stainless steel railings and cables. No pesticide-treated wood was installed below the typical high-water levels, and during on-site removal of old, pesticide-treated wood piers, no debris was allowed to fall into the water

**Sustainability matrix and report.** The full scope of the sustainability effort was captured in a "Sustainability Practices Matrix." More than 300 sustainability-focused practices, considerations and materials were identified and catalogued. The matrix is an important reference tool, providing a basis for tracking impacts and effectiveness and serving to inspire those inside and outside TriMet to learn from and advance sustainability efforts on future projects. "Making the Max Orange Line Green" is a report published by the project that highlights key sustainability practices captured in the Sustainability Practices Matrix.

**Measuring sustainability.** Two rating systems were informally applied to the project: the Envision™ Sustainable Infrastructure Rating System and the Infrastructure Voluntary Evaluation Sustainability Tool (INVEST) 1.0. This work is significant given the absence of a singular, exhaustive set of sustainability metrics or indicators for the transit industry. TriMet hopes that the knowledge gained by informally applying these rating systems will begin to develop an industry-wide standard.

### **Project Spotlight 3: Partners**

The bridge itself represents a great collaboration between TriMet and the City of Portland, between architects, engineers, developers and affected property owners in the area.

TriMet worked with an extensive array of community partners, including members of the Citizens Advisory Committee, who provided invaluable input during the Portland-Milwaukie Light Rail Transit Project.

#### Lead Partners

*Federal Transit Administration*

*Clackamas County*

*Metro*

*City of Milwaukie*

*Multnomah County*

*City of Oregon City*

*Oregon Department of Transportation*

*City of Portland*

*Portland Development Commission*

- North Clackamas Parks & Recreation
- Oak Lodge Sanitary District
- O’Neill Electric
- OpConnect
- Oregon Health & Science University
- Oregon Museum of Science and Industry
- Oregon Department of Transportation
- Parametrix
- Peg Butler and Buster Simpson
- Portland Bicycle Advisory Committee
- Portland Development Commission
- Portland General Electric
- Portland Pedestrian Advisory Committee
- Portland State University
- Ramos, Inc.
- Raimore Construction
- Rebar Group, Inc.
- The Rebuilding Center
- REC Solar
- Reworks, Inc.
- Skanska USA
- Stacy and Witbeck, Inc.
- Tad Savinar
- Team Electric
- Transportation Research and Education Center
- Union Pacific Railroad
- U.S. Army Corps of Engineers
- Urban Green Energy
- VIA Architecture
- Washington Creek Restoration Council
- Waterleaf Architecture
- Willamette River Bridge Advisory Committee
- Zidell Companies
- Zipcar, Inc.

#### All Partners

- Affordable Electric
- CH2M HILL
- City of Milwaukie
- City of Portland
- City of Roses Recycling
- Clackamas County
- DeaMor Associates
- Doug Hollis and Anna Valentina Murch
- Dynalectric Company
- Energy Trust of Oregon
- Envision Sustainable Infrastructure Rating System
- Federal Transit Administration
- Greenworks
- Habitat for Humanity
- Harding Portland Foundation
- Hollywood Lights
- JLA Public Involvement
- Johnson Creek Watershed Council
- Kiewit
- Metro
- Mayer/Reed
- Milwaukie Presbyterian Church

## **Co-benefits**

The MAX Orange Line and Tilikum Crossing bring many benefits to the region. These include increasing travel choices, incorporating sustainability and public art, boosting economic development, and making trains quieter.

## **Ongoing challenges and lessons learned**

Any major public transportation investment of this scale and scope has to contend with inherent challenges. In this case, regional collaboration and coordination across multiple jurisdictions, each with different political realities, posed one of the biggest challenges. Some of these are still being resolved legally. The longstanding history of collaboration and partnership between TriMet and the City of Portland Bureau of Transportation (PBOT), stood this project in good stead. Trust and experience helped these two agencies support each other and gain mutually desired outcomes over the long project duration.

On the land use side, one of the issues the region faces is how to do transit-oriented development when the transit alignment runs through an industrial employment district, as this one does. One of Portland's key land-use planning goals is to maintain industrial lands for the provision of middle-wage jobs to workers without college degrees. Much transit-oriented design focuses on residential and commercial land uses. It is a bit more challenging in an industrial district.

Project managers report several major lessons learned and successes that other communities may learn from. The project developed a "Conduct of Construction" guide that became part of the contract specifications. The guide specified City and TriMet expectations of contractors around a host of construction-related issues, including noise, dust, crosswalks, and holiday closures.

Another innovation is the specialized permitting process created among City of Portland agencies and TriMet. Long linear transit projects tend to hop in and out of public right-of-way. For this project, PBOT worked collaboratively with its sister City agency, the Bureau of Development Services, to create a very detailed permit process and to share inspection responsibilities across public and private lands. This worked well and streamlined what otherwise would have been a difficult and lengthy permitting process, since the City does not own its transit agency.

## Resources/Learning More

1. [http://trimet.org/pdfs/pm/Fact-sheets-timelines/PMLR\\_Bridge\\_Fact\\_Sheet\\_Aug2013.pdf](http://trimet.org/pdfs/pm/Fact-sheets-timelines/PMLR_Bridge_Fact_Sheet_Aug2013.pdf)Website

### Contacts

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#### Project Impact (Orange Line Light Rail plus Tilikum Crossing)

- 7.3 mile light-rail alignment connecting downtown Portland to commuter communities southeast of the city.
- One unique, multi-modal bridge, Tilikum Crossing.
- 14-foot bike and pedestrian paths on each side of the bridge.
- Connections to existing routes that create a four-mile bike/ped loop across the river.
- Congestion relief: an average of 22,765 weekday rides, taking 9,100 automobiles off the road during peak hours each day (by 2030).
- Mode shift: reduction of 60,000 miles traveled per weekday by shifting car travel to transit (by 2030).
- Carbon dioxide reductions from mode shift of nearly 60,000 pounds per day.
- Carbon dioxide reductions from land-use patterns of 114,000 pounds per day.
- Approximately 3,325 trees were planted along the light rail line—nearly four times as many as were removed.

#### Project Facts

##### Project Duration

4 years (April 2011-August 2015)

##### Project Cost

\$1.49 billion (MAX Orange Line)

\$134.6 million (Tilikum Crossing)

##### Population Served

City of Portland = 610,000

Clackamas County = 376,000

##### Community Type

Urban

#### Project Costs and Funding

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