Portland-Milwaukie Light Rail Transit Project—Leveraging Partnerships, Transforming Communities

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HOW A LIGHT RAIL PROJECT BRINGS MORE THAN TRANSIT TO COMMUNITIES

Introduction

For nearly four decades, the Portland, Oregon, region has planned, constructed and operated an extensive high-capacity transit system. Today, the existing light rail system consists of four light rail lines, 52 miles of tracks and 87 stations in three counties.

With each light rail project, TriMet and its partners strived to document lessons learned and apply those lessons to the next project. After the Eastside Blue Line – the region’s original light rail project – opened in 1986, project planners brought new knowledge about transit-oriented development to the Westside Blue Line extension. The Red Line project to Portland International Airport took public-private partnerships to a new level, and the subsequent Yellow Line project brought innovations in sustainability. When the Green Line project opened in 2009, it offered a new model for how light rail trains and buses can successfully operate together in a busy downtown core.

The Portland-Milwaukie Light Rail Transit (PMLRT) Project is currently constructing TriMet’s fifth light rail line as a vital element in the region’s strategy to manage growth. Continuing to expand transit options is essential to the region’s livability and economic vitality. By 2030, the region is expected to add one million new residents and nearly 100,000 new jobs within the project corridor. This project reflects the application of the region’s experience and collective knowledge in planning, designing and building light rail projects through successful partnerships, funding synergies, and design and construction innovations.

The $1.49 billion PMLRT project expands the regional light rail system to 60 miles and 97 stations and positively transforms the communities through which it travels. It combines new transit-oriented development, active transportation and roadway infrastructure improvements, while enhancing the environment and implementing sustainability strategies and features. The project will connect neighborhoods, encourage walking and cycling, and create engaging public spaces where people want to be.

Redevelopment and Station-Area Planning

Although PMLRT light rail service does not begin until September 12, 2015, the project already inspired redevelopment in the form of new educational, research and residential facilities. In addition, new commercial and residential property redevelopment proposed around the light rail alignment is helping to foster transit-oriented neighborhoods.
South Waterfront District:

**Existing Conditions**

Portland’s South Waterfront District is at the forefront of modern, urban multi-modal transportation. This high-density, mixed-use neighborhood south of downtown is one of the largest urban redevelopment areas in the United States. Redevelopment for commercial and residential uses with multi-modal transportation and station-area planning are signature features of this emerging district. By 2030, the district’s development potential is estimated to provide 12,000 jobs and 6,000 housing units. Commute trips into South Waterfront are expected to increase by 57 percent and the share of transit trips will double, making public transportation critical.

**Partnership Strategy**

Before the first redevelopment phase began in 2004, the South Waterfront District was a former industrial site with no residents and few businesses. Although several residential towers and a university facility were built in the southern portion of the district, the energy of a multi-faceted public-private partnership was required to unlock the potential of the district’s northern half.

Thirty-three acres of this area belong to the Zidell Companies, which maintains an active barge construction facility on the site. Beginning in the mid-1990s, Zidell worked with the state’s Department of Environmental Quality to clean up hazardous materials and mitigate the effects of almost a century of industrial uses on the site. The $20-million cleanup project covered 2,700 feet of riverfront property and worked to cap contaminant sediments in the river bottom. The light rail project includes a new bridge that spans the Willamette River on the district’s western edge and brings the route through the middle of Zidell’s remediation area. Zidell and the PMLRT project collaborated to address the difficult issues of hazardous materials’ mitigation and closely coordinate construction and remediation crews working side-by-side. Zidell also donated land underneath the light rail bridge and partnered with the light rail project to determine South Waterfront’s optimal light rail alignment. This partnership helped reduce both Zidell’s remediation costs and the PMLRT project’s construction costs by capping low-level contaminated soil underneath the light rail alignment.

**Resulting Improvement**

The remediation improves fish and wildlife habitat and prepares the Zidell property for a 100-foot-wide greenway near the riverbank. On the upland portion of the site, the remediation primes the area for 33 acres of market-driven redevelopment, a plan which includes 27 buildings and over three million square feet of development.

The light rail project also helped inspire Zidell’s redevelopment on property south of the future South Waterfront light rail station. The first result of that inspiration is a 118-unit apartment building that opened in 2013.

The remediation, plans to build a light rail station, and Portland Streetcar extensions in this district also encouraged the Oregon Health & Science University and the Oregon University System to move forward with development of a new campus adjacent to the new MAX station. The 480,000-square-foot Collaborative Life Sciences Building on the new Schnitzer Campus will open this summer. This pivotal project houses a School of Dentistry, a School of Medicine, a pharmacy program, Portland State University’s undergraduate biology and chemistry departments, and a significant amount of research space. In addition to enhancing connections and collaboration between the state’s higher-education institutions, the new light rail extension will provide metropolitan-wide transit access for thousands of building tenants, researchers and employees. The $295 million, 12-story project represents one-fifth of OHSU’s total 2.5 million square feet of development planned for the 19-acre Schnitzer Campus.

**Possibilities Project:**

The PMLRT project draws on expertise from both private and public partnerships in an initiative called the Possibilities Project. The Possibilities Project brought together architects, real estate developers, artists and neighborhood residents to identify opportunities for community-focused improvements within the PMLRT project area. The goal was to leverage existing project funding while capitalizing on existing land parcels that were previously unused or not suitable for development, while making sustainable community improvements.

**Existing Conditions**

The Brooklyn neighborhood in SE Portland is named for the many creeks and wetlands formerly present in the area. Residential properties are dotted among the neighborhood’s parks and vibrant small businesses. The PMLRT project improves
transportation and commuting options for neighborhood residents while providing trucks, cars, bicycles and pedestrians with safer facilities. Several sites in the neighborhood offer opportunities for transit-oriented development.

**Partnership Strategy**
To further enhance the project’s connection to the neighborhoods it serves, TriMet worked with the City of Portland’s Bureau of Transportation and Brooklyn neighborhood residents to identify redevelopment opportunities. In order to construct the light rail trackway and move the southbound roadway, land adjacent to the light rail project needed to be cleared. Not all of the land was used, leaving narrow strips to the west of the project alignment vacant. The Possibilities Project worked with TriMet, the City of Portland and the surrounding community to find feasible uses for these parcels.

**Resulting Improvements**
TriMet succeeded in attracting a developer to one of the narrow parcels stretching two blocks along the light rail route. The planned building is 36 units of multifamily apartments, with 14 parking spaces, 52 bike parking spaces and 2,000 square feet of commercial space. The three-story building has a variety of unit sizes – studio, one bedroom and two bedrooms – and was selected because of specific urban design elements that address the current neighborhood setting as well as future building occupants. This project is envisioned as the first development along this portion of the alignment, with other opportunities to follow.

**Freight Movement**
The PMLRT project is investing $40 million to facilitate surface freight movement infrastructure. Surface freight movement within the project area is comprised of two modes: railroad and truck.

**Harold Street Overcrossing:**
Existing Condition
SE Portland’s 17th Avenue corridor is a busy commercial freight hub anchored by SE Powell Boulevard to the north, and SE Holgate Street to the south. Union Pacific Railroad’s (UPRR) Brooklyn Yard is a busy regional rail yard located one block east of SE 17th Avenue. As the only intermodal yard in Portland, Brooklyn Yard is an important part of the local economy supporting freight movement along the West Coast, including the shipment of Oregon-made products. The main egress point for this yard crossed the project rail alignment at SE Harold Street. This created the potential to stop freight traffic while the light rail trains passed, creating lines of cargo trucks that would extend into a busy highway.

**Partnership Strategy**
Working closely with UPRR and representatives of local freight companies, the project redesigned this segment of the project to include a bridge that will carry light rail trains over the surface street entrance to Brooklyn Yard.

**Resulting Improvements**
The Harold Street Overcrossing will carry light rail over the entry and exit point for freight trucks and other vehicles accessing the Brooklyn Yard. This structure eliminated the need for a signaled crossing along the light rail route, removing a potential impediment to efficient freight truck access to this regional freight hub.

**SE Water Avenue:**
**Existing Conditions**
SE Portland’s Central Eastside Industrial District is largely characterized by warehouse, distribution and manufacturing uses. The district’s SE Water Avenue is home to the Oregon Museum of Science and Industry (OMSI), Portland Opera, a Portland Community College continuing education campus and now the Oregon Rail Heritage Foundation (ORHF). Both OMSI and Portland Opera have redevelopment plans that will transform this area into a vibrant regional destination. The road also serves as a major bike commute route and connects to the largest multi-use path in the region. All of this activity makes Water Avenue a busy arterial roadway for people with industrial, educational and recreational destinations.

Prior to project reconstruction, Water Avenue did not align with the connecting north-south street, had incomplete sidewalks and lacked bike facilities. Trucks, cars, bicyclists and pedestrians all shared this narrow two-lane roadway.

**Partnership Strategy**
Multiple bureaus of the City of Portland, the Portland Development Commission and OMSI worked hand-in-hand with TriMet to bring improvements to Water Avenue that allow safer movement of freight trucks moving between the Brooklyn freight depot and the warehouses and light industries of the Central Eastside Industrial District.
**Resulting Improvements**

Water Avenue was reconstructed and realigned to create a direct, safer connection to the street that continues to the south. The avenue was also widened to provide room for bike lanes in each direction, while continuing to accommodate freight trucks and cars. Improved sidewalks, street lighting and new crosswalks create a safer pedestrian experience. The relocated road improves the operational safety of the PMLRT system; helps unlock the development potential on the OMSI and Portland Opera sites; allowed ORHF, a non-profit railroad museum, to relocate to a high-visibility location next to the road and light rail station; and improves the bicycle, pedestrian and freight networks. Collaboration produced infrastructure that helps realize this unique area’s synergistic potential.

**Active Transportation**

The Portland-metropolitan area has a high degree of resident participation in active transportation. In fact, Portland has the highest percentage of bike commuters of any large U.S. city, and the PMLRT project is constructing active transportation improvements in conjunction with the light rail alignment. These improvements encourage car-free commuting and help keep communities livable and healthy.

Transit ridership depends on the integration of pedestrian, bike and mobility device access to station areas. Predictions show that 16 percent of the morning weekday trips on the project’s light rail line will access the alignment by bicycles. The project worked closely with advocates for cyclists, pedestrians and people with disabilities to incorporate access and related facilities into the project.

**Overall Bicycle and Pedestrian Improvements:**

**Existing Conditions**

Throughout the project alignment, existing railway, busy cross streets and natural features impeded safe and direct bike and pedestrian connections. In several instances, gaps between active transportation facilities such as sidewalks and bike lanes made biking or walking between those facilities precarious.

**Partnership Strategy**

Five years of consultation with project partners resulted in an array of bicycle and pedestrian improvements constructed by the project. The comprehensive mix of project partners included jurisdictional staff, bicycle and pedestrian advisory committees (such as TriMet’s 15-member Committee on Accessible Transportation), private entities, and PMLRT project planners and engineers. These efforts enhanced the existing bicycle and pedestrian network by providing safe and accessible crossings of light rail, streetcar and freight rail tracks. They also provided new connections to and across the Willamette River, and access to light rail stations. Many of these improvements were made possible by funding derived outside the project budget. These external funds leveraged project funding and construction efforts to create more improvements than the project alone could have accomplished.

**Resulting Improvements**

The project’s budget includes $40 million for bicycle and pedestrian improvements in the project area. By comparison, the City of Portland has estimated its entire existing bike network to be valued at $60 million. These improvements are likely the largest ever active transportation investment related to light rail. In total, the project is creating approximately 10.3 miles of new or replaced sidewalks and approximately 7.8 miles of new or replaced bike improvements.

Every station and a new multi-modal bridge over the Willamette River will meet, and often exceed, guidelines established in the Americans with Disabilities Act. Pedestrian improvements include new curb ramps, marked crossings, lighting, widened sidewalks and multi-use paths. The project’s travel-demand model shows that 3,000 pedestrians and 8,000 bicyclists will use the bridge daily. Two 14-foot multi-use paths are included on the light rail bridge over the Willamette River, one traveling in each direction. These paths are the widest of any on the many bridges crossing the river in Portland and are a direct result of collaboration with local bicycle and pedestrian advocates.

In addition, the project creates 445 new bike parking spaces, including two enclosed, secure Bike & Ride facilities at the new SE Tacoma Street/Johnson Creek and SE Park Avenue stations. The City of Portland code required the project to include 64 bike parking spaces—and the project far exceeded this goal with 312 spaces along just the Portland segment of the light rail route. Bike improvements also include bike signals at crossings, buffered bike lanes and connections to existing popular multi-use paths used for both recreation and commuting.
Kellogg Bridge Multi-use Path:

Existing Conditions
Prior to the PMLRT project, Union Pacific Railroad (UPRR) trains could cross over Kellogg Lake on the existing rail trestle, but there was no direct or safe route for bicyclists or pedestrians to cross the lake without interacting with adjacent highway traffic. The project was planning to build a bridge for light rail over the lake next to the UPRR trestle.

Partnership Strategy
Working together, TriMet and the City of Milwaukie secured funding from the Oregon Department of Transportation to include a multi-use path below the planned light rail bridge. The project deftly designed the path to match the light rail bridge’s existing design while retaining sightlines to the lake and allowing room for both bicyclists and pedestrians.

Resulting Improvements
The multi-use path allows bicyclists and pedestrians to safely cross over Kellogg Lake and avoid highway traffic. The improvement provides a more direct connection between downtown Milwaukie, the new light rail station and the neighborhoods south of Kellogg Lake.

Sustainability
The PMLRT project is actively working with partners to include sustainable elements and improve habitat. At the start of the project, a facilitated Sustainability Workshop conducted a 360-degree review of the project to look for sustainability opportunities. The workshop generated many concepts, some of which were already part of TriMet’s practices for light rail expansion. Other concepts required additional research and analysis. Through a systematic and structured process, the project is advancing 28 sustainability initiatives. The project’s commitment to sustainability has been reflected not only in providing a new transit option for the Portland metro area, but also by incorporating green principles in the conception, planning, design, construction and operation of the PMLRT project. The project employs a leadership approach to sustainable design practices, incorporating practices as diverse as the reuse of materials, habitat enhancement and on-site alternative energy generation.

Some examples of sustainable elements successfully included in the project are:

- Super-capacitor devices located in one of the project’s substations to capture regenerative breaking energy from light rail vehicles
- Eco-roofs on system buildings to manage stormwater
- Solar panels and LED lights on station-area shelters
- Vertical axis wind turbines on the system’s overhead catenary poles

Crystal Springs Creek restoration:

Existing Conditions
Crystal Springs Creek is 2.3 mile long tributary of Johnson Creek in SE Portland that offers significant habitat for salmon, birds and other wildlife. It begins on the Reed College campus and winds its way through Eastmoreland Golf Course, underneath Union Pacific Railroad (UPRR) and light rail tracks, through Westmoreland Park, and to adjacent residential neighborhoods. Several aging culverts existed to allow the creek to pass under tracks, roadways and paths. These culverts were created prior to established knowledge about fish-friendly passageways. As a result, they tended to restrict or hinder fish passage, raise water temperature and contribute to flooding. The City of Portland had plans to replace all of the culverts with fish-friendly facilities, but access to the culvert under UPRR’s mainline tracks and right-of-way was restricted. In addition, the creek had been damned at one point to create a large concrete-lined “pond” for waterfowl, which became another impediment to fish passage, native habitat formation, and flood prevention.

Partnership Strategy
The PMLRT project, UPRR, the City of Portland and the U.S. Army Corps of Engineers worked together to replace the critical fish culvert under the UPRR and light rail alignments. The project also provided a portion of the mitigation funding for removal of the concrete duck pond and the restoration of the creek to a natural riparian channel.

Resulting Improvements
The end result will be a stream channel that is more salmon friendly, emphasizes biodiversity, and supports native plant and fish communities. These partnerships have resulted in:
• A new fish-friendly culvert providing a healthier habitat for salmonid species and fish access to the full length of the creek
• Restoration of 1.1 acres of wetlands adjacent to Crystal Springs Creek
• Facilitation of species diversity and restoration of habitat structure in existing open-water habitat

Willamette River habitat restoration:

Existing Conditions
Situated in front of residential towers on the banks of the Willamette River, this riparian site in Portland’s South Waterfront district was dramatically altered by industry after World War II. Over time, 20 to 30 feet of industrial fill was added to the area, moving the riverbank 150 feet into the river. The site’s riverbank was covered in concrete rubble, degrading fish habitat.

Partnership Strategy
The PMLRT project worked with the City of Portland to identify the best use of the allotted mitigation funds related to the multi-modal transit bridge’s construction. The city identified a partnering opportunity with their project for restoration of shallow water habitat at South Waterfront.

Resulting Improvements
Aided by $1 million in construction mitigation funds from the PMLRT project, the City of Portland cleaned and replanted more than one acre of riverbank to create 25,500 square feet of restored riparian habitat. Modeled after similar undisturbed riverbanks nearby, the riverbank restoration recreates the shallow sloping gravel bar that likely existed in the area before development. An innovative retaining wall design includes protected riparian planting pockets for native vegetation and ensures future erosion will not impact the public spaces above the habitat restoration area.

The shallow sloping beach is covered with natural river gravel and rounded rock to provide a refuge for juvenile salmon from predatory fish such as bass. The shallow beach area also provides a lower velocity zone that accumulates natural woody material, key to salmon restoration efforts. An urban park, and pedestrian and bike paths will be built on a cap of clean soil at the western edge of the greenway.

The existing bank is being transformed into a densely planted healthy riparian buffer that slows and cleans water runoff, provides shade, and encourages insects, which are food for salmon. Native plants appropriate to this section of the Willamette River such as willow, alder, big leaf maple, native rose, spirea and dogwood will be added, with some plants derived from cuttings of nearby plants to reproduce the surrounding nature as closely as possible.

SE Park Avenue Park & Ride:

Existing Conditions
Prior to the PMLRT project, the SE Park Avenue Station and Park & Ride site was in a state of environmental disrepair. A severely degraded riparian forest stood southwest of the station, the site was rife with invasive plant species and there was minimal stormwater runoff management.

Partnership Strategy
The project obtained grant funding from Metro’s Nature in Neighborhoods program and an Oregon Department of Transportation stormwater treatment program. The project collaborated with the environmental non-profit Urban Green and the local community to leverage this funding into sustainable, innovative design elements for the Park & Ride project.

Resulting Improvements
The Park & Ride project dedicates 68 percent of its footprint to new and improved habitat. Invasive vegetation will be replaced by native plants and a variety of native habitats. New stormwater runoff facilities will treat and manage stormwater flows from the adjacent multi-use path and highway. Stormwater runoff will also be collected directly from the new Park & Ride structure. The garage will include a secure, enclosed Bike & Ride facility with 73 bike parking spaces and six electric vehicle charging stations. A signature feature of the Park & Ride will be the building’s solar array on its roof. This array will provide enough energy to offset annual energy use for basic building functions like the elevator and lighting.

The ecosystem restoration project will create a connected and thriving habitat corridor integrated with the multi-modal transportation network to provide a unique amenity for the community.
Conclusion

Leveraging partnerships to build the region’s fifth MAX light rail line is essential to the project’s long-term success. Working collaboratively and creatively with the local community to establish public and private partnerships within the project area made it possible to manage growth and build livable communities and assist those communities to envision and achieve their aspirations.

In addition to expanding the MAX system to 60 miles and 97 stations, the 7.3-mile PMLRT project will build transit capacity to support the projected growth of one million new residents in the region by 2030. Combining infrastructure improvements, quality design features and new transit-oriented development along the alignment will connect neighborhoods, encourage cycling and walking, and create engaging public spaces.

The redevelopment of neighborhoods along the alignment will bring new opportunities for commercial and residential properties, allowing for the development of transit-oriented communities. Similarly, the investment of more $40 million in freight movement will improve connections into freight hubs that were previously congested and lacked key bicycle and pedestrian network elements.

The PMLRT project’s investment of $40 million in active transportation will support car-free commuting while encouraging healthy communities of cyclists and walkers. The improvements to sidewalks, crosswalks and other bike and pedestrian amenities from downtown Portland to north Clackamas County will make connections to the project’s stations easier and safer.

Finally, the project’s sustainability initiatives are improving the existing environmental conditions through collaborations with project partners while creating new efficient systems, such as stormwater treatment at the SE Park Avenue Park & Ride. When the PMLRT project opens in September 2015, it will be a model for projects that not only want to build new transit infrastructure, but also want to provide communities with opportunities to realize their aspirations and transform themselves.