

## Exhibit C

### Final Engineering Recommendations

The City Council requests that the Portland to Milwaukie Light Rail Transit Project (PMLRT) prepare an updated Conceptual Design Report, in collaboration with the Portland Bureau of Transportation (PBOT), to be reviewed by the Portland Design Commission, Planning Commission, Portland Development Commission (PDC) and City Council prior to the completion of the final engineering phase of the project. The report should address and resolve the following issues and opportunities:

#### A. General Recommendations

##### 1. Willamette River Crossing:

- a) Coordinate with PBOT, the Bureau of Planning and Sustainability (BPS), PDC, the Bureau of Environmental Services (BES), Office of Healthy Working Rivers (OHWR), Bureau of Development Services (BDS) and the Bureau of Parks and Recreation (Parks), on the bridge design and associated impacts to the Willamette Greenway, water quality and wildlife habitat and mitigation of associated impacts. Continue to use the Streamline Permit Process for preliminary bridge design and permit uses.
- b) Coordinate with Portland Water Bureau (PWB) to address the vulnerability of the submerged Marquam Crossing waterline to damage resulting from settlement and scouring related to the installation of pile driven piers and cofferdam members from construction activities of the new bridge.
  - i. Prepare an analysis of impacts if the submerged Marquam Crossing waterline is damaged during installation of temporary construction bridge supports, and permanent transit bridge supports. Include a plan to minimize risk to the submerged waterline that includes the potential impact of relocating the submerged Marquam Crossing waterline out of the bridge construction zone.
  - ii. Consult with the Portland Harbor Master to secure written permission for the proposed Willamette Transit Bridge to be constructed within 200' of the submerged waterline in accordance with City Code 19.16.355, Protection of Water Mains prior to notice to proceed for in-water work. Coordinate with the PWB engineering staff to obtain bureau support prior to submitting request to the Harbor Master.
- c) Coordinate with the Office of Neighborhood Involvement to initiate a public process to establish a name for the bridge that celebrates its addition to the City of Portland.

##### 2. Harbor Drive Crossing

- a) Coordinate with BPS, PBOT and PDC on the design of the elevated structure that crosses over SW Harbor Drive, under the I-5/I-405 ramps and into the South Waterfront District.
  - i. Acknowledge the prominent visual and gateway location of the structure through its design.
  - ii. Coordinate with BPS, BDS and PBOT to visually link the structure to its urban context through consideration of sculptural elements, the concrete

forms, the column shape and design of edge treatments, and the catenary/lighting poles.

3. Station Development Strategies: Coordinate with the Station Area Planning provided by the City of Portland to develop comprehensive station development strategies for stations located in the City of Portland and coordinate with the Portland Plan and Central City 2035 Plan.
  - a) Continue to partner with OHSU, PSU, OMSI and PDC to develop the Innovation Quadrant station strategies
  - b) Support the City of Portland with the Station Area Planning for the OMSI, Clinton, Rhine and Holgate stations and affected CEIC planning area
  - c) Continue to partner with the City of Portland to optimize the station development strategies for the Bybee and Tacoma stations
4. Bus Routing with Fixed Rail Transit Service: Re-evaluate radial bus services to downtown from southeast and southwest Portland. Consider community transit service needs while taking advantage of the PMLRT, Eastside Streetcar Loop, Lake Oswego to Portland transit project, and the new Sellwood Bridge.
  - a) Minimize overlapping bus routes closer to the Central City where possible
  - b) Examine new cross town bus service between southeast and southwest Portland (i.e. Tacoma)
  - c) Examine north Portland and northeast Portland bus routes that would achieve similar outcomes (previously recommended as part of the Interstate MAX Project).
5. Work Force Plan: Work collaboratively to support and incorporate TriMet's and PDC's work force diversity goals to foster apprenticeship training, maximize training opportunities and increase recruitment and retention of women and minorities involved with the construction of the project.
6. Property Impacts: Minimize impacts to existing businesses and properties along the corridor. Work with PDC toward the goal that businesses impacted by property acquisition are relocated within the City of Portland.
  - a) Consider future economic viability of impacted sites in project design
  - b) Minimize right-of-way acquisitions
  - c) Minimize loss of on-street parking
  - d) Minimize loss of access to properties
7. Bicycle and Pedestrian access: Provide adequate pedestrian and bicycle access to the stations, neighborhoods and to the river. Integrate PMLRT stations to the adjacent areas by providing direct access, adequate sidewalks, lighting, signage, street crossings, and place-specific station design elements while ensuring that the transit platforms and stops are clearly identifiable as part of the regional transit system. Public art should be considered as an element to support bike and pedestrian access.
  - a) Continue working to resolve bicycle conflicts along the alignment and optimize potential for improved bike and pedestrian connections from adjacent neighborhoods to station areas
  - b) Explore opportunities to include additional bicycle and pedestrian facilities in the project to support improved access to LRT stations.
  - c) Support the development of a multiuse path along the entirety of the alignment as part of final design with consideration of the goals articulated under item 6 above.

- d) Identify locations for future bike parking at stations in addition to the current project scope for future expansion.

#### 8. Public Utilities

- a) Specific impacts to the City of Portland water system were identified during the PE phase, although the final proposed mitigation for those impacts will be completed during the final engineering phase. 100% of the water utility relocations costs shall be paid by the PMLRT project, and:
  - i. The Project should coordinate with PWB to identify impacts to the public water system, and provide mitigation in accordance with the PWB Electric Rail Standards.
  - ii. Large transmission and supply mains shall be relocated out of proposed light rail track way or replaced with new DI/Steel pipe with Steel Casing per the PWB Electric Rail Standards.
  - iii. The Project will build a protective structure overtop of, provide concrete supports, and install required cathodic protection for the 60" Washington County Supply Line where it will be crossed by the Light Rail Tracks at SE Reedway St.
  - iv. TriMet will coordinate PMLRT construction schedules to ensure no concurrent downtime of PWB Westside supply waterlines.
- b) Impacts to the City of Portland stormwater and sanitary sewer system were also identified during the PE phase. Per agreement between TriMet and BES, the PMLRT project will cover 100% of the expenses for sewer utility relocation, lateral replacement, providing alternate access for sewers where access will be hindered by the rail and facilities, and modifying sewers as necessary for the increased loading or lack of accessibility for maintenance. BES will be responsible for the incremental cost of sewer upsizing where required. PMLRT and BES have preliminarily identified and concurred on these impacts and the final mitigation will be completed during the final engineering phase.

#### 9. Greenway Connections

- a) On the west side of the Willamette River, TriMet should coordinate with BPS, PBOT, Parks, BES, PDC, Office of Healthy Working Rivers (OHWR) and Bureau of Development Services (BDS) to create a Development Agreement providing partial funding, (amount to be determined), for design and construction of the future greenway trail and greenway trail connections from the new transit bridge to the proposed Willamette River Greenway.
  - i. TriMet should coordinate with ZRZ remediation design to achieve future vertical clearance under the bridge of no less than 15 feet.
- b) On the east side of the Willamette River, TriMet should coordinate with BPS, PBOT, Parks, and BDS to design and build, in collaboration with OMSI, a temporary path connection and permanent stairs from the bridge to the existing greenway on the north side of the bridge. The temporary path should be suitable for both bicycle and pedestrian use. Enhancements to, and realignment of, the temporary north side path connection could be made permanent by OMSI as part of OMSI's future development.
  - i. Coordinate with BPS, PBOT, Parks, and BDS to create a safe and desirable south side connection from the bridge to the existing greenway via SE Water Ave and SE Caruthers St. Continue to evaluate the viability of adding a stair connection on the south side of the bridge to provide direct pedestrian access.

- ii. The east side greenway detour during construction of the improvements to the greenway under the new bridge shall be approved in advance by Parks through the Non-Park Use Permit (NPUP) process and meet Parks and PBOT design standards for trail design, notification, signage, and outreach requirements.

10. Public Art

- a) TriMet's Art Program will work in collaboration with project partners, the Regional Arts and Culture Council, the Clackamas County Arts Alliance and the communities along the alignment with regards to public art.
  - i. Explore creative incorporation of art along the alignment at stations as well as beyond station locations.

11. City of Portland Review Process

- a) Develop, and review with City staff prior to the start of Final Engineering, a permits matrix listing project elements both within and outside of public ROW requiring permitting and land use actions.
- b) Obtain a CLOMR and LOMR from FEMA including all required analysis and notification.
- c) Ensure the project is evaluated using adopted Design and Greenway Review procedures which allow for staff and Design Commission examination and public comment opportunities.
- d) Ensure that the project complies with all applicable street standards including the South Waterfront Streetplan and the South Auditorium Streetlight Standard, except where changes are approved through processes outlined above (if applicable).

12. Deferred Improvements from Transit Mall

- a) Ensure that the following outstanding components of the Portland Mall Revitalization Project move to completion as the focus shifts to the South Corridor project:
  - i. The construction of the LRT stations on SW 5<sup>th</sup> and 6<sup>th</sup> at Jackson
  - ii. The installation of second shelters at each station along SW 5<sup>th</sup> Avenue

13. Sustainability

- a) The Project should collaborate with BPS on its sustainability plans and criteria that indicate how TriMet will evaluate, and when appropriate, incorporate sustainable practices in the design and construction of the PMLRT project. Elements for consideration include: reuse of materials from the careful dismantling/deconstruction demolition of buildings; waste management practices that enable reuse and recovery of construction materials; incorporation of storm water plantings, vegetation and trees; reduced energy consumption; alternative power through renewable energy sources; and low-emission vehicles and equipment.

14. SE Portland Quiet Zone

- a) Continue to refine the designs at shared rail crossings to include the supplemental safety measures in project design and construction that will be required for the City of Portland to implement a Quiet Zone for crossings between SE 8<sup>th</sup> Avenue and SE Gideon. TriMet is the lead in acquiring ODOT Rail crossing permits for these crossings and will submit draft crossing order applications prior to the start of Final Design. TriMet will support the City of

Portland application requesting FRA designation of a Quiet Zone for these crossings.

15. Environmental Mitigation

- a) Continue working closely with PDC, Parks, BES, BDS and BPS on elements of a development agreement that address impacts and mitigation to the greenway, including in water impacts, along Willamette River.
- b) Continue excellent coordination with Parks, BDS and BES on mitigation at Westmoreland Park for the Crystal Springs impacts.
- c) Coordinate appropriate mitigation for impacts at Johnson Creek for the stream crossing at Johnson Creek including riparian vegetation, floodplain, stream tile removal (WPA tile), and stormwater.

15. Project Shelters and Furnishings

- a) Consider incorporating additional weather protection to supplement station shelters
- b) Consider incorporating additional seating at stations, bridge viewpoints, and trail connections.
- c) Consider the use of graffiti-resistant materials and paint in project.
- d) Evaluate garbage receptacles that better separate recyclable materials.

**B. Station Recommendations**

1. Specific Stations

a) SW Lincoln Street/RiverPlace Station Area

- i. Coordinate station design with PDC development plans for the adjacent properties.
- ii. Consult with PDC and Design Commission on design of elevated structure between Naito and Sheridan to ensure that the alignment preserves the aesthetic qualities of the Harbor Drive gateway, supports future development on adjacent parcels, and enhances pedestrian connections in the area.
- iii. Coordinate with BPS, PBOT and BDS to replace street trees and landscaping in a manner which reestablishes a new, but green character for the Project elements within the Halprin district.
- iv. Support alternative pedestrian and bicycle facilities to connect the South Waterfront and South Auditorium districts as an alternative to providing facilities on the Harbor Structure.
- v. Accommodate the development of a future multiuse path beneath the LRT Harbor Bridge structure from SW Sheridan to SW River Parkway.
- vi. Coordinate with BPS, PBOT and the Design Commission to evaluate unique transit shelters and furnishing designs that complement the Halprin District character.

b) South Waterfront Station

- i. Continue to support the City of Portland efforts to develop the North District of South Waterfront per the North District Partnership.
- ii. Construct project improvements at the location of the future SW Bond Street anticipating the future street ROW standards and to minimize demolition of project elements and disruption of transit service necessary for future intersection construction.

- iii. In coordination with the City of Portland's Moody Reconstruction Project, evaluate the traffic operations of the SW Moody and SW Porter intersection to ensure that traffic operations are acceptable to the City Engineer and the design does not create an unreasonable capacity constraint on transit or motor vehicle travel.
- iv. Coordinate Project design, construction planning, and construction with the SW Moody Reconstruction Project. Identify and pursue shared facilities that will mutually benefit both projects and result in net cost savings.
- v. Evaluate the possibility of the Project utilizing a shared stormwater facility adjacent to SW Moody above the Southwest Parallel Interceptor (SWPI).
- vi. Continue to coordinate with the City of Portland to refine the South Waterfront Willamette Greenway Plan to reflect the light rail alignment and design modifications to accommodate the light rail project while preserving the overall goals of the Plan, including pedestrian and bicycle connections to the Willamette Greenway and potential locations for a water taxi stop.

c) OMSI Station

- i. Continue to support the design, construction planning and construction of relocated SE Water Avenue and OMSI district plans to provide safe and clear multimodal connections through the area.
- ii. Continue to support the relocation of the Oregon Rail Heritage Foundation into the district.
- iii. Support examination and consideration of multi-modal access and circulation needs for the Central Eastside area and for potential redevelopment adjacent to light rail stations

d) Clinton Station

- i. Conduct traffic signal analysis of the PMLRT crossing with SE 11<sup>th</sup> and SE 12<sup>th</sup> to ensure that traffic operations acceptable to the City Traffic Engineer can be maintained. Evaluate signal system and roadway design alternatives that will maintain vehicular capacity and minimize traffic diversion on other facilities.
- ii. Coordinate with BPS and PBOT to re-evaluate the platform location at 150' east of SE 12<sup>th</sup> Street. The City desires the platform be moved closer to SE 12<sup>th</sup> Avenue to create a more urban, dynamic station area.
- iii. Coordinate with BPS, PBOT to evaluate the stairway and elevator system proposed for the pedestrian overpass location at the station (SE 14<sup>th</sup> Avenue), the current location (SE 16<sup>th</sup> Avenue), or some other option if feasible
  - a. The pedestrian overpass should reflect the future station area development potential
  - b. Explore design options with less bulk and mass and switchbacks than the series of ramps proposed in the 30% Design drawings
  - c. Consider travel times, overall connectivity and redevelopment potential as part of location evaluation
- iv. Coordinate with BPS, PBOT and BDS to evaluate additional design treatments at the SE 8<sup>th</sup> Avenue and SE Division rail crossing that draw attention to the importance of SE Division as a corridor connecting Portland neighborhoods to the river.

- v. Continue to explore opportunities to implement a continuous multi-use path between SE Gideon and the OMSI station as part of LRT construction.
- vi. Until the funding can be found to construct the improvements to the bike/pedestrian path between SE 9<sup>th</sup> and SE Milwaukie, the busway should not preclude bicyclist's use.
- vii. Investigate alternative bus and bike routing alternatives that controls or eliminates the bus and bicycle conflict on the designated bike ways on SE 9<sup>th</sup>, between SE 9<sup>th</sup> and 11<sup>th</sup> Avenues, and at the intersection of SE 9<sup>th</sup> and SE Division PL.

e) Rhine and Holgate Stations

- i. Coordinate with BPS, PBOT and ODOT to design Powell Boulevard overpass improvements that improve the safety and usability of the facilities and reflect the context of adjacent neighborhoods and land uses
- ii. Coordinate with BPS and PBOT to evaluate east/west pedestrian crossings on SE 17<sup>th</sup> Avenue to ensure that the adequate amount of crossings are provided and located where convenient for neighborhood pedestrian connectivity.
- iii. Coordinate with BPS, PBOT to evaluate possible enhancements to the pedestrian/bicycle connections between Milwaukie Avenue and the Holgate Station that can be implemented as part of the project.
- iv. Evaluate alternative ramp design for the Lafayette pedestrian bridge to reduce the number of switch backs, bulk and mass of the structures.
- v. Design sidewalks and vehicle lane widths on SE 17<sup>th</sup> and SE Holgate to comply with PBOT standards for sidewalk dimensions, with exceptions where necessary and with PBOT approval.
- vi. Develop a replacement parking plan for the TriMet employee parking lots impacted by project construction to minimize the potential for TriMet employee parking to impact on-street parking in the neighborhood.

f) Harold Station

- i. Coordinate with PBOT and BPS staff to develop a schematic design and cost estimate for the elevated Harold station platform and the Harold bridge structure that includes direct connections to east and west via pedestrian and bicycle bridges.
- ii. Coordinate with PBOT and BPS staff to develop a schematic design of the Harold station area infrastructure with aesthetic treatments appropriate for the area.
- iii. Continue to work with PBOT, BPS and adjacent community members on defining the future changes in land use and development character that would trigger a station.
- iv. Coordinate with PBOT and BPS to pursue funding opportunities, including federal active transportation programs, to provide an east-west pedestrian connection along SE Reedway Street from Reed College to Westmoreland that could support a future station.

g) Bybee Station

- i. Coordinate with the BES and Parks on the water quality and habitat impacts and mitigation of associated impacts of the Crystal Springs stream crossing.
- ii. Coordinate with BPS and PBOT to design with maximize visibility the station platform to increase the sense of safety, especially at night.
- iii. Coordinate with BPS and PBOT to design more visible and accessible bicycle parking that encourages bike/transit modal transfers.
- iv. Coordinate with BPS and PBOT to integrate station lighting to provide a safe nighttime environment on the platform and bridge and design it to be a defining feature of the station.
- v. Consult with the Portland Design Commission on any changes to the Bybee bridge structure to ensure that proposed LRT project modifications reflect the character of the bridge and surrounding neighborhood.

h) Tacoma Station

- i. Continue to explore opportunities for redevelopment of the site, in addition to the park-and-ride structure, and joint development opportunities with adjacent properties.
- ii. Coordinate with BPS and PBOT to refine the final Park and Ride design through material selection, screening, lighting and artwork.
- iii. Coordinate with BPS and PBOT to consider opportunities to design and incorporate direct pedestrian access from the west side of McLoughlin (i.e. through a pedestrian bridge connecting to an upper level of the parking structure).
- iv. Coordinate with BPS and PBOT to consider solar panels and electrical vehicle charging stations.
- v. Coordinate with Parks' effort to add stairway connections between McLoughlin Boulevard sidewalks and Springwater Corridor, in order to enhance pedestrian connectivity.
- vi. Continue to coordinate with PBOT, ODOT and adjacent neighborhood residents on the final package of transportation improvements to SE Johnson Creek Boulevard, SE Tacoma and SE McLoughlin required to mitigate the addition of the Tacoma Park & Ride.
- vii. Explore, in coordination with BES and other stakeholders, innovative stormwater management for the Tacoma parking structure such as ecoroofs or greenwalls.
- viii. Evaluate the design alternatives to connect the park and ride with future bus and streetcar service on SE Tacoma.