



ENVIRONMENTAL ASSESSMENT

West Eugene EmX Extension Project

July 2012

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WEST EUGENE EMX EXTENSION EUGENE, OREGON

ENVIRONMENTAL ASSESSMENT Bus Rapid Transit System for the West 11th Avenue Corridor

Prepared in Accordance with the
National Environmental Policy Act of 1969, as amended
42 U.S.C. 4332
and the
Federal Transit Act of 1964, as amended
49 U.S.C. 1601 eq. seq.

by the Federal Transit Administration
U.S. Department of Transportation



in cooperation with
Lane Transit District



7/9/12

Date of Approval

A handwritten signature in black ink, appearing to read "R.F. Krochalis".

R.F. Krochalis, Region X Administrator
for the Federal Transit Administration

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FACT SHEET

Environmental Assessment

West Eugene EmX Extension

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Abstract

The West 11th Avenue Corridor is the primary east/west transit travel corridor linking the west side of Eugene to downtown Eugene. The West Eugene EmX Extension project proposes to extend bus rapid transit (BRT) service from the Eugene Station in downtown Eugene through the West 11th Avenue Corridor to a proposed terminus station at Commerce Street. The corridor contains several major employment centers, significant commercial development, a growing residential population, and natural resources. Despite the current economic conditions, the West 11th Avenue Corridor remains an important element of local and regional land use plans that emphasize nodal and mixed-use development, all aimed at maintaining and improving the area's economic vitality and livability.

Lane Transit District (LTD) has named its BRT system EmX, short for Emerald Express. This rubber-tired transit system uses a combination of transit lanes, guideways, and traffic priority measures to provide high frequency, fast service that emulates light rail in several respects. BRT was adopted as the preferred strategy for the Eugene-Springfield metropolitan area following an extensive Major Investment Study and subsequent Regional Transportation Plan (RTP) (adopted in 2001). BRT continued to be supported in the 2004 and 2007 updates of the RTP. The West Eugene EmX Extension would be the third BRT corridor to be implemented in the metropolitan area.

Earlier technical analyses for this study evaluated a No-Build Alternative; a Transportation System Management (TSM) Alternative (consisting of non-capital improvements); and a BRT Alternative (consisting of 56 different BRT routing combinations). Environmental screening and early coordination efforts with the public and agencies helped to define the proposed project alternatives, eliminate non-viable alternatives, develop and select a Locally Preferred Alternative, and identify potential effects of the proposed action in the West 11th Avenue Corridor. This document applies more detailed analysis to the No-Build and the Locally Preferred alternatives.

Comments

Written comments on this document **must be received by Wednesday, August 29, 2012** and should be submitted to Lane Transit District at:

U.S. mail:

Lane Transit District

c/o West Eugene EmX Extension Project – EA Comments

PO Box 7070

Springfield, OR 97475-0470

E-mail:

Put “EA Comments” in subject line and send to: we.emx@ltd.org

Information on public meetings related to this Environmental Assessment (EA) is available from LTD and at www.ltd.org. Chapter 12 of this EA lists documents supporting this EA and describes where to review them.

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This document analyzes, summarizes and presents a large volume of technical information prepared over the last several years. For readers who want to explore the technical details, Chapter 12 includes a complete list of reports, studies, and analyses and describes where they may be viewed. Those documents are incorporated by reference into this environmental assessment. While Lane Transit District is making available all of the background reports and studies, the documents listed below (organized by relevant EA chapter) are most likely to be of interest. These documents, and other technical reports identified in Chapter 12, are available (a) on a CD in a sleeve at the back of the paper version of the EA, (b) as separate files on the CD version of the EA, and (c) in the “Project Library” section of the LTD website (www.ltd.org).

EXECUTIVE SUMMARY

Appendix ES-1 Summary of Possible Impacts, Benefits, and Mitigation

CHAPTER 1 – INTRODUCTION

Appendix 1-1 LPA Report (July 2011)

Appendix 1-2 LPA Recommendations, Approvals and Resolutions

Appendix 1-3 Alternatives Analysis Report (July 2011)

CHAPTER 2 – DEFINITION OF ALTERNATIVES

Appendix 2-1 Conceptual Design Plan Set for the LPA (August 2011)

CHAPTER 3 – AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES

- Appendix 3-1 Summary of Proposed Acquisitions by Tax Lot Number
- Appendix 3-2 LTD EmX Property Impacts Analysis Technical Report
- Appendix 3-3 Noise Impact Assessment Report
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- Appendix 3-5 Archaeological Resources Concurrence Letter from SHPO
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- Appendix 3-7 Section 4(f) De Minimis Impact Evaluation for Historic Properties
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CHAPTER 4 - TRANSPORTATION

- Appendix 4-1 Motor Vehicle Transportation Technical Report (Part I)
- Appendix 4-2 WEEE Transit Travel Time Methodology Memorandum

CHAPTER 5 – COST ESTIMATES AND FINANCE

- Appendix 5-1 Long Range Financial Plan (February, 2011)
- Appendix 5-2 Long Range Financial Plan (April, 2012)
- Appendix 5-3 Project Development Approval Letter from FTA

CHAPTER 7 – PUBLIC AND AGENCY INVOLVEMENT

- Appendix 7-1 Public Involvement Plan
- Appendix 7-2 Coordination Plan
- Appendix 7-3 Notice of Intent
- Appendix 7-4 FTA EA Determination Letter

Acronyms and Abbreviations

AA	Alternatives Analysis
AAI	All Appropriate Inquiry
ADA	Americans with Disabilities Act
AEO	Annual Energy Outlook
APE	Area of Potential Effect
API	Area of Potential Impact
BAT	Business Access and Transitway Lane
BMP	Best Management Practices
BRT	Bus Rapid Transit
CO	Carbon Monoxide
COGP	County Government Grant Program
Corps	U.S. Army Corps of Engineers
dB	Decibel
dBA	A-weighted decibel
DBE	Disadvantaged Business Enterprise
DEQ	Oregon Department of Environmental Quality
DOT	Department of Transportation
Draft EIS	Draft Environmental Impact Statement. Also referred to as DEIS.
DSL	Oregon Department of State Lands
EA	Environmental Assessment
EIS	Environmental Impact Statement
EJ	Environmental Justice
EmX	Emerald Express, Lane Transit District's Bus Rapid Transit System
EPA	U. S. Environmental Protection Agency
ESA	Endangered Species Act or Environmental Site Assessment
EWEB	Eugene Water and Energy Board
FEMA	Federal Emergency Management Agency
FHWA	Federal Highway Administration
Final EIS	Final Environmental Impact Statement. Also referred to as FEIS.
FTA	Federal Transit Administration
FY	Fiscal Year
HGM	Hydro-geomorphic
ISTEA	Intermodal Surface Transportation Efficiency Act
JLPAC	Joint Locally Preferred Alternative Committee
LCOG	Lane Council of Governments
L _{dn}	Day-night Sound Level
L _{eq}	Equivalent Sound Level

LGGP	Local Government Grant Program
L_{max}	Maximum Sound Level
L_{min}	Minimum Sound Level
LOS	Level of Service
LPA	Locally Preferred Alternative
LRAPA	Lane Regional Air Protection Agency
LRFP	Long-Range Financial Plan
LTD	Lane Transit District
LUST	Leaking Underground Storage Tank
LWCF	Land and Water Conservation Fund
MetroPlan	Eugene-Springfield Metropolitan Area General Plan
MOE	Measures of Effectiveness
MPC	Metropolitan Policy Committee
Mph	Miles per hour
MPO	Metropolitan Planning Organization
NAAQS	National Ambient Air Quality Standards
NAC	Noise Abatement Criteria
NEPA	National Environmental Policy Act
NHPA	National Historic Preservation Act
NHRP	National Register of Historic Places
NO_2	Nitrous Dioxide
NO_x	Nitrous Oxides
NOI	Notice of Intent
NPS	Department of Interior's National Park Service
NRHP	National Register of Historic Places
O_3	Ozone
O&M	Operations and maintenance
OAR	Oregon Administrative Rule
ODFW	Oregon Department of Fish and Wildlife
ODOE	Oregon Department of Energy
ODOT	Oregon Department of Transportation
OHP	Oregon Highway Plan
PEM	Palustrine Emergent Wetland
PM	Particulate matter
PM_{10}	Particulate matter – 10 microns in diameter
$PM_{2.5}$	Particulate matter – 2.5 microns in diameter
PPE	Personal Protective Equipment
Ppm	Parts Per Million
ROW	Right-of-Way

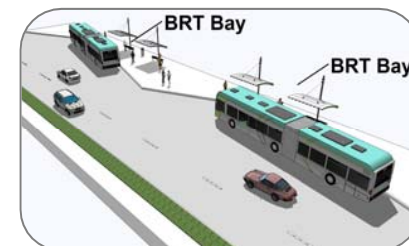
RTP	Central Lane Metropolitan Planning Organization Regional Transportation Plan (adopted December 2004). (The RTP includes the Financially Constrained Roadway Projects List)
SCC	Standard Cost Categories
SHPO	Oregon State Historic Preservation Office
SO ₂	Sulfur Dioxide
STA	Special Transportation Area
TDM	Transportation Demand Management
TESCP	Temporary Erosion and Sediment Control Plan
TMDL	Total Maximum Daily Load
TransPlan	Eugene-Springfield Transportation System Plan (adopted 2001)
TPAU	Department of Transportation – Transportation Planning Analysis Unit
TRP	Transportation Planning Rule
TSM	Transportation System Management
UGB	Urban Growth Boundary
USFWS	U.S. Fish and Wildlife Service
VMT	Vehicle Miles Traveled
VOCs	volatile organic compounds
WEEE	West Eugene EmX Extension
YOE	Year of Expenditure

WHAT IS BUS RAPID TRANSIT (BRT)?

BRT emulates light rail’s dedicated right-of-way, efficiency, and reliability without the capital cost of an expensive rail system, and with the advantages of a regular bus system’s flexibility and lower operating cost. The West Eugene EmX Extension would be LTD’s third BRT line.

This document uses the following terms to describe BRT elements typically implemented by LTD.

- **BRT Bays (and Double Bays):** BRT bays are pullout areas specifically designed to allow BRT buses to pick up and drop off passengers without blocking other traffic in the station area. Double bayed stations are simply stations containing two bus bays.
- **BRT Bus Lanes:** BRT is flexible enough to operate in a variety of physical environments; however, to better support rapid, reliable service, with convenient boarding and alighting, BRT *priority lanes* (bus lanes shared with other traffic) and *dedicated lanes* (BRT-only lanes), also called *transitways*, are preferred. “BRT bus lanes” can refer to either or both of these arrangements.
- **Business Access and Transitway Lane (BAT Lane):** A BAT lane is a kind of BAT-priority lane that provides BRT priority, but lets general-purpose traffic use the lane to make a turn into or out of a driveway or at an intersecting street.
- **BRT Stations:** Farther apart than local bus stops, BRT stations include permanent, architecturally significant shelters and raised platforms. They are well-lit, safe and secure, have unique EmX identity, include passenger amenities (seating, bike parking, real-time passenger information), are easily accessible to all users, and are sited to connect easily with non-BRT bus service.
- **BRT Station Pairs:** A BRT stop may be served by two stations located in the same area, providing incoming and outgoing service. Paired stations can be located on opposite sides of the roadway (curbside platform) or on opposite sides of a median (double-sided center platforms).
- **BRT Vehicles:** BRT systems like LTD use unique branded vehicles that are designed to allow rapid passenger loading and unloading, with front and rear doors on both sides of the bus, on-board bike storage, and quick wheelchair accommodation and securement.



BRT Bays (and Double Bays)



BRT Stations



BRT Vehicles



Business Access and Transitway Lane (BAT Lane)

- **Frequent, Reliable Service:** BRT systems like EmX feature frequent, all-day service. The routes are direct, easy to understand, and minimize the need for transfers. BRT services are integrated with existing local bus services.
- **Level Boarding:** Station platforms are typically level with the bus floor to speed passenger boardings and enhance accessibility.
- **Off-Vehicle Fare Collection:** All station platforms include automated ticket machines that let passengers pay their fares before boarding the bus; BRT further reduces wait times by allowing boarding through multiple doors.
- **Passenger Information:** BRT systems give passengers real-time transit arrival information on electronic display signs at stations and via audible and electronic boards on vehicles. These features give passengers useful information and also attract new riders by making the system easier to use and understand.
- **Queue Jump Lane:** This special roadway design gives preference to buses at intersections. It consists of a transit-only additional travel lane on the approach to a signalized intersection, usually accompanied by a signal that provides a phase specifically for the transit vehicles (see “transit signal priority”). Vehicles in the queue jump lane get a "head-start" over other queued vehicles and can therefore merge into the regular travel lanes immediately beyond the signal. The lane lets the higher-capacity vehicles jump to the front of the queue, reducing the delay caused by the signal and making the transit system more efficient.
- **System Identity and Image or Branding:** BRT systems use eye-catching logos and design to distinguish their service from regular bus service. This helps riders identify the BRT service and easily tell where and when it operates; studies also find that it helps draw new riders. A system can convey its identity through clearly and uniquely marked vehicles, signs, stations, graphics and even transitways.
- **Transit Signal Priority:** This traffic signal phasing technique speeds up BRT travel through intersections. As BRT vehicles approach signalized intersections, the bus is able to alter the signal phasing to receive a priority green light ahead of the green light phase for other traffic. (This is different from the automatic green light used only for emergency vehicles).



Level Boarding



Passenger Information



Queue Jump Lane



System Identity and Image or Branding

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EXECUTIVE SUMMARY

In 2007, the Eugene City Council and the Lane Transit District (LTD) Board of Directors selected West Eugene as the City's and LTD's priority for the next Emerald Express (EmX) bus rapid transit (BRT) corridor. The West Eugene EmX Extension (WEEE) project proposes to bring BRT to West Eugene by extending EmX from downtown Eugene through the West 11th Avenue Corridor to Commerce Street (Figure ES.1). This transportation investment will improve the transit network and support the City's goals to create a more livable community.

What is the WEEE project?

The WEEE Project will be an 8.8-mile (round trip) westerly extension of the highly successful Franklin/Gateway EmX BRT line (Figure ES.2). When the extension is complete, the EmX Line will link residential and commercial activity centers in the West 11th Avenue Corridor (the Corridor) with the region's two central business districts (Eugene and Springfield) and the region's two largest employers (the University of Oregon and Peace Health Hospital). The WEEE project will require construction of approximately 5.9 miles of BRT lanes and 13 new BRT stations or station pairs. Similar to the 24 existing BRT stations, the new stations will have level boarding, comfortable shelters, real-time passenger information, and fare-vending machines. As a part of the project, LTD will purchase seven new 60-foot articulated hybrid-electric BRT vehicles using a design and branding similar to its existing fleet of 11 BRT vehicles. Because LTD has existing excess capacity at its bus and BRT maintenance facility, the project will not include any expansion of its maintenance facility or storage yard. And because there will be adequate Park & Ride lot capacity within the corridor by the project's opening year (2017), the project will not need to expand the number or capacity of Park & Ride lots beyond what is otherwise planned.



Figure ES.1. Project Vicinity and BRT Network

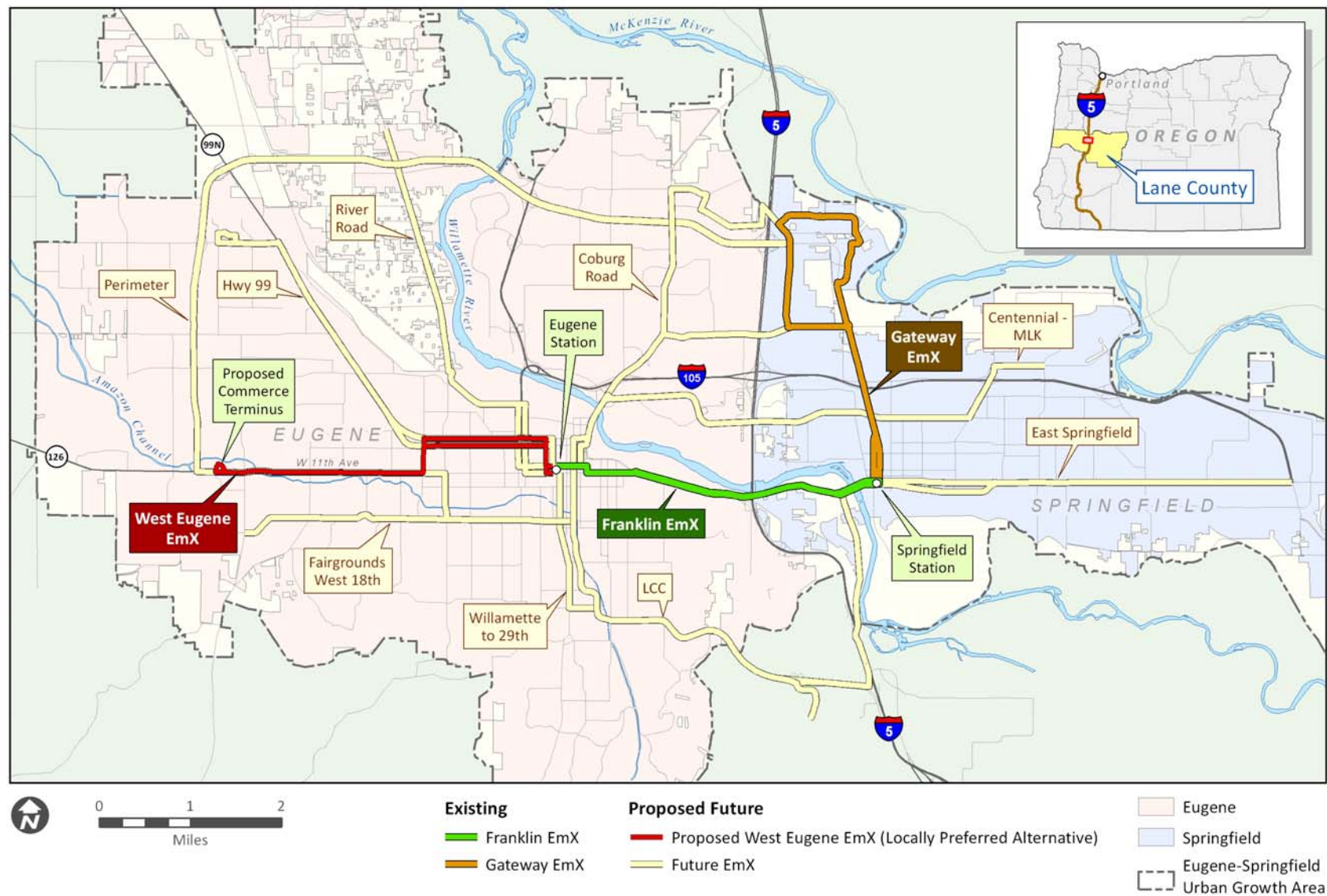
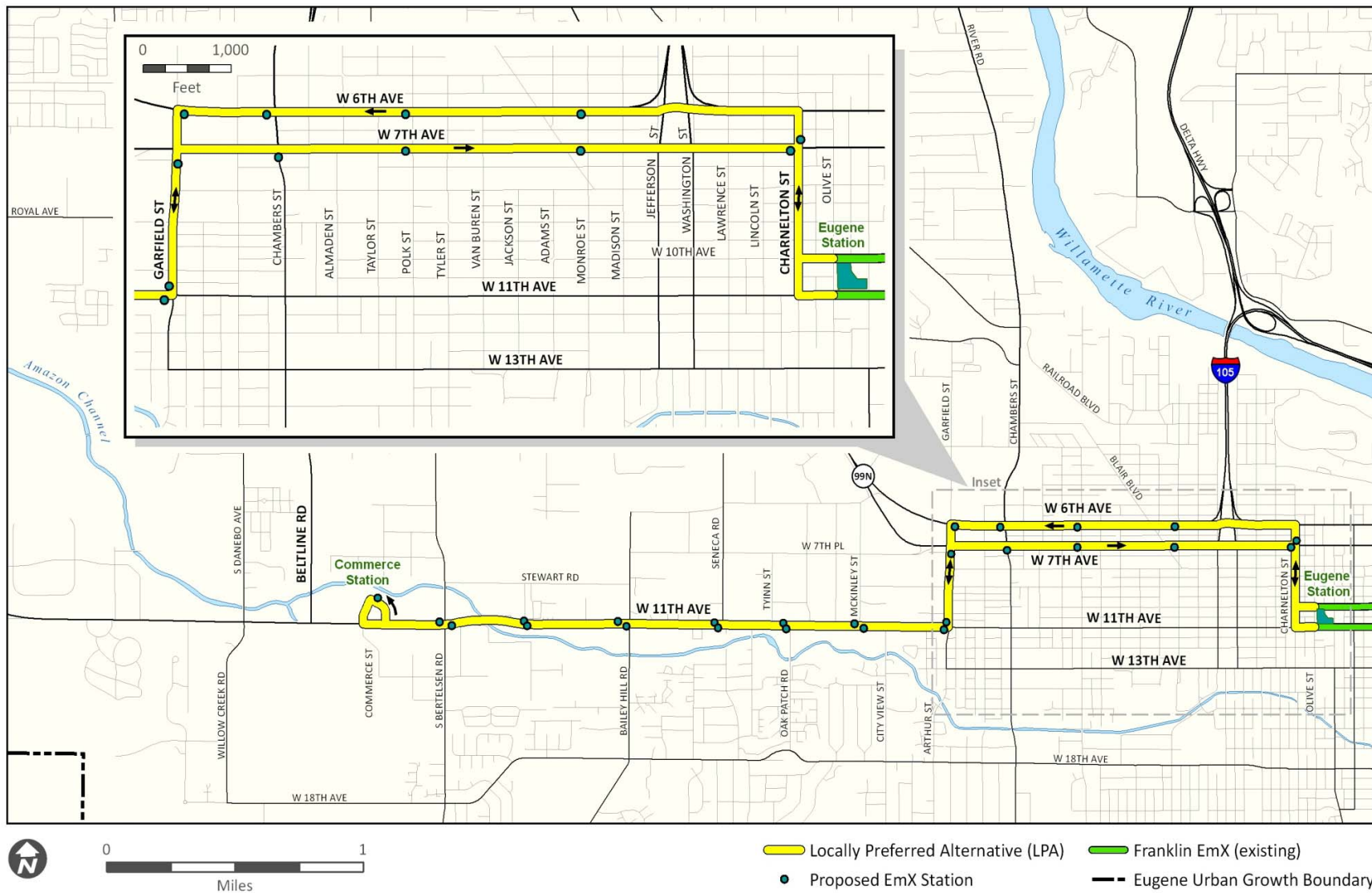


Figure ES.2. West Eugene EmX Extension Locally Preferred Alternative



Why is this environmental study being conducted?

Because LTD proposes to use federal monies to extend the EmX service into West Eugene, LTD is required to evaluate the potential negative (also referred to as adverse) and positive (also referred to as beneficial) effects (also referred to as impacts) of the proposed WEEE project and compare them to the option of taking no action. Two project alternatives – a No-Build Alternative and the Locally Preferred Alternative (LPA)¹ – were evaluated in a series of technical studies. This report, which is called an Environmental Assessment (EA), summarizes the findings from those studies. LTD prepared the EA in cooperation with the Federal Transit Administration (FTA), and it complies with the National Environmental Policy Act (NEPA) of 1969. FTA must consider the EA before it may decide whether to fund the construction of the project.

Why is this project needed?

As explained in detail in Chapter 1, the proposed WEEE project would implement high-capacity public transportation service in the West 11th Avenue Corridor using the bus rapid transit system identified in the adopted Regional Transportation Plan (RTP), extending the system's safe, efficient, effective, dependable, and visually appealing transit service to an important area.

The West 11th Avenue/Highway 126 route from Garfield Street west to the City of Veneta is a highly traveled corridor with a mix of business, residential, and recreational uses, ranging from commercial and office development in the east, to low-density residential development and commercial development in the west. The corridor serves as the gateway to the City of Eugene, the City of Veneta, and the Oregon coast. The existing roadway does not have adequate capacity to serve existing and long-term transportation needs. The inadequate road capacity causes



¹ The term Locally Preferred Alternative (LPA) also means the Preferred Alternative (PA), as used in NEPA and by the Council on Environmental Quality.

congestion during peak travel times, and without high-capacity transit, traffic-induced bus delays are common.

The Oregon Department of Transportation (ODOT) ranks the West 11th Avenue / Highway 126 Corridor (from West Garfield Street to the City of Veneta) 28th among the 50 worst surface transportation choke points in Oregon (TRIP, May 2010). The ODOT report explains that addressing choke points is critical to maintaining or improving safety, quality of life, mobility, travel times, environmental quality, and economic growth throughout the state.

LTD views the West Eugene EmX Extension as crucial to:

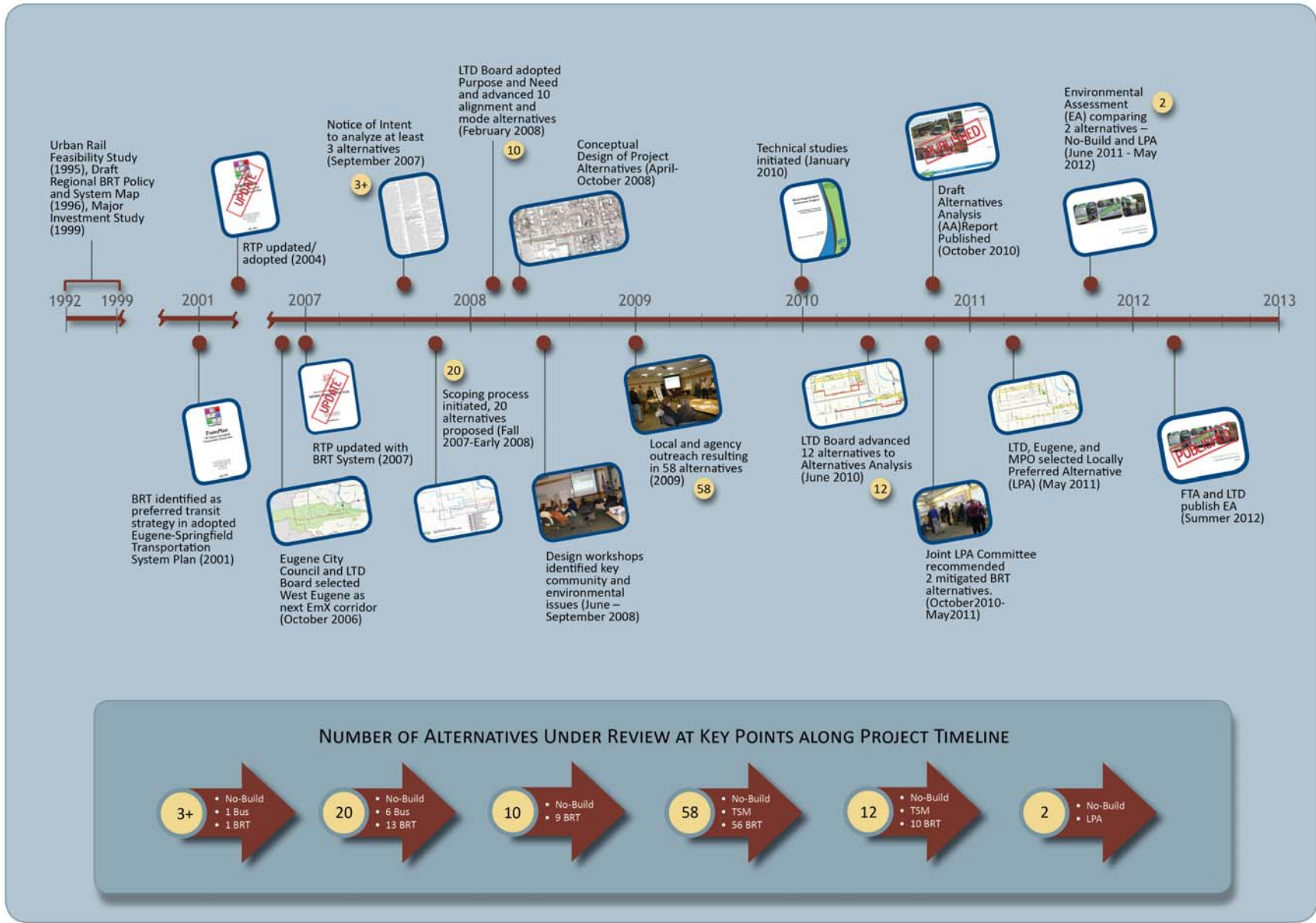
- Addressing the transportation and quality of life needs of the community.
- Addressing current and future operational challenges of the District.
- Building upon the success of the first two EmX corridors.

What alternatives were studied previously?

In 2007, the WEEE project started its Alternatives Analysis (AA) process with a relatively wide range of conceptual alternatives that considered how to extend transit service (that is, by bus or BRT) and where to extend the transit service through the Corridor (Figure ES.3). Over time, through public and agency feedback and environmental screening, the wide range of alternatives was reduced by eliminating those that were unfeasible or would result in too many negative impacts. The remaining alternatives were advanced to conceptual engineering refinement. In response to additional agency and public feedback about potential impacts, the range of design options combined with the project's four BRT Alternatives resulted in 56 unique routing combinations.



Figure ES.3. WEEE Project Alternatives – Background and Timeline



In early 2010, LTD conducted technical impact studies on the No-Build, Transportation System Management (TSM), and two BRT Alternatives (two bus alternatives plus the 56 unique BRT routing combinations). By June 2010, as a result of technical studies, LTD staff recommendations, public input, and advice from the Eugene City Council, the LTD Board eliminated 46 unique BRT routing combinations from further study. The No-Build and TSM Alternatives plus 10 BRT Alternatives (with design options) were then advanced for further consideration in a detailed AA.

Based on the findings of the AA Report (LTD, August 2011) and public and agency input, the project's three local decision-making bodies (Metropolitan Policy Committee, Eugene City Council, and LTD Board of Directors) eliminated the TSM Alternative and nine BRT Alternatives and selected one BRT alternative to advance for further study in this EA. The selected alternative is hereafter referred to as the Locally Preferred Alternative (LPA). Chapter 2 describes the alternatives development process and the alternatives themselves in more detail.

What alternatives are studied in this EA?

This EA builds on the results of the project's AA process and evaluates the transportation benefits, environmental impacts, and financial implications of two alternatives: the No-Build Alternative and the LPA.

The No-Build Alternative would include the region's existing transportation facilities, plus the capital improvements identified in the region's current RTP, with the exception of the planned extension of the existing EmX line into West Eugene.

The LPA would include 8.8 new route miles (round trip); 5.9 route miles of BRT lanes (and 2.9 miles of BRT in shared lanes); 13 new BRT stations or station pairs; and seven additional hybrid-electric BRT vehicles.



Chapter 3 Environmental Elements

- Land Use
- Socioeconomic Effects and Environmental Justice
- Noise and Vibration
- Air Quality
- Visual and Aesthetic Resources
- Historic, Archaeological, and Cultural Resources
- Park and Recreation Areas, and Section 4(f)
- Hazardous Materials
- Geology and Seismic Activity
- Biological Resources and Endangered Species
- Wetlands and Waters of the State and U.S.
- Water Quality and Hydrology
- Utilities
- Energy and Sustainability
- Street and Landscape Trees
- Construction Activities and Consequences
- Cumulative Effects

Would there be any significant environmental impacts from the proposed WEEE project? How would project effects be mitigated?

The alternatives' potential environmental effects help determine their consistency with both the local community environmental values and with laws related to resources in the natural and built environment. Therefore, after describing in more detail the No-Build Alternative and the LPA, the EA reports on the potential environmental effects associated with each. Chapter 3 includes sections on each of the elements of the environment listed in the box at right. Chapter 4 discusses potential transportation effects, such as impacts to traffic and circulation, to transit, and to pedestrians and bicycles. The EA also discusses measures that might be used to mitigate the potential impacts in each area that was examined (noise, air quality, etc.). In addition to the detailed discussion in the chapters, the project's potential effects and mitigation measures are summarized in Appendix ES-1.

Overall, taking into account mitigation, LTD does not expect that building and operating the LPA would cause significant adverse effects.

For summary purposes, one can look at measures in several categories to represent the likelihood and magnitude of the impacts that each alternative could have on the natural and built environment: transportation effects; potential acquisitions and/or displacement of residents, businesses, and parking; potential impacts to street and landscape trees; potential impacts to environmentally sensitive natural resources; and consistency with adopted plans and policies.

Transportation Impacts

Under the No-Build Alternative, out of 58 study area intersections, the number of intersections failing to meet mobility standards would increase from 5 under existing conditions to 19 by 2031. In comparison, by 2031 the LPA would have 16 intersections failing to meet mobility

standards. During the project's opening year (2017) through 2031, 33 LPA intersections would operate as well as or better than under the No-Build Alternative during the PM peak hour. The proposed LPA includes improvements to several intersections to accommodate increased future motor vehicle traffic volumes (including the project), and to meet City of Eugene and ODOT mobility standards.

The LPA would reduce transit travel times between Eugene Station and the proposed Commerce Station.

The No-Build Alternative does not include any pedestrian or bicycle improvements, so would create no new conflicts between vehicles and bikes or pedestrians. The LPA would create a moderate potential for conflicts between BRT and bicycles. However, where EmX replaces existing service, it would likely reduce existing bus/bicycle conflicts, given the reduced number of stops and the shorter time at stops. Pedestrian crossing distances in sections where EmX lanes have been added would be longer, but this should not be problematic with proper signalization and pedestrian refuges.

The LPA would improve sidewalks along West 6th, 7th, and 11th Avenues, creating a wider walking area to serve pedestrians and bicyclists on both sides of the street. The LPA would also create new or enhanced bicycle/pedestrian facilities, including an Amazon bike and pedestrian bridge, path, and sidewalk connecting Buck Street to West 11th and an Amazon bike and pedestrian bridge and path connecting Wallis Street/Obie Station and West 11th Avenue.

These new crossings provide added convenience for pedestrians and bicyclists to access EmX and destinations in the West 11th Avenue area. They also improve safety by reducing the need for bicyclists to use city streets to access West 11th Avenue from the south.

Some properties adjacent to Business Access and Transitway (BAT) lanes could experience improved access because the BAT lanes provide a right-turn deceleration lane at access points.

Left turns out of businesses would be slightly harder in some places due to the additional lane that the vehicles would need to cross.

Transit share and transit ridership would increase under both alternatives, but more travelers would shift to transit under the LPA than under the No-Build Alternative. The LPA would see about 6 percent more of an increase in transit ridership by 2031 than the No-Build. Under the LPA the absolute increase in mode split compared to the No-Build Alternative is 0.3 percent in 2031. Systemwide transit mode splits are also higher for the LPA.

Potential for Acquisitions and/or Displacements of Residents, Businesses, and Parking

The No-Build Alternative would have no property impacts. Under the LPA, just under 2.6 acres would be acquired, including partial acquisitions from 117 tax lots totaling 2.5 acres and possibly full property acquisitions from two tax lots totaling 0.07 acre. The acquisitions are generally small amounts of land along the edges of affected properties. The only possible full acquisitions would be of two small remnant parcels owned by the State of Oregon. The LPA could also displace two retail businesses (a small specialty grocer and an adult store) and one residential unit (one unit of uncertain legal status in a former motel). LTD would pay just compensation for any property acquired, and would assist displaced businesses as directed by the Uniform Relocation Act. LTD would use existing rights-of-way wherever possible to minimize land acquisitions.

The LPA could affect up to 63 on-street parking spaces. LTD would work with the City of Eugene to include in the project's final design up to 10 new on-street parking spaces on the west side of Charnelton Street between 6th and 7th Avenues. The LPA would affect 72 off-street parking spaces. Mitigation measures such as restriping could reduce the net loss of off-street parking to as few as 18 lost parking spaces affecting five business/institutional sites, which would lose between one and seven spaces each. LTD would also replace off-street parking if necessary and where feasible. The LPA would affect up to six property access points (e.g., curb



cuts and driveways), but it would not eliminate access to any property. Where possible, LTD would reduce access impacts by relocating affected driveways along the same roadway. If mitigation for parking or access impacts proved impracticable, LTD would compensate affected owners according to state and federal law. Some or all of the eliminated on-street parking spaces would not be replaced, since on-street parking utilization in the Corridor is below a level that would require mitigation.

On five properties, project property acquisition could affect billboards, regular business signs, landscaping, and bio-swales. LTD will assist the affected property owners with the costs and permitting associated with relocating signs and replacement landscaping. Fourteen properties that now use public ROW for private vehicle parking, landscaping or signs may experience effects resulting from facility expansion in the public ROW.

Potential Impacts to Street and Landscape Trees

This refers to the alternatives' potential impacts to street, charter, and landscape trees. Street, charter, and landscape trees are defined in Chapter 3.16.

The No-Build Alternative would not remove any street, charter, heritage or landscape trees. The LPA would not remove any charter trees or heritage trees. It would remove about 143 street trees and 61 landscape trees. About 130 of the affected street trees would be considered "large street trees" having a diameter of at least eight inches in 2016. Although the project would replace all removed trees at a ratio of at least one tree replanted for one tree removed, the removal of street trees would result in a short-term reduction of the tree canopy in some locations in the LPA corridor.

Likelihood of Adverse Impacts to Other Resources

This section encompasses the alternatives' impacts on certain other environmental and social issues:

- Biological Resources and Endangered Species





- Fish Ecology
- Wetlands and Waters of the State and U.S.
- Water Resources
- Socioeconomics and Environmental Justice Populations
- Hazardous Materials
- Geology and Seismic Standards
- Park and Recreation Areas, and Section 4(f)
- Historic, Archaeological and Cultural Resources (Section 106)
- Visual and Aesthetic Resources
- Noise and Vibration
- Air Quality

In each area listed above, Chapter 3 compares both alternatives' effects to the natural and built environment. The analyses show that the LPA, compared to the No-Build Alternative, is anticipated to have fewer impacts or more beneficial effects in the areas of socioeconomics, environmental justice, and air quality. It is anticipated to have the same or greater impacts in the areas related to biological resources, fish ecology, wetlands, water resources, hazardous materials, geology and seismic standards, historic resources, parks and Sections 4(f) and 6(f) resources, noise, and visual quality. However, even where the LPA would have more of an impact, the impact would not be significant. Of all of the environmental and social issues listed above, only three merit discussion in this summary because of the LPA's potential effects: noise, historic resources and wetlands.

The LPA would likely cause moderate impacts under FTA criteria at up to 11 residences in two structures. FTA noise guidance requires consideration of specified factors to determine whether a project must mitigate noise impacts. In this case, primarily because the impacts are moderate and the slight noise increase is imperceptible to most people, FTA would likely not require mitigation. Sound insulation would be considered, if appropriate. It is possible, though not likely, that the LPA noise levels at a new 25-unit apartment building in the downtown area may

exceed HUD noise criteria; for residential unit living and sleeping areas where noise criteria levels area exceeded building insulation would be considered, if appropriate. (See Section 3.4 for more details.)

There are 57 eligible historic resources along the LPA alignment. The No-Build Alternative would not affect any of them. The LPA would have no effect on 52 of them. It would affect, but not adversely, the other five resources, as a result of minor strip takes and limited tree removal. Neither alternative would affect any known or likely archaeological or cultural resources. (See Section 3.7 for more details.)

The LPA would directly impact 0.048 acre of wetlands, encroach into one wetland buffer, cause temporary construction impacts to one wetland and Amazon Channel, and could indirectly impact three wetlands due to the proximity of construction activities. The project would provide wetland buffer enhancement and riparian plantings along Amazon Channel. (See Section 3.12 of this EA for more details.)

Impacts to (Consistency With) Land Use/Plans and Policies

The No-Build Alternative does not offer a foundation for future nodal development within the Corridor, nor does it implement the policies found in local, regional, and state plans. Under the No-Build Alternative, there would be a lack of high-capacity transit to the West Eugene community, which is inconsistent with adopted land use, economic and transportation plans and policies that encourage increased density and nodal development along major arterial corridors including West 6th and 7th Avenues.

The proposed LPA is consistent with local, regional, and state land use plans and policies, which share the goal of improving transit accessibility and encouraging transit use by concentrating higher density, mixed land uses in nodal development. Additionally, the LPA would provide a basis for future nodal development - higher-density nodes where services and businesses can



congregate around high-capacity public transit. Nodal development is an economic strategy for community growth as well as a transportation strategy.

The LPA is consistent with the city's planned vision for economic growth and development. It would support the West Eugene Enterprise Zone by providing more reliable transit access to businesses and relieving long-term congestion in this area, which is also a freight corridor. As noted above, the LPA would eliminate some on-street and off-street parking spaces. However, LTD would avoid parking loss through redesign, where feasible, and replace parking if necessary and where feasible. The parking changes would not significantly affect land use. The LPA would also adversely affect one or two existing retail uses. In addition to compensation by LTD related to the loss of value as a result of these partial acquisitions, if the businesses are ultimately displaced, they would be eligible for relocation assistance by LTD as specified in the Uniform Relocation Act.

What about impacts from construction activities?

Because the LPA project would affect existing roadways, LTD could not avoid causing impacts during construction. However, with planning and coordination, impacts could be reduced to a manageable level. The following discussion highlights some of the impacts and proposed mitigation; the EA discusses both in more detail.

LPA construction would require short-term full and partial sidewalk and lane closures and rerouting of traffic. No long-term full roadway closures are anticipated.

Under the LPA, LTD and the contractor would carefully plan construction to minimize the potential impact to businesses, roadway users, and surrounding communities. For example, LTD would limit the length of the single lane closures to about five blocks, and one side of the road would be worked on at a time to minimize the impact to road users. Shorter segments would be used in locations with high driveway density. Short construction segments should allow for the



contractor to quickly complete the work within a segment and reopen it to the public. Two adjoining segments would be worked on simultaneously with the goal of excavating, utility installation, base rock, and paving being completed within a two-week period for each segment. Depending on the type of land uses in each construction segment (commercial or residential), and the predominant hours of operation for adjacent businesses, construction could occur at night if it would further reduce potential business and traffic disruptions. Any night work would have to comply with City noise restrictions.

Construction contracts would require contractors to take a number of measures to reduce or eliminate specific impacts. For instance, among other things, they would have to turn off idling engines to reduce air quality impacts, use only well maintained equipment to reduce unnecessary noise, implement erosion and sediment control plans to protect water quality, perform pre-construction site-specific investigations of locations likely to have hazardous soils, coordinate with affected business and property owners in advance of any utility interruptions, and so forth. Sections 3.17 and 4.3.4 summarize the LPA's proposed construction-related mitigation measures. The Summary of Impacts Table in Appendix ES-1 includes construction-related impacts and mitigation.

What are the trade-offs between doing nothing and building the EmX?

In March 2008, the LTD Board of Directors established a goal for the WEEE project: "To implement high-capacity public transportation service, in the West 11th Corridor (east/west), utilizing the adopted high-capacity transit mode identified in the Regional Transportation Plan, that is less hindered by congestion and that provides efficient, effective, dependable, and visually appealing service throughout the life of the project." LTD also established project objectives and measures to evaluate how well the alternatives could meet the objectives. Chapter 6 of this EA provides a detailed comparison of effectiveness, equity, and major trade-offs for the two alternatives.



Key findings of this comparison are:

- Transit travel times for the LPA are estimated to be 28 percent faster than the No-Build Alternative for the Eugene Station/Commerce Terminus trip.
- The LPA would have an operating cost per trip of \$3.90 compared to \$4.03 for the No-Build Alternative.
- The LPA would be consistent with regional, state, and local land use plans in the study area that share the goal of improving transit accessibility and encouraging transit use by concentrating higher density, mixed land uses in “nodal development areas” or transit-oriented development within the project corridor. The No-Build Alternative would support few local, regional, and state land use and transportation policies, and it would be inconsistent with regional and local plans that encourage density and nodal development.
- The LPA would improve access to regional employment centers, including Downtown, areas near the University of Oregon, Gateway Center in Springfield, and the River Bend Hospital. Conversely, under the No-Build Alternative, traffic congestion would increase, which could degrade access to these employment centers, increase the cost of travel, and reduce the efficiency of the region’s roadway network, all of which could negatively affect regional economics.
- The proposed project includes two new dedicated bicycle/pedestrian crossings of the Amazon Channel and other pedestrian (sidewalks) and bicycle facility improvements. The No-Build Alternative does not include any pedestrian or bicycle improvements associated with the project.
- Under the LPA, LTD would have a higher opening-year (2017) systemwide operating cost than under the No-Build Alternative (\$45.76 million vs. \$44.58 million). Over time, the cost difference between the alternatives would narrow as a result of increasing operating costs associated with the No-Build Alternative, such as longer transit and motor vehicle travel times caused by increased congestion, and enhanced service frequency necessary to accommodate ridership increases. By 2031, even with increased service frequency and other amenities, the systemwide operating cost are estimated to be \$54.50 million for the LPA, which is lower than the estimated \$54.95 million for the No-Build Alternative.

How much would the WEEE project cost, and how would it be paid for?

Chapter 5 details WEEE’s anticipated operating and capital costs and sources of revenues. LTD expects to begin building the WEEE project in 2015 and to start operating it in 2017. It estimates that the project cost, in inflated year-of-expenditure dollars, would be \$95.6 million. The WEEE budget assumes funding from FTA’s Section 5309 Small Starts program (\$74.9 million) and \$20.7 million in state lottery bonds.

In its opening year of 2017, the WEEE project is expected to result in an additional \$1.2 million in annual operating costs. LTD maintains a Long Range Financial Plan (LRFP) that projects system general fund revenues and costs for a rolling eight-year period. For this analysis, the LTD Long Range Financial Plan was extended to cover the period through Fiscal Year (FY) 2031. The estimated operating and maintenance revenues and costs between FY2012 and FY2031 show a projected operating surplus of \$9.5 million and, therefore, no projected shortfall in operations and maintenance funding. In years where reserves exceed 10 percent of total general fund expenditures, the analysis assumes LTD would look for the most effective ways to apply the surplus to service increases (see Section 5.5 for more details).

How has the public been involved in the WEEE project so far?

Since it undertook the WEEE project in 2007, LTD has used a broad array of strategies to engage public and agency stakeholders. The public involvement activities have sought to give the public and agencies access to project information and the chance to inform the project. LTD considered all of the input received and incorporated suggestions and recommendations wherever appropriate.

LTD used a variety of tools to reach out to the project’s diverse stakeholder groups and offered numerous opportunities for community conversations, exchanging project information and



providing feedback. Some of the communication tools have included meetings, briefings, workshops, field tours, newsletters, postings on the project website, media releases, radio advertising, open houses, information booths at community events, and public forums.

LTD has taken input for the project via telephone, e-mail, comment forms, meeting flip charts and notes, social media, public meeting testimony, and letters. Public input has been categorized by environmental subject and was considered by the project team throughout the environmental analysis and design refinement.

How can I get more information about the WEEE project?

More information about the WEEE project can be obtained from LTD's website (www.ltd.org), or by calling LTD's main line at 541-682-6100.



How can I comment on the WEEE project and the EA?

Written comments on the WEEE project can be submitted to LTD at the addresses below. Comments on this EA must be submitted in writing during the project's 45-day public review period Monday, July 16, 2012 through Wednesday, August 29, 2012.

By Mail:

Lane Transit District
PO Box 7070
Springfield, OR 97475-0470
Attention: WEEE EA Comments

In Person:

LTD's Glenwood Administration Building
3500 E. 17th Avenue
Eugene, OR 97403

Comments may also be emailed to we.emx@ltd.org.

Please put "EA Comments" in the subject line.

LTD will hold two drop-in sessions during the 45-day review period where LTD staff will be on hand to assist with review of the EA and answer questions. The drop-in session will be held at LTD's Next Stop Center, 1099 Olive Street, Eugene, at the following dates and times:

- July 25, 12 Noon – 7 p.m.
- August 7, 12 Noon – 7 p.m.

The Summary of Impacts Table in Appendix ES-1 of the EA summarizes impacts, benefits, and possible mitigation measures associated with the No-Build Alternative and the LPA under consideration for the West 11th Avenue Corridor.

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CHAPTER 1

PURPOSE AND NEED

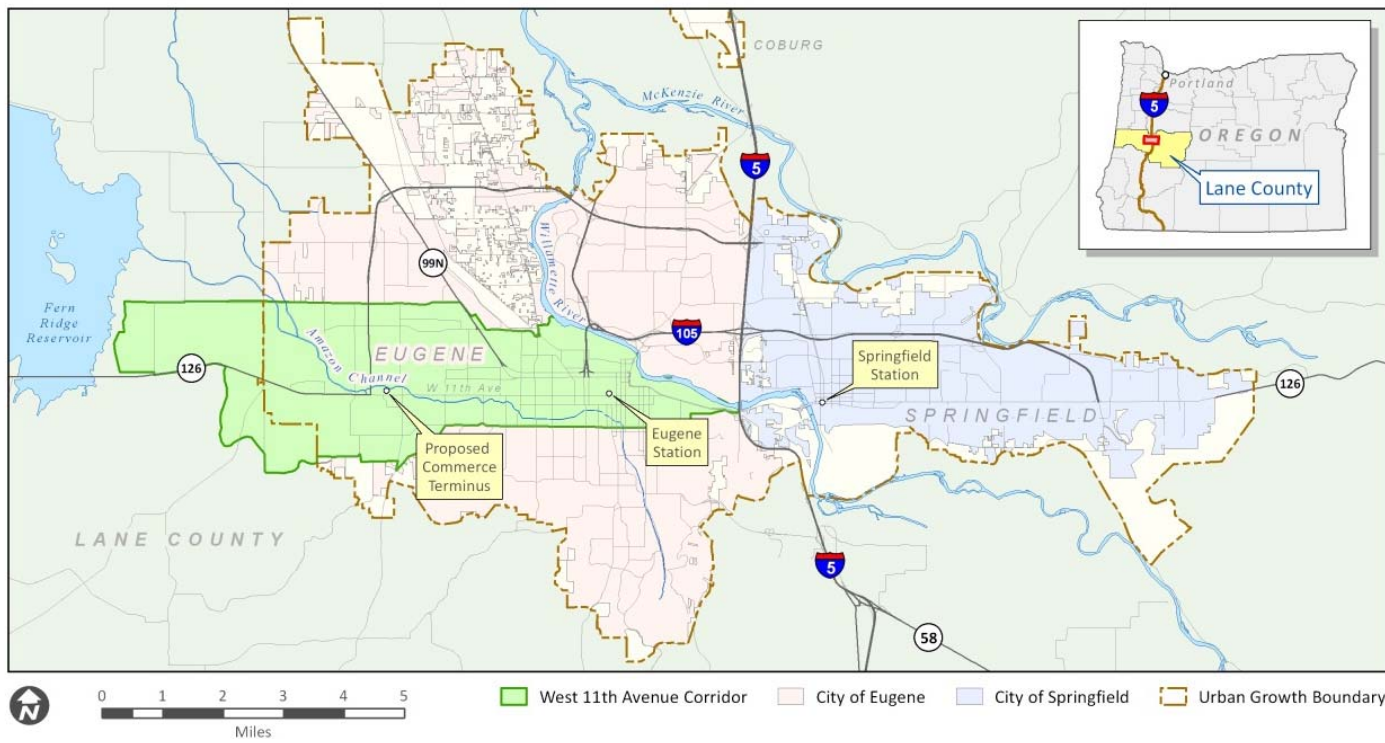
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1. PURPOSE AND NEED

1.1. Proposed Project

Lane Transit District (LTD) proposes to extend EmX bus rapid transit (BRT) service from its main downtown Eugene Station through the West 11th Avenue Corridor to a proposed terminus station at Commerce Street (Figure 1.1).

Figure 1.1. Project Vicinity Map



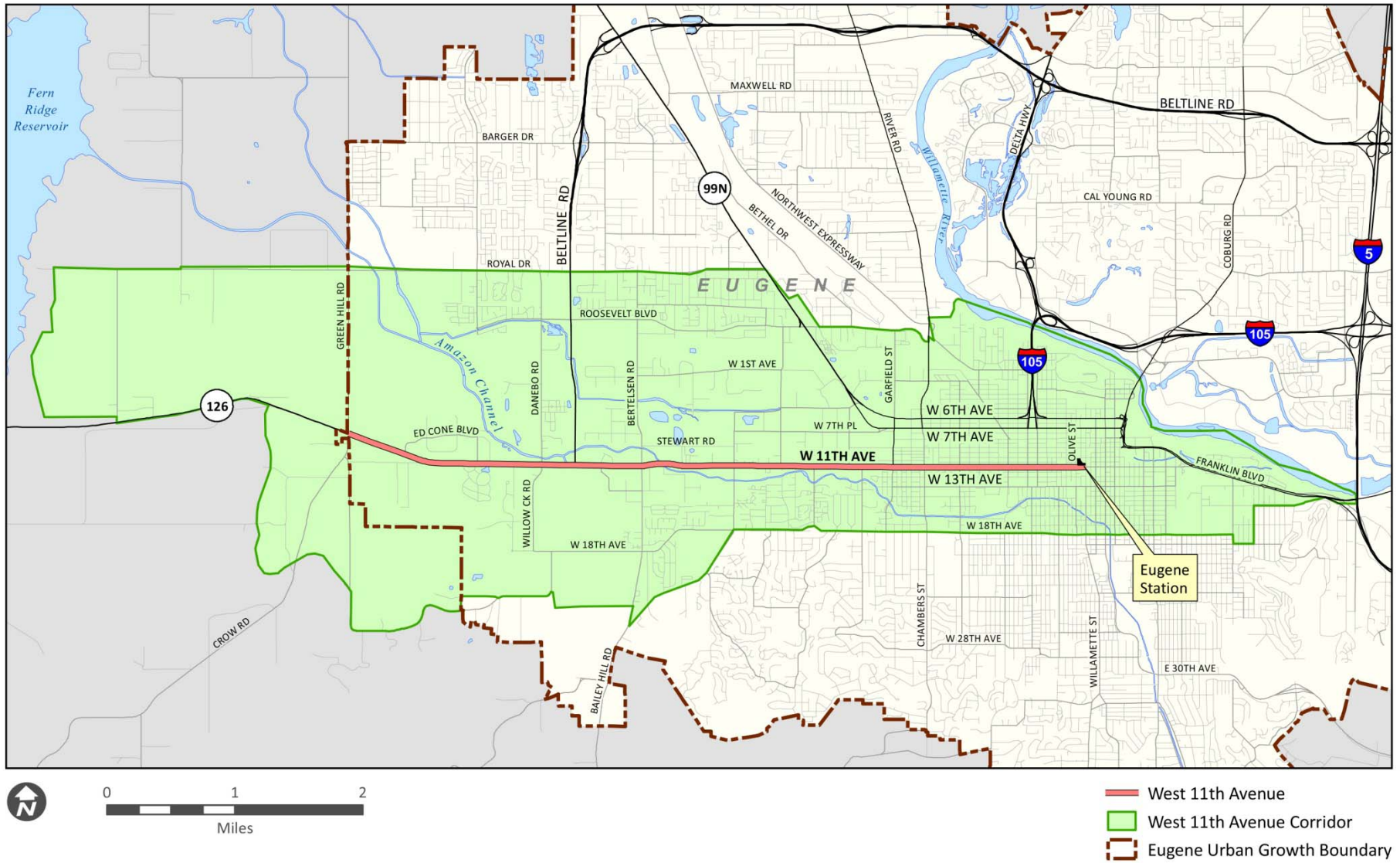
1.2. Project Background

In summer 2007, the Federal Transit Administration (FTA) and LTD initiated a study to identify and examine alternatives for improving safety, mobility, and public transit services in the west side of Eugene, Oregon (Lane County). The study examined a broad range of regular bus service and BRT service alternatives in the West 11th Avenue Corridor (Corridor), which is approximately 8.8 miles in length and is the primary east/west transit travel corridor linking the west side of Eugene to the Eugene Station located in downtown Eugene (Figure 1.2). The Corridor is home to several major employment centers, a variety of commercial developments, a growing residential population, and natural resources. It is expected to undergo an increase in traffic congestion with growing development. Without improvements, congestion will worsen, along with potential safety issues. The West Eugene EmX Extension (WEEE) project could play an important role in managing the expected increase in traffic along the Corridor.

1.3. Purpose and Need, and Goal and Objectives

Based on previous planning work and input from the public, LTD drafted a preliminary Purpose and Need Statement in summer 2007. LTD published a Notice of Intent to conduct an environmental review of the WEEE project, and began conducting workshops with local, State and Federal agencies and open houses with the public. In fall 2007, LTD established a project committee (WEEE Corridor Committee) comprised of representatives from agencies, businesses, neighborhoods and other interested groups. Throughout fall 2007 and early 2008, LTD and the Corridor Committee considered public and agency feedback to refine the project's Purpose and Need and its Goal and Objectives (below), which were adopted by the LTD Board of Directors on March 19, 2008.

Figure 1.2. West 11th Avenue Corridor



1.3.1. Purpose and Need Statement

The adopted Purpose and Need Statement for the project is:

The Purpose of the proposed WEEE project is to implement high-capacity public transportation service, in the West 11th Corridor (east/west), utilizing the adopted high-capacity transit mode identified in the Regional Transportation Plan, that is less hindered by congestion and that provides efficient, effective, dependable, and visually appealing service throughout the life of the project.

The project would support local, regional, and state plans and goals for land use and transportation, and support economic development and redevelopment opportunities in the corridor, while being sensitive to and protecting the natural and built environmental resources and continue to obtain local public participation in its development.

The Need for the project results from:

- Historic and projected increases in traffic congestion in the West 11th Corridor due to increases in regional and corridor population and employment;
- Lengthy transit travel times and deteriorating public transportation reliability in the West 11th Corridor due to growing traffic congestion;
- Increasing operating expenses, combined with increasingly scarce operating resources, while demanding more efficient public transportation operations;
- The decision in the Regional Transportation Plan (RTP) to implement a BRT strategy for the region;
- Recent removal of the West Eugene Parkway as a proposed regional project, further constraining future capacity on the corridor and increasing the need for public transportation-related options;



- The region’s growing reliance on public transportation to meet travel needs in the West 11th Corridor;
- Prioritization of the West 11th Corridor by the City of Eugene and LTD as the region’s third BRT corridor;
- Local and regional land use and development plans, goals, and objectives that identify the West 11th Corridor for residential, commercial, retail, and industrial development to help accommodate forecasted regional population and employment growth; and
- Limitation of options for transportation improvements caused by the identification and protection of important resources in the natural and built environment in the West 11th Corridor, including but not limited to wetlands, rare plants, and animals and their habitat.

1.3.2. Goal and Objectives

The WEEE project Goal, adopted by the LTD Board of Directors in 2008, is the same as the project’s Purpose, as stated in the preceding section. The project’s Objectives, also adopted in 2008, guide the establishment of evaluation criteria and measures, which were both used to select the project’s Locally Preferred Alternative (LPA)¹.

Within the project Corridor, the Objectives of the WEEE project are to:

1. Improve customer convenience by reducing travel time, increasing service reliability, and making other service improvements;
2. Improve operating and other efficiencies to maximize the use of scarce resources;
3. Serve as a catalyst for planned transit-oriented development and support development that is consistent with adopted land use plans;

¹ The term Locally Preferred Alternative (LPA) also means the Preferred Alternative (PA), as used in NEPA and by the Council on Environmental Quality.



4. Help accommodate future growth in travel by increasing public transportation's share of trips;
5. Take into account the travel and safety needs of pedestrians, bicyclists, and motorists;
6. Contribute to establishing a fiscally stable public transportation system;
7. Design the project in a way that is consistent with laws related to resources in the natural and built environment; and
8. Support LTD and the City of Eugene's sustainability policies, including efforts to reduce greenhouse gas emissions.

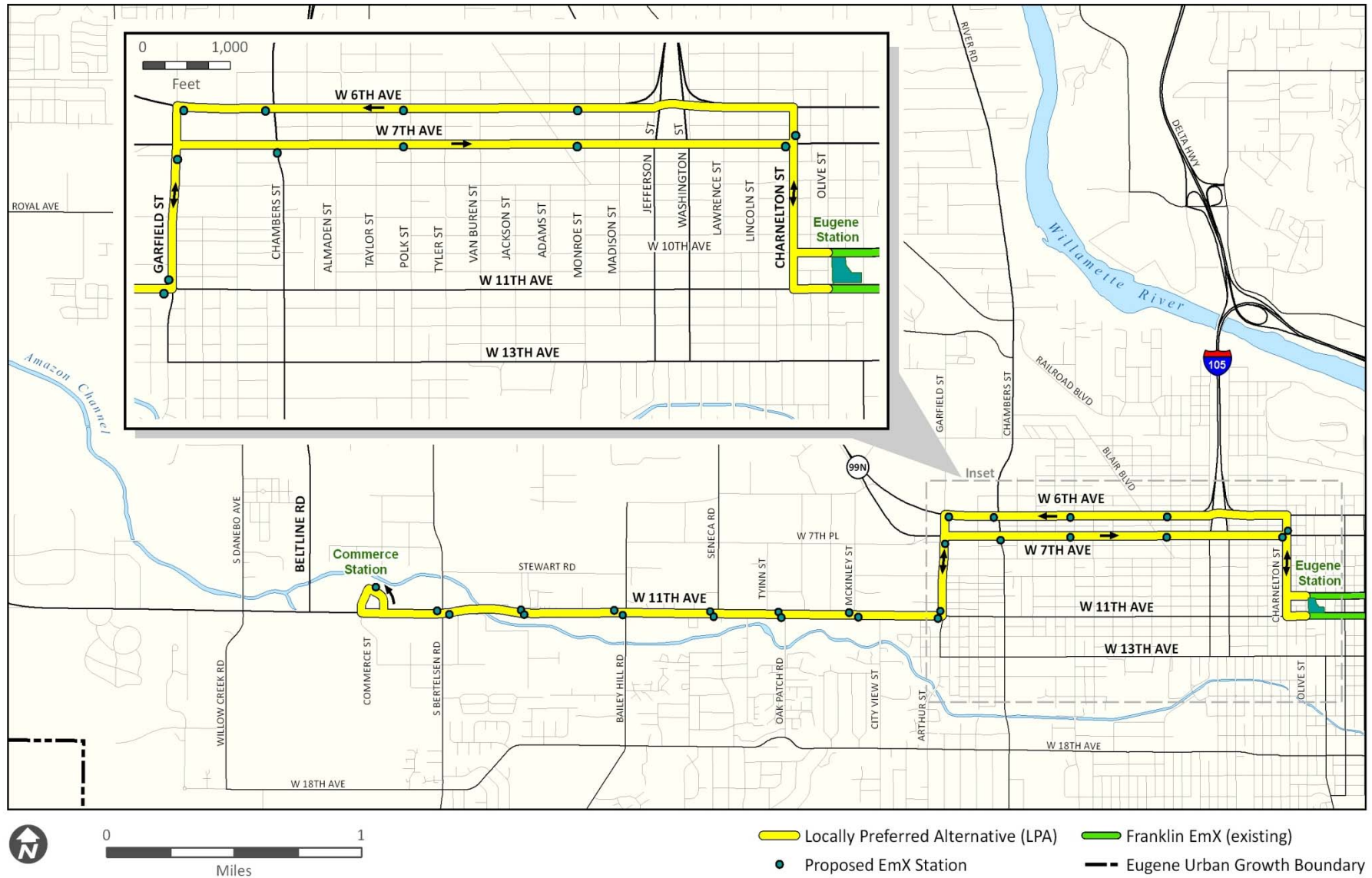
1.4. Summary of the Process for Selecting the LPA

After significant public input, an LPA was selected for the West 11th Avenue Corridor in May 2011. The LPA selection process included:

- Alternatives analysis, design and refinement
- Project team recommendations for an LPA
- Joint LPA Committee recommendations for an LPA
- Input from the public and agencies
- Selection of an LPA by decision-makers

The three decision-making bodies (Metropolitan Policy Committee (MPC), Eugene City Council, and LTD Board of Directors) selected an LPA based on the West 6th/7th Avenues – West 11th Avenue Alignment Alternative via Charnelton Two-Way Design Option (with the Reassign-a-Lane Design Option). The development and adoption of this alternative as part of the project's Alternatives Analysis (AA) process are described in the WEEE Locally Preferred Alternative (LPA) Report (LTD, 2011) (Appendix 1-1) and in more detail in Chapter 2 of this Environmental Assessment (EA). The LPA route is shown in Figure 1.3.

Figure 1.3. Locally Preferred Alternative



1.4.1. Alternatives Analysis, Design, and Refinement

The project team developed conceptual designs for Corridor alternatives, evaluated the alternatives for potential impacts, consulted with the community and interested agencies, refined the conceptual designs based on feedback, and then consulted with the community and agencies again to review the refined designs. This iterative process began in March 2008 and continued throughout 2009 and most of 2010. The resulting design avoided and minimized many of the possible impacts identified by the community and agencies throughout the project.

1.4.2. Project Team Recommendations for an LPA

In the Alternatives Analysis Report (LTD, 2010), the project team recommended the West 13th Avenue - West 11th Avenue Alignment Alternative for an LPA. The team found that after considering all technical subject areas, this alternative performed best from a technical perspective.

1.4.3. Joint LPA Committee Recommendations for an LPA

In fall 2010, LTD convened the Joint LPA Committee, a group of local decision makers representing the project's three decision-making bodies: the Eugene City Council, the MPC, and the LTD Board of Directors. In their charge to recommend an LPA to the three decision-making bodies, the Committee was asked to consider technical and community issues in weighing the trade-offs of each of the alternatives studied and possible mitigation measures.

From October 2010 through February 2011, the Joint LPA Committee reviewed updated project information and public input. It provided direction to the project team regarding mitigation measures to consider and alternatives to be eliminated. In January 2011, the Joint LPA Committee preliminarily recommended the West 13th - West 11th Avenue Alignment Alternative as the LPA. This alternative, along with other information about the project, process,

and alternatives, was publicly reviewed at two open houses in February 2011. After the second open house, the Eugene City Council, MPC, and LTD Board held a joint public hearing about the preliminary recommended LPA (Appendix 1-2). The majority of public testimony opposed the West 13th -West 11th Avenue Alignment Alternative, opposed spending public funds on this project, or both.

In February 2011, having considered the public input and technical information, the Joint LPA Committee recommended that local decision makers consider two alternatives: modified versions of the 1) West 13th Avenue - West 11th Avenue Alignment Alternative, and 2) West 6th/7th Avenues - West 11th Avenue Alignment Alternative via Charnelton Two-Way Design Option (with the Reassign-a-Lane Design Option).

1.4.4. Input from Public and Agencies

Several other committees and decision-makers participated in the LPA selection process. A summary of the other committees that participated is presented in Chapter 8 of this EA, and more details are provided in Chapter 10 of the AA Report (Appendix 1-3).

Additionally, a variety of public meetings and workshops were held during the LPA selection process. LTD facilitated three General Manager Chats, a Let's Talk Transit Forum, two Title VI agency luncheons, a Refined Alternatives Open House, three AA Open Houses, two LPA Open Houses and two Public Hearings. Each of these events gave the public and stakeholders an opportunity to review materials, ask questions, and provide input.

LTD responded to public and agency input in many different ways: it provided written and verbal responses, prepared meeting materials to address concerns raised through input, posted information on the project website, and scheduled additional meetings. Where appropriate, LTD modified conceptual designs of alternatives to address concerns raised by public and agency feedback, and to further avoid and reduce potential impacts.

1.4.5. Selection of an LPA by Decision-Makers

In May 2011, after considering the information and opinions presented during the entire AA process, the three decision-making bodies selected as the LPA a modified version of the West 6th/7th Avenues - West 11th Avenue Alignment Alternative via Charnelton Two-Way Design Option (with Reassign-a-Lane Design Option). Chapter 2 describes that alternative in detail.



CHAPTER 2

ALTERNATIVES CONSIDERED

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2. ALTERNATIVES CONSIDERED

Chapter 2 describes the alternatives considered to address the problems and opportunities in the West 11th Avenue Corridor. Section 2.1 discusses the process used to develop, screen, and select the alternatives for study, and, ultimately, to select the project's Locally Preferred Alternative (LPA). Section 2.2 describes the capital improvements and the transit vehicle, transit operation, and roadway improvements associated with the LPA and the No-Build Alternative — the two alternatives evaluated in detail in this document. Sections 2.3 and 2.4 summarize the LPA's capital costs and the operating and maintenance costs for both alternatives.

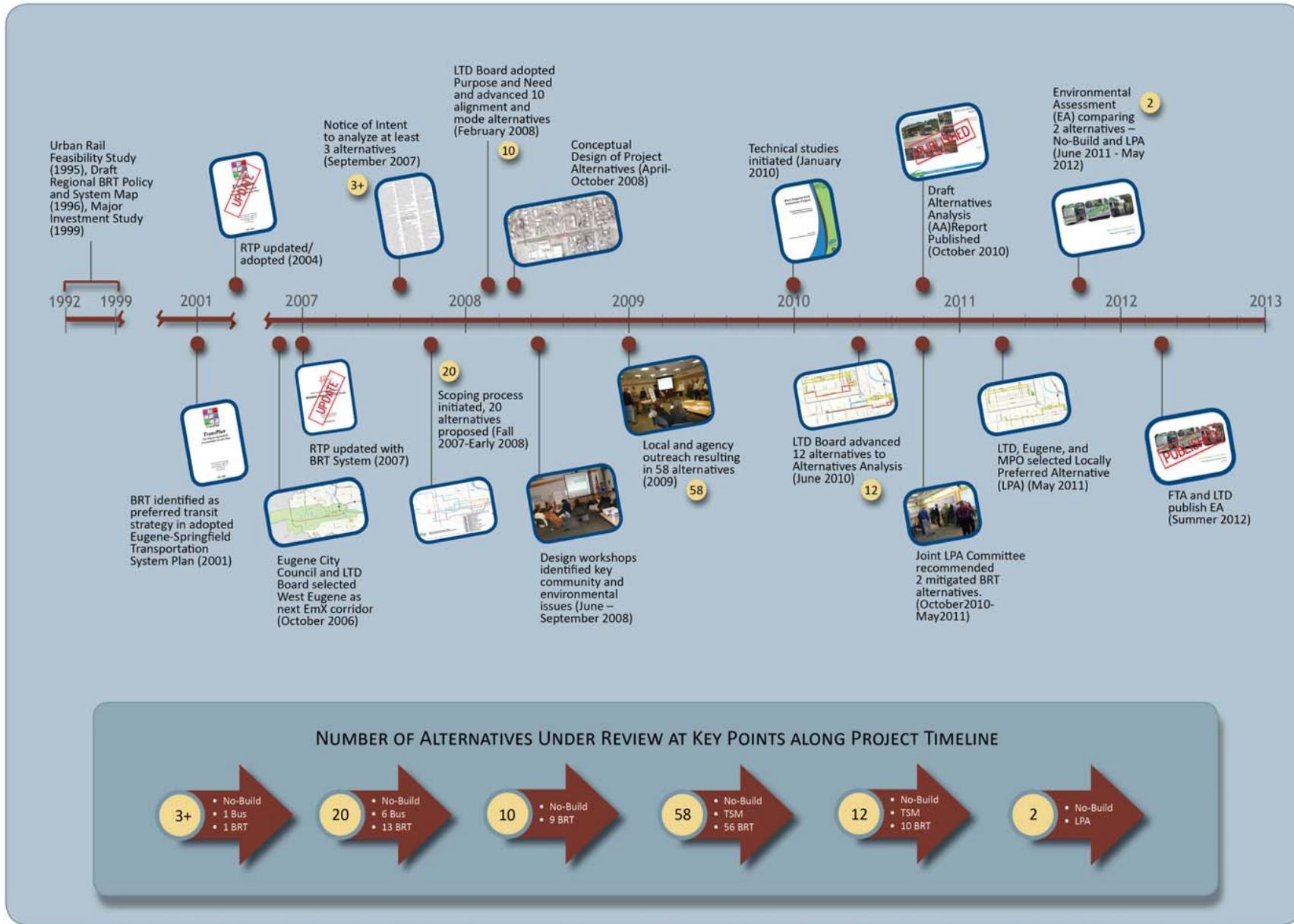
2.1. Alternatives Previously Considered and Eliminated

Through the project's screening and selection process, Lane Transit District (LTD), its partner jurisdictions and agencies, and the general public evaluated a wide range of alternatives and options, which ultimately led to the selection of the LPA (Figure 2.1 WEEE Project Alternatives – Background and Timeline). For a detailed description of the selection process and the project planning activities that preceded it, see the West Eugene EmX Extension (WEEE) LPA Report (Appendix 1-1) (LPA Report). Additional reports provide greater detail about each of the project phases and the alternatives considered, eliminated and advanced to the subsequent phase; these reports are referenced in sidebars in this chapter and in Chapter 12, and the reports are available on LTD's web site (www.ltd.org).

LPA - Locally Preferred Alternative

A Locally Preferred Alternative, or LPA, is the selected physical design concept and scope for a major corridor transit investment being proposed by the local project sponsor for funding assistance by the Federal Transit Administration (FTA). The project sponsor selects the LPA from the range of reasonable alternatives evaluated within an alternatives analysis. It represents the alternative that the local project sponsor finds, on balance, best meets the project's purpose and need. The LPA identifies the preferred mode, proposed location of capital facilities, such as the fixed guideway alignment and station locations, the operating plans for the transit service (hours of operation, how often vehicles run, etc.), and any design options to be further evaluated during subsequent project phases. After selecting the LPA, the local project sponsor can receive approval from FTA to enter into Project Development, which for Small Starts projects like WEEE includes both Preliminary Engineering and Final Design.

Figure 2.1. WEEE Project Alternatives – Background and Timeline



2.1.1. Screening and Selection Process

2.1.1.1. System Planning Studies

Bus rapid transit (BRT) emerged as the preferred transit strategy for the Eugene-Springfield metropolitan area through a major investment study undertaken as part of the Regional Transportation Plan (RTP) (Central Lane Metropolitan Planning Organization, November 2007) update in 2001. BRT was preferred because of its affordability, ability to reduce travel time, greater efficiency, reduced operating costs, and ability to more effectively compete with automobile travel. Based on the 1995 Urban Rail Feasibility Study and the 1999 Federal Major Investment Study, the Eugene-Springfield metropolitan region adopted the RTP in 2001, and updated the plan in 2004 and 2007. The RTP identifies BRT as the preferred transit strategy for the 20-year plan horizon. Additionally, the RTP identifies a comprehensive 61-mile system of several BRT corridors, including the West 11th Avenue Corridor (Figure 2.2).

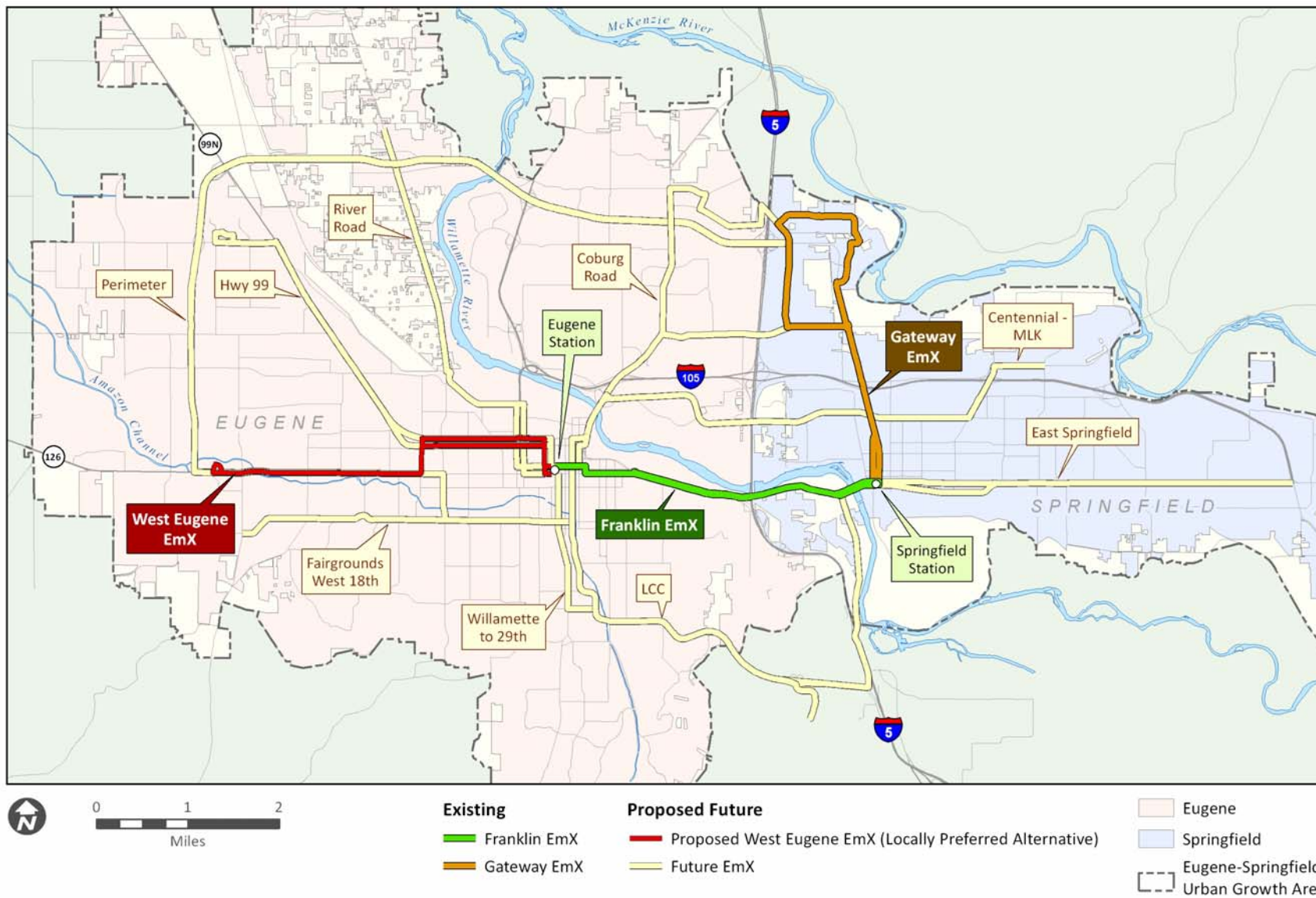
The conceptual long-range plan for the EmX system calls for high-frequency, fast, and reliable service along five major corridors connecting the downtowns of Eugene and Springfield and most of the region’s designated mixed-use nodes. The four-mile pilot corridor, EmX Franklin Line, links downtown Eugene and downtown Springfield, and travels primarily on Franklin Boulevard. By linking the Eugene and Springfield Stations, two major hubs for LTD, the Franklin EmX forms a “backbone” that will benefit all future EmX lines. The second EmX corridor, the Gateway EmX Extension, is a 7.7-mile route that connects downtown Eugene and downtown Springfield to the popular Gateway area and Peace Health Hospital.

System Planning Studies

- Regional Transportation Plan (RTP) (Central Lane Metropolitan Planning Organization, November 2007)
- Regional Transportation Plan (RTP) (Central Lane Metropolitan Planning Organization, November 2004)
- Regional Transportation Plan (RTP) (Central Lane Metropolitan Planning Organization, November 2001)
- Federal Major Investment Study (1999)
- Urban Rail Feasibility Study (1995)



Figure 2.2. LTD BRT System Plan



In January 2007, recognizing the traffic and transit issues in West Eugene and the opportunities for transit improvements to aid in making the area a more livable community, the Eugene City Council and the LTD Board of Directors selected West Eugene as the City's and LTD's priority for the next EmX corridor study.

2.1.1.2. Scoping and Screening

LTD initiated the project with publication of a Notice of Intent in the September 18, 2007, Federal Register, which stated the preliminary project's Purpose and Need and identified three alternatives. From Fall 2007 through early 2008, LTD with the project Corridor Committee refined the project's Purpose and Need and Goal and Objectives, defined the study area for the West 11th Avenue Corridor, collaborated with the public and stakeholders to develop a draft description of the 20 alternatives proposed in this public process, conducted initial screening of alternatives, eliminated alternatives that did not meet the project's Purpose and Need, and obtained LTD Board adoption and Federal Transit Administration (FTA) concurrence on a range of alternatives for further analysis. Alternatives proposed during Scoping are summarized in the sidebar. Several mode alternatives such as Trolley Bus, Streetcar, and Light Rail, were eliminated because they would not significantly improve transit travel time and reliability. Alignment alternatives such as West 18th, Roosevelt / Danebo, Highway 99 / Roosevelt, and Veneta were eliminated because they would not improve transit travel times for the primary markets within the West 11th Corridor. The 20 preliminary alternatives proposed during Scoping were reduced to 10 alignment and mode alternatives that were advanced for consideration, reflecting public and agency outreach. This process and the results are described in the project's Draft Scoping Screening of Alternatives Findings Report (February 25, 2008).

In summer 2008, after preparing sketch-level designs for the range of alternatives, LTD conducted a series of community design workshops with residents and businesses. LTD also held project committee meetings and made presentations to neighborhood, civic, and professional organizations. Each event explored opportunities and concerns about the alternatives and design options, and sought possible solutions.

Alternatives Suggested During Scoping

Fall 2007- Early 2008

Mode Alternatives

- Bus
- Trolley Bus (with overhead catenary)
- BRT
- Streetcar
- Light Rail
- Grade Separated Transit (e.g., heavy rail or monorail)

Alignment Alternatives

- Segment A – Eugene Station to Garfield Street
 - Amazon Channel
 - West 11th Avenue
 - West 18th Avenue
- Segment B – Garfield Street to Beltline Road
 - West 7th Place / Stewart Road
 - West 10th / West 11th Avenues
 - Amazon Channel
 - West 18th Avenue
 - Highway 99 / Roosevelt
 - West 1st Avenue / Roosevelt
- Segment C – West of Beltline Road
 - West 11th Avenue to City of Veneta
 - West 18th Avenue
 - Roosevelt / Danebo
 - Roosevelt / Royal

Scoping and Screening Studies

- WEEE Project Community Report Back on Design Refinement Process (LTD, October 2008)
- WEEE Project Scoping Summary Final Report (LTD, May 2008)
- WEEE Project Scoping Range of Alternatives Report (LTD, May 2008)
- WEEE Project Scoping Screening and Evaluation Findings Report (LTD, May 2008)
- WEEE Project Scoping Screening of Alternatives Findings Report (LTD, February 2008)

Transportation Systems Management Alternative

A TSM Alternative seeks to address transportation problems in a corridor by enhancing existing traditional bus service with low-cost improvements. Typical components include additional transit coverage and frequency, changes in service delivery (e.g., limited stops or express service), intersection and signal improvements, data collection to monitor and adjust system performance, and special events management strategies. For certain funding programs, FTA requires a TSM alternative against which all of the major investment alternatives are evaluated.

AA – Alternatives Analysis

AA is a locally managed study process to identify and compare the costs, benefits, and impacts of a range of transportation alternatives as a means of providing local decision makers with the information necessary to implement the most appropriate transportation solution in a priority corridor.

For more discussion about Alternatives Analysis, please refer to Chapter 1 of the Final AA Report (LTD, July 2011).

In fall 2008, LTD prepared conceptual engineering designs for the project alternatives. By the end of 2008, LTD began identifying possible impacts that could result from project alternatives and ways to avoid and minimize these impacts. Throughout 2009, LTD collaborated with public and agency stakeholders to avoid and reduce possible impacts by refining the 10 conceptual designs. As a result, the Alternatives Analysis process began by studying two bus alternatives and 56 unique BRT routing combinations.

2.1.2. Alternatives Analysis Process

This section describes the development of the Alternatives Analysis (AA) report.

2.1.2.1. Technical Studies and Draft AA Report

In January 2010, LTD concluded the design refinement process and initiated technical impact studies of the project's two bus alternatives and 56 unique BRT routing combinations (Figure 2.3). In June 2010, the LTD Board of Directors used findings from the technical studies, staff recommendations, public comments and the advice of the Eugene City Council to determine which of the proposed alternatives would advance for more detailed analysis. It eliminated 46 different BRT routing combinations and advanced the No-Build, Transportation System Management (TSM) and 10 shortened BRT alternatives for further consideration in the AA (Figure 2.4). The 28 full-length alternatives were eliminated because of their potential to have significant adverse impacts to protected species, critical habitat, sensitive areas and wetlands west of Beltline Road, and also the ratio of capital costs relative to projected ridership. The 14 Seneca Road Terminus alternatives were eliminated because they would not provide adequate service to the corridor and would not improve operating and other efficiencies to maximize use of scarce financial resources, and because of the high ratio of capital costs to projected ridership. The four alternatives proposed along the Amazon Channel were eliminated because of their potential to have significant adverse impacts to protected species and habitat, parklands, wetlands, the multi-use trail, cultural resources, and low-income housing.

The two bus alternatives plus the remaining 10 BRT alternatives advanced for further consideration in the AA all terminated at the proposed Commerce Street Station:

- W 13th Avenue – W 11th Avenue
 - Frontage Alley Design Option
 - Two-Lane Transitway Design Option
- W 6th / 7th Avenues – W 11th Avenue via Lincoln / Charnelton Couplet
 - Add-A-Lane Design Option
 - Reassign-A-Lane Design Option
- W 6th / 7th Avenues – W 11th Avenue via Charnelton Two-Way
 - Add-A-Lane Design Option
 - Reassign-A-Lane Design Option
- W 6th / 7th Avenues – W 7th Place via Lincoln / Charnelton Couplet
 - Add-A-Lane Design Option
 - Reassign-A-Lane Design Option
- W 6th / 7th Avenues – W 7th Place via Charnelton Two-Way
 - Add-A-Lane Design Option
 - Reassign-A-Lane Design Option

The detailed discussion of the analysis and reasons for eliminating alternatives is documented in the West Eugene EmX Extension Project Supplemental Alternatives Screening Report (LTD, 2010) (Appendix D of the AA Report).

Alternatives Analysis Studies and Reports

- WEEE Locally Preferred Alternative Report (LTD, August 2011)
- WEEE Locally Preferred Alternative Plan Set (LTD, July 2011)
- WEEE Project Alternatives Analysis Report (published, final version) (LTD, July 2011)
- WEEE Project Alternatives Analysis Report (published draft version) (LTD, October 2010)
- WEEE Revised Draft Conceptual Design Plan Set (LTD, October 2010)
- WEEE Project Supplemental Alternatives Screening Report (LTD, October 2010)
- WEEE Project Technical Reports (LTD, April 2010 - September 2011)

Figure 2.3. WEEE BRT Alternatives Considered in Technical Studies

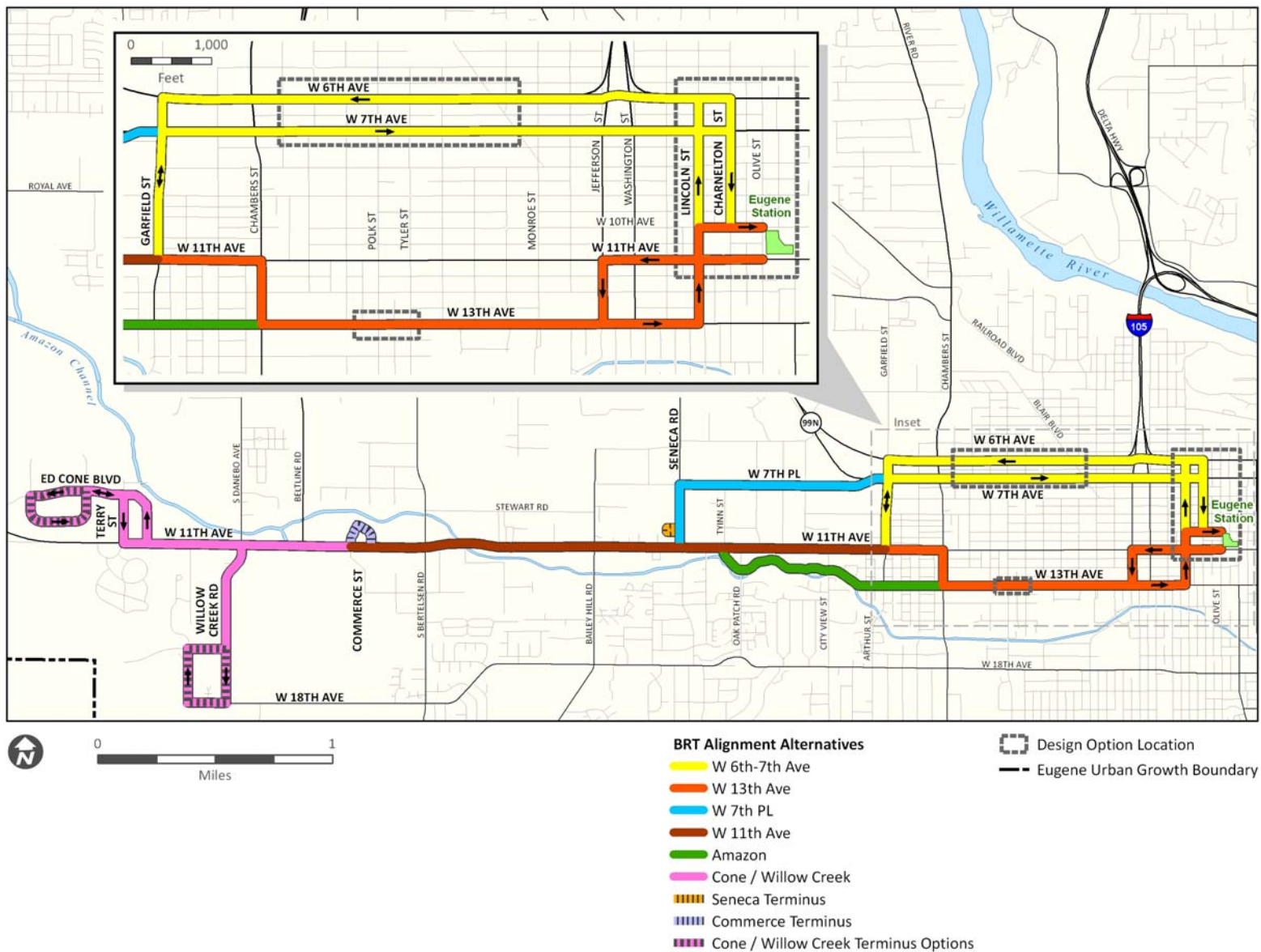


Figure 2.4. WEEE Project BRT Alternatives Eliminated from Further Consideration



In October 2010, LTD published the draft AA Report and all of the appendices on the project website. Electronic and print copies of the report were also distributed to key public locations throughout the community. LTD posted on its website the data, mapping, and technical studies supporting the AA's evaluation of the relative benefits and impacts of the alternatives. Issuing the draft AA Report at that time allowed the public and agencies to review the document and provide feedback to the project team.

From October 2010 through May 2011, the Joint LPA Committee (JLPAC) and the project's three decision-making bodies (Eugene City Council, the Metropolitan Policy Committee, and the LTD Board of Directors) considered the technical evaluations and feedback from public and agency stakeholders, while weighing the trade-offs of each of the alternatives studied and possible mitigation measures. During this period, decision-makers reviewed, considered and eliminated several of the BRT alternatives evaluated in the draft AA Report. The four West 6th / 7th Avenue alternatives that included Add-A-Lane design options were eliminated because of their potential impacts on abutting properties and the character of downtown Eugene. The remaining two alternatives that would travel along West 7th Place were eliminated because there was not sufficient population or ridership projections along these routes, the routes would have an adverse impact on the trucking industry in the area, and there was no public or agency support for continuing to study these alternatives. The JLPAC also eliminated the TSM Alternative because it did not meet the purpose of the project and because of its relatively high operating cost per trip. Through several meetings the JLPAC worked with the project team to develop mitigation measures addressing potential impacts to property, land uses, parking, driveways, and businesses. As a result, the JLPAC eliminated all other BRT alternatives in favor of advancing mitigated concepts for the West 13th Avenue – West 11th Avenue Frontage Alley Design Option Alternative and the West 6th / 7th Avenue – West 11th Avenue Charnelton Two-Way, Reassign-A-Lane Design Option Alternative.

In May 2011, after significant public input, the three decision-making bodies eliminated the remaining West 13th Alternative and mitigation concepts and selected an LPA for the West 11th Avenue Corridor, as described in more detail in Section 2.2.2.

2.1.2.2. Technical Studies Addenda, Final AA Report, and LPA Report

Some substantive comments received between October 2010 and June 2011 required modifications or clarifications to the draft AA Report. These were incorporated into the final AA Report and documented by the report's cover memo to FTA. Updates to previously prepared technical studies were made through addenda to the studies. The final AA Report was published in July 2011, along with addenda to the technical studies. The LPA Report, which describes the process to select the LPA, was published in August 2011.

2.2. Alternatives Considered in the EA

This section describes the two alternatives evaluated in detail within this EA: the No-Build Alternative and the LPA. Appendix 2-1, Conceptual Design Plan Set for the LPA (Otak, August, 2011) provides the detailed engineering designs for the project.

2.2.1. No-Build Alternative

The No-Build Alternative provides a reference point, allowing a comparison of future environmental conditions with and without the proposed WEEE.

2.2.1.1. No-Build Capital Improvements

Following is a brief description of the roadway and transit capital improvements that would occur under the No-Build Alternative. In summary, the No-Build Alternative would include the region's existing transportation facilities, plus the capital improvements listed for future funding in the region's current RTP, with the exception of the planned extension of the existing EmX line into



West Eugene. For purposes of comparison, Table 2.1 summarizes each alternative’s transit capital improvements and Table 2.2 summarizes their transit operating characteristics. Figure 2.5 illustrates the location of those improvements.

Table Notes:

¹ The 8.8 mile length of the LPA route does not equal the number of LPA lane miles because on Charnelton, one BRT lane is used for travel in both directions.

² Stations are BRT stations or BRT platforms at transit centers. In this table, each two-way station (stations with a single platform serving inbound and outbound BRT vehicles) is counted as one station; similarly, pairs of one-way stations (together providing inbound and outbound access to the same general geographic area) are counted as one station.

³ The existing operations and maintenance facility is located in Glenwood. There would be no changes to this facility under either of the alternatives.

⁴ Sixty-foot buses include articulated buses and BRT vehicles.

⁵ Revenue vehicles include all 25-foot, 40-foot, and 60-foot buses and 60-foot BRT vehicles.

⁶ Bus stops are those that would be served exclusively by Line 30 between the Eugene Station and the Commerce Park & Ride Lot, primarily on W 11th and W 13th Ave. Under the LPA, Line 30 would operate from Eugene Station westbound on W 11th Avenue, then southbound on Garfield St, then eastbound on W 13th Ave, and finally northbound on Olive Street, returning to Eugene Station; and under the LPA, Line 30 would operate from Eugene Station westbound on W 11th Ave, then northbound on Seneca Rd, into the Seneca Station, then southbound on Seneca Rd, then eastbound on W 11th Ave, then southbound on Garfield St, then eastbound on W 13th Ave, and finally northbound on Olive St, returning to Eugene Station.

⁷ The Corridor Park & Ride lots under the No-Build and the LPA Alternatives would be at the same locations with the same capacities: Eugene Fairground (200 spaces); Eugene Faith Center (40); Seneca (43); Lowe’s (50); Commerce (125); and Cone (25).

Table 2.1 Transit Capital Improvements for the No-Build Alternative and LPA (2031)

Attribute	No-Build	LPA
BRT System		
One-Way BRT Lane Miles ¹	14.3	20.2
BRT Stations ²	24	37
BRT Vehicles (in service / spares)	10/4	15/6
Operating and Maintenance Facility		
Number of Facilities ³	1	1
O&M Facility Capacity (40-foot buses/60-foot buses) ⁴	100/45	100/45
Storage Capacity (number of revenue vehicles) ⁵	150	150
Bus		
Line 30 Bus Stops ⁶	39	13
LTD Systemwide Buses (in service / spares)	91/19	92/19
Corridor Park & Ride Facilities⁷		
Lots	5	5
Spaces	478	478

Source: LTD – July 2010, revised July 2011.

Table 2.2. Transit Operating Characteristics of the No-Build Alternative and LPA (2031)

Attribute	No-Build	LPA
BRT		
Weekday Vehicle Miles Traveled		
Systemwide	1,450	2,260
Weekday Revenue Hours ¹		
Systemwide	99	140
EmX Round Trip Time ²	N/A	92 minutes
Corridor BRT Headways (in minutes) ³		
West of Eugene Station (peak/off-peak/evening)	N/A	10/10/20
Bus		
Weekday Vehicle Miles Traveled		
Systemwide	15,930	16,700
Weekday Revenue Hours ¹		
Systemwide	1,048	1,089
Line 30 Headways in Minutes ³ (peak / off-peak)		
Between Eugene Station and Garfield St	15/30	30/30
Between Garfield St and Seneca Station	15/30	30/30
Between Seneca and Commerce Stations	15/30	0/0

Source: LTD – January 2010, revised July 2011.

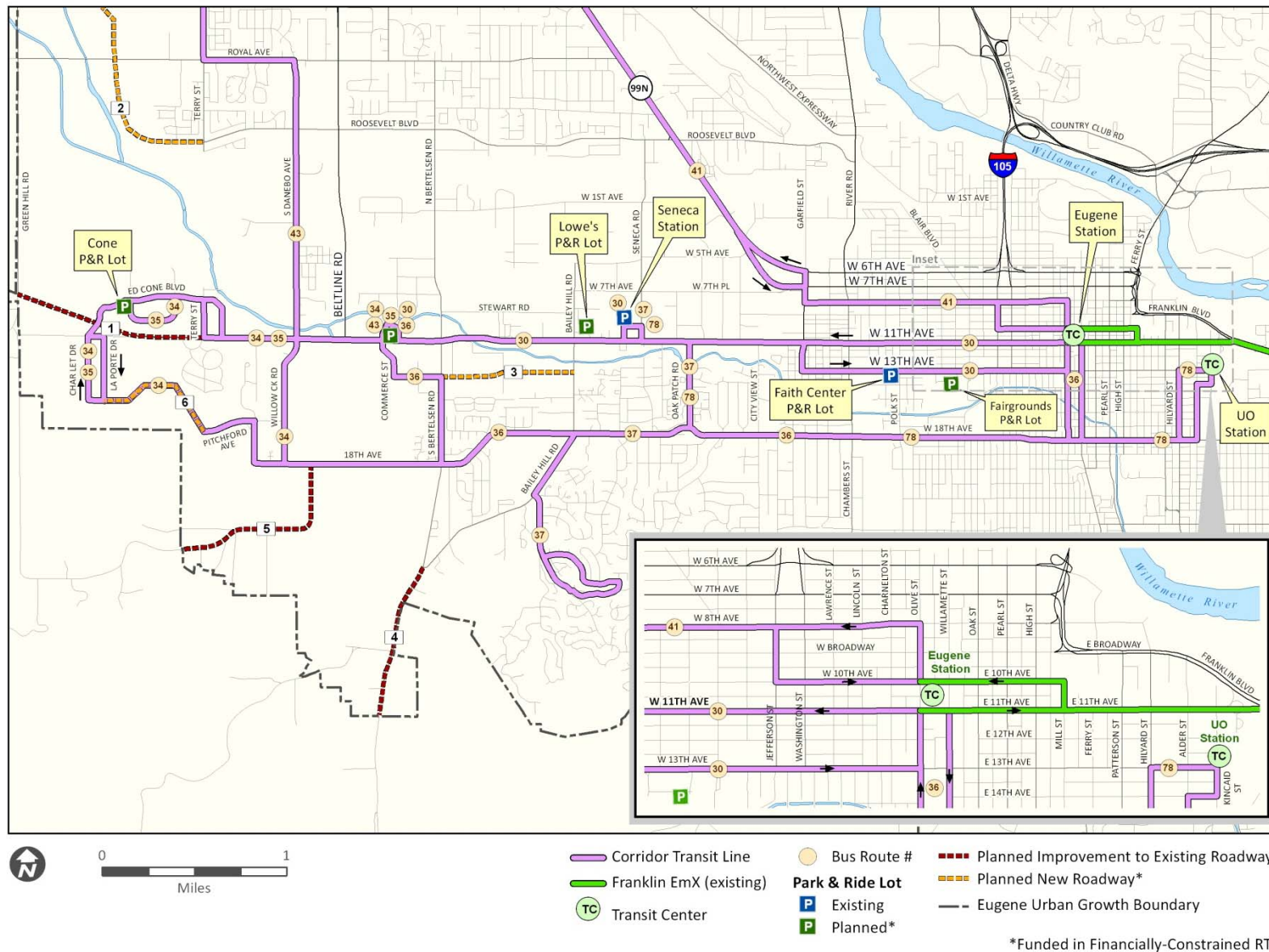
Table Notes:

¹ “Revenue hours” means the total number of hours on an average weekday that fixed route transit vehicles would be operating within revenue service, including layovers. Revenue hours do not include the time a vehicle spends traveling from or to the operations and maintenance facility to start or conclude revenue service, respectively.

² Average weekday PM peak-period round trip running time from the Commerce EmX terminus station to Gateway and back to the western terminus station – does not include layover.

³ “Headway” means the average time between transit vehicles moving in the same direction past a given point. It is inversely related to frequency (the average number of vehicles per hour that would pass by a given point in the same direction). Weekday peak is generally defined as 6:30 AM to 8:30 AM and 4:00 PM to 6:00 PM; weekday off-peak is generally defined as 5:00 AM to 6:30 AM, 8:30 AM to 4:00 PM and 6:00 PM to 7:00 PM; evening is generally defined as after 7:00 PM.

Figure 2.5. No-Build Alternative Transportation Network and Facilities



2.2.1.1.1. No-Build Roadway Capital Improvements

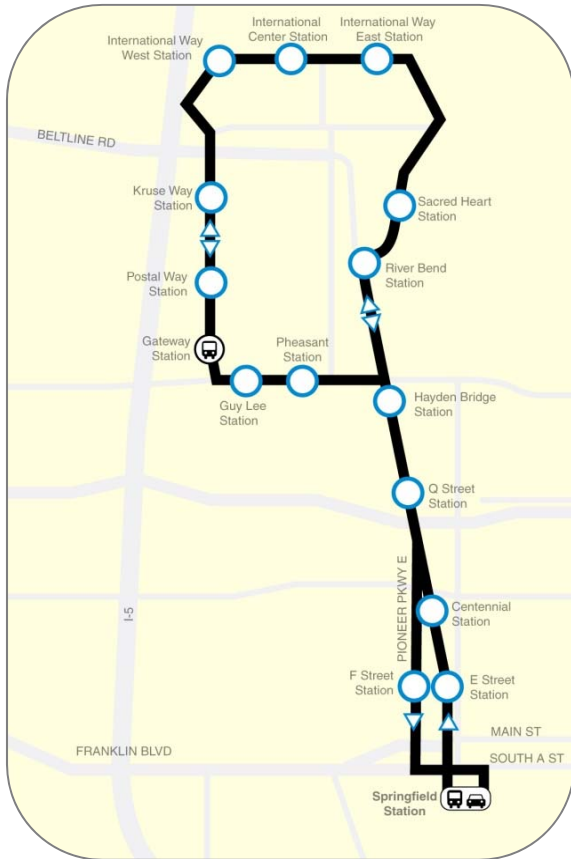
The No-Build Alternative includes the existing roadway, bicycle, and pedestrian networks in the Corridor and the addition of roadway, bicycle, and pedestrian capital improvements that are listed in the financially constrained road network of the RTP. The financially constrained RTP roadway network are those projects listed in the RTP (available through LTD or LCOG) that can be implemented using current and known revenue sources. The roadway projects planned within the Corridor by 2031 are listed below. See Figure 2.5 and Chapter 3 of the RTP for a full list of roadway, bicycle, and pedestrian improvements in the financially constrained RTP:

1. West 11th Avenue, Greenhill Road to Terry Street – upgrade the existing roadway to an urban facility.
2. Roosevelt Boulevard, Royal Avenue to Terry Street – extend the existing roadway as a new major collector roadway.
3. West 13th Avenue, Bertelsen Road to Bailey Hill Road – construct a new roadway segment as a new major collector roadway.
4. Bailey Hill Road, Bertelsen Road to the urban growth boundary – upgrade the existing roadway to an urban facility.
5. Willow Creek Road, West 18th Avenue to the urban growth boundary – upgrade the existing roadway to urban standards.

2.2.1.1.2. No-Build Transit Capital Improvements

The No-Build Alternative would include three existing major transit capital facilities within the West 11th Avenue Corridor, which are illustrated in Figure 2.5: Eugene Station (the region’s central off-street, timed-transfer transit hub), University of Oregon Station, and Seneca Station. It would include no new major bus capital improvements, although LTD expects to replace five existing standard buses with new 60-foot articulated buses by 2017.





EmX Franklin Line

BRT Facilities and Vehicles

LTD’s existing Franklin EmX line, which opened in early 2007, extends between the Eugene Station in downtown Eugene and the Springfield Station in downtown Springfield. It has approximately four miles of exclusive transit lanes and eight two-way BRT stations. The Gateway extension began operation in January 2011 and extends BRT lanes, stations, and service north from the Springfield Station into the Gateway area and to the new Peace Health Hospital, adding approximately 7.7 miles of BRT service, 14 BRT stations, and 7 BRT vehicles. Under the No-Build Alternative, LTD’s fleet of BRT vehicles would remain at 14 (including spares). No other major BRT facility improvements would be made under the No-Build Alternative.

Park & Ride Facilities

The No-Build Alternative would include LTD’s current leased and owned Park & Ride lots within the West 11th Avenue Corridor: Seneca Park & Ride Lot (owned, 43 spaces); and Eugene Faith Center Park & Ride Lot (leased, 40 spaces). It would add three leased Park & Ride lots: Fairgrounds Park & Ride Lot (200 spaces); Lowe’s Park & Ride Lot (50 spaces); and the Commerce Park & Ride Lot (125 spaces). The locations and capacities of these future lots are approximate, pending project-level siting and funding decisions.



Gateway EmX Extension

Operations and Maintenance Facilities

The No-Build Alternative would not add to or expand LTD's existing maintenance building and storage yard in Glenwood. The maintenance facility has a capacity of 100 standard and 45 articulated vehicles (including EmX vehicles). The storage yard has a capacity of approximately 150 vehicles (a mix of standard and articulated buses and BRT vehicles).

2.2.1.2. No-Build Transit Operations

This section summarizes the transit operating characteristics under the No-Build Alternative.

2.2.1.2.1. No-Build Bus Operations

The regular bus service routing that would occur under the No-Build Alternative is illustrated in Figure 2.5 (frequency of service for each bus line is provided in Chapter 4). Bus operations would be similar to LTD's existing fixed-route bus network, with improvements that would be consistent with the 2007 RTP's 20-year financially constrained transportation system. Transit service improvements would be limited to those that could be funded using existing and readily foreseeable revenue sources. Systemwide, these improvements would include: 1) increases in LTD bus route frequency to avoid peak overloads and/or maintain schedule reliability; 2) increases in run times to maintain schedule reliability; and 3) incremental increases in LTD's systemwide bus service hours and coverage consistent with available revenue sources and consistent with the 2007 RTP's 20-year financially constrained transit network (approximately 1.4 percent per year). As shown in Table 2.2, under the No-Build Alternative there would be 15,930 bus vehicle miles traveled and 1,048 bus revenue hours (for average weekdays in the year 2031).

Specifically within the Corridor, the route for Line 30 would be modified from its 2007 alignment to operate along West 11th and 13th Avenues between Eugene Station and Commerce Station. The new Line 30 would operate every 15 minutes during the two-hour peak periods and every 30 minutes during the off-peak (average weekdays in 2031). In addition, existing lines 36A and 36B serving West 18th Avenue would be consolidated into a single route, Line 36, which would operate every 15 minutes during the peak periods and every 30 minutes during off-peak periods. Two new routes would provide service west from the Commerce Park & Ride Lot into the planned Crow Road development area: Lines 34 and 35. Line 34 would operate during peak periods, with connections to employment centers near Willow Creek Road and in the Cone Industrial Park. Line 35 would operate off-peak with the same routing as Line 34, except that service along Pitchford Avenue and Willow Creek Road would be eliminated. Relatively minor rerouting would also affect western portions of Lines 41 and 43 to respond to new urban development.

2.2.1.2.2. No-Build BRT Operations

Under the No-Build Alternative, the BRT operations would remain as they are today. Currently, the round-trip running time on the Franklin/Gateway EmX line is approximately 62 minutes, not including layover time. The existing EmX line operates every ten minutes on weekdays until approximately 7:00 PM. Service is reduced weekends and after 7:00 PM on weekdays. Under the No-Build Alternative, the Franklin/Gateway line would continue to operate every 10 minutes throughout the day. However, to address increased peak-period ridership at the EmX line's peak load point (at approximately Agate Street), LTD would continue to operate an additional shortened EmX line every 30 minutes during peak periods in the peak direction between the Eugene and Springfield Stations.

2.2.2. Locally Preferred Alternative

The LPA is described below and illustrated in Figure 2.6.

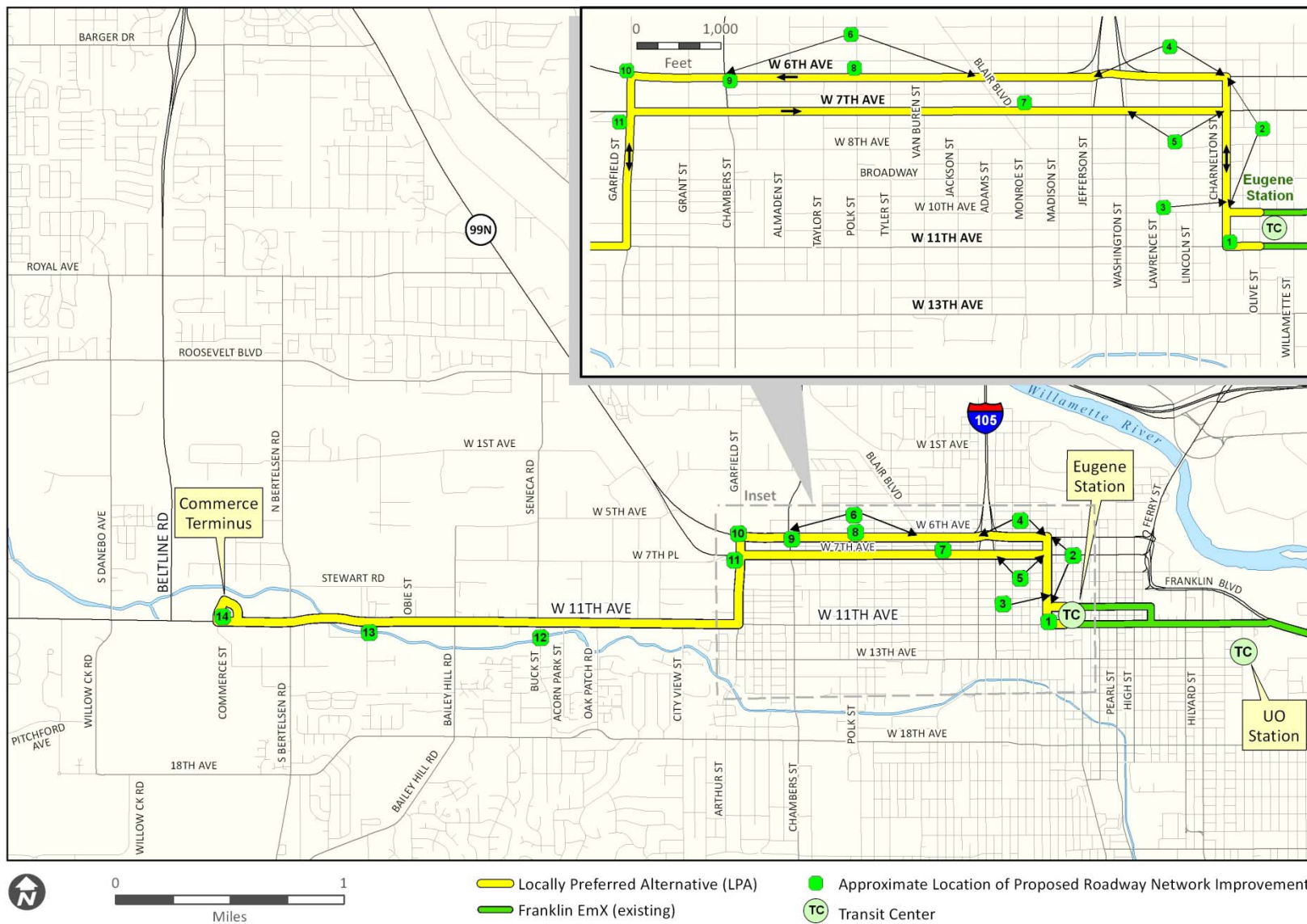
2.2.2.1. LPA Capital Improvements

2.2.2.1.1. LPA Roadway Capital Improvements

In addition to the new BRT lanes within the existing roadway network, the LPA includes a number of changes to the Corridor's roadway network. The numbered locations on Figure 2.6 correspond to a detailed list of design refinements that follow the figure. The refinements reflect the changes from the preliminary LPA to the adopted LPA. A narrative description of the LPA begins in Section 2.2.2.1.2. (Other relatively minor changes to the roadway network and changes to the bicycle and pedestrian facilities are documented in Appendix 2-1).



Figure 2.6. Locally Preferred Alternative Roadway Improvements



*Numbers correspond to text description on the next page.

1. Widen an existing dedicated right-turn lane from westbound West 11th Avenue to northbound on Charnelton Street.
2. Convert one of two southbound general-purpose lanes to a BRT lane on Charnelton Street, between Broadway and West 6th Avenues.
3. Convert an existing general-purpose lane to a BRT lane on Charnelton Street between Broadway and West 10th Avenues, and add a new northbound general-purpose lane by removing on-street parking and roadway widening on the east side of Charnelton Street.
4. Convert one of four westbound general-purpose lanes on West 6th Avenue to a westbound BRT lane between Charnelton and Jefferson Streets.
5. Convert one of four eastbound general-purpose lanes on West 7th Avenue to an eastbound BRT lane between Charnelton and Washington Streets.
6. Convert one of four general-purpose lanes on West 6th Avenue to a BRT lane, generally between Blair Boulevard and Chambers Street.
7. Add a dedicated left-turn lane from southbound on Monroe Street to eastbound on West 7th Avenue.
8. Add a dedicated right-turn lane from southbound on Polk Street to westbound on West 6th Avenue.
9. Add a dedicated left-turn lane from westbound on West 6th Avenue to southbound on Chambers Street.
10. Convert an existing curbside through/right lane on southbound Garfield Street at West 6th Avenue to a right-only lane.
11. Add a dedicated right-turn lane from eastbound on West 7th Avenue to southbound on Garfield Street.
12. Add a bicycle and pedestrian path connecting Buck Street across the Amazon Channel.
13. Add a bicycle and pedestrian path connecting across the Amazon Channel generally connecting West 12th and West 11th Avenues west of Obie Street.
14. Add a dedicated right-turn lane from westbound on West 11th Avenue to northbound on Commerce Street (west intersection.)

No new intersection signals would be constructed. Intersections would be retrofitted to include transit control signal heads, similar to those used on the Franklin and Gateway EmX Lines. The following intersections would receive a transit phase:

BRT Signal Phasing

BRT signal and signal phasing are additional hardware and software added to a traffic signal to allow for safe BRT operations. This hardware is typically added at locations where BRT vehicles may need to turn across several lanes of traffic, enter into the main traffic stream, or where some other operational or safety concerns for BRT operations exist.

- West 10th Avenue and Charnelton Street
- West 6th Avenue and Garfield Street
- West 7th Avenue and Garfield Street
- West 11th Avenue and Commerce Street
- West 11th Avenue and Seneca Road

All signalized intersections that would be traversed by BRT vehicles in the Corridor would be considered for transit signal priority as the project advances through preliminary engineering, final design, and construction. Decisions on whether or not to provide transit signal priority at any other intersections would be determined by LTD and the owner of the signal (i.e., Oregon Department of Transportation or the City of Eugene).

2.2.2.1.2. LPA Transit Capital Improvements

The LPA would extend intermittent sections of concrete BRT lanes and BRT stations west from Eugene Station to West 11th Avenue and Commerce Street (see Figure 2.7). In all, there would be approximately 5.9 miles of new BRT lanes (mostly shared BAT lanes with some BRT-only lanes (Appendix 1-1 for details)). Except for a bi-directional BRT-only lane on Charnelton Street between West 6th and 10th Avenues, all of the new BRT lanes would be one-way, traveling with the flow of the adjacent general-purpose lanes. BRT vehicles serving the LPA would also share approximately 2.4 miles of existing general-purpose lanes (Figure 2.8).

Following is a more detailed description of the transit capital improvements under the LPA. Under the LPA there would be no new Park & Ride lots.

BRT Vehicles

The LPA would add seven new BRT vehicles to LTD's fleet (including spares).

The proposed number of new BRT vehicles is based on travel demand forecasting using the LPA's anticipated average weekday peak-period peak-load point, which would be westbound during the PM peak period approaching Eugene Station.

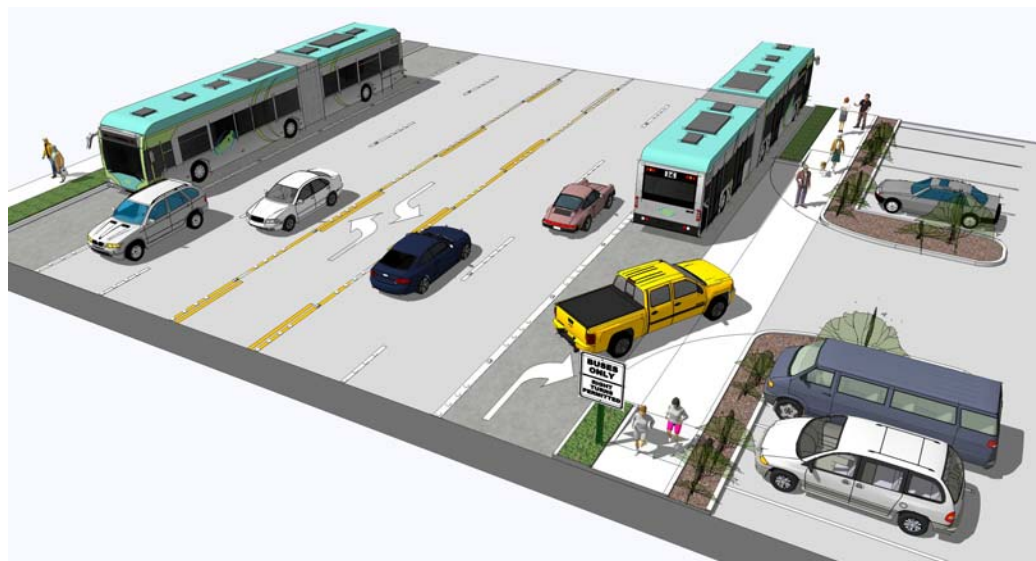
BRT Alignment

Because the proposed new BRT line would be an extension of the existing Franklin/Gateway EmX line, BRT vehicles would be through-routed at the Eugene Station between the existing and new BRT line. That is, a BRT vehicle that would start at the Commerce Terminus Station and travel east into Eugene Station would then continue east to Springfield Station and on through the Gateway loop, returning to the Commerce Terminus Station via generally the same route.

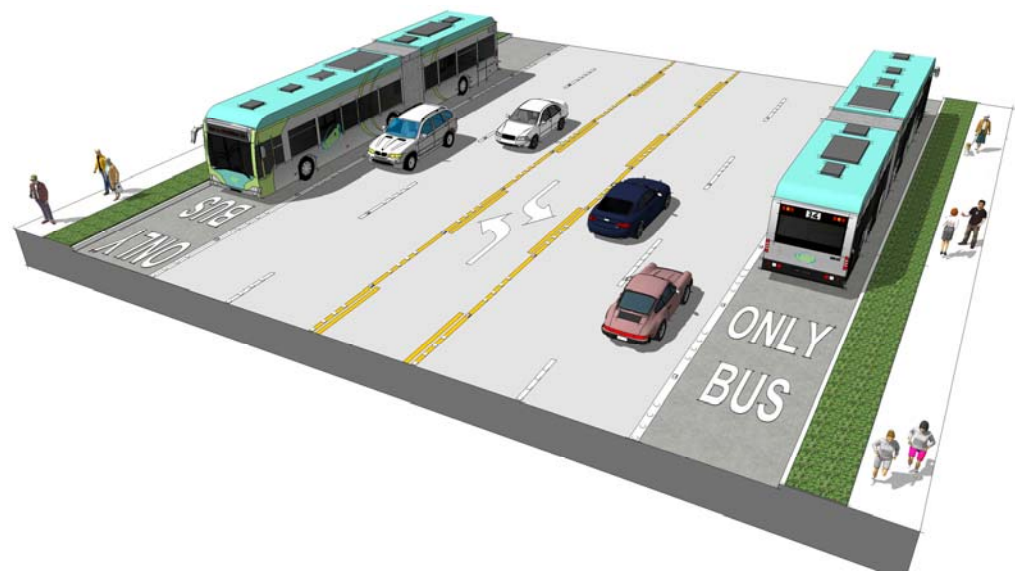
From the existing BRT platform at Eugene Station, located on the north side of West 11th Avenue (just west of Willamette Street), to Charnelton Street, outbound (westbound) BRT vehicles would operate in mixed traffic (Figure 2.9). Inbound (eastbound) BRT vehicles would operate in mixed traffic on West 10th Avenue between Charnelton Street and the BRT platform at Eugene Station. Inbound and outbound BRT vehicles would operate in one common BRT lane between West 6th and 10th Avenues on Charnelton Street.

Between Charnelton and Garfield Streets, the LPA would add a westbound BAT lane to the south side of West 6th Avenue and an eastbound BAT lane to the south side of West 7th Avenue (except between Chambers Street and Blair Boulevard, where BRT vehicles would travel in mixed traffic). In most instances, the BRT alignment would be a BAT lane, with some sections of BRT-only lanes (Figure 2.7). In general, the right-of-way (ROW) for the additional BAT lanes would be obtained through property acquisition, except on West 6th Avenue between Charnelton and Jefferson Streets and between Blair Boulevard and Chambers Street, and on West 7th Avenue between Charnelton and Washington Streets, where (because of existing and projected future available capacity) the ROW would be provided by converting a general-purpose lane in each direction to the BAT lanes. In these locations on West 6th and 7th Avenues, the number of general-purpose through lanes would be reduced to three lanes in each direction.

Figure 2.7. Illustrations of a Business Access and Transit Lane (BAT) and BRT-Only Lane



BAT Lane



BRT Only Lane

Southbound BRT vehicles on Garfield Street would operate in an inside (leftmost) BAT lane between West 6th and 7th Avenues, in mixed traffic between West 7th and Broadway Avenues, in an outside BAT lane between Broadway and West 10th Avenues (through the acquisition of additional ROW), and in a BRT-only lane between West 10th and 11th Avenues (also through the acquisition of additional ROW). Northbound BRT vehicles on Garfield Street would operate in mixed traffic between West 11th Avenue and Broadway and in an outside BAT lane on the east side of Garfield Street between Broadway and West 7th Avenues (through the acquisition of additional ROW).

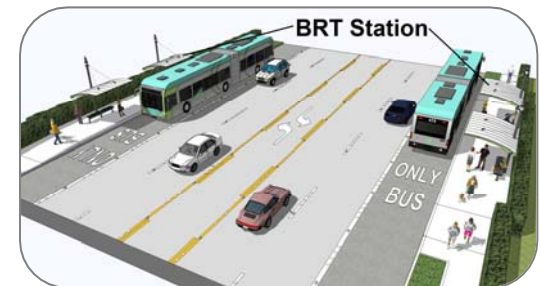
The LPA would add an outside BAT lane onto West 11th Avenue in both directions, generally between Acorn Park and Commerce streets westbound, and between Garfield and McKinley Streets and between Bailey Hill Road and Commerce Street eastbound, generally through the acquisition of new ROW or within available ROW (sometimes as a BRT-only lane). BRT would operate in mixed traffic westbound between Garfield and Acorn Park Streets and eastbound between Bailey Hill Road and McKinley Street (except for a one-block section of BRT-only lane between Tyinn Street and Oak Patch Road). There would be a terminus station with two BRT bays on the north side of Commerce Street, and a southbound BAT lane on the west side of Commerce Street between the station and West 11th Avenue.

BRT Stations and Changes to Bus Stops

There would be 13 new BRT stations or station pairs under the LPA (Figure 2.8). The station at the Commerce Terminus would include two BRT bays, an extended BRT station area, and operator restrooms. Two BRT vehicle bays are required at this station (with independent pull-in and pull-out) because the EmX line's scheduled recovery time would often exceed the line's headways. The BRT platforms of the Commerce Terminus Station would be located on the north side of Commerce Street. All new stations would be curbside platform stations; there would be no double-sided center platforms stations added.

BRT Station Pairs

BRT Station Pairs refers to two stations located in the same area and which provide incoming and outgoing service. Paired stations can be located on opposite sides of the roadway (curbside platform) or on opposite sides of a median (double-sided center platforms).



BRT Bays (and Double Bays)

BRT bays (and Double Bays) are areas specifically designed to allow BRT buses to pull into and out of to pick up and drop off passengers. These bays are designed so that the waiting BRT bus will not block other traffic in the station area.

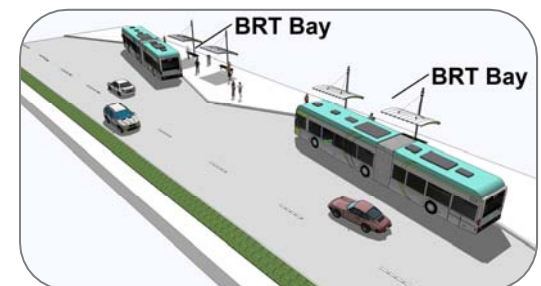
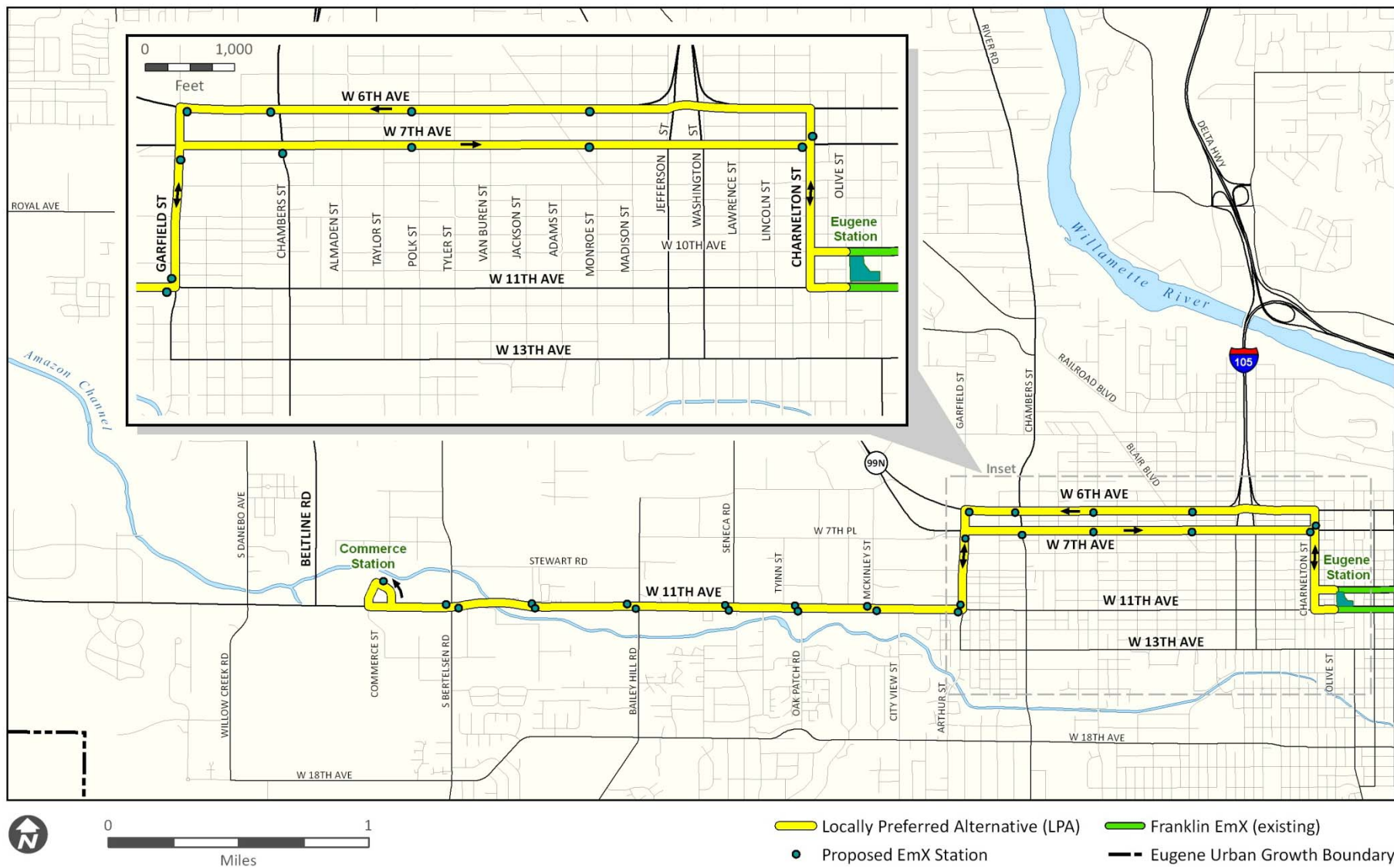


Figure 2.8. Locally Preferred Alternative Alignment and Station Locations



A double-bayed, non-BRT bus stop and passenger platform with shelter would be constructed in the vicinity of the Commerce Terminus Station to facilitate transfers and to provide layover space for buses. The new bus stop would be located with the public right-of-way on the Commerce Street loop.

New bus stops would be constructed and/or existing bus stops would be relocated in the vicinity of West 6th and 7th Avenues at Garfield Street and at Blaire Boulevard to facilitate transfers between the extended EmX line and Lines 41/43, 40 and 52 (see Section 4.2 for additional detail on transit operations under the LPA).

Park & Ride Facilities

Under the LPA, there would be no new Park & Ride facilities. Three existing and planned Park & Ride lots would be served by the LPA: Seneca (43); Lowe's (50); and Commerce (125). The latter two would be new.

Operations and Maintenance Facilities

BRT Operations and maintenance facilities under the LPA would be the same as those under the No-Build Alternative.

2.2.2.2. LPA Transit Operations

This section describes the Corridor's transit operations under the LPA. Figure 2.9 illustrates the transit network for the LPA.

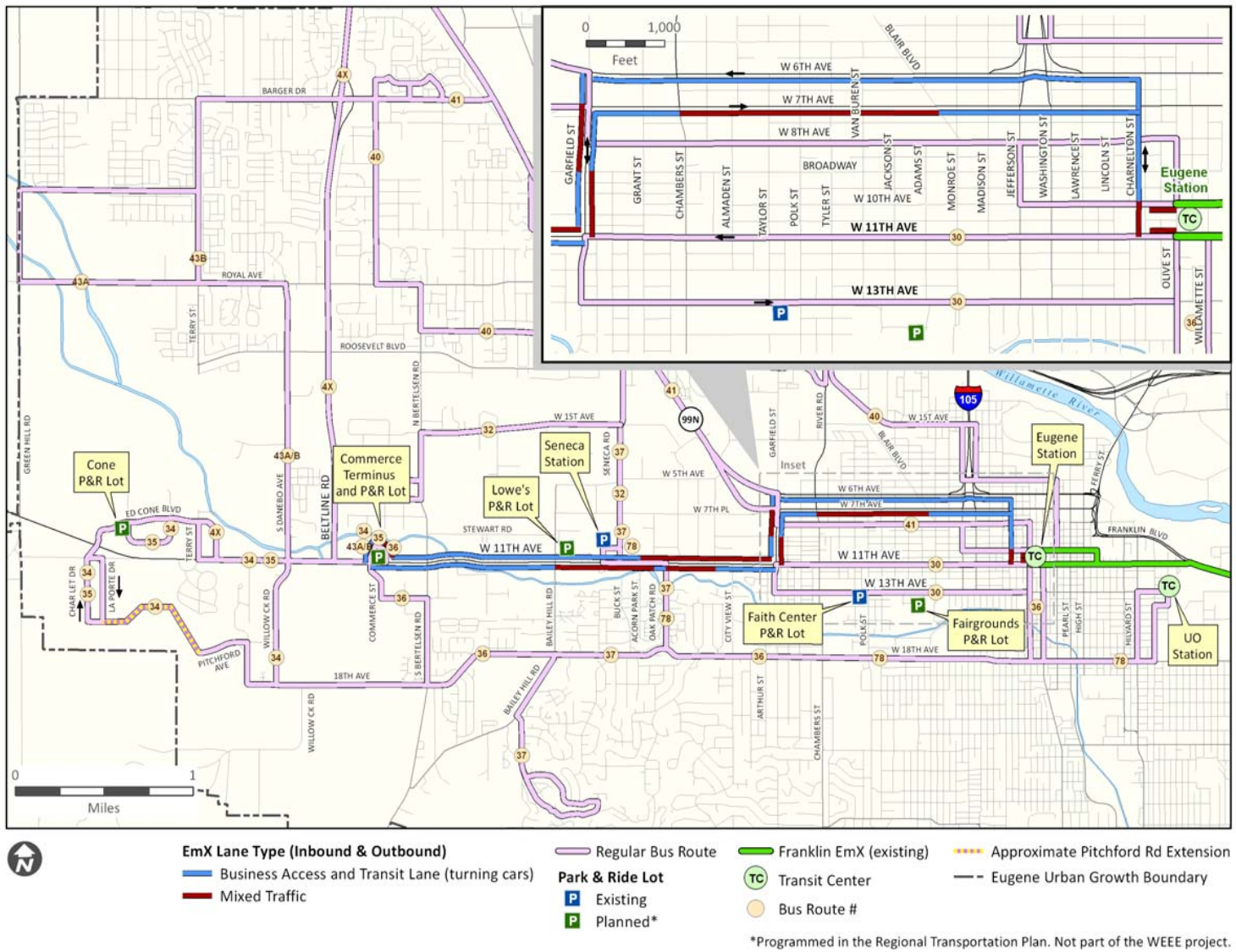


Side Platform BRT Station



Curb-Side Platform BRT Station

Figure 2.9. Locally Preferred Alternative Transportation Network and Facilities



2.2.2.2.1. LPA Bus Operations

Weekday bus operations (which do not include BRT) would be the same under the LPA as under the No-Build Alternative, except for the following changes (see Figure 2.9 for additional detail).

- Service on Line 41/43 between Commerce Street and Eugene Station (generally via West 11th and 13th Avenues) would be replaced by the extended EmX Line.
- Line 41/43 would be interlined with Line 36 at Commerce Street (to provide additional one-seat ride opportunities between the interlined transit lines). As a result, service provided by Line 36 on West 11th Avenue west of South Danebo Avenue and on Arrowsmith and Terry Streets would be eliminated (peak-period service in that segment would continue to be provided by Line 93).
- Line 41/43 would be rerouted from West 8th Avenue, generally between Garfield and Charnelton Streets, to West 6th and 7th Avenues, and that section of the line would operate as express.
- Lines 40 and 52 would be rerouted from West 5th Avenue, generally between Blaire Boulevard and Charnelton/Oak Streets, to West 6th and 7th Avenues, and that section of the lines would operate as express.
- Line 51 outbound from Eugene Station would be rerouted from West 8th Avenue to West 5th Avenue, between Olive and Washington Streets.
- Line 93 would operate as express on West 11th Avenue, between Commerce and Seneca streets.
- Due to reduced midday demand, midday headways on Line 40 would be reduced from 30 minutes to 45 minutes.

These changes would address redundant EmX and bus coverage in the Corridor and optimize the LPA's cost-effectiveness (that is, balance ridership and Operating and Maintenance (O&M) costs).



2.2.2.2. LPA BRT Operations

Under the LPA, the existing Franklin/Gateway EmX Line would be extended west using the BRT facilities described for the LPA (see Section 4.1). In general, every BRT vehicle would operate the full length of the EmX line. They would travel east from the new Commerce Terminus Station, through the Eugene and Springfield stations, around the Gateway loop, through the Springfield and Eugene stations and back to the Commerce Terminus Station. All layover and recover time on the full EmX Line would be scheduled to occur at the Commerce Terminus Station, rather than at Eugene Station as under the No-Build Alternative.

As noted in Table 2.2, the LPA would result in 810 more BRT vehicle miles traveled and 41 more BRT revenue hours, compared to the No-Build Alternative (average weekdays in 2031).

2.3.LPA Capital Costs

The LPA is in LTD's approved capital improvement plan and is expected to begin design in 2012 and to open in 2017. The budget for this project includes authorization of the local match (from state lottery funds) over the course of several years. The results of the tabulation of costs are summarized in Section 2.3.1. Capital costs for the LPA are presented in 2011 dollars. Year-of-expenditure costs are provided in Chapter 5, Cost and Financial Analysis.

2.3.1. Capital Cost Methodology

The methodology used to prepare the Conceptual Design capital cost estimates for the LPA provides a consistent procedure to allow comparison among segments of the complete alignment. By applying a uniform capital costing methodology, the results are comparable, are useful in determining the capital cost requirements, and allow an assessment of the cost to benefit ratio of the alternative studied. A similar methodology was used in the AA Report.

The process of estimating capital costs reflects the planning-level of design development and includes contingencies to account for unknown project details. The cost estimate will also become better defined as the project proceeds and the LPA is better defined.

Individual costs of construction bid items are based on recent construction bid data for similar projects in LTD's system, as well as typical items tabulated by the Oregon Department of Transportation (ODOT). Using the available LPA design information, historical construction bid data, and appropriate contingencies based on the level of design refinement, a reasonable estimate of the expected project capital costs was determined.

The development of the capital cost estimate required four general steps:

1. The LPA was divided into four project segments based on general types of construction and terrain-based limits. This division was primarily based on the street segment on which the work will be completed.
2. General quantities were calculated based on the design for each segment. While not comprehensive in scope, the items quantified define the major construction elements needed to complete construction. For this project, these elements included construction of the BRT lanes (BAT lanes), asphalt concrete, aggregate base, utility relocation and traffic signal construction, BRT stations, ROW requirements, and others. Using the conceptual design plan set, bid items were quantified on a per sheet basis.
3. Research determined appropriate unit prices for each of the quantified construction elements. These unit costs are based on historical bid tabulation data from ODOT, estimated work from previous BRT construction in LTD's system, and other estimating procedures based on project experience and construction cost trends in the region. The unit cost of bid items reflect current 2011 (base year) dollars determined by a review of ODOT's 2010 and 2011 bid data, and 2009 data adjusted for inflation; these costs are available for download on the ODOT website: (<http://www.oregon.gov/ODOT/HWY/ESTIMATING/index.shtml>). All costs were reviewed by project team members and verified against LTD's recent Gateway EmX Extension project costs where comparable.



4. Quantities and unit costs were multiplied to develop a price for each segment in base year dollars, and professional services necessary to design and administer the project were determined. The allocated contingencies were applied based on the level of risk of the alternative. An additional “unallocated contingency” was applied to the overall cost.

Using the quantities and unit costs developed, as described above, LTD populated the FTA Standard Cost Categories (SCC) spreadsheets. FTA SCC spreadsheets standardize the approach for estimating capital costs on transit projects (updated August 2011). The costs for this project were estimated using the format provided in the spreadsheet. The categories are broken into nine specific areas as described in Table 2.3 in the next section.



2.3.2. Capital Cost Estimates

The resulting capital cost estimates for the LPA are listed in Table 2.3. With a total estimated cost of \$84.2 million (in 2011 dollars), the greatest expenditure is in the Sitework category (Cost Category 40). This category includes all the improvements and construction tasks necessary to integrate the BRT lanes into the surrounding infrastructure; the higher percentage of total costs reflects this highly commercial and built-out part of the city. These costs do not reflect any future costs nor do they account for inflation or future financing options. Refer to Chapter 5 for a discussion of how these current-dollar costs form the basis for estimating year-of-expenditure costs and integration into LTD’s finance plan.



Table 2.3. LPA Projected Capital Cost Estimates (2011 dollars)

Cost Category	Cost in 2011 Dollars (rounded)	Percentage of Total Project Cost (rounded)
10 Guideway and Track Elements	\$9,961,000	11.8%
20 Stations, Transit Stops, Terminals, Intermodal	\$5,997,000	7.1%
30 Support Facilities	N/A	0%
40 Sitework & Special Conditions	\$31,363,000	37.3%
50 Systems	\$7,811,000	9.3%
60 Right-of-Way, Land, Existing Improvements	\$3,959,000	4.7%
70 Vehicles	\$8,162,000	9.7%
80 Professional Services	\$12,927,000	15.4%
90 Unallocated Contingency	\$4,009,000	4.8%
TOTAL	\$84,190,000	100%

Source: LTD and WEEE Project Team, 2011.

2.4. Operations and Maintenance Costs

This section provides information on the methodology for estimating O&M costs and presents the estimated O&M costs for each alternative.

2.4.1. Operations and Maintenance Cost Methodology

The methodology used to prepare the O&M cost estimates provides for a consistent and accurate comparison between the No-Build Alternative and the LPA. The methodology distinguishes between the O&M cost for EmX (BRT) service and conventional bus service.

Individual costs are based on research into historical O&M costs for LTD, as well as comparable information specific to BRT operations along the first two EmX corridors in the LTD system. A fully allocated cost model is used to determine O&M costs of the transit service alternatives. This

model, using LTD historical costs as a basis, allocates all current LTD service costs into three categories: direct fixed costs, indirect fixed costs, and direct variable costs.

Direct Fixed Costs are directly related to transportation, such as O&M administration costs, but do not necessarily increase as service levels increase. These costs amount to 2.2 percent of LTD operating costs.

Indirect Fixed Costs include most general administrative and marketing costs and other costs that are not directly tied to service. These costs amount to 35.2 percent of LTD's operating costs.

Direct Variable Costs are directly related to the level of transit service provided. Variable costs include driver wages, maintenance worker wages, vehicle fuel costs and supervisory costs that change as service levels change. They constitute the largest portion of operating costs, at 62.6 percent.

Fixed costs (both direct and indirect) are constant over very large increments of service and, therefore, do not vary with small changes in the level of transit service. Variable costs, on the other hand, are directly linked to the amount of service provided. Given that the additional O&M cost for this project's opening year is estimated to be less than 3 percent of the current operating budget, and that the difference between the No-Build Alternative and the LPA will be reduced in future years, it is reasonable to assume that fixed costs will not be affected.

To determine O&M costs, each cost category in the LTD budget has been subdivided into cost factors based on vehicle hours, vehicle miles, and peak buses (the maximum number of buses needed to provide service at peak hour) (Table 2.4). In general, transportation costs are allocated on a per-vehicle-hour basis, fleet maintenance costs are allocated per vehicle mile, and variable direct administrative costs and support costs are allocated per peak bus. For each budget item, a percentage allocation between conventional bus and EmX service was determined, and those costs were totaled. Other fixed costs not affected by the difference between the No-Build Alternative and the LPA are assumed to remain the same for both alternatives. To estimate the cost of the

alternatives, the additional hours, miles, and peak buses, allocated by service type (conventional and EmX), are multiplied by the applicable cost factors.

Table 2.4. Formula for Calculating Systemwide Operating and Maintenance Costs

	(Conventional bus vehicle hours) X (Conventional bus operating hourly rate)
+	(EmX vehicle hours) X (EmX operating hourly rate)
+	(Conventional bus vehicle miles) X (Bus fleet maintenance cost per mile)
+	(EmX vehicle miles) X (EmX fleet maintenance cost per mile)
+	(Conventional peak vehicles) X (Direct administrative costs of conventional peak vehicles)
+	(EmX peak vehicles) X (Direct administrative costs of EmX peak vehicles)
+	Direct Fixed Costs
+	Indirect Fixed Costs
=	Systemwide Operating and Maintenance Cost

Source: Lane Transit District and West Eugene EmX Extension Project Team, 2011.



The components of the cost model are summarized in Table 2.5.

Table 2.5. Operating and Maintenance Cost Model Components

Category	Components	Cost Type	Description and Applicability
Transit Operating: Allocated per vehicle hour	Operator cost per vehicle hour	Direct Variable	Operator cost is based on historical LTD costs. Operator cost per hour is \$2.00 higher for EmX service. That difference may be eliminated in the future, but is assumed to continue in this analysis.
	Direct operator supervision cost per vehicle hour	Direct Variable	Costs are split between EmX and conventional bus based on percentage of total service.
Fleet Maintenance: Allocated per vehicle mile	Fleet maintenance cost per vehicle mile	Direct Variable	Historical LTD data is used to allocate costs by conventional service and EmX service.
	Fleet supervision cost per vehicle mile	Direct Variable	This item is for the supervisory costs for fleet maintenance and is allocated between conventional service and EmX service.
Direct Administrative Costs: Allocated by peak vehicle	Direct administrative costs per vehicle hour in peak service	Direct Variable	This item varies with the number and type of vehicles in service. Costs include station costs, training, security, and fare collection.
Direct Fixed Costs	Direct fixed costs	Direct Fixed	These costs include non-supervisory administrative costs within operations and fleet maintenance.
Indirect Fixed Costs	Indirect fixed costs	Indirect Fixed	These costs include indirect administrative and marketing costs and other costs that do not change with a moderate change in service.

Source: Lane Transit District and West Eugene EmX Team, 2011.

2.4.2. Operations and Maintenance Cost Estimates

As shown in Table 2.6, the LPA has a higher O&M cost than the No-Build Alternative. The difference is approximately 2.6 percent in 2017. The cost differential is expected to decrease over time as a result of increasing operating costs associated with the No-Build Alternative relative to the LPA.

Over time, even with the LPA's improved transit service, it is expected to have slightly lower operating costs than the No-Build Alternative. The LPA would have elements, such as transit signal priority and transit lanes, to reduce the impact of traffic congestion on travel time, and the service frequency would improve in the opening year to 10 minutes throughout weekdays, a service frequency that is not expected to change for many years. Other O&M cost savings in year 2031 would result from the LPA's estimated savings of approximately 245 gallons of gasoline and 90 gallons of diesel per day.

Table 2.6. Year 2017 Operations and Maintenance Costs for the No-Build Alternative and LPA (Dollars in millions)

<i>Alternative</i>	<i>Year 2017 (Opening Year)</i>	<i>Year 2031</i>
No-Build	\$44.58	\$54.95
LPA	\$45.76	\$54.50

Source: Lane Transit District and West Eugene EmX Team, 2012.



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CHAPTER 3

AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES

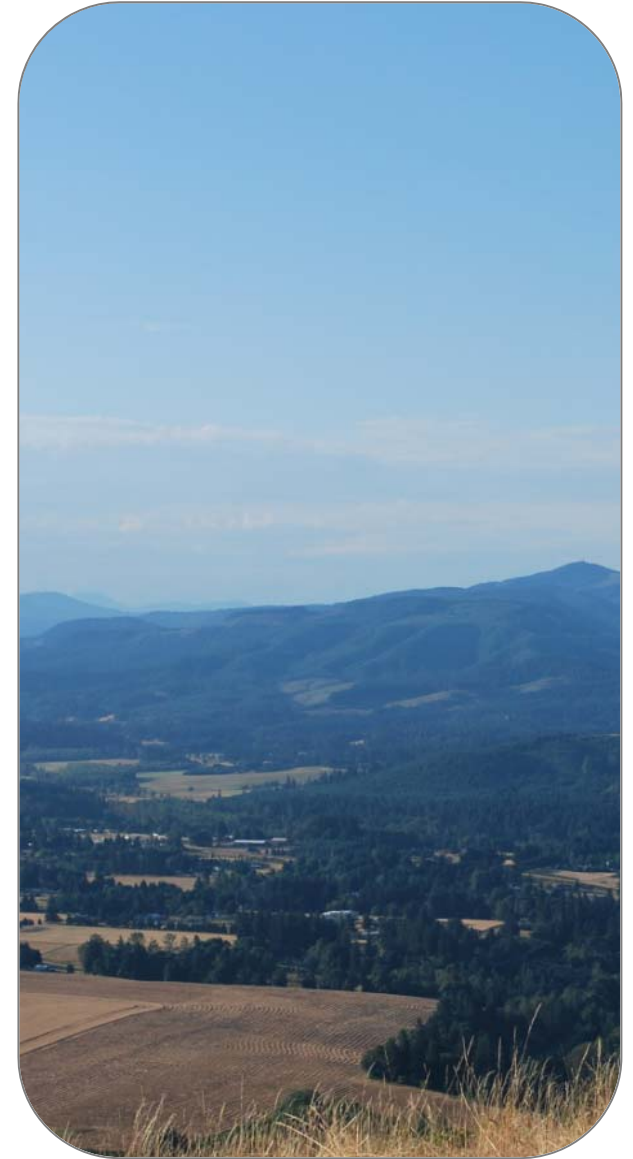
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3. AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES

This chapter addresses current conditions, effects, and possible mitigations measures that may occur under the No-Build Alternative and the LPA, for each environmental topic. (It does not address transportation conditions, effects, and mitigation, which are covered in Chapter 4.) A summary table of impacts and benefits is included in Appendix ES-1.

As discussed in Chapters 1 and 2 above, extensive analysis has been conducted to allow full consideration of the range of potential impacts and benefits of extending EmX service into West Eugene. The findings from the AA (October 2010) and its supporting technical reports (June-September 2010) were used to select the project's LPA. The AA was revised in August 2011 to reflect feedback received from the public and agencies. Additional analyses were conducted for the LPA and technical studies were updated and expanded in the summer and fall of 2011. This chapter summarizes the findings from these studies.

For more detailed information about any of the environmental topics in this chapter, refer to the project's studies and reports, all of which are available through the LTD website (see Chapter 11 of this EA for a listing of supporting documents). Some of these studies and reports are included on the CD at the back of this EA (the table of contents lists the CD contents).



Land Use, Prime Farmlands, and Development

Land Use - The existing or planned use of land, such as residential, commercial, industrial, etc.

Prime Farmland - As designated by U.S. Department of Agriculture, land that has the best combination of physical and chemical characteristics for producing food, feed, forage, fiber, and oilseed crops and that is available for these uses.

Development - The use of vacant land through the construction of buildings or other structures or improvements, such as housing, commercial, retail or industrial centers, public facilities, etc.

3.1. Land Use

This section summarizes the proposal's potential effects on land use. Also, its description of existing conditions provides a general overview of the project area for discussions in later sections.

In general, the No-Build Alternative is inconsistent with the Eugene-Springfield Metropolitan Area General Plan (MetroPlan), which calls for the development of the EmX system. The LPA would help link West Eugene with downtown Eugene and supports the Statewide Planning Goals and the Transportation Planning Rule.

3.1.1. Affected Environment

For the purposes of this land use analysis the study area is located on the west side of the City of Eugene, in an area that serves as a western entrance to the City as well as a travel corridor to and from nearby communities, such as Florence, Veneta, and the Oregon Coast (Figure 3.1). West of Chambers Street to South Danebo Avenue, the study area is characterized primarily by commercial and industrial uses. East of Chambers Street, the study area is characterized by a mix of residential and commercial land uses (Figure 3.2). The LPA would be entirely within the City of Eugene.

No prime farmlands are located within the project's affected environment.

In 2010, the City of Eugene completed its comprehensive lands assessment, as required by the State of Oregon, to identify changes in land use designations or zoning that might be necessary to accommodate the City's next 20 years of population and employment growth. This assessment (Envision Eugene) is the basis for the City's current comprehensive land use and transportation planning efforts. The following projections and assumptions, although not formally adopted, have been accepted by the City Council as the basis for further analysis.

Figure 3.1. Existing Land Uses: Western Portion of the Study Area

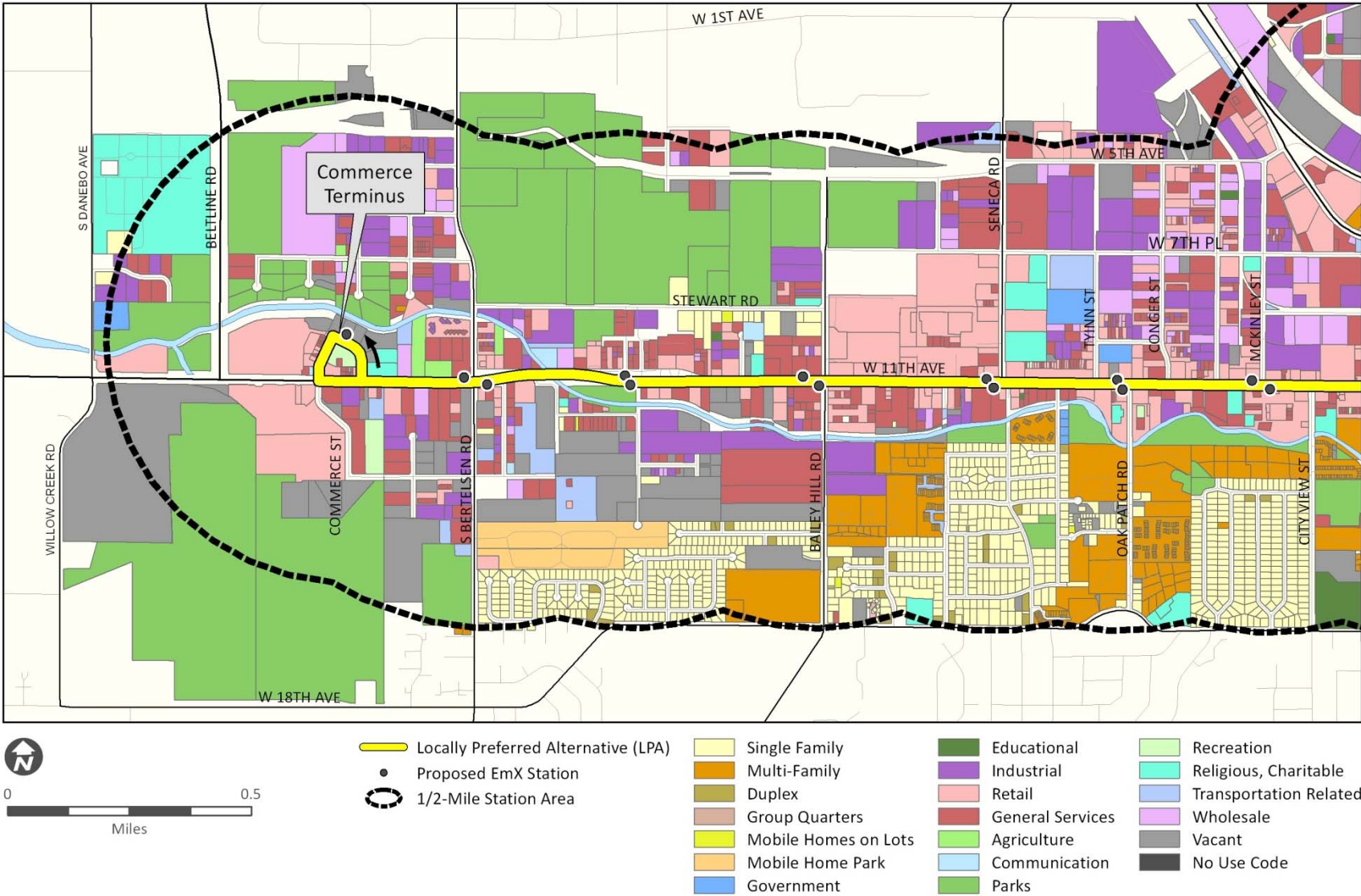
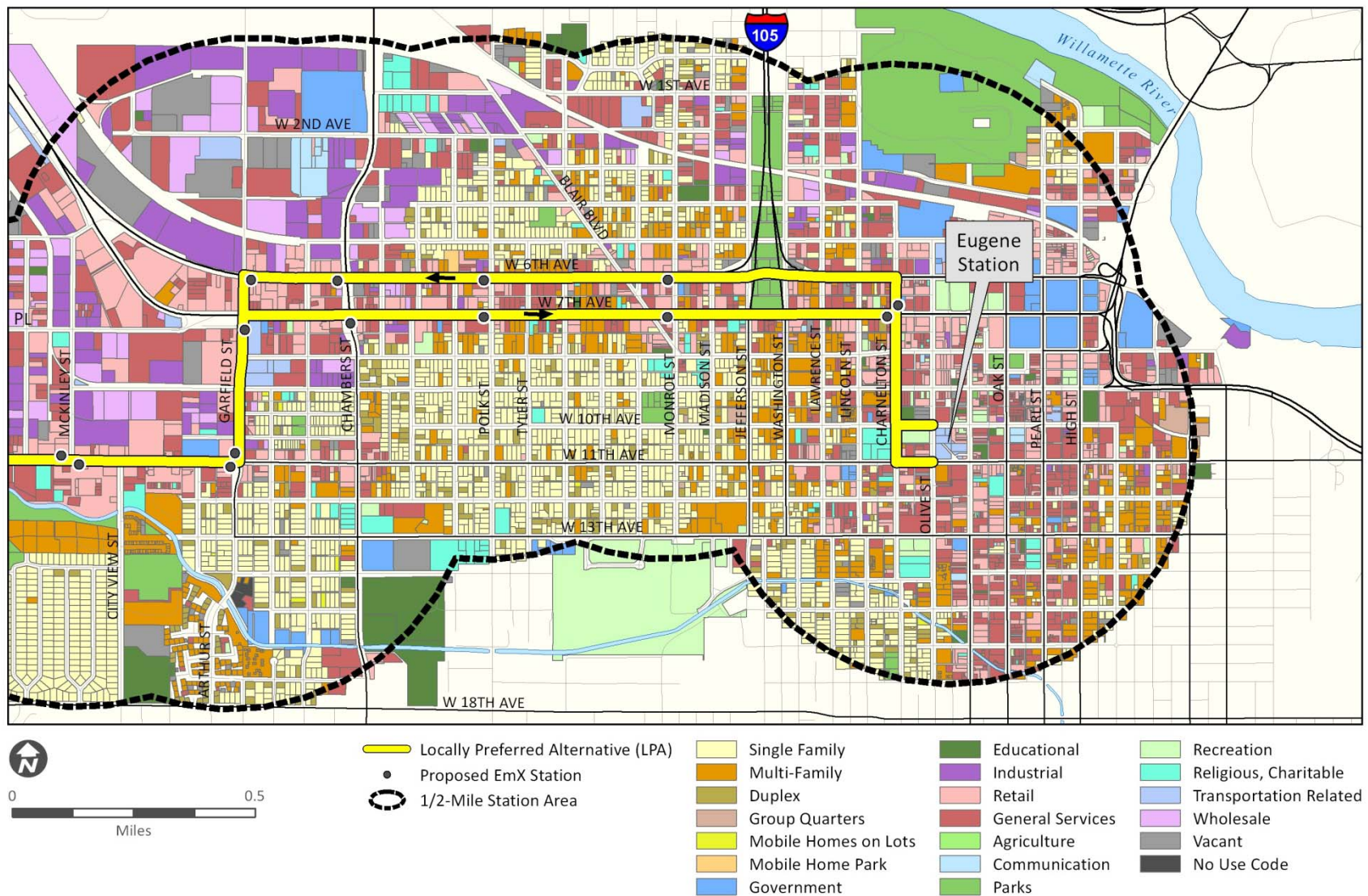


Figure 3.2. Existing Land Uses: Eastern Portion of Study Area



According to the assessment, in 2008, Eugene’s UGB had 34,446 acres; about 8 percent (2,758 acres) of it was vacant and classified as developable land. Most developable land was in residential (1,679 acres) or industrial designations (924 acres). About 1,569 acres near the LPA, approximately 37.9 percent of the land, is either vacant (341 acres, or 21.7 percent) or redevelopable (253.3 acres, or 16.2 percent) (City of Eugene, 2010).

Eugene will need 818 gross acres of industrial, commercial, and retail vacant land to accommodate projected employment growth over the 20-year planning period.

Additionally, Lane County’s adopted population forecast projects that the City’s population will likely increase by 33,900 people from 2011 to 2031. This will require about 2,420 gross residential acres by 2031 to accommodate new housing. The population and employment forecasts show that Eugene has a deficit of land needed to accommodate commercial and residential growth, arguing for more mixed-use, compact development.

These projections were compiled on a citywide aggregate basis and may not directly translate to the study area. Given the prevalence of commercial and industrial properties in the study area, however, especially in the downtown central business district and west of Chambers Street, employment within the study area is likely to grow steadily over the next 20 years.

Policies adopted by the City, the Metropolitan Planning Organization (MPO), and the State of Oregon support the concept of nodal development. As described by the City’s comprehensive plan, nodal development is a mixed-used, pedestrian-friendly land use pattern that seeks to increase concentrations of population and employment in well-defined areas. It features good transit service, a mix of diverse and compatible land uses, and public and private improvements designed to be pedestrian and transit-oriented. The Regional Transportation Plan (RTP) identified 13 areas in the study area with a high potential for nodal development. In addition, the University of Oregon and downtown Eugene’s central business district both already have the character of nodal development.

Acres, Gross

The entire acreage of a site, including areas used for infrastructure such as private streets and public utility easements. For example, a standard assumption is that about 20% of land in a subdivision is used for streets and utilities; if so, then a gross vacant acre will yield only about 35,000 sq. ft. (80% of a full acre) for lots. The term “gross acres” is often used opposed to the term “net acres.” **Net acres** are the remaining acreage of a site after excluding areas used for infrastructure such as public right-of-way, private streets and public utility easements or areas not useable for development such as wetlands or waterways.

3.1.2. Environmental Consequences

3.1.2.1. No-Build Alternative

The No-Build Alternative incorporates multi-modal transportation corridor improvements identified in the Financially Constrained Project List, including pedestrian, bicycle, roadway, and transit projects (most significantly three new Park & Ride facilities).

It would not displace any residences or businesses or affect the land use designation or zoning of any property. There would be no direct impact to land uses within the study area.

It is inconsistent with many local, regional, and state land use and transportation policies because it would not institute a bus rapid transit system connecting the region's highest-growth centers.

3.1.2.2. Locally Preferred Alternative

The LPA would help connect West Eugene to downtown Eugene with more reliable and frequent transit service. This alternative supports the Statewide Planning Goals and the Transportation Planning Rule.



The direct impacts to land uses result from the acquisition of property to be converted into rights-of-way (ROW). Although the ROW impacts from the LPA are greater than for the No-Build Alternative, the acquisitions are mostly small amounts of land along the edges of affected properties (with several exceptions). See Section 3.2 Property Acquisitions for additional discussion of the 2.6 acres of property acquired from 119 tax lots. Adequate property remains to support commercial and industrial uses pursuant to existing land use plans and zoning district regulations.

All permanent improvements proposed for the LPA, such as new lanes, curbs, and stations, which occur inside the expanded ROW, would comply with City, ODOT and FHWA requirements for such facilities. Improvements within waterside protection zones would also need site review permits to proceed.

The LPA would affect up to 63 on-street parking spaces; however, to mitigate that impact, LTD would work with the City of Eugene to include in the project's final design up to 10 new on-street parking spaces on the west side of Charnelton Street between 6th and 7th Avenues. Based on a 2012 on-street parking survey, maximum utilization rates vary between 25 percent and 66 percent, with the higher utilization rates occurring closer to the downtown. In the downtown area, loss of on-street parking spaces can be absorbed by under-utilized on-street areas and by two off-street public parking garages with 720 spaces and so would not have a significant impact on land uses (see Section 4.3.1.2 and Tables 4.10 and 4.16 for more information about parking and potential impacts). The LPA would affect 72 off-street parking spaces. Mitigation (e.g. restriping) might be able to reduce the net loss of off-street parking to as few as 18 spaces affecting five business/institutional sites, which would lose between one and seven spaces each. Figures 3.3 and 3.4 provide additional detail on the location and extent of the affected off-street parking.

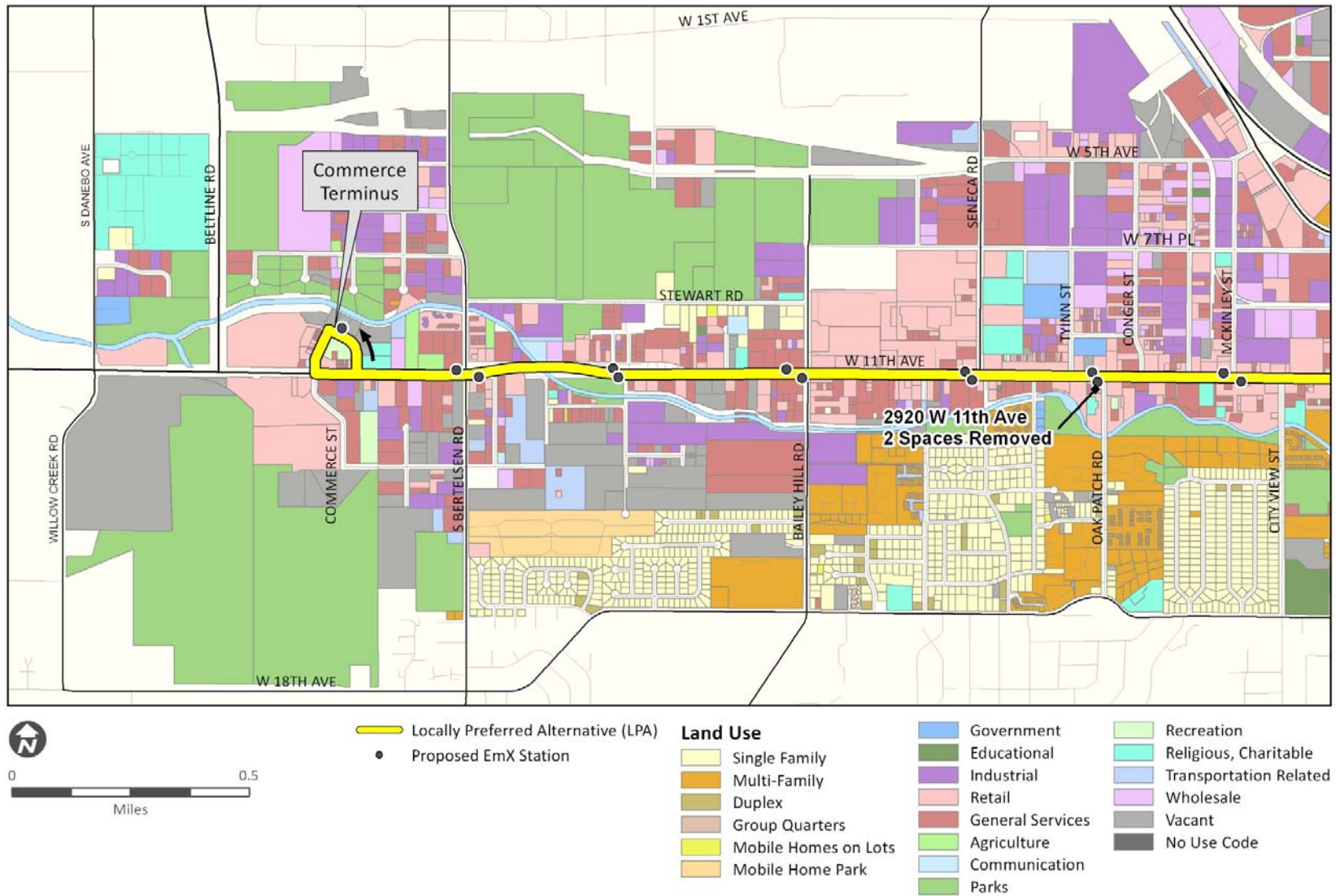
The LPA design would require acquisitions of street frontage that effectively close six existing driveway locations and modify an additional three driveways; the closures would occur only on

parcels that currently have more than one driveway and would therefore not significantly reduce business access. Acquisitions of street frontage and driveway closures and modifications would not result in properties becoming out of compliance with land use plans and zoning district regulations. Two businesses, due to the nature of the businesses, may have to relocate if measures cannot be employed to sufficiently reduce parking, access and circulation impacts. Additional discussion of parking and driveway impacts is provided below in Section 3.2 and in Chapter 4 of this EA.

The City's Planning and Building & Public Works Departments reviewed all properties potentially affected by the LPA's ROW widening. This review showed that the properties and businesses affected by ROW widening would not be out of compliance with City codes or be required to meet additional City code constraints as a result of the property acquisition. Section 3.2 (Property Acquisition) discusses property acquisitions in more detail.

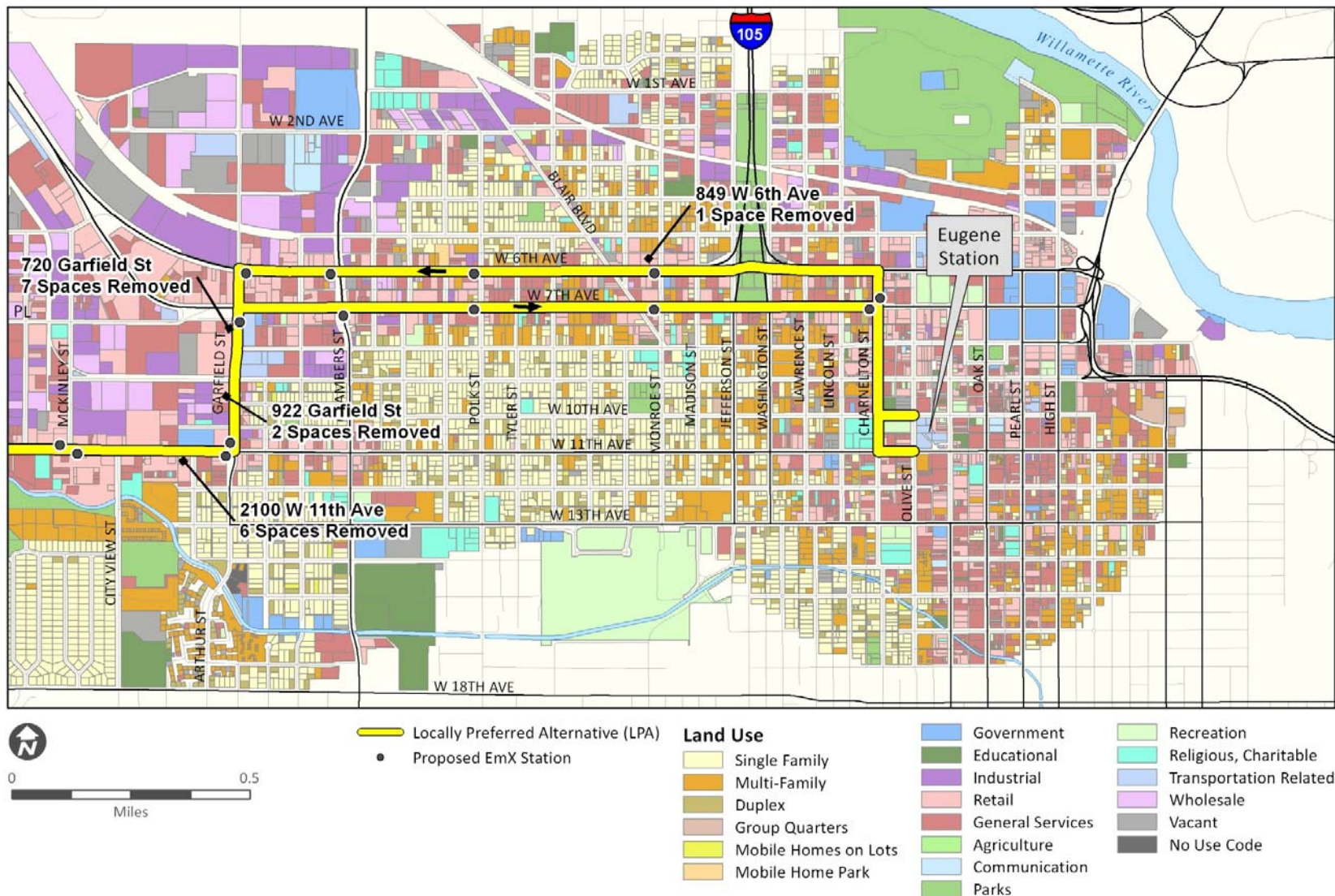
The LPA has high potential for supporting the City's designated areas for nodal development and growth management policies. It would serve eight nodal development areas, identified in Figure 3.5, including: Downtown, Midtown, Whiteaker, Chambers, Westmoreland, City View, Bailey Hill, and Beltline Employment. BRT improvements that are adjacent to a mix of land uses and provide capacity for future growth can catalyze new development and revitalize existing neighborhoods and downtowns. Like other forms of rapid transit, BRT can advance transit-supportive land development, promoting greater accessibility and employment and economic opportunities by concentrating development, ultimately contributing to higher property values and more livable places.

Figure 3.3. Mitigated Off-Street Parking Impacts – Western Portion



Note: Off-street parking impacts can be mitigated using measures such as re-striping, where a parking lot is reconfigured to reduce the net loss of parking space.

Figure 3.4. Mitigated Off-Street Parking Impacts – Eastern Portion



Note: Off-street parking impacts can be mitigated using measures such as re-striping, where a parking lot is reconfigured to reduce the net loss of parking space.

Figure 3.5. LPA Nodal Development Area and EmX Stations in the Project Study Area



Cumulative Effects

Cumulative effects may occur when a project's effects are combined with those from past, present, and reasonably foreseeable future projects. They can also result from individually small but collectively significant actions that occur over a long period of time.

3.1.2.3. Short-Term Impacts

No significant short-term land use impacts would occur from temporary street and access closures during construction.

3.1.2.4. Cumulative Effects

The LPA is consistent with regional, state, and local land use plans in the study area, which share the goal of improving transit accessibility and encouraging transit usage by concentrating higher density, mixed land uses in “nodal development areas” or transit-oriented development within the project study area. The cumulative effect of the project would be to advance the City’s land use plans for increased density of development in areas designated for nodal or transit-oriented development near the project study area. Acquisitions remove a relatively small amount of land along the frontage of each affected property, leaving adequate property on the remainder to support planned uses.

The project is not anticipated to alter land use patterns further west, between the project terminus and the UGB (at Greenhill Road), because of City policies combined with significant natural resource constraints on development. The current adopted zoning and Comprehensive Plan designations between the area west of the project terminus and the UGB are a mixture of residential, commercial, industrial, and protected natural resource lands. Recent long range planning efforts (Envision Eugene) indicate the City’s policies for this western area are likely to remain unchanged.

The No-Build Alternative is unlikely to prompt new development within the project study area or Corridor. Because of increased traffic congestion in the project study area new development and redevelopment would occur more slowly as traffic volumes and congestion cause more driver conflicts and collisions, freight delivery delays, intersection delays, and traffic diversion to parallel and connecting streets. The cumulative effect of these future traffic conditions would be to discourage development and redevelopment at higher densities, which is inconsistent with City policy.

3.1.3. Possible Mitigation Measures

Because there are no direct effects to land use associated with the No-Build Alternative, no mitigation is recommended.

The LPA's direct impacts on land use would be limited to property converted to new right-of-way. This would eliminate both on- and off-street parking spaces. The utilization rate of on-street parking spaces in the project study area is below a level that would require mitigation for the net loss of 53 on-street spaces (refer to Section 4.3.1.2). Still, LTD would try to minimize parking loss and any access changes through further design refinements where feasible. It would also replace off-street parking if necessary and where feasible, and support parking lot restriping that would create almost as many new off-street spaces as the project would eliminate.

Short-term construction impacts to adjacent streets and access points would be mitigated through the creation of a detailed construction plan that incorporates a flexible schedule for timing and staging of construction, communication with property owners and users, dust abatement measures, and limited hours of construction. Appendix ES-1 includes a summary of possible impacts, benefits, and mitigation measures by environmental topic.



3.2. Property Acquisition

This section identifies potential land acquisitions and displacements as well as impacts to properties and parking. Under the No-Build Alternative, no acquisitions or displacements are anticipated. Under the LPA, approximately 2.6 acres of land would need to be acquired, including partial acquisitions from 117 tax lots and full property acquisitions from two remnant tax lots, both of which are owned by the State of Oregon. The partial acquisitions are generally small strips of land along the right-of-way (ROW) of the project alignment. Additionally, two businesses may be displaced and one residential unit in a multi-unit building (former motel of unknown legal occupancy). Appendix 3-1 lists all potential property acquisitions and the report in Appendix 3-2 lists all potential property effects.



3.2.1. Affected Environment

The project study area includes public and private properties and public ROW. Most of the land within the project study area is developed, though there are occasional vacant lots and undeveloped land. The LPA utilizes City ROW and, on West 6th and 7th, ODOT ROW. West 6th and West 7th Avenues, between Washington Street and Garfield Street, is a part of the National Highway System (NHS).



3.2.2. Environmental Consequences

3.2.2.1. No-Build Alternative

No new ROW is needed under the No-Build Alternative and no property acquisitions or displacements would occur.

3.2.2.2. Locally Preferred Alternative

The potential effects discussed in this section are based on analyses from technical reports: property acquisitions, property impacts, and transportation (parking and driveway) impacts. Although the total number of properties affected varies when comparing potential impacts, the total area impacted is the same. For a more detailed explanation of the differences, please see the sidebar “Why Don’t the Property Impact Numbers Match?”

Why Don’t the Property Impact Numbers Match?

Although total property numbers vary when comparing potential impacts related to property acquisitions, property impacts, and parking and driveway impacts, the total area impacted is the same. Examples of why these numbers vary include:

- The **Property Acquisitions** analysis considers potential impacts to **tax lots** as a result of acquiring real property from each individual tax lot affected, regardless of ownership or location of the business. Because some businesses are located on a property comprised of multiple tax lots, the number of tax lots potentially affected by the proposed project is greater than the number of businesses (or larger parcels) potentially affected by the proposed project. In other cases, a single tax lot is occupied by more than one business.
- The **Property Impacts** analysis considers potential impacts to **real estate and businesses** as a result of acquiring real property from individual property owners, closure of a driveway (in some cases with no physical acquisition of real property), or eliminating off-street parking, landscaping or a sign associated with an individual business. There are a greater number of tax lots located in the Corridor than there are businesses; therefore, the number of properties (businesses) is less than the number of tax lots potentially affected by the proposed project. In addition, a business could potentially be affected by the proposed project when a driveway is closed but no real property is acquired or when a business has located its sign, landscaping or parking in the public right-of-way and the project requires use of the public right-of-way.
- The **Transportation** analysis considers potential impacts associated with **closing driveways** whether or not real property is acquired and **displacing off-street parking** located on a legal tax lot. For example, there are instances where some businesses are using public right-of-way for off-site parking associated with their business. In this instance, the potentially displaced parking would not be tabulated in the total number off-street parking spaces lost because the parking is located within public right-of-way, but the potential effect on the business of losing parking is considered in the Property Impacts analysis.

3.2.2.2.1. Public Right-of-Way

The LPA, to the greatest extent possible, would use public ROW owned by the City of Eugene and the State of Oregon to avoid and minimize acquisition of private property. Portions of the public ROW owned by ODOT are also a part of the National Highway System (NHS): West 6th and West 7th Avenues, between Washington Street and Garfield Street. The LPA would convert one eastbound general-purpose lane on West 7th Avenue between Charnelton and Washington Streets and one general-purpose lane on West 6th Avenue generally between Blair Boulevard and Chambers Street to a BRT lane. Conversion of this NHS ROW for a transit facility would require FHWA approval through ODOT.

3.2.2.2.2. Tax Lot Effects

The LPA would acquire approximately 2.6 acres of land in total. About 0.07 acre would come from acquiring two complete tax lots (remnant parcels owned by the State of Oregon), and the remaining approximately 2.5 acres would be acquired from portions of 117 separate tax lots (24.5 percent of the 477 tax lots abutting the LPA). This represents approximately one percent of the 273 acres of abutting tax lots along the LPA. Of the affected tax lots, 4 are located along Charnelton Street, 55 are located on West 6th and 7th Avenues, 11 are located along Garfield Street, and the remaining 49 are located on West 11th Avenue. The partial acquisitions all consist of relatively minor strips from tax lot frontages along the LPA alignment to accommodate BRT facilities and street widening. Tax lot acquisitions are summarized in Table 3.1.

Table 3.1. LPA Tax Lot Acquisition Needs

Full Acquisitions		Partial Acquisitions		Parking Spaces Affected		Off-Street Spaces Removed (w/Mitigation)	Driveway Closures
(number)	(acres)	(number)	(acres)	On-Street	Off-Street		
2	0.07	117	2.5	63	72	18	6

Source: LTD, August 2011

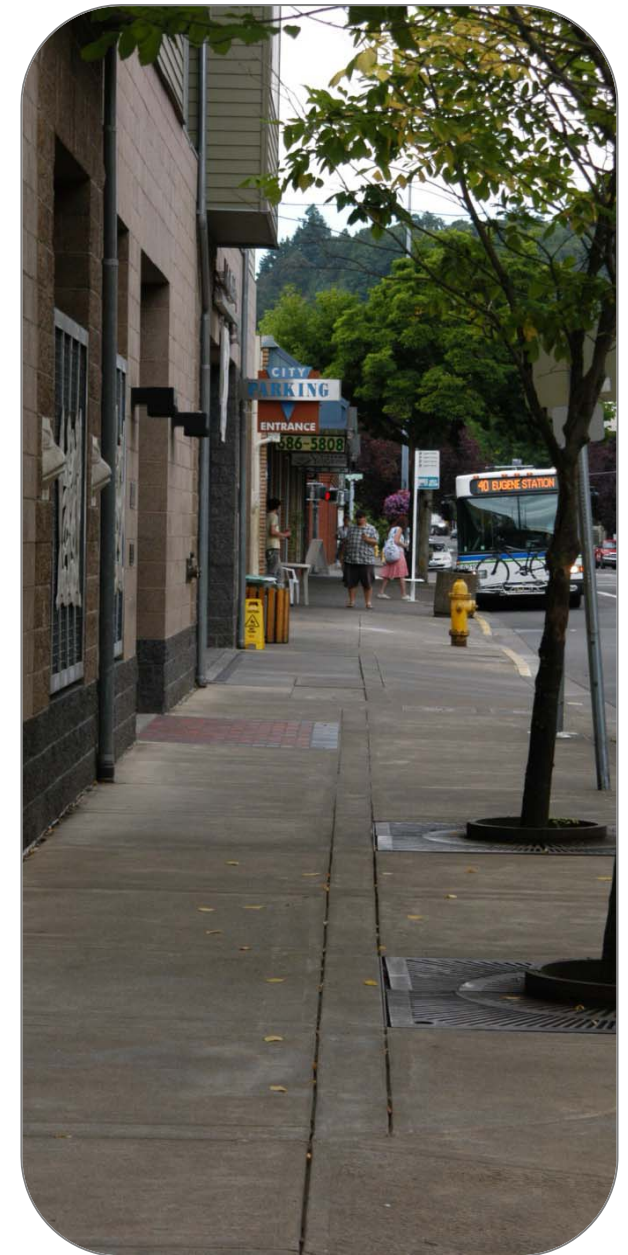
3.2.2.2.3. Property Effects

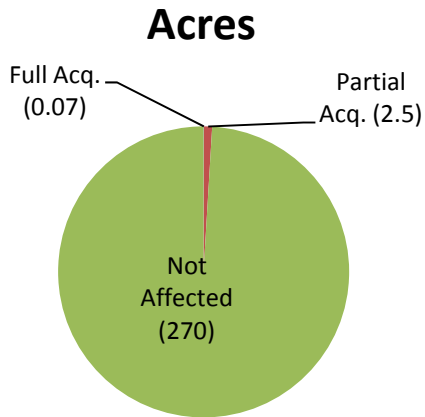
The property impacts analysis identified potential effects to 118 properties (under approximately 100 to 105 different ownerships) along the LPA alignment. The LPA would require more than 1,000 square feet (.02 acres) from only 35 of the 118 properties. The LPA also affects certain property that appears to be privately owned but is actually public right-of-way that is being used by the abutting landowner for landscaping or other purposes. Table 3.2 summarizes the eight properties with the potential for the most noteworthy impacts. A complete listing of all potential property effects is provided in the report in Appendix 3-2.

Two State-owned tax lots would be fully acquired as a result of the proposed project. Both are remnant parcels: one is located at the intersection West 6th Avenue and West Madison Street and the other at the intersection of West 7th Place and West Garfield Street.

The LPA might displace a residential unit in a former motel structure at 750 West 7th Avenue (Property #40 in Table 3.2). The LPA would require the removal of approximately 10 feet of the former motel building adjacent to the existing ROW. The site's condition could make reconstruction impossible. However, even though the motel structure was observed to be at least partially in residential use, it may not meet requirements for legal habitation. Attempts to contact both the owner of record and the current occupants have been unsuccessful.

The LPA could have potential parking impacts on 28 properties. The loss of off-street parking could cause the displacement of two retail businesses: a small specialty grocer at 2100 West 11th Avenue, and an adult store at 720 West Garfield Street (#68 and #58, respectively, in Table 3.2). Although the observed off-street parking requirements for both businesses appear low, the properties might not remain viable sites for these two specific businesses given the business types and limited nearby on-street parking. However, according to City staff, the property acquisition would not render these sites out of compliance with parking requirements or other building/development requirements for commercial / retail uses. Parking impacts on other properties can be mitigated by reducing the width of sidewalk improvements, parking lot





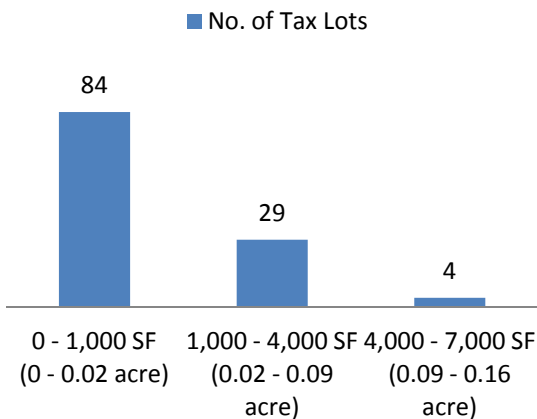
reconfiguration and constructing retaining walls on properties with significant slopes. City staff confirmed that the City would be flexible with regard to sidewalk widths and would work with LTD and property owners on a case-by-case basis to reduce impacts to properties. See section below for additional discussion of parking and driveway effects.

Five other properties are potentially subject to project effects of note:

- Mini Pet Mart at 974 West 6th Avenue (#14);
- Duck Inn Bar & Grill at 1795 West 6th Avenue (#27);
- Buckley House at 692 West Jefferson Street (#32);
- Vacant Building at 720 West 7th Avenue (#38); and
- Mac’s Radiator, AC and Exhaust at 2270 West 11th Avenue (#70).

These five properties would not be displaced. The potential effects on each of these properties and possible mitigation measures are summarized in Table 3.2.

Partial Acquisitions



Other potential impacts include issues related to billboards, business signs, landscaping, bio-swales, and access management medians. Five properties were identified as having potential billboard impacts, which varied from relocating the billboard to eliminating the billboard. Many of the business properties along the LPA alignment have signage and trees, which would be impacted by the LPA. According to City staff, all regular business signs potentially impacted by the LPA could be relocated; while most signs currently meet the City’s development codes, some signs would need to be brought up to current development codes. The LPA would require tree removal from a few properties with trees located within the private property boundaries. Tree removal is not anticipated to adversely impact any businesses. Potential impacts to trees are discussed in more detail in the street and landscape tree section (Section 3.16).

As noted above, most acquisitions would be of private property. However, in 14 instances the project would take not private property, but would affect property in the existing public right-of-way – the adjacent private property owners are currently using for vehicle parking, landscaping

improvements, and signs. In addition, two other properties would be potentially affected by the placement of a new EmX station, which would require closing a driveway. See section below for additional discussion of parking and driveway effects.

Nine properties would be affected by access closures or modifications. In most cases, alternate access would be available. As discussed earlier in this section, off-street parking and vehicular access impacts could result in full acquisition of two businesses. In three cases, LTD would have to modify station designs to avoid or minimize impacts to property access.

3.2.2.2.4. Parking and Driveway Effects

The LPA would affect up to 63 on-street parking spaces, potentially offset by 10 new parking spaces added by the project on Charnelton Street, resulting in a net reduction of 53 on-street parking spaces. The LPA would affect 72 off-street parking spaces. Through mitigation (e.g. restriping), net loss of off-street parking may be reduced to 18 parking spaces: 1 space on West 6th Avenue, 9 spaces on West Garfield Street, and 8 spaces on West 11th Avenue. After mitigation, this would affect five business/institutional sites, which would lose between one and seven spaces each. Figures 3.3 and 3.4 provide additional detail on the location and extent of the affected parking. A potential impact of reduced off-street parking as a result of property acquisitions is the shift of vehicles from off-street spaces to on-street parking spaces on nearby cross streets.

The LPA design would make six driveways unusable. However, this would occur only on parcels that currently have more than one driveway and would therefore not significantly reduce property or business access. Three other driveways would require modification but would remain usable. Additional discussion of parking and driveway impacts is provided in Chapter 4 of this EA.

Table 3.2. Business and Residential Property Impacts Summary

<i>Property Number</i>	<i>Property Address/Parcel No.</i>	<i>Use</i>	<i>Acquisition Impact</i>	<i>Suggested Mitigation</i>
14	974 W 6th Ave / 1703312208900/800	Retail Pet Supply	The project would require removal of a portion of a brick wall extension (parapet) extending north from the building. Acquisition of this portion of the building would require additional modifications to secure the building. Minimal impact to business, during construction only.	Does not appear to be a structural component of the building, but exterior of building would need to be repaired after removal of parapet. The exterior reconstruction would not likely be intrusive to the building.
27	1795 W 6 th Avenue / 17-04-36-21-01000 & 900	Bar & Grill	Widened ROW area would directly abut the southern elevation of the property along West 6 th Avenue. Parking and site improvements as well as a fireplace located at the southern end of the building may be impacted.	Reducing the width of the sidewalk improvements in this area would avoid impacting the fireplace and may also avoid or minimize impacts to parking and other site improvements.
32	692 Jefferson St/ 1703312110100	Group Home	Widened ROW would place sidewalk nearer to building, requiring rebuilding of exterior stairway and security fence. Minimal impact to business, during construction only.	Reconstruct affected exterior stairway and security fence. All reconstruction would be on the exterior of the building.
38	720 W 7 th Avenue / 17-03-31-22-12700	Vacant Building	Widened ROW would affect the existing building canopy and reduce traffic flow on the site.	Relocate overhead door to the other side of the building.
40	750 W 7th Ave / 1703312212500	Former Motel (Unresolved status and legality of current residential occupation)	Widened ROW would require removal of approximately 10 feet of this L-shaped building resulting in the removal or reconstruction of one unit in this former motel.	The proposed mitigation would depend on the interior configuration of the impacted residential unit (and its legal occupancy status) and the structural integrity of the building. Reconstruction would range from reconfiguring the unit to removing the entire unit and securing the remainder of the building. Displacement of any tenants within this unit would be eligible for relocation assistance by LTD as specified in the Uniform Relocation Act.

Table 3.2. Business and Residential Property Impacts Summary (Cont.)

Property Number	Property Address/Parcel No.	Use	Acquisition Impact	Suggested Mitigation
58	720 Garfield St 1704362300101	Adult Retail	Widened ROW would require removal of off-street parking spaces, a billboard sign, and fencing. Parking lot circulation will be restricted and access will be affected. Possible displacement and relocation of retail business.	Modifications to the building overhang, entryway and walkway on the eastern side of the structure to allow for adequate parking lot circulation. Modify curvature of proposed sidewalk to minimize encroachment on access. Depending on the interior layout of the building, additional modifications may be necessary such as relocation of doors or interior reconfiguration. Depending on the final building and parking modifications, the business may ultimately be displaced and eligible for relocation assistance by LTD as specified in the Uniform Relocation Act.
68	2100 W 11th Ave 1704363201101	Specialty Grocer	Widened ROW would require removal of a major portion of this property's off-street parking spaces and parking lot circulation area. Although the observed off-street parking requirements for the existing business appears low, given the business type and property use, the property is unlikely to retain long term viability for use as a retail operation. Possible displacement and relocation of retail business. However, based on discussions with City staff, the property acquisition would not render the business or the property out of compliance with parking requirements or other building/development requirements.	If the median located on West 11th Avenue, directly fronting this property, could be reduced, most or all of the impacts at this property could be alleviated. City staff have indicated that median modifications would be considered. If the median cannot be modified, the removal of off-street parking does not have any other apparent remedy given the limited remaining site area for off-street parking and circulation. LTD would compensate the business and property owners for the loss of value caused by the project. If displaced, the business would be eligible for relocation assistance by LTD as specified in the Uniform Relocation Act.

Table 3.2. Business and Residential Property Impacts Summary (Cont.)

Property Number	Property Address/Parcel No.	Use	Acquisition Impact	Suggested Mitigation
70	2270 W 11th Ave 1704363202002	Automotive Repair	Widened ROW would place sidewalk near existing overhead door, limiting traffic flow and rendering an overhead door inoperable. Minor impact during construction. If the proposed mitigation proves infeasible, there may be additional business impacts.	Replace the overhead door fronting West 11th Avenue with a glass storefront and, depending on the needs of the business, potentially relocate the removed overhead vehicle door to the west or south side of the building. If replacing the overhead door in an alternate location is infeasible, there may be additional business impacts, depending on the necessity of the overhead door to the operation of the business. LTD would compensate the business for these impacts.

Source: Duncan & Brown, December 2011.

3.2.2.3. Short-Term Impacts

Short-term construction impacts could occur if privately owned land were needed for construction activities. The areas used temporarily for construction require temporary construction easements (TCEs). Construction staging areas could also be located within existing ROW or on other publicly owned property. No permanent acquisitions or displacements are anticipated for construction activities.

3.2.2.4. Cumulative Effects

Property acquisitions are not expected to cause adverse cumulative effects when combined with other past, present, and reasonably foreseeable actions.

3.2.3. Possible Mitigation Measures

No mitigation is proposed under the No-Build Alternative, as no property acquisitions are anticipated.

The LPA has been designed to minimize impacts to adjacent properties by using existing ROW whenever possible. ROW acquisitions would primarily be of minor strips of property frontage. LTD would pay property owners at fair market value for the property acquired, consistent with state and federal law. Any business or residence displaced by the project would be eligible for relocation assistance as specified in the Uniform Relocation Act.

The effects caused by the elimination of off-street parking and driveway/access closures would have minor effects on the use of some properties, but would not be significant. Still, to minimize them, LTD would assist property owners with restriping parking lots, and the remainder can be accommodated by the availability of on-street parking on side streets. Elimination of off-street parking combined with access impacts may result in the displacement of two businesses. Mitigation measures to reduce impacts to these two properties may be possible. However, if impacts cannot be minimized to allow these two businesses to continue operation at their current locations, LTD would compensate the business and property owners for the loss of value caused by the project. If displaced, the business would be eligible for relocation assistance by LTD as specified in the Uniform Relocation Act. During final design, LTD would use a multi-step process to determine whether measures could successfully mitigate potential impacts:

- Understand the operation of the business in terms of utilization of the site, building and other aspects of the real estate. Real estate experts and architects will study the spatial layout of the site and structure and meet with business owners and/or managers.
- Understand the parking availability and current utilization, including both on- and off-site parking options; traffic engineers would analyze parking issues, particularly with regard to parking standards in relation to building occupancy and typical business operation.
- Determine potential mitigation measures including alterations to the physical site/structure or modification of the functional utility of the site (i.e. parking configuration, traffic flow or building orientation). Project engineers and architects should be consulted with regards to possible mitigation options.

- Discuss any potential code compliance issues with City of Eugene staff to confirm continued code compliance for the existing and future use of the property.
- Recommend partial or full acquisition of the property based on foregoing analysis of mitigation options and business or real estate impacts and in consultation with the property owner. Final staff recommendation will be made by a real estate expert.
- LTD will consider analysis and recommendation and make a final determination about acquisition of the property.

Mitigation of parking and driveway impacts is described in Chapter 4 of this EA.

Other mitigation measures to avoid or minimize impacts to properties include reducing the widths of sidewalk improvements, assisting property owners in permitting and relocating displaced business signs, installing replacement landscaping, installing glare shields at some businesses with drive-thru lanes, and modifications to EmX station designs.

Socioeconomics

The analysis of how alternatives would affect the social and economic environment, including neighborhoods, long and short-term employment, tax revenues, etc.

Environmental Justice

A formal federal policy on environmental justice was established in February 1994, with Executive Order 12898 (EO 12898), "Federal Actions to Address Environmental Justice in Minority Populations and Low-income Populations." There are three fundamental environmental justice principles:

- To avoid, minimize, or mitigate disproportionately high and adverse human health and environmental effects, including social and economic effects, on minority populations and low-income populations.
- To ensure the full and fair participation by all potentially affected communities in the transportation decision-making process.
- To prevent the denial of, reduction in, or significant delay in the receipt of benefits by minority and low-income populations.

3.3. Socioeconomic Effects and Environmental Justice

This section's analysis identifies potential effects of the proposed project on the Corridor socioeconomics. Socioeconomic effects may result from changes in the regional and local economy, the impact on environmental justice (EJ) populations, the impact on neighborhood and communities, and changes to public services.

Much of the impact analysis for this section overlaps with issues evaluated in other sections, so the following sections may be consulted where appropriate:

- Land Use (Section 3.1): for descriptions of land uses and zoning in the study area
- Parkland and Open Space (Section 3.8): for a description of recreational resources in the study area
- Air Quality (Section 3.5): for information on local and regional air quality
- Noise and Vibration (Section 3.4): for a description of potential noise and vibration impacts

- Transportation Impacts (Chapter 4): for description of impacts on regional and local traffic, transit and non-motorized transportation

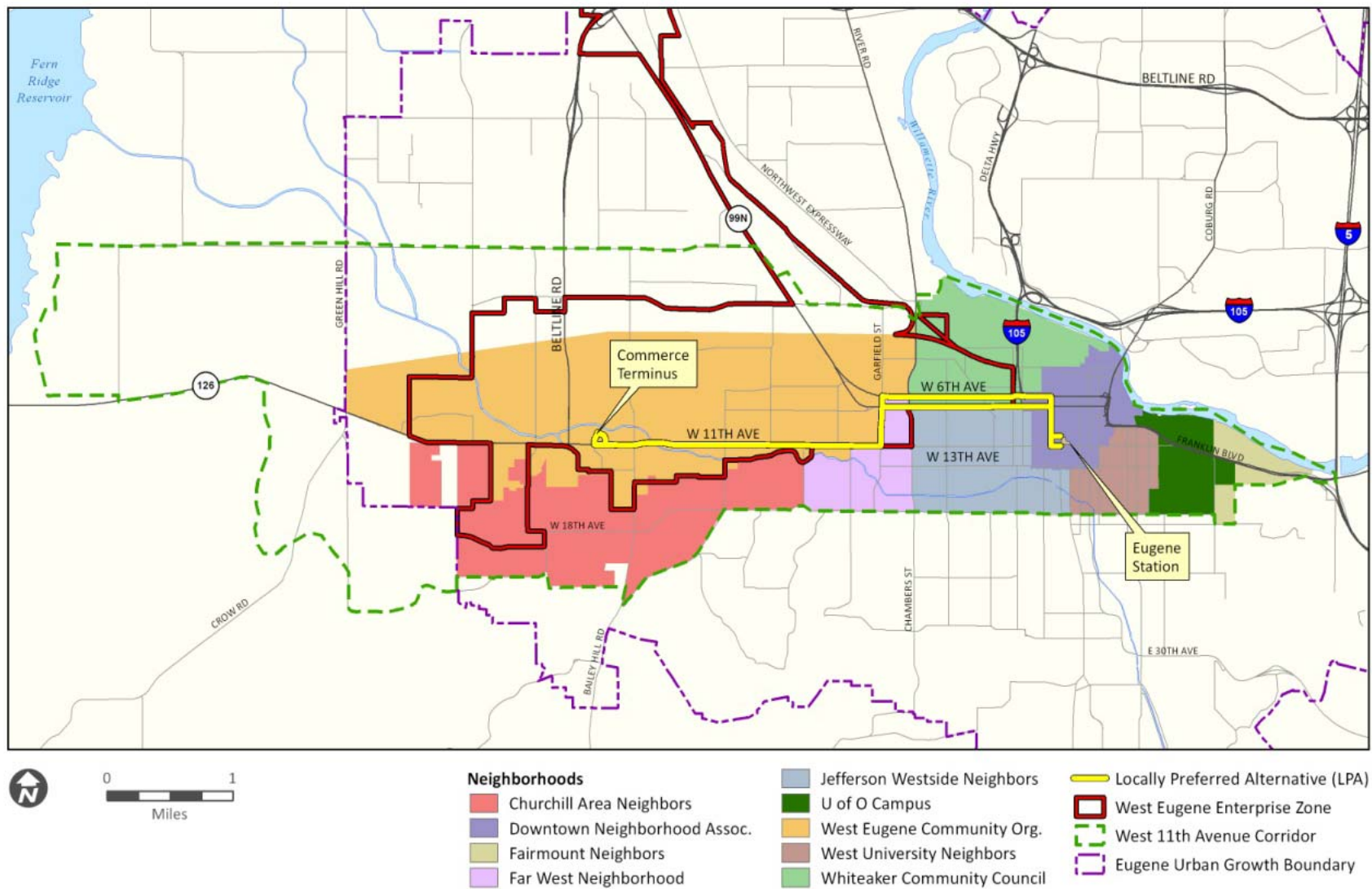
3.3.1. Affected Environment

This section's analysis focuses on data from two overlapping study areas: the area within one-half mile from the centerline of the LPA, and the area within one-half mile from each proposed EmX station (see Figures 3.1 and 3.2). The one-half mile distance is larger than the one-quarter mile area used in some BRT studies. It was chosen because ridership studies demonstrated that some riders were walking that far to reach Franklin EmX BRT stations. Data not available at the study area level was compiled at the larger Corridor-wide level.

The LPA alignment passes through or in close proximity to the boundary of six neighborhoods within the City of Eugene: Downtown, Jefferson Westside, Far West, Whiteaker, West Eugene, and Churchill, as shown in Figure 3.6. Detailed descriptions of each neighborhood are given in Chapter 7 of the AA Report and relevant socioeconomic characteristics are discussed in this section by neighborhood, as appropriate.



Figure 3.6. Neighborhoods along the LPA and No-Build Alternative Routes



The population in the entire West 11th Avenue Corridor is expected to increase by 12,434 people (38.4 percent) between 2006 and 2031. By 2031, 47 percent of the total Corridor population is anticipated to be living within one-half mile of the EmX stations (Table 3.3). The population density of the LPA study area is expected to increase from 9.1 to 9.9 people per acre east of Garfield Street and from 3.6 to 4.2 people per acre west of Garfield Street, where there is more developable land (Table 3.4).

Table 3.3. Population and Household Characteristics within One-Half Mile of Proposed EmX Stations, 2008 and 2031

	<i>Population in Households (Total)</i>	<i>Total Households</i>	<i>Single Family</i>	<i>Duplex</i>	<i>Multi-Family</i>	<i>Mobile Home</i>	<i>Total Dwelling Units</i>
2008	19,014	10,061	2,697	1,365	6,602	180	10,844
2031	21,157	11,551	2,818	1,485	7,719	192	12,208

Source: Socioeconomics and Environmental Justice Technical Memorandum for WEEE AA/DEIS, April 2010.

Table 3.4. Study Area Population Density, 2008 and 2031

	<i>2008 Gross Population Density (People / Acre)</i>	<i>2031 Gross Population Density (People / Acre)</i>
Eugene Station to Garfield St	9.1	9.9
Garfield St to Commerce Terminus	3.6	4.2

Source: Socioeconomics and Environmental Justice Technical Memorandum for WEEE AA/DEIS, April 2010.

The 2008 median household income in the City was \$42,398, which is lower than the national and state averages. Within the West 11th Avenue Corridor, income levels vary, and several neighborhoods have income levels that are lower than the average 1999 income level reported for Eugene (\$35,850). Within the Eugene-Springfield Metropolitan Planning Organization (MPO) boundary, the household poverty rate was approximately 15.4 percent in 2000; see Figure 3.7. A majority of the neighborhoods within the West 11th Avenue Corridor have a household

Population and Census Data

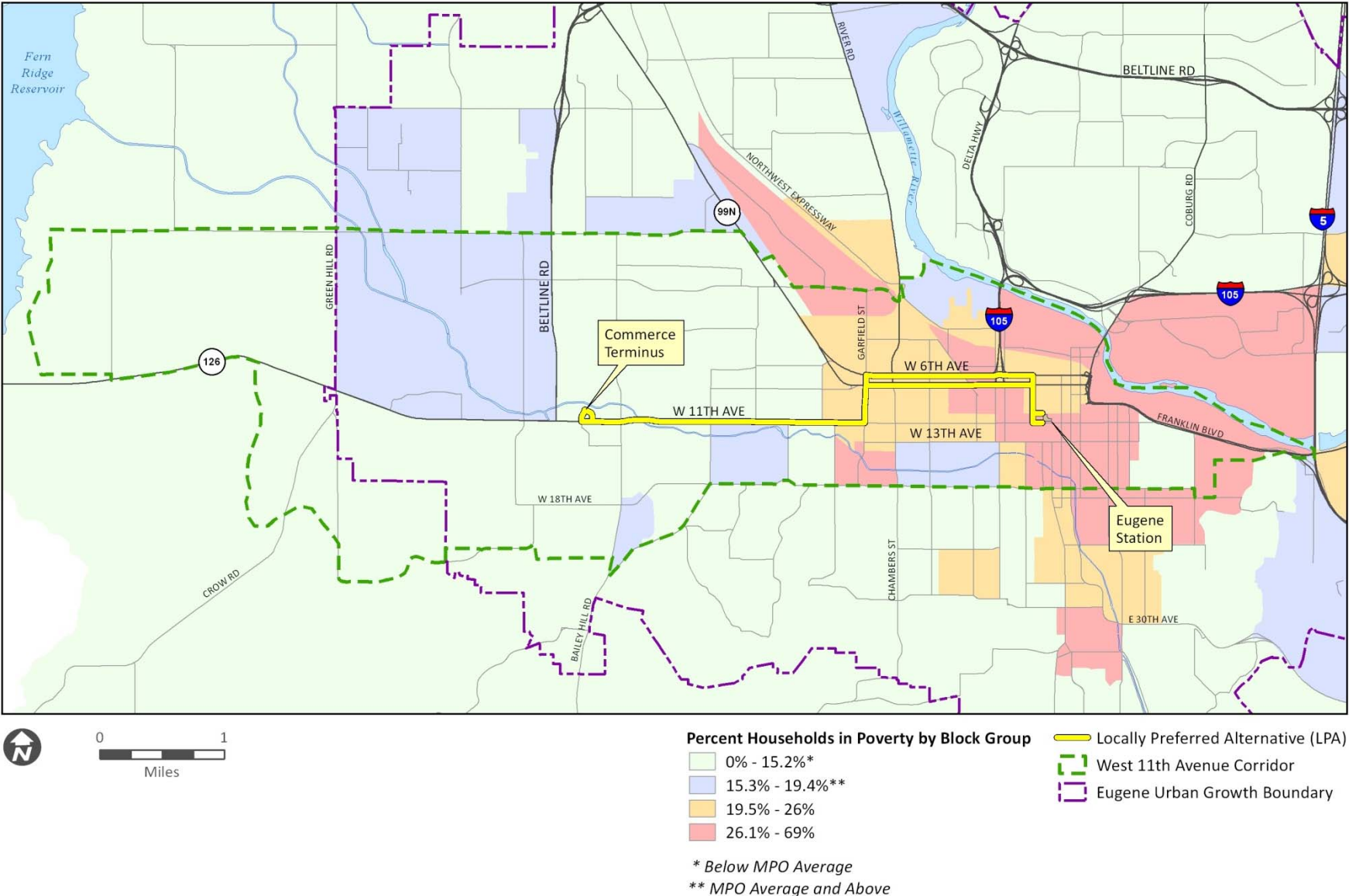
Data from the 2010 US Census Bureau is compiled and released by individual data categories over several months beginning in mid 2011. Pertinent 2010 Census data was not available when the technical analyses were completed for this Environmental Assessment. The most recent data available were used for the technical analyses, including 2000 Census and non-Census data sources.

poverty population greater than 15.4 percent, with the exception of some of the neighborhoods on the western side of the West 11th Avenue Corridor. The West University Neighborhood has the highest household poverty rate, perhaps because many college students live there.

Within Eugene, approximately 17 percent of the total population is minority and/or Hispanic/Latino. The largest racial group in poverty is White. Among minorities and Hispanic/Latinos, the incidence of poverty is higher than the population at large. The non-Hispanic/Latino minority population in Eugene, which makes up 14.3 percent of residents, has a poverty rate of over 30 percent; the Hispanic/Latino community, which makes up 7 percent of the city's total population, has a poverty rate of 33 percent (3,078 people). American Indians and Alaskan Natives experience the highest rate of poverty at 48 percent (1,015 people), followed by Other Race at 36 percent (1,436 people). Collectively, more than 6,000 people in the identified minority groups experience a disproportionate level of poverty.



Figure 3.7. Household Poverty in the Corridor (2000)



Employment in Lane County is expected to grow at an average annual rate of 1.4 percent across all major occupational categories between 2008 and 2016. This reflects the stagnant employment growth due to the current recession. The West Eugene Enterprise Zone, established in 2005, is located west of Interstate-105 along 7th Avenue and extends west and south, including much of the employment lands located within the West Eugene Community Organization. The primary purpose of the zone is to stimulate new investments that create jobs. Since 2005, despite the recession, 17 companies have participated in the Enterprise Zone and the City of Eugene estimates that Enterprise Zone investments have resulted in a net gain of 427 jobs.

Table 3.5 shows employment trends for the project study area (one-half mile of from centerline of LPA). This study area contained a total of 27,705 employees in 2008 and is forecast to have 30,992 employees in 2031. Projections are for the area to experience growth in all sectors, led by the trade and services sector.

Table 3.5. Employment within Project Study Area

<i>Employment Total</i>		
<i>Sector</i>	<i>2008</i>	<i>2031</i>
Trade & Services	17,480	19,237
Manufacturing	2,989	3,257
Resource Production	315	320
Governmental Services	3,036	3,870
Transportation, Communications and Utilities	648	799
Wholesale	1,671	1,879
Construction	1,155	1,285
Total	27,705	30,992

Source: Socioeconomics and Environmental Justice Technical Memorandum for WEEE AA/DEIS, April 2010.

EJ Population

The demographic makeup of populations within one-half mile of the proposed EmX stations is based on a geographic information system (GIS) extraction of 2000 Census data. Table 3.6 lists the demographic characteristics of residents living within one-half mile of proposed EmX stations in 2000. Within this area, approximately 21 percent of the population reported as minority, approximately 29 percent of households were low-income, and approximately 22 percent of households were without a vehicle (Figure 3.8 - 3.10).

Table 3.6. Demographic Characteristics within one-mile of EmX Stations in 2000

<i>Population Characteristics</i>	<i>Households (2000)</i>	<i>Population (2000)</i>
Total Population		18,335
Disability Population		3,616
Limited English Proficiency Population		596
Minority Population		3,856
Senior Citizen Population		1,270
Number of Households	10,367	
Low-Income Households	2,951	
Households with No Vehicle	2,290	

Source: Socioeconomics and Environmental Justice Technical Memorandum for WEEE AA/DEIS, April 2010.

Figure 3.8. Percent Minority by Block Group in the Corridor (2000)

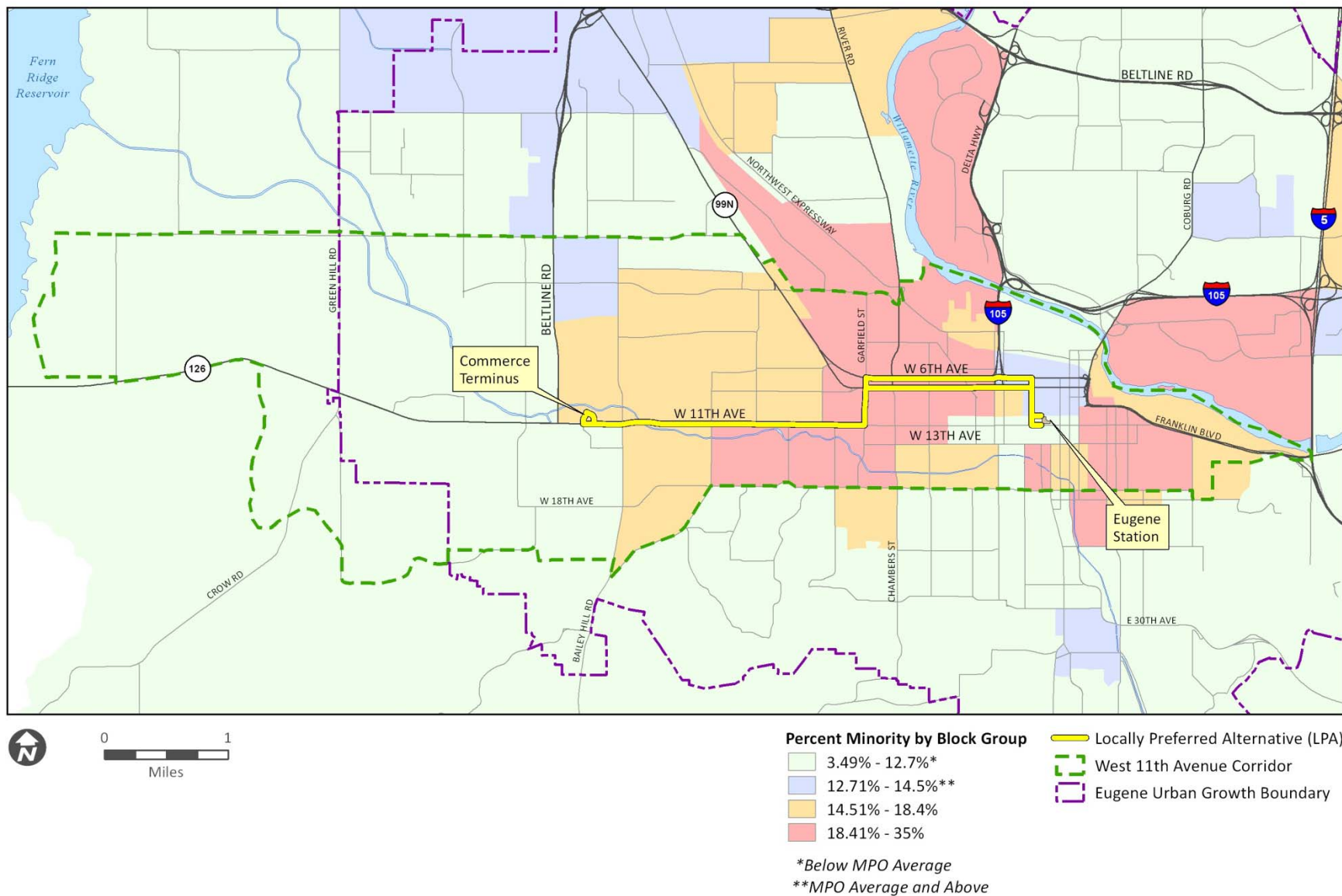


Figure 3.9. Disabled Population Concentration in the Corridor (2000)

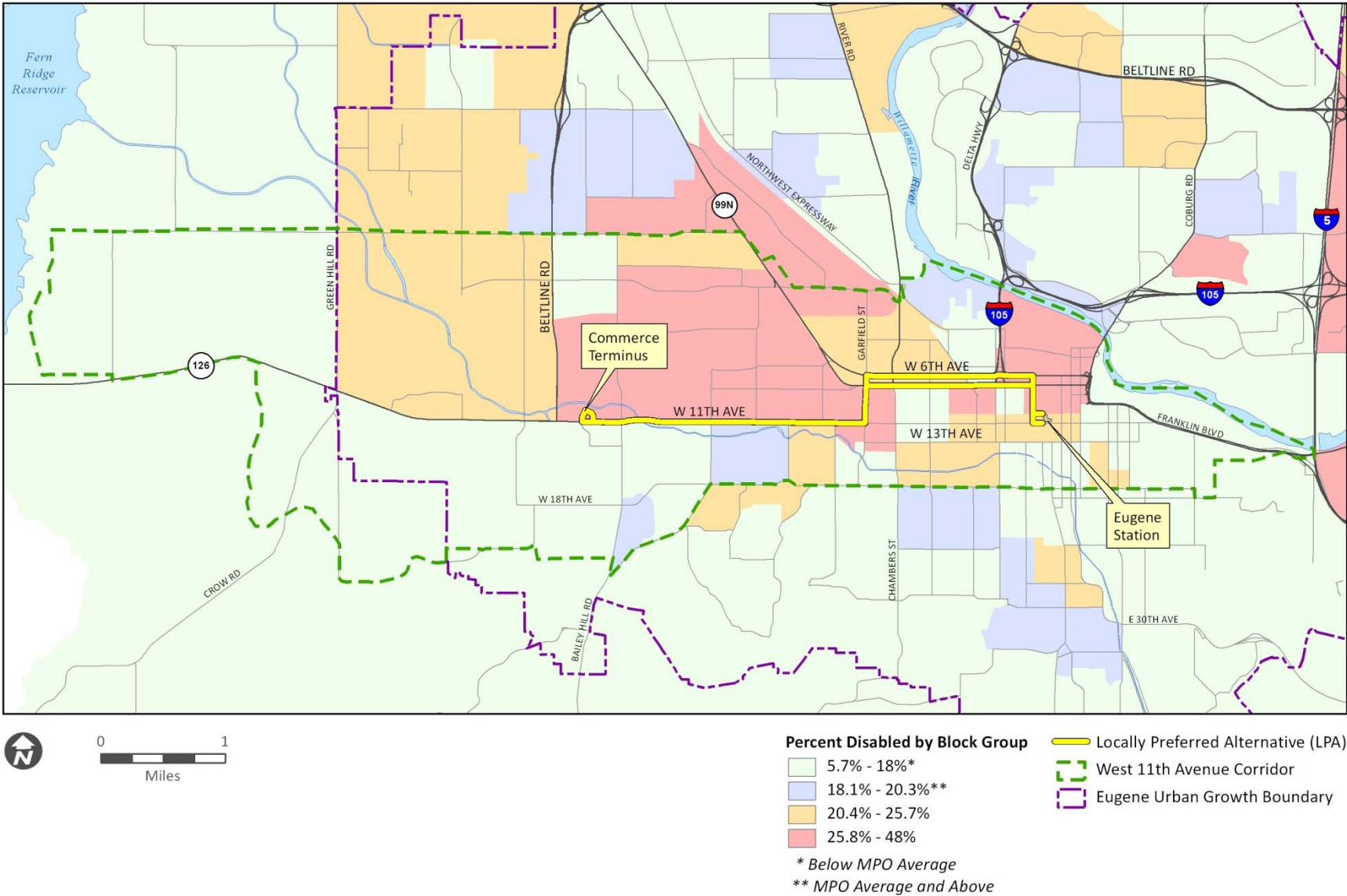
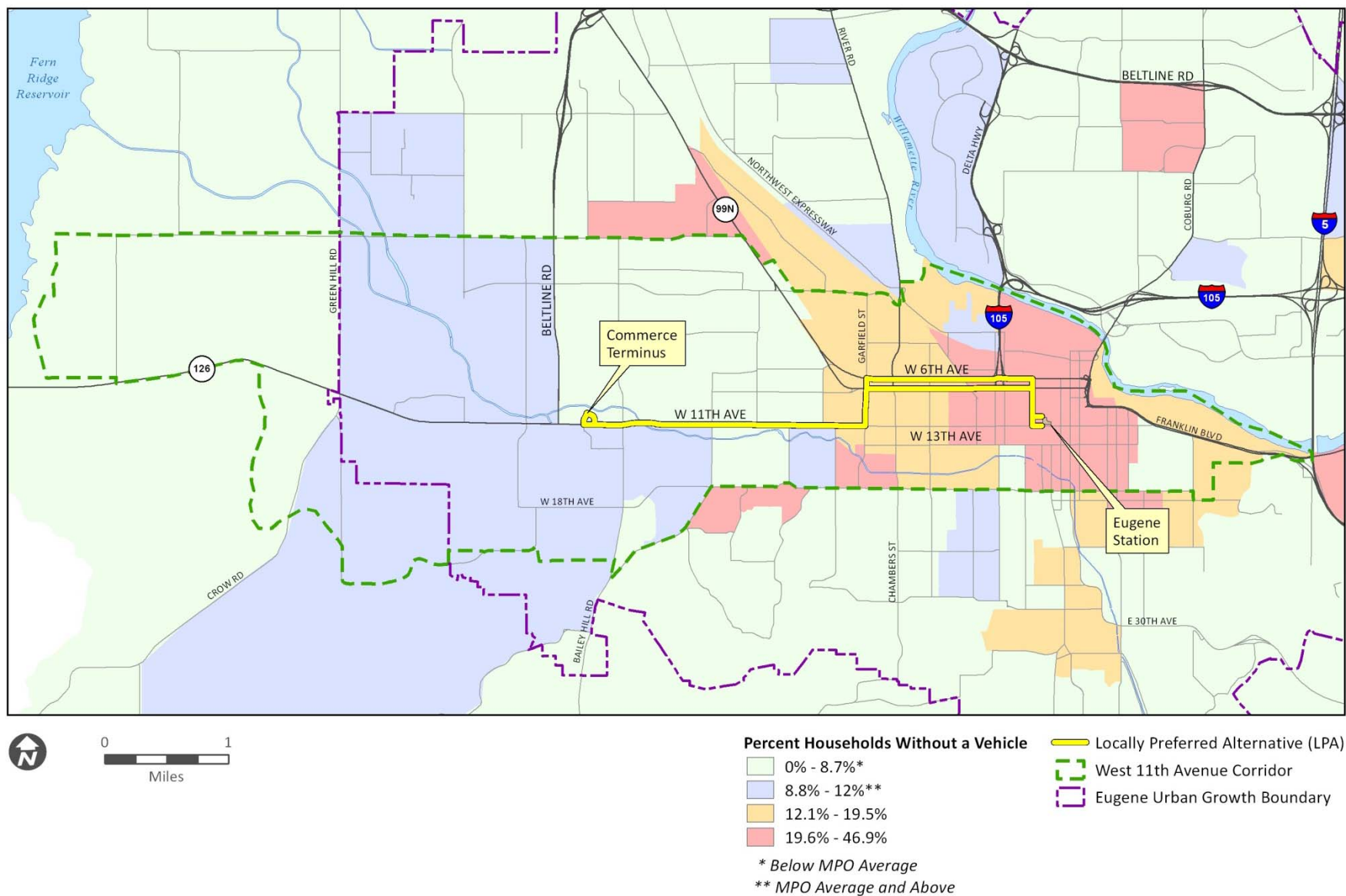


Figure 3.10. No-Vehicle Households in the Corridor (2000)



Public Services

The West 11th Avenue Corridor is within the service area of Eugene's Fire and Emergency Medical Services Department. The streets, roads, and highways within the service area are the primary means of getting fire, rescue, and emergency medical resources to incident scenes. While they are usually adequate for the volume of traffic they carry, rush-hour congestion significantly slows traffic, including emergency response, along these routes.

The Sacred Heart Medical Center/Hilyard Campus is the only hospital located within the Corridor.

The City of Eugene fire department currently operates 11 fire stations, 10 engines, two trucks, an Airport Rescue and Fire Fighting unit, and six ambulances. There are four fire stations that provide primary fire protection and emergency medical service coverage in the Corridor; however, there are no fire stations abutting the proposed LPA alignment.

The City of Eugene Police Department currently operates four public safety stations in addition to the main police department located in City Hall. Two public safety stations are located in the Corridor: Monroe Street Station and the West University Public Safety Station.

One public elementary school and private schools (early childhood through 12th grade) are located within one-half mile of the project study area. Four higher education facilities are located within one-half mile of the project study area.

Community Facilities

The Lane Events Center is located near downtown Eugene and houses events such as the Lane County Fair, Lane County Home and Garden Show, and Holiday Farmer's Market, as well as numerous private exhibitions and sales events.





3.3.2. Environmental Consequences

3.3.2.1. No-Build Alternative

Under the No-Build Alternative, LTD would continue to provide bus service on nearby West 8th and 5th Avenues, and there would be no direct transit service on West 6th and 7th Avenues except one express route to Junction City during AM and PM peak periods. Current service levels may be adequate in the near term; however, as traffic continues to increase, transit travel times and auto travel times will also increase. The long-term effect of increasing congestion will be lengthier transit and auto travel times for neighborhood residents and businesses along the Corridor, an area where, east of Garfield Street, more than 26 percent of the households have no vehicle, 32 percent are low-income households, 19.7 percent are minority residents, and 19.6 percent have a disability. Compared to current conditions, lengthier transit and auto travel times could result in reduced access to public services, community facilities, and employment; slower emergency response times; delayed freight delivery; and precluded trips. Precluded trips include travel decisions that avoid destinations within and through the project study area. (See Section 4.2.2.4 for travel time impacts.)

The No-Build Alternative would not support the City's goals of nodal development or long-term employment growth as well as the LPA, especially over time as the area becomes more congested and bus service becomes less reliable. Access to transit can be a valuable component for business recruitment and retention; the No-Build Alternative would not expand this tool. Additionally, east of Garfield Street, the West Eugene Enterprise Zone would be directly served by express transit service only during the AM and PM peak periods.

The No-Build Alternative is not anticipated to have construction-related impacts.

3.3.2.2. Locally Preferred Alternative

The LPA is consistent with the city's planned vision for economic growth and development. It would support the concept of nodal development, and the City's land use regulatory framework that encourages higher-density nodes where services and businesses can congregate around high-capacity public transit. The LPA would support the West Eugene Enterprise Zone by providing more reliable transit access to businesses and relieving long-term congestion in this area, which is also a freight corridor.

As shown above, the study area has a greater proportion of low-income people and minorities than does the Eugene-Springfield MPO. However, the LPA would have no disproportionately high and adverse human health or environmental effects on these populations. The LPA would provide improved access opportunities to transit, with shorter headways and access to a regional connected BRT system, as compared to the No-Build Alternative. Improved access to transit is particularly important given the higher percentage of residents in the surrounding neighborhoods that do not own a vehicle. Potential EJ communities (e.g., lower income, minority, or disabled residents) would likely receive greater benefit than other people from improved transit access to jobs and services.

Compared to the No-Build Alternative, the LPA would improve and preserve transit and auto travel times; maintain access to businesses, public services, community facilities, and employment; maintain emergency response times; and maintain adequate freight access. (See Sections 4.2.2.4 and 4.2.2.5 for travel times and reliability.)

The effect of removing off-street parking spaces was carefully considered during the LPA's preliminary design process. LTD revised the design to reduce the number of off-street parking spaces removed. The LPA's property acquisitions are not likely to have a significant effect. The project would primarily acquire and convert to ROW small strips of frontage from properties abutting the alignment; most of the strip acquisitions are currently zoned for commercial and industrial uses. The LPA would fully acquire two public right-of-way properties (median parcels)

owned by the State of Oregon and possibly two businesses (See Section 3.2.2.2.). See Appendices 3-1 and 3-2 for a complete summary of properties affected by right-of-way acquisition. Few land acquisitions would affect residential land, and no community resources would be displaced. The total number and acreage of property acquisitions would not substantially change land uses or development patterns and, therefore, would not affect the community's overall context or sense of cohesion.

3.3.2.3. Short-Term Impacts

During construction, short-term impacts could occur from street, sidewalk, and access closures. These temporary impacts could include reduced visits to businesses, public services, and community facilities in construction areas. Construction and staging activities could also result in short-term visual impacts to the neighborhoods.

Employment benefits from construction expenditures would include: direct employment impacts of immediate construction hiring; indirect employment benefits, as businesses providing goods and services to construction firms add jobs; and induced impacts, including jobs created as a result of additional purchases made by households using increased incomes linked to direct or indirect employment impacts. Based on studies of public transportation capital improvement projects, constructing the LPA could result in 2,852 short-term direct and indirect jobs, adding up to \$103 million in labor income.



3.3.2.4. Cumulative Effects

The LPA could enhance social interaction and access to community facilities among the neighborhoods in the West 11th Avenue Corridor. With a frequent and reliable transit service, residents, especially the transit-dependent, would be able to move more freely throughout the Corridor, using a wider variety of services. The addition of EmX stations would encourage transit use by concentrating higher density, mixed land uses in nodal development. The LPA is more likely than the No-Build Alternative to advance the West Eugene Enterprise Zone.

3.3.3. Possible Mitigation Measures

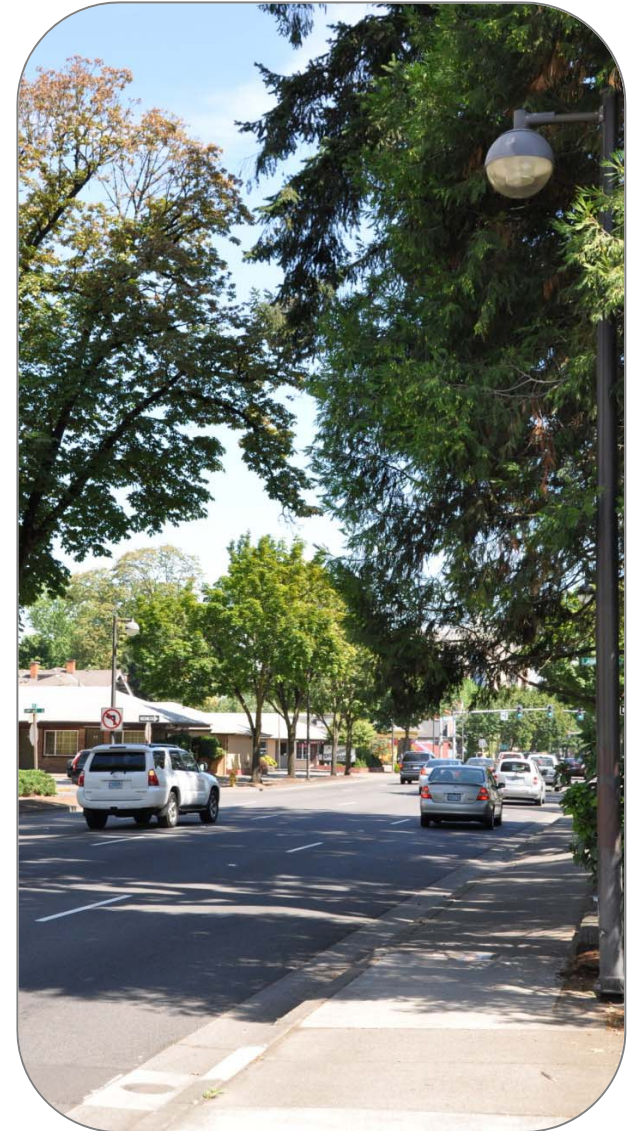
LTD would work closely with businesses and community facility managers to help ensure that short-term construction impacts are minimized. This mitigation program would be finalized with the construction contract and could include a detailed construction management plan, advance and ongoing consultation by LTD construction liaison with affected property owners and businesses, 24-hour hot line, attractive signage to reduce visual impacts, staging and scheduling to minimize noise and air quality impacts, temporary parking facilities (if necessary), and confining construction areas and lane closures. LTD would also work to make sure that community facilities are accessible during construction, and that alternative routes to the bike and pedestrian path are made available, if necessary.

LTD would maintain access to affected business throughout the project study area during normal operating hours. It would also use night construction where appropriate, adequate flagging and signing and proper staging of equipment to avoid disruption. Emergency response vehicles would be ensured adequate passage throughout the project study area during the construction period. Landscaping would be replaced or added as appropriate to mitigate property specific impacts. LTD would designate a construction liaison to maintain clear communications between businesses and the contractor.

3.4. Noise and Vibration

This section summarizes potential noise and vibration impacts associated with the proposed WEEE project.

This analysis predicted noise levels at 744 residences, 12 hotels, two churches, a park, and the Eugene Library. Under the LPA, noise levels along the alignment are predicted to range from 57 to 72 decibels (dBA) day-night sound level (L_{dn}) at residential land uses, a change of only 1 to 2 dBA at most locations from existing noise levels (see Appendix 3-3). Although a change of 1 to



2 dBA is not discernible to the average person, it could still result in future noise levels at two locations that would qualify as “impacts” under FTA criteria. FTA noise mitigation guidance would help determine whether LTD should install sound insulation in the residential units at those locations. No other noise impacts were identified. No vibration impacts were identified.

The project also performed an analysis using the Federal Highway Administration (FHWA) criteria. Under current conditions, an estimated 410 structures are predicted to meet or exceed the ODOT version of the FHWA Noise Abatement Criteria (NAC) (ODOT NAC). The alternatives both increase that number because they increase noise levels, but the actual change in noise levels is generally not discernible to the average person.

3.4.1. Noise and Vibration Introduction and Analysis Methods

Noise Descriptors

Several noise descriptors are used that take into account the variability of noise over time.

The equivalent sound level (L_{eq}) is the level of a constant sound for a specified period of time that has the same sound energy as an actual fluctuating noise over the same period of time. It is an energy average sound level.

The L_{max} and L_{min} are the maximum and minimum sound level, in dBA, during the measurement period.

The L_{dn} is the equivalent sound level for a 24-hour period with an additional 10 dBA added to sound levels occurring between 10 PM and 7 AM. The extra 10 dBA reflects the added annoyance often caused by nighttime sound.

The L_{eq} is the main descriptor for traffic noise analysis, and the L_{dn} is the primary noise descriptor for transit noise analysis.

Noise is generally defined as unwanted sound. It is a form of energy and measured in terms of sound pressure level. It is usually expressed in terms of decibels (dB). The human ear is less sensitive to higher and lower frequencies than to mid-range frequencies. Therefore, sound level meters used to measure environmental noise generally incorporate a weighing system that filters out higher and lower frequencies in a manner similar to the human ear. This system produces noise measurements that approximate the normal human perception of noise. Measurements made with this weighing system are termed "A-weighted" and are specified as "dBA" readings.

Ground-borne vibration consists of oscillatory waves that propagate from the source through the ground to adjacent buildings. It is almost exclusively an indoor problem. The primary concern is that the vibration and radiated noise can be intrusive and annoying to building occupants. For vehicles with rubber tires, most of the vibration produced is absorbed by the tires. Vibration is usually only a problem if the roadway surface is very rough or has potholes and other abnormalities.

This assessment of potential noise and vibration impacts follows FTA's Transit Noise and Vibration Impact Assessment (May 2006) (FTA Manual). The FTA noise impact criteria are based on documented research on community reaction to noise and to changes in noise exposure. More transit noise is permissible in neighborhoods with high levels of existing noise; however, as existing noise levels increase, smaller increases in total noise exposure are allowed than in areas with lower existing noise levels.

Because this project involves buses on existing public roadways and adds a limited number of bus-only lanes, and because the buses will frequently share the roadways with existing traffic, project-related traffic noise levels were also predicted using FHWA methods.

Significance thresholds were determined by the applicable noise criteria (FTA and/or FHWA) for transit- and traffic-related noise. For ancillary facilities, such as Park & Rides, the significance thresholds were determined by the Lane County Noise Control Ordinance. All locations identified with project-related noise or vibration impacts will be considered for mitigation measures. Complete details on the noise assessment criteria can be found in the *Noise Impact Assessment Report*, West Eugene EmX Extension (September 2011).

Construction noise was analyzed following the methods given in the FHWA Procedures for Abatement of Highway Traffic Noise and Construction Noise – Final Rule (July 2011).

3.4.2. Affected Environment

The proposed project travels east and west along West 6th, 7th, and 11th Avenues, which are all established truck corridors. The north-south routes are along Garfield Street, also an established truck route, and Charnelton Street, which provides the connection to the Downtown Eugene Transit Center.

The area for the noise analysis was determined according to the FTA Manual and the ODOT Traffic Noise Manual (2011) (ODOT Manual). Several factors (including the distance from project roadways to noise and vibration sensitive properties, structural shielding, and measured noise levels) assured that a 350-foot analysis area would identify all potential noise impacts.

Land use in the project study area includes residential uses (including hotels and motels), a library, a park, two churches, commercial uses (including offices, retail, and restaurants), and light and heavy industrial uses. Although most of the area is in a mature phase of conversion from mixed residential and commercial to near-exclusive commercial and industrial uses, the project team identified several hundred residential uses and analyzed potential effects on them.

Noise measurements were taken at eight locations along the LPA and used to establish the existing conditions and also to validate the FHWA Traffic Noise Model. Overall, measured noise levels ranged from 57 dBA to 75 dBA L_{eq} during the peak transit operational hour. This resulted in predicted 24-hour L_{dn} noise levels at residences of 55 to 73 dBA L_{dn} .

Vibration along the corridor is the result of heavy trucks, buses and miscellaneous construction activities. Existing vibration levels along the corridor are typically below the 72 VdB vibration criteria for residences. Higher levels may sometimes result from roadway paving, demolition of existing structures for new development, and heavy trucks traveling over rough roadways.

3.4.3. Environmental Consequences

This section provides details on the noise and vibration levels under the alternatives and discusses long-term operational impacts and short-term impacts from project construction, and potential mitigation.

3.4.3.1. No-Build Alternative

Under the No-Build Alternative, noise levels throughout the project study area would continue to increase as traffic volumes along the established truck routes increase. Noise modeling predicts increases of up to 2 dBA L_{eq} along project roadways. Under FTA criteria, there would be no impacts because there is no transit project.

An estimated 376 residences, four hotels, a park, a church, and the Eugene Library are predicted to have noise levels that fail to satisfy the ODOT version of the FHWA Noise Abatement Criteria (NAC). There are also two restaurants with outdoor seating that meet the ODOT NAC. However, because there is no proposed project under the No-Build Alternative, no noise mitigation measures are proposed.

3.4.3.2. Locally Preferred Alternative

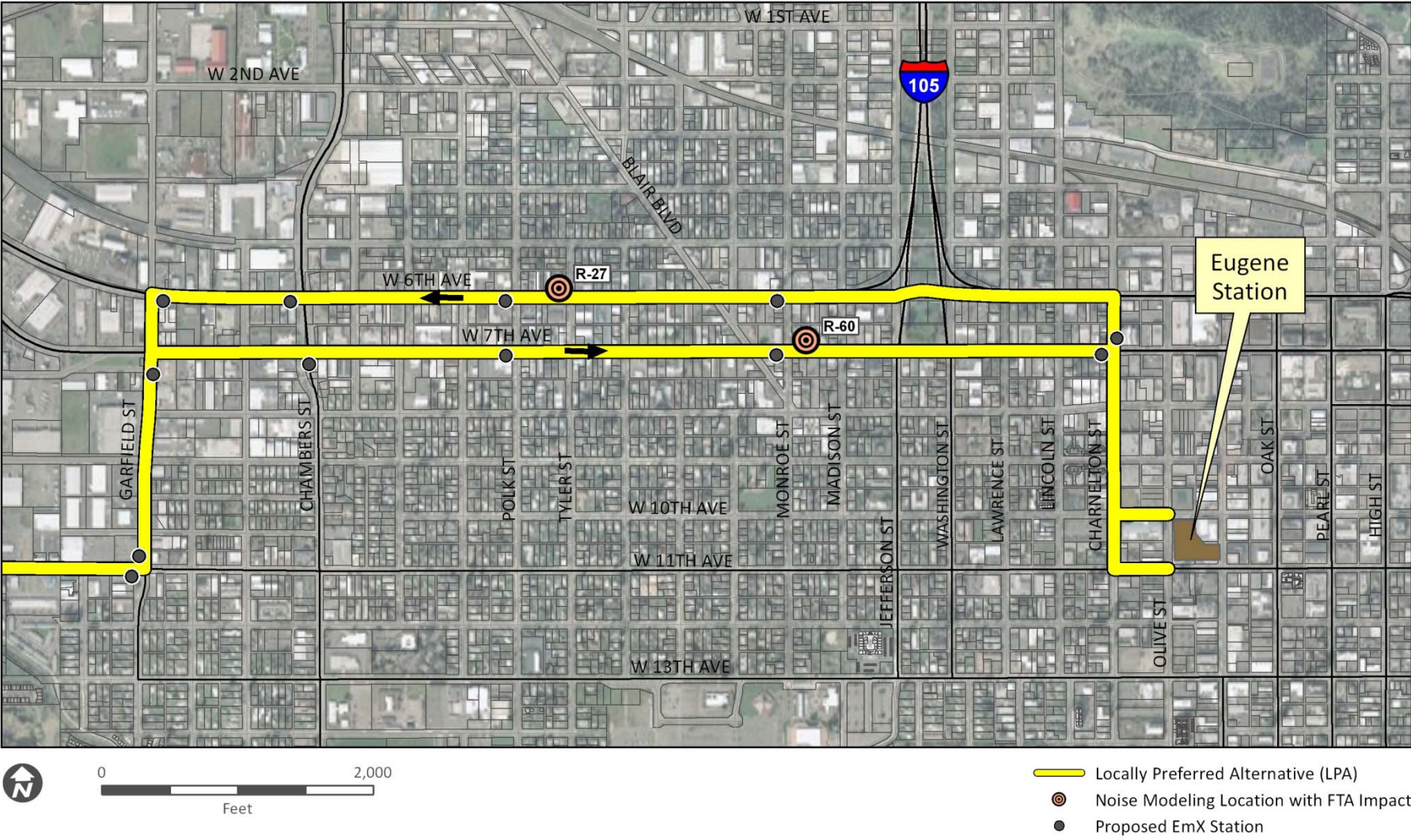
The LPA would increase overall noise levels by no more than 3 dB for the 24-hour L_{dn} , (and no more than 2 dB for the peak hour L_{eq}) over the No-Build Alternative. Sites that are adjacent to the new bus-only lanes would actually have reduced overall noise levels due to the movement of general purpose traffic farther from noise-sensitive properties. Conversely, there are some sites with slight increases due to the general purpose traffic being condensed to the near lanes when the far lane is converted to bus-only traffic. Overall, the change in noise levels at virtually all locations would be less than an average person can discern.

Even though the change in noise levels is less than an average person can discern, under the LPA, the noise levels at up to 11 residences are calculated to reach levels defined as “impacts” under the FTA criteria. This includes up to 10 units at a multi-family building on West 6th Avenue just west of Tyler Street, and a single-family residence on West 7th Avenue just east of Monroe Street (Figure 3.11).

LTD also performed a traffic noise study to comply with FHWA regulations. It predicted that 401 residences, four hotels, a park, a church, the Eugene Library, and outdoor seating at two restaurants would likely reach noise levels that constitute an impact under the ODOT NAC. The locations of the noise impacts under the LPA are similar to those locations that meet, or exceed the ODOT NAC under the No-Build Alternative. However, under the LPA, in addition to the single family building and the 10-unit apartment building that would have noise impacts under the FTA criteria, up to 25 units in the Westtown Apartments on Eighth Avenue are predicted to have exterior noise levels of 65 dBA, an increase of 1 dBA compared to the No-Build Alternative, but nevertheless an impact under the FHWA/ODOT NAC.

Because the Westtown Apartments building is a publicly subsidized low-income housing development from Eugene-based Metropolitan Affordable Housing Corporation, Housing and Urban Development (HUD) interior noise criteria apply. Constructed in 2007-2008, the building does not have any windows or outdoor uses that face toward the Charnelton Street corridor, where the new bus routes are located. Furthermore, the building's double-pane windows help insure interior noise levels that are compatible with noise levels in an urban downtown setting. The lack of outdoor use, new construction, double-pane windows, and absence of windows facing the BRT corridor make it highly unlikely that interior noise levels will exceed HUD's interior limit of 45 dBA.

Figure 3.11. Residences with Predicted LPA Noise Level Effects



3.4.3.3. Short-Term Impacts

Heavy equipment needed to build the project would create noise and vibration. Constructing bus-only lanes and rebuilding the project roadways, stations, and ancillary facilities would temporarily increase noise levels. Noise-generating haul truck and delivery truck volumes and times of travel would vary depending on the specific site activities occurring at any one time. The highest noise levels would occur during the heaviest construction, such as demolition, paving, jackhammering and hauling. Noise levels would only be slightly above the ambient levels during minor construction work, such as finishing work, roadway stripping, and system installation.

The only construction activities that may cause high levels of vibration include demolition and soil compacting. Other construction vibration is rarely high enough to cause structural damage, although it may at times be noticeable inside the structures. Areas with the highest potential for construction-phase vibration impacts would be near the alignment and within 100 to 150 feet of the construction site.

3.4.3.4. Cumulative Effects

The noise levels projected for this project include noise from local area traffic on major roadways. For most areas, traffic is the dominant noise source; therefore, the predicted noise levels are cumulative and include both the proposed WEEE project and local area traffic noise. When combined with the projected effects of the LPA, other noise sources, such as short-term construction projects, commercial and industrial activities, and aircraft, are either local in nature or not predicted to be a major noise source.



3.4.4. Possible Mitigation Measures

3.4.4.1. Long-Term Mitigation

The LPA would likely cause moderate impacts under FTA criteria at up to 11 residences in two structures. FTA noise guidance requires consideration of specified factors to determine whether

a project must mitigate noise impacts. In this case, primarily because the impacts are moderate and the slight noise increase is imperceptible to most people, FTA would likely not require mitigation. Sound insulation would be considered, if appropriate.

Under the ODOT and FHWA criteria, several forms of noise abatement must be considered whenever impacts are identified, no matter how slight. Noise abatement using traffic management measures was considered and rejected as the project roadways are established freight corridors, and traffic management, such as restricting trucks or modifying speeds, would conflict with the purpose of the roadways. Highway design measures were considered and rejected because of the cost of roadway modification, close proximity of structures along both sides of project roadways, and other design considerations. Finally, noise barriers were reviewed for all properties identified with noise levels exceeding the NAC. Because most locations exceeding the NAC are residences along West 6th and 7th Avenues, with driveways and pedestrian access requirements, noise walls were not feasible there. For those areas where noise barriers might be constructible, either the noise reduction would not meet the requirements or not enough residences would benefit to justify the cost of the mitigation.

As mentioned above, the Westtown Apartments building is subject to HUD interior noise standards. However, because the building is new construction, with double-pane windows, and has no windows facing the BRT corridor, it is highly unlikely that interior noise levels would exceed HUD's 45 dBA limit. Building insulation would be considered as mitigation for any residential unit living and sleeping areas with BRT-related noise levels above 45 dBA.

3.4.4.2. Short-Term Mitigation

Construction noise levels can range from 70 to 95 dBA at a distance of 50 feet from the noise source. These noise levels, although temporary, can be annoying. The project specifications would include at least the following construction noise abatement measures:

- All equipment shall have sound-control devices at least as effective as those provided on the original equipment.
- Equipment shall not idle unnecessarily.
- No equipment shall have unmuffled exhaust.
- All equipment shall comply with applicable equipment noise standards of the U.S. Environmental Protection Agency (EPA).
- LTD shall establish a construction communication web site or hot line with information on upcoming construction activities.

LTD would use a construction communications liaison who could assist with resolving any specific construction-related noise impact complaints, who could require the contractor to implement one or more noise mitigation measures at the contractor's expense, as directed by the project manager. In response to specific noise impact complaints received during construction, and depending on circumstances, the contractor could be required to:

- Locate stationary construction equipment as far from nearby noise-sensitive properties as feasible.
- Reschedule construction operations to avoid periods of noise annoyance identified in the complaint.
- Install temporary or portable acoustic barriers around stationary construction noise sources.



Vibration associated with general construction can affect surrounding receivers. Major vibration-producing activities would occur primarily during demolition and preparation for the new roadways and stations. Activities that have the potential to produce a high level of vibration include soil compacting, concrete breaking, and some hauling and demolition. It is unlikely that vibration levels would be disruptive at distances greater than 100 feet from the construction sites.

3.5. Air Quality

This section summarizes potential air quality impacts associated with the proposed project. Regional emissions of carbon monoxide (CO), nitrogen oxides (NO_x), and volatile organic compounds (VOCs) were estimated for the No-Build and LPA. Because the LPA reduces daily average vehicle miles traveled (VMT) compared to the No-Build Alternative, it causes lower emissions of all pollutants analyzed. While traffic volumes will increase by 2031, that increase is expected to be offset by reductions in individual vehicle emissions resulting from technology improvements over the same period.

3.5.1. Affected Environment

Air quality in the study area is regulated by three agencies: the EPA, the Oregon Department of Environmental Quality (ODEQ), and the Lane Regional Air Protection Agency (LRAPA). LRAPA monitors air quality within the region. EPA sets national air quality standards and has oversight authority over LRAPA and ODEQ.

EPA has developed National Ambient Air Quality Standards (NAAQS) for six criteria pollutants to protect the public health and welfare. The NAAQS specify maximum concentrations for CO, particulate matter less than 2.5 microns in diameter (PM_{2.5}), particulate matter less than 10 microns in diameter (PM₁₀), ozone (O₃), sulfur dioxide (SO₂), lead, and nitrogen dioxide (NO₂). These standards shall not be exceeded by ambient pollutant concentrations that are averaged over defined time intervals ranging from one-hour to one-year averages.

Areas of the country exceeding the NAAQS for a given pollutant are classified as non-attainment areas. In 1978, the Eugene/Springfield area was designated as being a non-attainment area for CO and in 1987 for PM₁₀. In 1994, based upon monitoring results that have shown no exceedances of the CO NAAQS for several years, the EPA redesignated the areas within the Eugene/Springfield UGB as being in attainment for CO. Former non-attainment areas are



required to continue to maintain air quality by adhering to a "maintenance plan" developed as part of the redesignation process.

LRAPA operates monitoring sites for CO, PM₁₀, and PM_{2.5} in the Eugene area. The nearest CO monitoring site is too distant to provide relevant data for this project. Carbon monoxide is a pollutant that dissipates rapidly with increasing distance from vehicle traffic; thus, monitoring results from distant sites will not reflect conditions elsewhere. The modeling in this report uses the ODEQ suggested value of 1.5 parts per million (ppm) as a one-hour average background CO concentration. Carbon monoxide concentrations have declined sharply since 1988 at all monitoring sites despite large increases in the number of vehicles and vehicle miles driven. This is due to improvements in automobile engine technology and the effectiveness of the State's Emission Check (I&M) program.

PM₁₀ and PM_{2.5} are monitored at Highway 99/Roosevelt Boulevard approximately 1.2 miles northeast of the Bailey Hill Road/West 11th Avenue intersection. In the most recently published data from 2009, there were no exceedances of the NAAQS with a 24-hour maximum of 85 micrograms per square meter $\mu\text{g}/\text{m}^3$ and an annual average of 17 $\mu\text{g}/\text{m}^3$.

The EPA strengthened its 8-hour ozone standard from 0.08 ppm to 0.075 ppm in March 2008. Ozone concentrations have declined slowly over the last 10 years despite large increases in regional population, employment, and vehicle miles driven. The fact that ozone concentrations have not increased is due to improvements in automobile engine technology; effectiveness of the various State programs, such as the Emission Check program; and controls on industrial sources of hydrocarbons, which is one of the precursors of ozone.

3.5.2. Environmental Consequences

3.5.2.1. Long-Term Impacts

Two computer programs developed by EPA were used to estimate current and future CO concentrations during "worst-case" meteorological conditions and heavy traffic flows. For the detailed analysis of potential CO concentrations along the project area, 20 representative receptors were placed around each of the three selected intersections: Bailey Hill Road/West 11th Avenue, Commerce Street/West 11th Avenue, and Jefferson Street/West 7th Avenue. Evening peak hour traffic volumes, which generally cause the most congestion, were used in the modeling. Cold and windless meteorological conditions were assumed in order to estimate the "worst-case" one-hour CO concentrations.

EPA modeling guidance requires that signalized intersections within the project boundaries that have, or will have, a Level of Service (LOS) of D or worse should be examined and assessed for modeling for air quality impacts. Under the No-Build Alternative, seven intersections had LOS of D or worse in 2009 and 2017 and 10 intersections had LOS of D or worse in 2031. Under the LPA, five intersections would be at LOS D or worse in 2017 and seven in 2031.

Three intersections with the highest PM peak volumes and the longest vehicle delays were selected for detailed modeling. The results are provided in the project's Air Quality Technical Report (Michael Minor & Associates, 2011). All of the modeled receptors are currently below the 8-hour CO standards. None of the receptors are expected to violate the CO standards in 2017 or 2031 under either alternative (Table 3.7).

As indicated in the previous section, concentrations of the other criteria pollutants are also likely to remain in compliance with applicable standards.

Table 3.7. PM Peak Carbon Monoxide Level

Project Scenario	CO Highest Concentration Levels (ppm)			NAAQS Regulations	
	Receptor	1-Hour	8-Hour	1-Hour	8-Hour
Bailey Hill Rd + 11th Ave					
2031 No-Build	1	5.3	4.0	35	9.0
2031 LPA	1	5.6	4.3	35	9.0
Commerce St + 11th Ave					
2031 No-Build	10	5.2	4.0	35	9.0
2031 LPA	10	5.4	4.1	35	9.0
Jefferson St + 7th Ave					
2031 No-Build	7	8.0	6.1	35	9.0
2031 LPA	10	7.7	5.9	35	9.0

Source: Michael Minor & Associates, 2011.

3.5.2.2. Short-Term Impacts

Short-term impacts would result from construction activities. During construction, CO and particulate matter are expected to increase due to clearing, excavation, and grading; direct emissions from construction vehicles; and impacts to traffic flow in the project area. Traffic congestion increases idling times and reduces travel speeds, resulting in increased vehicle emission levels. Construction of concrete structures may have associated dust-emitting sources, such as concrete mixing operations. Asphalt mix plants could also be associated with construction and could have particulate, hazardous air pollutant, and combustion source emissions. (Note, however, that sources such as concrete and asphalt mix plants are generally required to obtain air permits from state or regional authorities and to comply with regulations to control dust and other pollutant emissions.)

3.5.2.3. Cumulative Effects

Cumulative effects to air quality are not anticipated as a result of this project. (See Section 3.15 for a discussion of potential effects related to greenhouse gas emissions.)

3.5.3. Possible Mitigation Measures

One of the benefits of mass transportation improvements, such as EmX, is reduced automobile VMT and associated congestion. The LPA would reduce regional VMT compared with the No-Build Alternative and would result in a reduction of regional air pollution emissions.

To reduce short-term impacts, construction contractors would be required to take reasonable precautions and comply with local and state rules (including ODOT contract specifications) to control fugitive dust emissions. Required best management practices (BMPs) to control dust during construction would likely include applying water or chemicals to control dust during demolition, clearing, grading or construction; applying asphalt, water, or other suitable chemicals on unpaved roads, materials stockpiles, and other surfaces which can create airborne dusts; enclosing or covering materials stockpiles; using hoods, fans, and fabric filters to enclose and vent the handling of dusty materials; containment during sandblasting or other similar operations; and covering materials that could become airborne in open-bodied trucks. In addition, the contractor will be required to take measures to reduce vehicle idling, require equipment to be properly tuned and maintained, and use equipment that meets EPA's emissions standards. Other BMPs would be implemented as needed.

To reduce the effect of construction delays on traffic flow and resultant emissions, road or lane closures would be restricted to non-peak traffic periods when practical.

3.6. Visual and Aesthetic Resources

The section describes the potential impact on visual and aesthetic resources under the No-Build Alternative and the LPA.

3.6.1. Affected Environment

Because FTA does not have visual impact guidance, this evaluation follows the FHWA methodology described in Visual Impact Assessment for Highway Projects (FHWA-HI-88-054). The analysis to determine which views would potentially be impacted relied on site visits, GIS mapping, and existing planning documents. The evaluation characterized the existing visual environment in terms of its vividness, visual intactness, and unity, and assessed how the proposed project might impact the visual environment; viewer response has been evaluated based on viewer exposure and sensitivity.

For a description of the existing visual landscapes and additional detail about the analysis, see the WEEE project Visual and Aesthetic Technical Memo (LCOG, June 2010).

3.6.2. Environmental Consequences

3.6.2.1. No-Build Alternative

Under the No-Build Alternative, the bus route structure would remain substantially similar to the existing system, with some increase in frequency as needed to maintain schedule reliability and avoid peak overloads. Higher traffic volumes associated with the No-Build Alternative would result in minor and indirect visual impacts, including nighttime glare, visual streetscape clutter, and reduced horizon views. The diminished visual and aesthetic experience of greater peak-hour traffic is a possible consequence of the No-Build Alternative compared to the LPA.

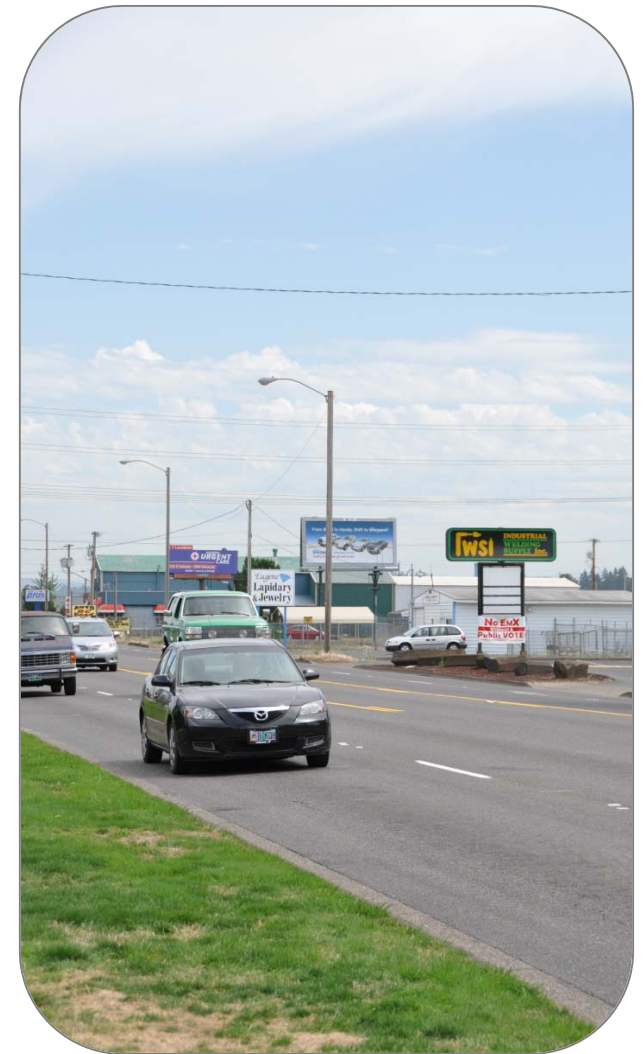


3.6.2.2. Locally Preferred Alternative

The proposed improvements, including dedicated BRT lanes, new stations, and new infrastructure designed to address and improve pedestrian and vehicular safety in intersections, would not block views of surrounding landscape features such as Skinner Butte or Spencer Butte, the south hills, Washington/Jefferson Park, or significant historic resources. The BRT stations are generally larger than existing bus stops; however, station design is sized for neighborhood scale and would incorporate visually appropriate public art, which could enhance neighborhood streetscapes. New lighting at stations would occur in areas with existing street lights and would not increase light levels at night significantly, with any potential glare controlled by lighting design.

Under the LPA, tree removal would be required. The street trees along the alignment provide an important visual amenity for vehicle users and pedestrians, both commuters and local residents. Their shade decreases glare from vehicles during sunny spring, summer, and fall days. The tree canopy frames the busy major arterials and contributes to the neighborhood identity, softening the visual impact of high volumes of traffic and creating visual transitions into the residential neighborhoods. The visual impact of tree removal would be low to moderate depending on design details of replanting.

The LPA is consistent with city plans to utilize nodal development, which in turn supports an urban design aesthetic of increased densities, pedestrian/bike-friendly infrastructure, and walkable neighborhoods centered on high-capacity transit. The visual aesthetic in the built environment is subject to individual preference, but design consistent with the pedestrian realm has generally been regarded as a desirable aesthetic in the urban setting. To the extent the LPA encourages or accelerates this kind of development, it would indirectly enhance urban design elements and community character in the long term.



3.6.2.3. Short-Term Impacts

Under the LPA there would be temporary construction impacts on the visual environment, which would include the presence and movement of equipment and materials, exposure of soils, glare and lights associated with nighttime construction, storage of construction materials, and general visual changes to viewed landscape.

3.6.2.4. Cumulative Effects

The Eugene-Springfield Metropolitan Area in general and the study area in particular are expected to continue to grow and increase in density and development over time. Continuing improvement of the transportation infrastructure will occur concurrently with development. This concentration of transportation functions will result in a greater density of transit-related structures along major streets, reduced size of street landscapes such as medians and street trees, and wider streets.

The tree removal, introduction of new transportation infrastructure, and construction of new EmX stations that are proposed as part of the LPA are similar in nature to the cumulative effects the area will continue to experience as it continues to grow.

Also, as noted above, an indirect effect of the LPA (combined with other City policies and regulations) could be to support a more visually appealing development pattern, the cumulative visual effects of which would be generally positive.

3.6.3. Possible Mitigation Measures

To reduce the LPA's impacts on visual and aesthetic resources, LTD would:

- Retain existing street trees and landscaping where practicable, using City standards and in consultation with the City Urban Forester.

- Wherever possible, replace street trees and landscaping after construction activity. This also requires replacement with appropriately sized plants and trees.
- Use source shielding for exterior lighting at stations and Park & Ride lots to ensure that light sources are not directly visible from residential areas and to limit spillover light and glare.
- Design stations and landscaping to be compatible with area character and to enhance its visual aesthetic. Design would incorporate art elements at station sites.

Visual impacts caused during construction of the proposed project can be mitigated using the following measures:

- Remove erosion control structures as soon as the area is stabilized.
- Keep the roadway and work areas as clean as possible by using street sweepers and wheel washes to minimize off-site tracking.
- Maintain construction equipment properly to minimize unnecessary exhaust.
- Stockpile materials in less visually sensitive areas, preferably where they are not visible from residences.
- Use short-term landscaping, berms, or fencing to buffer the neighborhoods from the construction area.

3.7. Historic, Archaeological, and Cultural Resources

Section 106 of the National Historic Preservation Act (NHPA) protects significant historic, archaeological and cultural resources. “Significance” is based on the criteria set forth in the Section 106 and its implementing regulations. A significant impact under Section 106 would result if the project caused the direct loss, destruction, or alteration of the historic character or integrity of significant scientific, cultural, or historical resources. The evaluation described in this section is to ensure that the project complies with Section 106 and state and local regulations that protect these resources.

This evaluation identified 90 historic resources in the project study area, of which 57 were evaluated for potential project effects. The analysis found that the project is likely to have an effect, but not an adverse effect, on five of these historic properties. The project is not anticipated to have any effect on archaeological or cultural resources.

3.7.1. Affected Environment

This evaluation uses different study areas, or “Areas of Potential Effect” (APE), for the historic and archaeological investigations. APEs must be approved by FTA and Oregon’s State Historic Preservation Office (SHPO). FTA and SHPO must account for both direct and indirect impacts when developing the APE. At meetings in late 2008 and early 2009, FTA, SHPO and LTD discussed and agreed upon an approach to determining the project’s APE.

The WEEE project area has been extensively altered over the last 160 years as the City of Eugene has developed and expanded. The eastern portion of the LPA passes through dense commercial and residential areas from Olive Street in downtown Eugene west to about Garfield Street. West of Garfield Street, development continues to be dense, but is predominantly commercial and industrial. This development becomes somewhat less dense west of Bailey Hill Road.



The APE for the archaeological investigation was approximately five meters on each side of the existing roadways along the LPA alignment, which would account for areas that could be physically altered by construction activities. Project team archaeologists conducted a background records search and a pedestrian survey of the proposed alignment in July 2008. This survey was performed to identify surface archaeological resources that might be present, assess the extent of development and disturbance that has occurred along the alternative routes, and identify areas that may have a high likelihood of containing archaeological resources. No prehistoric or demonstrably historical cultural materials were found on the ground surface in the surveyed project area. Development and disturbance have occurred along the alignment from road

construction, buried utilities, and neighboring residential, commercial, and industrial construction. Most of the surficial soils along the alternatives were likely brought in for landscaping purposes and are not natural exposures. For historic resources, the APE was defined as 100 feet on either side of the LPA.

For this evaluation, WEEE project team historians conducted record searches at the SHPO and at the City of Eugene. Numerous field reconnaissance surveys for historic resources assessed the potential for impacts to historic resources and re-assessed the potential as project designs were refined. During field investigations, LTD determined that there are 90 potentially historic resources (structures 45 years and older) that fall within the APE (a complete list of them is provided in Appendix 3-4.). Of these, 54 resources were determined eligible for listing on the National Register of Historic Places (NRHP). Three other resources are already listed on the NRHP and are in the category of “significant” resources:

- An apartment building known as the James W. Working Flats, located at 614 Lawrence Street;
- McDonald Theater, located at 1004 Willamette Street; and
- Schaefers Building, located at 1001 Willamette Street.

Four additional properties have been independently determined to meet the eligibility criteria for listing on the NRHP and are also included in the category of “significant” resources:

- St. Mary’s Church, located at 1062 Charnelton;
- Craftsman House, located at 700 Lawrence Street;
- Humphrey Apartments, located at 664-662 Lincoln Street; and
- Amazon Channel.

The Amazon Channel has been found eligible for listing on the NRHP due to its association with flood control efforts by the U.S. Army Corps of Engineers and the subsequent development of the City of Eugene. This channel is a natural drainage course that has been altered by human intervention. It is a work in progress, as environmental restoration projects



Effects and Adverse Effects

An *effect* on a historic property is anything that **alters** one or more of the characteristics that make it eligible to the NRHP.

An *adverse effect* is defined as something that **diminishes** one or more of those characteristics.

The characteristics of interest here are those having to do with the property's **integrity**: its location, setting, design, materials, workmanship, feeling, and association.

have been completed, and there will continue to be efforts to reverse the 1950s channelization of the Amazon and restore the creek to a more natural form. It has been altered in various segments over the years; however, it retains its original function as a flood control mechanism. The original engineering and design of the Amazon Channel and the associated systemwide construction as it pertains to the period of significance is intact.

3.7.2. Environmental Consequences

Adverse effects to historic resources are not anticipated under either alternative, as explained below.

3.7.2.1. No-Build Alternative

The No-Build Alternative would result in no effect to historic, archaeological or cultural resources, as no improvements outside the existing ROW are proposed.

3.7.2.2. Locally Preferred Alternative

No prehistoric or demonstrably historical sites, features, or artifacts were observed during this surface survey. Given the amount of observed ground disturbance, the areas with primarily native soils are probably most likely to contain relatively intact archaeological resources. Lots bordering the downtown may contain historical materials related to earlier uses of these parcels, but the majority of these artifacts and features are likely set back away from the established road grid and sidewalks. In general, the areas bordering the alignment have been severely disturbed by a variety of past actions, so the potential for intact archaeological materials, surface or buried, is low. SHPO formally concurred on September 1, 2011 that the LPA would have no effect on any known archaeological or cultural resources (Appendix 3-5).

Tables 3.8 and 3.9 list five eligible historic resources that the LPA could affect. FTA, in consultation with the LTD and SHPO, has determined that the project would not adversely affect these five resources, and also that the project would avoid effects to the other historic resources (that is, have no effect on other historic resources), including the existing NRHP sites. SHPO formally concurred on August 25, 2011 with the determinations of eligibility and findings of effect for above-ground historic resources (Appendix 3-6).¹

Table 3.8. Historic Resources Subject to LPA Effects and Effects Summary

<i>Resource</i>	<i>Effects Summary</i>
849 W 6th Ave	<ul style="list-style-type: none"> • Strip property acquisition (781 SF – 1.8% of total property) • Street tree removal (potential minor visual effect to setting)
931 W 7th Ave	<ul style="list-style-type: none"> • Strip property acquisition (481 SF – 6.5% of total property)
710 Polk St	<ul style="list-style-type: none"> • Station platform located adjacent to building (no property taken) • Street tree removal (potential minor visual effect to setting)
630 Garfield St	<ul style="list-style-type: none"> • Strip property acquisition (2,783 SF – 7.7% of total property)
888 Garfield St	<ul style="list-style-type: none"> • Strip property acquisition (4,219 SF – 2.3% of total property)






¹ A Section 4(f) de minimis impact evaluation for these five resources is provided in Appendix 3-7.

Table Notes

¹ "Eligible/Contributing": when a resource is currently over 45 years old and contains historic physical materials, and/or design and architectural features. (Appendix B of Recording Eligibility Evaluations Guidelines for Historic Resource Surveys in Oregon, 2011)

²For a property to be eligible for the National Register, it must meet at least one of the four National Register main criteria. Information about architectural styles, association with various aspects of social history and commerce, and ownership are all integral parts of the nomination. Each nomination contains a narrative section that provides a detailed physical description of the property and justifies why it is significant historically with regard either to local, state, or national history. The four National Register of Historic Places criteria are: Criterion A, "Event," the property must make a contribution to the major pattern of American history; Criterion B, "Person," is associated with significant people of the American past; Criterion C, "Design/Construction," concerns the distinctive characteristics of the building by its architecture and construction, including having great artistic value or being the work of a master; and Criterion D, "Information potential," is satisfied if the property has yielded or may be likely to yield information important to prehistory or history. The criteria are applied differently for different types of properties.

Table 3.9. Historic Properties Listed or Eligible for Listing on the NRHP with No Adverse Effect Evaluations

Resource Image	Street Address	Construction Date	Function	Eligibility Evaluation ¹	Criterion ¹	Effect Evaluation
	849 West 6th Avenue	c. 1960	Commercial (Red Apple Market)	Eligible / Contributing	C	No Adverse Effect
	931 West 7th Avenue	c. 1920	Residential	Eligible / Contributing	C	No Adverse Effect
	710 Polk Street	c. 1960	Financial Institute (Wells Fargo Bank)	Eligible / Contributing	C	No Adverse Effect
	630 Garfield Street	c. 1930	Commercial (Office Exchange)	Eligible / Contributing	C	No Adverse Effect
	888 Garfield Street	c. 1940	Warehouse	Eligible / Contributing	C	No Adverse Effect

Source: Historic, Archaeological and Cultural Resources Technical Memorandum. Heritage. 2011.

3.7.2.3. Short-Term Impacts

While construction is not anticipated to adversely affect individual resources, it could temporarily affect the area’s character. Construction contractors will be required to avoid above-ground resources. Still, minor changes could result from:

- Clearing and grading activities, resulting in exposed soils until replanting or repaving occurs
- Dust, exhaust, and airborne debris in areas of active construction
- Stockpiling of excavated material
- Staging areas used for equipment storage and construction materials
- Disruption to normal traffic flow

Temporary changes would be most noticeable at new stations, places where roads are being changed, and where mature trees are being removed. Other temporary construction-related effects could include noise, vibration, and dust. Because construction is estimated to move quickly along the alignment, short-term (construction) effects are estimated to be minimal.

3.7.2.4. Cumulative Effects

Cumulative effects to cultural resources depend on impacts from traffic, noise, air, and aesthetics. Beneficial effects may include improved access to historic community resources. No cumulative effects are expected to occur to archaeological or historic resources.

3.7.3. Possible Mitigation Measures

No mitigation measures are warranted for archaeological, cultural or historic resources. Prior to construction, LTD will prepare a cultural resources inadvertent discovery plan. In the event of inadvertent damage or loss to historic resources during construction, mitigation measures will be determined in consultation with FTA, SHPO, the City of Eugene, and the property owner. In the unlikely event that cultural deposits or artifacts are exposed during construction, federal and state laws require that work near such finds be suspended immediately. The project team must notify SHPO, and a professional archaeologist must be called in to evaluate the significance of the find. The archaeologist would then recommend an action in consultation with FTA, SHPO and appropriate Indian tribes.

3.8. Park and Recreation Areas, and Section 4(f)

This section addresses the project's potential impacts to park and recreation areas. In particular, the section examines resources that might be subject to the provisions of Section 4(f) of the Department of Transportation (DOT) Act of 1966. Section 4(f) resources include "publicly owned land of a public park, recreation area, or wildlife and waterfowl refuge of national, State,

Parklands, Recreation Areas, and Section 4(f) and Section 6(f) Resources

Lands that are protected by Section 4(f) of the 1966 federal Department of Transportation Act (49 USC 303) or Section 6(f) of the Land and Water Conservation Fund (LWCF) Act. In general, under Section 4(f), transportation projects may not use or impact a significant publicly-owned and publicly-accessible park or recreation area, a wildlife or waterfowl refuge, or a significant historic site unless there is no other prudent or feasible alternative, and the project has minimized the impacts as much as possible. Section 6(f) applies to outdoor recreation resources acquired or developed by State or local agencies with LWCF funds.

or local significance, or land of an historic site of national, State, or local significance (as determined by Federal, State, or local officials having jurisdiction over the park, area, refuge, or site).” The law generally prohibits the Secretary of Transportation from approving a transportation project requiring the use of such land unless there is no prudent and feasible alternative to using that land, and the project includes “all possible planning to minimize harm to the park, recreation area, wildlife and waterfowl refuge, or historic site resulting from the use.”

The section also evaluates potential impacts to “Section 6(f) Resources.” Section 6(f) of the Land and Water Conservation Fund (LWCF) Act applies to outdoor public recreation resources that were acquired or developed by State or local agencies with LWCF funds. It prohibits the conversion of such property to a non-recreational purpose without the approval of the Department of the Interior’s National Park Service (NPS). The NPS must ensure that the project provides replacement lands of equal value, location, and usefulness.

3.8.1. Affected Environment

The area of potential impacts (API) for this analysis includes the area within one-quarter mile of the LPA alignment. Within this API there are eight city parks, an urban plaza, the Amazon Corridor, and multiple public open space properties that are part of the West Eugene Wetlands. Also, the City operates the Trude Kaufman Senior Center, a community facility at Jefferson Street and West 10th Avenue that serves recreational purposes. Park and recreation facilities are described in Table 3.10.

Washington/Jefferson Park is managed by the City of Eugene on ODOT-owned properties at the Interstate 105 terminus. The southern blocks of the park are adjacent to the LPA alignment as it moves along West 6th and 7th Avenues. The land’s primary purpose is as right-of-way (ROW) for the Interstate 105 freeway structures. ODOT leases the land to the City to operate the park as a secondary use. Park amenities include active and passive recreation facilities with year-round restrooms that were developed using a LWCF grant.



The Amazon Corridor, a linear park and natural area which originates in the South Hills of Eugene, runs along the south side of West 11th Avenue, crosses near Sam Reynolds Road, and continues to Fern Ridge Reservoir. The Fern Ridge Shared Use Path runs through the Amazon Corridor. Built with transportation funding sources that allow shared recreational uses, the path serves both transportation and recreational purposes according to City staff. Aside from Washington/Jefferson Park, this is the only park resource directly adjacent to LPA facilities (at the West 11th Avenue bridge crossing and where the project would add two new bike and pedestrian crossings over the Amazon Channel).

A complex system of natural areas, which are part of the protected open space known as the West Eugene Wetlands (WEW), are within the API between Garfield Street and Commerce Terminus. WEW properties south of West 11th Avenue include Gudukut, Oak Patch East and West, and Luk-Wah Prairie, while those north of West 11th Avenue include Bertelsen Nature Park and Tsal Luk-Wah. There are no designated wildlife or waterfowl refuges in the API. Figure 3.12 shows the locations of the park and open space resources.



Table 3.10. Existing Park and Recreation Resources

Name	Facility Type	Location	Approx. Distance from LPA alignment	Ownership and Management	Site Features and Characteristics	Potential Views of BRT	LWCF or Similar Grant Funding?	Potentially Eligible Under Section 4(f)?
Monroe Park	Neighborhood Park	W 10th and Monroe	800 ft	City of Eugene	Art sculpture, fixed benches, a picnic table, drinking fountain, garbage cans, swings, a play structure, merry-go-round, teeter-totter, sand area, basketball courts	No	No	Yes
Martin Luther King, Jr. Park	Neighborhood Park	W 10th and Grant	570 ft	City of Eugene	Basketball courts, climbers, a play structure, slides, swings, talk tube	No	No	Yes
Scobert Gardens Park	Neighborhood Park	W 4th and Blair Blvd	550 ft	City of Eugene	Botanical garden, climbers, fixed benches, lighting, play structure, slides	No	No	Yes
Berkeley Park	Neighborhood Park	W 14th and Wilson	830 ft	City of Eugene	Basketball, play area, picnic tables	No	No	Yes
Garfield Park	Neighborhood Park	W 16th and Garfield	1,250 ft	City of Eugene	Community garden	No	No	Yes
Washington/Jefferson Park	Community / Metropolitan Park	I-105 terminus	Adjacent	ODOT / City of Eugene	Basketball, shelter, picnic tables, play area, restrooms	Yes	Yes	No
Skinner Butte	Community / Metropolitan Park	W 2nd and Lincoln	1,250 ft	City of Eugene	Community garden, shelter, picnic tables, play area, bathrooms, natural area	No	No	Yes
Park Blocks	Community / Metropolitan Park	E 8th and Oak	1,000 ft	City of Eugene	Fountain, performance space, picnic table, public art, shelter	No	No	Yes
Broadway Plaza	Urban Plaza	Broadway and Willamette	420 ft	City of Eugene	Art sculpture, picnic tables, garbage cans	No	No	Yes
Trude Kaufman Senior Center	Community Center	996 Jefferson St	1,000 ft	City of Eugene	Community center, restrooms	No	No	Yes

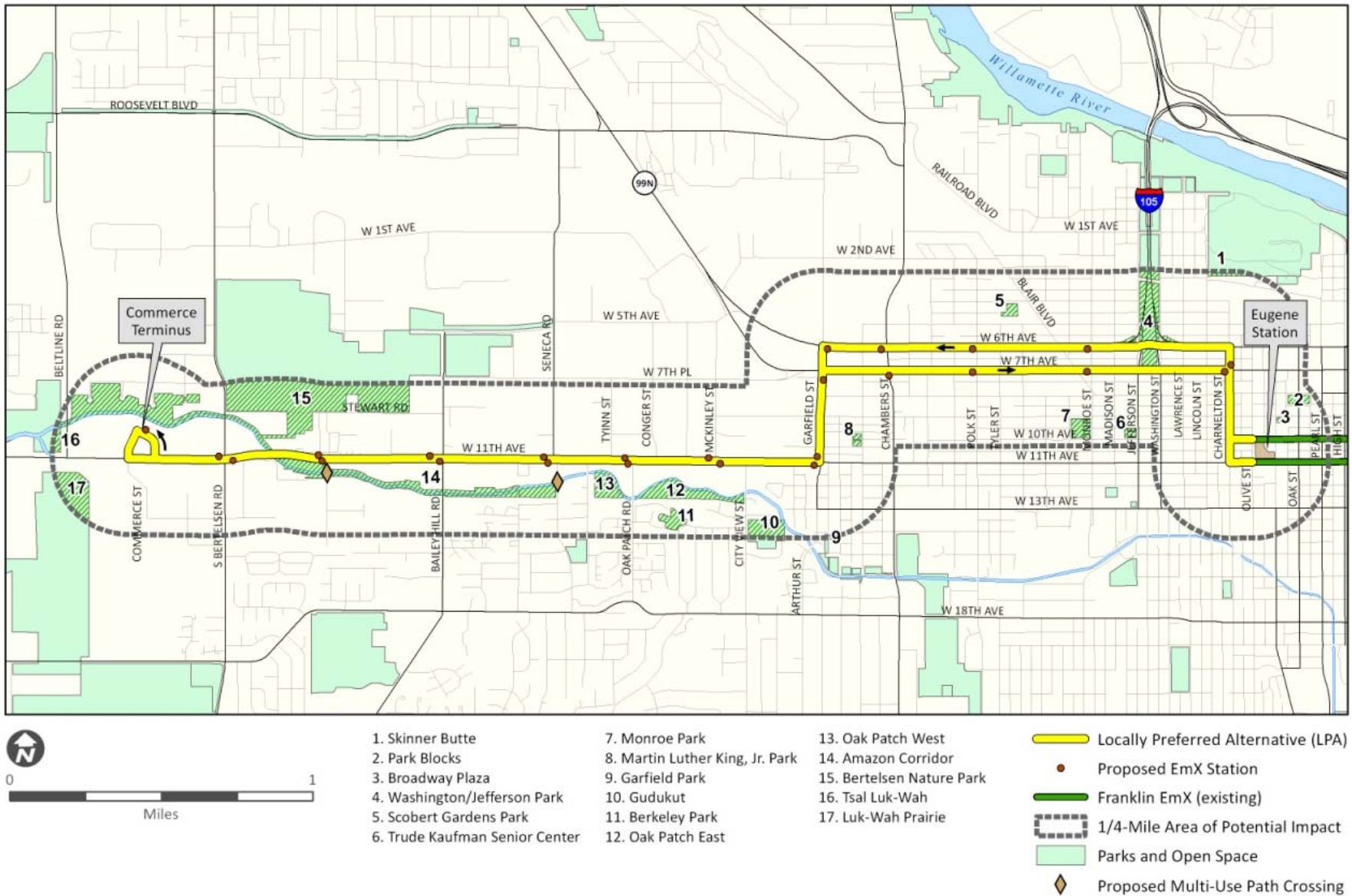
Table 3.10. Existing Park and Recreation Resources (Cont.)

Name	Facility Type	Location	Approx. Distance from BRT	Ownership and Management	Site Features and Characteristics	Potential Views of BRT	LWCF or Similar Grant Funding?	Potentially Eligible Under Section 4(f)
Amazon Corridor	Greenway	Along Amazon Channel	Adjacent	City of Eugene, Private property	Fern Ridge Path (multi-use recreational path)	Yes	No	Yes
Gudukut	West Eugene Wetlands	W 14th and City View	1,000 ft	City of Eugene	Natural area	No	No	Yes
Oak Patch East and West	West Eugene Wetlands	Amazon Channel and Oak Patch Rd	250 ft	City of Eugene	Fern Ridge Path, natural area	Yes	No	Yes
Luk-Wah Prairie	West Eugene Wetlands	West of Commerce St, south of W 11th	820 ft	City of Eugene	Natural area	No	No	No
Bertelsen Nature Park	West Eugene Wetlands	Bertelsen and Stewart Rd	380 ft	City of Eugene	Natural area, trails	No	No	Yes
Tsal Luk-Wah	West Eugene Wetlands	--	1,200 ft	City of Eugene	Natural area, Fern Ridge Path	No	No	Yes

Source: Lane Council of Governments, 2010

As noted in Section 3.7, the study area contains 57 eligible historic properties potentially subject to Section 4(f), although none would be adversely affected by the LPA. There are no known archaeological or cultural resources in the LPA project study area.

Figure 3.12. Park and Open Space Resources within one quarter-mile of LPA Route



3.8.2. Environmental Consequences

Adverse effects to park and recreation resources are not anticipated under either alternative. Neither alternative would use any properties that would trigger the restrictions of either Section 4(f) or Section 6(f).

3.8.2.1. No-Build Alternative

The No-Build Alternative would not affect parklands and recreation areas or wildlife and waterfowl refuges, because no improvements outside the existing ROW are proposed. Traffic congestion would likely increase at a greater rate under the No-Build Alternative, and this could affect the park user experience at certain locations.

3.8.2.2. Locally Preferred Alternative

Of the park resources within one quarter-mile of the LPA alignment, only two are within 100 feet of the LPA alignment: Washington/Jefferson Park and the Amazon Channel. All other park and open space resources are at a greater distance and sufficiently screened from any potential adverse project effects. Beneficial effects would include increased access to downtown park destinations from the Commerce Terminus, as well as increased access to nearby parks throughout the project study area through more frequent and reliable BRT service. In addition, the LPA includes new bicycle and pedestrian path crossings of the Amazon Channel at Buck Street and near Wallis Street. The two new crossings would be entirely within platted street ROW, and no additional ROW would be needed. This would greatly enhance bike and pedestrian connectivity from West 11th Avenue and LPA stations to the Fern Ridge Multi-Use Path and Amazon Corridor. There could also be beneficial effects from less noise and better air quality if Corridor traffic congestion were less than under the No-Build Alternative.

No adverse impacts are anticipated to the two resources adjacent to the LPA. At the West 6th Avenue crossing of Washington/Jefferson Park, there is no impact as the existing road width is maintained. The LPA improvements at the West 7th Avenue crossing (southern edge of the park) would move the existing travel lane approximately 12 feet to the north, requiring roadway widening onto a 12-foot strip of the park space and likely removal of the adjacent trees. Although leased by the City for a public park, the area of the proposed roadway widening is owned by ODOT and its primary purpose is the transportation right-of-way for Interstate 105. The effect to the park resource is expected to be minimal since the affected area is abutted by major transportation facilities on the east, west, and south sides (Interstate 105 on- and off-ramps and West 7th Avenue).

A section of the Amazon Corridor lies within 100 feet of the LPA where the Amazon Channel goes under West 11th Avenue east of Sam Reynolds Street. Here, the existing Fern Ridge Multi-Use Path on the north side of the Channel and under the bridge is unshielded from West 11th Avenue traffic for approximately 1,000 feet, and EmX buses would be visible to path users. However, no adverse effects are anticipated as BRT operations are not expected to significantly change environmental conditions compared to typical traffic use on West 11th Avenue. The exposed segment is less than 0.2 mile of the 6.5-mile Fern Ridge Path from Van Buren Street to Greenhill Road. The West 11th Avenue bridge crossing will be widened, but it will remain in existing public ROW and span over the Fern Ridge Path. Beneficial effects are anticipated at this location due to improved access provided by the proposed bike and pedestrian path crossing of the Amazon Channel.



3.8.2.2.1. Section 4(f) Resources

No wildlife or waterfowl refuges are present in the project study area. Public parks are present; however, there is no permanent, temporary, or constructive use of public park resources subject to Section 4(f).

Expanding West 7th Avenue into the southern edge of Washington/Jefferson Park would not trigger Section 4(f). The park is located on ODOT-owned ROW for the I-105 freeway. The

ODOT property is part of an existing transportation facility. ODOT allows the City to operate the park on the ROW under a special agreement that reserves ODOT's right to use the land for transportation purposes. The property's primary transportation purpose renders Section 4(f) inapplicable. On June 25, 2012, the city of Eugene concurred with this determination (see Appendix 3-8).

Nor does Section 4(f) apply to the planned bike and pedestrian crossings of Amazon Channel, which would occur in platted street ROW. The LPA in this location would not require the use of any non-ROW property. Existing ROW is also adequate to accommodate widening of the West 11th Avenue crossing at Amazon Channel. The bridge would span over park property and not substantially impair any critical features or attributes of the property, and thus not constitute an actual use under Section 4(f).

As detailed in Section 3.7 and in concurrence with the SHPO, FTA determined that project activities would have no adverse effect to five historic resources. Consequently, the "de minimis" provisions of Section 4(f) apply to those properties and no further action is required.

No known archaeological resources would be affected by the LPA. However, the potential for construction activities to inadvertently affect historic resources or buried archaeological resources always exists. In the unlikely event that this should occur, regulations and mitigations measures are summarized in Section 3.7.

3.8.2.2.2. Section 6(f) Resources

Of all the park and recreation facilities within the project API, only one park is known to have received funding from the LWCF: the Washington/Jefferson Park Restrooms (LWCF Grant ID 909, awarded in 1977). These restrooms are located where West 2nd Avenue would intersect the park, about four blocks north of West 6th Avenue. The LPA would not affect the restrooms.



3.8.2.3. Short-Term Impacts

Any potential short-term effects from construction activities would be minor. They would be addressed through alternative access provisions and construction plan coordination. Temporary construction-related impacts can be expected to occur at the West 11th Avenue and bike and pedestrian crossings of Amazon Channel. Adequate barriers, flagging and alternative route marking would be provided for the Fern Ridge Multi-Use Path.

3.8.2.4. Cumulative Effects

Effects from this project, in combination with other past, present and future effects to park and recreation resources, including 4(f) and 6(f) resources, are not expected.

3.8.3. Possible Mitigation Measures

Neither alternative would require mitigation for impacts to park and recreation resources, and neither would trigger the avoidance requirements of Section 4(f) or Section 6(f). To further reduce impacts, and as described in Section 3.16, LTD would replace affected trees at the southern end of Washington/ Jefferson Park in coordination with the City's Urban Forester.

Identified short-term minor impacts from LPA construction would be addressed through alternative access provisions and construction plan coordination to avoid or reduce disruptive activities for users of park resources. Adequate barriers, flagging, and alternative route marking would be provided for the Fern Ridge Multi-Use Path. The amount of closure time to the path would be minimized during widening of the West 11th Avenue structure as well as during construction of the two new bike and pedestrian crossings over the Amazon Channel.

3.9. Hazardous Materials

This section evaluates the possibility for short-term and long-term impacts related to the exposure and mobilization of hazardous materials from construction and operation of the project. Impacts to the project from hazardous materials are primarily from acquiring contaminated property or from encountering contaminated media during construction activities. The risk of encountering contamination is greatest during subsurface construction activities (e.g., trenching, excavation, or grading). Areas with a number of sites of concern pose the greatest risk for potential impacts.

3.9.1. Affected Environment

Table 3.11 details the number of sites of concern associated with the alternatives. Sites were assessed based on information available in a database review of known hazardous material locations, and placed in low to high risk categories. Open Leaking Underground Storage Tanks (LUST) have also been identified in a separate column, where the potential risk factor was unknown. Open LUST cases can range from low to high risk depending on the location of the tank relative to construction, tank contents, and the extent of the released contents.

On several sites along West 11th Avenue, industrial activities have occurred that are often associated with contamination. Work at such sites would likely have a higher risk of encountering hazardous materials.

Hazardous Materials

Materials in various forms that can cause death, serious injury, long-lasting health effects, and damage to buildings, homes, and other property.

A hazardous material site is a location or facility which has reportedly contained or contains a hazardous substance, or has released a hazardous substance into the environment.

Table 3.11 Hazardous Materials Sites of Concern

Alternative	Sites of Potential Concern				
	Total	High Risk	Medium Risk	Low Risk	Open LUST ¹
No-Build Alternative	0	0	0	0	0
Locally Preferred Alternative	28	10	7	1	10

Source: WEEE Project Hazardous Materials Technical Report. Ash Creek Associates. July 2010. Amended August 2011

¹ Open LUST: The search area includes a number of Leaking Underground Storage Tanks (LUST) sites identified on the LUST database (DEQ). The majority of the LUST sites have been documented with a cleanup completion date; however, those LUST sites which are not documented as completed have been identified using "Open LUST" as the risk indicator. A priority ranking has not been assigned to open LUST cases because of the uncertainty associated with the nature and extent of potential contamination.

3.9.2. Environmental Consequences

Potential long-term and short-term environmental consequences are limited under the No-Build Alternative. It could be necessary to conduct remedial actions on sites where releases to the environment have occurred, but probably not because of the No-Build Alternative. The operation of the LPA would not increase the occurrence or transport of hazardous materials within the project study area, although LPA construction has a significant chance of encountering contamination. More detail is provided below.

3.9.2.1. No-Build Alternative

The No-Build Alternative proposes no disturbance of subsurface material and ROW acquisitions are not anticipated; therefore the project would not transport, release, or remediate contaminated media.

3.9.2.2. Locally Preferred Alternative

There are 28 sites of potential concern within the vicinity of the LPA, of which 10 are high priority, seven are medium risk, and one is low risk. An additional 10 sites are Open LUST cases. Potential impacts associated with the sites could create unanticipated project delays and costs associated with characterization and handling of contaminated materials, health and safety measures, and/or remediation. Utility corridors can provide preferential flow pathways for impacted groundwater and may influence the migration of existing contaminants. Building new utility corridors may thus influence the future movement of groundwater and potential contaminants.

Acquiring land near sites of concern carries inherent risks. The LPA would require partial acquisitions of approximately seven of the 28 sites of concern. These would typically be strips 4 to 20 feet deep along the frontage width of the properties.

Sites of concern subject to potential partial acquisitions include:

- Northwest Solvents & Supply, Inc. – 509 Chamber Street
- Lane Transit District – 1944 West 8th Street
- Melamine Decorative Laminate Inc. – 888 Garfield Street
- Mansell Recapping – 1875 West 7th Avenue
- Small World Auto Center, Inc. – 3808 West 11th Avenue
- Peterson Bros. – 606 Blair Boulevard
- Eugene Linen (Former) – 1850 West 6th Avenue

10 other known sites of concern are immediately adjacent to the LPA. These sites include:

- Hammer/ Furtick Property – 11th & Olive Street
- KBTC – West 7th Avenue & Charnelton Street
- Herbert Property – 2511 West 11th Avenue
- West 7th and Charnelton Street
- Shell Service Center – 1080 West 7th Avenue

- Ray McGowan Property – 2780 West 11th Avenue
- Golden Orient Restaurant – 2513 11th Avenue
- Astro/Chevron #207 – 925 West 6th Avenue
- West 11th Coin Laundry/Cleaners – 2410 West 11th Avenue
- Chevron 9-3400 – 2395 West 11th Avenue

10 other known sites of concern are within 500 feet of the LPA:

- Forrest Paint Co. – 1011 McKinley Street
- Mcayels Wardrobe Cleaners – 1060 Olive Street
- Sears & Roebuck Auto Center Property– 942 Olive Street
- Diamond Parking Rainer Properties – 540 Charnelton Street
- 3M National Advertising – 1000 Obie Street
- Valley Plating – 3985 West 12th Avenue
- Hamilton Electric – 232 West 5th Avenue
- Transportation – 1938 West 8th Avenue
- E Z Duz It Laundry & Dryclean – 3131 West 11th Avenue
- The Cleanery – West Eugene – 3333-B West. 11th Avenue

The potential sites of concern are summarized in Table 3.12.

Table 3.12. Summary of Identified Hazardous Materials Sites by Proximity to LPA

	<i>Displaced</i> ¹	<i>Possible Partial Acquisition</i> ²	<i>On Alignment</i> ³	<i>Near Alignment</i> ⁴	<i>Total</i>
Number Sites in Proximity to LPA	0	7	10	10	28

Source: Ash Creek Associates, 2011.

¹ *A site will no longer function in its current land use.*

² *Identified sites where a partial acquisition may be necessary. Note: These properties have been reconciled with those addressed in the Acquisitions section of Chapter 3. Additional investigation of these properties may be necessary.*

³ *Immediately adjacent to the proposed project alignment.*

⁴ *Within 500 feet of proposed project alignment.*

Long-term adverse impacts associated with the LPA include possible exposure to and/or mobilization of contaminated materials. It could be necessary to conduct remedial actions on sites where releases to the environment have occurred, potentially causing project delays and additional costs. Remedial actions could include deed restrictions and/or engineering controls, placement of soil caps, and operation of groundwater treatment systems. These actions could affect long-term operations. However, the use or operation of the LPA would not increase the occurrence or transportation of hazardous materials within the Corridor. Moreover, the remedial actions would be a benefit for the community, removing existing contamination or dramatically reducing the likelihood of its release into the environment.

3.9.2.3. Short-Term Impacts

Potential construction impacts primarily come from encountering contaminated soil and/or groundwater during excavation, trenching, or grading operations. Construction activities could also result in the inadvertent spreading of any existing contamination, and appropriate measures (e.g., contamination delineation, strategic excavation, and dewatering) would be required for construction activities in contaminated areas. If impacted media (soil or groundwater) is encountered during construction, the following issues arise:

- Appropriate screening and handling of the impacted material;
- Equipment decontamination;
- Risks to human health and the environment;
- Worker personal protective equipment (PPE);
- Risks of spreading contamination; and
- Storage, transport, and disposal of impacted material.

3.9.2.4. Cumulative Effects

No cumulative effects related to hazardous materials are anticipated for the No-Build Alternative.

Cumulative effects associated with the LPA could include:

- Increased demand for contaminated soil disposal facilities resulting from cumulative site cleanup.
- Cumulative exposure to hazardous materials for some construction workers. This level of exposure could be minimized through a soil management plan which discusses proper training and the use of PPE.
- Because any discovery of a hazardous material during construction is likely to be remediated, development of the LPA could result in the beneficial effect of reduced hazardous materials exposure to the general public and ecologic receptors.

3.9.3. Possible Mitigation Measures

Mitigation plans for short-term impacts would be prepared before construction. The Phase I Environmental Site Assessment is part of the due diligence process and typically includes review of agency files and permits, site inspection, and interviews. A Phase II Environmental Site Assessment may be warranted if information obtained from a Phase I report indicates uncertainties about the environmental conditions at the site or that contamination may be present.

To reduce the risk of liability, an LPA-wide corridor site assessment is being completed. It would be used to help perform All Appropriate Inquiry (AAI)-compliant Phase I site assessments for each parcel prior to being acquired. AAI-compliant Phase I site assessments would be conducted after the completion of additional engineering and confirmation of proposed sites for acquisition. FTA requires due diligence both to reduce project costs and liabilities and so that property appraisals are fully informed during the acquisition.

A soil management plan would be developed to help minimize adverse impacts to construction and excavation workers and to reduce the risk to human health and the environment. The plan would provide emergency contact information and prescribe practices for safe working

conditions, such as training, Personal Protection Equipment (PPE) and monitoring for vapors in the breathing zone and for explosive conditions. A supplemental management plan for groundwater would be developed if dewatering activities are proposed. If contamination is discovered, a site-specific management plan would be developed in cooperation with the appropriate regulatory agencies. The site-specific plan would address management, storage, and disposal of hazardous substances and/or petroleum products.

3.10. Geology and Seismic Activity

This evaluation addresses potential effects of geology and seismic activity on the alternatives.

3.10.1. Affected Environment

The geology of the West 11th Avenue Corridor is broadly uniform. Due to the nature of the project, the majority of soil disturbance will occur within the upper 10 feet of native and fill material currently present. The near-surface materials throughout the Corridor are dominated by unconsolidated alluvium derived from relatively recent river and stream deposits at the ground surface along the creeks and drainages adjacent to the site. These soils are mapped by the Natural Resource Conservation Service as silt and clay loam soils. Generally, these soils are slightly to highly plastic with very high fines contents, and somewhat susceptible to erosion. Because of their plasticity, they typically function poorly as structural fill or trench backfill in areas where post-construction trench backfill settlements may be of concern. This would include road subgrade areas or areas that will need to function as bearing strata, such as foundation areas for retaining walls and buildings.

Shallow groundwater is prevalent throughout the Corridor. Groundwater gradients in the project vicinity trend downward to the west and north. Water well logs generally show water was encountered from eight to 14 feet below the existing ground surface. Seasonal fluctuation is

Geotechnical Seismic Considerations

The study of how the geologic environment may affect alternatives (such as earthquakes) and how the alternatives may affect the geologic environments (such as by causing increased erosion or landslides).

minor, although water depths can be reduced to a few feet in places during prolonged wet weather.

Seismically, the entire Corridor has lowest to low hazard potential. This mapping is consistent with the evaluation of conditions along the project alignment. The probability of soil liquefaction, fault displacement, and subsidence beneath the project study area is also low. The project alignment is located well away from any non-retained, exposed slopes. As such, the LPA would generally not be susceptible to dynamic landslides.

3.10.2. Environmental Consequences

3.10.2.1. No-Build Alternative

No impacts are expected to result from the No-Build Alternative.

3.10.2.2. Locally Preferred Alternative

The LPA is not anticipated to experience significant adverse impacts associated with earthquakes, slopes, or construction activities. The terrain is generally flat and major slopes are not present. The two proposed Amazon Channel bike and pedestrian crossings would be considered major new structures and could result in localized slope impacts to the Channel banks. The LPA could also create benefits, including stabilization of the Amazon Channel banks through appropriate geotechnical design and installation of modern bridges that meet seismic standards.

3.10.2.3. Short-Term Impacts

The possibility of construction impacts is about the same along the length of the LPA alignment due to broadly uniform soil and groundwater conditions. The presence of relatively shallow groundwater could complicate utility installation. Further, the shallow soils are moisture-sensitive and difficult to grade in wet weather.

3.10.2.4. Cumulative Effects

Cumulative impacts related to geologic and seismic hazards would be quite low for the LPA and No-Build Alternative.

3.10.3. Possible Mitigation Measures

Established design criteria require structures to address known earthquake hazards in the area. The only geologic hazards identified for this project are the limited locations where LPA improvements cross the Amazon Channel. The existing Channel banks are marginally stable in places and are susceptible to erosion. Partial bank failure during a design earthquake event is certainly possible. However, conventional design and construction techniques exist to mitigate these potential hazards. The principal mitigation measure is appropriate design that considers and responds to subsurface conditions. This requires a project geotechnical study prepared by a qualified geotechnical engineer.

3.11. Biological Resources and Endangered Species

The biological resources analysis identified the following: 1) existing biological resources within the impact analysis area; and, 2) any potential significant impacts of the project alternatives on these biological resources. Biological resources are addressed in the following order:

- Habitat
- Federal and State Listed Wildlife
- Federal and State Listed Plants
- Fish Ecology

Biological Resources

Biological resources are generally non-plant living organisms that live within a project study area that are evaluated during an environmental analysis.

Fish Ecology

The study of the relationship between fish and their environment.

Threatened and Endangered Species

Species that are listed or that are likely to be listed by the federal government as either threatened or endangered under the Endangered Species Act (ESA) of 1973. Threatened means that a species is likely to become endangered if it is not protected; endangered means that the species is in immediate danger of becoming extinct and needs protection to survive.



The evaluation relies in part on existing data sources, including previously prepared environmental reviews for the project area and documents from local and regional planning efforts. It also included a field review of aquatic, riparian, wetland, and terrestrial habitat features and conditions.

3.11.1. Affected Environment

Much of the project is located within a highly urbanized area consisting of residential and commercial/industrial development. The highly developed areas do not provide substantial habitat features. The Area of Potential Impact (API) for this evaluation is located on both sides of West 11th Avenue and extends to approximately Roosevelt Boulevard on the north and West 18th Avenue to the south for the entire length of the alignment.

Waterways within the API include the Amazon Channel and Willow Creek. The Amazon Channel is crossed by the LPA alignment and Willow Creek is located west of the LPA alignment. Willow Creek is a tributary of Amazon Creek, which is a tributary of the Long Tom River. The Long Tom River is a tributary of the Willamette River, and connects with the Willamette River north of Harrisburg and Junction City, Oregon.

The Amazon Channel has been historically manipulated and disturbed. A paved bike and pedestrian path extends along most of the length of the Amazon Channel within the API. Many areas along the riparian corridor are characterized by an herbaceous plant community that is periodically mowed. Despite the level of historical disturbance along the Amazon Channel, the wetland, riparian, and aquatic habitats are occupied by numerous plant and wildlife species, including federal and state protected, or “listed,” species.

The Willamette River is adjacent to the Corridor but is more than one-half mile from the LPA. Amazon and Willow Creeks do not connect directly to the Willamette River.

Portions of the West Eugene Wetlands are located in the western part of the study area. Many of these areas contain remnant native wet prairie habitats. Native upland prairie habitats are also located in the western portions of the study area. Several areas in this vicinity are occupied by listed and sensitive plant species. Most of the sensitive prairie habitat and associated listed species occurrences in the study area are located west of the project area.

Designated critical habitat for Fender's blue butterfly (*Icaricia icarioides fenderi*), Willamette daisy (*Erigeron decumbens* var. *decumbens*), and Kincaid's lupine (*Lupinus sulphureus* ssp. *kincaidii*) is found in the western portion of the API; however, there is no designated critical habitat along the LPA alignment.

3.11.1.1. Federal and State Listed Wildlife

A list of protected federal and state listed wildlife species documented as occurring in Lane County is presented in Table 3.13. Only one of them, Fender's blue butterfly, is known to occur in the API.

Table 3.13. Federal and State Listed Wildlife Species Documented as Occurring in Lane County

Common Name	Scientific Name	Federal Status	Designated Critical Habitat	State Status
Birds				
Marbled murrelet	<i>Brachyramphus marmoratus</i>	Threatened	CH	Threatened
Western snowy (coastal) plover	<i>Charadrius alexandrinus nivosus</i>	Threatened	CH	Threatened
Short-tailed albatross	<i>Phoebastria albatrus</i>	Endangered	No	-
Northern spotted owl	<i>Strix occidentalis caurina</i>	Threatened	CH	Threatened
Bald eagle	<i>Haliaeetus leucocephalus</i>	Delisted	No	Threatened
Invertebrates				
Fender's blue butterfly	<i>Icaricia icarioides fenderi</i>	Endangered	CH	No
Oregon silverspot butterfly	<i>Speyeria zereene hippolyta</i>	Threatened	CH	No
CANDIDATE SPECIES				
Birds				
Streaked horned lark	<i>Eremophila alpestris strigata</i>	-	-	-
Amphibians				
Oregon spotted frog	<i>Rana pretiosa</i>	-	-	-

Source: WEEE Biological Resources Technical Report. Environmental Science & Assessment. April 2012. www.ltd.org.

Northern Pacific pond turtle (*Actinemys marmorata marmorata*) is not a federal or state listed species, but during agency coordination meetings United States Fish and Wildlife Service (USFWS) and Oregon Department of Fish and Wildlife (ODFW) requested that it be addressed. Northern Pacific pond turtle is known to occur in the API.

3.11.1.2. Federal and State Listed Plants

Federal and state listed plant species documented as occurring in Lane County are listed in Table 3.14. Extensive rare plant surveys were conducted along proposed project alignment corridors during the 2008 and 2009 growing seasons. Several populations of federal and state listed plant species were identified within the rare plant survey area, as identified in the West Eugene EmX Expansion Rare Plant Survey Report (Environmental Science & Assessment, LLC, 2010).

Table 3.14. Federal and State Listed Plant Species Documented as Occurring in Lane County

Common Name	Scientific Name	Federal Status	Designated Critical Habitat	State Status
Willamette daisy	<i>Erigeron decumbens</i> var. <i>decumbens</i>	Endangered	CH	Endangered
Bradshaw's desert parsley	<i>Lomatium bradshawii</i>	Endangered	No	Endangered
Kincaid's lupine	<i>Lupinus sulphureus</i> ssp. <i>kincaidii</i>	Threatened	CH	Threatened
Wayside aster	<i>Eucephalus vialis</i>	Species of Concern	No	Threatened
White-topped aster	<i>Sericocarpus rigidus</i>	Species of Concern	No	Threatened

Source: WEEE Biological Resources Technical Report. Environmental Science & Assessment. April 2012. www.ltd.org.

3.11.1.3. Fish Ecology

Amazon and Willow Creeks predominantly provide habitat for native and non-native temperature-tolerant species, including speckled dace (*Rhinichthys osculus*), sculpin (*Cottus sp.*), reidside shiner (*Richardsonius balteatus*), Northern pikeminnow (*Ptychocheilus oregonensis*), largescale sucker (*Catostomus macrocheilus*), mosquito fish (*Gambusia affinis*), bluegill (*Lepomis macrochirus*), common carp (*Cyprinus carpio*), bass (*Micropterus sp.*), crappies (*Pomoxis sp.*), among other species. Native fish also include resident cutthroat trout (*Oncorhynchus clarki*), which occurs within the API typically in the winter when water temperatures are not too high. Cutthroat trout seek cooler water refuge when the water temperatures rise in the spring. None of the fish discussed above are federally listed as threatened or endangered.

Fish species federally listed as threatened that occur within the Upper Willamette River include Upper Willamette River Evolutionarily Significant Unit Chinook salmon (*Oncorhynchus tshawytscha*), Upper Willamette River Distinct Population Segment steelhead (*Oncorhynchus mykiss*), bull trout (*Salvelinus confluentus*), and Oregon chub (*Oregonichthys crameri*). None of these has been documented in API waterways. Critical habitat is designated for Chinook salmon in the Willamette River. Critical habitat is also designated for bull trout in the Willamette River. Critical habitat has been designated for Oregon chub in creeks and ponds off of the Middle Fork Willamette River, but not in the project area. Critical habitat has not been designated for steelhead in the Upper Willamette River south of the Calapooia River confluence.

3.11.2. Environmental Consequences

3.11.2.1. No-Build Alternative

The No-Build Alternative would not involve any construction activities and, therefore, would not result in any direct impact to the environment. As a result, there would be no injury, loss, or change in biological resources and, therefore, the No-Build Alternative would have no effect on

Endangered Species Act-listed fish or critical fish habitat in the Upper Willamette River, nor on other listed plants or animals.

3.11.2.2. Locally Preferred Alternative

Potential impacts to biological resources are discussed by category in the following sections.

3.11.2.2.1. *Habitat*

No direct impacts to designated critical habitat are anticipated since none exists along the LPA alignment. If the project discharges stormwater west of the LPA alignment, minor alternations to seasonal change in hydrology could occur in designated critical habitat for Fender's blue butterfly and Willamette daisy. Significant alterations of the hydrologic regime could adversely impact these populations.

3.11.2.2.2. *Federal and State Listed Wildlife*

No impacts to federal or state listed wildlife are anticipated. Development of riparian crossings could result in impacts to the non-listed Northern Pacific pond turtle. Minor localized impacts to Northern Pacific pond turtles could occur at bridge and bike and pedestrian crossings. Direct mortality of Northern Pacific pond turtles, a federal species of concern, is unlikely.

3.11.2.2.3. *Federal and State Listed Plants*

Extensive rare plant surveys within the API revealed no federal or state listed plant species are in the path of the alignment or likely to be directly affected by the LPA.

3.11.2.2.4. *Fish Ecology*

While it would affect stormwater, the LPA would have no effect on Endangered Species Act-listed fish or critical fish habitat in the Upper Willamette River. The LPA would add 0.91-acres of net new impervious surface to 17.1-acres of existing impervious surface that currently drains to the Upper Willamette River. The Upper Willamette River basin in the project area is comprised of a total of 7,023 acres, 40 percent of which is impervious. Of the 2,809 acres that



are impervious in the basin, the project would increase the impervious surface runoff to the Willamette River by 0.03 percent. Runoff from the API could reach the Willamette River via the stormwater system in downtown Eugene. If the runoff were not controlled or treated, the increase in impervious surface proposed for the LPA could affect the four threatened and endangered fish species (Chinook salmon, steelhead, bull trout, and chub) that occur in the Willamette River near the API.

However, the project design would incorporate a number of protective measures that would eliminate effects to fish. Runoff from the project would be required to meet ODOT's stormwater design standards, which are more stringent than the City's, and would also meet Department of Environmental Quality standards. Required Corps of Engineers permitting would add more regulatory protection. Significantly, the project would not only treat runoff from new impervious surface, but also treat runoff from existing impervious surface, which now goes untreated to a City of Eugene facility before being conveyed to the Willamette River. For these reasons, the LPA would have no effect on threatened and endangered fish species or designated critical habitat. Refer to Section 3.13, Water Quality and Hydrology, for a more detailed discussion of the potential impacts due to increased impervious surface and proposed water quality treatment options.

The Upper Willamette River contains some areas identified under federal law as Essential Fish Habitat (EFH) for Chinook and coho salmon (*Oncorhynchus kisutch*), although coho salmon are not documented to occur south of Mary's River. For the same reasons, the project would not adversely affect ESA-listed fish, it would not adversely affect EFH in the Upper Willamette River.

3.11.2.3. Short-Term Impacts

Short-term construction related-impacts to riparian habitat would occur as a result of widening the West 11th Avenue bridge crossing of the Amazon Channel and the addition of new bicycle and pedestrian crossings of the Amazon Channel. The work could increase the potential for

sediment transport to wetlands or waterways and might temporarily displace wildlife. Impacts to Northern Pacific pond turtles could range from temporary displacement from the vicinity to disruption of nesting sites. In addition, short-term, temporary increases in waterway turbidity and sedimentation could result from grading and other road construction activities, and temporary bank instability may result from bank manipulation and removal and subsequent planting of vegetation (until new plantings are established). None of these effects would be significant. Therefore, the LPA may affect, but is not likely to adversely affect fish and wildlife species that occur within the Amazon Channel.

3.11.2.4. Cumulative Effects

The LPA improvements would result in a more efficient mass transit system than the No-Build Alternative and therefore decrease overall traffic volumes compared to the No-Build Alternative (see Chapter 4: Transportation Facilities). This would be beneficial to biological resources. The LPA would also reduce the amount of roadway runoff pollutants entering the Upper Willamette, compared to the No-Build Alternative. Nevertheless, over the long run the project would cause some incremental impacts to riparian and aquatic habitat in the Amazon Channel basin due to increased stormwater runoff.

3.11.3. Possible Mitigation Measures

To minimize impacts to biological resources, LTD would:

- Assure a clear span over the waterway at all crossings
- Design the project to minimize new pollution-generating impervious surface as much as possible
- Design and install habitat-friendly landscaping
- Minimize the use of riprap
- Incorporate the use of large wood debris (including downed wood and standing snags) in riparian areas

- Remove non-native, invasive plant species, such as Himalayan blackberry and reed canarygrass
- Plant native trees and shrubs and seed with native herbaceous mix within the riparian areas
- Replace removed street trees (see Section 3.16)
- Comply with ODFW preferred in-water work period for the Amazon crossings (July 15 thru October 15)
- Avoid tree removal between March 1 and September 1 to avoid impacts to migratory birds
- Enhance the wetland buffer associated with the protected wetland north of the Commerce Street station
- Employ erosion and pollution control plans to minimize water quality impacts during construction
- Install stormwater conveyance and treatment systems consistent with ODOT and DEQ water quality requirements (see Section 3.13)

3.12. Wetlands and Waters of the State and U.S.

This section describes the alternatives' potential impacts to wetlands and other waters.

Wetlands

Where saturation with water is the dominant factor determining the nature of soil development and the types of plant and animal communities living in the soil and on its surface.

Waters of the United States

Relatively permanent, standing or continuously flowing bodies of water forming geographic features that are typically described as streams, oceans, rivers, lakes, wetlands, sloughs, ponds, tributaries, etc. (see 40 CFR 122.2).

3.12.1. Affected Environment

The study area for this analysis considered wetlands and other water resources within approximately 50 feet of the edge of the proposed project. The potentially affected wetlands and waters within the project study area are summarized in Table 3.15, and their locations are shown in Figures 3.13 through 3.16.

The majority of wetlands identified in the project study area are palustrine emergent wetlands (PEM) with a hydro-geomorphic (HGM) classification of slope/flats. Potential impacts to these water resources were analyzed without respect to whether they would actually be regulated by

the Corps and/or DSL. Based on the characteristics of the resources, nearly all of the wetlands would probably be regulated.

Table 3.15. Summary of Potentially Affected Wetlands/Waterways within the Project Study Area

Wetland/Waters ¹	Cowardin	Hydrogeomorphic classification	Likely Jurisdiction ²	
			DSL	Corps
Amazon Channel	R2UBHx	NA	Yes	Yes
Wetland 1	PEM	Slope/flats	Yes	No
Wetland 4	PSS	Slope/flats	Yes	Yes
Wetland13a	PEM	Slope/flats	Yes	Yes
Wetland 14	PSS	Riverine flow-through	Yes	Yes
Wetland 15	PEM	Depressional-outflow	No	Yes
Wetland 39	PEM	Depressional-closed	Yes	Yes

Source: WEEE Project Wetlands and Waters of the State and U.S. Technical Report. ESA Adolffson. July 2010.

WEEE Project Wetlands and Waters of the State and U.S. Technical Report. Environmental Science & Assessment, August 2011.

¹*The wetland numbering is out of sequence because some of the wetlands identified during the planning phase occur in areas that are no longer included in the API. The original wetland naming conventions were maintained to avoid confusion.*

²*This is a preliminary determination that would require concurrence from DSL and the Corps.*

Figure 3.13. Wetland 1

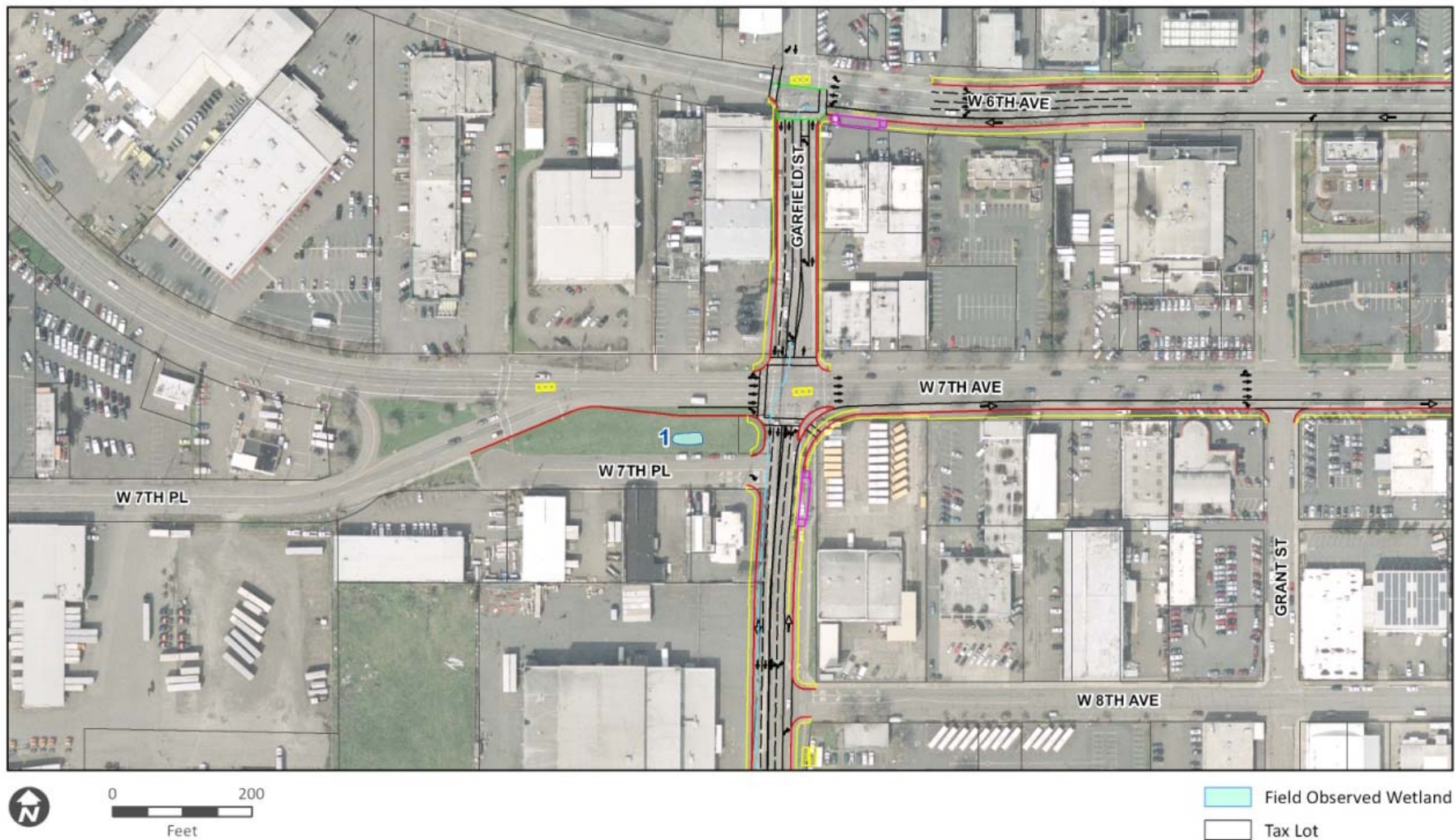


Figure 3.14. Wetland 4



- Field Observed Wetland
- Tax Lot

Figure 3.15. Wetlands 13A, 14, and 15

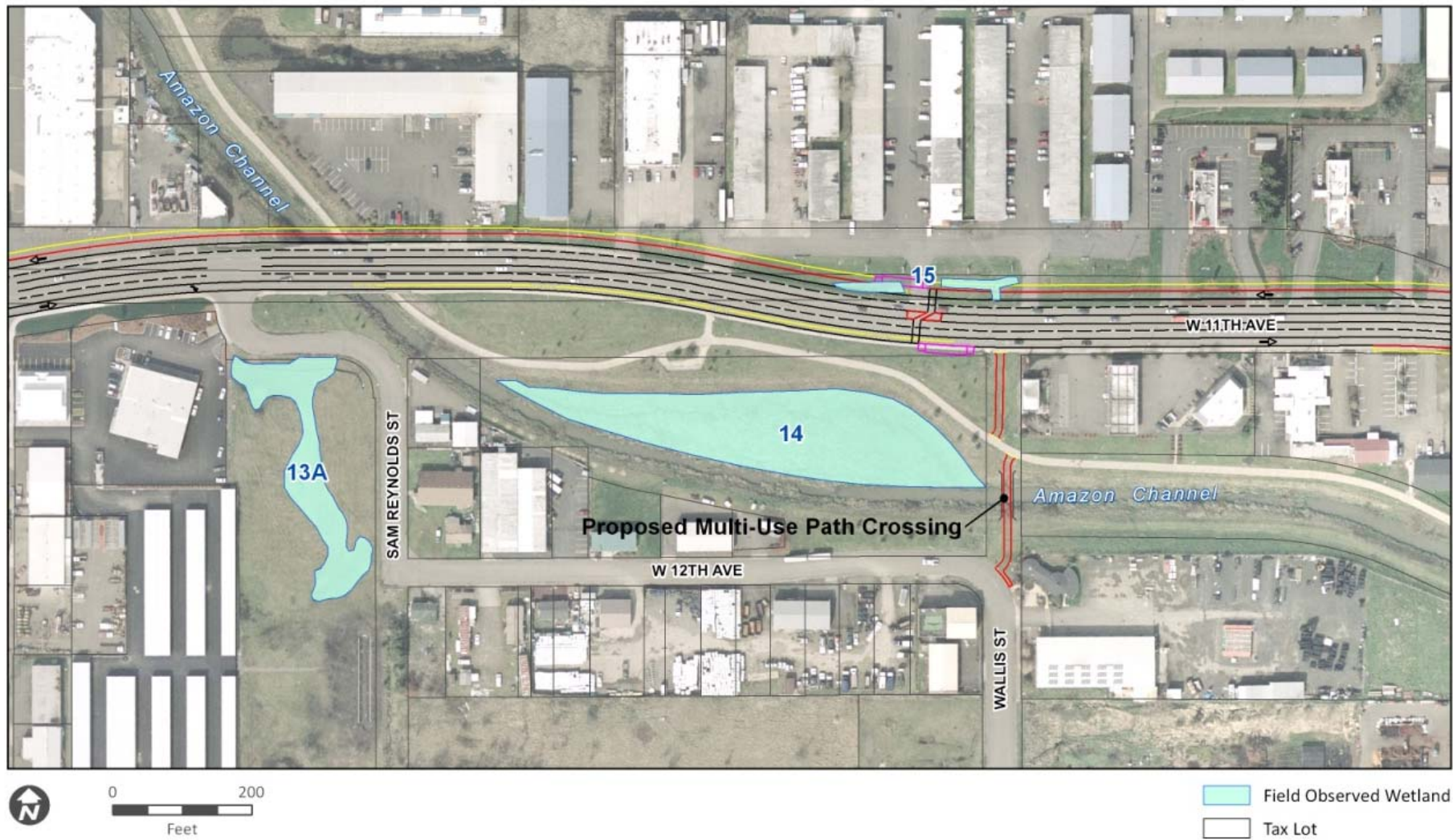
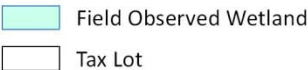
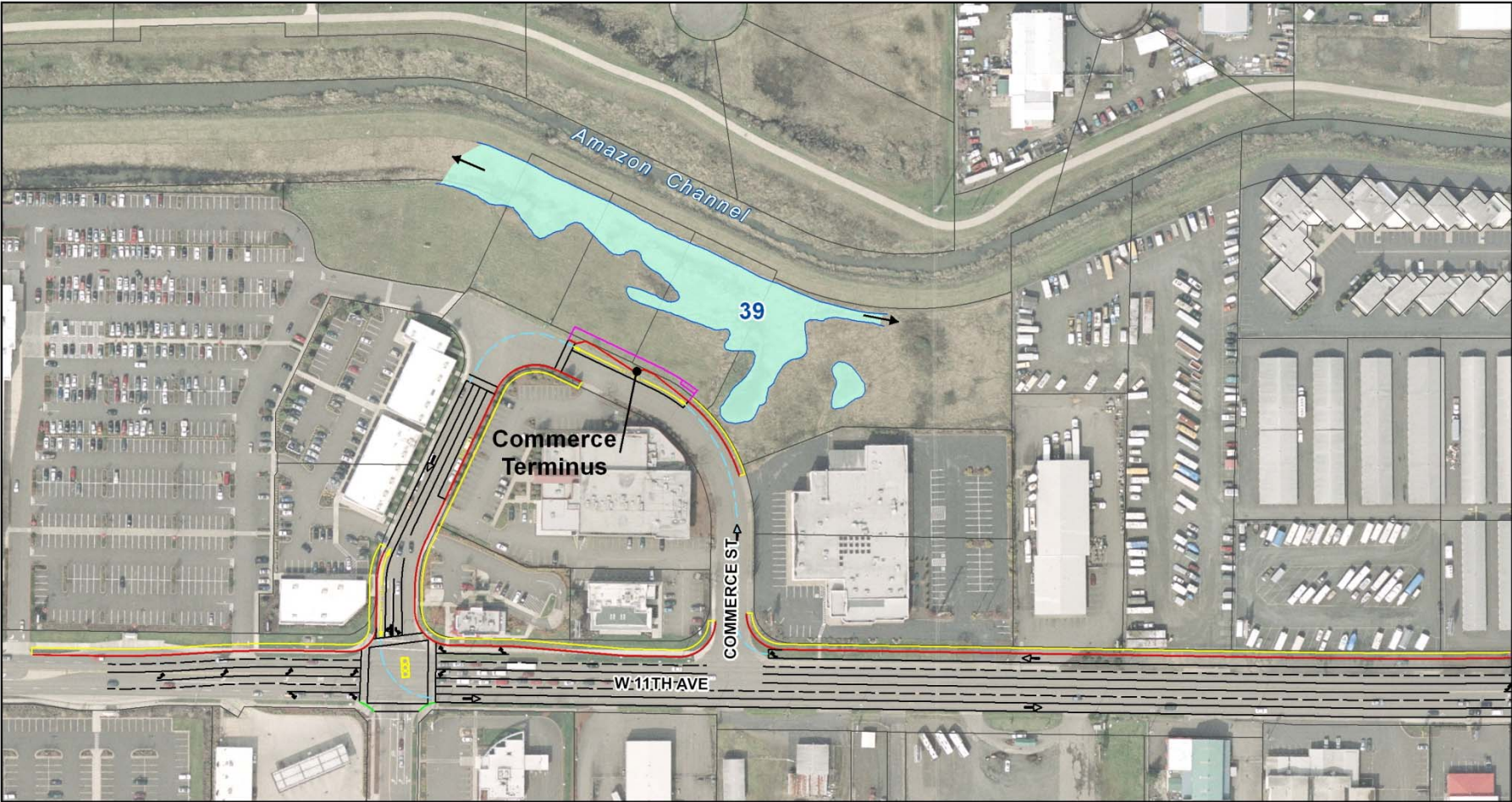


Figure 3.16. Wetland 39



3.12.2. Environmental Consequences

3.12.2.1. No-Build Alternative

The No-Build Alternative would not involve any construction activities and, therefore, would not result in any direct impact to wetlands or waters of the State or U.S.

3.12.2.2. Locally Preferred Alternative

Depending on final design, the LPA would result in about 0.048 acre of permanent impact as well as temporary construction impacts to Wetland 15 (Table 3.16 and Figure 3.15). Widening of the West 11th Avenue bridge and constructing two new bike and pedestrian crossings are likely to result in impacts below the ordinary high water elevation of Amazon Channel.

The LPA could indirectly impact five wetlands (Wetlands 1, 4, 13a, 14, and 39) due to the proximity of construction activities (Table 3.16 and Figures 3.13 through 3.16). There would be potential for sediment transport to wetlands and waterways.

Near the Commerce Street Terminus, the LPA would result in minor encroachment into the buffer of a protected wetland area (Wetland 39); the buffer is regulated by the City of Eugene (Figure 3.16). This minor encroachment would be allowed by the City of Eugene Code with buffer enhancements and/or buffer averaging.

Table 3.16. Summary of Direct Impacts

Wetland/Waters	Permanent Impact (acres)
Amazon Channel	0
Wetland 1	0
Wetland 4	0
Wetland13a	0
Wetland 14	0
Wetland 15	0.048
Wetland 39	0

Source: WEEE project Wetlands and Waters of the State and U.S. Technical Report. ESA Adolphson. July 2010.

WEEE Project Wetlands and Waters of the State and U.S. Technical Report. Environmental Science & Assessment, August 2011.

3.12.2.3. Short-Term Impacts

No short-term construction related impacts would result from the No-Build Alternative.

Short-term impacts of the LPA include potential sediment transport to waterways via existing stormwater systems. In addition, widening the West 11th Avenue bridge and building new bike and pedestrian crossings could result in short-term impacts to the Amazon Channel. The type and extent of short-term impacts would depend on factors such as construction methods, bridge footing locations, and potential bank armoring to protect bridge footings. Possible short-term impacts could include temporarily placing fill material or equipment below the ordinary high water elevation of the Amazon Channel and sediment transport. Portions of Wetland 15 that are not permanently filled as a result of widening West 11th Avenue would likely be subject to short-term construction-related impacts. Potential short-term impacts to Wetland 15 include sediment transport and temporary disturbance to vegetation and substrate as a result of construction activities. Short-term impacts could occur to Wetlands 4 and 14 due to their proximity to new bike and pedestrian crossings.

3.12.2.4. Cumulative Effects

The improvements proposed under the LPA would result in a more efficient mass transit system than under the No-Build Alternative. Increases in traffic volumes would still be expected, requiring an increase in infrastructure and resulting in related impacts from runoff. The cumulative effect to wetlands and waterways caused by increased runoff and pollution could be expected to be less under the LPA than under the No-Build Alternative.

3.12.3. Possible Mitigation Measures

The Corps of Engineers' and DSL's regulatory and permitting standards would require LTD to minimize and mitigate potential impacts to wetlands and waterways. Required measures would likely include:

- Providing compensatory mitigation
- Restoring temporary wetland and waterway impact areas
- Assuring a clear span over waterways at all crossings
- Designing the project to minimize new impervious surface, and especially pollution-generating impervious surface, as much as possible
- Minimizing use of riprap associated with the proposed structures
- Incorporating the use of large woody debris in riparian areas
- Removing non-native, invasive plant species from around wetlands and riparian areas
- Planting native trees and shrubs and seeding with native herbaceous mix within the riparian areas
- Enhancing the buffer associated with Wetland 39
- Employing BMPs for construction activities such as those described in Section 3.13.3
- Retaining and/or treating stormwater runoff from impervious surfaces (see Section 3.13)

3.13. Water Quality and Hydrology

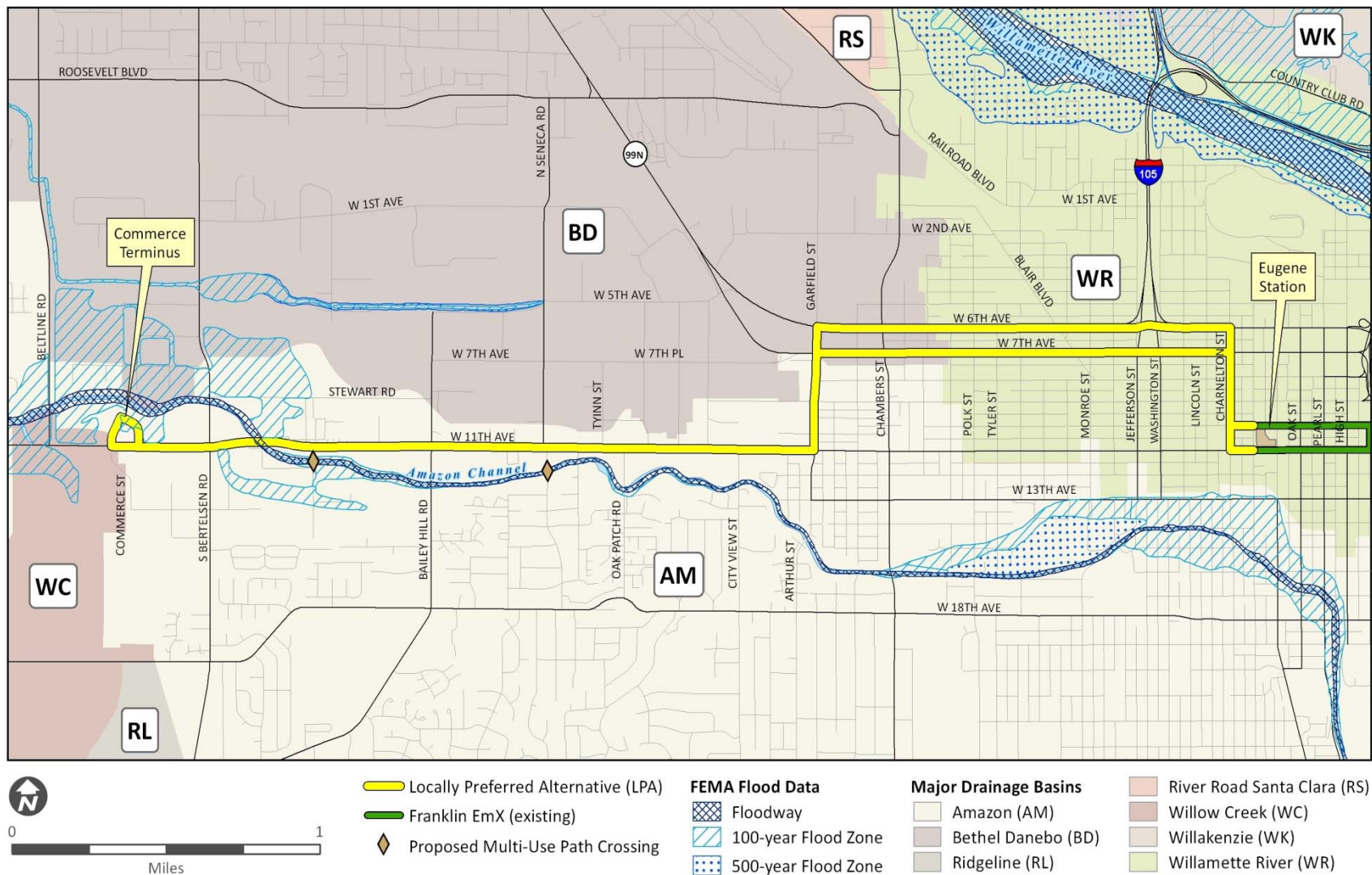
This section summarizes the alternatives' potential impacts to the study area's water quality and hydrology. No new impervious area would be generated as result of the No-Build Alternative; therefore, the risk of flooding and potential to violate applicable water quality standards would not be affected. The LPA would add approximately 7.3 acres of new impervious surface within the project area. Federal and state stormwater regulations were referenced to assess the impacts of the proposed project.

3.13.1. Affected Environment

The WEEE project area is located within the Amazon, Willamette, and Bethel-Danebo drainage basins, and touches the Willow Creek drainage basin near the Commerce Street Terminus. The alignment crosses over the Amazon Channel, and a small portion of the project is located within the 100-year floodplain (Figure 3.17). Much of the area surrounding the LPA is developed; however, building this project could cause new water quality impacts to these drainage basins.

Section 303(d) of the federal Clean Water Act requires states to maintain a list of water bodies that do not meet water quality standards. This list is called the 303 (d) List. Each receiving body of water on this list has its own designated Total Maximum Daily Loads (TMDLs) for pollutants that are likely to be present in its system. Amazon Channel is on Oregon's 303(d) List and has TMDLs for bacteria and dissolved oxygen, and its receiving body of water (Fern Ridge Reservoir) has TMDLs for turbidity and bacteria.

Figure 3.17. Floodplains and Drainage Basins in the LPA Area



Other pollutants common in urbanized areas will affect all receiving waters. These include litter, sediment, cadmium from tires, antifreeze, engine oil, lead, zinc, and copper. Treatment for these types of pollutants can be achieved by implementing BMPs to control the quantities and types of pollutants released to receiving waters.

Land use within the study area is primarily urban, with a mix of residential, commercial, and industrial development. Land is generally more heavily developed east of Garfield Street. Current impervious area within the LPA ROW totals 54.7 acres.

The WEEE project is located in an infiltration-limited area with a shallow water table. There are no designated groundwater recharge areas in the project vicinity.

3.13.2. Environmental Consequences

3.13.2.1. No-Build Alternative

No new impervious area would be generated as result of the No-Build Alternative; therefore, the risk of flooding and potential to violate applicable water quality standards would not be affected. Potential benefits associated with project construction, as described below, would also not be realized under the No-Build Alternative.

3.13.2.2. Locally Preferred Alternative

Stormwater. The LPA would increase the amount of impervious surfaces, creating a larger amount of runoff (and pollutants) and increasing flow volumes to receiving waters. Net new impervious area (total increase in impervious area from existing conditions) would be approximately 7.3 acres, a 13.3 percent increase over the existing 54.7 acres of impervious area in the LPA ROW (Table 3.17). The City of Eugene also requires the treatment of runoff from existing surfaces which are reconstructed, which for the LPA would add 9 more acres. The LPA would thus treat the runoff generated by about 16.3 acres of pavement.



Table 3.17. Current and Projected Impervious Surface Area of LPA

Current Impervious Area within Existing LPA ROW (acres)	Net New Impervious Area – LPA (acres)	Total Impervious Area (New and Reconstructed Existing) – LPA (acres)
54.7	7.3	16.3

Source: Otak, 2011.

The project’s water quality treatment facilities would be designed to meet or exceed the standards listed in the SLOPES IV Programmatic Biological Opinion (NMFS No. 2008/04070). These standards not only require treatment of runoff from surfaces that are part of the project, but also from “contributing impervious area (CIA)” (side streets that slope toward the project area). The LPA would therefore treat a somewhat larger area than the total impervious area listed in Table 3.17. The amount of CIA would be determined during project design.

Groundwater. Groundwater will have even less potential for recharge under the LPA than it does now, and site runoff will increase flows to receiving waters.

Floodplains. New impervious surface in floodplains, if not mitigated, increases pressure on the remaining flood zone. Impacts to the existing floodplains are possible at the following LPA locations:

- Commerce Street Terminus
- North of West 11th Avenue and east of Commerce Street Terminus
- West 11th Avenue, between South Bertelsen Road and Ocean Street
- West 11th Avenue at Amazon Channel crossing
- Two bicycle and pedestrian path crossings of Amazon Channel

Any flood zone encroachment must be mitigated to produce no rise in flood levels during the occurrence of the base flood, under local and federal law.

3.13.2.3. Short-Term Impacts

The main source of construction-related impacts from the LPA would be roadway expansion and construction of some water quality treatment facilities along the alignment. Most facilities located outside of the project ROW would be vegetated and will require grading. These off-site vegetated facilities will most likely be needed along West 11th Avenue where site runoff directly discharges into local drainageways, such as at the Amazon Creek crossing.

The mitigation described below should prevent short-term water quality impacts.

3.13.2.4. Cumulative Effects

It is anticipated that the LPA would slow Eugene's increase in vehicular traffic, thereby reducing the generation of pollutants on the roadways compared to the No-Build Alternative. Along with the new stormwater quality treatment facilities that would be required for the LPA, this would decrease overall impacts compared to those of the No-Build Alternative.

3.13.3. Possible Mitigation Measures

To mitigate for added pollutants generated from additional impervious area, new developments such as the LPA must meet stormwater pollution reduction standards. City, ODOT, and Corps of Engineers standards would apply; the most stringent are those summarized in the SLOPES IV Programmatic Biological Opinion. The project is not at a level of design detail to determine exactly which techniques would make the most sense, but stormwater runoff treatment could include methods including vegetated swales, raingardens, stormwater planters, vegetated filter strips, and some proprietary facilities like StormFilter™ catch basins and manholes. Each treatment method has limitations on placements, size, and effectiveness in treating various parameters. Regardless of the method(s) selected, facilities would be sized to meet the SLOPES IV water quality design standards. Each treatment method has limitations on placement, size,



and effectiveness in treating various parameters. Correct design and utilization of these measures would mitigate long-term impacts.

Consistent with the City's stormwater standards and with SLOPES IV's emphasis on the use of low-impact development (LID) facilities, the LPA would not propose to use dedicated flow control facilities.

The City of Eugene requires a floodplain development permit for all development within a designated floodplain, and requires that encroachments must not result in any increase in flood levels during the occurrence of the base flood. During further design stages for this project, a floodplain analysis would help determine the severity of impacts to the flood zone, as well as provide information that could be used to mitigate the impacts. The City would have to approve the proposed mitigation plan.

LTD's contractor would prepare a Temporary Erosion and Sediment Control Plan (TESCP) to protect receiving water quality from construction impacts. The TESCP would require practices such as the following:

- Graveled or paved construction entrances to staging and work areas.
- Either watertight trucks or on-site load draining for transport of excavated saturated soils.
- Procedures to prevent the discharge of any wash water from concrete trucks.
- Procedures for the correct installation and use of all erosion and sediment control (ESC) measures.
- A program to monitor erosion/sediment control measures and keep them in working order.
- On-site procedures for prompt maintenance or repair measures.
- Periodic site inspections to ensure compliance with the TESCP.

These practices would minimize any short-term erosion and sedimentation impacts.

3.14. Utilities

This section identifies potential adverse impacts and beneficial effects of the alternatives on utilities in the project area. It focuses on determining which, if any, utilities would likely need to be relocated as a result of the LPA, since no utility relocations are associated with the No-Build Alternative.

3.14.1. Affected Environment

Underground utilities include cables for telecommunication and energy, pipes for natural gas and water, fiber optic lines for Century Link service, and access points (manholes and vaults) for all types of utilities. Telecommunication utilities are generally concentrated on the east side of Charnelton and the south side of West 11th Avenue.

In general, the depths of the various utilities are unknown. Where road widening would occur, LTD is coordinating with the City of Eugene Public Works Department on procedures to accommodate potential conflicts with stormwater drainage basins. Above ground utilities include Century Link telephone poles and Eugene Water and Energy Board (EWEB) power poles. Century Link telephone poles are located alongside sections of many streets and cross over many streets in the project area.

3.14.2. Environmental Consequences

3.14.2.1. No-Build Alternative

No impacts to utilities are anticipated with the No-Build Alternative because there would be no construction activities.

Utilities

Telephone, electrical, fiber optic, natural gas, oil water, sewer, stormwater and other lines and related sites/facilities (such as electrical substations, cell phone towers).





3.14.2.2. Locally Preferred Alternative

Under the LPA, utilities will be relocated where necessary during construction activity and minimal disruption to service is anticipated.

3.14.2.3. Short-Term Impacts

Potential utility relocations might be necessary for removing and resurfacing the top 24 inches of pavement cover with new pavement and compacted rock; road widening; sidewalk improvements; bridge replacement; and the construction of BRT station platforms. This work could temporarily disrupt services, and could cause spills from transformers or from relocating Cumulative Effects.

No cumulative effects are anticipated as a result of this project.

3.14.3. Possible Mitigation Measures

In general, the design will seek to avoid or minimize utility relocations to avoid disruptions to the community and the utility purveyors, and to help reduce costs. Prior to construction, utility locations will be determined. LTD and the construction contractor will coordinate all construction activities, scheduling, and staging with utility purveyors. As appropriate, businesses and residents will be notified of extended temporary utility disruptions. BMPs would mitigate the potential impacts of spills from transformers or from the relocation of storm or sanitary lines. Hazardous materials BMPs would be employed when relocation involves transformers or other potentially hazardous materials.

3.15. Energy and Sustainability

This section summarizes energy use under the No-Build Alternative and the LPA. It also looks at consistency with applicable sustainability goals and at greenhouse gas emissions.

LTD has developed policies to advance the social, economic, and environmental sustainability of the Eugene/Springfield metropolitan area. As part of these policies, LTD commits to action in the following four areas: providing quality transit service, using environmentally friendly vehicles, constructing earth-friendly projects, and implementing sustainable operating practices.

Energy use for the LPA is comparable to the No-Build Alternative. Still, the LPA would save approximately 245 gallons of gasoline and 90 gallons of diesel per day in 2031 and is estimated to use approximately 55 million Btu less total energy on an average weekday.

3.15.1. Affected Environment

The U.S. Energy Information Administration's Annual Energy Outlook (AEO 2011) forecasts the energy market into 2035. This report looks at trends in energy supply and demand linked to the projected performance of the U.S. economy, advances in energy production and consumption technologies, annual weather pattern changes, and future public policy decisions.

Key results highlighted in AEO 2011 include strong growth in shale gas production, growing use of natural gas and renewables in electric power generation, declining reliance on imported liquid fuels, and projected slow growth in energy-related carbon dioxide (CO₂) emissions even in the absence of new policies designed to mitigate greenhouse gas emissions (EIA, 2011).

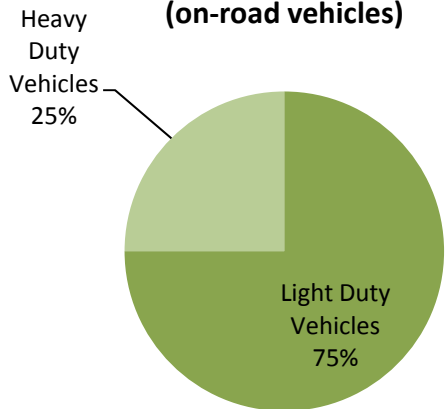
There is some concern over the supply of petroleum to Oregon, most of which originates on the North Slope of Alaska and is transported through a 600-mile pipeline. The pipeline is located in a harsh environment. An accident could upset the flow of crude oil to refineries in Washington and other states that supply Oregon. (e.g., reduced domestic supply resulted from the 2005 hurricane season, which disrupted supplies from oilfields and refineries in the Gulf of Mexico). In addition, there is little storage of petroleum in Oregon (Oregon Department of Energy, 2005).

Btu

A British thermal unit (Btu) is a standard unit of energy that is used in the United States and sometimes in the U.K. It represents the amount of thermal energy necessary to raise the temperature of one pound of pure liquid water by one degree Fahrenheit at the temperature at which water has its greatest density (39 degrees Fahrenheit). The Btu is a measure in the English system of units. Other countries use the joule, the unit of energy in the International System of Units (SI). A Btu is equivalent to approximately 1055 joules (or 1055 watt-seconds).

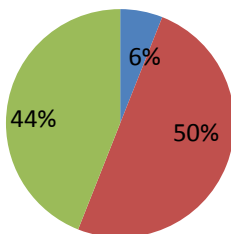


Greenhouse Gas Emissions (on-road vehicles)



Light Duty Vehicle GHG Emissions

- Eugene-Springfield Metro Area
- Other Metro Areas
- Rest of Oregon



Nationally, the price of gasoline has consistently increased, rising at a steeper level since 2000. This is a consequence of greater global demand and supply constraints for crude oil. Refiners in the U.S. now import more than 60 percent of their crude from foreign sources (Federal Trade Commission, 2005). Volatility in the global supply of crude oil (political upheaval, natural disasters) has a significant effect on local prices at the gasoline pump.

Transportation comprises the highest use of petroleum in Oregon. According to DEQ, Oregon consumed approximately 1.59 billion gallons of motor fuel in 2007. Approximately 560 million gallons of diesel gasoline was used for on-highway transportation in 2007. Based upon local fuel sales tax receipts, gasoline sales in the Central Lane area have been in decline in recent years, largely due to the current recession. In March 2010, fuel consumption was about 85 percent of July 2005 levels. It is anticipated that the levels of use will remain lower than 2005 levels until the economy begins to recover.

The number of hybrid vehicles registered in Oregon has risen from zero in 2000 to more than 26,000 at the beginning of 2008. The Department of Motor Vehicles reports that the number of hybrids being registered is nearly doubling every year.

Nationwide, carbon dioxide emissions in 2007 were 20 percent higher than in 1990. Carbon dioxide accounts for most greenhouse gases. Vehicles are responsible for the majority of greenhouse gas emissions in the transportation sector. Light duty vehicles, which include passenger cars and light duty trucks (sport utility vehicles, pickup trucks, and minivans) accounted for almost 75 percent of the on-road emissions, while heavy duty vehicles (primarily freight trucks) contributed the remaining 25 percent.

Like the national trend, emissions from on-road motor vehicles (cars, trucks, buses) account for about 80 percent of Oregon’s transportation sector emissions. Of these, light vehicles (less than 10,000 pounds) account for 75 percent of emissions. Vehicular travel by metropolitan area households makes up 56 percent of the emissions of all statewide light vehicles, or 11.2 percent

of all greenhouse gas emissions (ODOT, 2009). The Eugene-Springfield area emits approximately 6 percent of the state's light vehicle greenhouse gas emissions (ODOT, 2009).

3.15.1.1. No-Build Alternative

Table 3.18 outlines the predicted 2031 transportation energy use for the No-Build Alternative in the West 11th Avenue Corridor. The total average weekday vehicle miles traveled (VMT) for this alternative would be approximately 6,428,167 miles (John Parker Consulting, 2011). The average weekday energy use associated with these vehicle miles is forecast to be approximately 41.241×10^9 Btu. Of this amount, gasoline would account for about 70 percent and diesel about 30 percent. Average weekday consumption of fuel would be about 233,886 gallons of gasoline and 86,365 gallons of diesel.

The total forecast maintenance and repair energy use in 2031 under the No-Build Alternative would be approximately 10.828×10^9 Btu. About 75 percent of the total maintenance and repair energy would be consumed by light-duty vehicles and 25 percent by heavy-duty vehicles.

The total estimated energy use for all vehicles, including maintenance and repair, is predicted to be approximately 52.069×10^9 Btu. Greenhouse gas emissions would likely continue to increase as VMT increased, although technological advances (e.g., electric vehicles, high-mileage vehicles) would affect the rate of increase.



Table 3.18. 2031 No-Build Alternative Transportation Energy Consumption

Vehicle Type	% of VMT	Average Weekday VMT	Average Fuel Consumption Rate (mpg)	Average Weekday Fuel Consumption (Gallons)	Average Weekday Energy Consumption (BTUx10 ⁹)
Light-Duty Gasoline Autos	0.566	3,638,343	30.16	120,635	15.079
Light-Duty Gasoline Trucks	0.302	1,941,306	22.46	86,434	10.804
Heavy-Duty Gasoline Vehicles	0.029	186,417	7.07	26,367	3.296
Light-Duty Diesel Autos	0.0015	9,642	35.96	268	0.037
Light-Duty Diesel Trucks	0.003	19,285	28	689	0.096
Heavy-Duty Diesel Trucks	0.093	597,820	7.15	83,611	11.622
LTD Buses	0.0021	13,499	7.51	1,797	0.250
Motorcycles	0.0035	22,499	50	450	0.056
Total	--	6,428,167	--	320,251	41.241
Maintenance & Repair Energy					
Light-Duty Vehicle (815 Btu/mile)					4.571
Tires (316 Btu/mile)					1.772
Oil (308 Btu/mile)					1.727
<i>Subtotal</i>					8.071
Heavy-Duty Vehicle (1,592 Btu/mile)					1.249
Tires (725 Btu/mile)					0.569
Oil (1,199 Btu/mile)					0.940
<i>Subtotal</i>					2.757
Total Energy Use					52.069

Source: Otak, 2011

3.15.1.2. Locally Preferred Alternative

Estimates of the operational energy use for the LPA in 2031 are listed in Table 3.19 by vehicle type. The total average weekday VMT under the LPA would be 6,421,434, which would consume approximately 41.197 x 10⁹ Btu in 2031. This is not significantly different than the No-Build Alternative. The LPA would use approximately 245 gallons less gasoline and 90 gallons less diesel per day in 2031. Over a full year (using an annualization factor of 290 days), the LPA would save approximately 71,050 gallons of gasoline and 26,100 gallons of diesel. On an average weekday, the total energy use for the LPA in 2031, including fuel, maintenance, and repair, is

expected to be approximately 52.014×10^9 Btu, or 55 million Btu less total energy than the No-Build Alternative. It is likely that additional VMT savings would occur with the LPA. For example, someone using the West Eugene EmX could connect to the Franklin and Pioneer Parkway EmX lines for an extended trip outside the West 11th Avenue Corridor in lieu of traveling in a personal vehicle. This potential energy savings is not captured in the analysis.

With the LPA predicted to produce slightly fewer VMT on an average weekday, it would correspondingly reduce the amount of greenhouse gases generated by vehicles in comparison to the No-Build scenario.

Table 3.19. 2031 Locally Preferred Alternative Transportation Energy Consumption

<i>Vehicle Type</i>	<i>% of VMT</i>	<i>Average Weekday VMT</i>	<i>Average Fuel Consumption Rate (mpg)</i>	<i>Average Weekday Fuel Consumption (Gallons)</i>	<i>Average Weekday Energy Consumption (BTUx10⁹)</i>
Light-Duty Gasoline Autos	0.566	3,634,532	30.16	120,508	15.064
Light-Duty Gasoline Trucks	0.302	1,939,273	22.46	86,343	10.793
Heavy-Duty Gasoline Vehicles	0.029	186,222	7.07	26,340	3.292
Light-Duty Diesel Autos	0.0015	9,632	35.96	268	0.037
Light-Duty Diesel Trucks	0.003	19,264	28	688	0.096
Heavy-Duty Diesel Trucks	0.093	597,193	7.15	83,524	11.610
LTD Buses	0.0021	13485	7.51	1796	0.250
Motorcycles	0.0035	22475	50	450	0.056
Total	--	6,421,434	--	319,916	41.197
Maintenance & Repair Energy					
Light-Duty Vehicle (815 Btu/mile)					4.566
Tires (316 Btu/mile)					1.770
Oil (308 Btu/mile)					1.726
<i>Subtotal</i>					<i>8.062</i>
Heavy-Duty Vehicle (1,592 Btu/mile)					1.247
Tires (725 Btu/mile)					0.568
Oil (1,199 Btu/mile)					0.939
<i>Subtotal</i>					<i>2.754</i>
Total Energy Use					52.014

Source: Otak, 2011

3.15.1.3. Short-Term Impacts

Table 3.20 shows the estimated energy that would be used during construction, calculated using standard assumptions for various types and amounts of work. There would also be construction energy use associated with maintenance and repair of roads and intersections, as well as new road construction; these are projects planned for in the RTP. For the purposes of this analysis, no construction energy use is assumed for the No-Build Alternative. The LPA would consume approximately 18.48×10^9 Btu for 7.5 miles of bus and turning lanes, 42.2×10^9 Btu for 12 station pairs plus the Commerce terminal (13 total), and 33.51×10^9 Btu for sitework. The total construction energy consumed for the project would be approximately 94.2×10^9 Btu.

Table 3.20. Construction Energy Use (Btu x 10⁹)

	No-Build Alternative	LPA
BAT lanes	0	18.48
Stations and Terminals	0	42.20
Sitework	0	33.51
Total Energy Use	0	94.20

Source: Otak, 2011

3.15.1.4. Cumulative Effects

Combined with other local programs aimed at reducing energy consumption, the LPA would contribute to the long-term local reduction in rates of energy use and greenhouse gas emissions in the transportation sector when compared to the No-Build scenario.

3.15.2. Possible Mitigation Measures

Operating the LPA would reduce energy consumption and greenhouse gas emissions for the total transportation system compared to the No-Build Alternative. Therefore, no mitigation measures are necessary. However, as it is becoming increasingly important to reduce dependence on fossil fuels, overall energy needs, and greenhouse gas emissions, the following measures,



although not required, could be incorporated into the project design to provide additional energy savings and to advance project goals:

- Incorporate green building practices and design elements, such as, but not limited to:
 - Use light colored (high-albedo) roofing materials, high-volume fly-ash concrete pavements, and sustainably harvested wood products.
 - Orient and design buildings to take advantage of natural light.
 - Use water-efficient and low maintenance landscaping.
 - Use low carbon intensity building materials.
 - Use locally sourced and reused building materials.
 - Use energy efficient bulbs and appliances in traffic lights, street lights, and other electrical uses.
 - Reduce unnecessary outdoor lighting.
 - Install solar panels on unused roof and ground space, where feasible. Where solar systems cannot feasibly be incorporated into the project at the outset, build “solar ready” structures.
- Enhance the energy efficiency of the maintenance building and maintenance operations.
- Design street improvements to be bicycle and pedestrian-friendly.
- Implement low-impact development practices that maintain the existing hydrology of the site to manage stormwater and protect the environment, whenever feasible.
- Purchase low or zero-emission vehicles as scheduled upgrades to the fleet are needed.
- At Park & Ride lots, provide the necessary facilities and infrastructure to encourage the use of low or zero emission vehicles.
- Ensure that the project enhances, and does not disrupt or create barriers to, non-motorized transportation.
- Design all infrastructure, especially waterway crossings, in anticipation of more frequent and severe storm events.
- Design all infrastructure in anticipation of more frequent extreme heat events.
- Design stormwater management and treatment systems to accommodate more frequent and severe storm events.

- Take special precautions that the improvements in the floodplain near Commerce Terminus can accommodate more frequent and severe storm events.
- During construction:
 - Minimize idling time either by shutting equipment off when not in use or reducing the time of idling to no more than 5 minutes. Provide clear signage that posts this requirement for workers at the entrances to the site.
 - Maintain all equipment in proper working condition according to manufacturer's specifications. The equipment must be checked by a certified mechanic and determined to be running in proper condition before it is operated.
 - Train equipment operators in proper use of equipment.
 - Use the proper size of equipment for the job.
 - Use equipment with new technologies when possible (repowered engines, electric drive trains).
 - Where feasible, use alternative fuels for generators at construction sites such as propane or solar, or use electrical power.
 - Where feasible, use an ARB approved low carbon fuel for equipment. (*NO_x* emissions from the use of low carbon fuel must be reviewed and increases mitigated.)
 - Encourage and provide carpools, shuttle vans, transit passes and/or secure bicycle parking for construction worker commutes.
 - Recycle or salvage non-hazardous construction and demolition debris (goal of at least 75% by weight).
 - Use locally sourced or recycled construction materials (goal of at least 20% based on costs for building materials, and based on volume for roadway, parking lot, sidewalk and curb materials).
 - If feasible, use SmartWay certified trucks for deliveries and equipment transport.
 - Develop a plan to efficiently use water for adequate dust control.

3.16. Street and Landscape Trees

This section analyzes potential significant impacts of the LPA to tree resources in the API. It addresses both street trees, which are located in the public ROW, and landscape trees, which are located on adjacent private property. Additionally, the evaluation looked specifically (and separately) at impacts to charter and heritage trees. The evaluation relied on mapped data, field surveys, and aerial photographs, as well as consultation with the City of Eugene Urban Forester.

The No-Build Alternative will not affect street or landscape trees. Potential impacts from the LPA include removal of up to 143 street trees and 61 landscape trees. No charter trees or heritage trees will be affected by the project.

3.16.1. Affected Environment

The API encompasses street and landscape trees within the footprint of the LPA alignment and associated improvements. Street trees are those within the existing road ROW. Landscape trees are those located on adjacent private property outside the existing ROW. There are over 650 street trees within 50 feet of the proposed LPA improvements.

The trees that are considered of greater significance are those eligible for charter tree status or those that have been designated as heritage trees, both of which are provided protections through City of Eugene policy. Heritage trees are trees of exceptional community value as defined in the Eugene Urban Forest Management Plan. Charter trees are protected through the Historic Tree Charter. To qualify, they must have at least a 25-inch circumference, be at least 50 years old, and be located within the 1915 city boundary. For more discussion of these policies, see the Regional and Local Regulations section of the WEEE Street and Landscape Trees Technical Memorandum (Otak, August 2011).

Street and Landscape Trees

Street trees are trees that are located within public street right-of-way, typically within the park strip (the area between a road/curb and a sidewalk). Landscape trees are trees that are located within publicly or privately-owned parcels.



3.16.2. Environmental Consequences

3.16.2.1. No-Build Alternative

The No-Build Alternative will have no direct short-term, long-term, or cumulative adverse impacts to tree resources as no new facilities are proposed.

3.16.2.2. Locally Preferred Alternative

As part of the evaluation, tree diameter was projected for 2016 (the anticipated construction year) based on an average annual diameter growth rate of 0.33 inch per year. Depending on final design, the LPA could remove up to 143 street trees at locations where the existing curb will be moved to accommodate roadway widening and sidewalk improvements or at new EmX station locations. Most of the tree impacts would occur along West 6th and 7th Avenues, where the tree canopy is the densest.

Of the 143 affected street trees, 130 have an estimated 2016 diameter of eight inches or greater (in terms of tree circumference, 25 inches or greater). Street trees located east of Chambers Street fall within the 1915 city boundary. While there are 83 street trees potentially affected by project improvements within this boundary, no impacted trees meet all the criteria for charter tree consideration. Major street improvements to West 6th and 7th Avenues occurred in the 1980s, and street tree plantings dating from that era do not meet the 50-year-old criterion. Potentially impacted street trees on Charnelton Street are not eligible for charter status. Two potentially eligible trees just north of West 7th Avenue would be impacted by station construction, not ROW widening. It was determined by the City Attorney and LTD legal counsel during construction of the Franklin EmX line that trees removed by project construction other than ROW widening do not fall under the provisions of the charter law. An additional four potential charter trees are already designated for removal through Lane Community College's redevelopment of property at the corner of Charnelton and West 10th Avenue. No other affected street trees meet the size and age criteria of the charter amendment. The project would not affect any heritage trees either.

Depending on final design, the LPA could impact up to 61 landscape trees. These trees are typically located on private property frontages adjacent to the LPA alignment and street improvements. Eight landscape trees located on ODOT property at Washington/Jefferson Park and West 7th Avenue would be impacted. Although the property is used by the City for a park, its primary purpose is highway ROW for the Interstate-105 freeway structures. Two large trees in the Hollywood Video parking lot on West 7th Avenue appear to be the most mature of the affected landscape trees. The LPA would remove 47 less mature landscape trees west of Garfield Street, typically planted in landscape strips behind sidewalks. Potential street and landscape tree impacts are listed in Table 3.21, and locations are shown in Figure 3.18.

Table 3.21. Summary of Potential Impacts – Street and Landscape Trees

<i>Alternatives</i>	<i>Street Trees</i>	<i>Charter Trees</i>	<i>Landscape Trees</i>	<i>Heritage Trees</i>
No-build	0	0	0	0
LPA	143	0	61	0

Source: WEEE Street and Landscape Trees Technical Report. Otak. July 2010, amended August 2011. www.ltd.org.

3.16.2.3. Short-Term Impacts

Construction activities could affect trees beyond the direct impacts of roadway widening accounted for above. Areas of street reconstruction will require excavation and compaction of new base materials where BAT lanes and concrete intersection pads are proposed. Excavation could impact shallow root systems and affect tree health. Trees also face potential damage from operation of heavy equipment and unintended collisions with lower branches.

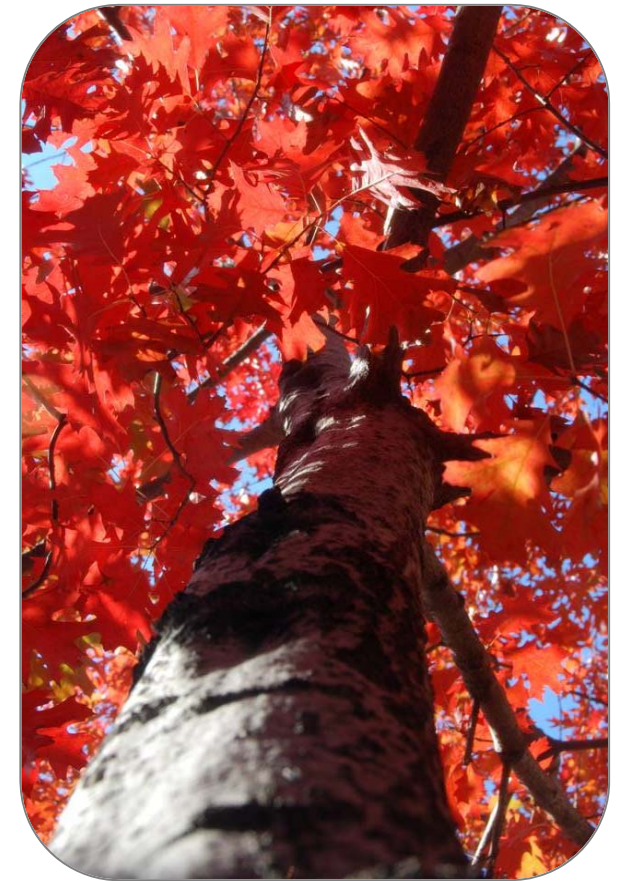


Figure 3.18. Potential Street and Landscape Tree Impacts Under the LPA



3.16.2.4. Cumulative Effects

Future development in the area identified in regional and municipal plans and other proposals may result in additional impacts to trees in the API. If the tree canopy were substantially altered, project effects could occur across disciplines. The cooling and shading benefits of trees affect energy use. The removal of a healthy tree canopy affects visual quality and diminishes habitat for birds and animals. Trees also provide benefits by retaining water and minimizing the impact of stormwater runoff from impervious surfaces. However, all of these impacts can be mitigated by providing tree replacement and landscaping around the LPA improvements.

3.16.3. Possible Mitigation Measures

Where street tree removals are required, long-term impacts would be mitigated through planting new trees, replacing all removed trees at a ratio of at least one tree planted for one tree removed, and coordinating with the City of Eugene's Urban Forester on the selection of tree species to be planted and their specific locations.

Where landscape tree removals are required, long-term impacts would be mitigated through tree replanting or replacement as agreed to by the property owner. LTD will coordinate with respective property owners on the selection of trees to be replanted or replaced.

LTD would require the construction contractor to develop a Tree Protection Plan before construction. The plan would include, among other things, staging and scheduling practices that minimize the risk of harming trees close to the construction site. Implementing the plan would mitigate impacts related to construction activity. BMPs for tree protection would be employed as specified through consultation with an arborist and landscaping professional.

In sum, no significant adverse impacts are anticipated. None of the potentially affected trees have been characterized for special protection and those removed can be reasonably replaced.



3.17. Construction Activities and Consequences

3.17.1. General Construction Methods

The following section describes how construction of the LPA would likely be staged and sequenced. This description is based on LTD's experience with the Franklin and Gateway EmX Corridors. The final plan for construction methods, sequencing, and staging will be determined in coordination with the contractor and permitting authorities.

Utility work will generally be completed before construction begins on the construction of the transportation facilities. This work, often conducted by local utility companies, occurs separately from project-related construction. After completing required utility relocation and other preparatory site work, the contractor will begin with construction of new transit lanes, bike lanes, sidewalks, and any other "flatwork." The contractor will modify existing signals or construct new traffic signals as part of this work. In some cases, the contractor may construct the signal footings but install signal arms after initial work is complete. Flatwork for stations, including curbs, ramps, and station footings, will be completed as the work progresses along the alignment. Streets and street segments will be restored to normal operations after this work is complete. The contractor is expected to progress approximately two blocks every two weeks, with an additional two weeks for each transit station. Additional time will be required at intersections that require new or substantially modified traffic signals. The construction sequencing will be determined through coordination between the contractor and local residents, businesses, and property owners regarding construction scheduling preferences. It is expected that for each major segment (West 6th, 7th, and 11th Avenues) the work would start at one end of the segment and progress to the other end of the segment. All flatwork is expected to be completed in two construction seasons.

Stations will be fabricated during the second construction season and installed during the subsequent (final) construction season, along with landscaping, fare machines, real-time passenger information, station amenities, and other similar items.

The contractor and LTD will coordinate closely with ODOT (for West 6th and 7th Avenues west of Washington Street) and with the City of Eugene (for all other parts of the alignment) on traffic control. Depending on the segment, ODOT or the City will review and approve traffic plans for construction.

On streets with multiple lanes in each direction (or multiple lanes in one direction for one-way streets), at least one lane of traffic will be open at all times. Flaggers will coordinate travel at intersections and other points of congestion as necessary. On streets with a single lane, it may be necessary to close one direction of traffic for certain periods. In those situations, flaggers will be used to manage the traffic flow safely. The contractor and LTD will also coordinate with businesses to ensure that the project maintains access for patrons and deliveries.

3.17.2. Coordination with Businesses and Residents

LTD's Franklin and Gateway EmX projects demonstrated LTD's commitment to communicating with impacted businesses, residences, and travelers, both before and during construction. As with those projects, LTD will contact all businesses and residents along the alignment well before construction begins to solicit local concerns, issues, and scheduling preferences. Businesses and residents will also be able to communicate with the contractor and LTD during construction. LTD's construction liaison will provide e-mail updates and serve as an ongoing point of contact to address concerns and to provide information to affected businesses, residents, and other interested persons. LTD will provide a 24-hour hotline to quickly address construction concerns from businesses and residences.



LTD will also work to enhance activity at businesses affected by construction. This can be done through attractive signage, direct communications with the public (e.g., direct mail and advertising), community events (e.g., street fairs), encouraging project construction crews to do business locally, and widely distributing discount coupons for those businesses. These techniques succeeded in keeping business areas active during previous EmX projects.

3.17.3. Short-Term Construction Impacts

This section summarizes the previous discussions of possible short-term, construction-related impacts, and how LTD will avoid, minimize or mitigate those impacts.

3.17.3.1. Land Use

No short-term land use impacts would occur from temporary street and access closures during construction.

3.17.3.2. Property Acquisition

Construction impacts could occur if additional land is needed for staging. LTD will avoid or minimize these by identifying temporary staging areas within existing ROW, on city property, or, if necessary, on private property with permission from landowners. No permanent acquisitions or displacements are anticipated for construction staging activities.

3.17.3.3. Socioeconomic Effects

Short-term impacts could occur from street and access closures during construction. These temporary impacts could include reduced visits to businesses, public services, and community facilities in construction areas. LTD will use careful planning, phasing, and staging of work and adequate flagging and signing during the work to maintain access to neighborhoods, residences, and businesses during normal operating hours. Construction and staging activities could also result in minor, short-term visual impacts to the neighborhoods.



3.17.3.4. Noise and Vibration

Construction-related noise and vibration would result from the operation of heavy equipment. The contractor would have to adhere to state and local ordinances regulating construction noise. Constructing bus-only lanes and rebuilding the project roadways, stations, and ancillary facilities would result in temporary increases in noise levels along the alignment. Haul truck and delivery truck volumes and times of travel would vary depending on the specific site activities occurring at any given time. The highest levels would occur during heavy construction, such as demolition, paving, and hauling. Noise levels would only be slightly above the ambient levels during minor construction work, such as finishing work, roadway stripping, and system installation.

The project specifications would include construction noise abatement measures, including limiting the distance and duration of construction activities near occupied dwelling units, using sound-control devices on equipment, prohibiting unmuffled exhaust, and using equipment that complies with EPA noise standards. LTD would use a construction communications liaison who could assist with resolving any specific construction-related noise impact complaints, who may require the contractor to implement one or more of the noise mitigation measures at the contractor's expense, as directed by the project manager, including relocation of stationary construction equipment, shutting off idling equipment, rescheduling construction operations, notifying nearby residents whenever extremely noisy work will be occurring, and installing temporary or portable acoustic barriers around stationary construction noise sources.

Major vibration-producing activities would occur primarily during demolition and preparation for the new roadways and stations; however, it is unlikely that vibration levels would exceed 0.5 inch per second at distances greater than 100 feet from the construction sites.



3.17.3.5. Air Quality

Construction activities would temporarily increase CO and PM emissions due to heavy construction vehicles, lowered traffic speeds, earth excavation, and occasionally open burning. This would impact the ambient air quality.

Construction specifications would require contractors to take reasonable precautions to avoid dust emissions:

- Use water or chemicals where possible to control dust from construction activities, grading stockpiles, and other surfaces that can create airborne dusts from demolition, grading, and clearing, and other construction activities.
- On unpaved roads, apply asphalt, water, or other suitable chemicals on materials to control dust.
- Enclose materials stockpiles in cases where water or chemical applications do not prevent particulate matter from becoming airborne.
- Use hoods, fans, and fabric filters to enclose and vent the handling of dusty materials.
- Adequately contain sandblasting and other similar operations.
- Always cover open-bodied trucks while they are transporting materials likely to become airborne.
- Reduce vehicle idling, require equipment to be properly tuned and maintained, and use equipment that meets EPA's emissions standards.



3.17.3.6. Visual and Aesthetic Resources

Temporary construction impacts to the visual environment would include the presence and movement of equipment and materials, exposure of soils, glare and lights associated with nighttime construction, storage of construction materials, and general visual changes to landscapes.

Construction specifications would require contractors to take reasonable precautions to mitigate visual impacts by using the following measures:

- Remove erosion control structures as soon as the area is stabilized.
- Keep the roadway and work areas as clean as possible by using street sweepers and wheel washes to minimized off-site tracking.
- Maintain construction equipment properly to minimize unnecessary exhaust.
- Stockpile materials in less visually sensitive areas, preferably where they are not visible from residences.
- Use temporary fencing, where appropriate, to buffer the neighborhoods from the construction area.

3.17.3.7. Historic, Archaeological and Cultural Resources

While no effects are anticipated to individual resources, construction could affect the area's character. Construction contractors will be required to avoid above-ground resources. Minor temporary changes could result from:

- Clearing and grading activities, resulting in exposed soils until replanting or repaving occurs
- Dust, exhaust, and airborne debris in areas of active construction
- Stockpiling of excavated material
- Staging areas used for equipment storage and construction materials
- Disruptions to normal traffic flow

Prior to construction, LTD will prepare a cultural resources inadvertent discovery plan. In the event of inadvertent damage or loss to historic resources during construction, mitigation measures will be determined in consultation with FTA, SHPO, the City of Eugene, and the property owner. In the unlikely event that cultural deposits or artifacts are exposed during construction, federal and state law requires that work near such finds be suspended immediately. The project team must notify FTA and SHPO, and a professional archaeologist must be called in to evaluate the significance of the find. The archaeologist would then recommend an action in consultation with SHPO, FTA, and appropriate Indian tribes.

3.17.3.8. Park and Recreation Areas, and Section 4(f)

Any potential short-term effects from construction activities would be addressed through alternative access provisions and construction plan coordination. Adequate barriers, flagging, and alternative route marking would be provided for the Fern Ridge Multi-Use Path during construction.

LTD would replace affected trees at the southern end of Washington/Jefferson Park in coordination with the City's Urban Forester.

3.17.3.9. Hazardous Materials

Potential construction impacts primarily include encountering contaminated soil and/or groundwater during excavation, trenching, or grading operations. Construction activities could also result in the inadvertent spreading of any existing contamination, and appropriate measures (e.g., contamination delineation, strategic excavation, and dewatering) would be required for construction activities in contaminated areas.

Utility corridors can provide preferential flow pathways for the movement of impacted groundwater. An existing utility corridor may influence the migration of existing contaminants. The construction of new utility corridors may influence the future movement of groundwater and potential contaminants.



Construction specifications would require contractors to prepare and implement mitigation plans for short-term impacts prior to construction activities. LTD is preparing a project alignment site assessment, which will assist in subsequent preparation of AAI-compliant Phase I site assessments for each parcel prior to acquisition.

3.17.3.10. Geology and Seismic Activity

The presence of relatively shallow groundwater could complicate utility installation. Further, the shallow soils are moisture-sensitive and difficult to grade in wet weather. Both of these issues would be readily addressed through a geotechnical study and appropriate geotechnical design.

3.17.3.11. Biological Resources and Endangered Species

Short-term construction-related impacts could result from bridge widening and adding new bike and pedestrian crossings, which would increase the potential for sediment transport to wetlands or waterways. Construction along riparian habitats could temporarily displace wildlife. Impacts to Northern Pacific pond turtles could range from temporary displacement from the vicinity to disruption of nesting sites. In addition, short-term, temporary increases in waterway turbidity and sedimentation could result from grading and other road construction activities, and temporary bank instability may result from bank manipulation and removal and subsequent planting of vegetation (until new plantings are established).

The contractor would be required to implement temporary erosion and sediment control measures during and after construction to minimize short-term impacts.

3.17.3.12. Wetlands and Waters of the State and U.S.

BMPs would mitigate potential sediment transport to waterways via existing stormwater systems. In addition, temporary construction impacts to the Amazon Channel would be associated with widening the West 11th Avenue bridge and constructing two new bicycle and pedestrian crossings, as described in Section 3.17.3.11. Short-term impacts that could occur to Wetland 15 from widening of West 11th Avenue and to Wetlands 4 and 14 due to their proximity to new bicycle and pedestrian crossings should be avoidable through use of BMPs. Other mitigation measures will be applied through the Corps of Engineers' and DSL's regulatory and permitting requirements.



3.17.3.13. Water Quality and Hydrology

Roadway expansion and construction of some water quality treatment facilities at selected locations along the alignment could require grading vegetated features. These off-site vegetated facilities will most likely be needed along West 11th Avenue where site runoff directly discharges into local drainageways, such as at the Amazon Channel crossing. As described above, temporary erosion and sediment control measures would minimize short-term impacts.

3.17.3.14. Utilities

Road widening, sidewalk improvements, bridge replacement, and construction of BRT station platforms could require utility relocation.

BMPs would mitigate any potential for spills from transformers or from the relocation of storm or sanitary lines, and would minimize disruption to businesses and residences.

3.17.3.15. Energy and Sustainability

The LPA would consume approximately 18.48×10^9 Btu for 7.5 miles of bus and turning lanes, 42.2×10^9 Btu for 12 station pairs plus the Commerce terminal (13 total), and 33.51×10^9 Btu for sitework. The total construction energy consumed for the project would be approximately 94.2×10^9 Btu. Energy consumption associated with construction can be highly variable, depending upon the source, manufacturing, and transport of materials. To ensure greater sustainability, locally sourced and reused building materials would be utilized, where practicable and feasible. BMPs (e.g., no-idling practices, properly maintained equipment) would minimize energy use during construction.

3.17.3.16. Street and Landscape Trees

Construction activities could affect trees beyond the direct impacts of roadway widening. Areas of street reconstruction will require excavation and compaction of new base materials where BAT lanes and concrete intersection pads are proposed, which could impact shallow root



systems and affect tree health. Trees also face potential damage from operation of heavy equipment and unintended collisions with lower branches.

The contractor would be required to develop a Tree Protection Plan. Among other things, it would describe staging and scheduling practices that minimize the risk of harming trees close to the construction site during construction.

3.18. Cumulative Effects

The following is a summary of potential cumulative effects from the proposed project. Cumulative effects may occur when a project's effects are combined with those from past, present, and reasonably foreseeable future projects. They can also result from individually small but collectively significant actions that occur over a long period of time.

3.18.1. Land Use

The LPA is consistent with regional, state, and local land use plans in the study area, which share the goal of improving transit accessibility and encouraging transit usage by concentrating higher density, mixed land uses in “nodal development areas” or transit-oriented development within the project study area. The cumulative effect of the project would be to advance the City’s land use plans for increased density of development in areas designated for nodal or transit-oriented development near the project study area. Acquisitions remove a relatively small amount of land along the frontage of each affected property, leaving adequate property on the remainder to support planned uses. The No-Build Alternative does not support the long-term development goals of the City and would not likely prompt new development within the Corridor.

3.18.2. Property Acquisition

Property acquisitions are not expected to cause cumulative effects when combined with other past, present, and reasonably foreseeable actions.

3.18.3. Socioeconomic Effects

The LPA could enhance social interaction and access to community facilities among the neighborhoods in the West 11th Avenue Corridor. With a frequent and reliable transit service, residents, especially those who depend on transit, would be able to move more freely throughout the Corridor, using a wider variety of services. The addition of EmX stations would encourage transit use by concentrating higher density, mixed land uses in nodal development. The LPA would provide more efficient and reliable transit service in an area with a higher than average population of minority and low-income residents and would serve a number of organizations located along the LPA alignment that provide services to minority and low-income populations. Under the No-Build Alternative, bus service would continue to be provided on nearby West 8th and 5th Avenues and would cumulatively enhance access and social interaction in this area, if less effectively than the LPA. Increased congestion would undermine its effectiveness over time.

3.18.4. Noise and Vibration

The noise levels projected for this project include noise from local area traffic on major roadways. For most areas, traffic is the dominant noise source; therefore, the predicted noise levels are cumulative and include both the proposed WEEE project and local area traffic noise. When combined with the projected effects of the LPA, other noise sources, such as short-term construction projects, commercial and industrial activities, and aircraft, are either local in nature or not predicted to be a major noise source.

3.18.5. Air Quality

Cumulative effects on air quality are not anticipated as a result of the LPA or the No-Build Alternative. (See Section 3.15 for a discussion of potential effects related to greenhouse gas emissions.)

3.18.6. Visual and Aesthetic Resources

The tree removal, introduction of new transportation infrastructure, and construction of new EmX stations that are proposed as part of the LPA are similar in nature to the cumulative effects the area will continue to experience as it continues to grow. The No-Build Alternative is not expected to cause cumulative effects.

Also, as noted above, an indirect effect of the LPA (combined with other City policies and regulations) could be to support a more visually appealing development pattern, the cumulative visual effects of which would be generally positive.

3.18.7. Historic, Archaeological and Cultural Resources

Cumulative effects on cultural resources depend on impacts from traffic, noise, air, and aesthetics. Beneficial effects may include improved access to historic community resources. No cumulative effects are expected to occur to archaeological or historic resources under the LPA or the No-Build Alternative.

3.18.8. Park and Recreation Areas, and Section 4(f)

No uses or cumulative effects related to Section 4(f) and 6(f) resources are anticipated from either alternative.



3.18.9. Hazardous Materials

No cumulative effects related to hazardous materials are anticipated for the No-Build Alternative.

Cumulative effects associated with the LPA could include:

- Increased demand for contaminated soil disposal facilities resulting from cumulative site cleanup.
- Cumulative exposure to hazardous materials for some construction workers. This level of exposure could be minimized through a soil management plan that includes proper training and the use of personal protective equipment.
- Because any discovery of a hazardous material during construction is likely to be remediated, development of the LPA could result in the beneficial effect of reduced hazardous materials exposure to the general public and ecologic receptors.

3.18.10. Geology and Seismic Activity

Cumulative effects related to geologic and seismic activity would be unlikely for either alternative.

3.18.11. Biological Resources and Endangered Species

The LPA improvements would result in a more efficient mass transit system than the No-Build Alternative, and would therefore decrease overall negative cumulative effects that increased traffic volumes may have on biological resources and endangered species. Cumulative habitat impacts from the LPA could include incremental impacts to riparian and aquatic habitat in the Amazon Creek basin due to increased stormwater runoff.

3.18.12. Wetlands and Waters of the State and U.S.

The improvements proposed under the LPA would result in a more efficient mass transit system than under the No-Build Alternative, and would therefore decrease the rate of overall traffic growth. Increases in traffic volumes would still be expected, requiring an increase in infrastructure and resulting in related impacts from runoff. The cumulative effect to wetlands and waterways caused by increased runoff and pollution could be expected to be less under the LPA than under the No-Build Alternative.

3.18.13. Water Quality and Hydrology

The LPA would slow Eugene's increase in vehicular traffic, thereby reducing the generation of pollutants on the roadways compared to the No-Build Alternative. Along with the new stormwater quality treatment facilities that would be required for the LPA this would decrease overall impacts to a level below those that would be expected to occur through the No-Build Alternative.

3.18.14. Utilities

No cumulative effects are anticipated with either alternative.

3.18.15. Energy and Sustainability

Construction and operation of the LPA is not expected to affect local or regional energy supplies or consumption. Compared to the No-Build Alternative, operation of the LPA would cumulatively add to the availability of energy by reducing overall VMT and associated energy consumption.

3.18.16. Street and Landscape Trees

Future development in the area identified in regional and municipal plans and other proposals may result in additional impacts to trees in the Corridor. If the regional tree canopy were substantially altered, project effects could occur across wildlife habitat disciplines. The cooling and shading benefits of trees affect energy use. Even relatively minor removal of a portion of healthy tree canopy affects visual quality. Trees also provide benefits by retaining water and minimizing the impact of stormwater runoff from impervious surfaces. However, all these impacts could be mitigated by providing tree replacement and landscaping around the LPA improvements.

No cumulative effects to street and landscape trees are anticipated under the No-Build Alternative.



CHAPTER 4

TRANSPORTATION FACILITIES

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4. TRANSPORTATION FACILITIES

This chapter provides an overview of existing transportation facilities and services within the West 11th Avenue Corridor (Figure 1.2) and how they would be affected by the No-Build Alternative and the Locally Preferred Alternative (LPA). Specifically, it summarizes the affected transportation environment, transit impacts, highway and street impacts, and permits. More detailed information on transportation facilities, services, and impacts is provided in the West Eugene EmX Extension (WEEE) Motor Vehicle Transportation Technical Report (Part I)¹ (Appendix 4-1).



4.1. Affected Transportation Environment

This section describes the existing transportation conditions along the project alignment (Figure 1.3). The existing conditions form a baseline of comparison for the future No-Build Alternative. This section also compares the future No-Build Alternative to the LPA. This section addresses public transit roadways, bicycle and pedestrian facilities, parking, freight facilities, and emergency services.



4.1.1. Corridor Travel Behavior

The travel behavior along the corridor is influenced by the available facilities and the adjacent land uses. A mix of residential, commercial, retail, and industrial land uses within walking distance of the West 11th Avenue Corridor attracts various roadway users. While much of the current land uses are accessed via single occupant vehicles, there are fixed route transit service



¹ Part I of the Motor Vehicle Transportation Technical Report is the narrative and Part II is all the supporting data sheets and is available at www.ltd.org and LTD offices.

and sidewalks available along West 11th Avenue. Bicycle facilities are also available on facilities parallel to and intersecting the Corridor.

Local and regional land use and development plans have identified the West 11th Avenue Corridor for future increases in travel demand resulting from residential, commercial, retail, and industrial development. This development would drive increases in traffic congestion and the need for reliable public transit in the Corridor. Reliable and convenient public transit, together with forecast increases in land use and traffic congestion, could lead current motorists to change their mode of travel from single-occupancy vehicles to public transit.

4.1.2. Public Transit

This section provides a summary of the public transit providers, fixed transit service, passenger facilities, current fares, and accessible services within the West 11th Avenue Corridor.

4.1.2.1. Public Transit Provider

Lane Transit District (LTD) is the public transit provider for the Eugene and Springfield area. It carries about 38,200 people on an average weekday, accounting for annual ridership of over 11.2 million people. Over a one-year period, LTD currently operates for approximately 277,000 hours, with an average of about 41 passengers per schedule hour.

LTD enhances the Eugene-Springfield community and provides transportation services to a diverse community of commuters through the following:

- The Bus! (fixed-route bus service)
- EmX bus rapid transit service
- Event shuttle service
- Commuter Solutions program (carpool, vanpool, employer programs)
- RideSource (demand-response service for people with disabilities)

4.1.2.2. Fixed Route Transit Service

Eugene Station, at the east end of the Corridor serves 26 bus lines and one bus rapid transit (BRT) line from 20 bus bays and one street side stop. It is an important transfer point and also serves as the western terminus for the EmX.

Peak hour transit service frequency in the Corridor ranges from one to four buses per hour. Some routes are limited to weekday only or peak-period only service.

4.1.2.2.1. Operating Characteristics

- **Coverage and Hours of Service:** LTD considers its service coverage to extend 0.25 mile from regular bus stops. Although some routes run earlier or later, bus service is generally provided between 6:00 AM and 11:00 PM on weekdays, 7:00 AM and 11:00 PM on Saturdays, and 8:00 AM and 8:00 PM on Sundays.
- **Route Structure:** LTD operates 26 routes that fully or partially travel within the West 11th Avenue Corridor.
- **Additional Services:** LTD also provides demand-response service for customers who have disabilities that prevent them from using fixed-route bus service.

4.1.2.2.2. Transit Travel Times

Table 4.1 shows the baseline (2007) transit travel time estimates for the project alignment based on current schedules. Details for the development of the methodology and calculations for the transit travel times are included in the WEEE Transit Travel Time Methodology Memorandum (Appendix 4-2 to this document).



Table 4.1. 2007 Transit Travel Times along the West 11th Avenue Corridor

Trip	Travel Time Estimates (minutes)
Downtown Eugene Station to:	2007
W 11th Ave/Seneca Rd	15.1
W 11th Ave/Commerce St	19.5

Source: DKS Associates, 2011.

4.1.2.3. Passenger Facilities

LTD has developed major transit facilities throughout its system, including the Amazon, Seneca, Thurston, River Road, Valley River Center, Lane Community College, University of Oregon, and Gateway Stations, and main stations in downtown Eugene and Springfield. LTD also owns or leases several Park & Ride facilities and operates the RideSource paratransit facility. LTD’s existing EmX service operates between the Eugene and Springfield main stations and extends from the Springfield Station to the Gateway area of Springfield. All EmX stops feature enhanced shelters, passenger waiting area, and fare purchasing facilities.

The Eugene Station is the largest facility along the Corridor. It houses the LTD Customer Service Center and the Next Stop Center (public meeting facility), and it has several shelters with benches, restrooms, bicycle parking, and other customer facilities. Seneca Station is on the proposed alignment and has a 44-space Park & Ride lot.



4.1.2.4. Current Ridership, Operating Revenue, and Operating Expenses

Over the past decade, LTD’s average annual systemwide ridership has greatly increased from 8.6 million boardings in 2000 to 11.3 million boardings in 2010 (Table 4.2). This increasing trend suggests the importance of the transportation service that LTD provides to the community.

Table 4.2. Annual Systemwide Transit Boardings, Revenue, and Expenses

Time Period	Boardings	Operating Revenue	Operating Expenses
2000	8,623,496	\$4,568,222	\$22,228,806
2010	11,349,579	\$7,933,611	\$34,792,955
Increase 2000 to 2010			
Amount	2,726,083	\$3,365,389	\$12,564,149
Percent	31.6%	73.7%	56.5%

Source: LTD 2009-2010 Comprehensive Annual Financial Report, June 30, 2010.

Between 2000 and 2010, the number of passenger boardings, revenue, and annual costs have all increased. Increases in revenue have helped to cover some of the operating cost. However, several factors, such as service expansion, increase in the cost of personnel service, and inflation have led to an increase in operating expenses. A full analysis of operating revenue and expenses is provided in Chapter 5.

4.1.2.5. Accessible Service

All of LTD's fixed-route vehicles are accessible and equipped with either ramps, lifts, kneeling function, or low-floor technology; they also have on-board announcements of landmarks and major destinations. LTD also offers the Accessible Services Program. This program oversees transit services for people with disabilities and older residents that complement accessible fixed-route bus services; it also maintains contracts with other transit providers throughout Lane County.

LTD also operates RideSource, which provides transportation services within the Eugene/Springfield area for individuals who have a disabling condition that prevents them from using LTD's fixed-route or EmX services. It meets the requirements of the Americans with Disabilities Act (ADA) for "complementary paratransit."



4.1.3. Highways and Streets

This section provides a summary of the existing motor vehicle environment along the project alignment. Topics covered include transportation policies and plans, roadway network, baseline traffic volume and speed, mobility standards, intersection operations, and motor vehicle collisions.

4.1.3.1. Transportation Policies and Plans

This analysis was guided by the numerous transportation plans and policy documents adopted by jurisdictions within the Corridor. Key elements of relevant plans and policies are highlighted below, and the plans and policies are discussed in more detail in the Technical Memo.

Level of Service (LOS)

A measure used by traffic engineers to determine the effectiveness of transportation facilities. It is most commonly used to analyze highways, but has also been applied to intersections, and transit. Acceptable and reliable performance is defined by the following levels of service under peak hour traffic conditions: Level of Service (LOS) E (or better) within Eugene’s Central Area Transportation Study area and LOS D (or better) elsewhere. Performance standards outlined in the 1999 Oregon Highway Plan are applied to state facilities in the Eugene-Springfield metropolitan area

V/C Ratio

A principal measure of congestion. The “V” represents the volume or the number of vehicles that are using the roadway at any particular period. The “C” represents the capacity of a roadway at its adopted LOS. If the volume exceeds the capacity of the roadway (volume divided by capacity > 1.00), congestion exists.

The Regional Transportation Plan (RTP) (Central Lane Metropolitan Planning Organization (MPO), December, 2011) guides the planning and development of the transportation system within the Central Lane Transportation Management Area (TMA). The federally required RTP was most recently updated in December, 2011 and includes provisions for meeting residential transportation demand over at least a 20-year period. The WEEE project is located within the Central Lane MPO boundary and is subject to its policies, including the RTP.

The RTP identifies a freight route network; two freight routes that overlap or are within the immediate vicinity of the LPA alignment are:

- West 6th and 7th Avenues between Garfield and Charnelton Streets
- West 11th Avenue west of Beltline Road

Other major and minor arterials in the LPA are:

- Garfield Street, between West 6th Avenue to West 11th Avenue – Major Arterial
- West 11th Avenue, east of Garfield Street – Minor Arterial
- West 11th Avenue, Garfield Street to Beltline Road – Major Arterial
- Chambers Street, West 11th Avenue to West 13th Avenue – Minor Arterial

The 2035 transportation impact and benefit analysis was based on a future roadway network which included the RTP financially constrained projects (2011-2035 RTP, Lane Council of Governments (LCOG)), that is, those projects that can be implemented using current and known revenue sources. The Financially Constrained Roadway Projects that would result in capacity improvements in the Corridor are shown in Table 4.3.

Table 4.3. 2031 Financially Constrained Roadway Projects

<i>Project Name</i>	<i>RTP Project Number</i>	<i>Description</i>
11th Ave	333	Upgrade to 5-lane urban facility from Green Hill Rd to Terry St
13th Ave	318	Construct new major collector from Bertelson Rd to Bailey Hill Rd
Bailey Hill Rd	343	Upgrade to urban facility from Bertelson Rd to urban growth boundary (UGB)
Bertelsen Rd	315	Upgrade to 2- to 3-lane urban facility from 18th Ave to Bailey Hill Rd
Green Hill Rd	454	Upgrade to 2- to 3-lane urban facility from Barger Dr to 11th Ave
Royal Ave	481	Upgrade to 3-lane urban facility from Green Hill Rd to Terry St
Willow Creek Rd	342	Upgrade to 2-lane urban facility from 18th Ave to UGB

Source: 2011-2035 Regional Transportation Plan, LCOG Planning Organization, adopted December 2011.

The Oregon Highway Plan (OHP) establishes a state highway classification system and provides mobility standards for state facilities. The OHP mobility standards were applied to the following study area roadway segments:

- West 6th Avenue – Garfield Street to Washington Street
- West 7th Avenue – Garfield Street to Washington Street
- West 11th Avenue – Beltline Road to Terry Street

Major Arterial

Major arterial streets should serve to interconnect the roadway system of a city. These streets link major commercial, residential, industrial, and institutional areas. Major arterial streets are typically spaced about one mile apart to assure accessibility and reduce the incidence of traffic using collectors or local streets for through-traffic in lieu of a well placed arterial street. Access control, such as raised center medians, is a key feature of an arterial route. Arterials are typically multiple miles in length.

Minor Arterial

Minor arterial street system should interconnect with and augment the urban major arterial system and provide service to trips of moderate length at a somewhat lower level of travel mobility than major arterials. This system also distributes travel to geographic areas smaller than those identified with the higher system. The minor arterial street system includes facilities that allow more access and offer a lower traffic mobility. Such facilities may carry local bus routes and provide for community trips, but ideally should not be located through residential neighborhoods.

Local Streets

Local streets have the sole function of providing direct access to adjacent land. Local streets are deliberately designed to discourage through-traffic movements.

Collector Streets

Collector streets provide a balance of both access and circulation within and between residential and commercial/industrial areas. Collectors differ from arterials in that they provide more of a citywide circulation function, do not require as extensive control of access, and are located in residential neighborhoods, distributing trips from the neighborhood and local street system.

Urban Standards

Facilities that are upgraded to urban standards are rebuilt from basic roadways to include curbs, sidewalks and bicycle facilities.



The Oregon Transportation Planning Rule (TPR) implements statewide planning Goal 12 (Transportation), which must be addressed in each city and county comprehensive plan in Oregon. The TPR was used as a basis for overall project development and reviewed to confirm that the analysis addressed the appropriate elements consistent with Goal 12.

Various state and local authorities ensure (a) mitigation of significant local traffic impacts, and (b) development of a safe, inviting, connected, and logical network of sidewalks and bicycle facilities.

4.1.3.2. Roadway Network

The major east-west roadways in the Corridor are West 6th, 7th, 11th, and 13th Avenues. West 6th Avenue is a one-way facility westbound and West 7th Avenue is a one-way facility eastbound. Within the Corridor, they serve as a couplet to the north of the Corridor. West 11th Avenue is a two-way facility west of Garfield Street and a one-way facility westbound east of Garfield Street. West 13th Avenue is a one-way facility eastbound east of Garfield Street. Within the study area, they serve as a couplet south of Eugene Station and downtown Eugene.

The major north-south roadways in the study area are Washington Street, Jefferson Street, Garfield Street, Chambers Street, Bailey Hill Road, and Bertelsen Road. Washington Street is a one-way facility northbound and Jefferson Street is a one-way facility southbound in downtown Eugene. These roadways serve as a couplet between the I-105 ramps (at West 6th and 7th Avenues) and West 13th Avenue. The remaining major roadways are two-way facilities.

Portions of West 11th, 6th, and 7th Avenues and Chambers Street are classified by the Oregon Department of Transportation (ODOT) as Statewide Highways. OR 126 is on the National Highway System (NHS) and a state freight route. The street naming for OR 126 and OR 99 within the study is as follows:

- West 11th Avenue is OR 126 west of Garfield Street
- Garfield Street is OR 126 between West 11th Avenue and West 6th Avenue
- West 6th and 7th Avenues are OR 99 and OR 126, respectively, between Garfield Street and I-105
- West 6th and 7th Avenues are OR 99 and OR 126 Business Route, respectively, between I-105 and Coburg Road

West 6th and West 7th Avenues (OR 99) are designated by ODOT as Special Transportation Areas (STA) between Lincoln Street and Pearl Street. An STA is a highway segment designation that promotes local access and multi-modal movements along and across the highway.

The transportation characteristics of key study area roadways are listed in Table 4.4. The functional classification specifies the purpose of the roadway and is a determining factor of applicable cross-section, access spacing, and intersection performance standards.



Table 4.4. Existing Study Area Roadway Characteristics

Roadway	Functional Classification ¹	Street Width (feet)	Travel Lanes	Posted Speed (mph)	Sidewalk	Bike Lane	On-Street Parking
W 6th Ave	Major Arterial	40	4 (WB)	30	Yes	No	No
W 7th Ave	Major Arterial	40	4 (EB)	30	Yes	No	No
W 11th Ave (Beltline Rd to Garfield St)	Major Arterial	48 to 58	5	35	Yes	No	No
W 11th Ave (east of Garfield St)	Minor Arterial	44 to 46	3 (WB)	30	Yes	No	No
Beltline Rd (south of 5th Ave)	Minor Arterial	24 to 32	2	55	No	No	No
Commerce St	Local	40 to 42	2/4	25	Yes	No	Yes (Both sides)
Bertelsen Rd	Minor Arterial	32	3	40	Yes	Yes	No
Bailey Hill Rd	Minor Arterial	36 to 52	3	35	Yes	Yes	No
Seneca Rd	Minor Arterial	30	3	35	Yes	No	No
Tyinn St	Local	36 to 40	2/3	30	Yes	No	Partial (Both sides)
Oak Patch Rd	Major Collector	35	2	30	Yes	No	No
McKinley St	Major Collector	38 to 40	2/3	30	Yes	No	No
City View St	Major Collector	36 to 40	2/3	25	Yes	No	Partial (Both sides)
Garfield St (W 6th Ave to W 11th Ave)	Major Arterial	40 to 50	4	30	Yes	No	No
Chambers St (W 6th Ave to W 7th Ave)	Major Arterial	70	5	30	Yes	Yes	No
Chambers St (south of W 7th Ave)	Minor Arterial	32 to 36	3	30	Yes	Yes	No
Charnelton St	Local	38 to 40	2 (SB)	30	Yes	Short Segment	Yes
Lincoln St	Local	36	2	30	Yes	Yes (One side)	Yes (One side)
Lawrence St	Local	38 to 40	2 (SB)	30	Yes	No	Yes (Both sides)
Washington St	Minor Arterial	38 to 40	2/3 (NB)	30	Yes	No	Partial (Both sides)
Jefferson St	Minor Arterial	30 to 40	2/3 (SB)	30	Yes	No	No
Blair Blvd	Major Collector	38	3	25	Yes	No	Partial (One side)
Polk St	Major Collector	38	2/3	35	Yes	No	Partial (Both sides)

Source: WEEE Project Team, August 2011.

¹ Obtained from City of Eugene Street Classification Map, November 1999, Figure 60.

4.1.3.3. Baseline Traffic Volume and Speed Analysis

Vehicular volume and speed surveys were conducted for 24 hours on West 11th and 13th (in 2007) and West 6th and 7th (in 2009). The detailed data are provided in the Technical Memo.

4.1.3.3.1. Roadway Traffic Volumes

Table 4-5 summarizes the 24-hour volume survey data for five select roadways, which include the four roadways where speed surveys were collected plus West 7th Place.

Table 4.5. Existing Daily Roadway Volumes

Location	Daily Traffic Volume		
	Eastbound	Westbound	Total
W 11th Ave – west of Garfield St (two-way street)	13,880	13,990	27,870
W 11th/13th Ave Couplet – west of Chambers St	-	-	19,480
W 13th Ave – west of Chambers St	7,110	-	-
W 11th Ave – west of Chambers St	-	12,370	0
W 6th/7th Ave Couplet– east of Polk St	-	-	44,040
W 6th Ave – east of Polk St	-	22,200	-
W 7th Ave – east of Polk St	21,840	-	-
W 7th Pl – west of McKinley St ¹	-	-	6,600

Source: All Traffic Data, West 11th and 13th Avenues data collected Wednesday, December 12, 2007; West 6th and 7th Avenue collected Thursday, April 2, 2009.

¹ City of Eugene Public Works – Transportation Division Traffic Flow Map, 2006-2007 (Includes both eastbound and westbound traffic)

4.1.3.3.2. 85th Percentile Speed

The 24-hour speed survey data and 85th percentile speed are summarized in Table 4.6. The 85th percentile speed is the speed at or below which 85 percent of the vehicles are traveling.

Table 4.6. Existing Daily Vehicle Speeds

<i>Location</i>	<i>85th Percentile Speed</i>		<i>Posted Speed</i>
	<i>Eastbound</i>	<i>Westbound</i>	
W 11th Avenue – west of Garfield St	35 mph	36 mph	35 mph
W 13th Ave – west of Chambers St	35 mph	-	30 mph
W 11th Ave – west of Chambers St	-	35 mph	30 mph
W 6th Ave – east of Polk St	-	39 mph	30 mph
W 7th Ave – east of Polk St	35 mph	-	30 mph

Source: All Traffic Data, West 11th and 13th Avenues data collected Wednesday, December 12, 2007; West 6th and 7th Avenues collected Thursday, April 2, 2009.

4.1.3.3.3. Existing Vehicle Intersection Counts

Manual turn movement counts were collected at all 58 of the study intersections during the evening peak period (4 PM to 6 PM), as shown in Figure 4.1. The 2009 base year volumes for the traffic analysis were developed following the Transportation Planning Analysis Unit (TPAU) methodology. The Technical Memo contains more details about the data and modeling.

Figure 4.1. Study Area Intersections



4.1.3.4. Mobility Standards

Table 4.7 summarizes minimum standards that apply to different study area intersections. ODOT standards apply to study intersections located on ODOT facilities. All remaining study intersections must meet performance standards set by the Central Lane MPO and the City. City intersections located within the Central Area Transportation Study Area have a lower mobility standard. The standards are commonly expressed in one of two ways.

The *intersection LOS* is similar to a “report card” rating based upon average vehicle delay. LOS A, B, and C indicate conditions where traffic moves during peak hours without significant delays. LOS D and E are progressively worse operating conditions. At LOS F, average vehicle delay has become excessive, demand has exceeded capacity, and long lines and delays result.

The *volume to capacity (v/c) ratio* represents how saturated an intersection or turning movement is. Expressed as a decimal, it is determined by dividing the peak hour traffic volume by the maximum hourly capacity of the intersection or turn movement. When the v/c ratio approaches 1.0, small disruptions can cause the traffic flow to break down, resulting in long lines and delays.

Table 4.7. Study Intersection Mobility Standards by Major Roadway

Major Roadway	Jurisdiction (Category)	Minimum Mobility Standard
W 11th Ave (west of Beltline Rd)	ODOT (Statewide Highway)	$v/c \leq 0.80$
W 11th Ave (Beltline Rd to Jefferson St)	City of Eugene	LOS D or better
W 11th Ave (east of Jefferson St)	City of Eugene – CATS area	LOS E or better
W 6th/W 7th Ave (west of Washington St)	ODOT (Statewide Highway)	$v/c \leq 0.85$
W 6th/W 7th Ave (east of Washington St)	City of Eugene – CATS area	LOS E or better
W 13th Ave (west of Jefferson St)	City of Eugene	LOS D or better
W 13th Ave (east of Jefferson St)	City of Eugene – CATS area	LOS E or better
W 7th Pl	City of Eugene	LOS D or better
W Lincoln St	City of Eugene – CATS area	LOS E or better
W Charnelton St	City of Eugene – CATS area	LOS E or better

Source: Oregon Highway Plan (ODOT) and 2011-2035 Regional Transportation Plan (LCOG)
 CATS – Central Area Transportation Study area defined by the Regional Transportation Plan.

4.1.3.5. Existing Intersection Performance

A traffic operations model using base year traffic volumes (2009) was created for the study area to evaluate roadway traffic flow and intersection conditions. The existing performance of the study intersections was evaluated using a traffic operations model based on a Highway Capacity Manual methodology. Table 4.8 shows the five intersections that were found not to meet mobility standards. A complete table of all of the study intersections is provided in the Technical Memo.

Level of Service (LOS)

A measure used by traffic engineers to determine the effectiveness of transportation facilities. It is most commonly used to analyze highways, but has also been applied to intersections, and transit. Acceptable and reliable performance is defined by the following levels of service under peak hour traffic conditions: Level of Service (LOS) E within Eugene’s Central Area Transportation Study area and LOS D elsewhere. Performance standards outlined in the 1999 Oregon Highway Plan are applied to state facilities in the Eugene-Springfield metropolitan area

V/C Ratio

A principal measure of congestion. The “V” represents the volume or the number of vehicles that are using the roadway at any particular period. The “C” represents the capacity of a roadway at its adopted LOS. If the volume exceeds the capacity of the roadway (volume divided by capacity exceeds 1.00), congestion exists.

Table 4.8. Existing Study Intersection Performance (2009 Base Volumes)

Intersection	Operating Standard	2009 PM Peak Hour		
		Delay	LOS	V/C
<i>Signalized Intersection</i>				
W 7th Ave/Chambers St	0.85 v/c	31.8	C	0.95
W 7th Ave/Jefferson St	0.85 v/c	35.3	D	0.96
W 7th Ave/Washington St	0.85 v/c	25.0	C	0.97
W 11th Ave/Beltline Rd	0.80 v/c	34.8	C	0.92
<i>Unsignalized Intersections</i>				
W 13th Ave/Garfield St	LOS D	194.4	A/ F	0.61

Source: DKS Associates, 2010.

Signalized intersections:

Delay = Average Intersection Delay (sec.)

LOS = Level of Service

v/c = Volume-to-Capacity Ratio

Bold values do not meet standards

Unsignalized intersection:

Delay = Critical Movement Approach Delay (sec.)

LOS = Major Street LOS/Minor Street LOS

v/c = Critical Movement Volume-to-Capacity Ratio

Bold values do not meet standards

4.1.3.6. Motor Vehicle Collision Analysis

A collision analysis based on five years of collision data (2004 through 2008) was conducted for the study intersections to identify potential safety issues. The Technical Memo includes base collision data and the detailed analysis, including the collisions at each study intersection by quantity, equivalent crash rate per million entering vehicles, severity (property damage only, non-fatal injury, fatal injury), and whether any pedestrians or bicyclists were involved.

There were four fatal collisions – one each at West 6th Avenue/Garfield Street, West 7th Avenue/Lincoln Street, West 11th Avenue/McKinley Street, and West 11th Avenue/Commerce Street intersections. Two fatal collisions involved a pedestrian at the West 6th Avenue/Garfield Street and West 11th Avenue/McKinley Street intersections. In addition, seven intersections had a collision rate greater than 1.0, which can indicate the need for further safety investigation.

Table 4.9 shows the types of collisions at each of the intersections. The most prevalent were rear-end (42.5 percent of total) and turning movement collisions (32.0 percent of total). Both are typically associated with signalized intersections, but they can also be associated with driveways or other unsignalized access points along a roadway.

Collision Rates

Collision rates reveal the frequency of collisions along highway segments or intersections. This analysis used the following formula to calculate the rate:

$$\text{Collision Rate (Collisions per million entering vehicles)} \\ = (\text{Collisions} * 1,000,000) / (\text{365} * \text{Number of years} * \text{Number of entering vehicles at the intersection})$$



Table 4.9. Collision Breakdown for High Collision Intersections

Intersection	Collision Rate	Collisions by Type								
		Rear-End	Turning Movement	Side Swipe	Angle	Bike/Ped	Fixed Object	Backing	Other	Total
W 7th Ave/Garfield St	1.03	15	27	4	8	-	1	-	-	55
W 7th Ave/Blair Blvd	1.21	28	10	2	14	2	-	-	-	56
W 7th Ave/Seneca Rd	1.06	3	9	1	9	-	-	-	-	22
W 11th Ave/Seneca Rd	1.13	30	24	-	2	1	-	1	-	58
W 11th Ave/Bailey Hill Rd	2.10	65	34	11	7	-	1	-	1	119
W 11th Ave/Bertelsen Rd	1.11	21	18	12	6	-	1	-	-	58
W 13th Ave/Polk St	1.02	3	2	4	10	-	1	-	-	20
Percent Total		42.5%	32.0%	8.8%	14.4%	0.8%	1.0%	0.25%	0.25%	100%

Source: City of Eugene, August 2011.

4.1.4. Bicycles and Pedestrian Facilities

Surveyors of current bicycle and pedestrian facilities used maps generated by the City of Eugene and LCOG, aerial photographs, and field inspections.

4.1.4.1. Bicycle Facilities

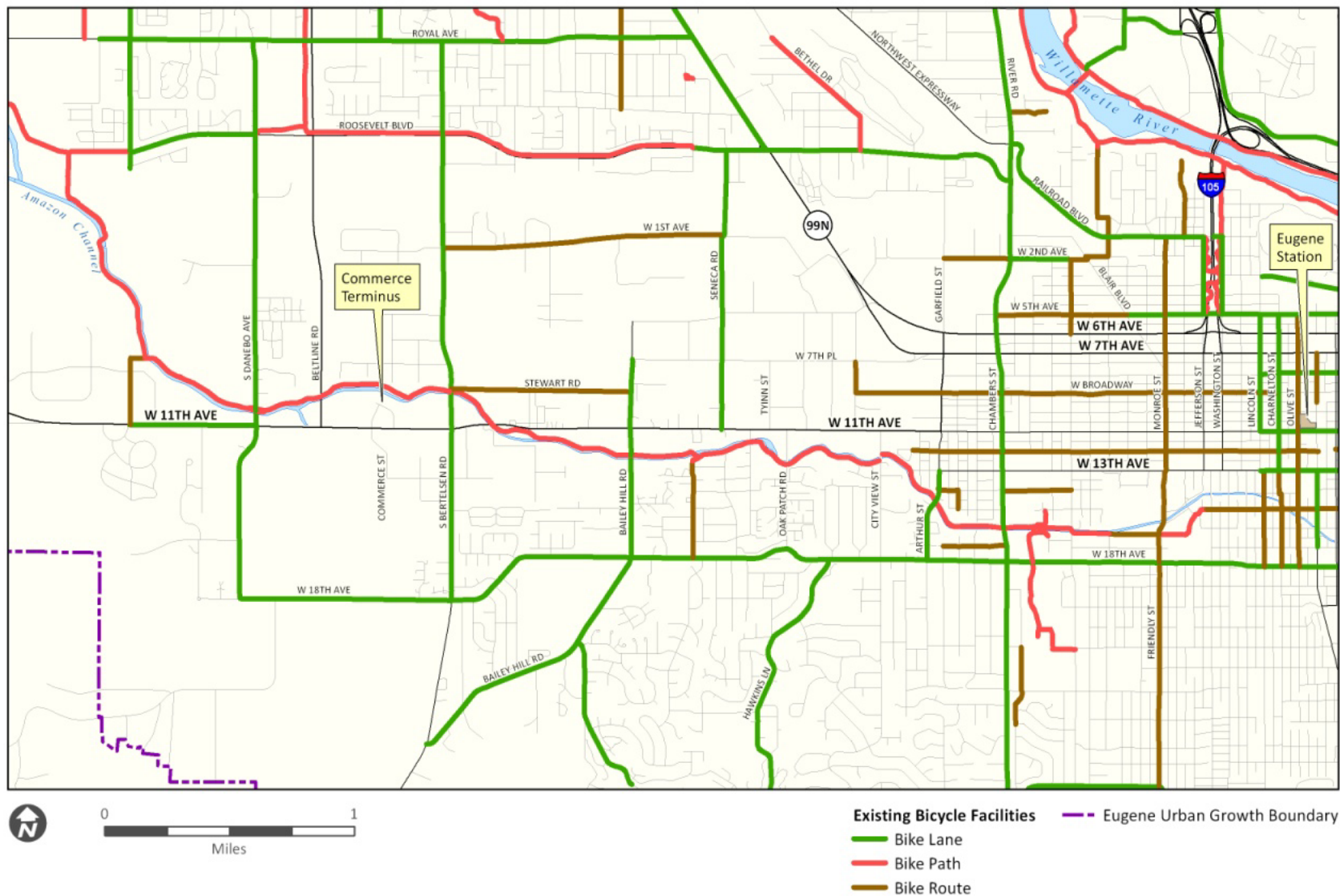
Bike facilities are provided in the City of Eugene as shared use paths, bike lanes, bicycle routes, or shared roadways. Along the LPA alignment, bike lanes are currently provided along several blocks of West 10th Avenue, West 11th Avenue, and Charnelton Street in the downtown area. While there are no other exclusive bicycle facilities along the rest of the LPA alignment, bicycle facilities are provided along routes that parallel the LPA. In general, the project area consists of a fairly complete network of bicycle lanes, bicycle routes, and multi-use paths, as shown in Figure 4.2.

4.1.4.2. Pedestrian Facilities

Pedestrian facilities are generally well developed in and near downtown Eugene; however, fewer and less uniform pedestrian facilities are available west of Garfield Street. Most streets have sidewalks on both sides. Along the Amazon Channel, which generally runs parallel to West 11th Avenue west of Garfield Street, there is a 10-foot bike and pedestrian path on one side of the canal. In some areas, the existing pedestrian facilities do not meet city standards or include all the amenities that are encouraged by city guidelines. Deficiencies include sidewalks that are narrow or not set back from travel lanes, lack of street trees, and obstructions.



Figure 4.2. Existing Bicycle Facilities in and Around the West 11th Avenue Corridor



4.1.5. Parking

An inventory of on-street parking spaces was conducted for public streets where on-street parking would be impacted by the LPA. Utilization rates for on-street parking along the corridor were determined by field observations at 10:00 AM, 3:00 PM, and 7:00 PM on different weekdays. These counts were used to determine a utilization rate for each of the time periods.

Table 4.10 shows the maximum utilization rate of the on-street parking over the three observation periods. Within the downtown area, on-street parking utilization was recorded to be higher than for the rest of the project alignment. While not surveyed, it should be noted that there are two off-street public parking garages, Broadway North and Broadway South Parking Garages, which are located adjacent to Charnelton Street and provide an additional 720 spaces.

Table 4.10. On-Street Parking Supply and Utilization

<i>Area Parking Spaces Available</i>	<i>Existing Parking Spaces</i>	<i>Measured Occupancy</i>	<i>Maximum Utilization</i>
Charnelton Street Area ¹	183	121	66%
Polk Street	17	9	53%
Monroe Street	20	5	25%
Commerce Street	58	20	34%

Source: LTD, 2010; DKS Associates, 2011(per the May 2012 parking addendum).

¹ *Charnelton Street parking space tabulation includes on-street parking spaces on Charnelton Street and on-street parking spaces on side streets for one block east and west of Charnelton Street on W 11th, W 10th, Broadway, and W 8th Avenues.*

4.1.6. Freight Facilities

Two freight routes serve area businesses and freight facilities within the immediate vicinity of the LPA alignment:

Charnelton Area Parking Utilization

In the Charnelton area, where most of the parking impacts would be experienced, parking inventories were also collected on adjacent side streets, since these streets contribute to the overall on-street parking supply for a given area. The downtown streets inventoried included Charnelton Street and the side streets within one block east and west of Charnelton between 11th Avenue and 6th Avenue. (i.e. 8th Avenue, Broadway, 10th Avenue, and 11th Avenue.

Maximum Parking Utilization

On-street parking utilization rates were surveyed for three time periods at 10:00 AM, 3:00 PM, and 7:00 PM on different weekdays. The maximum utilization rate refers to the highest number of parked vehicles observed using the on-street parking spaces. Maximum utilization rates are used to determine the potential impact of any reduction in the number of available on-street parking spaces.

- West 6th and 7th Avenues between Garfield and Charnelton Streets
- West 11th Avenue west of Beltline Road

The 24-hour vehicle classification survey data are summarized in Table 4.11. Heavy vehicles (vehicles with three or more axles) use of the surveyed roadways was moderate. West 7th Avenue east of Polk Street had the highest, with 7 percent in the eastbound direction.

Table 4.11. Existing Daily Heavy Vehicle Usage

Location	Heavy Vehicles as a Percent of Total Traffic	
	Eastbound	Westbound
W 11th Ave – west of Garfield St	4%	5%
W 11th Ave – Chambers St to Garfield St	-	4%
W 6th Ave – east of Polk St	-	5%
W 7th Ave – east of Polk St	7%	-

Source: DKS. All Traffic Data, West 11th Avenue data collected Wednesday, December 12, 2007; West 6th and 7th Avenues collected Thursday, April 2, 2009.

4.1.7. Emergency Services

The City of Eugene Fire Department operates 11 fire stations, 10 engines, two trucks, an Airport Rescue and Fire Fighting unit, and six ambulances. In 2009, it responded to over 21,000 calls for fire and emergency medical service (EMS). While no station is located directly on the proposed LPA alignment, four stations provide fire protection and EMS coverage along the alignment.

The City of Eugene Police Department currently operates four public safety stations and the main police department located in City Hall. One of these safety stations is within the LPA alignment at the intersection of 6th Avenue/Monroe Street. Police officers are dispatched to about 300 calls for service per day, which generates about 25,000 criminal cases per year. In



In addition to regular patrols, the police department also operates a Special Operations Section of the Patrol Division.

The Lane County Sheriff's Office is located a few blocks northeast of the LPA alignment on West 8th Avenue. It provides a variety of correctional services, including a 507-bed jail and a 33-bed Community Corrections Center (work-release).

The Sacred Heart Medical Center/Hilyard Campus, which is located approximately seven blocks east of Eugene Station, is the closest hospital to the Corridor.

4.2. Transit Facilities Services and Impacts

This section provides a summary of impacts to the transit system resulting under the No-Build Alternative and LPA. Topics covered include capital improvements, service characteristics, transit operations, and ridership.

4.2.1. Capital Improvements

This section summarizes the proposed differences in capital improvements under the No-Build Alternative and the LPA. Table 2.1 in Chapter 2 lists the proposed investments for BRT lanes, BRT stations, BRT vehicles, operations and maintenance (O&M) facilities, buses, and Park & Ride facilities.

- BRT lanes: Under the LPA, there would be a net increase of 5.9 lane miles of BRT lanes (Transitway, BRT-Only and BAT lanes) with an additional 2.9 miles of BRT service in mixed traffic.
- BRT stations: There would be no new stations under the No-Build Alternative. There would be 13 new BRT stations or station pairs for the LPA. The station at the Commerce



Terminus would be larger than the others. All new stations under the LPA alternative would be curbside platform stations; there would be no new double-sided center platform stations.

- BRT vehicles: The LPA would include seven new BRT vehicles (including spares).
- O&M facilities: There would be no difference in the number of O&M facilities between the two alternatives.
- Buses: Under the LPA, bus capital facilities would be the same as under the No-Build Alternative, except for the removal of up to 26 bus stops, generally on West 11th Avenue, between Garfield Street and the Commerce Park & Ride Lot, due to removal of Line 30 (a new “Line 30” would be implemented under the No-Build Alternative).
- Park & Ride facilities: Under the LPA, Park & Ride facilities would be the same as under the No-Build Alternative. The Park & Ride lots that would be served by Line 30 under the No-Build Alternative and by EmX under the LPA are Seneca (existing 44 spaces); Lowe’s area (planned 50 spaces); and Commerce (planned 125 spaces).

4.2.2. Service Characteristics

This section compares the alternatives’ service characteristics, including transit coverage, transit operations, hours and frequency of service, transit travel time, and reliability.

4.2.2.1. Transit Coverage

For the purpose of this study, transit coverage is defined as the number of households and jobs within one-half mile of proposed EmX stations. Tables 3.3 and 3.5 in Section 3.3 of Chapter 3 provide all population and job data within one-half mile of the proposed EmX stations.

4.2.2.2. Transit Operations

This section describes the LPA’s transit operations. Table 2.2 in Chapter 2 summarizes the differences between the alternatives.



4.2.2.2.1. BRT Operations

Under the No-Build Alternative, the BRT operations would remain as they are today.

Under the LPA, the existing Franklin/Gateway EmX Line would be extended west using the BRT facilities described for the LPA (see Section 4.1). In general, every BRT vehicle would operate the full length of the EmX line. BRT vehicles will travel east from the new Commerce Terminus Station, through the Eugene and Springfield Stations, around the Gateway loop, through the Springfield and Eugene Stations, and back to the Commerce Terminus Station. All layover and recover time on the full EmX Line would be scheduled to occur at the Commerce Terminus Station, rather than at Eugene Station as under the No-Build Alternative.

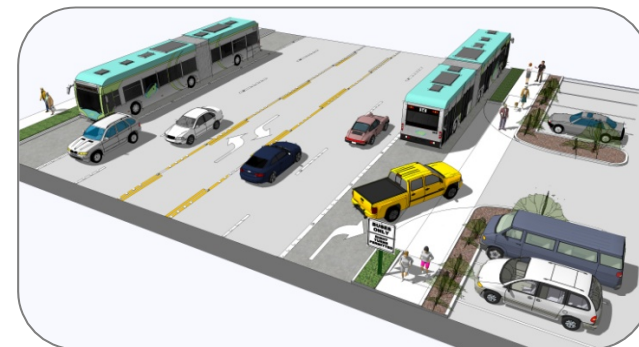
The LPA would result in 810 more BRT vehicle miles traveled and 41 more BRT revenue hours, compared to the No-Build Alternative (average weekdays in 2031).

4.2.2.2.2. Bus Operations

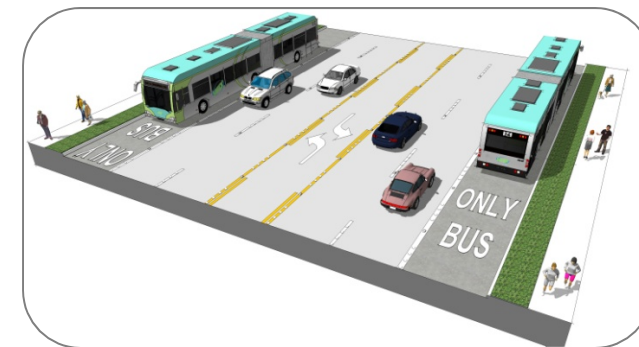
No-Build Alternative

Under the No-Build Alternative, the route for Line 30 would be modified from its 2007 alignment to operate along West 11th and 13th Avenues between Eugene Station and Commerce Station (Figure 2.4, Chapter 2).

In addition, Lines 36A and 36B serving West 18th Avenue would be consolidated into a single route, Line 36, which would operate every 15 minutes during the peak periods and every 30 minutes during off-peak periods. Two new routes would provide service west from the Commerce Park & Ride Lot into the planned Crow Road development area: Lines 34 and 35. Line 34 would operate during peak periods, with connections to employment centers near Willow Creek Road and in the Cone Industrial Park. Line 35 would operate off-peak with the same routing, except that service along Pitchford Avenue and Willow Creek Road would be



BAT Lane



BRT-Only Lane

eliminated. Relatively minor rerouting would also occur with western portions of Lines 41 and 43 to respond to new urban development.

LPA

Weekday bus operations under the LPA would be the same as under the No-Build Alternative, except for the following changes to optimize all service with the new EmX extension. (See Figure 2.8, Chapter 2, for additional detail.):

- Service on Line 41/43 would be eliminated between Commerce Street and Eugene Station (generally via West 11th and 13th Avenues). This service would be replaced with the extended EmX Line.
- Line 41/43 would be interlined with Line 36 at Commerce Street (to provide additional one-seat ride opportunities between the interlined transit lines). As a result, service provided by Line 36 on West 11th Avenue west of South Danebo Avenue and on Arrowsmith and Terry Streets would be eliminated (peak-period service in that segment would continue to be provided by Line 93).
- Line 41/43 would be rerouted from West 8th Avenue, generally between Garfield and Charnelton streets, to West 6th and 7th avenues, and that section of the line would operate as express.
- Lines 40 and 52 would be rerouted from West 5th Avenue, generally between Blaire Boulevard and Charnelton/Oak Streets, to West 6th and 7th Avenues, and that section of the lines would operate as express.
- Line 51 outbound from Eugene Station would be rerouted from West 8th Avenue to West 5th Avenue, between Olive and Washington Streets.
- Line 93 would operate as express on West 11th Avenue, between Commerce and Seneca streets (because there would be right-hand BRT lanes in that segment, which would not be able to accommodate bus stops without potentially increasing BRT operating times).
- Due to reduced midday demand, midday headways on Line 40 would be reduced from 30 minutes to 45 minutes.

These proposed changes to bus operations are designed to address redundant EmX and bus coverage in the Corridor under the LPA and to optimize the LPA's cost-effectiveness (i.e., appropriately balance ridership and O&M costs).

4.2.2.3. Hours and Frequency of Service

Under the No-Build Alternative, the outbound bus route offered by the new Line 30 would be comparable in some respects to the EmX under the LPA. Table 4.12 lists the service hours and frequency of service for Line 30 under the No-Build Alternative and the EmX Line under the LPA. Both the operating hours and frequency of service would be greater under the LPA than the bus service that would be offered under the No-Build Alternative.

Table 4.12. Frequency of Service

	No-Build – Route 30	LPA – EmX Route
Service Hours		
Weekdays	6:00 a.m. – 11:00 p.m.	6:00 a.m. – 11:30 p.m.
Saturday	7:00 a.m. – 11:00 p.m.	7:00 a.m. – 11:30 p.m.
Sunday	8:00 a.m. – 8:00 p.m.	8:00 a.m. – 8:30 p.m.
Frequency¹		
Weekday Peak	4 vehicles per hour	6 vehicles per hour
Weekday Off-Peak	2 vehicles per hour	6 vehicles per hour ²
Weekends	2 vehicle per hour	3 vehicles per hour ³
Evenings	1 vehicle per hour	3 vehicles per hour

Source: LTD 2011.

¹ Weekday Peak hours are generally considered as 6:30 to 8:30 AM and 4:00 to 6:00 PM. Weekday off-peak hours are generally considered as before 6:30 AM, 8:30 AM to 4:00 AM, and 6:00 to 8:00 PM. Evenings are generally considered as after 8:00 PM on weekdays and after 6:00 PM on weekends. Like current service, some routes run earlier and later,

² EmX would run six vehicles per hour until 6:30 PM on weekdays, and three vehicles per hour after 6:30PM on weekdays.

³ EmX would run two vehicles per hour after 9:15 PM on Saturday and two vehicles per hour all Sunday.



4.2.2.4. Transit Travel Time

Based on future traffic volume forecasts and transit operating parameter estimates, both auto and transit travel times were estimated for the 2031 No-Build Alternative and LPA. The estimated travel times are significantly shorter, both for cars and transit, for the LPA compared to the No-Build Alternative (Table 4.13).

Table 4.13. 2031 Travel Time Estimates by Alternative

Trip (From Downtown Eugene Station to)	Travel Time Estimates (minutes)			
	2031 No-Build		2031 LPA	
	Transit	Auto	Transit	Auto
W 11th Ave/Seneca Rd	19.8	13.3	13.7	9.4
W 11th Ave/Commerce St	26.1	18.4	18.8	16.1

Source: DKS Associates, August 2011

4.2.2.5. Reliability

The reliability of transit service would be measured as a ratio of the number of on-time arrivals and departures of the bus/BRT vehicle versus the number of late arrivals and departures for any given stop/station on a line. Under the LPA, an additional 5.9 BRT lane miles would be constructed. This would minimize delay in-route and result in more reliable transit travel times than under the No-Build Alternative. Table 4.14 shows the different operating environments by segment. A key to reliable transit service is providing dedicated transit lanes that are not impacted by traffic congestion in mixed flow travel lanes. As shown in Table 4.15, 67 percent of the LPA Alignment has dedicated BRT lanes which will significantly improve the reliability of transit service under the LPA.



Table 4.14. Physical Operating Characteristics of the LPA

Street Segment	2031 LPA		
	BAT	Mixed	Total (miles)
W 11th, Olive to Charnelton (outbound)	0.00	0.08	0.08
W 10th Olive to Charnelton (inbound)	0.00	0.08	0.08
Charnelton, W 11th to W 10th (outbound)	0.00	0.08	0.08
Charnelton, W 10th to W 7th (outbound)	0.23	0.00	0.23
Charnelton, W 10th to W 7th (inbound)	0.23	0.00	0.23
Charnelton, W 7th to W 6th (outbound)	0.08	0.00	0.08
W 6th, Charnelton to Garfield (outbound)	1.35	0.00	1.35
W 7th, Charnelton to Garfield (inbound)	0.75	0.60	1.35
Garfield, W 6th to W 7th (outbound)	0.08	0.00	0.08
Garfield, W 7th to W 11th (outbound)	0.15	0.15	0.30
Garfield, W 7th to W 11th (inbound)	0.15	0.15	0.30
W 11th, Garfield to Seneca (outbound)	0.11	0.77	0.88
W 11th, Garfield to Seneca (inbound)	0.40	0.48	0.88
W 11th, Seneca to Commerce (outbound)	1.31	0.00	1.31
W 11th, Seneca to Commerce (inbound)	1.04	0.36	1.40
Commerce St loop (inbound)	0.07	0.13	0.21
Total	5.93	2.87	8.84

Source: DKS, 2011.

4.2.3. Transit Ridership

This section provides a summary of the projected ridership under the alternatives.

4.2.3.1. Systemwide and Corridor Ridership

Both systemwide and Corridor transit ridership would be greater under the LPA than under the No-Build Alternative (Table 4.15). Compared to the No-Build Alternative, the LPA is projected to attract approximately 2,150 systemwide additional riders during an average weekday in 2031.

Table 4.15. Systemwide and Corridor Transit Ridership¹

Systemwide and Corridor Transit Ridership								
	2007		2031 No-Build		2031 LPA		2031 New Riders Compared to No-Build	
	Weekday ²	Annual ²	Weekday ²	Annual ²	Weekday ²	Annual ²	Weekday ²	Annual ²
LTD Systemwide	30,900	9,081,050	47,850	14,135,350	50,000	14,816,100	2,150	680,750
West 11th Avenue Corridor	20,580	6,009,350	33,650	9,831,650	35,750	10,507,400	2,050	675,750

Source: John/Parker Consulting, August 2011.

¹ Ridership is rounded to the nearest 50 and is measured in person trips (i.e., linked/ originating trips) that originate from and/or are destined to the Corridor, excluding intra-Downtown Eugene and University of Oregon trips and trips between the Downtown Eugene and University of Oregon.

² Weekday is average weekday ridership; Annual is average weekday ridership multiplied by an annualizing factor.

Person Trip

A person trip is a single one-way trip by a single person using any mode of transportation.

Mode Share

Mode share is a term that describes the percentage of trips being taken by a particular mode (or type of travel) within a given area. Modes of travel could include motor vehicles, transit, bicycle, walking, etc.

Work and Non-Work Trips

Work and non-work trips are terms to describe the end goal of a person's trip within an area. Work trips are undertaken by people traveling to or from their place of employment. Non-work trips are trips made for reasons other than work, i.e. shopping, visiting friends, going to school, etc.

4.2.3.2. Mode Share

Work and non-work trips and the mode share split for those trips were analyzed. The LPA would increase the number and mode share of the transit trips into, within, and out of the Corridor by 1 to 7 percent. The greatest increase would be seen for trips destined to the University of Oregon, which would also have the greatest mode split for both work (39 percent) and non-work trips (10 percent). Chapter 6 provides additional details on mode share.

4.3. Highways and Street Facilities Services and Impacts

This section provides a summary of impacts to highways and streets that would result from the LPA compared to the No-Build Alternative. The following topics are addressed: local streets and

roads; Park& Ride lots; on-street and off-street parking; bicycle facilities; pedestrian facilities; access and loading facilities; and emergency services and facilities. Short-term (construction) impacts are discussed collectively in Section 4.3.4, rather than by topic.

4.3.1. Local Facility Impacts

Local facilities reviewed included bicycle and pedestrians, parking, access, emergency services, safety and freight.

4.3.1.1. Bicycle and Pedestrian Impacts

4.3.1.1.1. Potential Impacts

In general, the LPA would improve certain sidewalks and some bicycle facilities along West 6th, 7th, and 11th Avenues as compared to the No-Build Alternative. Under the LPA, sidewalks would be constructed or widened to 10 feet at, and approaching, areas where the LPA would require roadway widening for BAT lanes, queue jumps, or turn lanes. In some cases, sidewalks would be improved to less than 10 feet wide as necessary to avoid direct impacts to existing buildings. The No-Build Alternative would not improve bicycle and pedestrian facilities.

Under the LPA, pedestrian crossing distances would increase at locations where the construction of BAT/BRT-only lanes would require roadway widening. This would result in slightly longer pedestrian crossing time and additional exposure to traffic.

Under the LPA, sidewalk improvements along West 6th, 7th, and 11th Avenues would provide a wider area to serve pedestrians on both sides of the street. New or enhanced pedestrian facilities proposed as part of the LPA includes the following (also see Figure 2.3 and associated text description of these improvements in Chapter 2):

- Amazon bike and pedestrian bridge, path, and sidewalk connecting Buck Street to West 11th Avenue



- Amazon bike and pedestrian bridge and path connecting Wallis Street/Obie Station and West 11th Avenue
- Enhanced mid-block crossing of West 11th Avenue at the West 11th/Obie Station
- New wider sidewalks on West 6th and 7th Avenues at and approaching all locations where the project would result in ROW widening
- New wider sidewalks on West 11th Avenue from Bailey Hill to Commerce Street (north side of road)

The LPA would maintain or improve the existing bicycle facilities and access within the Corridor. In some areas, bike paths, multi-modal paths, or striped lanes would be realigned to accommodate the LPA; however, no facilities would be removed or reduced. BRT stations would include bicycle parking, and BRT vehicles would have greater bicycle carrying capacity than current LTD buses. A new northbound bike lane would be added on Charnelton Street between Broadway Avenue and West 7th Avenue.

4.3.1.1.2. Possible Mitigation

The LPA would improve the pedestrian and bicycle facilities along the majority of the corridor. No mitigation would be necessary for the LPA.

4.3.1.2. Parking

4.3.1.2.1. Potential Impacts

Parking impacts associated with the 2017 and 2031 LPA are listed in Table 4.16. No parking impacts would occur under the No-Build Alternative.

The LPA would remove 63 on-street parking spaces along the project alignment. In the downtown area (Charnelton Street area between 11th and 6th Avenues), maximum recorded on-street parking utilization was 66 percent. On Polk Street between West 5th and 6th Avenues the maximum recorded on-street parking utilization was 63 percent. On Monroe and Commerce

Streets the maximum recorded utilizations were 27 percent and 34 percent, respectively. There are adequate on-street parking spaces available within one block of each areas identified above to accommodate the removal of the on-street parking spaces under the LPA. Additionally, in the downtown area, where the loss of on-street parking spaces is the greatest, there are two off-street public parking garages with 720 spaces adjacent to Charnelton Street north and south of Broadway available for use by the general public. Property-specific parking impacts are addressed in Sections 3.1 (Land Use and Prime Farmlands) and 3.2 (Property Acquisition) of Chapter 3.

Table 4.16. Future LPA Parking Impacts

On-Street Parking Spaces						Off-Street Parking Spaces			
Street	Existing Spaces	Maximum Utilization	Spaces Removed	Spaces Added	Percent Removed	Existing Spaces	Total Affected ¹	Spaces Removed	
								Number	Percent
Charnelton ²	183	66%	40	10	16%	951	72	18	2%
Polk	17	53%	3	0	18%				
Monroe	20	25%	4	0	20%				
Commerce	58	34%	16	0	28%				
Total	278	-	63	10	-				

Source: DKS, August 2011, Duncan & Brown, December 2011.

Notes: ¹ "Affected" spaces would be moved or removed by the project. "Removed" spaces would be removed by the project.

² Charnelton Street parking space tabulation includes on-street parking spaces on Charnelton Street and on-street parking spaces on side streets for one block east and west of Charnelton Street on W 11th, W 10th, Broadway, and W 8th Avenues.

The impact on off-street parking arises from property acquisitions for the project. The LPA has been designed to minimize impacts to adjacent properties by using existing ROW whenever possible. Still, it could affect approximately 72 off-street parking spaces out of the 951 spaces adjacent to the alignment. Many of the affected off-street parking spaces could be maintained by restriping, shifting, or relocating the affected spaces. Additionally, restriping the parking spaces to a different configuration could minimize the number of spaces removed due to property acquisition. Through the mitigation methods listed below, the number of permanently removed parking spaces could be reduced to as few as 18.

On-Street Parking in Charnelton Area

Under the LPA there will be 39 on-street parking spaces removed along Charnelton Street and one on-street parking space removed from 10th Avenue in Downtown. There will be 10 new spaces created on Charnelton as part of the LPA. This results in a net loss of 30 on-street spaces.

Off-Street Charnelton Area Public Parking

In the Charnelton Area, the Broadway North and Broadway South Parking Garages are located on either side of Broadway and are accessible from Charnelton Street. The 720 space provided by these garages are available for public use at the same hourly rate as the adjacent on-street parking spaces.

A third parking garage is located underneath the City of Eugene Library at the intersection of 10th Avenue/Charnelton Street. This garage is available to Library patrons and is accessible from Charnelton Street between 10th and 11th Avenues.

Maximum Parking Utilization

On-street parking utilization rates were surveyed for three time periods at 10:00 AM, 3:00 PM, and 7:00 PM on different weekdays. The maximum utilization rate refers highest number of parked vehicles observed using on-street parking spaces. Maximum utilization rates are used to determine the potential impact of any reduction in the number of available on-street parking spaces.

4.3.1.2.2. Possible Mitigation

LTD would pay fair market value to property owners for its acquisition of off-street parking spaces (and all acquired property), consistent with state and federal law. LTD would try to minimize parking loss through (a) further design refinements, and (b) parking lot restriping where feasible. It would also replace off-street parking if necessary and where feasible, and support property owners who wish to restripe parking lots to maximize available space.

Overall, the LPA's elimination of on-street parking spaces would not be a significant adverse effect because the parking inventory shows that adequate on-street parking would remain within one block of the removed spaces. LTD would work with the City of Eugene to include in the project's final design up to 10 new on-street parking spaces on the west side of Charnelton Street between 6th and 7th Avenues. No additional mitigation would be necessary.

4.3.1.3. Access

4.3.1.3.1. Potential Impacts

Access impacts to adjacent properties (i.e., driveway impacts) that would result from the LPA were assessed by examining the project's conceptual engineering design. The existing and proposed access points were compared to identify specific access impacts. Possible impacts (closure and modifications) are listed in Table 4.17 and the closure locations are shown in Figures 4.3 and 4.4.

The LPA would close up to six and modify an additional three access points along the project alignment, although it would not eliminate access to any property. All properties affected by an access closure (five commercial driveways and a driveway for the 4J School District bus maintenance facility) would retain adequate alternate access(es) (driveways) to a public street. Two of the six driveways identified for closure, as well as three additional driveways, could potentially be relocated along the same roadway for no net loss of existing roadway access (Table 4.17), subject to safety requirements. Properties adjacent to BAT lanes could experience

improved access due to the presence of the BAT lanes which provides a right turn deceleration lane at access points.

Table 4.17. Access Closure/Modification Sites

<i>Current Use</i>	<i>Address</i>	<i>Access Closure or Modification</i>	<i>Alternate Access</i>	<i>Access Relocation Potential*</i>
Retail	220 W 7th Ave	W 7th Ave	Charnelton St	Yes – West of station on same roadway
Retail	737 W 6th Ave	W 6th Ave (Modification Only)	Madison St and Monroe St	Not necessary. Access to remain.
Automotive Repair	1330 W 6th Ave	W 6th Ave (60 ft west of Polk St)	Polk St and W 6th Ave (120 ft west of Polk St)	No – Second driveway already exists on W 6th Ave
Retail	720 Garfield St	W 7th Place (Modification Only)	Garfield St	Not necessary. Access to remain.
Retail	1704 W 6th Ave	W 6th Ave	Chambers St	Yes – West of station
Retail	1968 W 6th Ave	W 6th Ave	W 6th Ave and Garfield Ave	No – Station covers frontage
4J School District Maintenance Facility	731 Garfield St	W 7th Ave (50 ft east of Garfield St)	W 7th Ave (125 ft east of Garfield St)	No – Second driveway already exists on W 7th Ave
Retail	2920 W 11th Ave	W 11th Ave (Modification Only)	Oak Patch Rd	No – Potential shared access to west
Multiple Retail	4065 W 11th Ave	W 11th Ave (center access of three)	W 11th Ave (access 150 ft east and 300 ft west)	No – Two alternate driveways exist to east and west on W 11th Ave

Source LTD, LCOG, Duncan & Brown LLC, 2012, and DKS Associates-September 2011.

**Note: Final determination for access relocation would occur during project design.*

4.3.1.3.2. Possible Mitigation

LTD would pay fair market value for any property acquisition that affects access, consistent with state and federal law. No additional mitigation would be required, but where feasible LTD would further reduce the impacts by modifying station designs or relocating affected driveways along the same roadway.

Figure 4.3. LPA Access Impacts (Closures): Eastern Portion of Project Corridor



Figure 4.4. LPA Access Impacts (Closures): Western Portion of Project Corridor



4.3.1.4. Emergency Services

4.3.1.4.1. Potential Impacts

Under the LPA, BRT facilities would be designed to allow unimpeded emergency access to the greatest extent possible. However, access to the BRT station or adjacent property could potentially be restricted when EmX vehicles access the stations. For four blocks on Charnelton Street between West 10th and West 6th, there would be limited space for an EmX vehicle to pull out of the way, and an emergency vehicle might need to pull into oncoming traffic to go around the EmX vehicle.

No impacts would occur under the No-Build Alternative.

4.3.1.4.2. Possible Mitigation

It is common practice for emergency vehicles to pull out into oncoming traffic when their lane is blocked. Given the low posted speed and forecast traffic volume on Charnelton Street, the impact of the LPA to emergency vehicles would be minor. No mitigation measures would be necessary.

4.3.1.5. Safety

4.3.1.5.1. Potential Impacts

The LPA's potential safety benefits and impacts include:

Where the LPA would require roadway widening for BAT lanes, queue jumps, or turn lanes, LTD would widen sidewalks along West 6th, 7th, and 11th Avenues to serve pedestrians or bicyclists on both sides of the street. At intersections, the sidewalk improvements would also include ADA compliant ramps. The wide sidewalks (up to 10 feet) would provide more separation between pedestrians and bicyclists than what would be available under the No-Build Alternative.

The addition of BRT lanes on West 6th, 7th, and 11th Avenues would increase the crossing distance for pedestrians. Pedestrian crossing time at modified signalized intersections would be adjusted to allow adequate crossing time. A new mid-block pedestrian crossing with a pedestrian refuge in the median would facilitate pedestrian crossings of West 11th Avenue at the West 11th/Obie Station. Intersection improvements would be designed to allow for clear lines of sight, reducing pedestrian - motorist conflicts.

The LPA would also include exclusive BRT phases at traffic signals when needed to provide safe movement of the BRT vehicle through the intersection. The addition of BAT and BRT lanes would improve traffic safety at intersections by reducing congestion at several intersections.

West 11th Avenue west of Garfield Street would be widened to a seven-lane facility for select segments to provide BAT lanes in both directions. BAT lanes would serve both BRT vehicles and turning general-purpose vehicles. The addition of a turn lane would reduce potential vehicle conflicts for right-turning vehicles, but would increase the potential vehicle conflicts for left-turning vehicles exiting adjacent properties. Vehicles turning left from driveways on West 11th Avenue would be required to cross an additional lane.

In most cases, BRT stations would be located adjacent to designated BRT-only lanes and would eliminate the need for BRT vehicles to stop in a through-travel lane. BRT vehicles would be required to stop in the general-purpose lane for passengers to board and alight from the vehicle at five station locations.

Under both alternatives, increases in traffic volume and congestion from the levels experienced today would lead to increased driver exposure to potential conflicts and collisions. The increases would occur more slowly and create correspondingly less exposure under the LPA.



4.3.1.5.2. Possible Mitigation

Overall, road user safety would be improved under the LPA and no mitigation measures would be necessary.

4.3.1.6. Freight

4.3.1.6.1. Potential Impacts

In general, the LPA would improve traffic flow and, thus, freight movement, compared to the No-Build Alternative. It would include BAT and BRT-only lanes that remove the buses (and bus stops) from the general-purpose traffic lanes, except at three locations along the National Highway System (NHS) as discussed below. In addition, the BAT lane would be shared with turning traffic in several sections along the alignment, which would eliminate vehicle turning movements and the potential friction they create from the adjacent lanes.

The LPA would reduce auto capacity on a NHS arterial street in three places. At two locations on West 6th Avenue and one location on West 7th Avenue, the LPA would convert a general-purpose lane to a BAT lane shared with right- or left-turning traffic. The locations on West 6th Avenue are between Blair and Fillmore Streets and between Charnelton and Lawrence Streets. On West 7th Avenue, the conversion would happen between Washington and Charnelton Streets.

West 6th and 7th Avenues are designated as an ODOT freight route on the NHS. The potential impact to freight on the NHS would be minimal, since intersection capacity and auto/truck travel times would be maintained or increased along the West 11th Avenue Corridor. The conversion of this NHS ROW for a transit facility would require FHWA approval through ODOT.

Under the No-Build Alternative, increases in traffic volume and congestion from the levels experienced today would lead to increased driver exposure to potential conflicts. Increased



BRT Signal Phasing

BRT signal and signal phasing are additional hardware and software added to a traffic signal to allow for safe BRT operations. This hardware is typically added at locations where BRT vehicles may need to turn across several lanes of traffic, enter into the main traffic stream, or where some other operational or safety concerns for BRT operations exist.

congestion would also affect freight delivery schedules due to the potentially long queues and delays along major freight routes.

4.3.1.6.2. Possible Mitigation

The LPA would add street capacity at several intersections that would be used by EmX and turning vehicles. No mitigation measures would be necessary for the LPA.

4.3.2. Local Traffic Impacts

The following sections describe potential impacts to local traffic, including intersection modifications, intersection operations, and travel pattern variations.

4.3.2.1. Local Traffic Intersection Modifications

4.3.2.1.1. Potential Impacts

The LPA would include traffic signal modifications at several intersections to accommodate exclusive BRT signal phasing. This would allow BRT vehicles to safely enter traffic flow or travel through an intersection. The proposed traffic signal changes summarized in Table 4.18 would be in place for opening day of WEEE service.

Under the No-Build Alternative, traffic signal timing would be modified in response to increases in traffic volume. The amount of increased traffic would likely outweigh the benefits gained from signal retiming and congestion levels would likely increase from those experienced today.

Table 4.18. LPA Traffic Signal Modification and BRT Phases

<i>Intersection</i>	<i>No-Build</i>	<i>BRT Phasing</i>
W 10th Ave/Charnelton St	Signalized	Exclusive BRT Phase - Inbound
W 6th Ave/Garfield St	Signalized	Exclusive BRT Phase - Outbound
W 7th Ave/Garfield St	Signalized	Exclusive BRT Phase - Outbound
W 11th Ave/Garfield St	Signalized	Exclusive BRT Phase - Inbound
W 11th Ave/Commerce St	Signalized	Exclusive BRT Phase - Inbound
W 11th Ave/Seneca Rd	Signalized	Exclusive BRT Phase - Inbound

Source: LTD, August 2011.

4.3.2.1.2. Possible Mitigation

The signal modifications would not adversely affect traffic. No mitigation would be necessary for the LPA.

4.3.2.2. Local Traffic Intersection Operations

4.3.2.2.1. Potential Impacts

Part of the traffic analysis focused on operations at the study intersections shown in Figure 4.1. The 2017 and 2031 performance for the No-Build Alternative and LPA are listed in Table 4.19. During both the 2017 and 2031 PM peak hours, 33 of the study intersections would operate as well as or better under the LPA than under the No-Build Alternative. Still, the number of intersections failing to meet mobility standards would increase from five (existing conditions) to 16 in 2031.

No intersection improvements would be constructed under the No-Build Alternative. Under the No-Build Alternative, the number of intersections failing to meet mobility standards would increase from five (existing conditions) to 19 by 2031.

Table 4.19. Future Study Intersection Performance (PM Peak Hour)

Intersection	Operating Standard	2017 No-Build			2017 LPA			2031 No-Build			2031 LPA		
		Delay	LOS	V/C	Delay	LOS	V/C	Delay	LOS	V/C	Delay	LOS	V/C
<i>Signalized Intersections</i>													
W 6th Ave/Garfield St	0.85 v/c	10.6	B	<u>0.90</u>	12.5	B	<u>0.90</u>	11.8	B	<u>0.95</u>	11.8	B	<u>0.94</u>
W 7th Ave/Garfield St	0.85 v/c	23.1	C	0.83	29.1	C	0.80	24.5	C	<u>0.89</u>	29.5	C	0.85
W 6th Ave/Chambers St	0.85 v/c	31.4	C	<u>0.97</u>	20.4	C	<u>0.90</u>	56.1	E	<u>1.05</u>	30.9	C	<u>0.98</u>
W 7th Ave/Chambers St	0.85 v/c	39.0	D	<u>1.03</u>	47.2	D	<u>1.03</u>	52.8	D	<u>1.08</u>	62.6	E	<u>1.08</u>
W 7th Ave/Polk St	0.85 v/c	7.7	A	0.81	8.5	A	0.77	9.5	A	<u>0.90</u>	11.4	B	<u>0.88</u>
W 6th Ave/Blair Blvd	0.85 v/c	9.4	A	0.84	11.2	B	0.84	22.8	C	<u>1.01</u>	26.6	C	<u>1.00</u>
W 7th Ave/Blair Blvd	0.85 v/c	7.4	A	0.79	9.0	A	0.78	10.2	B	<u>0.91</u>	12.3	B	<u>0.91</u>
W 6th Ave/Monroe St	0.85 v/c	4.3	A	0.76	4.0	A	0.75	6.0	A	<u>0.86</u>	5.6	A	<u>0.86</u>
W 6th Ave/Madison St	0.85 v/c	10.3	B	0.76	4.8	A	0.65	15.6	B	<u>0.88</u>	5.1	A	0.73
W 6th Ave/Jefferson St	0.85 v/c	7.6	A	0.76	7.3	A	0.74	9.8	A	<u>0.86</u>	8.7	A	0.83
W 7th Ave/Jefferson St	0.85 v/c	46.6	D	<u>1.05</u>	35.5	D	<u>1.02</u>	84.1	F	<u>1.16</u>	68.6	E	<u>1.12</u>
W 7th Ave/Washington St	0.85 v/c	15.7	B	0.91	16.0	B	<u>0.91</u>	28.9	C	<u>1.01</u>	29.9	C	<u>1.01</u>
W 11th Ave/Beltline Rd	0.80 v/c	42.4	D	<u>1.05</u>	44.6	D	<u>1.05</u>	95.3	F	<u>1.25</u>	93.4	F	<u>1.25</u>
W 11th Ave/Commerce St	LOS D	54.3	D	<u>0.88</u>	48.4	D	<u>0.88</u>	108.5	F	<u>1.08</u>	104.5	F	<u>1.00</u>
W 11th Ave/Bertelsen Rd	LOS D	41.6	D	<u>0.98</u>	39.0	D	<u>0.97</u>	73.6	E	<u>1.13</u>	59.8	E	<u>1.08</u>
W 11th Ave/Bailey Hill Rd	LOS D	55.8	E	<u>1.03</u>	49.6	D	<u>0.95</u>	99.2	F	<u>1.23</u>	93.1	F	<u>1.19</u>

Table 4.19. Future Study Intersection Performance (PM Peak Hour)(Cont.)

Intersection	Operating Standard	2017 No-Build			2017 LPA			2031 No-Build			2031 LPA		
		Delay	LOS	V/C	Delay	LOS	V/C	Delay	LOS	V/C	Delay	LOS	V/C
Unsignalized Intersections													
W 13th Ave/Garfield St	LOS D	>200	B/<u>F</u>	>2.00	>200	B/<u>F</u>	>2.00	>200	B/<u>F</u>	>2.00	>200	B/<u>F</u>	>2.00
W 13th Ave/Washington St	LOS E	34.1	A/D	0.43	34.4	A/D	0.44	57.3	A/<u>F</u>	0.45	57.4	A/<u>F</u>	0.45
W 13th Ave/Lincoln St	LOS E	35.4	A/E	0.39	49.9	A/E	0.49	128.7	A/<u>F</u>	0.96	128.7	A/<u>F</u>	0.96

Source: DKS, 2011.

Signalized intersections:

Delay = Average Intersection Delay (sec.)

LOS = Level of Service

v/c = Volume-to-Capacity Ratio

Bold Underlined values do not meet standards

Unsignalized intersection:

Delay = Critical Movement Approach Delay (sec.)

LOS = Major Street LOS (worst movement)/Minor Street LOS (worst approach)

v/c = Critical Movement Volume-to-Capacity Ratio

Bold Underlined values do not meet standards

4.3.2.2.2. Possible Mitigation

Compared to the No-Build Alternative, the LPA would cause no significant effects on intersection operations. LTD would continue to refine its designs as well as measures such as signalization to improve traffic flow, but no mitigation would be necessary.

4.3.2.3. Travel Pattern Variations

4.3.2.3.1. Potential Impacts

The potential for drivers to modify their travel patterns during the PM peak hour because of the project was investigated. Under the No-Build Alternative, traffic volumes would increase throughout the Corridor. Table 4.20 compares the estimated difference in traffic volumes along key roadway segments for the LPA compared to the No-Build Alternative. A positive number indicates an increase in traffic volume on the road, and a negative number indicates a decrease. Under the LPA, the travel patterns along the West 11th Avenue Corridor are not expected to be substantially different from those under the No-Build Alternative. The numbers shown in Table 4.20 indicate that there would be a low probability of traffic cutting through the neighborhoods.

Table 4.20. Travel Pattern Change from the No-Build Alternative to the LPA (PM Peak Hour)

Street	Cross Streets	Difference (No-Build Alternative – LPA) Vehicles per Hour	
		2017 LPA	2031 LPA
W 5th Ave	Charnelton and Garfield	+ (0 to 5)	+ (0 to 5)
W 6th Ave	Charnelton and Garfield	- (0 to 25)	- (0 to 30)
W 7th Ave	Charnelton and Garfield	+ (0 to 10)	+ (0 to 25)
W 8th Ave	Charnelton and Garfield	- (0 to 15)	- (0 to 20)
W 11th Ave	Charnelton and Garfield	+ (0 to 15)	+ (0 to 15)
W 13th Ave	Charnelton and Garfield	+ (0 to <5)	+ (0 to 5)
W 11th Ave	Garfield and Bertelson	+ (0 to 40)	+ (0 to 50)
W 7th Place	Garfield and Bertelson	- (0 to 20)	- (0 to 25)
W 5th Ave	Garfield and Bertelson	- (0 to 20)	- (0 to 25)

Source: LCOG Regional Travel Demand Model and DKS Associates, December 2011.

4.3.2.3.2. Possible Mitigation

Since the travel patterns along the West 11th Avenue Corridor are not expected to differ substantially between the LPA and the No-Build Alternative, no mitigation would be necessary for the LPA.

4.3.3. Cumulative (Systemwide) Effects

4.3.3.1. Potential Impacts

Long-term LCOG forecasts for the Eugene-Springfield area indicate that development and traffic would continue to grow along the West 11th Avenue Corridor and throughout the area. Future traffic volume forecasts indicate increasing congestion in the Corridor.

Compared to the No-Build Alternative, the LPA Alternative would offer more potential for mode shifts from motor vehicle travel to transit to help reduce congested traffic conditions. Additionally, compared to the No-Build Alternative the LPA would decrease the level of congestion at many of the intersections by the construction of BAT lanes. This comparatively decreased congestion would benefit both transit users and motor vehicle drivers.

4.3.3.2. Possible Mitigation

Compared to the No-Build Alternative, the LPA would reduce the level of congestion at many intersections. No additional mitigation would be necessary for the LPA.



4.3.4. Construction Traffic Impacts and Mitigation Measures

4.3.4.1. Potential Impacts

There would be no construction impacts under the No-Build Alternative.

The LPA alignment would follow the alignment of existing streets—primarily Charnelton Street, West 6th, 7th, and 11th Avenues—and would require the construction of new BAT/BRT-only lanes along much of the alignment. All of the new facilities would be at-grade, and the construction of the new lanes would require widening and reconstructing the existing roadway cross section (travel lane, shoulder, curb, gutter, and sidewalk). This wider road footprint would be constructed within the existing ROW wherever possible, but ROW acquisition would be necessary at places all along the extent of the alignment. Potential Corridor-wide construction-related impacts are summarized in Table 4.21.

LTD anticipates a construction period of approximately 18 months. Of that period, the first several months would be preliminary low-impact work, such as surveying and staging. It would take about six to ten months of heavy construction (street demolition and reconstruction) to build the LPA. That work would be spread over two (summer) construction seasons due to the difficulty of working during winter weather. As described in more detail in the Mitigation section below, the contractor would typically work in contained segments of four to six blocks on one side of the street at a time. LTD anticipates work progressing from west to east.

Sidewalk construction would affect pedestrians and bicyclists. Construction of the BAT/BRT only lanes along the length of the project would impact the existing curb along the extent of these new lanes. The demolition and reconstruction of the curbs, gutters, sidewalks, and other facilities would be necessary to make room for the construction of the project. This activity would generate construction traffic for the removal of debris and the delivery of construction materials and equipment.

Construction may require short-term full and partial lane closures and rerouting of traffic. No long-term full roadway closures are anticipated.

BAT and BRT-only lane construction would also impact side streets. Temporary restrictions of turn movements, into or out of the side streets, and some detours may be necessary in some of these intersections.

Work in residential areas would be completed during the day to comply with City noise limits.



Table 4.21. Corridor-Wide Construction Impacts

Roadway	Functional Classification	Construction Truck Traffic	Road Closure	Detour Route Available?	Sidewalk	Bike Lanes	On Street Parking
W 6th Ave	Major Arterial	Medium	Lane	N/A	Yes	No	No
W 7th Ave	Major Arterial	Medium	Lane	N/A	Yes	No	No
W 11th Ave (Beltline Rd to Garfield St)	Major Arterial	Medium	Lane	N/A	Yes	No	No
W 11th Ave (east of Garfield St)	Minor Arterial	Medium	Lane	N/A	Yes	No	No
Commerce St	Local	Medium	Lane	No	Yes	No	Yes
Bertelsen Rd	Minor Arterial	Limited	Int.	Yes	Int.	Int.	No
Bailey Hill Rd	Minor Arterial	Limited	Int.	Yes	Int.	Int.	No
Seneca Rd	Minor Arterial	Limited	Int.	Yes	Int.	No	No
Tyinn St	Local	Limited	Int.	Yes	Int.	No	Limited
Oak Patch Rd	Major Collector	None	Int.	Yes	Int.	No	No
McKinley St	Major Collector	None	Int.	Yes	Int.	No	No
City View St	Major Collector	None	Int.	Yes	Int.	No	Limited
Garfield St (W 6th Ave to W 11th Ave)	Major Arterial	Medium	Lane	N/A	Yes	No	No
Chambers St	Major Arterial	Medium	Int.	Yes	Int.	Int.	No
Charnelton St	Local	Medium	Int.	Yes	Yes	Yes	Yes
Washington St	Minor Arterial	Limited	Int.	Yes	Int.	No	Limited
Jefferson St	Minor Arterial	Limited	Int.	Yes	Int.	No	No
Blair Blvd	Major Collector	Limited	Int.	Yes	Int.	No	Limited
Polk St	Major Collector	Limited	Int.	Yes	Int.	No	Limited

Source: Obtained from City of Eugene Street Classification Map, November 1999, Figure 60.

*N/A = Not Applicable

Int. = Intersection

Note: Full lane closure means that one full travel lane would be closed to general traffic to allow for construction.

Intersection closure means that a partial or full lane for a street intersecting the corridor would need to be closed to general traffic.

Intersection sidewalk impacts mean that sidewalk reconstruction would be necessary for one or more of the corners of the intersection to match in with the new sidewalk.

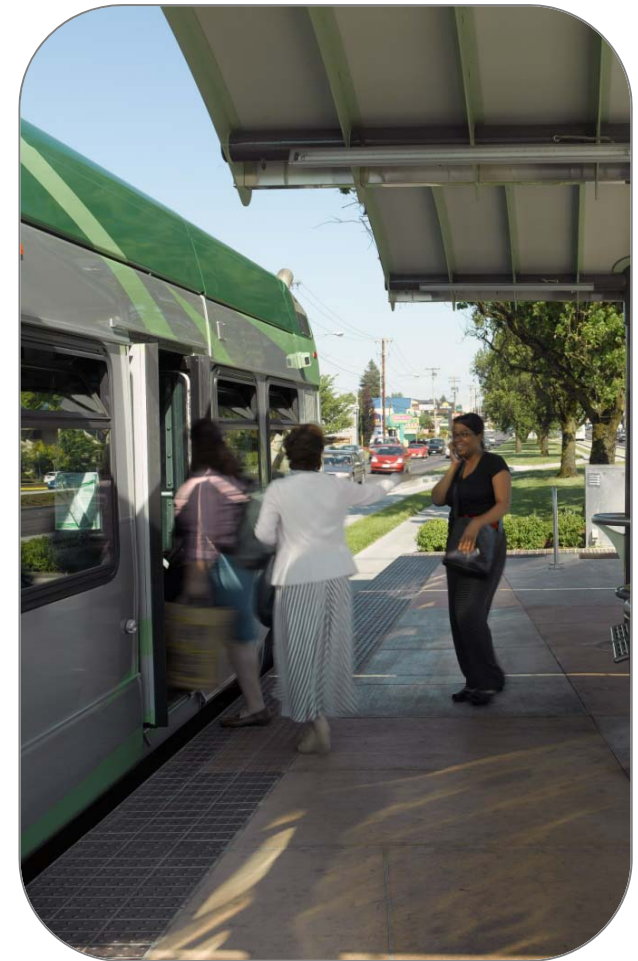
Intersection bike lane impacts mean that the bike lane would be affected by the construction of the project at the intersection.

4.3.4.2. Possible Mitigation

LTD and the contractor will carefully plan construction to minimize the potential impact to businesses, roadway users and surrounding communities. For example, LTD plans to limit the length of the single lane closures to about five blocks, and one side of the road would be worked on at a time to minimize the impact to road users. Shorter segments would be used in locations with higher than normal driveway density. Short construction segment lengths should allow for the contractor to quickly complete the work within a segment and reopen it to the public. The construction activities would flow from one segment to the next in a rolling construction sequence. Two adjoining segments would be worked on simultaneously with the goal of excavating, utility installation, base rock, and paving being completed within a two week period for each segment. Depending on the type of land uses in each construction segment (commercial or residential), and the predominant hours of operation for adjacent businesses, construction could occur at night if it would further reduce potential business and traffic disruptions. Any night work would have to comply with City noise restrictions.

Business access would be maintained to the greatest extent practicable throughout all stages of construction. In high traffic locations or locations with heavily accessed business driveways, construction could take place at night if consistent with the City of Eugene's night construction requirements. This would reduce impacts to the adjacent businesses and their customers.

Mitigation measures would also require early, frequent, and ongoing communication among LTD, contractors, and affected property owners/tenants. Construction timing, staging, and signage would be coordinated by LTD's designated staff liaison in consultation with the affected property owner/tenants to minimize business and residential disruptions. Speed zone reductions within the construction zone, closed or narrow lanes, and temporary driveway relocation would



also be considered to mitigate construction impacts. Variable message signs could also be used to provide road users with advance notice of current or pending construction activities and alternate routes. All required mitigation measures would be specified in LTD's construction contracting documents.

Emergency vehicle access would be provided at all times throughout the construction process.



CHAPTER 5

COSTS AND FINANCIAL ANALYSIS

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5. COSTS AND FINANCIAL ANALYSIS

This chapter presents the financial analysis of the No-Build Alternative and the Locally Preferred Alternative (LPA). Projections based on LTD's Long Range Financial Plan (LRFP) were made using the February, 2011 LRFP, the latest version of the plan available at the time of the analysis. The LRFP is updated annually and typically covers eight fiscal years, however for consistency with related analyses in this EA, the February 2011 LRFP planning horizon was extended to 2031. The February 2011 LRFP and the current LRFP are included as Appendix 5-1 and Appendix 5-2, respectively. The discussion is in year-of-expenditure/year-of-receipt dollars except where noted. The following items are covered:

- Currently Available Revenue
- Operations and Maintenance (O&M) Costs
- Project Capital Costs, Revenue, and Shortfall
- Proposed Additional Project Revenue Sources
- Cash Flow Analysis
- Risk and Uncertainties
- Implementation

5.1. Currently Available Revenue

5.1.1. Payroll and Self-Employment Taxes

LTD is authorized by the State of Oregon to collect a payroll tax to fund public transportation. LTD's payroll tax rate is currently 0.68 percent, with approval in place to increase to 0.7 percent on January 1, 2014. The 2009 State Legislature authorized LTD to collect up to 0.8 percent, with the stipulation that the increase be implemented over a 10-year period, that the increase in any



one year not exceed 0.02 percent, and that the increase beyond 0.7 percent not be initiated until the LTD Board of Directors can make a finding of economic recovery. The LRFP assumes that there will be annual increases of 0.01 percent every year for 10 years starting on January 1, 2015 (Appendix 5-1). LTD's records show a long-term (30-year) payroll tax average annual growth rate of approximately six percent, though there are significant periodic fluctuations reflecting local economic conditions. The LRFP assumes that the payroll tax and self-employment tax will slowly rebound from the current economic downturn, causing annual growth in the tax base of three, four, and five percent for fiscal year (FY) 2012, FY2013, and FY2014, respectively. Long-term growth in the tax base is assumed to be five percent per year, a conservative estimate compared to the long term historic average (six percent) growth rate.

There is also additional tax revenue generated by the increase in the tax rate. The payroll tax is expected to generate \$927.3 million between FY2012 and FY2031 (total of line 12 in LRFP in Appendix 5-1).

5.1.2. Current Fares

LTD fares are based on a flat rate for its entire service area. Table 5.1 lists the current fares as of August 2011. The base adult fare for a single trip (including transfers) is \$1.50. Youth and EZ Access riders pay a reduced fare of \$0.75, and there is no charge for children under the age of five or for Honored Riders age 65 or older. These fares are subject to annual change, according to fare policy guidelines adopted by the LTD Board.

LTD has established the Group Pass Program, an annual contractual program with area employers to provide employees with an annual transit pass. As of June 30, 2010, participating members in LTD's Group Pass Program included 84 area businesses and colleges, including the University of Oregon students, staff, and faculty. Approximately 46,000 area employees and students enjoy group-pass benefits. The Group Pass Program allows unlimited rides for all participants.

Table 5.1. LTD's Current Fare Structure (August 2011)

<i>Cash Fares (per trip – free transfers)</i>	<i>Price</i>
Adult (19-64)	\$1.50
Youth (6-18) & EZ Access	\$0.75
Children (5 & Under) & Honor Riders (65+)	Free
Day Passes	
Adult (19-64)	\$3.00
Youth (6-18) & EZ Access	\$1.50
Monthly Passes	
Adult: One Month	\$48.00
Adult: Three Month	\$130.00
Youth, Senior, Reduced: One Month	\$24.00
Youth, Senior, Reduced: Three Month	\$65.00
Ride Source	
Regular	\$3.00
Escort	\$3.00
Shopper (roundtrip)	\$2.00

Source: LTD, August 2011.

5.1.3. Passenger Revenue

Passenger revenue is a function of ridership and the fares charged. LTD fares are assumed to increase by an inflationary factor, which, when combined with the ridership growth projected under the No-Build Alternative, yields an average increase of fare revenue of five percent per year. Although the LPA is projected to have greater ridership, and therefore greater fare revenue, the analysis used for this EA conservatively assumes the same fare revenue estimates as under the No-Build Alternative. For comparison, over the 25-year period between 1986 and 2011, LTD's passenger revenue records show a seven percent per year average increase in fare revenue. Using these assumptions, passenger revenues under both alternatives are projected to total \$210.4 million for the FY2012 to FY2031 period (total of line 4 in LRF in Appendix 5-1).

5.1.4. Interest Earnings

Projected interest on cash and reserve accounts are based on conservative average interest rates of 0.5 percent. They are projected to total \$.79 million between FY2012 and FY2031 (total of line 24 in LRFP in Appendix 5-1).

5.1.5 Grants

Federal Section 5307 grants are anticipated to continue to provide funding for LTD capital purchases (e.g., vehicles) and system maintenance. LTD also expects continued funding from the Surface Transportation Program and the State Transportation Improvement Plan. Together, these grants are projected to provide \$50.5 million in funding for LTD operations between FY2012 and FY2031 (total of line 22 in LRFP in Appendix 5-1). Funding from FTA's Section 5309 discretionary grants is not assumed as "currently available revenue" and thus is not included in Table 5.2. However, Section 5309 discretionary grants have played a major role in funding LTD's large capital projects, including both previous EmX lines. On January 9, 2012, LTD received notice from FTA that the West Eugene EmX Extension meets all requirements for consideration as a Small Starts project. FTA also determined that the project is ready to proceed into Project Development which allows the project to begin preliminary and final engineering tasks. This is discussed further in Section 5.4: Proposed Additional Capital Revenue Sources.

LTD has requested \$30 million in funding for the WEEE project from lottery-backed bonds issued by the State of Oregon Lottery Funds. The state legislature already allocated \$1.6 million in 2009 for WEEE planning and \$4.2 million in 2011 for the project. LTD will ask for an additional \$24.2 million in future legislative sessions. This latter portion of the projected lottery funds is not assumed as "currently available revenue" thus is not included in Table 5.2. If the entire \$30 million request were to be funded, the balance could address a cost overrun or funding for project elements not eligible for federal funding.

Working Capital

As used in this report, working capital is the balance of funds available for general fund expenditures at the beginning of the fiscal year.

Table 5.2 summarizes anticipated LTD general fund revenue between FY2012 and FY2031 in year-of-expenditure/year-of-receipt dollars. Table 5.3 summarizes currently available project capital funding. Appendix 5-1 provides additional detail on General Fund revenues, including a year-by-year breakdown.

Table 5.2. Summary of Currently Available Transit System General Fund Revenue/Working Capital: Cumulative Total from FY2012 through FY2031 (in millions of year-of-expenditure/year-of-receipt dollars)

<i>Source</i>	<i>Amount (in millions)</i>
General Fund Revenues/Working Capital	
Passenger Fares	\$210.4
Other Operating Revenues (advertising, special service)	\$14.4
Payroll Taxes (including self-employment and state in-lieu taxes)	\$927.3
Operating Grants (includes Sec. 5307 funds for maintenance)	\$50.5
Working Capital	\$9.1
Miscellaneous	\$5.0
Interest	\$0.8
Total General Fund Revenue	\$1,217.5

Source: LTD and WEEE Project Team, 2012.

Table 5.3. Summary of Currently Available Project Capital Funds (in millions of dollars)

<i>Source</i>	<i>Amount (in millions)</i>
Section 5309 Small Starts Funds	\$0.0
State Lottery Bonds	\$4.2
Other local funds	\$0.0
Total Project Capital Funds Currently Available	\$4.2

Source: LTD and WEEE Project Team, 2011.



5.2 Operations and Maintenance Costs

LTD maintains a LRFP that projects system general fund revenues and costs for a rolling eight-year period. For the analysis used in this EA, the LRFP has been extended to cover the period through FY2031. The LRFP is included in Appendix 5-1. The LRFP shows the following:

- Beginning fund balances
- Funding sources and forecast revenue
- Operations and Maintenance costs
- Accessible services fund transfers
- Capital fund transfers
- Ending fund balances

The WEEE project is expected, in its opening year of 2017, to add approximately \$1.2 million (2.8 percent) annual operating cost. Since the WEEE service is scheduled to start in January 2017, only half the annual cost would be added in FY2017. This analysis factors in the additional WEEE service cost and also includes projected inflationary increases in the service cost for future years. (See line 47 of the LRFP in Appendix 5-1)

Table 5.4 summarizes LTD's systemwide estimated operating revenues and costs between FY2012 and FY2031. When including the 2012 beginning working capital, it shows a projected surplus of \$9.5 million with the LPA. Thus, since this operational analysis indicates that adequate resources would be available to operate the LPA, there would also be adequate resources for the lower-cost No-Build Alternative. Appendix 5-1 provides additional detail on general fund revenues and costs, including a year-by-year breakdown.

Table 5.4. Summary of LPA Anticipated Operating Revenue and Operating Cost: Cumulative Total from FY2012 through FY2031

<i>Operating Revenues and Costs</i>	<i>Amount (in millions)</i>
LTD Projected Revenue (+ 2012 Beginning Working Capital): FY2012-FY2031 (from Table 5.2)	\$1,217.5
LTD Projected Operating Cost: FY2012-FY2031	\$1,208.0
Anticipated Surplus: FY2012-FY2031	\$9.5

Source: LTD and WEEE Project Team, 2012.

5.3 Project Capital Costs and Revenues

The No-Build Alternative is conservatively projected to have no capital cost (ignoring vehicle replacements, shelter replacement, and other occasional costs). Table 5.5 summarizes the estimated capital costs for the LPA, the currently available revenue, and the estimated funding shortfall. The estimated cost of the LPA is \$95.6 million in year-of-expenditure (YOE) dollars. This cost was estimated using FTA’s Standard Cost Categories for determining the costs of capital projects. The YOE cost calculation determined the expected spending schedule for the various project elements (such as design, vehicles, and construction) and applied an annual inflation factor of 3.5 percent. Table 5.5 shows \$4.2 million in secured funding, as described above, and the resulting shortfall of \$91.4 million. Options for addressing this shortfall are discussed in Section 5.4.

Table 5.5. LPA Capital Cost, Secured Funding, and Shortfall

<i>LPA Cost and Funding</i>	<i>Amount (in millions)</i>
LPA Capital Cost Estimate	\$95.6
Secured Funding: State Lottery-Backed Bonds	\$4.2
Shortfall	\$91.4

Source: LTD and WEEE Project Team, 2011.

5.4 Proposed Additional Revenue Sources

As explained above, there is no need to identify additional operating revenue sources. LTD has identified two primary sources to address the \$91.4 million shortfall for the capital cost of the LPA: FTA Section 5309 “Small Starts” funds and State of Oregon lottery-backed bonds. Small Starts can fund up to 80 percent of an eligible project, up to a maximum of \$74.9 million. LTD’s proposed capital funding plan assumes that it will secure the maximum Small Starts funding and \$16.5 million in state lottery bonds for the remainder, as shown in Table 5.6.

Table 5.6. Proposed Additional Capital Funding

<i>Funding Source</i>	<i>Amount (in millions)</i>
Section 5309 Small Starts Funds	\$74.9
Additional State Lottery-Backed Bonds (\$4.2 Million already secured) ¹	\$16.5
Total Additional Funding	\$91.4

Source: LTD and WEEE Project Team, 2011.

¹ LTD is requesting a total of \$30 million in lottery funds over multiple legislative sessions. If the entire \$30 million request is funded, an additional \$7.7 million would be available for project elements not eligible for federal funding, or cost overruns.

5.4.1 Federal Funding Sources

The major source of federal funding being sought is FTA’s Section 5309 Capital Investment Grant program. This program applies to major transit investment projects like the West Eugene EmX Extension. Congress sets aside funds for it each year, and eligible projects may compete for the funds. The program includes two categories of projects: “New Starts” and “Small Starts”. LTD will seek funding from the “Small Starts” category.

For a project to qualify for Small Starts funds, its total cost must be less than \$250 million and the requested Section 5309 Capital Investment grant funding must be under \$75 million. It must also include fixed guideway (e.g., priority lanes for BRT) for at least 50 percent of the project’s

length during the peak period, or absent meeting the fixed guideway requirement, it may also qualify if it is a corridor-based bus project that meets certain other minimum requirements.

FTA evaluates Small Starts projects based on the nature of the local financial commitment as well as certain project justification criteria and assigns a rating for each criterion.¹ Some of the project justification criteria compare the proposed project to a so-called “Baseline Alternative.” The Baseline Alternative consists of improvements to the transit system that are relatively low in cost and represent the “best that can be done” to improve transit without a major capital investment. As such, it may be different from the No-Build condition against which environmental impacts are measured in the NEPA document.

The three project justification criteria include:

- **Cost effectiveness.** Incremental cost per hour of transportation system user benefits compared to the baseline alternative; using opening year forecast.
- **Transit Supportive Land use.** Evaluates existing land use patterns.
- **Economic Development.** Evaluates economic development benefits of the project in terms of transit supportive plans and policies and performance and impact of these policies.

FTA may also consider other factors when evaluating project justification.

FTA will assign a medium rating to the local financial commitment if:

- **Funding the local share.** A reasonable plan is developed to secure funding for the local share of capital costs or sufficient available funds for the local (non-Federal) share.
- **Low O&M costs.** The additional operating and maintenance costs of the project are less than five percent of the agency’s operating budget.
- **Overall finances.** The agency is in reasonably good financial condition.

¹ FTA is currently in the process of revising guidance for applying for Federal New Starts funding which could change some of the eligibility criteria in the near future. The information cited here is current as of early 2012

A candidate project is given an overall rating of “High”, “Medium-High”, “Medium”, “Medium-Low” or “Low” based on the individual ratings for the project justification and local financial commitment criteria. FTA will recommend funding for projects rated “Medium” or better. As with all Section 5309 Capital Investment Grants, the rating process is separate from the budget decisions and a “Medium” or better rating makes a project eligible, but does not guarantee funding.

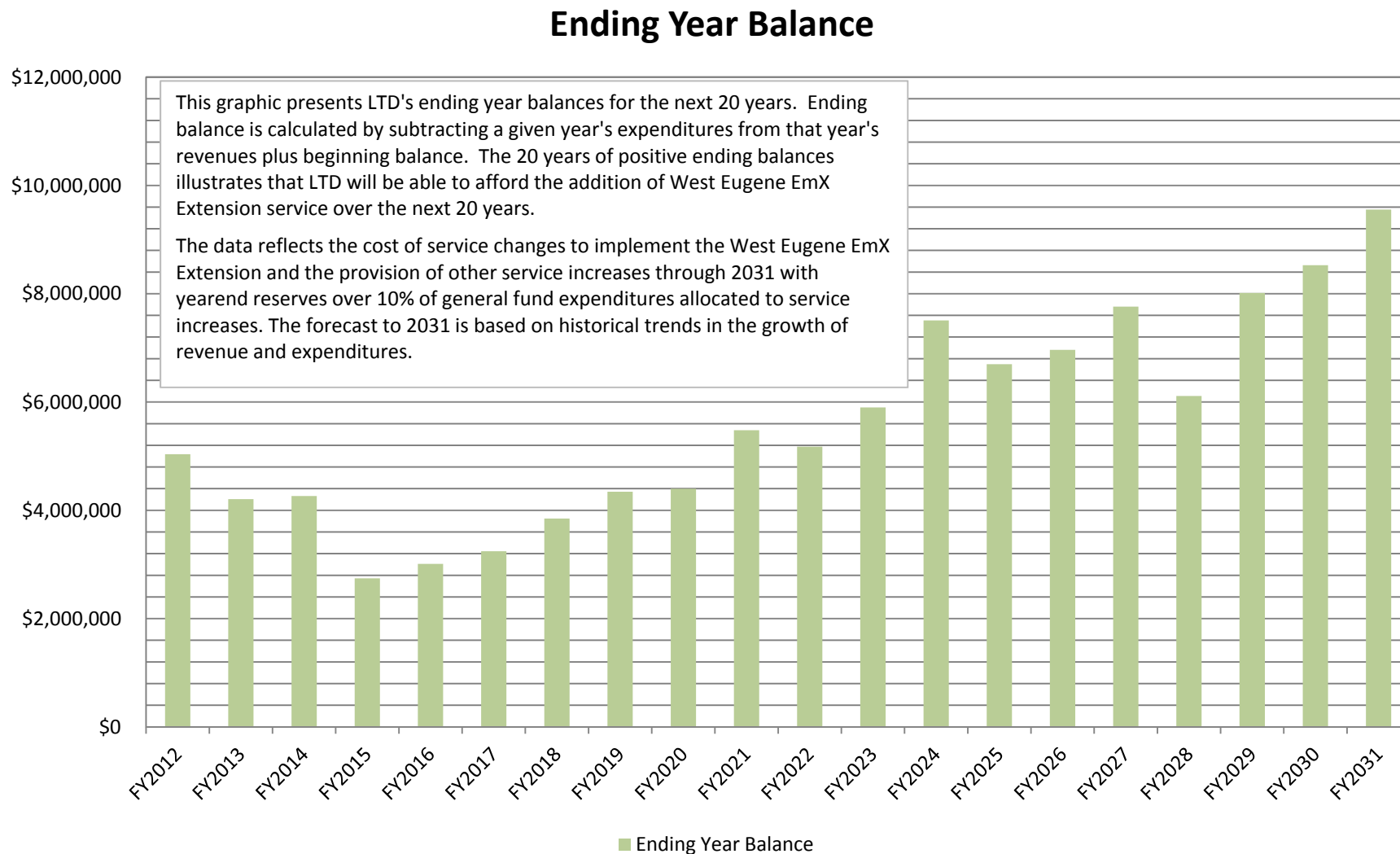
On January 10, 2012, FTA notified LTD that the West Eugene EmX Extension meets all requirements for consideration as a Small Starts project, and the project received an overall project rating of “Medium” (See Appendix 5-3 for FTA letter). This was based on “Medium” ratings for project justification and local financial commitment. FTA also determined that the project is ready to proceed into Project Development phase which combines preliminary engineering and final engineering activities. Note that project evaluation is an on-going process which occurs annually in support of budget recommendations presented in FTA’s *Annual Report on Funding Recommendations* to Congress as a companion document to the annual budget submitted by the President.

5.5 Cash Flow Analysis

LTD’s policy is to maintain reserves of at least \$3 million. Appendix 5-1 includes the most recent LRF extended to 2031, which assumes the implementation of the LPA. Figure 5.1 shows the beginning and ending balances from the LRF for FY2012 through FY2031. Adequate year-end balances of at least \$3 million would be maintained, except for a year-end balance of \$2.74 million in FY2015. For the purpose of the analysis LTD assumed that cash reserves will not exceed 10 percent of total general fund expenditures, and that LTD would look for the most effective ways to apply the surplus to service increases (line 46 in LRF in Appendix 5-1). Because the cash-flow projections are conservative, LTD considers that small one-year dip below the \$3 million threshold to be acceptable.



Figure 5.1. LTD Cash Flow Summary: FY2011 through FY2031



Source: LTD and WEEE Project Team, 2012.



5.6 Risk and Uncertainty

5.6.1 Operating Cost Uncertainty

As with any similar project, WEEE's estimated general fund revenues and costs are based on a series of assumptions regarding (a) the availability and growth rates of funding sources and (b) future costs. While these estimates have been conservative, significant events, such as a policy shift in state or federal funding or an economic recession, could lead to an unanticipated shortfall in money needed for operations.

Anticipated revenue projections create the greatest uncertainty. Payroll taxes make up the greatest portion of the general fund revenues. While its long-term growth is highly likely, short-term fluctuations created by changes to the local economy are more difficult to anticipate. Because the payroll tax represents such a significant portion of the general fund, a small change in its projected growth rate can significantly affect downstream revenues.

Current projections indicate a surplus of \$9.5 million in general fund revenues between FY2012 and FY2031. Should there be a shortfall in funding or an unanticipated increase in cost, the surplus funds could be used to absorb the revenue/cost differential. Should the shortfall exceed the anticipated surplus, possible solutions would be to find additional revenue or reduce costs. Identifying and securing additional operating revenue is very difficult and would likely involve a proposal that would go to voters. LTD has considered options for additional long-term operating revenue and, to this point, has decided not to pursue those options. The most likely response to an operating fund shortfall, at least in the short term, is to reduce costs. LTD would likely first look for reductions to items that do not directly affect the service level. However, since a large percentage of LTD's operating budget is tied to service, a significant operating fund shortfall would ultimately look towards service cuts as a remedy.

Given LTD's five-year experience with EmX operations, it is fairly unlikely that operating costs inherent to BRT operations will significantly exceed estimates. However, there are risks, such as fuel price spikes or labor contract cost increases, which could increase the cost of LTD operations systemwide. The LPA would not affect or be affected by these risks differently than the No-Build Alternative. LTD is constantly trying to manage these risks and would continue to do so regardless of whether or not the LPA is implemented.

5.6.2 Capital Cost Uncertainty

The project capital cost estimate was prepared based on a design that is currently six to eight percent complete. This level of design unavoidably includes many unknowns that can affect project costs (e.g., soil conditions). LTD included industry-standard contingencies in its cost estimates to account for such unknowns (\$19.0 million in allocated contingencies and \$4.0 million in unallocated contingencies).

Despite the large contingency allocation and LTD's extensive EmX experience, there is a chance that capital costs will exceed estimates. If that occurs, LTD could: 1) reduce project costs; and/or 2) obtain additional revenue. Reducing project costs could be done through value engineering or by reducing or eliminating some project elements, such as exclusive transit lanes, transit stations, and project amenities. The option to eliminate project elements brings its own risks, since the project was developed with a great deal of public participation, review by elected officials, and participation and approvals by FTA. In addition, the current design was used to determine project performance measures, including ridership and cost-effectiveness. Significant changes in project scope would have to be weighed against public expectations, elected officials' decisions, commitments made to FTA, and possible effects on project performance.

Several potential sources of additional funding could cover possible cost overruns:

- LTD could seek additional lottery-backed bonds through the State of Oregon. The proposed project funding includes \$20.7 million from lottery funds. However, LTD's pending request to the state legislature is for \$30 million in lottery funds. If the entire \$30 million request were to be funded, the \$7.7 million balance could address a cost overrun or funding for project elements not eligible for federal funding (such as undergrounding of utilities).
- LTD could seek more funding from the City of Eugene and/or Lane County, and/or apply to programs such as Connect Oregon (a state funding program for non-highway transportation projects).

5.7 Implementation

To implement the funding plan successfully, LTD must:

- Properly refine and finalize capital cost estimates as the project design moves forward.
- Obtain the required state lottery-backed bonds in upcoming legislative sessions, or identify and secure other sources of non-FTA funds.
- Secure approval of Small Starts funds from the FTA.



CHAPTER 6

EVALUATION OF ALTERNATIVES

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6. EVALUATION OF ALTERNATIVES

This chapter summarizes the abundance of project evaluation information and identifies key differences between the alternatives in non-technical language. It evaluates the effectiveness, equity, and major trade-offs for each alternative, relying on the analyses described in previous chapters. The preliminary level of design and the challenges of long-term forecasting mean that some of the specific numerical values compared below may not prove precisely accurate, but they are nevertheless valuable for comparative purposes.

Section 6.1 evaluates the alternatives' effectiveness in meeting the transportation, land use, and environmental objectives listed in Chapter 1. Section 6.2 evaluates the social equity issues associated with project alternatives, assessing the adverse impacts and benefits of the project to minority and low-income communities, as well as LTD's Disadvantaged Business Enterprises (DBE) Program. The major fiscal, effectiveness, and cost-effectiveness trade-offs of the alternatives and options are summarized in Section 6.3.

6.1. Effectiveness in Meeting Corridor Objectives

Based on the project's Purpose, Needs, Goals and Objectives, LTD established seventeen Measures of Effectiveness (MOE) in March 2008 to assess project alternatives (see Table 6.1). This section looks at each objective in turn and uses the MOEs to assess and compare each alternative's ability to meet the objective. The measures were selected to be particularly relevant to the choices at hand.



Most of the information summarized in this section is based on the analyses documented in preceding chapters of this EA. In general, those chapters provide information or reference supporting technical reports that include more detailed descriptions of the data and the methodologies used to develop the data referenced in this section.

Table 6.1. Project Objectives and Measures of Effectiveness

<i>Objective</i>		<i>Measure(s) of Effectiveness</i>
1	Improve customer convenience by reducing travel time, increasing service reliability, and making other service improvements	Round-trip transit travel time between select origins and destinations
		Difference in transit ridership vs. today
2	Improve operating and other efficiencies to maximize the use of scarce resources	Cost per trip
		Operating hours of regular bus service replaced by EmX within the corridor
		Ability to support the overall Bus Rapid Transit System Plan
3	Support development that is consistent with planned land use documents and serves as a catalyst for planned transit-oriented development	Vacant and redevelopable land near the alignment
		Number of mixed-use centers (land use nodes) served by the alignment
4	Help accommodate future growth in travel by increasing public transportation's share of trips	Population and employment density near alignment
		Transportation mode shift
5	Consider the mobility and safety needs of pedestrians, bicyclists, and motorists	General assessment of interface with pedestrians, bicycle, and vehicle facilities
6	Provide for a fiscally stable public transportation system	General effect on fiscal stability
		Operating cost
7	Protect environmental resources	Potential for acquisitions and/or displacements of residents, businesses, and parking
		Potential impact to street and landscape trees
		Likelihood of adverse impact to environmentally sensitive natural resources (i.e., wetlands, parkland, historic resources, critical habitat)
8	Support LTD's sustainability policy and the City of Eugene's efforts to reduce greenhouse gas emissions	Ability to support LTD's sustainability policy
		Potential for alternative to increase public transportation's share of trips, thereby reducing vehicle miles traveled and single occupancy vehicle use

Source: West Eugene EmX Extension Alternatives Analysis Report, July 2011.

6.1.1. Improve Customer Convenience by Reducing Travel Time, Increasing Service Reliability, and Making other Service Improvements

This objective is evaluated based on (a) round-trip travel times between select pairs of origins and destinations, and (b) projected transit ridership.

6.1.1.1. Transit Travel Time between Select Origins and Destinations

One favorable measure of customer convenience is reduced travel time between select origins and destinations. Table 6.2 shows 2007 transit travel times for the Corridor. Details of the development of the methodology and calculations for the transit travel times are provided in the WEEE Transit Travel Time Methodology Memorandum (Appendix 4-2).

Table 6.2. 2007 Transit Travel Times along West 11th Avenue Corridor

Trip	Travel Time (minutes)
Downtown Eugene to:	2007
W 11th Ave/Seneca Rd	15.1
W 11th Ave/Commerce St	19.5

Source: DKS Associates, January, 2011.

Based on future traffic volume forecasts and transit operating parameter estimates, estimated auto and the transit travel times would be better under the LPA in 2031 (Table 6.3).



Table 6.3. 2031 Travel Times Estimates by Alternative

Trip (From Downtown Eugene to)	Travel Time Estimates (minutes)			
	2031 No-Build		2031 LPA	
	Transit	Auto	Transit	Auto
W 11th Ave/Seneca Rd	19.8	13.3	13.7	9.4
W 11th Ave/Commerce St	26.1	18.4	18.8	16.1

Source: DKS Associates, Transportation Technical Report. 2010. Addendum August 2011.

6.1.1.2. Transit Ridership

For this MOE, higher levels of ridership are considered more favorable. Ridership projections were generated from the Lane Council of Governments (LCOG) Travel Demand Forecasting Model. The LPA’s average Corridor weekday ridership would exceed that of the No-Build Alternative by 6.1 percent (2,050 riders); the LPA would exceed the No-Build Alternative in systemwide average weekday ridership by 4.5 percent (2,150 riders) (Table 6.4).

Table 6.4. Systemwide and Corridor Transit Ridership¹

Systemwide and Corridor Transit Ridership								
	2007		2031 No-Build		2031 LPA		2031 New Riders Compared to No-Build	
	Weekday ²	Annual ²	Weekday ²	Annual ²	Weekday ²	Annual ²	Weekday ²	Annual ²
LTD Systemwide	30,900	9,081,050	47,850	14,135,350	50,000	14,816,100	2,150	680,750
West 11th Avenue Corridor	20,580	6,009,350	33,650	9,831,650	35,750	10,507,400	2,050	675,750

Source: John/Parker Consulting- August 2011.

¹ Ridership is rounded to the nearest 50 and is measured in person trips (i.e., linked/ originating trips) that originate from and/or have destinations in the Corridor, excluding intra-Downtown Eugene and University of Oregon trips and trips between the Downtown Eugene Station and University of Oregon.

² Weekday refers to average weekday ridership; Annual refers to average weekday ridership multiplied by an annualizing factor.

6.1.2. Improve Operating and other Efficiencies to Maximize the Use of Scarce Resources

Improving operating and other efficiencies to maximize the use of scarce resources is measured by the cost per trip of each alternative, the service replaced by the EmX route, and the ability to support the overall Bus Rapid Transit (BRT) System Plan.

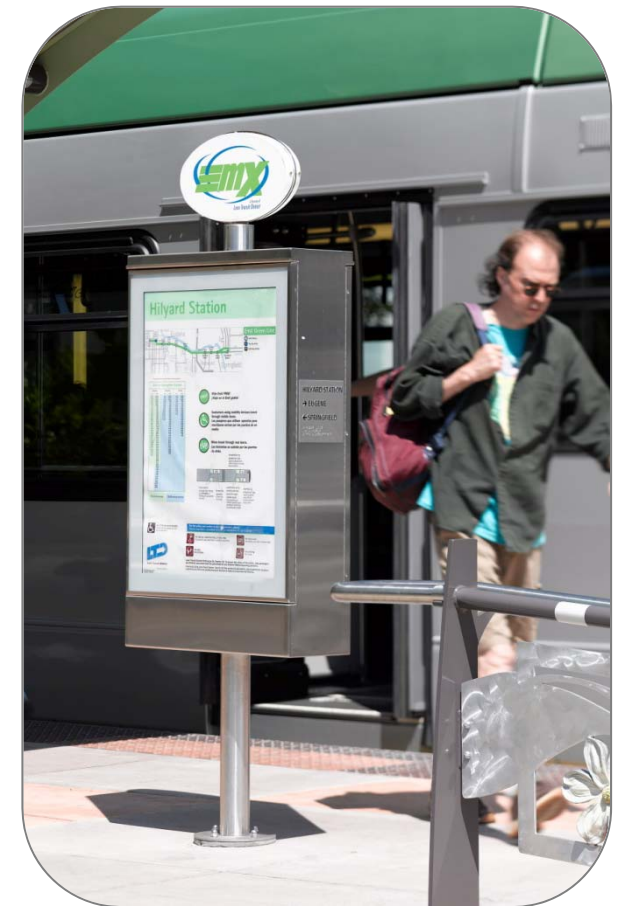
6.1.2.1. Cost per Trip

The cost per trip indicates the operating efficiency of a transit system. To calculate it, LTD divided the systemwide operating cost (determined by service hours, service miles, and peak buses required to operate each alternative) (in Year 2011 dollars) by the ridership projections for each alternative. As shown in Table 6.5 the LPA would have an opening-year operating cost per trip of \$3.90 compared to \$4.03 for the No-Build Alternative, a 3.3 percent difference. As explained in Section 2.4.2, the savings would be greater over time, because the LPA costs would increase less than the No-Build Alternative costs.

Table 6.5. Opening-Year Cost per Trip Comparison

	<i>Operating Cost (in millions)</i>	<i>Annual Ridership (2017, person-trips)</i>	<i>Cost per Trip (2011 dollars)</i>
No-Build	\$44.58	11,056,100	\$4.03
LPA	\$45.76	11,733,900	\$3.90
LPA Compared to No-Build	--	--	-\$0.13 (-3.3%)

Source: LTD and West Eugene EmX Extension Project Team, 2012.



6.1.2.2. Operating Hours of Regular Service Replaced by EmX within the Corridor

The EmX system is designed to replace existing transit service along major transportation corridors with BRT. This decreases LTD’s operating cost and avoids a potential duplication of service. LTD reviewed existing service along the Corridor and determined that the LPA would replace 13,408 hours annually of regular bus service. The No-Build Alternative would not replace any existing transit service.

6.1.2.3. Ability to Support the Overall BRT System Plan

The EmX System Plan, as envisioned in the RTP, identifies EmX service on major transportation corridors and nearby activity centers. The LPA would implement BRT and, therefore, would support the overall EmX System Plan; the No-Build Alternative would not.



6.1.3. Support Development that is Consistent with Planned Land Use Documents and Serves as a Catalyst for Planned Transit-Oriented Development

Two measures were used to assess the LPA’s potential to catalyze or support transit-oriented development in the Corridor: the amount of vacant and redevelopable land near the alignment and the number of designated mixed-use centers served by the alignment. The LPA would likely catalyze such development; the No-Build Alternative would not.

6.1.3.1. Vacant and Redevelopable Land Near the Alignment

Studies have shown that BRT, in combination with other factors, can promote positive changes in land use, encouraging redevelopment opportunities along the BRT corridor and enhancing property values. This MOE tabulates the amount of vacant and redevelopable land located within one-quarter mile of proposed EmX stations. The assessed values of tax lots within one-

quarter mile of proposed stations were reviewed to identify underdeveloped and vacant land in the corridor. Any tax lot touched by the one-quarter mile buffer line was included. Tax lots were categorized as developed, redevelopable, vacant, or non-developable based on the ratio of land value to improvement value and the zoning classification. Some tax lots were categorized as “unknown” because the land value and the improvement value were equal to \$0.

For the LPA, within one-quarter mile of all proposed EmX stations, approximately 37.9 percent of the land is redevelopable (16.2 percent) or vacant (21.7 percent). The redevelopable and vacant land is valued at \$259.97 million and \$46.75 million respectively, for a total of approximately \$306.72 million.

Table 6.6 identifies the amount and value of land types, including vacant and redevelopable land, within one-quarter mile of all proposed EmX stations. (Vacant and redevelopable land data were not compiled for the No-Build Alternative since there is no indication that it would have any effect on development and revitalization.)

Table 6.6. Vacant and Redevelopable Land within one-quarter mile of the LPA

Land Type	Acres	Percent of Total Land Types	Value (in millions of 2011 dollars)
Developed ¹	758.08	48.3	\$1,673
Redevelopable ²	253.26	16.2	\$259
Vacant ³	340.95	21.7	\$46
Non-Developable ⁴	182.35	11.6	\$104
Unknown ⁵	34.20	2.2	\$0
Total	1,568.84	100.0	\$2,084

Source: Otak, Land Use and Prime Farmlands and Development Technical Memo Addendum. August 2011.

Notes:

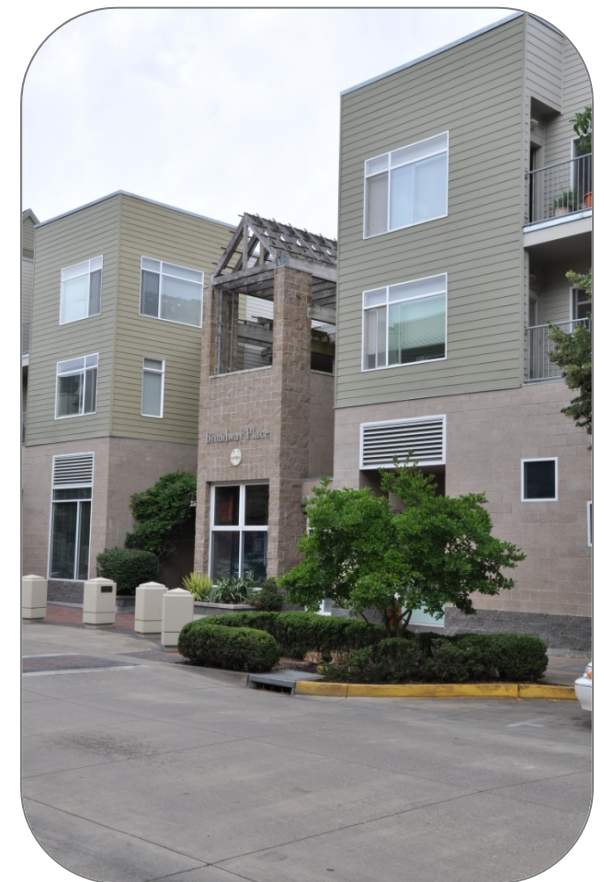
¹ Land Value/Improvement Value = less than 1.5 and Improvement Value = \$1,000 or greater

² Land Value/Improvement Value = 1.5 or greater and Improvement Value = \$1,000 or greater

³ Improvement Value = less than \$1,000

⁴ Includes all tax lots with a zoning classification of natural resource, parks/open space, public land

⁵ Land Value and Improvement Value both = \$0



6.1.3.2. Number of Mixed-Use Centers (land use nodes) Served by the Alignment

BRT supports existing market forces that increase the potential for transit-oriented development. Improved transit access can increase the convenience and desirability of surrounding residential, commercial, and office properties. Because transit stations concentrate the number of people at the station locations, development near stations can be more intense and mixed-use in nature.

Policies adopted by the City of Eugene, the Metropolitan Planning Organization (MPO), and the State of Oregon support nodal development (also called Mixed-Use Centers and Transit-Oriented Development). Alternatives providing high-capacity transit service to, or connecting, the greatest number of mixed-use centers are considered to have the highest potential for supporting the City's growth management policies and designated areas for development. Additionally, alternatives serving greater numbers of mixed-use centers are better able to maximize transportation options.

The No-Build Alternative would not support local, regional, and state land use and transportation policies that encourage increased density and nodal development along major arterial corridors because it would not include BRT. Without the high-capacity transit component, nodal development would be severely limited in scope and density. To the extent that it does occur due to market forces or other conditions, it would exacerbate congestion on nearby roadways. A further effect could be development in lower density areas at the perimeter of the urban area and continued automobile-oriented land use patterns. This could lead to developing more land area and creating longer travel patterns.

By comparison, the LPA would serve eight designated nodal development areas. The West 6th/7th Avenue segment of the LPA would serve three: Downtown, Midtown, and Whiteaker. The West 11th Avenue (West of Garfield Street) segment of the LPA would serve another five: Chambers, Westmoreland, City View, Bailey Hill, and Beltline Employment. The LPA would support the growth envisioned by adopted plans and policies. The presence of EmX and the



increased mobility in the Corridor would support more development, less need for automobile parking, and a wider mix of uses already allowed in the existing zone districts. Overall, the LPA would support applicable land use plans that encourage higher density, mixed land uses in the Corridor's nodal development areas.

6.1.4. Help Accommodate Future Growth in Travel by Increasing Public Transportation's Share of Trips

This criterion assesses the alternatives' effectiveness in providing improved transit service and increased transit use. It is based on the project's objective to help accommodate future growth in travel by increasing public transportation's share of trips. Two MOEs are used for this criterion: population and employment density served and transit mode shift.

6.1.4.1. Population and Employment Density Near Alignment

The population and employment density served by the No-Build Alternative and LPA was measured (Tables 6.7 and 6.8). Above-average population and employment densities within a one-half mile area around the LPA's proposed stations are indicators of potentially high levels of transit ridership. The population density was calculated by dividing the number of people by the total number of acres within the one-half mile area. The employment density was calculated by dividing the number of employees by the number of acres within the one-half mile area.

While the density of residents and employees in the Corridor is the same under both alternatives, however, the mobility and mode choices of the residents and employees are likely to differ under the LPA. Traffic congestion would be expected to increase more quickly under the No-Build. This would reduce the efficiency of the region's roadway network for all modes of travel and reduce the attractiveness of transit. Ridership would increase, but more slowly. The LPA's enhancement of the project area's transportation network would make transit more efficient and attract new riders, increasing the transit mode share. This is one reason why the LPA is likely to



increase public transit’s share of trips more than the No-Build Alternative, and explains the quantitative findings in the following section.

Table 6.7. Population within One-Half Mile of BRT Stations along the LPA

Corridor Segment	2008 Population	2031 Population	2008 Population Density (people / acre)	2031 Population Density (people / acre)
Eastern Corridor – Eugene Station to Garfield St	13,025	14,179	9.1	9.9
Western Corridor – Garfield St to Commerce Terminus	5,989	6,978	3.6	4.2

Source: West Eugene EmX Extension Project Team, 2011.

Table 6.8. Employment within One-Half Mile of BRT Stations along the LPA

Corridor Segment	2008 Employment	2031 Employment	2008 Employment Density (employees / acre)	2031 Employment Density (employees / acre)
LPA	27,705	30,992	8.6	9.6

Source: Socioeconomics and Environmental Justice Technical Memorandum for WEEE AA/DEIS, April 2010.

6.1.4.2. Transportation Mode Shift

This MOE also derives from the project’s objective to increase public transportation’s share of trips (known as mode split). For each alternative it measures the projected shift from other travel modes to transit.

Table 6.9 summarizes the corridor and systemwide transit mode split for each alternative in Year 2017 (opening year) and Year 2031, based on projections from the LCOG Travel Demand Forecasting Models. Both alternatives see an increase in transit ridership and transit share. Table 6.9 shows that the LPA sees about 9 percent more of an increase in transit share than the No-Build in 2017; similarly, the LPA's share of transit riders is about 6 percent more than the No-Build's share would be in 2031. Under the LPA the absolute increase in mode split compared to the No-Build Alternative is 0.4 percent in 2017 and 0.3 percent in 2031. Systemwide transit mode splits are also higher for the LPA, though by a smaller amount than for corridor trips. Thus, more travelers would shift to transit under the LPA than under the No-Build Alternative.

Table 6.9. Mode Split Comparison

	Mode Split Year 2017		Mode Split Year 2031	
	Corridor ¹	Systemwide	Corridor	Systemwide
No-Build	4.4%	2.5%	5.0%	2.7%
LPA	4.8%	2.6%	5.3%	2.8%
LPA Absolute Increase	0.4%	0.1%	0.3%	0.1%
LPA Percent Increase Over No-Build	9.1%	4.0%	6.0%	3.7%

Source: John Parker Consulting, *Transit Impacts and Travel Demand Forecasting Results Technical Report, 2010*

¹ Corridor is defined as trip having at least one trip end in the corridor.

6.1.5. Consider the Mobility and Safety Needs of Pedestrians, Bicyclists, and Motorists

The project prioritizes the travel and safety needs of pedestrians, bicyclist, and motorists. This was qualitatively assessed by reviewing the various types of facilities to determine if alternatives had the potential to cause conflicts. The LPA would introduce some increased risk of conflict, but its new/improved pedestrian and bike facilities would also lessen the risk in many locations. The No-Build Alternative would have no discernible effect on safety.



6.1.5.1. General Assessment of Interface with Pedestrians, Bicycle, and Vehicle Facilities

This criterion examines whether the alternatives would create potential conflicts with other corridor users. The assessment first reviewed the existing facilities along the Corridor to determine what type of bicycle facilities exist. The degree of conflict would depend on several factors, including the presence of dedicated bicycle lanes, type of intersection control, and intersection geometry. The assessment also determined what types of pedestrian facilities exist and considered whether the alternatives would either relocate or lengthen any pedestrian facilities. Finally, the analysis examined whether the planned traffic signal phasing and potential use of priority measures would impact motor vehicle safety and mobility.

The No-Build Alternative does not include any pedestrian or bicycle improvements; it would create no new conflicts. The LPA would create a moderate potential for conflicts between BRT and bicycles. However, where EmX replaces existing service, it would likely reduce existing bus/bicycle conflicts, given the reduced number of stops and the shorter time at stops. Pedestrian crossing distances in sections where EmX lanes have been added would be longer, increasing the pedestrian crossing phase of the traffic signal. With proper signalization and pedestrian refuges, this would not be problematic.

The LPA would improve sidewalks along West 6th, 7th, and 11th Avenues, creating a wider walking area to serve pedestrians and bicyclists on both sides of the street. The LPA's other new or enhanced bicycle/pedestrian facilities include the following:

- Amazon bike and pedestrian bridge, path, and sidewalk connecting Buck Street to West 11th
- Amazon bike and pedestrian bridge and path connecting Wallis Street/Obie Station and West 11th Avenue
- Enhanced mid-block crossing of 11th Avenue at the W 11th/Obie Station
- West 11th Avenue sidewalk west of Bailey Hill (north side of road)
- West 11th Avenue sidewalk, west of Bertelsen (north side of road)

These new facilities, especially the crossings, provide added convenience for pedestrians and bicyclists to access EmX and destinations in the West 11th Avenue area, and also improve safety by reducing the need for bicyclists to use city streets to access West 11th Avenue from the south.

Finally, the numerous intersection improvements incorporated into the LPA (see Table 4.19) would increase intersection safety as well as performance.

6.1.6. Provide for a Fiscally Stable Public Transportation System

To preserve the viability of LTD and the BRT system, each EmX corridor should contribute to the fiscal stability of the public transportation system. This criterion is measured by assessing the alternatives' effect on LTD's fiscal stability as it relates to the affordability of their capital investments and operating costs. It focuses on the LPA because of that alternative's capital requirements.

6.1.6.1. General Assessment of Effect on Fiscal Stability

This MOE focuses on the affordability of the capital investment.

The LPA's cost estimate was based on the preliminary design, and it includes design and engineering, property acquisition, vehicles, construction costs, management/administrative costs, and a significant contingency factor to account for the inherent risks in preliminary designs. As shown in Table 6.10, these estimates total \$95.6 million. The No-Build Alternative would have no capital costs. Regarding revenue, an estimated \$103 million in federal and state grants could be available for the LPA; however, additional local funding might be required if the project's capital costs exceed the amount of federal and state grants available. Use of local funding for the project would impact LTD's operating budget and could affect service levels. LTD believes that the capital costs and the budgeted federal and state grant funds are conservatively estimated and that the risk of capital requirements exceeding the budgeted funding is small, and that the LPA would not require local funding to be completed.



Table 6.10. Capital and Operating Costs Comparison, 2017

<i>Alternative</i>	<i>Capital Cost (millions)</i>	<i>Annual System Operating Cost (millions)</i>	<i>Systemwide Operating Cost per Trip (YOE dollars)</i>
No-Build	\$0.0	\$44.58	\$4.03
LPA	\$95.6	\$45.76	\$3.90

Source: LTD and West Eugene EmX Extension Project Team, 2012.

6.1.6.2. Operating cost

Operating cost is an important MOE for the project due to its potential impact on the level of transit service LTD provides to the community. LTD maintains a Long Range Financial Plan (LRFP) that projects system general fund revenues and costs for a rolling 8-year period. For this analysis, the LRFP has been extended to cover the period through fiscal year (FY) 2031.

The LPA opening year operating cost is expected to be \$1.2 million more than the No-Build Alternative’s operating cost would be. Table 6.11 summarizes LTD operating revenues and costs through FY2031, assuming the implementation of the LPA. LTD is projected to have sufficient resources to absorb the addition of the LPA’s operating cost without requiring service reductions. Although the District’s LRFP can support the operating costs for the LPA, lower operating costs would allow for expansion of service elsewhere in the system and provide a cushion against unanticipated changes in operating revenues or expenditures.

LTD’s policy is to maintain general fund reserves of at least \$3 million. For the purpose of the analysis LTD assumed that cash reserves will not exceed 10 percent of total general fund expenditures, and that LTD would look for the most effective ways to apply the surplus to service increases (line 46 in LRFP in Appendix 5-1). (See Section 5.5 for more details.)



Table 6.11. Summary of LPA Anticipated Operating Revenue and Operating Cost: Cumulative Total from FY2012 through FY2031

<i>Operating Revenues and Costs</i>	<i>Amount (in millions)</i>
LTD Projected Revenue: FY2012-FY2031(from Table 5.2)	\$1,217.5
LTD Projected Operating Cost FY 2012-FY2031	\$1,208.0
Anticipated Surplus: FY2012-FY2031	\$9.5

Source: LTD and West Eugene EmX Extension Project Team, 2012.

Over time, the cost differential between the alternatives would probably decline due to the No-Build’s increasing operating costs: It is likely to experience longer transit travel times caused by increased congestion, and would require additional buses and associated costs to maintain existing service frequency. Conversely, LPA elements such as transit signal priority and transit lanes would reduce the impact of traffic congestion on travel time, and its 10-minute service frequency is not expected to change prior to FY2031.

6.1.7. Protect Environmental Resources

The alternatives’ potential environmental effects help determine their consistency with both the local community environmental values and with laws related to resources in the natural and built environment. Three measures were used to represent the likelihood and magnitude of the impacts that each alternative could have on the natural and built environment: potential acquisitions and/or displacement of residents, businesses, and parking; potential impacts to street and landscape trees; and potential impacts to environmentally sensitive natural resources.

6.1.7.1. Potential for Acquisitions and/or Displacements of Residents, Businesses, and Parking

This measure identifies for each alternative the property that could be required for right-of-way (ROW) improvements, and any resulting displacements or other impacts to residents, businesses, and parking.

The No-Build Alternative would have no property impacts. The LPA would acquire approximately 2.6 acres of land. About 0.07 acre would result from acquiring two complete tax lots (both remnant median parcels owned by the State of Oregon). The remaining approximately 2.5 acres consist of relatively minor strip acquisitions from the frontages of 117 separate tax lots (Table 6.12). The LPA could also displace two retail businesses (a small specialty grocer and an adult store) and one residential unit (one unit in the former motel identified above). LTD would pay just compensation for any property acquired, and would assist displaced businesses as directed by the Uniform Relocation Act. Although the ROW impacts from the LPA are greater than for the No-Build Alternative, the acquisitions are small amounts of land along the edges of affected tax lots. In the final design considerations, LTD would use existing rights-of-way wherever possible to minimize land acquisitions. See Section 3.2 Property Acquisitions for a full discussion of the 2.6 acres of property acquisitions.



The LPA would affect up to 63 on-street parking spaces, potentially offset with up to 10 new parking spaces on Charnelton Street. The utilization rate of on-street parking spaces in the Corridor is below a level that would require mitigation for the on-street parking impact, as detailed in Chapter 4. The LPA would affect 72 off-street parking spaces, and up to six property access points (but it would not eliminate access to any property). Through mitigation (e.g. restriping), net loss of off-street parking may be reduced to as few as 18 parking spaces. This would affect five business/institutional sites, which would lose between one and seven spaces each. LTD would also replace unavoidable off-street parking if necessary and where feasible. LTD would pay fair market value for any property acquisition that hinders parking or access, consistent with state and federal law, and where possible LTD would further reduce access impacts by relocating affected driveways along the same roadway.

The LPA design would make six driveways unusable. However, this would occur only on parcels that currently have more than one driveway and would therefore not significantly reduce property or business access. Three other driveways would require modification but would remain usable. Chapter 4.3.1 provides additional discussion of parking and driveway impacts.

Table 6.12. Potential Property Acquisitions and Parking Displaced

Full Acquisitions		Partial Acquisitions		Parking Spaces Affected		Off-Street Spaces Removed (w/Mitigation) ²
(number)	(acres)	(number)	(acres)	On-Street	Off-Street	
2	0.07	117	2.5	63	72	18

Source: LTD and West Eugene EmX Extension Project Team, 2012.

¹ Affected parking spaces include those removed by the project as well as those “regained” within the existing parking lot through parking lot restriping paid for by the project.

² Anticipated net parking spaces removed following mitigation; actual net reduction depends on future outcome of mitigation negotiations with property owners and affected businesses.

6.1.7.2. Potential Impact to Street and Landscape Trees

This measure accounts for the potential number of street, charter, and landscape trees removed under the alternatives. Street, charter, and landscape trees are defined in Chapter 3.16.

The No-Build Alternative would not remove any street, charter, or landscape trees. The LPA would not remove any charter trees or heritage trees. It would remove about 143 street trees and 61 landscape trees. Approximately 130 of the 143 street trees would be considered “large street trees” having a diameter of at least eight inches in 2016. Although the project would replace all removed trees at a ratio of at least one tree replanted for one tree removed, the removal of street trees would result in a short-term reduction of the tree canopy in some locations in the LPA corridor.

6.1.7.3. Likelihood of Adverse Impact to Environmentally Sensitive Natural Resources

While the MOE refers solely to “environmentally sensitive natural resources,” the project team has included under it the alternatives’ impacts on a number of environmental and social issues not directly addressed under other MOEs:

- Biological Resources and Endangered Species
- Fish Ecology
- Wetlands and Waters of the State and U.S.
- Water Resources
- Socioeconomics and Environmental Justice Populations
- Hazardous Materials
- Geology and Seismic Standards
- Parklands and Recreation Areas and Wildlife and Waterfowl Refuges (Sections 4(f) and 6(f))
- Historic, Archaeological and Cultural Resources (Section 106)
- Visual and Aesthetic Resources
- Noise and Vibration
- Air Quality

Compared to the LPA, the No-Build Alternative is anticipated to have the same or fewer impacts to the natural and built environment in the areas related to biological resources, fish ecology, wetlands, water resources, hazardous materials, geology and seismic standards, parks and Sections 4(f) and 6(f), noise and visual quality. The LPA is anticipated to have fewer impacts or more beneficial effects in the areas of socioeconomics, environmental justice, and air quality. Of the environmental and social issues listed above, three merit discussion because of their potential effects: noise, historic resources and wetlands.



Although there is a potential for slightly more noise impacts under the LPA when compared to the No-Build Alternative, the actual increase in noise levels are less than an average person can discern, and there is no measurable difference in noise between the No-Build Alternative and the LPA. (See Section 3.4 of this EA for more detail.)

The LPA would have no effect on 52 of the 57 eligible historic resources along the alignment. It would affect, but not adversely, the other five resources, as a result of minor strip takes and limited tree removal. The LPA would not affect any known or likely significant archaeological or

cultural resources. The No-Build Alternative would not affect any significant historic, archaeological, or cultural resources.

The LPA would directly impact 0.048 acre of wetlands, encroach into one wetland buffer, cause temporary construction impacts to one wetland and Amazon Channel, and could indirectly impact three wetlands due to the proximity of construction activities. The project would provide wetland buffer enhancement and riparian plantings along Amazon Channel. The LPA would not significantly impact wetlands. (See Section 3.12 of this EA for more detail.)

For information on the analyses used to support this MOE, please refer to Chapter 3 of this EA.

6.1.8. Support LTD's Sustainability Policy and the City of Eugene's Efforts to Reduce Greenhouse Gas Emissions

This objective uses two MOEs to qualitatively evaluate the project's ability to support LTD's sustainability policies, specifically by (a) reducing the energy consumed and greenhouse gases generated by the transit system, and (b) attracting riders to transit services and away from single-occupant vehicles (i.e., reducing regional vehicle miles traveled).

6.1.8.1. Ability to Support LTD's Sustainability Policy

This MOE uses the differences in round-trip travel times and in transit operating cost per trip as indicators of sustainability. These two measures generally capture the energy consumed and greenhouse gases generated to operate transit service within the Corridor. Round-trip travel times indirectly capture the alternatives' relative abilities to attract single-occupant automobile users to transit, which also reduces energy consumption and the production of greenhouse gases. The alternative with shorter round-trip travel times would best meet LTD's sustainability policy.

As discussed in Section 6.11.1, the LPA would improve travel time for both transit and general traffic as compared to the No-Build Alternative.



By moving people with greater efficiency, the LPA would reduce greenhouse gas emissions. Reductions in emissions would occur *directly*, through direct reductions in energy consumption as individuals choose public transportation instead of private vehicles. Reductions would also be achieved *indirectly*, through savings from improved traffic flow and reduced travel, and as the types and intensity of land uses along the corridor become more pedestrian-oriented. Finally, the overall life-cycle greenhouse gas emissions – that is, the net greenhouse gas emissions over the lifespan of the project – would be lower under the LPA.

6.1.8.2. Potential for Alternatives to Increase Public Transportation's Share of Trips and the Concurrent Reduction in Vehicle Miles Traveled

LTD's ability to attract riders away from single-occupant vehicles will reduce regional vehicle miles traveled, supporting LTD's sustainability policy.

The number of systemwide and Corridor transit person-trips (trips from an origin to a destination, regardless of the number of boardings that they may require) associated with the alternatives is described in Section 6.1.1.2. By 2031, during an average weekday the LPA would attract approximately 2,150 new systemwide transit trips and 2,050 new transit trips to, from, or within the corridor.

Hispanic Origin

Persons of Hispanic origin were identified by a question that asked for self-identification of the person's origin or descent. Persons of Hispanic origin, in particular, were those who indicated that their origin was Mexican, Puerto Rican, Cuban, Central or South American, or some other Hispanic origin. It should be noted that persons of Hispanic origin may be of any race.

6.2. Social Equity Considerations

Social equity is measured in this section by assessing (a) the alternatives' potential project benefits and the adverse impacts to minority, Hispanic, and low-income neighborhoods, to ensure that the impacts and benefits are not unfairly distributed across population sub-groups, and (b) the provisions of LTD's Disadvantaged Business Enterprise program for contracts that would be used to construct the LPA.

6.2.1. Benefits and Impacts on Minority and Low-Income Neighborhoods

This section compares the potential benefits and adverse impacts of the alternatives on minority, Hispanic, and low-income neighborhoods in the Corridor. Examples of likely benefits for these communities would be improvements in transit access, speed and reliability. Examples of common adverse impacts on these communities would be displacements and significant noise and vibration impacts. Several sections of this EA provide more detailed information on the analyses used to identify these social equity considerations: Chapter 2 – Alternatives Considered; Chapter 3 – Section 3.2 – Property Acquisition; Section 3.3 – Socioeconomic Effects; Section 3.4 – Noise and Vibration; and Chapter 4 – Transportation.

As shown in Table 6.13, in the area east of Garfield Street more than 30 percent of the households are below the poverty line and more than 26 percent of the households have no vehicles, which are both greater than the Eugene-Springfield MPO percentages. The area west of Garfield Street contains the higher percentages of minorities and people with disabilities along the project alignment – nearly 24 percent and 20 percent, respectively. The percentage of people who have limited English proficiency is higher in the project study area than the population as a whole for the region, according to the 2000 U.S. Census – 3.5 percent in the eastern portion and 2.7 percent in the western portion of the project study area compared to 1.5 percent within the MPO boundaries. Spanish is the second most predominant language.

Table 6.13. Transit Dependency and Socioeconomic Characteristics of Residents along the LPA

LPA	Low Income Households (%)	Households with No Vehicle (%)	Disability Population (%)	Minority Population (%)	Limited English Proficiency Population (%)
Eastern portion of Corridor– Eugene Station to Garfield St	32.0	26.1	19.6	19.7	3.5
Western portion of Corridor – Garfield St to Beltline Rd	19.4	11.6	20.0	23.9	2.7
<i>Comparative Geography: Central Lane MPO</i>	<i>15.4</i>	<i>8.7</i>	<i>18.0</i>	<i>12.0</i>	<i>1.48</i>

Source: 2000 Census Data

The No-Build Alternative would cause no significant noise and vibration impacts to minority, Hispanic, and/or low-income communities, nor displace any homes, businesses, or public facilities. However, it could indirectly affect neighborhood quality in the corridor’s minority, Hispanic, and/or low-income neighborhoods by allowing a degradation of quality (i.e., speed and reliability) of transit service in the project corridor, thereby contributing over time to further reliance on the automobile by neighborhood residents. This is particularly important given the higher percentage of residents who commute to work by transit in the neighborhoods (in particular the Downtown, Jefferson Westside, and Far West Neighborhoods). The study area also has a higher representation of households that do not own a vehicle, and therefore are more likely to rely on transit for mobility. In the long term, residents in these communities may have difficulty finding reliable and affordable access to good jobs, education and job training, affordable housing, childcare, and other services and opportunities throughout the Eugene-Springfield area, further marginalizing these communities.

The LPA, with the mitigation measures it includes, would cause no significant noise and vibration impacts to the minority, Hispanic, and/or low-income communities, nor would the LPA result in more than one permanent residential displacement. In contrast to the No-Build

Alternative, the LPA would increase the quality (i.e., speed and reliability) of transit serving the minority, Hispanic, and low-income neighborhoods. It would improve access between the neighborhoods and community services located in and out of the project corridor. Further, the improvements in transit service would increase transit ridership and reduce automobile trips compared to the No-Build Alternative, helping to slow the growth of traffic congestion on major through-streets in the Corridor, which in turn could help reduce the frequency of cut-through traffic onto local streets in the minority, Hispanic, and low-income neighborhoods.

6.2.2. Disadvantaged Business Enterprises

LTD administers a Federal DBE Program consistent with FTA policies and requirements. It thus requires bidders on LTD contracts to make good faith efforts to achieve DBE goals set by LTD and, if not met, to show evidence of these efforts. Furthermore, LTD encourages contractors to utilize DBE subcontractors and to satisfy DBE goals on all major contracts. These programs and procedures would be employed only if construction were undertaken by LTD or an agency with similar rules. Since the LPA would involve construction, it would provide opportunities for DBEs to participate in LTD contracts.

6.3. Significant Trade-offs between the Alternatives

This section summarizes the major trade-offs that were considered in the selection of the LPA over the No-Build Alternative.

The LPA would require approximately \$95.6 million in capital spending to construct BRT improvements and to purchase BRT vehicles. The No-Build would avoid this expenditure.

The LPA would reduce total transit travel times throughout the Corridor over the project's 20-year planning horizon; increase the Corridor and systemwide transit mode splits in the LPA's opening year (2017) by 9.1 percent and 4.0 percent, respectively; increase Corridor transit



ridership by 6.1 percent by 2031 (additional 2,050 trips); and decrease LTD's systemwide operating costs per trip by 3.2 percent. The No-Build Alternative would perform worse than the LPA in each area: it would have longer travel times, lower transit mode splits, less growth in Corridor transit ridership, and gradually increasing systemwide operating costs.

The LPA would avoid inconsistencies with local, regional, and state land use and transportation policies, and in fact advance many of those policies, because it would construct a BRT system connecting the region's highest-growth centers and would encourage increased density and nodal development along major arterial corridors. The No-Build Alternative would conflict with those policies, and provide no significant benefit to transit operations and service in the Corridor.

The No-Build Alternative would not result in any property acquisitions or impacts to parking; whereas the LPA would require up to 121 partial and two full property acquisitions, and the potential displacement/relocation of up to two businesses and one resident. The LPA would also affect up to 63 on-street and 72 off-street parking spaces and six property access points (although mitigation could reduce those numbers markedly). Although not significant overall, these effects are real and should be minimized as much as possible.

Finally, as demonstrated in Section 6.1, the LPA as compared to the No-Build Alternative better meets the purpose of the project, which is to provide efficient, effective, and dependable high capacity transit service in the West 11th Avenue Corridor. The LPA also achieves land use and transportation goals, catalyzes economic opportunities, and protects environmental resources.



CHAPTER 7

COMMUNITY INVOLVEMENT AND AGENCY COORDINATION

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7. COMMUNITY INVOLVEMENT AND AGENCY COORDINATION

This chapter summarizes the community participation and agency coordination process for the West Eugene EmX Extension (WEEE) project. It describes general activities and elements, as well as those specifically related to this environmental assessment (EA). Additional information about community participation and agency coordination is in Chapters 1 and 2 of this EA and on the LTD WEEE web page (www.ltd.org).

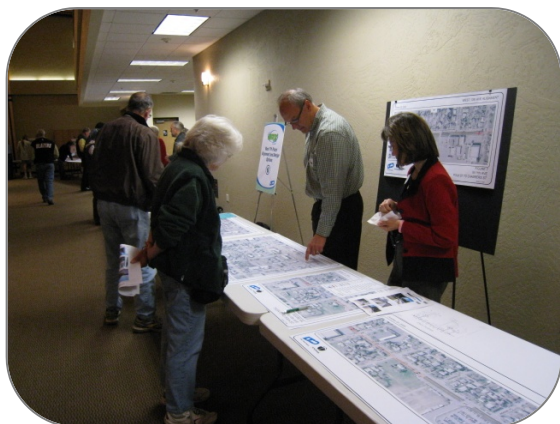
7.1. Community Involvement

Given the potential for community and operational benefits, the political environment, and the challenges a project such as this can have, it is especially important to seek out, engage, and have meaningful conversations with the community.

7.1.1. Goals of the Community Involvement Program

The goals of the public involvement activities have been to give the public and agencies access to the project and the chance to inform the project and identify their opportunities and concerns. In response, LTD has tried to understand and explore the concerns and comments and to incorporate the public's and agencies' input wherever appropriate.





7.1.2. General Elements of the Community Involvement Program

LTD recognizes that good transit planning and project development use a variety of techniques to engage people and organizations in the decision-making process.

7.1.2.1. Public Involvement Plan

An inclusive public involvement plan ensures that projects have broad-based public support by incorporating input from the community and investing taxpayer dollars wisely. Early in the project, LTD prepared a Public Involvement Plan (PIP) that was designed to comply with the project's adopted Coordination Plan (October 2007, revised March 2008). The PIP is included as Appendix 7-1 of this EA. The Coordination Plan complies with FTA requirements and is included as Appendix 7-2 of this EA. Complementing the PIP is the Agency Coordination program for cooperating and participating agencies, described in Section 7.2.

The WEEE team used the PIP to guide its various public and agency involvement activities. The plan outlined program goals and the overall approach to achieving those goals from initial scoping through the National Environmental Policy Act (NEPA) determination (Appendix 7-1).

The PIP was designed to solicit early and continued feedback from stakeholder groups and to incorporate that input into the decision-making process. It was also designed to be capable of reacting to feedback and project changes as needed.

LTD implemented a broad array of strategies to reach all of the project's stakeholders. These included numerous opportunities to exchange project information and receive valuable public feedback:

- The WEEE Corridor Committee developed the project's Purpose and Need statement in 2007 and continued to provide advice to the project team through the Alternatives Analysis (AA). This committee was composed of Corridor representatives from businesses, residents, neighborhood associations, and property owners, and the LTD Board of Directors, Lane

County Commissioners, Eugene City Council, bus riders, seniors, bicycle advocates, environmental advocates, and people with disabilities.

- The EmX Steering Committee has met regularly to provide policy guidance for the project, and will continue to do so through the completion of the project. It includes representatives of the LTD Board of Directors, City of Springfield, City of Eugene, Oregon Department of Transportation (ODOT), Lane County Commissioners, and Springfield Chamber of Commerce.
- The WEEE Project Management Group, composed of senior and executive level agency representatives from LTD, Lane Council of Governments (LCOG), City of Eugene, ODOT, and Lane County, met periodically to review and provide input on the project's technical considerations and will continue to do so throughout the project.
- The Metropolitan Planning Organization's (MPO) Citizen Advisory Committee held three meetings during the Alternatives Analysis and Locally Preferred Alternative (LPA) selection phases, and ultimately made an LPA recommendation.
- Public meetings and events (including open houses and hands-on design workshops) provided project information and solicited feedback. Spanish language interpreters were available at all public meetings and events. Informational booths were also provided at community and regional events.
- Communications about project progress and milestones and encouraging participation in upcoming events were sent via mailed postcards, letters and newsletters, e-mail, Facebook, and Twitter. Project information and documents were posted on the project's web page.
- LTD offered workshops and field tours for interested agency and tribal representatives several times. Issue-specific agency meetings were also held as needed.
- Throughout the process the project team provided briefings to three decision-makers: LTD Board of Directors, Eugene City Council Board, and the Metropolitan Policy Committee (MPC). These decision-makers also held public hearings to better understand community concerns and desires about the project.



Draft WEEE Project Scoping Screening of Alternatives Findings Report February, 25, 2008

This report summarized the findings prepared by Lane Transit District on the alternatives proposed by LTD, the public, and agencies during WEEE's Scoping phase. The LTD Board of Directors used these findings to determine which of the proposed alternatives would advance into the project's Alternatives Analysis (AA) and Draft Environmental Impact Statement (DEIS) for further study. [Note: On May 12, 2011, FTA determined that the project's environmental review under NEPA could proceed through an EA rather than an EIS. Consequently, the Board's selected alternatives were advanced from the AA to this EA. See Section 7.2.2.]

Community Report Back on Design Refinement Process November 2008

This report gave an overview of the preliminary design phase activities and community input, between April 2008 and October 2008. The most intensive activities were held during summer 2008 when, after preparing the sketch-level designs for the alternatives, LTD conducted a series of Community Design Workshops, to talk with residents and businesses at a deeper level about the sketch-level designs. This report summarized the process, data and feedback used to refine the range of alternatives advanced for further study.

- LTD held workshops with Title VI/Environmental Justice Service Providers to better understand the relationship between the project and the needs of the populations served by these organizations.
- Both newspaper and radio coverage informed area stakeholders about the project and provided opportunities for participation, including participation in a Spanish language radio talk show.
- LTD held many one-on-one meetings with property owners, business owners, and residents to provide project information and to seek solutions to potential project impacts.
- The project team made presentations to neighborhood associations and civic and professions organizations, tailored to meet the specific interests of each group.
- The project team also provided periodic updates to LTD bus drivers and employees not directly involved in the project.

7.1.3. Public Participation Efforts by Project Phase

Public involvement activities coincided with major project milestones.

7.1.3.1. Project Initiation, Scoping and Alternatives Development

During this phase, LTD filed a Notice of Intent to Prepare an Environmental Impact Statement (EIS) (Appendix 7-3); developed the project's Purpose and Need and its Goals and Objectives; defined the Corridor; developed a draft description of alternatives; conducted initial alternatives screening; and obtained LTD Board adoption and FTA concurrence of a range of alternatives for further analysis. Public and agency outreach was substantial for this phase, and the input significantly influenced the results.

LTD proposed five alignment alternatives and one mode alternative: bus rapid transit (BRT). The public proposed four additional modes and 13 alignment alternatives and design options.

In summer 2008, after preparing sketch-level designs for the alternatives, LTD conducted a series of well-attended community design workshops. Community members commented on important neighborhood features, known resources, and other elements for consideration. Participants also helped refine proposed alternatives and identify key community and environmental issues. Comments collected from the community design workshops most commonly addressed the following:

- Impacts to adjacent properties
- Pedestrian and bicyclist safety
- Conflicts between EmX buses and vehicles
- Neighborhood benefits, including increased transit ridership
- Consistency with the City’s long-range plans for mixed-use, higher density development
- Opportunities for EmX to encourage economic development and improve streetscapes

LTD also held WEEE Corridor Committee meetings and met with neighborhoods, civic groups, and professional organizations to discuss concerns and to develop possible solutions.

7.1.3.2. Design Refinement Workshops

During summer and fall 2008, LTD met with local, state, and federal agencies to review project alternatives and options, sketch-level designs, public input, and the results of ongoing data collection and evaluations. In September 2008, LTD held a workshop and field tour for Participating Agencies.

LTD used the public input, along with existing conditions data, transit operations data, and conceptual engineering drawings, for the detailed evaluation of alternatives. Outreach included media releases and paid advertising; project website and newsletters; Community Design Workshops (5) and Report Back Open House (1); project Committee Meetings, EmX Steering Committee meetings, and LTD Board of Directors meetings; Eugene City Council Board meetings; presentations to neighborhood and civic organizations; booths at community events; a



meeting and field tour for interested agencies and tribes; and an informational mailing and meeting for Title VI/Environmental Justice Service Providers.

7.1.3.3. Alternatives Design Refinement and Preliminary Impact Analysis

Overall Outreach

During this phase, the project development team worked with the community and agencies to avoid and minimize potential impacts through design refinement. Team efforts included technical impact studies of all alternatives and terminus options; meetings with potentially affected property owners and business owners, as well as with neighborhoods and special interest groups; a special design study conducted with neighborhoods along the proposed project Corridor; avoidance and minimization work sessions with property owners, businesses, and agencies to explain the significance of potential impacts and potential mitigation; review sessions with agencies; and refinement of engineering designs.



Project outreach and involvement efforts during this phase included weekly drop-in hours at a staffed project storefront in the Corridor; website updates; project newsletters and e-newsletters; 58 agency meetings; 60 small group/one-on-one meetings; 26 community group speaker's bureau presentations; 17 community event/booths; 15 Corridor Committee meetings; six EmX steering committee meetings; meetings with Title VI/Environmental Justice Community and Service Providers; and WEEEDO outreach (see below).

West Eugene EmX Extension Design Options (WEEEDO) Project

The City of Eugene and LTD explored several site-specific design opportunities along the proposed WEEE routes. Groups composed of neighborhood residents and property owners, business owners, special interest group representatives (e.g., bicycle, recreational), and agency staff held meetings and open houses between March and June 2010. The WEEEDO project helped identify design details and project amenities so that the alternatives were better integrated with residential neighborhoods.



7.1.3.4. Refinement of the Range of Alternatives, and Change in Environmental Review Process

While conducting the preliminary impact analysis for the Draft Environmental Impact Statement (DEIS), LTD concluded that some project alternatives did not, in fact, meet the project's Purpose and Need. On May 25, 2010, the LTD Board of Directors approved a public process aimed at narrowing the number of alternatives for further study. The Board also approved a process change: from a concurrent AA/DEIS process, to a sequential process of AA, LPA selection, and then preparation of the environmental documentation.

On June 9, 2010, LTD held an open house to share, discuss, and get input on (a) the preliminary findings of the impact analysis, and (b) staff recommendations for narrowing the range of alternatives for further study. Nearly half of the 64 attendees submitted comments expressing their interests about which alternatives to eliminate or retain and desires to reduce potential impacts to the environment.

LTD's EmX Steering Committee and the Corridor Committee met several times to review the Open House information and reactions. LTD presented the staff recommendations, process change, and summary of feedback received to the City Council on June 23, 2010. The City Council urged LTD to retain the West 7th Place alignment for further study. The LTD Board ultimately adopted the staff recommendations, with the exception that members chose to retain the West 7th Place Alternative for further study. The LPA Report (LTD, August 2011) (Appendix 1-1) provides more detailed information about this process.

7.1.4. Alternatives Analysis and LPA Selection Process

During the AA (January 2010 through May 2011), LTD prepared technical impact analyses. After coordination with FTA, LTD published the Draft AA Report in October 2010. Publishing it at that time let the public provide feedback to the project team during the LPA selection process. Substantive comments led to several modifications and clarifications in the Final AA

NEPA Roles of FTA and LTD in WEEE Project

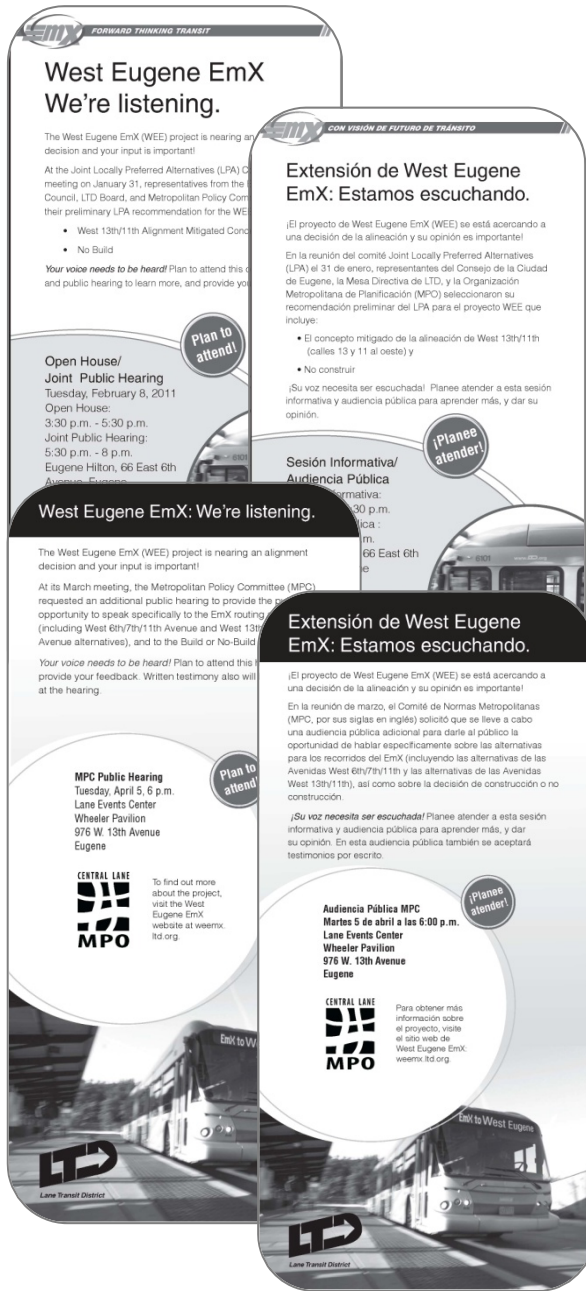
A U.S. Department of Transportation agency must serve as the lead Federal agency for a federally funded transportation project – for WEEE, FTA is the lead Federal agency. The direct recipient of Federal funds for the project must serve as a joint lead agency – for WEEE, that is LTD.

FTA, in cooperation with LTD, is responsible for the following functions:

- Manage initiation of the environmental review process including defining the project and its purpose, need, goals and objectives
- Supervise and guide in the preparation of the environmental documents
- Ensure opportunities for public and participating agency involvement in defining the purpose and need and determining the range of alternatives
- Collaborate as needed with interested agencies regarding the project process
- Provide oversight in managing the process and resolving issues
- Provide independent evaluation of the environmental documents.

LTD, in cooperation with FTA, is responsible for the following functions:

- Plan, program and initiate the proposed project
- Develop substantive portions of environmental documents and supporting documents
- Assist FTA in coordinating with interested agencies
- Provide opportunities for public and agency involvement in defining the purpose and need and determining the range of alternatives
- Assist FTA in collaborating with agencies regarding the project process
- Manage the environmental review process



Report, which was published in July. A memorandum to FTA documenting these changes was included in Appendix H of the Final AA Report (Appendix 1-3). The LPA Report (August 2011) provides more detailed information about this process (Appendix 1-1).

7.1.4.1. Environmental Justice Outreach

During the AA and LPA selection process, LTD met with various organizations that serve low-income and minority populations and individuals with disabilities.

Title VI Agency Meeting

LTD met with representatives and advocates for minority, disabled and low-income populations on March 2, 2010 (5 attendees), and March 2, 2011 (10 attendees). LTD provided a project update, and invited help disseminating information and inviting input.

LTD’s standing committee on transit accessibility includes representatives from social service agencies, travel training, and bus riders. LTD provided updates to and received feedback from the group at meetings on September 21, 2010, January 18, 2011, and April 19, 2011.

St. Vincent DePaul Low-Income Housing Facilities

LTD held meetings at two St. Vincent DePaul’s housing facilities in 2011. Twenty-nine people attended.

Uhlhorn Program

Uhlhorn Program provides training, support, and housing to people with acquired brain injuries. These individuals receive training to achieve the highest level of independence possible. The Uhlhorn facility is located on the previously proposed West 13th Avenue alignment alternative. In a 2011 meeting with LTD, Uhlhorn administrators, staff, and caseworkers voiced support for the project, which would be easier for their residents to use.

Centro Latino Americano

LTD met with Centro Latino Americano staff and Board of Directors early in the project, and the organization was generally supportive. During the LPA selection period, Centro's support became tempered with concerns. In general, Centro urged that more (new) bus routes and increased frequency would be better than BRT for the working poor it serves.

Public Input Regarding Environmental Justice

During the AA and LPA selection process, LTD received 39 comments relating to environmental justice. Table 7.1 summarizes them (it shows more than 39 because some submittals addressed more than one issue and some individuals submitted the same comment multiple times). Generally, input addressed nine different issues:

Table 7.1. Summary of Environmental Justice Related Comments

Comment	#
Transit with excellent connections for specific populations and businesses could attract passengers who have the choice of a car or bus and thus would increase riders, increase income, help the environment by taking cars off the road; and it provides transportation for people that have no choice: those with low incomes; without cars or with unreliable vehicles; with disabilities, the ill, and the elderly who no longer drive.	19
Eliminating bus stops on the Corridor could make it more difficult for the elderly and people with disabilities by making longer distances to stops and stations.	12
Restoring route service would help those who are disabled, poor.	2
Willamalane Senior Center and other areas in Springfield would need shuttles to take people to the main lines and WEEE.	1
People with brain injuries living directly across the street from the fairgrounds could have problems learning to look both ways to cross the street in the area.	1
Property owners with disabilities or on Social Security will be adversely impacted by acquisition of lot or parking.	2
Eliminating regular bus routes in the Corridor makes it more difficult for the elderly and people with disabilities by eliminating frequent service closer to their homes.	6
WEEE will hurt the working poor by eliminating service frequency and service to rural areas.	6
EmX is not good for slow-moving seniors.	1



7.1.4.2. Joint Locally Preferred Alternative Committee

In fall 2010, LTD convened the Joint Locally Preferred Alternative Committee (Joint LPA Committee) to help it select the LPA. This group was comprised of representatives from the Eugene City Council, Metropolitan Policy Committee (MPC), and LTD. It was to make recommendations to the Eugene City Council, MPC, and LTD Board after considering technical and community issues (and potential mitigation measures) relating to each alternative. The LTD Board's ultimate decisions about the LPA would be informed by the technical evaluations and the full range of discussion by the Joint LPA Committee.

From October 2010 through February 2011, the Joint LPA Committee met five times to review updated project information and public input and then to provide direction to the project team regarding mitigation measures and eliminating alternatives. At the fourth meeting, it preliminarily recommended that the West 13th – West 11th Avenue Alternative be selected as the LPA. The public reviewed this alternative at two open houses. The three decision-making bodies then held a joint public hearing to take testimony about the preliminary recommended LPA. The majority of public testimony opposed this alternative and/or spending public monies on this project.

In February 2011, based on public input and technical information, the Joint LPA Committee sent two alternatives forward for consideration: modified versions of (a) the West 13th Avenue – West 11th Avenue Alternative, and (b) the West 6th/7th Avenues – West 11th Avenue via Charnelton Two-Way Design Option (with the Reassign-a-Lane Design Option). The LPA Report provides more detailed information about this process (Appendix 1-1).



7.1.4.3. Other Committees

Several committees discussed in Section 7.1.2 participated in the LPA selection process and made LPA recommendations (Table 7.2). All but one of them recommended the West 13th Avenue – West 11th Avenue Alternative. The exception was the Joint LPA Committee, which recommended that the decision-making bodies also consider the West 6th/7th Avenues – West 11th Avenue Alignment Alternative.

Table 7.2. Summary of Committee LPA Recommendations

Committee	Recommendation
Project Committees	
WEEE Corridor Committee	Advisory body – no recommendation
WEEE Project Management Group	West 13th-11th Avenue
Joint LPA Committee	West 13th-11th Avenue, or West 6th/7th Avenue
Standing Advisory Committees	
MPO Citizen Advisory Committee	West 13th-11th Avenue
EmX Steering Committee	West 13th/11th Avenue

7.1.4.4. Decision-Makers

Project decision-makers met numerous times throughout the LPA selection process to consider public and agency feedback, as well as the findings of technical evaluations. The MPC held five meetings and one special public hearing. The Eugene City Council held four meetings, including one joint meeting with the LTD Board of Directors. The LTD Board of Directors held 10 meetings, including the joint meeting with the Eugene City Council.

By April 14, 2011, all three decision-making bodies had selected the West 6th/7th – 11th Alignment as the preliminary LPA for evaluation in the environmental document. The MPC stated it would review the LPA decision after the environmental analysis was finished.

7.1.4.5. Public Meetings and Workshops

General Manager Chats

In October 2010, LTD held three well-promoted community conversations, hosted at Corridor coffee shops by LTD's General Manager, where the public could meet with him and his staff to learn about and provide input regarding the project.

Standard Means of Encouraging Public Participation

Throughout the project, LTD has used a variety of methods to promote opportunities for public participation, including:

- Newspaper ads (English and Spanish)
- Legal publications
- E-newsletters
- LTD website

Sign language and Spanish-speaking assistants were available at most events.

Let's Talk Transit Forum

A Town Hall-style event was held on November 9, 2010, with speakers John English from Utah Transit Authority, Congressman Peter DeFazio, Eugene Mayor Kitty Piercy, Springfield Mayor Christine Lundberg, and LTD Board member Greg Evans. Attendees commented on the importance of transit in the community. Approximately 290 people attended the conference.

Title VI and Environmental Justice Agency Meetings

Two luncheons provided project updates to area agencies and advocates of minority, low-income and disabled populations. The luncheons were in March 2010 and March 2011.

Refined Alternatives Open House

Staff and project stakeholders believed the number of alternatives could be reduced to focus the analysis. An open house on June 3, 2010 let the public comment on alignments to be kept and on others to be eliminated. Sixty-four people signed in and 57 comment forms were received.

Alternatives Analysis Open Houses

LTD held three open houses in November 2010 to let the public learn about the analysis.

Locally Preferred Alternative Open Houses and Public Hearings

In February 2011, LTD held two open houses to inform the public of the LPA recommendations and process.



Two public hearings were held following the selection of the Preliminary LPA. The first, held on February 8, 2011, at the Hilton Eugene immediately following an open house, was a joint public hearing of the Eugene City Council, MPC, and LTD's Board. The second was presented by the MPC on April 5, 2011, at the Lane County Fairgrounds.

7.1.4.6. Newsletters, Public Notices, and Presentation Materials

Electronic Newsletters

During the AA and LPA selection period, LTD sent out 11 electronic project newsletters. Three project-related articles also ran in the City of Eugene's electronic newsletter.

MPC Public Hearing Letter

In March 2011, at MPC's request, LTD sent letters to 1,088 businesses, residents, and property owners along the West 6th/7th Avenue Alignment encouraging participation in the April 5, 2011, public hearing.

7.1.4.7. Input from the Public and Agencies

From May 1, 2010 through May 4, 2011, LTD logged 1,225 comments about a range of environmental topics (Table 7.3). LTD responded to public and agency input in many different ways, including providing written and verbal responses, preparing meeting materials to address concerns raised through input, posting information on the project website, and scheduling additional meetings. Where appropriate, LTD modified conceptual designs of alternatives.

Table 7.3. Topics Receiving the Most Public and Agency Comments

<i>Environmental Topic</i>	<i>#</i>
Transit, Traffic, Safety, Parking, BRT System	792
Alternatives, Alignments, Mode, Study Area	169
General/Miscellaneous	113
Process, Public Involvement, Agency Coordination	81
Cost, Finance	58
Construction, Design	53
Land Use, Economic Development, Plans and Policies	45
Displacement, Relocation, Acquisition	43
Environmental Justice	39
Social/Neighborhood/Communication/Public Services	33



7.1.5. Selection of the Locally Preferred Alternative

In May 2011, the three decision-making bodies selected an LPA for the West 11th Avenue Corridor. It was based on the West 6th/7th Avenues – West 11th Avenue Alignment Alternative via Charnelton Two-Way Design Option and Reassign-a-Lane Design Option, with a number of modifications to further avoid and reduce potential impacts. It is described in Chapter 2.

7.1.6. LPA Report

The August 2011 LPA Report documents the LPA selection process. It was provided to FTA and made available to the public and interested agencies through LTD’s website (www.ltd.org).

7.1.7. EA Public Comment Period and Adoption of the LPA

The public and agencies will have the opportunity to review and comment on this Environmental Assessment, and LTD and FTA will respond to comments as part of preparing the final environmental documentation, which may include revisions to the analysis in response to substantive comments on the EA. FTA will review the EA to determine whether or not the project will significantly affect the environment. If FTA determines that the project will not significantly affect the environment, it will issue a Finding of No Significant Impact (FONSI). If FTA determines the project may significantly affect the environment, LTD and FTA will coordinate to determine the next steps in the process which could include further refinement of the LPA.



7.2. Agency Coordination

7.2.1. Coordination Plan

In 2007, when the WEEE project was initiated, it was anticipated to require an EIS. At that time, as required by applicable federal law, LTD prepared a draft Coordination Plan.

The purpose of the Coordination Plan was to guide LTD's WEEE project team through the various public and agency involvement activities for the project. It outlined activities covered from the Scoping phase through NEPA determination and was designed to solicit early and continued feedback from stakeholder groups and ensure that input was incorporated into the decision-making process. It specified how the Lead Agencies would coordinate with other agencies and the public.

LTD invited 30 local, state, and federal agencies and tribes to participate in the project. The U.S. Army Corps of Engineers agreed to a Cooperating Agency role, and the 10 remaining agencies and the Confederated Tribes of the Grand Ronde agreed to a Participating Agency role. In March 2008, after review and comments by the agencies and the tribe, LTD revised and published a modified Coordination Plan (Appendix 7-2).

7.2.2. Agency Involvement

Throughout the project's Scoping and Alternatives Development and Refinement phases, the participating agencies and tribe attended workshops, field tours, and issue-specific meetings, and reviewed project-related materials and analyses. Their feedback was an important part of defining the WEEE project. All agencies and tribes, regardless of participating status, were kept informed about the project, public meetings and open houses through mail and e-mail communications.



Through every step of the project, LTD consulted with FTA. In April 2011, LTD presented the revised LPA to FTA and outlined how the preliminary LPA had evolved and incorporated a number of design elements to avoid significant impacts to the natural and built environment. On May 12, 2011, FTA determined that the project's environmental review under NEPA could proceed through an EA rather than an EIS (Appendix 7-4). FTA's determination was based on the LPA incorporating the following elements:

- Ending approximately two miles east of the original terminus at Ed Cone Boulevard, thereby avoiding serious issues with wetlands, endangered species, and recreation and parklands.
- Avoiding Amazon Channel and the adjacent trail except for at one existing roadway crossing and at two multi-purpose path crossings.
- Avoiding street improvements that would have used property from historic properties.
- Requiring much less property acquisition than originally anticipated.
- Avoiding adverse impacts to established neighborhoods.
- Affecting far fewer street and landscape trees than early alternatives.

The Corps of Engineers concurred with the decision to proceed with an EA. FTA notified the agencies and the tribe of the change to an EA and invited their continued participation.



CHAPTER 8

PERMITS AND APPROVALS

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8. PERMITS AND APPROVALS

LTD has prepared this Environmental Assessment (EA) in accordance with and to fulfill the National Environmental Policy Act of 1969 (NEPA). The EA addresses short-term construction-related impacts and long-term changes to existing environmental conditions under the proposed Locally Preferred Alternative, as well as the cumulative impacts that would result from this and other proposed projects in the area. The following is a preliminary list of permits and approvals that could be required by various federal, state, and local agencies for the proposed EmX system improvements (Table 8.1).

Table 8.1. Preliminary List of Permits and Approvals

<i>Lead Agency</i>	<i>Permit or Approval</i>
<i>Federal Authorities</i>	
Environmental Protection Agency	Air Quality Permits
Federal Highway Administration	Right of Way
U.S. Fish and Wildlife Service or National Marine Fisheries Service	Endangered Species Act Section 7
U.S. Fish and Wildlife Service	Fish and Wildlife Coordination Act
U.S. Fish and Wildlife Service	Migratory Bird Treaty Act
National Marine Fisheries Service	Endangered Species Act Section 7 and Magnuson-Stevens Fisheries Conservation Management Act
State Historic Preservation Office	Section 106 – National Historic Preservation Act
Federal Emergency Management Agency	Floodplain Development
U.S. Army Corps of Engineers (Corps)	Clean Water Act Section 404 (Waters of the United States fill permit)

Table 8.1. Preliminary List of Permits and Approvals (Cont.)

<i>Lead Agency</i>	<i>Permit or Approval</i>
<i>State Authorities</i>	
Department of Environmental Quality (DEQ)	Clean Water Act Section 401 (Water Quality Certification) and Section 402 (National Pollutant Discharge Elimination System (NPDES) 1200-C permit)
Department of Environmental Quality, Lane Council of Governments	Transportation Conformity – Air Quality
Department of State Lands	Oregon’s Removal-Fill Law
Department of Fish and Wildlife	Oregon ESA – Fish and Wildlife
Department of Fish and Wildlife	Fish Passage; Fishways; Screen devices; Hatcheries Near Dams
Department of Agriculture	Oregon ESA – Plants
Historic Preservation Office	Section 106
Oregon Department of Transportation	Right of Way
<i>Local Authorities</i>	
City of Eugene	Wetland Buffer Overlay Zone; Tree Preservation and Removal Standards
Lane Regional Air Pollution Authority (LRAPA)	Indirect Sources Required to have Indirect Source Construction Permits
City of Eugene	Floodplain Development Permit
City of Eugene	Construction Permits
City of Eugene	Land Use Permits
City of Eugene	Privately Engineered Public Improvement Permit
City of Eugene	Public Way Construction and Use Permit
City of Eugene	Erosion Prevention Permit
City of Eugene	Access Permit
City of Eugene	Planting Permit in ROW
City of Eugene	Inter-governmental agreements (IGA) for long-term utility access or maintenance (potential)
City of Eugene	Conditional Use Permits within the NR Natural Resource Zone or Wetland Buffer Overlay Zone

CHAPTER 9

REFERENCES

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9. REFERENCES

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CHAPTER 10

LIST OF PREPARERS

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10. LIST OF PREPARERS

<i>Name / Project Title</i>	<i>Organization</i>	<i>Qualifications (Degree, Education, Other Special Training)</i>	<i>Years of Professional Experience</i>	<i>Primary Project Role</i>
Stuart Albright / Principal Geotechnical Engineer	Ash Creek Associates, Inc.	M.S., Civil Engineering with Emphasis in Geotechnical Engineering B.S., Civil Engineering	25	<ul style="list-style-type: none"> • Geology and Earthquake Discipline
Carl Bloom/ Air Quality Specialist	Michael Minor & Associates	B.S.- Forestry- Silviculture- University of British Columbia 1970 Air and Waste Management Association- Pacific Northwest International Section	15	<ul style="list-style-type: none"> • Air Quality
Stacy Clauson/ Planner	Lane Council of Governments	BSS, Environmental Policy and Assessment, Western Washington University Certificate in Site Planning, University of Washington NEPA Training, Writing the perfect EA, FONSI or EIS Author, Central Lane MPO Title VI Plan.	13	<ul style="list-style-type: none"> • Socioeconomic and Environmental Justice • Energy and Sustainability
Herb Clough, P.E. / Principal Environmental Engineer	Ash Creek Associates, Inc.	M.S., Civil Engineering B.S., Civil Engineering	25	<ul style="list-style-type: none"> • Hazardous Materials
Peter Coffey / Principal Transportation Engineer	DKS Associates, Inc.	B.S., Civil Engineering Oregon Licensed Civil Engineer Oregon Licensed Traffic Engineer	25	<ul style="list-style-type: none"> • Transportation
Jack Dalton / Senior Wildlife Biologist Senior Wetland Scientist	Environmental Science & Assessment, LLC	B.S., Biology, Lewis and Clark College, Portland, OR	17	<ul style="list-style-type: none"> • Fish Ecology
Hilary Dearborn / Landscape Architect	Lane Council of Governments	MLA, Landscape Architecture BLA, Landscape Architecture Wetland Delineation Certification--Portland State University, Portland, OR IBPI Accessibility Training—PSU & University of Oregon, Eugene, OR	13	<ul style="list-style-type: none"> • Visual and Aesthetic • Public Parks- Section 4(f) and 6(f)

<i>Name / Project Title</i>	<i>Organization</i>	<i>Qualifications (Degree, Education, Other Special Training)</i>	<i>Years of Professional Experience</i>	<i>Primary Project Role</i>
John Evans AICP/ Senior Project Manager	Lane Transit District	B.A., Environmental Studies and Public Policy American Institute of Certified Planners American Planning Association, Transportation Division Duke University NEPA Overview Certification Duke University NEPA Advanced Topics Certification Bleiker Informed Consent Training	24	<ul style="list-style-type: none"> • Project Management • Senior Environmental Analyses Reviewer • Primary NEPA Author • Public Involvement • Agency Coordination
Mandy Flett / Planner and Project Coordinator	Otak, Inc.	B.S., Community Development, Portland State University	7	<ul style="list-style-type: none"> • Project Coordination • Technical Analysis Coordinator • Technical Analysis Support • Document Control
Reah Flisakowski / Senior Transportation Engineer	DKS Associates, Inc.	B.S., Civil Engineering Oregon Licensed Civil Engineer	14	<ul style="list-style-type: none"> • Transportation
John Gordon/ Senior Wetland Scientist	ESA Adolfson	B.S., Biology, Portland State University U.S. Army Corps of Engineers Wetland Delineation Training, 1996 Interim Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Western Mountains, Valleys, and Coast Region, 2008 Certified consultant for ODOT Biological Assessment Deliverables, 2007 Certified ODOT CS3 Consultant, 2005	12	<ul style="list-style-type: none"> • Wetlands

<i>Name / Project Title</i>	<i>Organization</i>	<i>Qualifications (Degree, Education, Other Special Training)</i>	<i>Years of Professional Experience</i>	<i>Primary Project Role</i>
Sarah Hartung/ Wetland Scientist	ESA Adolfson	M.S., Avian Ecology, University of Illinois, Champaign-Urbana B.A., Biology, Hamline University, St. Paul, Minnesota Oregon Rapid Wetland Assessment Protocol (ORWAP), 2009 Interim Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Western Valleys, Mountains and Coast Range, 2008 Advanced Soils Training, 2004	11	<ul style="list-style-type: none"> • Wetlands
Patrick Hendrix / Senior Botanist Senior Wetland Scientist	Environmental Science & Assessment, LLC	B.S., Botany, Humboldt State University, Arcata, CA B.S., Cellular Molecular Biology, Humboldt State University, Arcata, CA	17	<ul style="list-style-type: none"> • Biological Resources • Wetlands • Rare Plants
Jennifer John/ Senior Travel Demand Modeling	John Park Consulting	B.S., Economics, 1991, Lewis and Clark College, Portland, OR	18	<ul style="list-style-type: none"> • Travel Demand Forecasts
Jason Lien / Environmental Planner	Otak, Inc.	M.S. City & Regional Planning, Rutgers University B.A., International Studies, University of Washington American Institute of Certified Planners American Planning Association	12	<ul style="list-style-type: none"> • GIS Analyst • Technical Writer
Michael Minor, INCE / President Senior Noise Engineer Senior Air Quality Specialist	Michael Minor & Associates	B.A. Physics B.A. Mathematics Institute of Noise Control Engineering Acoustic Society of America	21	<ul style="list-style-type: none"> • Air Quality • Noise
Jean J. Ochsner / Senior Environmental Scientist	Environmental Science & Assessment, LLC	B.A., Aquatic Biology, University of California at Santa Barbara, CA M.S., Geology, University of Southern California, Los Angeles, CA	27	<ul style="list-style-type: none"> • Fish Ecology • Biological Resources
Albert C. Oetting / Project Archaeologist	Heritage Research Associates, Inc.	Ph.D., M.A., Anthropology Registered Professional Archaeologist (RPA)	30	<ul style="list-style-type: none"> • Archaeological
Amanda Owings / Project Engineer	Otak, Inc.	M.S., Urban and Regional Planning M.S., Civil Engineering B.S., Civil Engineering	10	<ul style="list-style-type: none"> • Alternative Cost Estimating

<i>Name / Project Title</i>	<i>Organization</i>	<i>Qualifications (Degree, Education, Other Special Training)</i>	<i>Years of Professional Experience</i>	<i>Primary Project Role</i>
Randy Parker/ Senior Travel Demand Modeling	John Park Consulting	B.S., Economics, Portland State University, Portland, OR	18	<ul style="list-style-type: none"> • Travel Demand Forecasts
Susan Payne/ Senior Planner	Lane Council of Governments	BSc. Math/Computer Science, University of Melbourne MSc. Systems Ecology, Utah State University B.L.A Landscape Architecture, University of Oregon M.L.A Landscape Planning, University of Oregon	9	<ul style="list-style-type: none"> • Travel Demand Forecasting, Land Use Modeling
Cosette Rees/ Senior Public Involvement Specialist	Lane Transit District	B.A., Marketing and Management, University of Oregon	26	<ul style="list-style-type: none"> • Public Involvement • Environmental Justice and Title VI Analysis /Compliance
Robert Schottman/ Senior Water Resources Engineer	Otak, Inc.	Ph. D. Agricultural Engineering, Cornell University, 1978 B.S. Agricultural Engineering, University of Illinois 1966 P.E. State of Washington	35	<ul style="list-style-type: none"> • Drainage • Hydrology • Water Quality
Christopher Sheridan/ Hazardous Materials Geohydrologist	Ash Creek Associates, Inc.	M.S., Geology: Geohydrology, Portland State University, 2009 B.A., Geology, Humboldt State University, 2000	9	<ul style="list-style-type: none"> • Hazardous Materials
Leon Skiles/ Senior Planner	Leon Skiles and Associates	B.A. History, University of Oregon, 1978 Masters of Urban and Regional Planning, University of Oregon, 1983	30	<ul style="list-style-type: none"> • Travel Demand Forecast • Definition of Alternatives
Ashley Simonson/ Water Resources Engineer	Otak, Inc.	B.S. Civil Engineering, University of Portland, 2004 P.E. State of Oregon LEED AP Certification	7	<ul style="list-style-type: none"> • Drainage • Hydrology • Water Quality

<i>Name / Project Title</i>	<i>Organization</i>	<i>Qualifications (Degree, Education, Other Special Training)</i>	<i>Years of Professional Experience</i>	<i>Primary Project Role</i>
Natalie Stiffler / Planner	Lane Transit District	B.A. Urban Studies and Planning, University of California, San Diego, 2009 Master of City and Regional Planning, California Polytechnic State University, San Luis Obispo, 2011 M.S. Civil Engineering, California Polytechnic State University, San Luis Obispo, 2011	2	<ul style="list-style-type: none"> • Technical Writer
Brad Swearingen PE/ Senior Civil Engineer	Otak, Inc.	B.A. International Relations, University of California, Davis Certificate of Completion: Civil Engineering Technology, Santa Rosa Junior College P.E. State of Washington LEED AP Certification ODOT Certified General Inspector American Society of Civil Engineers, Member	15	<ul style="list-style-type: none"> • BRT Engineering Design
Tama Tochihara / Historic Preservation Specialist	Heritage Research Associates, Inc.	M.A., Historic Preservation Planning MEd, Policy Studies	11	<ul style="list-style-type: none"> • Historic Resources •
Kathryn Toepel/ Cultural Resource Project Manager	Heritage Research Associates, Inc.	Ph.D., M.S., Anthropology M.S., Historic Preservation Registered Professional Archaeologist (RPA)	32	<ul style="list-style-type: none"> • Archaeological • Historic Resources
Dan Tutt / Associate Planner	Lane Transit District	B.A., Technical Journalism, Colorado State University	36	<ul style="list-style-type: none"> • GIS • Property Acquisition • Parking • Public Involvement
Stefano Viggiano / Senior Planning Analyst	Parsons Brinckerhoff	B.A., Mathematics, University of California at Berkley, 1975 Master of Urban Planning, University of Oregon, 1985	29	<ul style="list-style-type: none"> • Transit • Finance • Operations & Maintenance, • Federal Transit Regulatory

<i>Name / Project Title</i>	<i>Organization</i>	<i>Qualifications (Degree, Education, Other Special Training)</i>	<i>Years of Professional Experience</i>	<i>Primary Project Role</i>
Lynda Wannamaker / Senior Environmental Manager	Wannamaker Consulting, Inc.	B.S. Art, University of Wisconsin-Madison M.S., Urban and Regional Planning, University of Wisconsin-Madison Bleiker Informed Consent Training Duke University NEPA Overview Certificate Duke University NEPA Advanced Topics Certificate NHI Public Involvement in Transportation Decision Making FHWA Section 4 (f) Training	29	<ul style="list-style-type: none"> • Senior Environmental Analyses Reviewer • Primary NEPA Author • Public Involvement • Agency Coordination
Kurt Yeiter/ Senior Transportation Planner	City of Eugene, OR	B.S., Environmental Planning and Management; University of California, Davis, CA Bleiker: Systematic Development of Informed Consent – NTI: Financial Planning in Transportation – Eugene, OR	31	<ul style="list-style-type: none"> • Land Use • Pedestrian and Bicycle
Paul Zvonkovic/ Senior Transit System Planner	PZ Consulting	B.A., American Government, 1981, University of Virginia, Charlottesville, VA Master of Public Administration, 1983, Pennsylvania State University, State College, PA.	26	<ul style="list-style-type: none"> • Transit System Service Planning

CHAPTER 11

LIST OF RECIPIENTS

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11. LIST OF RECIPIENTS

The following list of recipients will receive an email Notice of Availability that the West Eugene EmX Extension (WEEE) Environmental Assessment (EA) is available for review and can be downloaded from Lane Transit District's (LTD's) website. The recipient may request a copy of the EA from LTD. Recipients requesting a copy of the EA will be sent a CD or DVD with an electronic copy of the EA unless they specifically request a paper copy of the document.

<i>Federal Agencies/Division</i>
Advisory Council on Historic Preservation
Bonneville Power Administration
Environmental Protection Agency, Oregon
Environmental Protection Agency, Region 10
Federal Emergency Management Administration Region X
Federal Highway Administration, Portland: Environmental Compliance
Federal Transit Administration (FTA), Region 10
FTA, Headquarters Office: Office of Planning and Environment
National Oceanic and Atmospheric Administration / National Marine Fisheries (Portland)
NW Power and Conservation Council: Environmental Review
US Army Corps of Engineers
US Department of Energy: Office of NEPA Policy and Compliance
US Department of the Interior: Environmental Reviewer

<i>Federal Agencies/Division</i>
US Fish and Wildlife Service (USFWS): Oregon State Supervisor
USFWS: Oregon Division Supervisor
US Forest Service

<i>Tribes</i>
Confederated Tribes of the Grand Ronde
Confederated Tribes of the Siletz Indians
Confederated Tribes of the Warm Springs

<i>State Agencies</i>
Oregon Department of Energy
Oregon Department of Environmental Quality: Director
Oregon Department of Fish & Wildlife
Oregon Department of Geology and Minerals
Oregon Department of State Lands: Director
Oregon Department of Transportation (ODOT): Archaeology and Historic Preservation
ODOT: Geo-Environmental Section
ODOT: Utilities
ODOT: Region 2, District 5 Manager
ODOT: Region 2, Senior Transportation Planner

<i>State Agencies</i>
ODOT: Public Transit Operations Manager
Oregon Biodiversity Information Center Institute for Natural Resources
Oregon Parks and Recreation Department: State Historic Preservation Office
Oregon Soil and Water Conservation District
Oregon State Police, District Patrol Office

<i>City of Eugene</i>
Fire and Emergency Medical Services Marshal
Police Chief
Public Works Director
Parks Director
Public Works Transportation Planner
Planning Division Director
Mayor
City Council
City Manager

<i>Lane County</i>
Lane County Public Works Engineering Division
Lane County Public Works Transportation Planning
East Lane District
West Lane District
North Eugene District
South Eugene District
Springfield District

<i>Other Local Agencies or Organizations</i>
University of Oregon
Willamalane Park & Recreation District
Lane Regional Air Protection Agency (LRAPA)
Lane Community College
Lane Council of Governments
PeaceHealth Medical Center
Eugene School District 4J

<i>Lane Transit District Board of Directors</i>
Doris Towery
Mike Eyster
Michael Dubick
Ed Necker
Gary Gillespie
Greg Evans
Dean Kortge

<i>Utilities</i>
Eugene Water & Electric Board: Service Planning
Northwest Natural Gas

<i>Media</i>
Eugene Register Guard
Springfield News
Churchill Communications - KXOR-LaX 660 AM (Spanish Language Radio)
KPNW Radio Station

11.1. General Public

Public stakeholders who provided their contact information and attended any project related public meetings or who provided written comment about the project will receive a Notice of Availability and may request a copy of the EA for the cost of production and shipping/handling. The EA will be made available through LTD's web site (at no cost to download) and copies of the EA will be available for review at the locations listed in Chapter 12. Recipients requesting a copy of the EA will be sent a CD or DVD with an electronic copy of the EA unless they specifically request a print copy of the document.

All property owners within one-half mile of the Corridor will be sent a Notice of Availability.



CHAPTER 12

SUPPORTING DOCUMENTS

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12. SUPPORTING DOCUMENTS

A lengthy planning process and a great deal of technical analysis led to the information presented in this Environmental Assessment. The project-related supporting documents listed below are all available for review on the project website at www.ltd.org.

Print copies of some of the documents are available at the following locations:

- City of Eugene City Manager's Office, 777 Pearl Street, #105, Eugene, OR 97401.
Phone: 541-726-3700. Monday – Friday, 8:00 AM – 5:00 PM.
- Eugene Public Library, Downtown Library, 100 West 10th Avenue, Eugene OR 97403.
Monday – Thursday, 10:00 AM – 8:00 PM; Friday – Sunday, 10:00 AM – 6:00 PM; First Friday of each month, 10:00 AM – 8:00 PM.

Lane Transit District will provide electronic or printed copies of any of the listed documents at cost of reproduction, and will make these documents available for review at its administrative offices free of charge:

- Lane Transit District Administrative Offices, 3500 East 17th Avenue, Eugene, OR 97403.
Phone: 541-682-6100. Monday – Friday, 8:00 AM – 5:00 PM.

12.1. WEEE Project Alternatives Analysis and Technical Reports

- WEEE Locally Preferred Alternative Report (LTD, August 2011)
- WEEE Locally Preferred Alternative Plan Set (LTD, July 2011)
- WEEE Project Alternatives Analysis Report (published, final version) (LTD, July 2011)
- WEEE Project Alternatives Analysis Report (published draft version) (LTD, October 2010)
- WEEE Project Technical Report Addenda (LTD, July 2011 – June 2012)
 - Geology and Earthquake Standards Technical Memorandum Addendum

- Hazardous Materials Technical Memorandum Addendum
- Transportation and Parking Technical Report Addendum
- Parking Impact Addendum
- Biological Resources Technical Memorandum Addendum
- Fish Ecology Technical Memorandum Addendum
- Determination of Endangered and Threatened Species and MSA Effects and Screening Checklist
- Wetlands Technical Memorandum Addendum
- Historic, Archaeological, and Cultural Resources Technical Memorandum Addendum
- Property Acquisition Technical Memorandum Addendum
- Clarification of Process for Partial vs. Full Acquisition
- Capital Cost Technical Report Addendum
- Energy and Sustainability Technical Memorandum Addendum
- Land Use, Prime Farmlands and Development Technical Memorandum Addendum
- Public Parks and Recreation Areas, Cultural Resources, and Wildlife and Waterfowl Refuge (Section 4(f) and 6(f)) Technical Memorandum Addendum
- Socioeconomics and Environmental Justice Technical Memorandum Addendum
- Visual and Aesthetic Resources Technical Memorandum Addendum
- Water Resources Technical Memorandum Addendum
- WEEE Project Technical Reports
 - August - September 2011
 - Draft Air Quality Technical Memorandum
 - Draft Finance Technical Report
 - Draft Noise Impact Assessment Technical Report
 - Draft Operating and Maintenance Technical Memorandum
 - Draft Street and Landscape Trees Technical Memorandum
 - Draft Transit Impacts and Travel Demand Forecasting Results Technical Report
 - Draft Utilities Technical Memorandum
 - LTD EmX Property Impacts Analysis

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- June - September 2010
 - Draft Hazardous Materials Technical Report
 - Draft Geology and Earthquake Standards Technical Report
 - Draft Land Use, Prime Farmlands and Development Technical Report
 - Draft Public Parks and Recreation Areas, Cultural Resources, and Wildlife and Waterfowl Refuge (Section 4(f) and 6(f)) Technical Memorandum
 - Draft Rare Plants Survey Technical Report
 - Draft Motor Vehicle Transportation Technical Memorandum
 - Draft Visual and Aesthetics Resources Technical Memorandum
 - Draft Wetlands and Waters of the State and U.S. Technical Report
 - April 2010
 - Draft Biological Resources Technical Report
 - Draft Capital Cost Technical Report
 - Draft Energy and Sustainability Technical Memorandum
 - Draft Historic, Archaeological and Cultural Resources Technical Report
 - Draft Parking Technical Memo
 - Draft Property Acquisitions Technical Memorandum
 - Draft Socioeconomics Technical Report
 - Draft Water Resources Technical Memorandum
 - Draft Bicycle and Pedestrian Technical Memorandum
 - Freight Memorandum
 - WEEE Project Supplemental Alternatives Screening Report (LTD, October 2010)
 - WEEE Revised Draft Conceptual Design Plan Set (LTD, October 2010)
 - WEEE Working Draft Conceptual Design Plan Set (LTD, January 2010)
 - WEEE Draft Definition of Alternatives Report (LTD, July 2010)

12.2. Other WEEE Project Documents

- *WEEE Project Notice of Intent*. Federal Register: (LTD, September 18, 2007)
- *WEEE Project Scoping Screening of Alternatives Findings Report*. (LTD, February 2008)
- *WEEE Project Scoping Screening and Evaluation Findings Report*. (LTD, May 2008)
- *WEEE Project Scoping Range of Alternatives Report*. (LTD, May 2008)
- *WEEE Project Scoping Summary Final Report*. (LTD, May 2008)
- *WEEE Project Section 6002 Coordination Plan* (and attachments). (LTD, May 2008)
- *WEEE Project Community Report Back on Design Refinement Process*. (LTD, October 2008)

12.3. Other Relevant Documents

- Long Range Financial Plan. (LTD, April 9, 2012)