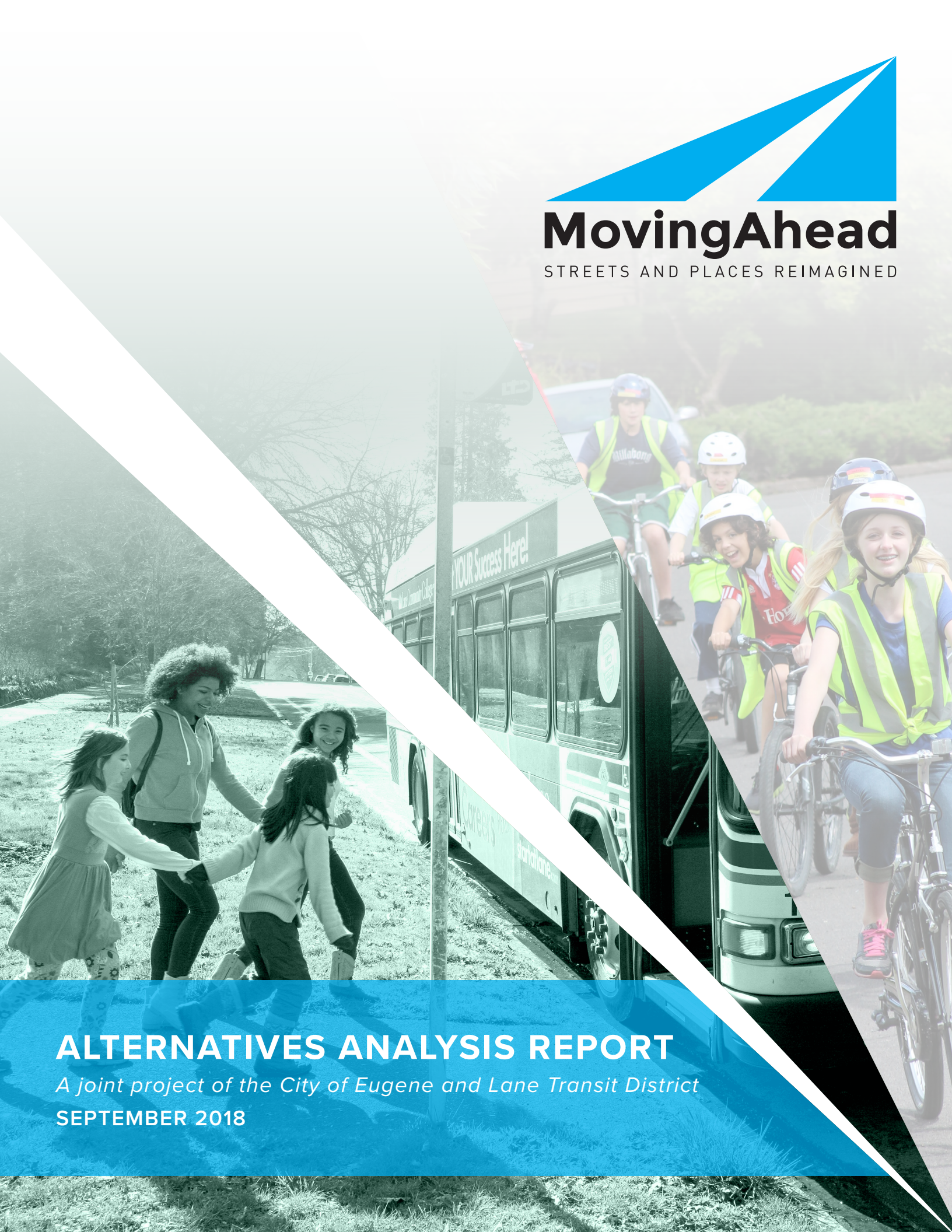




MovingAhead

STREETS AND PLACES REIMAGINED



ALTERNATIVES ANALYSIS REPORT

A joint project of the City of Eugene and Lane Transit District

SEPTEMBER 2018

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Glossary of acronyms, abbreviations and terms used throughout this AA report is found in Appendix A

Chapter 1: Introduction

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Overview

The City of Eugene (City) and Lane Transit District (LTD) are working with regional partners and the community to determine what investments will be needed on some of our most important transportation corridors for people using transit, as well as walking, biking and using mobility devices. As part of the MovingAhead project, the LTD Board of Directors and Eugene City Council will select a preferred package of transit, walking, and biking investments along these corridors that can be funded and built in the near-term.

MovingAhead builds upon transportation and land use plans including Envision Eugene, LTD's Long-Range Transit Plan, the Eugene 2035 Transportation System Plan (Eugene 2035 TSP), and the Central Lane Metropolitan Planning Organization Regional Transportation Plan (RTP).

The MovingAhead project has focused on creating active, vibrant places that are safe and accessible, serve the community, and accommodate future growth. Input from community members has been critical to this process.

Community members' input was used to select the 5 most important corridors for investment and to develop corridor concepts that accommodate people who walk, use a mobility device, bike, take the bus, and drive. These 5 corridors and their unique corridor concepts have been studied in this alternatives analysis process.

MovingAhead Investment Packages

The MovingAhead project proposes to extend multimodal investments in 5 key corridors throughout Eugene. Although each corridor is identified with a single street, LTD and the City refer to them as corridors because several streets may work as a system to serve transportation needs.

Corridor alternatives include a no action alternative (called the No-Build Alternative) and 1 or 2 build alternatives that are made up of multimodal investments. The build alternatives include either Enhanced Corridor or EmX transit service. Each of the alternatives was evaluated individually to determine which would work best for the corridors and their communities.

After the community provides feedback about the findings of this Alternatives Analysis (AA) report, the most viable alternatives will be combined to create packages of investments. The packages will be evaluated to determine which combination of investments could be implemented in the near term and would best serve the corridor, the transportation system, and the community.

The LTD Board of Directors and Eugene City Council will consider the findings of this AA report along with the evaluation of the packages and input from the community to select the preferred package of multimodal investments.

City of Eugene Plans

Both the Envision Eugene Comprehensive Plan and the Eugene 2035 TSP were in the draft stages while the technical reports were being prepared and, therefore, the technical reports refer to the draft plans. During the writing of this AA report, both plans were finalized and adopted and this AA reflects the adopted version of the plans.

Alternatives Analysis

This section describes why an alternatives analysis process is conducted and how this AA report is organized.

Alternatives Analysis Purpose

Alternatives analysis is a part of established transportation planning practice and, for more than 30 years, alternatives analysis has been a key part of the Federal Transit Administration's (FTA's) process for advancing local fixed guideway transit projects. Projects seeking federal Small Starts funding must be based upon the evaluation of options, which may occur during the local transportation planning process, and the review of alternatives that occurs to meet the requirements of the National Environmental Policy Act (NEPA).

Although a stand-alone separate AA report is no longer required by FTA, project sponsors are encouraged to conduct an evaluation of alternatives, which is intended to aid in local decision-making and ultimately streamline the environmental review process.

An effective analysis of alternatives answers critical project development questions:

- What are the current and anticipated problems and opportunities along the corridor(s)?
- What are the underlying causes of problems?
- What changes are needed within the corridor to achieve future goals?
- What are viable options for addressing these problems?
- What are the costs?
- What are the impacts associated with investments?
- How can impacts be avoided or minimized?
- What are the benefits?

At its core, alternatives analysis is about serving local decision-making and is a locally managed study process that relies to a large extent on information about regional travel patterns, problems, and needs generated as part of the local transportation planning process.

The purpose of this alternatives analysis is to:

- Aid in the selection of the preferred package that includes investments in up to 5 corridors that are likely to be constructed in the near term (within 10 years)
- Aid in determining the order in which the corridor investments will occur (investment prioritization)
- Enhance the project's likelihood of success by:
 - » Identifying investments whose scope and cost address the defined corridor problems and opportunities, and whose costs are consistent with expected benefits
 - » Developing a realistic financial plan
 - » Advancing investments that support local and regional land use and transportation plans and policies
 - » Providing a summary of the technical analysis, engineering and cost estimates, and other information critical to reaching decisions on which investment strategy to pursue

Report Organization

This report is organized to provide information about the MovingAhead project, the planning process, the potential impacts and benefits of corridor alternatives to aid in selecting multimodal investments for each corridor, and comparisons between the corridors and alternatives to aid in creating, evaluating and selecting a preferred package of multimodal investments. The organization of this report is as follows:

- **Chapter 1:** a summary description of the report's purpose and organization, the project's Purpose and Need, and Goals and Objectives, the corridors and alternatives considered in this evaluation, the project background, and the project schedule and next steps in the project development process
- **Chapter 2:** a summary description of the public involvement and agency coordination during this stage of the project, key issues raised by project stakeholders, and decisions made throughout the

process leading to the alternatives considered in this AA report

- **Chapter 3:** an introduction to the corridor chapters and a description of the environmental topics discussed in the corridor chapters:
 - » Acquisitions and displacements
 - » Air quality
 - » Community, neighborhoods, and environmental justice
 - » Cultural resources
 - » Ecosystems (biological resources and protected species, fish ecology and protected species, wetlands and waters of the state and U.S.)
 - » Energy, sustainability, and greenhouse gas emissions (GHG)
 - » Geology and seismic
 - » Hazardous materials
 - » Land use and prime farmland
 - » Noise and vibration
 - » Parklands, recreation areas, and Section 6(f) resources
 - » Section 4(f) resources
 - » Street and landscape trees
 - » Utilities
 - » Visual and aesthetic resources
 - » Water quality and hydrology
- **Chapter 4:** a summary description of the **Highway 99 Corridor**; its proposed alternatives (including infrastructure investments and transit operating characteristics; capital costs; and, operating and maintenance costs); and, the environmental and transportation benefits and impacts of each alternative considered
- **Chapter 5:** a summary description of the **River Road Corridor**; its proposed alternatives (including infrastructure investments and transit operating characteristics; capital costs; and, operating and maintenance costs); and, the environmental and transportation benefits and impacts of each alternative considered
- **Chapter 6:** a summary description of the **30th Avenue to Lane Community College (LCC) Corridor**; its proposed alternatives (including infrastructure investments and transit operating characteristics; capital costs; and, operating and maintenance costs); and, the environmental and transportation benefits and impacts of each alternative considered
- **Chapter 7:** a summary description of the **Coburg Road Corridor**; its proposed alternatives (including infrastructure investments and transit operating characteristics; capital costs; and, operating and maintenance costs); and, the environmental and transportation benefits and impacts of each alternative considered
- **Chapter 8:** a summary description of the **Martin Luther King (MLK), Jr. Boulevard Corridor**; its proposed alternatives (including infrastructure investments and transit operating characteristics; capital costs; and, operating and maintenance costs); and, the environmental and transportation benefits and impacts of each alternative considered
- **Chapter 9:** a comparative description of the transit and transportation characteristics of the alternatives and corridors considered in this AA report
- **Chapter 10:** a comparative description of the financial and funding characteristics of the alternatives and corridors considered in this AA report
- **Appendices:** The appendices include:
 - » **Appendix A:** Glossary: Acronyms/Abbreviations and Definitions
 - » **Appendix B:** Discipline Technical Reports Preparers and Reviewers
 - » **Appendix C:** Summary of Impacts by Corridor
 - » **Appendix D:** References and Supporting Documents

MovingAhead Project Overview

The MovingAhead project proposes to identify multimodal investments in 5 key corridors in the Eugene area.

Selecting and prioritizing the capital investments in multimodal transit corridors will be a powerful tool for implementing local and regional comprehensive land use and transportation plans, agency strategic plans, and other community planning documents.

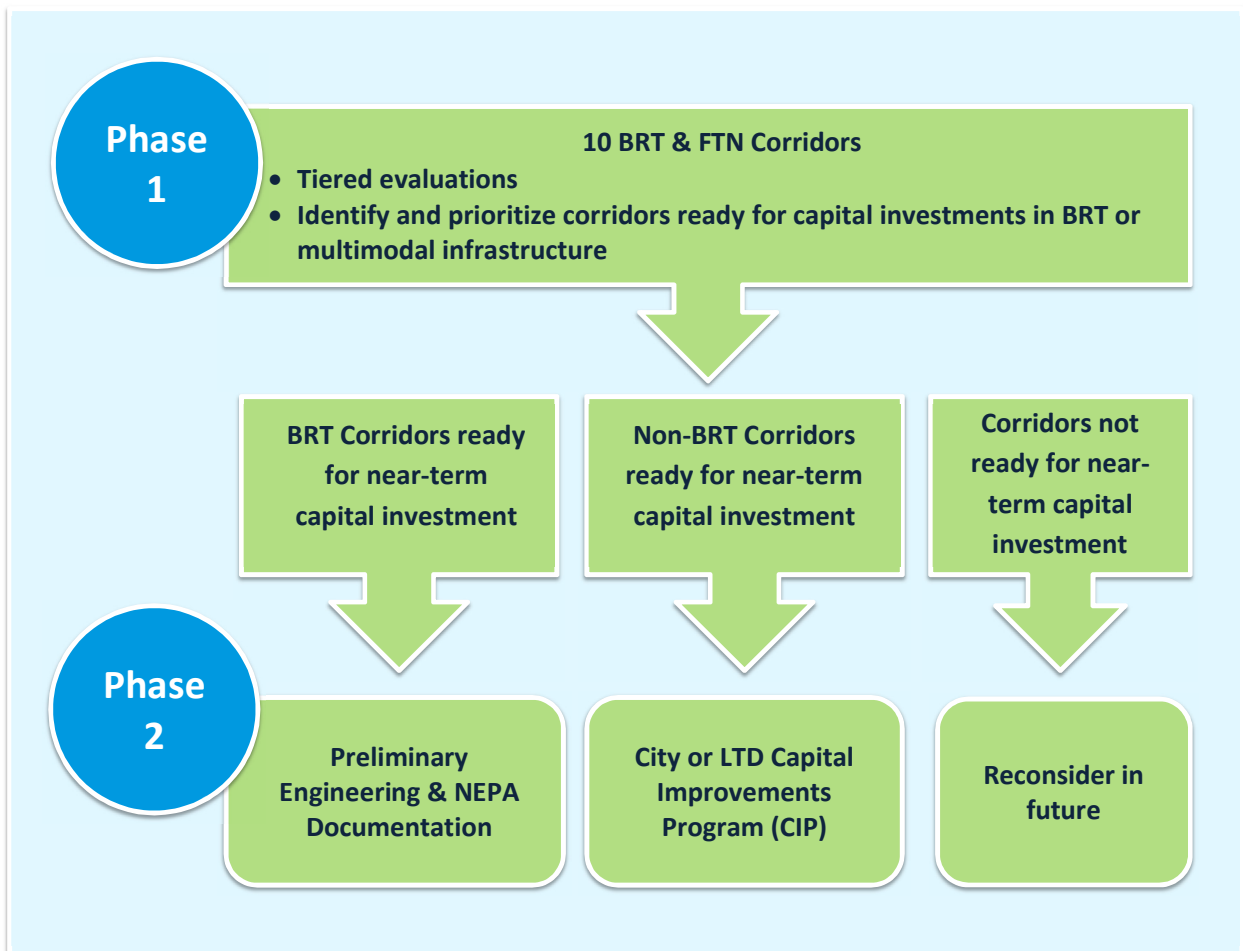
Capital investments in multimodal transit corridors can have a substantial impact on patterns of growth and development. By coordinating the timing and

funding for strategic multimodal capital investments, the MovingAhead project will help to ensure that development occurs consistent with our region's plans and vision.

The MovingAhead project includes 2 phases. This first phase has 3 tiered evaluations that aid in determining which alternatives and corridors are ready for near-term investments (Figure 1-1 and Figure 1-2):

- Fatal Flaw Screening: Determine which corridors from LTD's Emerald Express (EmX) System Plan (for bus rapid transit (BRT)) and Frequent Transit Network (FTN) are ready for investments in multimodal infrastructure

Figure 1-1: MovingAhead Phases

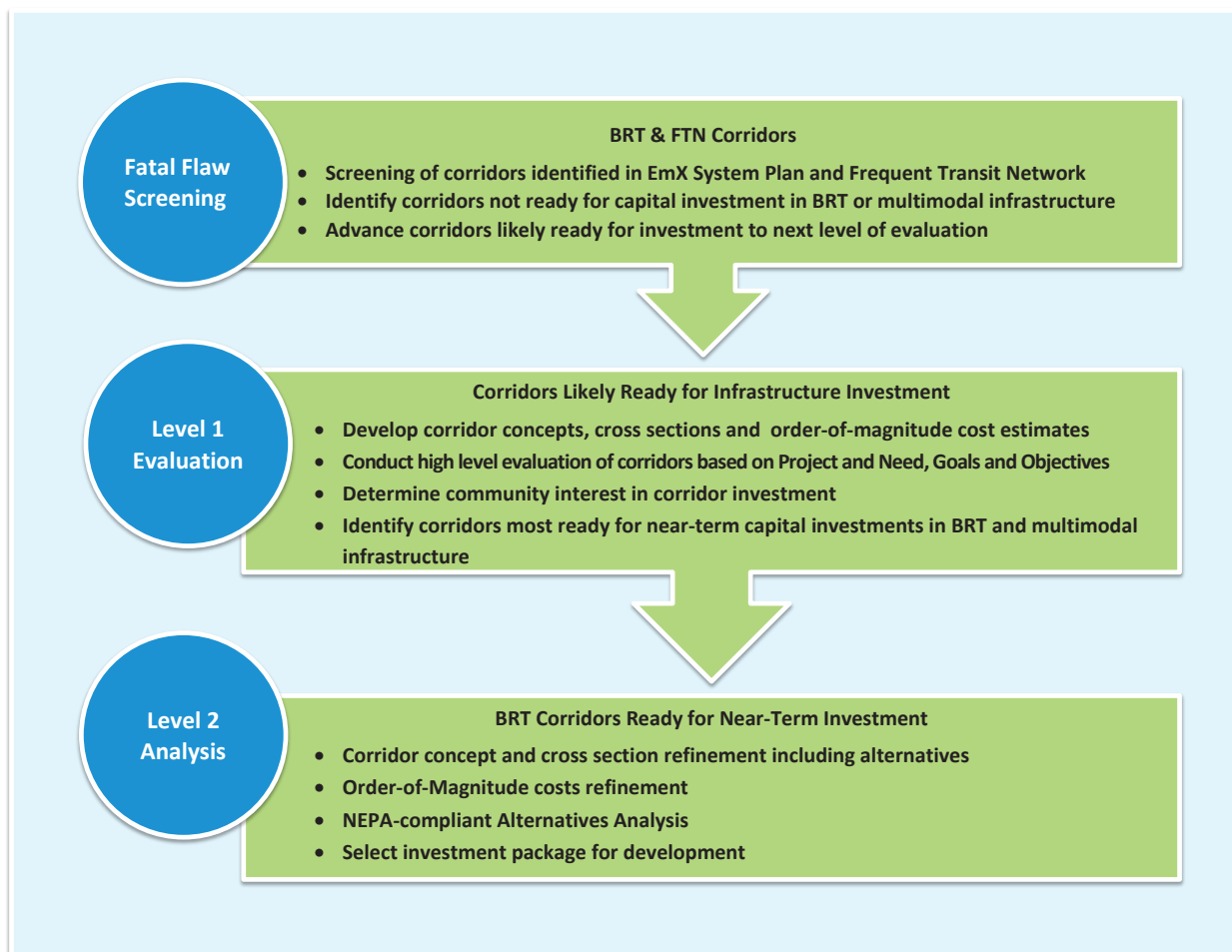


Source: MovingAhead Project Team.

- Level 1 Evaluation: Work with the community and partner agencies to identify corridor investments for people walking, biking, using transit, and using mobility devices and, through a screening level evaluation, determine which corridors and alternatives are most ready for near-term investments
- Level 2 Alternatives Analysis: Work with partner agencies to refine corridor concepts and cost estimates; prepare a NEPA-compliant evaluation of alternatives focused on the region's transportation system, and work with the community and partner agencies to create, evaluate and select the preferred package of multimodal investments and the order in which the investments will occur

Corridor options identified as part of the first phase were developed using multimodal cross sections that included variations on automobile, truck, and bus travel lanes, bicycle lanes, landscaping strips, and sidewalks. After hearing back from the community, the most viable corridor options will be combined into investment packages that will identify the level and timing of investments in the 5 corridors. At the end of the first phase, the Eugene City Council and LTD Board of Directors will select a package of multimodal investments that could be implemented in the near term. The selected package of investments will be advanced to the second phase, which will focus on preparing NEPA environmental reviews, initiating the FTA project development process for qualifying transit projects

Figure 1-2: MovingAhead Phase 1 Steps



Source: MovingAhead Project Team.

and, for those projects that do not qualify for FTA funding, seeking other appropriate funding and design refinement once funding is identified.

Purpose and Need, Goals and Objectives

Defining the need for the project and its underlying purpose are fundamental to the process for selecting the preferred package of multimodal investments. Project goals identify what the project aims to achieve and objectives identify strategies or methods that will be used to accomplish the goals. A project's objectives must be measurable and are used to aid in determining how effective an alternative would be in achieving the project's goals.

The MovingAhead project's Purpose and Need, and Goals and Objectives were reviewed by the Eugene City Council and LTD Board of Directors on May 11, 2015 and referred back to the MovingAhead Oversight Committee for approval on June 29, 2015.

Purpose and Need Statement

The purpose of the MovingAhead project is to:

- Develop a Capital Improvements Program (CIP) that forecasts and matches projected revenues and capital needs over a 10-year period
 - » Balance desired multimodal transit corridor investments with the community's financial resources
 - » Ensure the timely and coordinated construction of multimodal transit corridor infrastructure
 - » Eliminate unanticipated, poorly planned, or unnecessary capital expenditures
- Identify the most economical means of financing multimodal transit corridor capital investments
- Establish partnerships between LTD, the City, and other local agencies that prioritize multimodal transit infrastructure needs and promote interagency cooperation
- Ensure that multimodal transit corridor investments are consistent with local comprehensive land use and transportation plans and are supported by community members in the corridor

The need for the MovingAhead project is based on the following factors:

- LTD's and the region's commitment to implementing the region's vision for BRT in the next 20 years consistent with the Regional Transportation Plan (RTP) that provide the best level of transit service in a cost effective and sustainable manner
- Need for streamlined environmental reviews to leverage system-wide analysis
- Selection of the next EmX/ FTN corridors is based on long-range operational and financial planning for LTD's service

Goals and Objectives

Goal 1: Improve multimodal transit corridor service

- Objective 1.1: Improve transit travel time and reliability
- Objective 1.2: Provide convenient transit connections that minimize the need to transfer
- Objective 1.3: Increase transit ridership and mode share in the corridor
- Objective 1.4: Improve access for people walking, using mobility devices, and bicycling to transit
- Objective 1.5: Improve the safety of pedestrians, mobility device users, and bicyclists accessing transit, traveling in and along the corridor, and crossing the corridor

Goal 2: Meet current and future transit demand in a cost-effective and sustainable manner

- Objective 2.1: Control the increase in transit operating cost to serve the corridor
- Objective 2.2: Increase transit capacity to meet current and projected ridership demand
- Objective 2.3: Implement corridor improvements that provide an acceptable return on investment
- Objective 2.4: Implement corridor improvements that minimize impacts to the environment and, where possible, enhance the environment

Objective 2.5: Leverage funding opportunities to extend the amount of infrastructure to be constructed for the least amount of dollars

Goal 3: Support economic development, revitalization, and land use redevelopment opportunities for the corridor

Objective 3.1: Support development and redevelopment as planned in other adopted documents

Objective 3.2: Coordinate transit improvements with other planned and programmed pedestrian, mobility device users, and bicycle projects

Objective 3.3: Coordinate transit improvements with other planned and programmed roadway projects

Objective 3.4: Minimize adverse impacts to existing businesses and industry

Objective 3.5: Provide high-capacity transit that is consistent with community vision for the corridor

Objective 3.6: Improve transit operations on state facilities in a manner that is mutually beneficial to vehicular and freight traffic flow around transit stops and throughout the corridor

Objective 3.7: Improve transit operations in a manner that is mutually beneficial to vehicular traffic flow for emergency service vehicles



Transit System Studies and Strategy

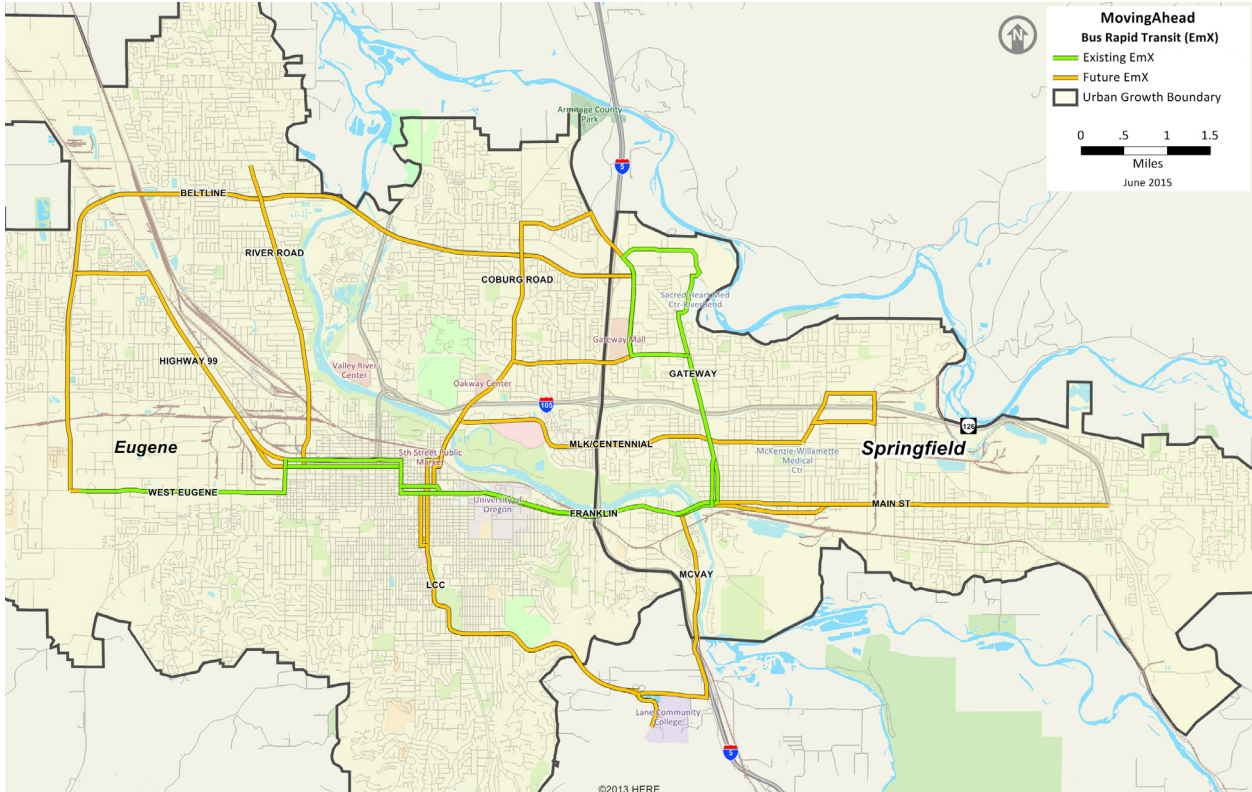
For more than 2 decades, the Eugene-Springfield region has identified and implemented improved transit strategies and programs. In that time, the region has advanced its vision for multimodal corridors, completing several projects that included a coordinated set of bicycle, pedestrian and transit investments. These investments have focused on cost effective measures to provide a safe, reliable, and well-connected transit system supporting the region's land use and transportation goals. LTD was among the nation's first transit agencies to implement BRT as a preferred transit strategy. Over time, the BRT concept has progressed in meeting the region's changing needs. The concept of a Frequent Transit Network (FTN) has been adopted into LTD's Long-Range Transit Plan. A new transit mode (Enhanced Corridor) has evolved to bridge the gap between BRT and fixed-route service. The features of enhanced corridors are described later in this chapter.

BRT and EmX System

In 1995, the BRT system concept was introduced as part of the Alternative Plan Concepts (APC) developed during the regional transportation planning. In 1998, the draft RTP (TransPlan) included a BRT policy and system map, and was adopted in 2001.

Extensive public outreach was conducted as part of the regional transportation planning process. BRT emerged as the preferred transit strategy for the Eugene-Springfield metropolitan area through a major investment study undertaken as part of the RTP 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

Figure 1-3: Lane Transit District's Bus Rapid Transit (BRT) System



Source: LTD and City of Eugene 2015.

adopted the RTP in 2001 (required updates every 4 years). The RTP identified BRT as the preferred transit strategy for the 20-year plan horizon. Additionally, the RTP identified a comprehensive 61-mile system of BRT corridors (Figure 1-3).

Over the decades, as the metropolitan area has evolved, so has the BRT concept. The region has considered various options to better connect areas of more active land use development to transit. This initiative to align the level of transit investment with the level of development led to the FTN Strategy.

Frequent Transit Network (FTN) Strategy

LTD's Long Range Transit Plan (2014) describes the FTN as a regional initiative to better connect areas of more active development to transit, providing 15-minute or better service, transit stops or EmX stations with high quality amenities, and safe bicycle and pedestrian connections to stops or stations.

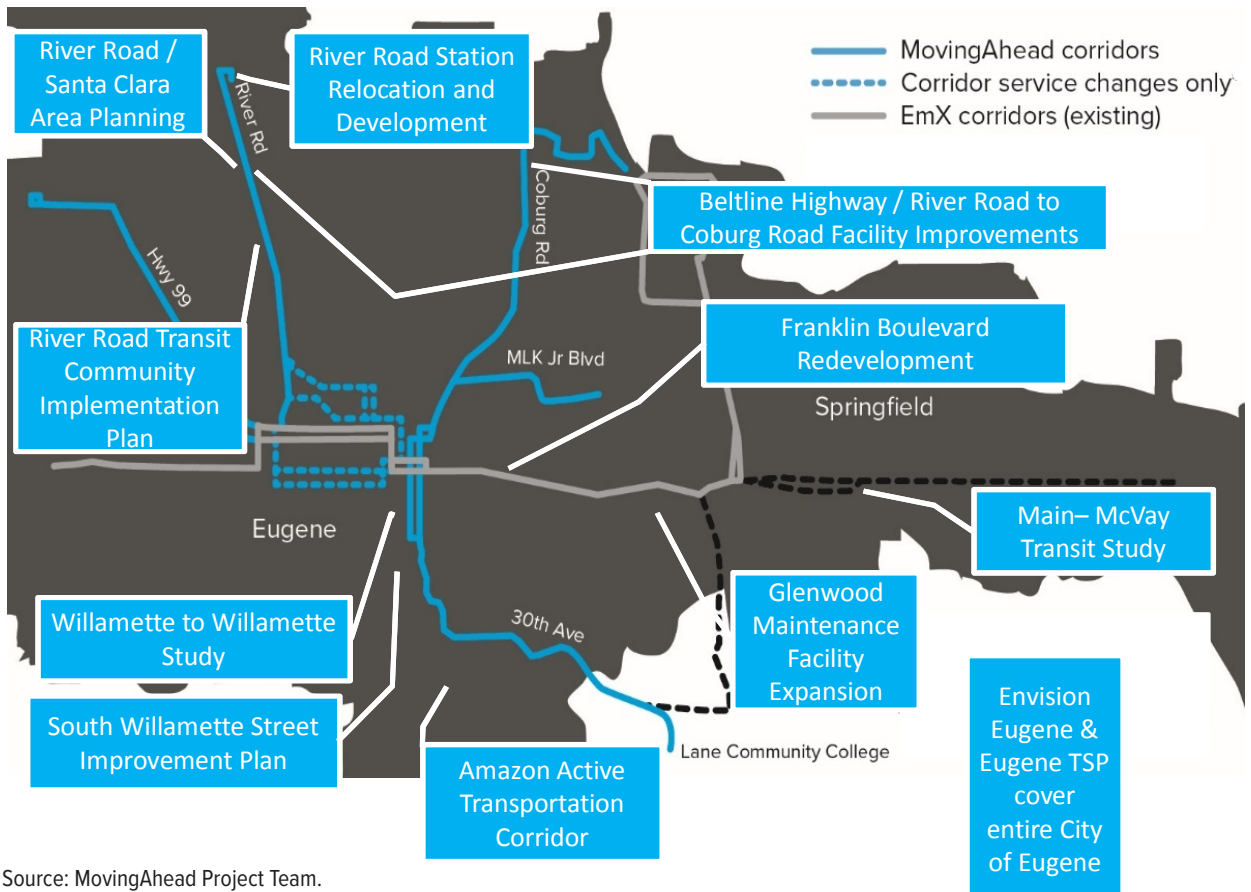
Both EmX and Enhanced Corridor transit service would meet the goals of the FTN strategy. Enhanced Corridor service is a new concept for LTD and represents the lower end of the spectrum of transit infrastructure investments on LTD's FTN.

Relationship to Other Projects

A number of projects and studies throughout the Eugene-Springfield metropolitan area could affect corridors that were identified and considered in the technical analysis of the MovingAhead alternatives (Figure 1-4). These projects and their relationship to the MovingAhead project are described in detail in the Level 1 Screening Evaluation Report (CH2M et al. 2015) and in the technical reports prepared for this AA report. This list has been updated since the Level 1 Screening Evaluation to ensure accuracy. These other related projects and studies include:

- EmX Studies
 - » Main Street-McVay Highway Transit Study
- LTD Capital Projects
 - » Glenwood Maintenance Facility Expansion
 - » River Road Station Relocation and Development (Santa Clara Community Transit Center)
- City of Eugene Plans and Studies
 - » Envision Eugene
 - » Eugene 2035 TSP
 - » Amazon Active Transportation Corridor Project
 - » South Willamette Street Improvement Plan
 - » Willamette-to-Willamette Study
 - » River Road / Santa Clara Neighborhood Planning
 - » River Road Transit Community Implementation Plan
- Oregon Department of Transportation (ODOT) Projects
 - » Randy Papé Beltline Highway/River Road to Coburg Road Facility Improvements
- City of Springfield Projects
 - » Franklin Boulevard Redevelopment

Figure 1-4: Other Projects Related to the MovingAhead Project



Source: MovingAhead Project Team.

Evaluation Process

The MovingAhead project has used 3 levels of evaluation to assess whether or not an alternative is ready for near-term investment. Each level of evaluation has required a greater level of data and analysis than the previous evaluation. The project started with a high level screening, called a fatal flaw screening, which focused on eliminating alternatives that were not ready for capital investment. Alternatives that were likely ready for near-term investment were advanced to the Screening Evaluation.

No-Build Alternative

Every corridor under consideration includes a No-Build Alternative. The No-Build Alternative serves as a reference point to gauge the benefits, costs, and effects of the build alternatives. Throughout this report the build alternatives are compared to the No-Build Alternative to allow decision makers the opportunity to better consider the key differences among the alternatives across all perspectives. This broad view highlights the advantages and disadvantages of each alternative and points to the key trade-offs of costs and benefits that must be made in choosing a preferred package of multimodal investments.

Alternatives Previously Considered and Eliminated

At each stage of the MovingAhead project, alternatives were considered and either eliminated or advanced to the next project stage for further analysis. Alternatives considered have been based on existing plans and studies and were the result of working with neighborhood and community stakeholders through a series of workshops held at the launch of the project. Alternatives considered have included the route alignment, modes (No-Build, Enhanced Corridor or EmX service), and design concepts (e.g., lane treatments, variations in stop or station locations, bicycle or pedestrian facilities).

Alternatives were eliminated from further consideration based on evaluation results and/or feedback from the community or interested agencies. Each of the alternatives eliminated from further consideration and the reasons for eliminating the alternatives are described in each corridor chapter of this AA report (Chapters 4 through 8).

Fatal Flaw Screening

The project team conducted a fatal flaw screening in February 2015 to identify which of the 10 corridors should not move forward to the Level 1 Screening Evaluation. This high-level evaluation used criteria based on MovingAhead’s Purpose, Need, Goals, and Objectives (LTD 2015) and existing data to determine which corridors were not ready for capital investment in BRT or multimodal infrastructure in the next 10 years. The screening was conducted with local, regional, and state agency staff. Of the 10 corridors identified, the following 3 corridors were not advanced from the fatal flaw screening to the Level 1 Screening Evaluation: 18th Avenue, Bob Straub Parkway, and Randy Papé Beltline Highway. Table 1-1 shows the results of the fatal flaw screening.

Although originally advanced from the fatal flaw screening, the Main Street-McVay Highway Corridor was also not advanced to the Level 1 Screening Evaluation because the Springfield City Council (on May 18, 2015) and LTD Board of Directors (on May 20, 2015)

Table 1-1: Results of the Fatal Flaw Screening

Corridor	Advanced to Level 1	Consider Later
Highway 99	✓	
River Road	✓	
Randy Papé Beltline		✓
18th Avenue		✓
Coburg Road	✓	
MLK, Jr. Boulevard / Centennial Boulevard	✓	
30th Avenue to LCC	✓	
Main Street-McVay Highway*	✓	
Valley River Center	✓	
Bob Straub Parkway		✓

Source: LTD and City of Eugene 2015.

* Although the Main Street-McVay Highway Corridor was advanced ahead of the MovingAhead project, it was later delayed due to the City of Springfield receiving an award to study safety improvements along Main Street.

determined that the corridor is ready to advance to a study to select a locally preferred transit solution ahead of the MovingAhead project schedule. Subsequent to that decision, in summer 2016, the City of Springfield received an award from ODOT allowing the City to focus on ways to improve the safety of the Main Street. The study of transit improvements in the Main Street-McVay Highway Corridor has been delayed and will be reconsidered when the safety project is further along.

The 6 remaining multimodal corridors were advanced to the Screening Evaluation to determine how they compared with each other in meeting the Purpose, Need, Goals, and Objectives.

Level 1 Screening Evaluation

The Level 1 Screening Evaluation assessed how each corridor would perform according to the Purpose, Need, Goals, and Objectives of MovingAhead. The Level 1 Screening Evaluation used existing studies and readily available data to evaluate each corridor. Based on community input and technical analysis, the following corridors and alternatives were advanced from the Level 1 Screening Evaluation to the Level 2 Alternatives Analysis (Table 1-2):

- No-Build Alternatives: all corridors
- Enhanced Corridor and EmX Alternatives:
 - » Highway 99 Corridor
 - » River Road Corridor

- » 30th Avenue to LCC Corridor

- » Coburg Road Corridor

- Enhanced Corridor Alternative:

- » MLK, Jr. Boulevard Corridor

The Valley River Center Corridor received the least public support during outreach and was not carried forward to the Level 2 Alternatives Analysis.

Level 2 Alternatives Analysis

Technical Studies

To guide the Level 2 Alternatives Analysis process, LTD prepared new ridership forecasts and related evaluation measures using the Lane Council of Governments (LCOG) regional model. Base-year and future-year forecasts were prepared for corridor alternatives based upon updated inputs and transit networks specific to each corridor. The planning horizon year used for the AA report is 2035. The built and natural environments, transit operations, traffic, finance, historical resources, and other areas were also evaluated as part of this AA report. These evaluations are detailed in technical reports and are available through the project's website and at LTD's administrative offices and the City's Public Works Transportation Planning and Planning and Development Departments.

Table 1-2: Corridors and Transit Alternatives Advanced to the Level 2 Alternatives Analysis

Corridor	No-Build	Enhanced Corridor	EmX
Highway 99	✓	✓	✓
River Road	✓	✓	✓
30th Avenue to LCC	✓	✓	✓
Coburg Road	✓	✓	✓
MLK, Jr. Boulevard	✓	✓	

Source: CH2M et al. 2016.

Alternatives Analysis Report

The findings from the technical studies are summarized in the various chapters of this AA report.

Each corridor and its alternatives are discussed in separate chapters (Chapters 4 through 8). The corridor alternative defines the mode (No-Build, Enhanced Corridor, or EmX), associated route and other multimodal investments. In some cases, the alternative may identify areas where refinement to the design is needed.

Working together, LTD and the City will engage each of the corridor communities as well as the broader community in discussions about the benefits and impacts of the alternatives, which will aid in creating the packages of investments for evaluation.

Selection of Preferred Investment Package

After the public review of this AA report closes, LTD and the City will develop the packages of multimodal investments based on community, agency and tribal input. To begin the process to select the preferred

package of multimodal investments, LTD and the City will hold additional public review of the refined packages.

The findings summarized in this AA report combined with feedback from the community and other project stakeholders will be presented to the Sounding Board and Oversight Committee, and LTD's Strategic Planning Committee for recommendations about which investment package best meets the community's vision for the corridors and how each of the corridors should be prioritized for capital investments over the next 10 years.

Decision makers will consider the findings from the technical analysis, feedback from the community, and recommendations from project committees in developing and selecting preferred investment package for near-term implementation. These decisions will allow the project team to begin pursuing funding opportunities for the multimodal investments that have the highest priority. The remaining multimodal investments (other than No-Build) will continue to move forward, but on a slower course, to implementation.



Corridors Considered in this Evaluation

Highway 99 Corridor

The Highway 99 Corridor begins at the Eugene Station, travels through downtown, then extends northwest along Highway 99 to Barger Drive, turning west at Barger Drive to terminate north of the intersection of Barger Drive and Cubit Street, east of the Randy Papé Beltline Highway. This corridor is approximately 11.1 round-trip miles for the No-Build and Enhanced Corridor Alternatives and 10.5 round-trip miles for the EmX Alternative.

Alternatives considered for this corridor are:

- No-Build Alternative
- Enhanced Corridor Alternative
- EmX Alternative

The Enhanced Corridor and EmX Alternatives use different routes for this corridor.

The technical evaluation findings for the Highway 99 Corridor are discussed in Chapter 4 of this AA report.

River Road Corridor

The River Road Corridor begins at the Eugene Station, travels through downtown, and then north to the Santa Clara Community Transit Center (south of the intersection of Hunsaker Lane and River Road). This corridor is approximately 10.3 round-trip miles.

Alternatives considered for this corridor are:

- No-Build Alternative
- Enhanced Corridor Alternative
- EmX Alternative

The Enhanced Corridor and EmX Alternatives use different routes for this corridor.

The technical evaluation findings for the River Road Corridor are discussed in Chapter 5 of this AA report.

30th Avenue to LCC Corridor

The 30th Avenue to LCC Corridor begins at Eugene Station and travels south along Pearl Street (outbound) to Amazon Parkway, then on E. 30th Avenue to its terminus at the LCC Station. The return trip travels on Oak Street (inbound), which is the northbound couplet to Pearl Street. This corridor is approximately 10.3 round-trip miles.

Alternatives considered for this corridor are:

- No-Build Alternative
- Enhanced Corridor Alternative
- EmX Alternative

The technical evaluation findings for the 30th Avenue to LCC Corridor are discussed in Chapter 6 of this AA report.

Coburg Road Corridor

The Coburg Road Corridor begins at Eugene Station and continues to Coburg Road using the Ferry Street Bridge. The corridor continues north on Coburg Road to Crescent Avenue, east on Crescent Avenue and Chad Drive to N. Game Farm Road, and south on N. Game Farm Road and Gateway Street to the existing Gateway Station at the Gateway Mall. Although service extends from N. Game Farm Road to the Gateway Station, capital investments for the corridor terminate at Interstate 5 (I-5). This corridor is approximately 11.2 round-trip miles for the No-Build Alternative and 13.2 round-trip miles for the Enhanced Corridor and EmX Alternatives.

Alternatives considered for this corridor are:

- No-Build Alternative
- Enhanced Corridor Alternative
- EmX Alternative

The technical evaluation findings for the Coburg Road Corridor are discussed in Chapter 7 of this AA report.

MLK, Jr. Boulevard Corridor

The MLK, Jr. Boulevard Corridor begins at Eugene Station and travels through downtown Eugene on Oak and Pearl Streets and on 7th and 8th Avenues. The corridor uses the Ferry Street Bridge to reach MLK, Jr. Boulevard and continues east on MLK, Jr. Boulevard past Autzen Stadium to Centennial Boulevard. Although transit service continues along Centennial Boulevard, capital investments for the corridor terminate at I-5. The corridor is approximately 6.0 round-trip miles.

Alternatives considered for this corridor are:

- No-Build Alternative
- Enhanced Corridor Alternative

The technical evaluation findings for the MLK, Jr. Boulevard Corridor are discussed in Chapter 8 of this AA report.

Alternatives Considered in this Evaluation

This section provides an overview of the general concepts for the No-Build, Enhanced Corridor and EmX Alternatives under study in this AA report.

No-Build Alternative

The No-Build Alternative is based on projected conditions in the year 2035, the project's environmental forecast year. For each corridor, the No-Build Alternative serves as a reference point to gauge the benefits, costs, and effects of the build alternatives. The No-Build Alternative represents conditions under which adopted policy and projects (outside the scope of identified investments to the 5 MovingAhead corridors under study) are programmed in regional and local plans and can reasonably assumed to be implemented.

Capital Investments

Under the No-Build Alternative, the following capital investments are anticipated by 2035:

- **Santa Clara Community Transit Center.** Relocation of the existing River Road Station to a site north of the Randy Papé Beltline Highway by the end of 2020.
- **Main Street EmX Extension.** Extension of the existing Franklin EmX line on Main Street from Springfield Station to Thurston Station is included in the RTP and

was under study until summer 2016. This transit study has been delayed while the City of Springfield studies safety investments on Main Street. Despite the delays, LTD still anticipates completion of the transit study and implementing the preferred investments within the 20-year planning horizon (2035). The No-Build Alternative transit network assumes EmX service on Main Street; however, until the transit study is completed, the outcome of this study, and the ultimate investments chosen, are unknown at this time.

- **McVay Highway Enhanced Corridor.** Enhanced Corridor service from Springfield Station on McVay Highway to LCC and associated capital investments (e.g., improved stops, transit queue jumps, and improved bicycle and pedestrian crossings) is included in the RTP. As with the Main Street EmX Extension, the transit study has been delayed while the City of Springfield studies safety investments on Main Street. Despite the delays, LTD still anticipates completion of the transit study and implementing investments within the 20-year planning horizon (2035). The No-Build Alternative transit network assumes Enhanced Corridor service on McVay Highway; however, until the transit study is completed, the outcome of this study, and the ultimate investments chosen, are uncertain at this time.

Transit Operations

The No-Build Alternative for each corridor includes changes to transit service anticipated as a result of the recently opened West Eugene EmX (WEEE) service, Main Street EmX Extension project, development of the Santa Clara Community Transit Center, and other changes to fixed route service. Changes to the existing 2016 fixed-route services anticipated by 2035 are described in detail in each of the corridor chapters (Chapters 4 through 8) of this AA report.

Key transportation investments specific to each corridor are also described under each corridor's No-Build Alternative in Chapters 4 through 8.

Enhanced Corridor Alternatives

Enhanced Corridors are a new concept for the Eugene-Springfield region and represent the lower end of the spectrum of infrastructure investments on LTD's FTN (corridors identified for 15-minute service or better). Enhanced Corridor Alternatives are intended to address the project's Purpose, Need, Goals, and Objectives without major transit capital investments, instead focusing on lower-cost capital investments, operational improvements, and transit service refinements. Features could include transit queue jumps (lanes for buses that allow the bus to "jump" ahead of other traffic at intersections using a separate signal phase), stop consolidation, enhanced shelters, and redesigned service to improve cross-town connectivity. These features improve reliability, reduce transit travel time, and increase passenger comfort.

Buses generally share lanes with other vehicles, but business access and transit (BAT) lanes can also be used. New facilities to make walking, cycling, and using mobility devices safer and more convenient could be constructed along with Enhanced Corridor investments. The current definition of transit service in Enhanced Corridors does not include branded vehicles, which makes Enhanced Corridor Alternatives ineligible for some federal funding. This definition may be re-evaluated to include branded vehicles, which would increase the available funding options for this mode choice.

Enhanced Corridor service would run from 6:45 a.m. to 11:30 p.m. weekdays, 7 a.m. to 11 p.m. Saturdays,

and 8 a.m. to 8 p.m. Sundays. Service frequencies are assumed to be 15 minutes during all periods.

Enhanced Corridor Alternatives include pedestrian and bicycle investments; these investments vary by alternative and corridor.



Enhanced Corridors have amenities at bus stops, like shelters and seating.

Transit Queue Jumps

Transit queue jumps are bus-only lanes approaching intersections to allow buses to proceed through signals and merge into regular travel lanes ahead of other vehicles. Signals typically provide a phase specifically for buses. Transit queue jumps reduce delay at signals and improve the operational efficiency of the transit system. They would be used with both EmX and Enhanced Corridor Alternatives.



EmX Alternatives

EmX is short for Emerald Express and is LTD's branded BRT service. EmX Alternatives are characterized by exclusive guideways (BAT or bus-only lanes); branded, multi-door 60-foot-long BRT vehicles; enhanced stations instead of stops; off-board fare collection; signal priority; wider stop spacing; and frequent and redesigned service to improve cross-town connectivity.

An EmX station is a substantial facility that typically includes a shelter, level boarding platforms, opportunity for advance fare collection, unique name, distinctive look and feel, passenger information including real time signage, lighting and security, seating, bicycle racks, and trash cans.

EmX service is assumed to run from 6:45 a.m. to 11:30 p.m. weekdays, 7 a.m. to 11 p.m. Saturdays, and 8 a.m. to 8 p.m. Sundays. Service frequencies are assumed to be 10 minutes during all periods.

EmX Alternatives include pedestrian and bicycle investments; these investments vary by alternative and corridor.



EmX stations include level boarding, shelters, lighting, seating, and other amenities. They may also include ticket vending machines.

Upgraded and Enhanced Crossings

New upgraded and enhanced pedestrian crossings are included as part of both Enhanced Corridor and EmX Alternatives. New crossings are generally located at areas where there is no legal pedestrian crossing (often at mid-block locations away from intersections). Upgraded crossings consist of installing Americans with Disabilities Act (ADA) ramps and possibly pedestrian crossing islands and/or crosswalk striping. In addition to the infrastructure included as part of an upgraded crossing, enhanced crossings can also consist of installing either a flashing yellow indication (flashing beacon) or yellow, red, flashing red indication (Pedestrian Hybrid Beacon) along the corridor to warn vehicles of a pedestrian crossing.

Upgraded Crossing



Enhanced Crossing



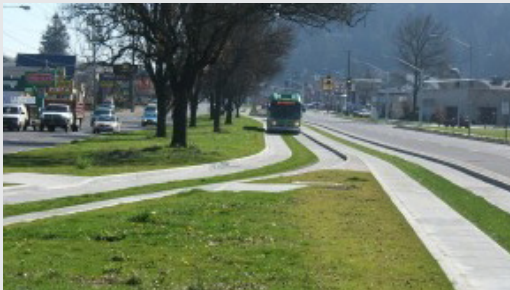
Business Access and Transit (BAT) Lanes

A business access and transit (BAT) lane is reserved for buses and turning vehicles only. BAT lanes allow access to businesses and residences while improving bus reliability and reducing transit travel time. BAT lanes also enhance the capacity of the remaining travel lanes by removing buses from general traffic. BAT lanes are restricted to transit vehicles except where vehicles enter or exit adjacent property or where they need to make a right turn at an intersection. Typically, only buses are allowed to use the lane to cross an intersecting street. In general, a BAT lane is separated from general-purpose lanes by a paint stripe and signage. Both Enhanced Corridor and EmX Alternatives would use BAT lanes.



Bus-Only Lanes

Bus-only lanes are reserved for transit. Bus-only lanes may be located in the median of the street or, in some cases, in the outside travel lanes. Other vehicles are typically allowed to cross bus-only lanes only at signalized intersections. Bus-only lanes would be used with EmX Alternatives.



Schedule

The MovingAhead project was initiated in 2014. LTD and the City anticipate that by the end of 2018 the LTD Board of Directors and the Eugene City Council will select the preferred package of multimodal investments. The project phases and schedule are summarized in Table 1-3 and illustrated in Figure 1-5.

With the publication of this AA report, the immediate next steps in the project include:

- Public review of the AA report
- Creating, evaluating, and selecting a preferred package of multimodal investments
- Determining the priority order for investments for the corridor alternatives within the preferred investment package
- For the highest priority corridor or corridors that will seek federal funds
 - » Complete NEPA process
 - » Initiate FTA project development process
 - » Complete Small Starts grant application process
- For the highest priority corridor or corridors that will not seek federal funds but instead rely on local and/or state funds
 - » Determine and pursue funding
 - » Initiate design, engineering, and permitting

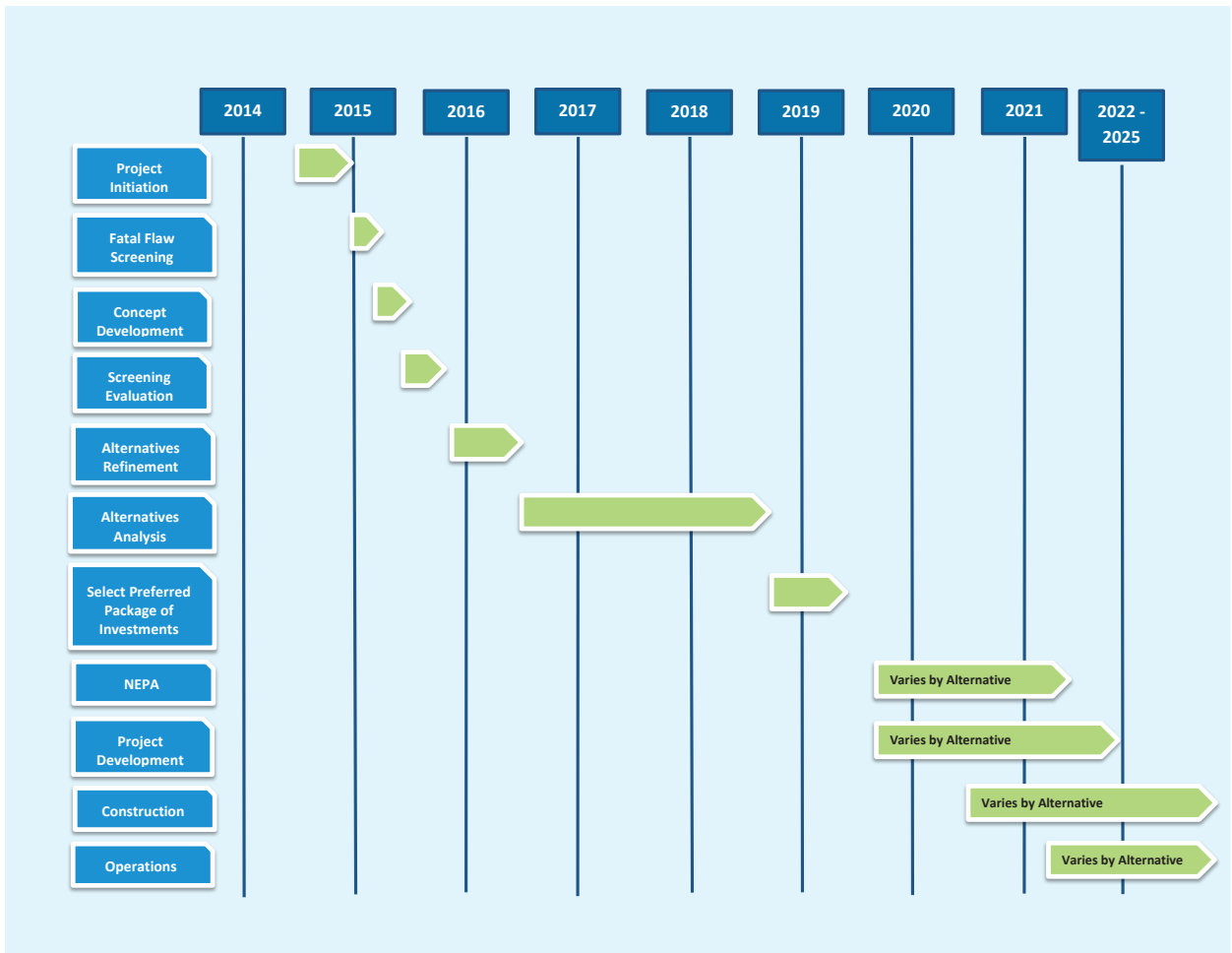
During each of these next steps, LTD and the City will coordinate with the FTA, as well as other agencies that may have an interest in the project. LTD and the City will also continue to engage project committees and the community and consider any feedback received.

Table 1-3: MovingAhead Project General Phases and Time Periods

General Phase	What	When	Status
Project Initiation	Problem statement, Purposed and Need, Goals and Objectives, FTA consultation	Jun 2014 – Jan 2015	Completed
Fatal Flaw Screening	Determine corridors likely ready for investment	Jan – Feb 2015	Completed
Concept Development	Community and agencies develop concepts to study	Mar – Jun 2015	Completed
Screening Evaluation	High level screening of corridors and alternatives	Jun – Oct 2015	Completed
Alternatives Refinement	Refine advanced corridor alternatives	Nov 2015 – Jun 2016	Completed
Alternatives Analysis	Evaluate alternatives	Jul 2016 – Summer 2018	Underway
Selection of Preferred Investment Package	Community engagement and decision-making process for creating, evaluating, and selecting a preferred investment package of multimodal improvements	Fall 2018 – Spring 2019	
NEPA	Prepare FTA NEPA documentation (Varies by alternative advanced as part of the preferred investment package)	Begins Fall 2019	
Project Development	Design, engineering, permitting (Varies by alternative advanced as part of the preferred investment package)	Begins Fall 2019	
Construction	Construct and testing (Varies by alternative advanced as part of the preferred investment package)	Could begin as early as Summer 2020	
Operations	Begin operations (Varies by alternative advanced as part of the preferred investment package)	Could begin as early as Winter – Spring 2021	

Source: MovingAhead Project Team.

Figure 1-5: MovingAhead Project Process and Schedule Overview



Source: MovingAhead Project Team.

Chapter 2: Outreach and Involvement

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Overview

Lane Transit District (LTD) and the City of Eugene (City) have engaged in extensive public involvement throughout the MovingAhead project. Additionally, LTD and the City have coordinated with local, state and federal agencies and tribes to keep them informed about the project's progress and obtain information related to potential environmental effects and regulatory issues.

MovingAhead is built on a history of engagement that supported development of the adopted Emerald Express (EmX) System Plan (LTD 2014), the Frequent Transit Network (FTN), and the City's vision for concentrating new development near key transit corridors and within core commercial areas while protecting neighborhoods and increasing access to services for everyone.

The project's 5 study corridors are primarily located in the City of Eugene, with a portion of the 30th Avenue to Lane Community College (LCC) Corridor located within unincorporated Lane County, and a portion of the Coburg Road Corridor located in the City of Springfield. As proposed project construction and service changes would primarily affect land and streets in Eugene, outreach activities have focused on Eugene residents, and on business and property owners. Regardless of the outreach focus, events have been broadly advertised in the Eugene-Springfield area and open to anyone with an interest in the project.

LTD and the City have provided early and continuous information in a variety of formats, encouraging feedback and a continuing dialogue to shape a project that will benefit the entire community. The MovingAhead Draft Community Involvement and Agency and Tribal Coordination Report (CH2M 2017) includes a complete listing of all public, stakeholder, and committee meetings, outreach events, and input received.

Summary of Outreach Activities

Since project initiation, the project team has used a broad array of strategies to engage the public and agency stakeholders. Some of these strategies have targeted specific demographic or stakeholder groups,

while others have been used to reach out to the entire community.

Community feedback has been gathered through written comment forms, online surveys, emails, telephone calls, meeting notes, public meeting testimony and letters. Public input has been summarized at each project milestone and considered by the project team throughout the project.

The MovingAhead project began with stakeholder interviews to better understand how the City and LTD were viewed in the community, what issues should be addressed, and how the engagement process could best reach community members. In May 2015, the City and LTD hosted 5 workshops where community members

MovingAhead Public Involvement Goals

- » Provide early and ongoing opportunities for stakeholders to raise issues and concerns that can be considered through equitable and constructive 2-way communication between the project team and the public
- » Encourage the participation of all stakeholders regardless of race, ethnicity, age, disability, income, or primary language by offering alternative accommodations, as needed (for example, translation services, activities for children at community meetings, accessible meeting facilities)
- » Promote fair treatment so that no group of people (racial, ethnic, or a socioeconomic group) bears a disproportionate share of the negative environmental consequences resulting from a program or policy
- » Ensure that public contributions are considered in the decision-making process and can influence decisions
- » Build on information gathered through related planning processes and ensure effective coordination and consistency with those efforts

defined corridor concepts using scaled roadway design elements (such as sidewalks, bicycle lanes, bus lanes, landscaping, etc.) to determine possible cross sections for each corridor. These cross sections formed the basis for the corridor alternatives evaluated in this Alternatives Analysis (AA) report.

In subsequent milestones, LTD and the City asked community members to weigh in on refining and narrowing the alternatives by hosting 2 in-person open houses and 3 online open houses; visiting all the neighborhood associations in or adjacent to the project area; canvassing more than 500 businesses and homes along the 5 MovingAhead corridors; and staffing information tables at more than 25 community events. The project team has also maintained a robust website with corridor graphics at each step, a library of project documents, a calendar of project events, and a comment form for asking questions of the project team.

Summary of Public Outreach Outcomes

At each step of the MovingAhead project process, LTD and the City responded to community and agency input. The project team integrated this input into the development and refinement of alternatives including:

- Incorporating a bicycle and pedestrian bridge connecting the Trainsong Neighborhood into the Highway 99 Corridor build alternatives
- Reducing the footprint of the Coburg Road Corridor EmX Alternative to decrease impacts to vehicle traffic and adjacent properties
- Refining the Highway 99 Corridor Enhanced Corridor and EmX Alternatives capital investments and routing to reflect input from the Jefferson Westside Neighbors
- Incorporating redevelopment plans at the former Eugene Civic Stadium into the 30th Avenue to LCC Corridor build alternatives
- Refining the footprint of the build alternatives in the 30th Avenue to LCC Corridor to minimize and/or avoid impacts to threatened and endangered species and Section 4(f) resources along Amazon Parkway
- Setting aside EmX service on Martin Luther King (MLK), Jr. Boulevard as a near-term solution and only moving forward with the Enhanced Corridor Alternative for the MLK, Jr. Boulevard Corridor
- Incorporating bicycle facilities and improved pedestrian crossings into the build alternatives in all corridors



Who is Involved in Decision Making?

The MovingAhead process included working with many committees and groups – some formed specifically for MovingAhead and others that oversee regional policy and planning decisions on an ongoing basis. The LTD Board of Directors and Eugene City Council provided informal input throughout the process and formal approval to advance selected alternatives to the AA report. Other groups have received briefings throughout the MovingAhead process because they will be asked to make recommendations about, or approve, the preferred investment package.

Involvement Key Terms

Stakeholder

A person, group, or organization with an interest in or concern about the project.

Canvassing

Door to door visits to businesses and residents located adjacent to the project to share and gather information.

Tabling

Project members staffing a table at a community event to engage attendees; sharing project information and soliciting feedback.

Committees and Groups

Committees and groups involved in the MovingAhead decision-making process are described in Table 2-1.

Agencies

Agencies have been involved through Project Management Team (PMT) and Project Sponsor meetings (listed in Table 2-1), individual agency meetings, and webinars. The project has held 46 agency coordination meetings to-date. City, county, state, and federal agencies have been asked to provide feedback on design, potential impacts and benefits, and regulatory and permit compliance.

Tribes

Based on other existing studies, 5 tribes were identified as potentially having an interest in the MovingAhead project:

- The Confederated Tribes of the Grand Ronde
- The Confederated Tribes of the Siletz Indians
- The Confederated Tribes of the Warm Springs
- The Confederated Tribes of Coos, Lower Umpqua, and Siuslaw Indians of Oregon
- The Coquille Indian Tribe of Oregon

LTD has provided project information to the 5 tribes and invited them to participate in a web-based meeting with city, state, and federal agencies. LTD followed up after the meeting to provide a recording of the web-based meeting.

Community

LTD and the City have conducted outreach with an emphasis on engaging all members of the community including those who have been traditionally underrepresented in transportation planning processes.

The MovingAhead project used the following tools to engage community members in the planning process:

- **Project Website** – The project website provides information on the project, library of project documents, upcoming events, information on participation opportunities, and a contact form where the public can provide comments, ask questions, or join the project mailing list. In addition, an online version of each open house has been hosted on the project website
- **Social Media** – Twitter, Facebook, and Rich Site Summary (RSS) accounts maintained by LTD and the City have been used to advertise public input opportunities and public events
- **Fact Sheets** – Fact sheets have been used to provide information on the project including project steps and opportunities for all local residents to be involved. The fact sheets were created in English and Spanish

- **Interested Parties List** – The MovingAhead interested parties list includes nearly 900 people. The project team sent updates to the interested parties list, via email, regularly during the process
- **Property Owner Outreach** – LTD and the City mailed a notice to all property owners, businesses and residents (approximately 5,500 addresses) within 1/4 mile of any proposed MovingAhead investments in November 2016
- **Business and Resident Canvassing** – LTD and the City canvassed businesses and residents along the MovingAhead corridors to share information about the project and inform businesses owners and residents about how to be involved in MovingAhead. Canvassers left information at more than 500 businesses and homes, and spoke with someone at 273 businesses or homes
- **Meetings and Events** – Meetings and events included tabling at public events and locations, project-specific open houses and workshops, presentations to neighborhood and community groups, and committee meetings

Table 2-1: Committees and Groups Involved in Decision-Making

Committee/Group	Who	Role/Purpose
Project Management Team (PMT)	<ul style="list-style-type: none"> • City of Eugene technical staff • LTD technical staff • Consultant team technical staff 	<ul style="list-style-type: none"> • Day-to-day project management • Develop technical recommendations at each project milestone
Project Sponsors	<ul style="list-style-type: none"> • LTD Director of Planning and Development • City of Eugene Planning Division Principal Planner • City of Eugene Transportation Planning Manager • When Project Sponsors and PMT meet with additional LTD and City staff, meetings are called Expanded PMT meetings 	<ul style="list-style-type: none"> • High level oversight to the PMT • Engage in discussion and resolution of policy-related issues • Maintain oversight of project’s scope, schedule, and budget
Sounding Board	<ul style="list-style-type: none"> • LTD Strategic Planning Committee (formerly the EmX Steering Committee) • LTD Accessible Transportation Committee • City of Eugene Human Rights Commission • City of Eugene Sustainability Commission • City of Eugene Planning Commission • City of Eugene Active Transportation Committee • Lane County Public Health 	<ul style="list-style-type: none"> • Input to PMT and Oversight Committee • Serve as liaison between project and City of Eugene and LTD standing committees and commissions • Support public engagement outside of each agency’s regular decision-making process
LTD Strategic Planning Committee (SPC) (formerly the EmX Steering Committee)	<ul style="list-style-type: none"> • Community leaders, including representatives from: <ul style="list-style-type: none"> » Springfield City Council » Eugene City Council » Lane County Commission » LTD Board of Directors » ODOT Area Manager » Community members 	<ul style="list-style-type: none"> • Consider regular updates on project progress • Review input and recommendations from community, PMT, Sounding Board, and Oversight Committee • Make recommendation to LTD Board of Directors

Table 2-1: Committees and Groups Involved in Decision-Making (cont'd)

Committee/Group	Who	Role/Purpose
Oversight Committee	<ul style="list-style-type: none"> • Eugene City Councilors (2 representatives) • LTD Board of Directors members (2 representatives) • Lane County Board of Commissioners (1 representative) • LTD General Manager • ODOT Area Manager • Eugene Public Works Director • Eugene Planning & Development Director • Transportation Planning Supervisor from Lane County Public Works 	<ul style="list-style-type: none"> • Recommendations to Eugene City Council and LTD Board of Directors at each milestone, including preferred investment package • Support public engagement outside of each agency’s regular decision-making process
Eugene City Council	<ul style="list-style-type: none"> • The City Council, Eugene’s legislative body, has 8 members and is responsible for passing laws, setting community goals, adopting policy and deciding which services the City will provide • The mayor serves as the City’s political head and chairperson of council, presiding over City Council meetings but has no vote except in the case of a tie 	<ul style="list-style-type: none"> • Informal approval at all project milestones • Formal approval of range of alternatives • Select preferred investment package
LTD Board of Directors	<ul style="list-style-type: none"> • 7-member Board of Directors appointed by governor provides policy direction and collaborates with local elected officials on regional transportation planning 	<ul style="list-style-type: none"> • Informal approval at all project milestones • Formal approval of range of alternatives • Select preferred investment package
Metropolitan Policy Committee (MPC)	<ul style="list-style-type: none"> • City of Coburg City Councilor • Mayor of City of Springfield • Mayor of City of Eugene • Eugene City Councilor • Springfield City Councilor • Lane County Commissioners (2 representatives) • LTD Board of Directors members (2 representatives) • ODOT 	<ul style="list-style-type: none"> • Approve preferred investment package selected by Eugene City Council and LTD Board of Directors

Source: MovingAhead Project Team.

Decision-Making Process

The major steps in the decision-making process used throughout the project are shown in Figure 2-1. The decision-making bodies (the LTD Board of Directors and Eugene City Council) may seek recommendations from other advisory bodies prior to selecting a preferred investment package.

Throughout the MovingAhead process, decisions have generally adhered to the following process:

1. Public input gathered through online and in-person open houses or workshops
2. Technical recommendations from the PMT
3. Input from the Sounding Board
4. Consensus-based recommendations from the Oversight Committee
5. Discussion of recommendations at a joint work session held by the Eugene City Council and the LTD Board of Directors to encourage dialogue and issue resolution

6. Approval from the Eugene City Council and the LTD Board of Directors

The formal process for selecting the preferred investment package will include the following additional steps:

- The LTD Strategic Planning Committee will review input and recommendations from the community, PMT, Sounding Board, and Oversight Committee and make a recommendation to the LTD Board of Directors prior to the Eugene City Council and LTD Board of Directors selecting the preferred investment package
- The Metropolitan Policy Committee (MPC) will also approve the final preferred investment package after the Eugene City Council and LTD Board of Directors' selection per regional policy

Figure 2-1: MovingAhead Decision-Making Process



Source: CH2M. MovingAhead Public Involvement Plan. 2015.

Outreach and Input by Project Milestone

This section summarizes outreach and input by project milestone. Key events and activities are described in chronological order.

Project Initiation and Fatal Flaw Screening

During summer and fall 2014, LTD and the City began working on an approach that would better integrate each agency's capital investment programming and multimodal transportation planning.

In December 2014, LTD met with the Federal Transit Administration (FTA) to present the programmatic approach for considering capital investments in multiple corridors through a single process. FTA endorsed the proposed process, later to become known as MovingAhead, and asked for regular progress briefings.

In February 2015, LTD and the City conducted a fatal flaw screening to determine which corridors in the BRT (Bus Rapid Transit) System Plan and the FTN should be advanced for concept development and community consideration.

Representatives from LTD, the cities of Eugene, Coburg, and Springfield, Lane County, Oregon Department of Transportation (ODOT), and the Central Lane Metropolitan Planning Organization (MPO) held 2 workshops to conduct the fatal flaw screening. Using evaluation criteria developed from the project's draft Purpose and Need, Goals and Objectives, they screened 10 corridors to aid in determining how well each of the corridors would meet the Purpose and Need, Goals and Objectives. The agency team considered a mix of quantitative and qualitative data to compare and contrast the corridors and measure the readiness of each corridor for advancing to capital investment.

In February 2015, after reviewing and rating the corridors, the agency team recommended advancing the 7 highest ranked corridors to the community for consideration, and for concept development and screening evaluation:

- Highway 99 Corridor
- River Road Corridor
- 30th Avenue to LCC Corridor
- Coburg Road Corridor
- MLK, Jr. Boulevard/Centennial Boulevard Corridor
- Main Street Segment of Main Street-McVay Highway Corridor
- Valley River Center Corridor

The agency team determined that the Randy Papé Beltline Corridor should not be advanced as an independent corridor but instead should be considered as an east-west connector for other routes. Although EmX would not operate on the full length of Beltline Highway in the near term, short segments of EmX or Enhanced Corridor service on Beltline Highway that connect other corridors could provide significant regional connectivity to the transit network. As the MovingAhead study advances, the Beltline Highway or an alternate road, will be considered as an east-west connector between any advanced EmX corridors.

The Central Lane MPO's Transportation Planning Committee (TPC), which collaborates on regional transportation issues, and its standing staff committee called the Technical Advisory Sub-Committee (TASC) met in February 2015 and concurred with the findings and recommendations of the fatal flaw screening. In March 2015, the Project Sponsors concurred with the findings and recommendations of the fatal flaw screening.

Concept Development

Between March and May 2015, the project team met with the following committees and groups to review preliminary data, define key corridor features and infrastructure and operating characteristics for project concepts, and provide briefings on outreach materials and upcoming events:

- LTD Strategic Planning Committee
- City of Eugene Planning Commission
- MovingAhead Sounding Board
- LTD Board of Directions
- Eugene City Council

Key feedback from committees and groups focused on:

- Ensuring integration of the MovingAhead project with Envision Eugene, Springfield 2030, and other local and regional transportation plans
- Modifications to the project's Purpose and Need, Goals and Objectives

In March and April 2015, LTD and the City conducted interviews with community stakeholders to gather input about the most effective means to engage the community, provide project information, and encourage participation on the project's Sounding Board.

Stakeholder groups included:

- 1000 Friends of Oregon
- Bethel School District
- Better Eugene-Springfield Transportation (BEST)
- City of Eugene Bicycle and Pedestrian Advisory Committee
- City of Eugene Human Rights Commission
- City of Eugene Sustainability Commission
- Downtown Languages
- Eugene Chamber of Commerce
- Lane Independent Living Alliance
- LCC, President's Office
- LiveMove (University of Oregon student group)
- LTD Accessible Transportation Committee
- Neighborhood Leaders Council



- River Road Community Organization
- Santa Clara Community Organization
- ShelterCare
- St. Vincent De Paul

Key feedback and questions from stakeholder groups included:

- A capital improvement program and system-level approach is important
- Input should be gathered by going to people or using online tools rather than asking people to attend project meetings
- Project objectives need to be clearly defined for the community
- Criteria need to be identified and applied to selecting corridors for further study

In April 2015, the project's website was launched. At that early stage, the website provided information about the project, opportunities to participate in the project, and an overview of the project's schedule. A project fact sheet was available in both English and Spanish.

In April and May 2015, the project website and the City's website were updated to advertise upcoming

workshops. Emails encouraging participation in the workshops were sent to over 500 interested parties. A press release was sent to all major news outlets and newspaper ads were published in the Register Guard, the regional newspaper, during 3 different weeks. LTD and the City advertised the workshops on Facebook and Twitter. Event flyers were distributed around the city and all LTD buses carried large advertisements with information about the workshops. On May 12, 2015, the Register Guard published an article about the project and the details about the upcoming workshops.

In May 2015, the City and LTD hosted 5 workshops where community members defined corridor concepts using scaled game pieces to determine possible cross sections for each corridor. These cross sections formed the basis for the corridor alternatives evaluated in this AA report. In total, approximately 130 people attended the workshops. In addition to the in-person workshops, community members could participate in a virtual workshop to provide comments through the project's website. The virtual workshop was open from May 11 to June 5, 2015. Approximately 1,000 people viewed the website during that time, with over 850 unique visitors to the website.

Outreach from the corridor workshops elicited feedback on important destinations, opportunities, and challenges present in each corridor to inform concept development. Forty-four people submitted comment forms at workshops, with an additional 89 comment forms collected online. There were also 17 comments collected by email and 2 comments sent by postal mail.

From May through September 2015, LTD and the City continued to provide project information to individual groups and at community events to seek input:

Groups

- Bethel Lions Club
- Eugene Chamber – Local Government Affairs Council (LGAC)
- Eugene Chamber - LGAC Transportation Subcommittee (multiple times)
- Latino Community Leaders
- League of Women Voters

- Jefferson Westside Neighbors
- Oakway Mall Management
- Oregon American Society of Landscape Architects (ASLA) Chapter

Community Events

- Amazon Pool
- Art Walk-Downtown library tabling
- Bethel Family Fun Night
- Casa de Luz
- Centro Latino Bus Pass Day
- Concert in the Park: Make-A-Band
- Echo Hollow Pool
- Jefferson Westside Picnic
- River Road Picnic
- Sunday Streets Downtown
- Sunday Streets Friendly
- We Are Bethel
- Willamalane Summer Fair

In June 2015, staff from LTD and the City held 3 workshops to review input from the public and develop low and high-level improvement concepts for the 6 corridors advanced to the screening-level evaluation. The team did not develop a design concept for the Main Street-McVay Highway Corridor because this corridor was being studied under a different project in coordination with the City of Springfield, which was further along than the MovingAhead project.

Screening Evaluation

From June through September 2015, LTD and City of Eugene staff reviewed concept options with elected officials, staff from other City of Eugene departments, Lane County, the City of Springfield, and the FTA Region X. During this time period, the Project Sponsors met to confirm:

- The project's Purpose and Need, Goals and Objectives
- The evaluation process for screening alternative concepts
- Concepts to advance into screening evaluation

During this time, the project team briefed LTD's Strategic Planning Committee, the MPC, and the project's Sounding Board and Oversight Committee.

In July 2015, the City of Springfield determined that they only had the resources to pursue 1 multimodal corridor and that their highest priority was the Main Street Corridor. Based on this determination, the Centennial Boulevard Corridor segment of the MLK, Jr. Boulevard/ Centennial Boulevard Corridor was eliminated from near term consideration.

In September 2015, LTD and the City of Eugene held an open house in downtown Eugene to gather input on the corridor alternatives to advance. The open house was well attended and most participants said that EmX should be studied further in the Highway 99, River Road, 30th Avenue to LCC, Coburg Road, and MLK, Jr. Boulevard Corridors. Support was stronger for Enhanced Corridor Alternatives than for EmX Alternatives in the 30th Avenue to LCC and MLK, Jr. Boulevard Corridors. It was determined that the EmX Alternative should not be advanced on the MLK, Jr. Boulevard Corridor until infrastructure investments could be coordinated with the City of Springfield regarding Centennial Boulevard.

Project Sponsors met several times to review the findings of the screening evaluation, provide direction for refinement of the alternatives, and determine which concepts they recommended advancing to the AA report. The project's Sounding Board and Oversight Committee met to review the findings of the screening evaluation and recommended advancing the following corridors and mode concepts for further study:

Highway 99 Corridor

- No-Build
- Enhanced Corridor
- EmX

River Road Corridor

- No-Build
- Enhanced Corridor
- EmX

Coburg Road Corridor

- No-Build
- Enhanced Corridor
- EmX

30th Avenue to LCC Corridor

- No-Build
- Enhanced Corridor
- EmX

MLK, Jr. Boulevard Corridor

- No-Build
- Enhanced Corridor

The LTD Board of Directors and the Eugene City Council held a joint work session in September 2015 to review the findings of the screening evaluation and the project committees' recommendations.

In October 2015, in separate sessions, the LTD Board of Directors and Eugene Council took action to advance the recommended corridors and mode concepts for further study.

Alternatives Refinement

During October through December 2015, LTD and City staff briefed elected officials on design refinements and met with project committees and groups to update them on design refinements, project progress and any input received. Key issues discussed included:

- Hilyard Street/Patterson Street options
- Options serving Eugene Water & Electric Board (EWEB) site on 5th Street
- Highway 99 terminus at Echo Hollow Road
- Concepts for W. 11th and W. 13th Avenues
- Coordinating with the City Forester about tree impacts on Coburg Road between Ferry Street Bridge and I-105
- Business access and transit (BAT) lane options on W. 6th and W. 7th Avenues
- Routing options for Coburg Road between Ferry Street Bridge and I-105
- Willamette Street option
- River Road station locations near Silver Lane

Starting in October 2015, LTD and the City met with community stakeholders in all corridors to provide project information, findings of the screening evaluation, the alternatives analysis process, and how to stay involved. These outreach efforts continued through March 2017. Staff met with some organizations more than once. Feedback from stakeholders was provided to the project team to consider in the evaluation of alternatives. Outreach during this time included meetings with the following key stakeholders and participation at the following events:

Key Stakeholders

- Amazon Neighbors Association
- Churchill Area Neighbors
- Downtown Neighbors
- Fairmount Neighbors Association
- Friendly Area Neighbors
- Goodpasture Island Neighbors
- Harlow Neighbors
- Jefferson Westside Neighbors
- Northeast Neighbors
- River Road Community Organization
- Santa Clara Community Organization
- South University Neighborhood Association
- Southwest Hills Neighborhood
- Whiteaker Community Council
- Airport Rotary
- BEST
- Bethel School District
- Better Bethel
- Cascade Middle School
- Civic Alliance
- Clear Lake Elementary School
- Eugene Chamber Local Government Affairs Council
- 5th Street Market Merchants
- 4J School District

- Housing and Community Services Agency of Lane County (HACSA)
- Les Schwab
- Looking Glass
- Kalapuya High School
- North Eugene High School
- NW Natural Gas
- Oregon Metropolitan Planning Organization Consortium
- Shasta Middle School
- Sheldon High School
- South Eugene High School
- Toxic Wings
- We Are Bethel
- Willamette High School
- Zip-O-Log

Events

- Coburg Road canvassing businesses and residents
- Highway 99 canvassing businesses and residents
- River Road canvassing businesses and residents
- 30th Avenue to LCC canvassing businesses and residents
- Bascom Village Earth Day celebration event
- Breakfast at the Bike Bridges – Defazio
- Bridge Breakfast at the Bike Bridges – Greenway Bridge
- Breakfast at the Bike Bridges – 24th/Amazon
- Campbell Center Ice Cream Social
- Latino Family Fun Night
- Party in the Parks (Awbry Park)
- Party in the Parks (Bethel Park)
- Party in the Parks (Willakenzie Neighborhood)
- Sunday Streets – Downtown Eugene
- Washington/Jefferson Food Festival

Key issues or concerns raised during this outreach included:

- Important to canvas the Whiteaker neighborhood
- Property specific impacts
- Increasing infrastructure connectivity and transit service to Bascom Village
- Better connectivity, both east-west and north-south connectivity
- Safe cycling and pedestrian routes for students and families
- Park and ride coordination
- Traffic signal improvements
- Homeless population and personal safety at bus stops
- Bicycling and pedestrian safety improvements
- Transit vehicle design to accommodate cargo-carrying bicycles for parents of alter-abled children
- Maintenance of improvements
- Elimination of local service if MovingAhead streamlines bus service

Jefferson Westside Neighbors members voted to oppose non-conventional mass transit on any street (except W. 7th Avenue) within the Jefferson Westside Neighbors boundaries. As a result, EmX Alternatives were modified to use W. 7th and W. 6th Avenues, and the Highway 99 Corridor Enhanced Corridor Alternative was modified to eliminate capital improvements inside of the Jefferson Westside Neighborhood boundary (crossing improvements are proposed along Chambers Street).

In January 2016, LTD briefed FTA Region X staff on the results of the screening evaluation, alternatives advanced for further study, and design refinement issues.

In February and March 2016, project committees and groups continued to hold workshops and meetings to refine design concepts. Key issues discussed included:

- Locations for Enhanced Corridor stops and EmX stations
- Enhanced and new pedestrian and bicycle crossings
- Intersection improvements

- BRT and mixed flow options on 13th Avenue for Highway 99
- River Road Corridor Enhanced Corridor Alternative maintaining 2 general-purpose lanes in each direction and providing queue jumps at intersections
- Reducing number of general-purpose lanes on Pearl Street to allow for a bicycle lane or parking, as well as a transit lane
- New terminus options for Highway 99 Corridor
- Bicycle parking at stations
- Bicycle lane options on Oak and Pearl Streets
- High Street cycle track

In March 2016, LTD and the City held an open house in downtown Eugene to confirm the corridor alternatives before beginning work on the AA report. The open house was well attended and most participants submitting comment forms said that the corridor alternatives as presented should be studied further. For 2 weeks around this time period, an online version of the open house was held. Comment forms were submitted by 106 people. Most online respondents also said that the corridor alternatives as presented should be studied further.

In March 2016, LTD invited potentially interested local, state and federal agencies and tribes to participate in a web-based meeting about the project. Initial email invitations were followed by phone calls and other emails to encourage participation. In addition to LTD and the City, the following agencies participated in the web-based meeting:

- FTA Region X
- Lane County Public Works
- Lane Council of Governments (LCOG)
- ODOT
- U.S. Army Corps of Engineers (Corps)

No tribes participated in the meeting. Key issues raised during the web-based meeting were:

- Potential Section 4(f) impacts related to Amazon Parkway and the proposed pedestrian and bicycle bridge connecting to the Trainsong Neighborhood

- Potential impacts to Heritage and Charter Trees
- Function based mitigation for any wetland impacts at Amazon Park

After the meeting, LTD sent an email to all invited participants with a link to a recording of the web-based meeting to ensure that all interested stakeholders had the opportunity to review the project information and provide comments. No additional comments were received.

In April and May 2016, the PMT and Project Sponsors discussed whether or not to include concrete lanes for EmX options. Project Sponsors determined that EmX options would reconstruct pavement in concrete where the BRT vehicle would travel in an exclusive or priority lane, stop at EmX stations, or make turning movements through an intersection. Based on this direction, design alternatives were evaluated for potential environmental impacts.

In June 2016, LTD and City staff updated Project Sponsors on design refinements and initiating the AA.

Alternatives Analysis

From July 2016 through August 2017, corridor alternatives were evaluated for potential impacts and benefits, cost estimates were prepared and possible mitigation measures were developed. LTD and City staff met with project committees and groups to keep them apprised of the progress and findings of the AA report.

Summary of Key Community Concerns Expressed by Corridor

This section summarizes all the key concerns expressed by community stakeholders for each corridor.

Throughout the project, community members have emphasized the need for pedestrian crossings, enhanced bicycle facilities, and improved transit in all corridors. Community members have also noted the need for better east-west transit connectivity in North Eugene. Finally, community members have noted the importance of retaining street trees and minimizing impacts to adjacent homes and businesses in each corridor.



Highway 99 Corridor

Table 2-2 summarizes key community concerns related to the Highway 99 Corridor by project milestone.

The Highway 99 Corridor build alternatives were refined prior to the AA report to reflect community input from Jefferson Westside Neighbors, which passed a resolution opposing any EmX improvements within the neighborhood boundaries except service on W. 7th Avenue. The build alternatives are consistent with this request. In addition, as a result of comments from

community members, the build alternatives include a bicycle and pedestrian bridge to provide a connection between the Trainsong Neighborhood and Highway 99. Although requested by some community members, the project alternatives were not changed to provide service to the Eugene Airport; LTD's most recent effort to provide transit service to the airport yielded very low ridership, leading LTD to determine that the level of demand for service to the airport is not a strong enough market to support EmX or Enhanced Corridor service.

Table 2-2: Key Community Concerns by Project Milestone – Highway 99 Corridor

Milestone	Summary
Concept Development	<ul style="list-style-type: none"> • Randy Papé Beltline Highway is a major barrier for pedestrians and cyclists • Railroad presents crossing barrier for pedestrians and bicyclists • Highway 99 needs safer pedestrian and bicycle crossings • Need for more frequent transit service
Screening Evaluation	<ul style="list-style-type: none"> • Consider route options that do not cross downtown Eugene • Important corridor for complementing transit service to Junction City • Existing pedestrian and bicycle crossings are unsafe • Consider connections to the Eugene Airport • Consider how to link the Trainsong Neighborhood to the corridor
Alternatives Refinement	<ul style="list-style-type: none"> • Remove EmX from 11th and 13th Avenues • Need to provide transit service to the traditionally underserved community • Need improved (safe) bicycle facilities • Additional pedestrian crossings are needed on Highway 99 • Consider extending service to the Eugene Airport

Source: MovingAhead Project Team.

River Road Corridor

Community comments about the River Road Corridor focused on the community’s desire for traffic calming on River Road, improved active transportation facilities, and improved transit service. Community comments included requests to minimize impacts to trees along the corridor (Table 2-3). Comments were generally supportive of Enhanced Corridor and EmX Alternatives.

As a result of these comments the River Road Corridor build alternatives have been designed to minimize impacts to trees in this corridor. The AA report documents those impacts. The build alternatives were also designed to include enhanced pedestrian crossings and improvements to bicycle facilities along River Road as a result of this input.

Table 2-3: Key Community Concerns by Project Milestone – River Road Corridor

Milestone	Summary
Concept Development	<ul style="list-style-type: none"> • River Road is uncomfortable for pedestrians and bicyclists • Randy Papé Beltline Highway is a barrier for pedestrians and bicyclists • Need for safer pedestrian and bicycle crossings on River Road • Need for EmX service on River Road • Consider repurposing lanes before expanding the right of way
Screening Evaluation	<ul style="list-style-type: none"> • Strong community interest in EmX service • Prefer separation between bicycle facilities and the roadway • Need for improved biking and pedestrian facilities • Prefer solutions with dedicated transit lanes • Consider safety of all roadway users in the design
Alternatives Refinement	<ul style="list-style-type: none"> • Strong community interest in EmX service • Prefer separation between bicycle facilities and the roadway • Both support for and concern about reducing the number of general-purpose lanes in the corridor • Concern about tree removal

Source: MovingAhead Project Team.

30th Avenue to LCC Corridor

Community comments about the 30th Avenue to LCC Corridor focused on the need for EmX improvements in this corridor (Table 2-4). Community members referenced the need for active transportation enhancements that are associated with MovingAhead build alternatives, including bicycle facilities on Pearl, Oak, and/or High Streets.

To address the community’s comments, the 30th Avenue to LCC Corridor build alternatives include several

approaches to addressing bicycling needs on Oak and Pearl Streets, including bicycle lanes on Oak and Pearl Streets and a cycle track on High Street. The project team has also coordinated design of build alternatives with the Civic Stadium property developer so that construction of the build alternatives would not conflict with future development plans for the site and would support redevelopment of the site.

Table 2-4: Key Community Concerns by Project Milestone – 30th Avenue to LCC Corridor

Milestone	Summary
Concept Development	<ul style="list-style-type: none"> • Need for improved bicycle facilities and crossings on 30th Avenue; bicycle facilities should extend to LCC • Need better weekend transit service to LCC
Screening Evaluation	<ul style="list-style-type: none"> • Need more transit service earlier in the morning and later at night • Oak and Pearl Streets should be used for buses, and High Street should accommodate bicyclists • Need for improved bicycle facilities and crossings on 30th Avenue • Need for efficient transit service to LCC
Alternatives Refinement	<ul style="list-style-type: none"> • Prefer EmX option because it includes better bicycle facilities • Improvements at 20th Avenue should connect to the development activity at the former Civic Stadium property • Interest in service later/earlier in the day to LCC • Concern about safety for students crossing 30th Avenue to reach Camas Ridge Elementary School

Source: MovingAhead Project Team.

Coburg Road Corridor

Community comments about the Coburg Road Corridor focused on the need to provide improved transit service in this corridor, along with concerns about impacts to private property that would result from improvements in this corridor (Table 2-5). Community comments also referenced concern about Enhanced Corridor or EmX Alternatives increasing congestion for auto traffic in the corridor, and restricting business access.

As a result of these comments, the Coburg Road Corridor build alternatives were designed to minimize impacts to adjacent businesses and to maintain business access. The build alternatives would also maintain the general-purpose lanes to reduce impacts on traffic flow.

Table 2-5: Key Community Concerns by Project Milestone – Coburg Road Corridor

Milestone	Summary
Concept Development	<ul style="list-style-type: none"> • Crossing safety on Coburg Road, especially at Oakway Center • Coburg Road is uncomfortable for pedestrians and bicyclists • Heavy traffic on Coburg Road • Consider separated facilities to improve transit travel times
Screening Evaluation	<ul style="list-style-type: none"> • Concerns about pedestrian and bicyclist safety due to heavy traffic on Coburg Road • Concerns about how transit improvements would impact traffic flow • Need for improved crossings on Coburg Road • Important to maintain auto access to businesses • Concerns about the lack of transit service to the Veterans Administration (VA) clinic and other new development in the vicinity
Alternatives Refinement	<ul style="list-style-type: none"> • Concern about impacts to auto traffic on Coburg Road • Concern about property impacts and business access impacts • Interest in transit to relieve congestion on Coburg Road • Interest in separated bicycle lanes

Source: MovingAhead Project Team.

MLK, Jr. Boulevard Corridor

Community comments about the MLK, Jr. Boulevard Corridor were generally supportive of the Enhanced Corridor Alternative (Table 2-6). Community comments included suggestions to consider future connections to Springfield and improved pedestrian facilities. Based on consultation with the City of Springfield, extension

of capital investments on Centennial Boulevard in Springfield will be considered at a later date. LTD and the City of Eugene will continue discussions with the University of Oregon to address traffic related concerns through this project or other projects which may be more appropriate to resolving those concerns.

Table 2-6: Key Community Concerns by Project Milestone – MLK, Jr. Boulevard Corridor

Milestone	Summary
Concept Development	<ul style="list-style-type: none"> • MLK, Jr. Boulevard is wide and uncomfortable for pedestrians and bicyclists • Schools and Autzen Stadium were identified as important destinations in the corridor
Screening Evaluation	<ul style="list-style-type: none"> • Need to connect the service to Springfield • Traffic concerns related to Autzen Stadium • Good candidate for Enhanced Corridor service • Opportunity to provide connections for students, housing, and between Eugene and Springfield
Alternatives Refinement	<ul style="list-style-type: none"> • Good candidate for Enhanced Corridor service • Connection to Springfield is needed; allow for future conversion to EmX • Address auto speeds along MLK, Jr. Boulevard

Source: MovingAhead Project Team.

Targeted Outreach to Environmental Justice Populations

The MovingAhead project has fully complied with federal policies ensuring full and fair participation by community stakeholders. The MovingAhead project team utilized a range of public involvement techniques and venues to reach minority, low-income and limited English-speaking populations and to reduce barriers to participation.

Outreach Activities

Targeted outreach activities to environmental justice populations included the following:

- Advertising for public open houses and workshops, and distributing information through affordable housing providers
- Advertising open houses and workshops in places with broad exposure, including the library, LTD stations, LTD buses, and City offices
- Distributing meeting and project information through public schools
- Providing supervised children’s activities and food for meeting participants at all public open houses and workshops
- Providing information about how to request accommodations or translations on public open house and workshop notices; translation services were available on request at all open houses and public meetings; Spanish-speaking staff were available at some meetings
- Translating project information into Spanish, including a Spanish-language fact sheet with general project information and instructions on how to request additional information in Spanish, and information about upcoming workshops and open houses distributed in Spanish
- Preparing public outreach materials that conveyed information with graphics (reducing the need to translate materials and to accommodate multiple learning styles) and “easy to understand” language with “jargon” words removed or fully explained
- Presenting to a Latino Leaders Focus Group to share project information and gather input
- Meeting with social service providers, including St. Vincent De Paul, ShelterCare, and the Lane Independent Living Alliance

Environmental Justice Key Terms

Environmental Justice

A federal policy applied to projects receiving federal funds ensuring full and fair participation by all potentially affected communities and efforts are made to avoid, minimize, or mitigate disproportionately high and adverse human health and environmental effects, including social and economic effects, on minority and low-income populations.

Title VI of the Civil Rights Act of 1964

This policy authorizes and directs the appropriate federal departments and agencies to take action to ensure that discrimination on the grounds of race, color, or national origin shall not occur in connection with programs and activities receiving federal financial assistance.

Low-Income Persons

Those individuals whose median household income is at or below the poverty guidelines set by the Department of Health and Human Services.

Minority

A person who is 1 or more of the following racial or ethnic groups: Black, Asian American, American Indian and Alaskan Native, Native Hawaiian and other Pacific Islander, Hispanic, or Latino.

Limited English Proficiency (LEP)

A characteristic of individuals who do not speak English as their primary language and have limited ability to read, write, speak, and/or understand English.

- Meeting with representatives from LTD’s Accessible Transportation Committee and the City of Eugene’s Human Rights Commission on the Sounding Board
- Staffing tables at Latino Family Fun Night, Casa de Luz in the Bethel neighborhood, Food for Lane County box distribution, and Centro Latino Americano bus pass distribution events

Key Comments from Environmental Justice Communities

Comments from events targeted toward environmental justice communities generally supported the MovingAhead build alternatives. Community members commented on the need for more frequent transit service and for safe pedestrian facilities, including crosswalks. Community members specifically referenced the need for improved crossings on Highway 99 and River Road, and for improved transit to the Bethel neighborhood, which the Highway 99 Corridor serves.

Participants at the Latino Leaders Focus Group noted that improving public transportation is a major goal and that the City should work towards encouraging more people to ride the bus. Participants mentioned that the long timeline to construct new service could be a problem if no solutions can be offered sooner. Participants also shared some of the things they had heard in the community regarding transit options in the region. Some of the major issues they discussed included the following:

- Springfield has a larger Latino population than Eugene, and Springfield is very important in planning for transit improvements to serve this population.
- EmX needs to run more frequently. It takes a significant amount of time to get to destinations. Gateway, with 20-minute service, is a problem.
- Most of the Latino constituents live near Highway 99, River Road, or Coburg Road.

- Walkability needs to be improved, including safe crosswalks and transit.
- Constituents want lighting and more blinking crosswalks spaced closer together.
- Highway 99 and River Road lack crosswalks near social services.
- Younger participants mentioned that accessing destinations on the bus takes too long.
- Families are concerned about safety and where the bus stops are located, especially downtown.
- The project team should meet with bus riders, so that they can speak for themselves.
- Highway 99 is important because it helps bridge the gap to Junction City.
- Projects that contribute to improving the environment by getting people to use public transportation are important.
- EmX and increased frequencies will help get more people to use public transit.

Input from Spanish speakers at other events stressed the need for safe biking and walking facilities, convenient access to transit stops, and service that is easy to navigate.

Representatives from social service agencies and affordable housing providers said that public transit was critical to the people they serve. These representatives encouraged the team to reach out to people through affordable housing providers and by staffing tables at community events, both of which were incorporated into the project’s outreach strategy.

Future Outreach

LTD and the City value meaningful, timely, and accessible engagement with community members, tribes and agencies, and will continue engagement during future project phases, including selection of the preferred investment package, design, and construction.

Alternatives Analysis

LTD and the City are seeking community and other stakeholder feedback on the findings in this AA report. During this project milestone, outreach will include:

- Corridor open houses
- Online open house
- Agency and tribes web-based meeting
- Stakeholder listening sessions
- Public comment period (30 days) on the findings of this draft AA report

LTD and the City will compile all input received during the AA public comment period. The feedback will be used by project committees and groups to develop, evaluate and refine investment packages.

Selection of Preferred Investment Package

LTD and the City will go back out to the community to review the investment packages, provide project updates, reminders of the decision-making process, and information about where and how they can get information, provide feedback, and formally comment on the project.

LTD and the City will continue to use a broad array of outreach strategies to inform the selection of the preferred investment package.

The community will have an additional 30-day comment period to provide input on the investment packages before they are advanced to the LTD Board of Directors and Eugene City Council.

The LTD Board of Directors and Eugene City Council will consider all feedback in selecting the preferred investment package. The package will include an alternative from each of the corridors.

At the end of the project, after the preferred investment package is selected, LTD and the City will document the process to create, evaluate and select the preferred investment package in a separate report (Table 2-7).

Table 2-7: Selection of Investment Package Process and Schedule

	Summer 2018	Fall 2018	Winter 2018	Spring 2019	Summer 2019
Draft AA Published		●			
Community Outreach	●	●	●		
Technical Team Recommendation			●		
FTA Consultation		●	●	●	
Sounding Board Input	●	●	●		
Oversight Committee Recommendations		●	●		
LTD Strategic Planning Committee Recommendations		●	●		
Joint LTD Board/City Council Work Sessions			●		
City Council Selects Preferred Investment Package				●	
LTD Board Selects Preferred Investment Package				●	
MPC Considers for Concurrence Corridor Investment				●	
FTA Consultation			●	●	●
Final AA Published					●
Begin Funding and Grant Application Process				●	●

Source: MovingAhead Project Team.

Chapter 3: Introduction to Corridor Chapters

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How to Read Chapters 4 through 8 (Corridor Specific Chapters)

This chapter provides an introduction to the corridor specific chapters (Chapters 4 through 8) and background information about the environmental topics evaluated for each alternative.

Throughout this chapter definitions relevant to each topic are provided in callout boxes.

The purpose of the corridor specific chapters is to identify benefits and impacts of the proposed alternatives that are relevant to the ultimate selection of investment packages. Chapters 4 through 8 focus on the 5 individual corridors and compare the alternatives under consideration for each corridor.

Each corridor chapter covers 4 topics which are described below.

Corridor Overview

This section describes the existing corridor's termini, land uses, and transit and transportation characteristics. A call-out box summarizes the existing corridor's transit service and ridership, employment, population, and neighborhoods.

Alternatives Considered and Dismissed

This section describes alternatives that were considered for the corridor, but dismissed from further evaluation. Reasons for eliminating alternatives from further consideration are summarized.

Alternatives Advanced

This section of the corridor chapter describes the operations and capital investments of the 2035 No-Build Alternative (no action alternative) and the proposed build alternatives (Enhanced Corridor and/or EmX). The alternatives advanced were evaluated in this Alternatives Analysis (AA) report.

Environmental Consequences and Mitigation

This section compares the impacts and benefits of the alternatives advanced for evaluation.

It is highly recommended that readers read this chapter before reading any of the corridor specific chapters, as it provides an overview of the environmental topics evaluated and describes, where applicable, the following elements:

- What the environmental topic analysis is and why it is evaluated
- An overview of the evaluation method, the area studied, and how to interpret the findings
- Findings relevant to all No-Build and build alternatives
- Possible mitigation measures to offset identified impacts

Alternatives Considered in this AA

Alternatives considered have been based on existing plans and studies and input from neighborhood and community stakeholders. Using an iterative evaluation process, the most promising corridor alternatives were advanced for further analysis and refined based on technical analysis and community input. Alternatives considered in this AA reflect those refinements and are comprised of different elements: alignment, mode, and design.

Alignment: The streets that the transit vehicle would follow from the beginning of the trip to the end of the trip.

Mode Alternatives: The form of travel distinguished by operational characteristics. For the MovingAhead project, modes considered are No-Build (existing regular bus service), Enhanced Corridor (enhanced bus service with some multimodal investments), and EmX (BRT service with more multimodal investments).

Design Concepts: Design concepts include transit lane configurations (mixed traffic or transit lanes), stop or station locations, landscape and stormwater treatment, and new or revised bicycle and pedestrian facilities.

MovingAhead Investment Packages

The MovingAhead project proposes to extend multimodal investments in 5 key corridors throughout Eugene. Although each corridor is identified with a single street (and named accordingly), LTD and the City of Eugene refer to them as corridors because several streets may work as a system to serve transportation needs.

Corridor alternatives include 1 no action alternative (called the No-Build Alternative) and 1 or 2 build alternatives that are made up of multimodal investments. The build alternatives include either Enhanced Corridor or EmX transit service. Each of the alternatives was evaluated individually to determine which would work best for the corridors and their communities.

After the community provides us feedback about the findings of this AA report, the most viable alternatives will be combined to create packages of investments. The packages will be evaluated to determine which combination of investments could be implemented in the near term and would best serve the corridor, the transportation system, and the community.

The LTD Board of Directors and Eugene City Council will consider the findings of this AA report along with the evaluation of the packages and input from the community to select the preferred package of multimodal investments.

Analysis Topics

In general, for each environmental topic, the area of potential impact is based on the conceptual engineering and construction footprint. For some environmental topics, the area of potential impact is limited to the abutting properties, such as acquisitions and displacements, cultural resources, and trees. For other environmental topics, the area of potential impact is broader and considers both adjacent corridor properties as well as broader areas such as the region (e.g. air quality), the watershed (e.g., ecosystems), or the system of transportation or transit facilities and services. A more detailed description of the study area by environmental topic can be found in each draft technical report.

For some environmental topics, impacts were revealed during the alternatives analysis and additional evaluation was conducted to determine other ways to avoid or minimize these impacts; this effort was documented in the Addendum to the MovingAhead Alternatives Analysis Technical Reports Memorandum (CH2M 2017). At this stage of the project, proposed mitigation options have not yet been analyzed. Any mitigation options advanced to the next stage of the project would be evaluated for benefits and impacts. Additionally, during design refinement, other opportunities to further reduce or

avoid impacts would be investigated in more detail; any new mitigation options determined to be feasible would also be evaluated.

While there is generally minimal differentiation between corridor alternatives, there are some distinguishing benefits and impacts that may be relevant to alternatives selection. These differences were found for the following environmental topics:

- Acquisitions and Displacements
- Cultural Resources
- Community, Neighborhood, and Environmental Justice
- Ecosystems
- Land Use and Prime Farmlands
- Noise and Vibration
- Parklands, Recreation Areas and Section 6(f)
- Section 4(f) Resources
- Street and Landscape Trees
- Transportation and Transit
- Water Quality and Hydrology

Environmental topics that generally did not result in differentiating findings for any of the corridors are:

- Air Quality
- Energy, Sustainability, and Greenhouse Gases (GHG)
- Geology and Seismic
- Hazardous Materials
- Utilities
- Visual and Aesthetic Resources

Acquisitions and Displacements

The acquisitions and displacements analysis identifies where project build alternatives would need to acquire property and the potential significant impacts of those acquisitions, such as disruption to the site's parking and circulation or displacement of the current use. The area of potential impact for acquisitions and displacements is based on the conceptual engineering and construction footprint. The No-Build Alternative would not require acquisition of any properties and would result in no displacement.

Long-term direct impacts would result from acquiring a portion of the property (a "partial acquisition") or acquiring all of the property (a "full acquisition"). Typically, high capacity transit projects require small slivers of property from the front of parcels where they abut roadways. All project alternatives were designed to avoid and minimize property acquisitions, where possible. Where it would not be possible to avoid an impact, mitigation measures are proposed. An example of a possible mitigation measure to further minimize impacts includes shifting bus stop or station locations where feasible to reduce property impacts.

Short-term impacts during construction would include temporary construction easements (TCEs) for construction staging and construction activities that would be located on properties adjacent to the construction. The location of required TCEs would be identified during final design. All properties used for TCEs would be returned to their original condition after construction.

After property impacts were revealed during the analysis, additional evaluation was conducted to determine other ways to avoid or minimize impacts at some properties; this effort is documented in the Addendum to the MovingAhead Alternatives Analysis Technical Reports Memorandum (CH2M 2017).

When projects are advanced into project development, during the design refinement phase, potential property impacts would be further evaluated to determine if impacts could be avoided or minimized. LTD and the City would comply with all federal and state laws and regulations for acquiring property.

More detailed information about this topic can be found in the Draft Acquisitions and Displacements Technical Report (CH2M 2017).

Air Quality

The air quality analysis compares air pollutant emissions of the build alternatives to the No-Build Alternative for the future year (2035) to determine the potential environmental burden or benefit of the alternatives on regional air quality. The primary pollutants of concern for transportation projects in the Eugene-Springfield area are carbon monoxide (CO), nitrogen oxides (NO_x), and volatile organic compounds (VOCs). The affected environment is the area generally within 150 feet of signalized intersections along the proposed corridor and the greater Eugene-Springfield area.

Long-term impacts would result from changes in vehicle miles traveled (VMT) for each build alternative. The air quality analysis found that the level of change in pollutants between No-Build and build alternatives is negligible for all corridors because the overall volume of traffic in the Eugene-Springfield area is at a scale much larger than the changes in VMT for each of the build alternatives.

Short-term construction impacts would result from the generation of dust from site clearing, excavation, and grading, direct emissions from construction vehicles, and impacts to traffic flow in the project area.

No air quality impacts are predicted for any build alternatives; thus, no operational air quality mitigation is needed for this project. Reasonable precautions to avoid dust emissions during construction of any build alternatives would be taken.

More detailed information about this topic can be found in the Draft Air Quality Technical Report (MMA 2017).

Community, Neighborhood, and Environmental Justice

The community, neighborhood and environmental justice analysis evaluated all project alternatives for potential effects on neighborhoods, community resources, public services, and economics. The evaluation also determined if project alternatives would result in any disproportionately high and adverse effects on environmental justice populations and underserved populations. The basis of this study is mostly dependent on the analysis and findings from other environmental disciplines.

The study area varied by alternative evaluated: 0.25 mile from the centerline of the No-Build and Enhanced Corridor Alternatives and any proposed stop locations and 0.5 mile from the centerline of the EmX Alternative and its proposed station locations. Because transit riders are generally willing to walk farther for premium service, the study area for the EmX Alternative is larger.

Long-term impacts would result from changes in:

- Neighborhood quality, including changes in multimodal access and safety that could lead to diminished or increased accessibility to parks, places of employment, and civic centers
- Access to community facilities and public services that could have an adverse effect such as diminished access or increased response time, or a beneficial effect such as improved delivery of public services
- Property tax revenues resulting from acquisition of privately owned land
- Business accessibility including parking, drive-through circulation, ingress and egress, and if applicable, potential for employment displacement if potential property and/or business acquisition is required

Long-term impacts to minority and low-income populations could occur as a result of acquisitions and displacements, changes in air quality, noise and vibration levels, accessibility to employment and/or services, and/or failure to adequately provide notice and opportunity to review and participate in the project. If adverse impacts were identified, additional evaluation was conducted to determine if the adverse impacts would be appreciably more severe or greater in magnitude on minority and/or low-income populations than on the remainder of the population.

Short-term construction impacts to communities might be high in intensity but would be short in duration. To minimize these short-term impacts LTD and the City would develop a construction management plan tailored to the build alternative selected and use measures such as concentrating construction in short lengths of the corridor to reduce the duration of construction on adjacent uses and providing adequate barriers and flagging during construction for people bicycling and walking to maximize safety. All build alternatives would result in an increase in construction related jobs and expenditures in the corridor and community.

Environmental Justice

A formal federal policy on environmental justice was established in February 1994, with Executive Order 12898, "Federal Actions to Address Environmental Justice in Minority Populations and Low-income Populations." There are 3 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 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

Avoidance and minimization measures would be needed as a result of potential impacts to community facilities, public services, neighborhoods, economics, and environmental justice-associated impacts. Many of these measures can be found in the associated technical reports.

More detailed information about this topic can be found in the Draft Community, Neighborhood, and Environmental Justice Technical Report (CH2M 2017).

Cultural Resources

The cultural resources analysis identifies where project build alternatives could impact above ground and below ground historic resources that have local, state or federal significance. Cultural resources are determined to be significant based on the criteria set forth in 36 CFR 63. A significant impact with respect to the National Historic Preservation Act (NHPA) Section 106 would result if the project causes the loss, destruction, or alteration of the historic character or integrity of significant cultural or historical resources. The No-Build Alternative would not require construction under the MovingAhead project and would not result in MovingAhead project impacts to cultural resources.

A high-level screening was conducted based on findings from data collection and the significance assessment of historic resources. The Area of Potential Effect (APE) is the area immediately adjacent to the proposed investments for each corridor.

Direct construction impacts would result if the project causes the loss, destruction, or alteration of the historic character or integrity of significant cultural or historical resources.

Short-term impacts on historic resources could include noise and air quality changes, and change in access caused by construction.

Some historic resources may be affected by property acquisitions, modifications to property access, changes to parking strips and historic treescapes, and construction of stops or stations in the immediate vicinity of the resources. For all corridor alternatives, it is anticipated that changes to project design would eliminate or minimize adverse effects.

Section 36 CFR 63 Determinations of Eligibility

This federal law provides criteria to determine eligibility for inclusion on the National Register of Historic Places (NRHP).

During final design, a final impact analysis would be conducted. If unavoidable impacts to cultural resources are identified, then mitigation plans would be designed. Mitigation measures could include interpretive panels, photo documentation, or other measures as agreed upon with the appropriate agencies.

More detailed information about this topic can be found in the Draft Cultural Resources Technical Report (HRA 2017).

Ecosystems

The ecosystems analysis addresses where project build alternatives would impact ecosystems including habitat, waterways, wetlands, and federal and state threatened and endangered species. The area of potential impact is based on the conceptual engineering and construction footprint and considers potential effects to resources in the corridor as well as to watersheds and water bodies. The No-Build Alternative would not involve construction under the MovingAhead project and would not result in any direct impacts to biological resources, wetlands, waterways, endangered species, or designated critical habitat. Population and job growth is anticipated to continue throughout the region and increases in traffic volumes are anticipated during the 20-year planning horizon. Without improvements to water quality treatment systems, indirect and cumulative effects to ecosystems would occur over time.

A list of protected federal and state listed species documented as occurring in the project vicinity is presented in Table 3-1.

Long-term impacts would result from the destruction or adverse modification of critical habitat; a “take” of a federally or state-listed species; creating an obstruction in fish passage; and/or destruction or modification of

wetlands including potential degradation of wetland quality and functions, impacts to Water Resource Conservation setbacks, and impacts associated with runoff from increased impervious surface area.

Short-term construction-related activities may result in temporary displacement of wildlife, tree removal resulting in temporary loss of urban avian habitat, and potential increased sediment transport to waterways.

Local regulations could require mitigation for direct impacts to street and landscape trees and the Water Resources Conservation setback associated with wetlands. Other potential mitigation measures are likely to involve best management practices (BMPs) for avoiding and minimizing impacts. Mitigation for direct impacts to resources as required by state and federal regulations is not anticipated for any of the alternatives.

More detailed information about this topic can be found in the Draft Ecosystems Technical Report (ESA 2017).

Table 3-1: Listed Species Documented as Occurring in Project Vicinity

Common Name	Federal Status	State Status
Bradshaw’s lomatium	LE	LE
Bull trout (Willamette SMU)	LT	SC
Chinook (Upper Willamette ESU)	LT	SC
Fender’s blue butterfly	LE	---
Kincaid’s lupine	LT	LT
Steelhead (Upper Willamette ESU)	LT	SV
Taylor’s checkerspot butterfly	LE	--
Wayside aster	SOC	LT
White-topped aster	SOC	LT
Willamette daisy	LE	LE

Source: Environmental Science & Assessment, LLC . Draft Ecosystems Technical Report. 2017.

Notes: ESU = Evolutionarily Significant Unit LE = Listed Endangered LT = Listed Threatened SC = Sensitive Critical
 SMU = Species Management Unit SOC = Species of Concern SV = Sensitive Vulnerable -- = Not Listed

Energy, Sustainability and GHG

The energy, sustainability and GHG analysis uses energy and GHG emissions as a framework for evaluating the sustainability of the alternatives. The analysis focuses on estimating the variations in the type and amount of energy that would be consumed to build and operate the build alternatives as compared to the No-Build Alternative. Additionally, the sustainability analysis qualitatively evaluates the alignment of the proposed alternatives with the sustainability policies of the City and LTD. The analysis area includes the entire Eugene-Springfield region.

Energy measures include consumption (measured in Btu) and GHG emissions (measured in grams of CO₂e). The long-term direct impacts of the proposed alternatives include changes to direct energy consumption. Indirect energy effects involve ongoing vehicle maintenance and repair energy.

Construction energy effects involve the 1-time, non-recoverable energy costs associated with construction of roadways and structures.

Btu

Btu stands for British thermal unit, which is a standard unit of energy. A Btu represents the amount of thermal energy necessary to raise the temperature of one pound of pure liquid water by 1 degree Fahrenheit at the temperature at which water has its greatest density (39 degrees Fahrenheit). Using Btu allows us to convert physical units of measure to a common unit of measurement for analysis.

CO₂e

CO₂e is an abbreviation for Carbon dioxide equivalent, which is a standard unit for measuring GHG emissions. The CO₂e allows for the conversion of different GHGs into a common unit of measurement for analysis.

Mitigation measures related to energy and GHG emissions could include preserving or replanting trees and minimizing traffic obstructions and would be specified in LTD and the City's construction contracting documents.

Overall, for all corridors, the impacts of the Enhanced Corridor and EmX Alternatives on direct and indirect energy consumption are negligible and are not large enough in relation to the No-Build Alternative to warrant mitigation measures.

More detailed information about this topic can be found in the Draft Energy and Sustainability Technical Report (DKS 2017).

Geology and Seismic

The geology and seismic analysis assessed geologic and seismic hazards along each corridor to determine whether project construction for any of the build alternatives would occur in areas identified as significant geologic hazard zones. The No-Build Alternative would not require construction under the MovingAhead project. Existing infrastructure and transit service as well as planned improvements in the Eugene 2035 TSP would be affected by slope instability and seismic hazards.

Geologic hazards include erosion, problematic soil properties, landslide, volcano, ground motion, faults rupture, liquefaction hazards, and tsunami or seiche. The area of potential impact is within 100 feet from either edge of the existing corridor. No mapped active faults or fault zones are close to the project; therefore, fault rupture is not a concern. Additionally, the project area is located too far and at an elevation too high above the Oregon coast for tsunami inundation. No significant waterbodies are located near any of the corridors where seiche inundation could be a concern. Although there is a remote potential for a seismic event, volcanic activity is not considered a significant hazard to the proposed project.

Long-term impacts would be related to geologic and seismic hazards that already exist. These would include the potential for slope instability, landslides, and seismic hazards.

Impacts during construction would be associated with the equipment used to perform the construction, as well as the direct and indirect impacts of the construction activities.

Detailed study during final design would confirm the degree of geologic risk. Where appropriate, design and construction measures would be implemented to avoid potential effects and geologic risks during operations. Engineering design standards and best management practices would be used to avoid and minimize potential construction impacts.

More detailed information about this topic can be found in the Draft Geology and Seismic Technical Report (CH2M 2017).

Hazardous Materials

The hazardous materials analysis focused on the potential risk of encountering contaminated soil or hazardous substances during project construction or operation of transit service associated with the build alternatives. The purpose of the risk assessment was to prioritize sites to determine the need for avoidance, remediation, or mitigation while considering associated costs and liability. The study area included the construction footprint plus a 1/8-mile buffer area from the centerline of the affected corridors. The No-Build Alternative would not require construction under the MovingAhead project and would not generate or encounter hazardous materials as part of the MovingAhead project. Planned improvements in the Eugene 2035 TSP, not associated with the MovingAhead project, are anticipated to generate a mix and quantity of hazardous materials proportional to the magnitude of the investments.

The project team identified and categorized the sites within the Oregon Department of Environmental Quality (DEQ) comprehensive federal and state regulatory databases into 3 potential risk categories – high, medium, and low.

Long-term direct impacts would result from acquiring contaminated sites and potentially releasing hazardous materials into the environment due to accidental spills.

Hazardous Materials Risk Categories

High: Assigned to contaminated sites that might create liability for LTD and the City either because of construction activities or by acquiring all or a portion of the site. High-risk sites included sites overlapping with a potentially affected tax lot identified on 1 or more regulatory lists and have not obtained a no further action (NFA) determination or cleanup complete status from regulatory agencies.

Medium: Assigned to contaminated sites that are identified on 1 or more regulatory lists and located within the study area but are not on a potentially affected tax lot, or overlap with a potentially affected tax lot that has received a NFA determination or cleanup complete status from regulatory agencies.

Low: Assigned to known sites within the study area but not on a potentially affected tax lot, and with no documented release of contaminants to the environment. Therefore, these sites would be expected to have negligible impacts related to the project. The low-risk level was also assigned to sites that are located outside of the potentially affected tax lot where past releases had occurred, but where remedial cleanup had been completed and applicable regulatory agencies had provided either an NFA determination or cleanup complete status. Sites with active, non-leaking underground storage tanks (USTs) were also considered as low-risk level sites.

Construction impacts would be related to the use of hazardous materials, waste generation, inadvertently disturbing sites with previously undocumented contamination, or affecting known sites with contaminated materials during construction activities.

Mitigation could include performing proper environmental due diligence for all potentially acquired property or avoiding the acquisition of contaminated sites where possible. Potential long-term impacts associated with potential releases of hazardous materials into the environment could be minimized by preparing contingency and hazardous substances

management plans, worker health and safety plans, spill prevention control and countermeasures plans, and stormwater pollution prevention plans, and by managing and disposing of hazardous or contaminated materials in accordance with applicable requirements.

Implementing BMPs and developing plans to guide the characterization, management, and disposal of contaminated materials could be used to avoid or minimize construction-related impacts. Construction-related BMPs can be grouped into 3 general categories – site avoidance, cleanup prior to construction, and minimization of potential impacts on contaminant migration.

More detailed information about this topic can be found in the Draft Hazardous Materials Technical Report (CH2M 2017).

Land Use and Prime Farmlands

The land use and prime farmland analysis evaluated project alternatives to determine effects on land uses, including prime farmlands, and consistency with adopted plans. The potential effects include changes in allowable uses of parcels in the present and foreseeable future. The analysis also looks at the beneficial indirect impacts associated with Transit Oriented Development (TOD). The project No-Build Alternative would not acquire property or displace residents or businesses and would not have direct impacts on comprehensive plan designations, or zoning designations. While redevelopment of vacant and underutilized lands within corridor study areas could occur under the No-Build Alternative, indirect impacts and benefits associated with TOD would not likely occur within corridor study areas because investment in transit would be less than under the Enhanced Corridor or EmX Alternatives.

It is not anticipated that the No-Build Alternative would have any cumulative land use impacts. However, many planned projects under the No-Build Alternative would help improve transportation mobility and areas identified through local policy and zoning as transit supportive. These improvements would not be as extensive as those under the Enhanced Corridor or EmX Alternatives.

Land Use Definitions

Key Transit Corridors: Corridors identified in Envision Eugene that are intended to have frequent transit service.

Transit Oriented Development (TOD): Compact, mixed-use developments situated at or around transit stops. TOD encourages build transit ridership, while discouraging sprawl, improving air quality and helping to coordinate a new type of community for residents

Farmland Protection Policy Act: A 1981 law passed by Congress that seeks to minimize the impact of federal programs and spending contribute to the conversion of farmland to non-agricultural uses.

The study area for direct impacts is 300 feet from the centerline of affected corridors. For potential indirect impacts (such as supportive of TOD implementation) a 0.25-mile radius from fixed-route stops for the Enhanced Corridor Alternatives, and a 0.5-mile radius from proposed EmX stations for the EmX Alternatives is used. The 0.25-mile study area around proposed fixed-route stops and the 0.5 mile study area around proposed EmX stations are based on the maximum reasonable distances bus and EmX customers are likely to walk to reach transit. These are the locations that build alternatives are most likely to affect the land use market and market conditions related to infill and redevelopment. For the Enhanced Corridor and EmX Alternatives, preliminary stop and station locations have been identified. However, stop and station locations could be altered during design refinement.

Direct land use impacts would occur where the project would convert land from its existing and designated use to a transportation-related use.

Short-term impacts would result from construction activities resulting in temporary noise, dust, vibration, and interference with access to properties located along the corridors.

Indirect Impacts to Transit Oriented Development

No-Build Alternative: Beneficial indirect impacts associated with TOD would not likely occur under the No-Build Alternative because this alternative would provide less transit service and infrastructure investments than the Enhanced Corridor or EmX Alternatives.

Enhanced Corridor Alternatives: Indirect impacts associated with TOD could occur within the corridors, but potentially not to the same degree or intensity as with the EmX Alternatives because the EmX Alternatives support more concentrated population and employment areas with higher levels of infrastructure investments and more frequent transit service.

EmX Alternatives: Compared to the No Build and Enhanced Corridor Alternatives, the EmX Alternatives would better support and foster accelerated rates of TOD implementation in places that local and regional land use planning documents have designated for mixed-use and multi-family residential development. Lands zoned Mixed-Use and Multi-Family Residential along the corridors would be more likely to develop or redevelop to their allowable development densities at a faster rate with the transportation investments proposed under EmX Alternatives.

Construction activities for both build alternatives would result in temporary noise, dust, vibration, and potential interference with access to properties located along the corridor. Construction activities would not likely cause a permanent change to the existing or future use of the land because they would only be temporary. Additionally, the build alternatives would include measures to maintain access during construction and reduce construction-related impacts. As a result, it is unlikely that land uses would change during construction because of existing businesses leaving and the land becoming vacant. It is expected that for each major segment the work would start at one end of the segment and progress to the other end of the segment. Construction of either build alternative is estimated to be completed in 2 construction seasons. Property owners

would be notified of upcoming construction activities in advance.

No specific mitigation measures are required specifically related to land use. Potential mitigation measures for long-term and temporary construction impacts have been identified for acquisitions and displacements, noise and vibration levels, visual and aesthetic resources, and transportation facilities; these measures are discussed by environmental topic in this chapter as well as the individual corridor chapters.

More detailed information about this topic can be found in the Draft Land Use and Prime Farmlands Technical Report (CH2M 2017).

Noise and Vibration

The noise and vibration analysis assesses potential noise and vibration effects that the project build alternatives would have on sensitive receivers as compared to the No-Build Alternative. The assessments are based on the proximity of proposed changes to sensitive receivers. For noise, the area of potential impact is 50 to 500 feet from each of the affected roadways that are part of the project corridors; the distance from each use varies by type of noise source, topographical conditions, and shielding between the source and the receiver. For vibration, the area of potential impact is no more than 20 feet from the source.

The noise and vibration technical analysis assessed each of the alternatives for potential impacts under the Federal Transit Administration (FTA) guidance set forth in the Transit Noise and Vibration Impact Assessment Manual (FTA 2006).

Long-term direct impacts would consist of noise impacts from transit vehicle operations to adjacent noise-sensitive properties. No vibration impacts are predicted under any of the alternatives because all of the alternatives use rubber-tired vehicles (buses and BRT vehicles) on public right of way (ROW), and vibration levels from rubber-tired vehicles are below the FTA criteria for structures that are greater than 15 to 20 feet from the travel lane.

During construction of the proposed project investments, noise and vibration levels in the project

corridor may increase due to normal construction activities. If construction was planned outside the hours of 7:00 a.m. to 7:00 p.m., the project would be required to obtain a noise variance from local jurisdictions.

Noise mitigation will be considered for areas anticipated to experience long-term noise impacts. Mitigation for noise impacts will be evaluated using the criteria contained in the FTA Manual (FTA 2006). No vibration mitigation will be considered unless further analysis indicates potential vibration impacts. During final design, all impacts and potential mitigation measures

will be reviewed for verification. If it is discovered that the mitigation can be achieved by less costly means, or if a detailed analysis shows no impact, the mitigation measure may be eliminated.

More detailed information about this topic can be found in the Draft Noise and Vibration Technical Report (MMA 2017).

Noise-Sensitive Uses

The FTA has determined noise-sensitive uses or “receivers” based on community reaction to noise and on change in noise exposure. Noise-sensitive land uses are grouped into 3 categories:

- » Where quiet is essential for the intended purpose, such as outdoor amphitheaters, concert pavilions or NRHP landmarks with significant outdoor space
- » Buildings where people normally sleep such as homes, hospitals, and hotels
- » Institutional uses where it is important to avoid interference with activities such as schools, libraries, theaters and churches

Vibration-Sensitive Uses

The FTA has determined vibration-sensitive uses or “receivers” based on community reaction to vibration and on change in vibration levels. Vibration-sensitive land uses are grouped into 3 categories:

- » Buildings where vibration would interfere with operations within the building such as concert halls, or manufacturing facilities, research buildings or hospitals with vibration-sensitive equipment
- » Buildings where people normally sleep such as homes, hospitals, and hotels
- » Institutional uses where it is important to avoid interference with activities such as schools, churches, institutions, and quiet offices

Parklands, Recreation Areas and Section 6(f) Resources

The parklands, recreation areas, and Section 6(f) analysis assesses project build alternatives for potential effects on designated parklands, recreation areas, and Section 6(f) resources located within 200 feet of the project corridors. The No-Build Alternative would not have impacts on parklands, recreation areas, or Section 6(f) resources.

Long-term impacts would include acquisitions or physical use of a portion of parks or recreational areas; proximity effects such as increased levels of traffic noise or degradation of the visual setting; and the addition of new pedestrian and bicycle connections.

Short-term impacts would include construction-generated noise, air pollution, visual clutter, traffic detours, and temporary closures of access to parks and recreational properties.

LTD and the City would mitigate short-term minor impacts from construction through coordination of

Section 6(f) Resources

Section 6(f) properties are recreation resources that received funds from the Land and Water Conservation Fund (LWCF) Act. Land purchased with LWCF grants cannot be converted to a non-recreation use without coordination with the Department of Interior’s National Park Service (NPS) and mitigation that includes replacing the quality and quantity of land used. Converting any portion of these lands follows Title 36, Code of Federal Regulations (CFR), Section 59.3 of the Land and Water Conservation Fund Program.

construction timing with the owners and managers of the resources (e.g., City of Eugene Parks and Open Space Division, River Road Recreation District, Eugene Civic Alliance, etc.) to avoid or reduce disruptive activities for users of parks and recreation resources.

During final design, additional refinements will consider measures to further avoid and minimize adverse effects to park and recreational resources. If no other practical avoidance is possible and a proposed alternative would result in the need to convert parkland from a Section 6(f) resource, and that alternative is subsequently selected as a preferred mode alternative, then the project would need to coordinate with the Eugene Parks and Open Space Division, Oregon Parks and Recreation Department (OPRD), and National Park Service (NPS) to develop a Section 6(f) conversion proposal, in accordance with Title 36 CFR 59.3 of the Land and Water Conservation Fund Program.

More detailed information about this topic can be found in the Draft Parklands, Recreation Areas, and Section 6(f) Technical Report (CH2M 2017).

Section 4(f) Resources

The Section 4(f) resources analysis evaluated project build alternatives for potential effects on resources protected by the provisions of Section 4(f) of the U.S. Department of Transportation Act. Resources located within 350 feet of corridor alternatives were assessed. The No-Build Alternative would not affect Section 4(f) resources.

This evaluation identifies potential impacts to all Section 4(f) resources and provides associated preliminary use determinations for affected parks and recreation resources. Because use determinations for Section 4(f) historic resources are tied to Section 106 Findings of Effect (FOEs), and FOE analysis is not being undertaken at this stage of the project, the evaluation could only make preliminary use determinations for historic resources. During final design, additional Section 106 and Section 4(f) analysis would be conducted for any potentially affected historic resources.

Long-term impacts to Section 4(f) resources may occur as a result of partial or full acquisitions of the Section 4(f)

property. Other long-term impacts may occur from proximity to a build alternative that causes substantial impairment to protected activities, features, or attributes that qualify a property for protection under Section 4(f).

Short-term impacts to Section 4(f) resources may occur as a result of being temporarily occupied during construction or proximity to construction causes substantial impairment to protected activities, features, or attributes that qualify a property for protection under Section 4(f).

Mitigation through design refinements is an option to avoid or reduce adverse effects. LTD and the City would seek a *de minimis* impact determination for properties where no adverse effect is expected based on this Section 4(f) analysis.

More detailed information about this topic can be found in the Draft Section 4(f) Technical Report (CH2M 2017).

Section 4(f) Resources

Section 4(f) of the U.S. Department of Transportation Act of 1966, 49 United States Code 303(c), is a federal law that protects publicly owned, significant parks, recreation areas, wildlife and / or waterfowl refuges, as well as significant historic sites, whether publicly or privately owned. Section 4(f) requirements apply to all transportation projects that require funding or other approvals by the U.S. Department of Transportation (USDOT). As a USDOT agency, the FTA must comply with Section 4(f).

De Minimis Impact

Per 23 CFR 774.5 and 774.17, a *de minimis* impact determination is made for a historic resource if FTA makes a determination for a property of “No Adverse Effect” or “No Historic Properties Affected” through consultation under Section 106, and the SHPO concurs with that determination.

Street and Landscape Trees

The street and landscape trees analysis identifies the potential significant effects of project build alternatives on street and landscape trees. The analysis identifies the number of trees potentially removed due to construction of each build alternative. The analysis also includes a review of project alternatives for consistency with applicable City statutes because trees in the City of Eugene are subject to varying levels of protection by City ordinance and charter. Evaluation of potential impacts to street and landscape tree resources relied heavily on Geographic Information Systems (GIS), aerial imagery, and photos from LTD. The evaluation also included consultation with the City of Eugene Urban Forestry staff. The area of potential impact encompasses street and landscape trees within the construction footprint of the build alternatives within each corridor. The No-Build Alternative would not impact street and landscape trees.

Long-term impacts would result in removal of existing trees along a corridor. Proposed construction impacts to a tree's root system, trunk, or canopy could result in the tree's failure or decline in long-term health and vigor. Pursuing a build alternative could allow for replacing impacted trees that are not on the City Urban Forestry approved species list, that are approaching their maximum life, are in poor health, or are difficult to maintain with approved, young, healthy street trees. Short-term impacts would result in damage to tree limbs and root systems during construction activities adjacent to trees.

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 a certified project arborist, a landscaping professional, and City Urban Forestry staff.

Removed street trees would be mitigated by replacing all removed trees at a ratio of at least 1 tree planted for 1 tree removed or as otherwise required by City Code and coordinated with the City Urban Forestry



Tree Definitions

Street Tree: A living, standing, woody plant with a trunk that exists in the public right of way (ROW).

Landscape Tree: A living, standing, woody plant with a trunk that exists on private property.

Charter Tree: Trees protected through the City's Historic Tree Charter. Proposed removal of trees with this status requires a public vote.

Heritage Tree: Trees of exceptional community values protected through City code. Removal of designated Heritage Trees is prohibited unless the City Manager directly issues a permit and only if removal of the tree is for the health, safety, or benefit of the public.

staff on the selection of tree species to be planted, their specific locations, and provision of adequate soil conditions. Removed landscape trees would be mitigated through tree replanting or replacement. During the design refinement phase, potentially affected trees would be assessed by an International Society of Arboriculture (ISA) certified project arborist to confirm tree-classification status, health, and any measures that could be employed to avoid and minimize potential impacts.

More detailed information about this topic can be found in the Draft Street and Landscape Trees Technical Report (CH2M 2017).

Transportation and Transit

This multimodal transportation analysis of project build alternatives compared to the No-Build Alternative identified potential impacts and benefits to motor vehicle operations, freight, parking, emergency vehicle flow, pedestrian and bicycle operations, safety, and transit service. This analysis focused on motor vehicle operations; on- and off-street parking; emergency vehicle flow; pedestrian and bicycle conditions; safety; transit; and the alternatives' ability to support the City's and LTD's transportation policies.

Long-term impacts and benefits may result in changes to local traffic operations; connectivity to roadway, bicycle, and pedestrian facilities; consistency with local plans; transit signal priority; safety; roadway circulation; freight travel; parking and access; emergency vehicle flow and access; amount of transit service; transit and passenger vehicle travel time; transit service reliability; and transit ridership. All project alternatives were designed to avoid and minimize transportation-related property impacts, where possible. Where it would not be possible to avoid an impact, mitigation measures are proposed. An example of a possible mitigation measure to further minimize impacts includes redesigning a parking lot where feasible to reduce off-street parking impacts. Short-term construction activities would result in some traffic disruption, including increased delays and potential detour routing for motor vehicles, bicycles, and pedestrians. In addition, there could be safety issues due to increases in heavy vehicle movements and potential transport of hazardous waste during construction.

After transportation-related property impacts were revealed during the analysis, additional evaluation was conducted to determine other ways to avoid or minimize impacts at some properties; this effort is documented in the Addendum to the MovingAhead Alternatives Analysis Technical Reports Memorandum (CH2M 2017). Opportunities to further reduce or avoid impacts would be evaluated in more detail during design refinement.

More detailed information about this topic can be found in the Draft Transportation Technical Report (DKS 2018).

Emergency Services

Emergency service providers did not foresee major issues of concern related to expanded transit services or the proposed improvements associated with the build alternatives. Transit operators would need to yield to police sirens because police are not able to preempt traffic signals (as fire engine vehicles can). Improved pedestrian and bicycle facilities that provide refuge would improve safety.

Emergency service providers would have an opportunity to review more detailed designs and would work with LTD and the City to address issues in the future. The alternatives with dedicated transit lanes that emergency service providers could use would provide an advantage over alternatives with fewer or no dedicated transit lanes. In general, compared to general purpose lanes, emergency service providers have fewer minor collisions when transit-only lanes are implemented.

Transit

The number of one-way trips taken by riders, regardless of how many buses they take to complete the trip.

Upgraded and Enhanced Crossings

New upgraded and enhanced pedestrian crossings are included as part of both Enhanced Corridor and EmX Alternatives. New crossings are generally located at areas where there is no legal pedestrian crossing (often at mid-block locations away from intersections). Upgraded crossings consist of installing Americans with Disabilities Act (ADA) ramps and possibly pedestrian crossing islands and/or crosswalk striping. In addition to the infrastructure included as part of an upgraded crossing, enhanced crossings can also consist of installing either a flashing yellow indication (flashing beacon) or yellow, red, flashing red indication (Pedestrian Hybrid Beacon) along the corridor to warn vehicles of a pedestrian crossing.

Upgraded Crossing



Enhanced Crossing



Utilities

The utilities analysis focused on identifying potential impacts to utility infrastructure identified as “large,” “primary,” “main,” or “major” based on information that municipal and private utility companies provided. Existing and proposed future utilities are potentially impacted by each proposed build alternative. Depending on the type, size, location, and importance of a given utility conflict, construction costs and schedule might be impacted due to mitigation efforts. The No-Build Alternative would not impact utilities.

The exact location and depth of underground utilities is unknown at this level of design. Precise determination of the number, extent, and location of utilities at this stage of design is not feasible. It is possible to make a determination of the general risk of relocation for a given utility based on the type of construction and the infrastructure potentially impacted.

The area of potential impact encompasses existing and proposed future utilities within the construction footprint of the build alternatives within each corridor.

Numerous small water and sewer pipes and other utilities that roadway construction projects routinely encounter and modify might require relocation under the build alternatives. Natural gas, telecommunication, power, telephone, and storm and sanitary sewer lines could be present and potentially impacted wherever roadway reconstruction, roadway widening, or station construction activities occur. The build alternatives would modify or relocate these facilities as needed to mitigate conflicts.

Potential impacts to stormwater facilities would occur due to curb movement or reconstruction, thus impacting curbside catch basins and manholes as well as underground pipe. The build alternatives would include replacement of affected stormwater facilities and installation of new conveyance and treatment facilities to address the estimated stormwater impact of the build alternatives.

At various locations, street lighting and traffic signals would require movement or modification of utilities. In many cases, this movement or modification would include all associated signals, loops, pedestals,

vaults, cabinets, and mast arms. Long-term impacts to utilities would result if utility infrastructure needed to be relocated. Potentially impacted facilities include underground utilities such as water lines, cables and conduit for telecommunications and electrical service, sanitary sewer lines, storm sewer lines, fiber-optic cable, natural gas pipes, and associated aboveground access points such as manholes, vaults, and hydrants. Utility poles and traffic signals might also require relocation.

In general, the design of build alternatives would seek to avoid or minimize utility relocations. Where relocation of large utilities would be cost- and schedule-prohibitive (such as large power transmission lines, sewer mains, gas mains, or other large and critical infrastructure), the design would be refined to lessen or avoid these impacts.

To the degree possible, LTD, the City, and the construction contractor would coordinate all construction activities, scheduling, and staging with utility companies. As appropriate, businesses and residents would be notified of extended temporary utility disruptions. BMPs would be in place to mitigate the potential hazards associated with 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.

Short-term utility impacts (such as temporary service disruptions while utilities are relocated) would occur during project construction. LTD and the City would coordinate with utility providers to minimize disruptions in service to the extent possible

Impacts to utilities would be minimized by working with utility providers early and throughout the design process to coordinate and schedule relocations. Careful coordination with utility providers, before and during construction for guidance and design assistance, would minimize the risk of construction-related impacts and associated cost, delay, and inconvenience to utility customers in the corridor.

LTD and the City would communicate and coordinate with utility owners so that necessary plans and permits are in place to successfully relocate affected utilities

prior to the commencement of construction. Prior to construction, all utility locations would be determined.

The most common mitigation option is to avoid impacts through design refinements, especially where relocation of large utilities would severely impact the project schedule and /or be cost prohibitive.

More detailed information about this topic can be found in the Draft Utilities Technical Report (CH2M 2017).

Visual and Aesthetic Resources

The visual and aesthetic resources analysis assesses how the proposed project build alternatives would change the visual and aesthetic conditions of the project corridor. The assessment is based on how potential impacts to street and landscape trees and introduced project components (such as stops, stations, sidewalks, etc.) would impact or benefit the existing visual character of areas along the corridors. The analysis area for visual and aesthetic resources is considered to encompass an area from the centerline of the proposed corridor out to an area from between approximately 100 feet to 0.25 mile, depending on surrounding conditions. The No-Build Alternative would not impact street and landscape trees or visual character.

The potential removal of street and landscape trees along the corridors would be the most visible direct impact, and would have the greatest influence on potentially impacting visual character in the corridors. In some locations, replanted trees would replace trees that are not on the City approved species list, are over mature, are in poor health, or may require extensive maintenance. Removing these types of trees would produce long-term benefits to the visual and aesthetic character of the corridor by replacing them with trees that would be healthier, more visually consistent with the other street trees, and easier to maintain. The impacts of tree removal were quantified in terms of the number or large and medium trees that would be removed under each alternative as presented under the Street and Landscape Trees topic.

In areas with minimal or no landscaping, the typical landscaping associated with LTD and the City's multimodal build alternatives could enhance the visual

character of the corridors. For corridors where EmX components are constructed, these elements would provide more visual unity along the corridor.

There are no protected views, view corridors, or viewpoints in the project study area. Most proposed multimodal project investments would either be on the ground plane or would be of limited height (bus shelters and EmX stations for instance). These features would have a low likelihood of blocking views of features valued by viewers – even though none were identified in laws, regulations, plans, and ordinances.

Short-term impacts to tree resources would occur when construction-related activities would potentially damage trees in a way that would require their removal.

The presence of construction equipment and light associated with construction, dust, and material storage along parts of the corridors would have minor short-term impacts on the existing character of the corridors.

Mitigation options include avoiding and minimizing impacts to mature and significant trees where practicable, and replanting all removed street and landscape trees at a ratio of at least 1 to 1.

More detailed information about this topic can be found in the Draft Visual and Aesthetic Resources Technical Report (CH2M 2017).

Water Quality and Hydrology

The water quality and hydrology analysis identifies how the project build alternatives would change the amount of impervious surface area in the 5 study corridors and how that change would impact or benefit water quality, floodplains, and hydrology along the corridors. Under the MovingAhead project, the No-Build Alternative would not require construction or increase impervious area in the corridors. Under the No-Build Alternative, planned investments identified in the Eugene 2035 TSP would potentially increase the volume and velocity of stormwater runoff from the roads to waterways. Additionally, increased traffic volumes would increase the pollutant load to receiving waters.

The area of potential impact includes the receiving waterways and floodplains of the stormwater runoff from the 5 corridors. The receiving waterways include the Willamette River, Russel Creek, Q Street Canal, Dodson Slough, Debrick Slough, Spring Creek, and Amazon Creek.

Potential long-term impacts could include an overlap of the relevant road section on the existing floodplain; increased runoff from expanded roadway surfaces; and the release of additional treated stormwater runoff to receiving waters. Impacts are significant if the receiving water body has applicable total maximum daily load (TMDL) requirements or is on the 303(d) list of impaired waters.

Short-term construction impacts could include a temporary construction easement within a floodplain; removing existing stormwater management system components with the intention to replace or enlarge the system; and directing stormwater runoff temporarily into the existing stormwater management system. Clearing, grading, and removal or fill operations for the roadway could potentially have a temporary impact on water quality if not mitigated. Appropriate erosion and sediment control measures would be expected to mitigate impacts during construction.

BMPs could be implemented to help minimize the adverse environmental consequences resulting from the construction and redevelopment of impervious surface areas for the MovingAhead project. Mitigation options could include construction of water quality facilities,

such as swales, planters, ponds, pervious pavement, and proprietary structures to reduce the negative impacts to water quality from stormwater runoff. These measures are also likely to improve the water quality, particularly where existing impervious area is being replaced and associated water quality facilities do not currently exist. To comply with state and local regulations, and federal mandates, water quality and flow control facilities will be required in certain drainage basins.

More detailed information about this topic can be found in the Draft Water Quality, Floodplain, and Hydrology Technical Report (CH2M 2017).

303(d) Water Quality Limited Streams

Two waterways, the Willamette River and Amazon Creek, are listed as 303(d) water quality limited streams, which indicates they do not meet the water quality standard for certain pollutants. Under the federal Clean Water Act, once it is determined that a water quality standard is not met, a total maximum daily load (TMDL) is established to allocate pollutant load reductions to restore water quality and meet water quality standards. Pollutants for which a TMDL has been established for the Willamette River include dioxin, temperature, and E. coli. Pollutants for which a TMDL has been established for Amazon Creek include dissolved oxygen and E. coli. The Willamette River and Amazon Creek floodplains are crossed by at least one proposed alternative.

Alternatives Considered in Chapters 4 through 8

Each corridor chapter describes the alternatives eliminated from further consideration and those advanced for additional evaluation. The alternatives

advanced for evaluation in this Alternatives Analysis are summarized in Table 3-2 and are discussed in Chapters 4 through 8.

Table 3-2: Corridors and Transit Alternatives Advanced to the Level 2 Alternatives Analysis

Corridor	No-Build	Enhanced Corridor	EmX
Highway 99	✓	✓	✓
River Road	✓	✓	✓
30th Avenue to LCC	✓	✓	✓
Coburg Road	✓	✓	✓
MLK, Jr. Boulevard	✓	✓	

Source: CH2M et al. 2016.

Chapter 4: Highway 99 Corridor

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INTRODUCTION TO THE CORRIDOR CHAPTERS

Before reading this chapter, please read **Chapter 3**, which introduces the corridor specific chapters (Chapters 4 through 8) with background information about the environmental topics evaluated for each alternative

Corridor Overview

The Highway 99 Corridor begins at the Eugene Station, travels through downtown, then extends northwest along Highway 99 to Barger Drive, turning west at Barger Drive to terminate on Cubit Street north of the intersection of Barger Drive and Cubit Street and east of Randy Papé Beltline Highway. Highway 99 is identified as a Key Transit Corridor in Envision Eugene and the Eugene 2035 Transportation System Plan (Eugene 2035 TSP) – 1 of 6 corridors intended for multi-modal planning with frequent transit service (defined as 15-minute or better service frequency), connecting downtown Eugene with numerous core commercial areas. This corridor is approximately 10.5 round trip miles.

Near downtown Eugene, the Highway 99 Corridor is characterized by high-density residential areas. Farther north and west of Polk Street, land use transitions to industrial and commercial uses west of Garfield Street along Highway 99, and then to areas of commercial and multi-family residential along Barger Drive. Along the 5-lane Highway 99 street, land uses are largely industrial or commercial (non-retail) and are characterized by extensive paved parking and storage areas and utilitarian buildings of various scales set back from the highway. Refer to Table 4-1 for Highway 99 Corridor demographic data and Table 4-2 for Highway 99 Corridor household data.

Generally, between Eugene Station and Garfield Street, the Highway 99 Corridor build alternatives follow separate alignments to connect downtown to

Corridor Length

10.5 miles round trip (No-Build)
 11.1 miles round trip (Enhanced Corridor)
 10.5 miles round trip (EmX)

Transit and Average Daily Ridership on Existing Transit Routes

🚌 40 Echo Hollow = 1,270 riders/day
 🚌 41 Barger/W11th = 1,580 riders/day
 🚌 95 Junction City = 170 riders/day
 🚌 West Eugene EmX = 4,300 riders/day

Employment

Labor Force 16 Years Old and Older:

17,617 people (Enhanced Corridor)
 25,967 people (EmX)

Number of Jobs:

15,380 jobs (Enhanced Corridor)
 28,963 jobs (EmX)

Major Employers: Peacehealth Medical Group, City of Eugene, Lane County, Lane Education Service District, WinCo Foods, Glorybee Natural Sweeteners, Western Pneumatics, B & R Wrecking & Towing

Population

34,027 residents (Enhanced Corridor)
 50,323 residents (EmX)

Neighborhoods

- » Active Bethel Citizens
- » Downtown Neighborhood Association
- » Far West Neighborhood Association
- » Industrial Corridor Community Organization
- » Jefferson Westside Neighbors
- » River Road Community Organization
- » Trainsong Neighbors
- » West Eugene Community Organization
- » West University Neighbors
- » Whiteaker Community Council

Highway 99, with the Enhanced Corridor Alternative running on 11th Avenue and 13th Avenue and the EmX Alternative using 6th Avenue and 7th Avenue. The majority of the corridor length, from the intersection of Highway 99 and Roosevelt Boulevard to that of Barger Drive and Cubit Street, east of the Randy Papé Beltline Highway, is shared-by both build alternatives. Highway 99 is currently a heavily traveled state-owned and managed (Oregon Department of Transportation [ODOT]) facility with an average daily traffic (ADT) volume of

more than 20,000 vehicles. Under current legislation, Highway 99 will become owned and managed by the City of Eugene (City) in the near future.

Barger Drive is a minor arterial owned and maintained by the City. The corridor terminates adjacent to WinCo Foods on Cubit Street, a major trip generator for existing Lane Transit District (LTD) routes. Willamette High School, another major transit trip generator, is a Bethel School District high school located within ¼ mile of the corridor terminus.

Table 4-1: Highway 99 Corridor Demographic Data (2015 Estimates)

Area	Non-Minority Population	Minority Population				Limited English Proficiency	Population from Whom Poverty Determined	Median Household Income	Unemployment
	White Alone	Hispanic or Latino ^a	African American	Asian	Others ^b				
Enhanced Corridor	76.8%	13.8%	1.3%	2.7%	5.4%	2.9%	34.6%	\$29,952	13.2%
EmX	78.2%	12.0%	1.3%	3.2%	5.45	2.6%	25.9%	\$29,827	13.5%
City of Eugene	77.5%	10.6%	1.7%	3.6%	6.7%	3.9%	24.4%	\$42,715	6.0%
Lane County	82.6%	8.5%	1.2%	2.3%	3.8%	3.0%	20.4%	\$43,685	6.6%
Central Lane Metropolitan Planning Organization	--	--	--	--	--	--	23.0%	\$40,400 ^c	6.6%

Source: CH2M. Draft Community, Neighborhood, and Environmental Justice Technical Report. 2017.

Notes:

- a Hispanic / Latino is defined as a person of Mexican, Puerto Rican, Cuban, Central or South American, or other Spanish culture or origin, regardless of race.
- b Others is a combination of the categories American Indian or Alaskan Native, Hawaiian or Pacific Islander, some other race, and 2 or more races.
- c Median income is calculated by taking the average of the Equity and Opportunity Assessment (EOA) median income levels for Lane County (\$42,621), Eugene (\$41,326), and Springfield (\$37,255).

Table 4-2: Highway 99 Corridor Household Data (2015 Estimates)

Area	Total Population	Population Under 18	Population Over 65	Owner/ Renter Occupied Housing	Average Household Size	Households with No Vehicle
Enhanced Corridor	34,027	5.8%	9.0%	34.5% / 65.5%	1.9	20.5%
EmX	50,323	20.6%	9.4%	33.4% / 66.7%	1.9	18.9%
City of Eugene	158,131	18.0%	13.6%	48.9% / 51.1%	2.3	11.4%
Lane County	354,764	19.4%	16.25	59.3% / 40.7%	2.4	8.4%
Central Lane Metropolitan Planning Organization	251,721	20.0%	15.0% ^a	55.0% / 45.0%	2.4	10.0%

Source: CH2M. Draft Community, Neighborhood, and Environmental Justice Technical Report. 2017.

Note:

a Percentage represents population 60 and over.



Alternatives Considered and Dismissed

During design development 3 other alignment options were considered but eliminated from advancing for further study. The options considered and reasons for eliminating them are summarized below:

- The Highway 99 Corridor EmX Alternative considered an alignment option traveling on 11th Avenue and 13th Avenue. This alignment option was eliminated from consideration based on input from Jefferson Westside Neighbors
- The Highway 99 Corridor Enhanced Corridor Alternative considered an alignment option traveling on Garfield Street. The option was eliminated from consideration because Chambers Street was determined to have more transit-supportive land uses
- The Highway 99 Corridor Enhanced Corridor and EmX Alternatives considered an alignment option for exiting the terminus near the WinCo parking lot via a new ramp from the Randy Papé Beltline Highway interchange. The option was eliminated from consideration because of potential stormwater and wetland impacts, potential conflicts with the interchange, and high construction cost estimates

Alternatives Advanced

This section summarizes the 3 Highway 99 Corridor alternatives advanced for further evaluation in this Alternatives Analysis (AA) report. Table 4-6 at the end of this section summarizes the attributes of these alternatives. A more comprehensive description of the alternatives is provided in the Draft MovingAhead Level 2 Definition of Alternatives (CH2M et al. 2016).

Other planned operation and capital investments that would occur regardless of which alternative is selected for the MovingAhead project are considered in the analysis of each of the alternatives. Some of these planned investments have already taken place since the original definition and modeling of the alternatives for the MovingAhead project in 2016.

No-Build Alternative

Operations

Roadway operations would be the same as current conditions on Highway 99 and Barger Drive. There are no planned operations improvements in the corridor as part of the MovingAhead project.

Highway 99 would continue to have 2 travel lanes in each direction and a center turn lane along most of the

corridor. Barger Drive would continue to have 1 travel lane in each direction and a center turn lane.

Under the No-Build Alternative, Highway 99 Corridor service would remain at 15-minute headways during peak periods and up to 60-minute headways during off-peak periods and evenings. Route 41 would operate on Highway 99, Royal Avenue, W. 11th Avenue, and W. 13th Avenue with 15-minute peak frequencies, 30-minute midday frequencies, and 60-minute evening frequencies. Route 95, which primarily serves commuters from Junction City, travels along Highway 99 between Eugene Station and Junction City and would operate with approximately 8 round trips per day. While Route 40 does not run along Highway 99, it would continue to serve the corridor with stops in downtown Eugene and on Highway 99, Roosevelt Boulevard, and Barger Drive.

The No-Build Alternative would not include EmX service on Barger Drive or Highway 99 (west of Garfield Street). For the 2035 planning year, the No-Build Alternative would include the following existing and planned EmX lines:

- Franklin EmX
- Gateway EmX

- West Eugene EmX
- Anticipated EmX service on Main Street in Springfield from Springfield Station to Thurston Station (see Chapter 1 for more discussion about this project)

The Franklin and West Eugene EmX lines would continue to serve the downtown Eugene terminus of this corridor.

Capital Investments

The No-Build Alternative would not include capital investments on Highway 99 as part of the MovingAhead project. This alternative includes existing roadway, bicycle, pedestrian, and transit facilities in the corridor, as well as planned investments in the Eugene 2035 TSP.

The Eugene 2035 TSP includes the following transportation investments planned along or adjacent to the corridor:

- Upgrade Bethel Drive, from Highway 99 to Roosevelt Boulevard, to a 2-lane urban facility with sidewalks on both sides of the road, bicycle lanes, and planting strips
- Widen Barger Drive immediately west of the Randy Papé Beltline Highway interchange to include an additional travel lane in each direction
- Add a shared-use path on the west side of Highway 99 from Roosevelt Boulevard south to the intersection of W. 7th Avenue (Highway 99) and Garfield Street (The section of this project from Roosevelt Boulevard to W. 5th Avenue has been completed)
- Add bicycle lanes on Garfield Street from Roosevelt Boulevard south to W. 6th Avenue
- Add a bicycle lane on W. 6th Avenue from Garfield Street to W. 5th Avenue
- Complete sidewalk network on Highway 99 from Roosevelt Boulevard south to Garfield Street
- Add a shared-use path on Roosevelt Boulevard from Maple Street to Highway 99
- Add bicycle lanes on Roosevelt Boulevard from Highway 99 east to the railroad tracks

Enhanced Corridor Alternative

Operations

Roadway operations under the Enhanced Corridor Alternative would be similar to that of the No-Build Alternative, with the following exceptions:

- Business access and transit (BAT) lanes would be constructed at certain locations and available for buses and right-turning vehicles only
- To reduce delay for buses, transit queue jumps would alter traffic signal timing at the intersections of Highway 99 and Roosevelt Boulevard and Highway 99 and Barger Drive
- A new traffic signal on Cubit Street north of Barger Drive would affect intersection operations
- Signal timing at some existing signalized intersections would be altered to reduce delay for buses

Buses would primarily operate in mixed traffic, except at transit queue jump locations, bus-only turn lanes, and sections of BAT lanes on W. 7th Avenue and Highway 99 on either side of the intersection with Roosevelt Boulevard. Enhanced Corridor service would run from 6:45 a.m. to 11:30 p.m. weekdays, 7 a.m. to 11 p.m. Saturdays, and 8 a.m. to 8 p.m. Sundays. For purposes of this analysis, service frequencies are assumed to be 15 minutes during all periods.

Existing fixed-service bus operations under the Enhanced Corridor Alternative would be similar to operations under the No-Build Alternative, with the following exceptions:

- Route 41 would be replaced by Highway 99 Enhanced Corridor service
- Route 36 would be extended to provide connecting service from the terminus of West Eugene EmX to the Highway 99 Corridor terminus

The Enhanced Corridor Alternative would result in 686 additional average weekday bus vehicle miles traveled (VMT) and 28 additional average weekday revenue hours as compared to the No-Build Alternative.

Capital Investments

The Enhanced Corridor Alternative would include the following roadway capital investments in addition to those of the No-Build Alternative (Figure 4-1):

- Convert 1 existing general-purpose lane to a BAT lane on the south side of W. 7th Avenue, from W. 7th Place to Garfield Street
- Construct transit queue jumps at the following intersections:
 - » Highway 99 and Roosevelt Boulevard
 - » Highway 99 and Barger Drive
- Construct BAT lanes in both directions on Highway 99 approaching Roosevelt Boulevard
- Construct a bus-only left-turn lane on Highway 99 onto westbound Barger Drive
- Reconstruct traffic signals at the following intersections:
 - » W. 7th Avenue and W. 7th Place
 - » Highway 99 and W. 5th Avenue
 - » Highway 99 and Roosevelt Boulevard
 - » Highway 99 and Royal Avenue
 - » Highway 99 and Fairfield Avenue
 - » Highway 99 and Bethel Drive
 - » Highway 99 and Barger Drive
- Widen Cubit Street to accommodate 2 layover spaces for 60-foot articulated buses
- Construct a new traffic signal at the driveway north of Barger Drive and Cubit Street

Bicycle and pedestrian investments include those listed under the No-Build Alternative plus the following:

- Nine new enhanced crossings at the following locations:
 - » W. 6th Avenue and W. 5th Avenue
 - » W. 7th Avenue and W. 5th Avenue
 - » Highway 99 north of Elmira Road
 - » Highway 99 north of Richard Avenue
 - » Highway 99 south of Fairfield Avenue

- » Highway 99 south of Pattison Street
- » Highway 99 north of Pattison Street
- » Barger Drive east of Century Drive
- » Barger Drive east of Altamont Street

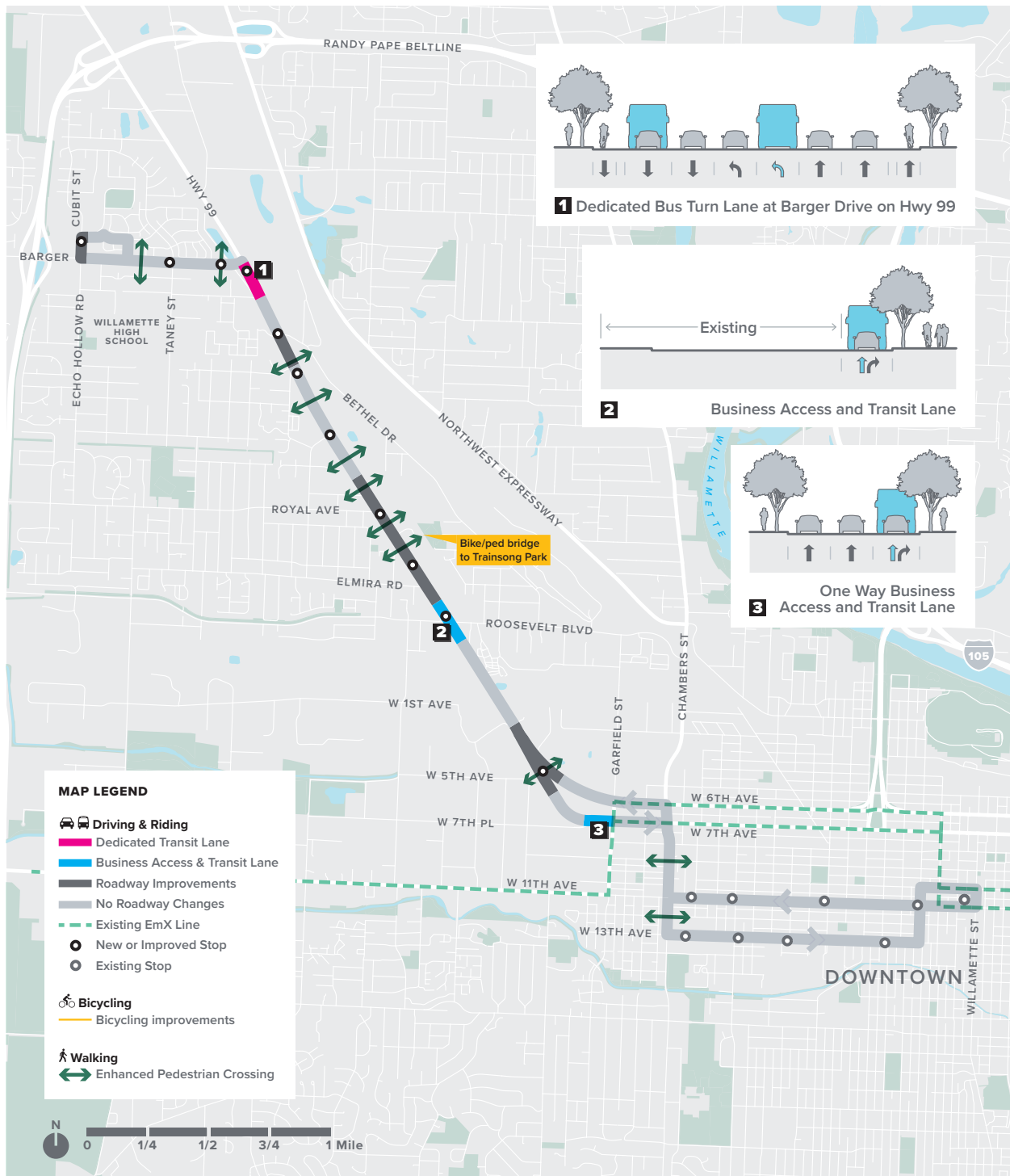
- Two upgraded crossings at the following locations:
 - » Chambers Street and W. 12th Avenue
 - » Chambers Street and Broadway
- Reconstruct sidewalks at some locations and replace curb ramps at all locations where construction occurs
- Construct new sidewalk on W. 6th Avenue from W. 5th Avenue to Garfield Street
- Construct a pedestrian bridge across the freight railroad line, from Highway 99 just north of Side Street east to Trainsong Park
- Construct new sidewalk on the north side of Barger Drive from Highway 99 to near Century Drive

Bus stops would be spaced approximately 0.25 mile to 0.33 mile apart, except where existing bus stops and spacing would be used. Some stops would be improved with seating and shelters. Due to increased spacing between bus stops under the Enhanced Corridor Alternative 16 existing bus stops in the corridor would be eliminated as compared to the No-Build Alternative.

Under the Enhanced Corridor Alternative, 13 existing stops would be used for the enhanced bus service, but would not receive capital investments; 8 existing stop locations would receive capital investments; and 11 new stop locations would be constructed (Table 4-3). The existing stop on the east side of Cubit Street north of Barger Drive would be improved for the extended Route 36, as described under the Enhanced Corridor operation improvements.

The corridor terminates north of the intersection of Barger Drive and Cubit Street with the final outbound stop at the layover location north of this intersection. The bus would layover at this location before picking up inbound passengers. Buses would reach this terminus by turning north onto Altamont Street from Barger Drive and traveling north to Aerial Way. Buses would turn west on Aerial Way from Altamont Street, then turn west on Wagner Street and south on Cubit Street, reaching

Figure 4-1: Highway 99 Corridor Enhanced Corridor Alternative



Source: MovingAhead Project Team.

Table 4-3: Highway 99 Corridor Enhanced Corridor Alternative Bus Stops

<p>Existing Stops Remain – No Capital Investments</p> <p>13</p>	<ul style="list-style-type: none"> • Eugene Station • W. 11th Avenue and Lincoln Street westbound • W. 13th Avenue and Lincoln Street eastbound • W. 11th Avenue and Jefferson Street westbound • W. 13th Avenue and Washington Street eastbound • W. 11th Avenue and Monroe Street westbound • W. 13th Avenue and Monroe Street • W. 11th Avenue and Jackson Street westbound • W. 13th Avenue and Jackson Street eastbound • W. 11th Avenue and Polk Street westbound • W. 13th Avenue and Polk Street eastbound • W. 11th Avenue and Almaden Street westbound • W. 13th Avenue and Chambers Street eastbound
<p>Existing Stops Remain – Receive Capital Investments</p> <p>8</p>	<ul style="list-style-type: none"> • Highway 99 and Roosevelt Boulevard northbound • Highway 99 and Roosevelt Boulevard southbound • Highway 99 between Fairfield Avenue and Richard Street northbound • Highway 99 between Fairfield Avenue and Richard Street southbound • Highway 99 and Pattison Street northbound • Highway 99 and Pattison Street southbound • Highway 99 and Bethel Drive northbound • Highway 99 and Bethel Drive southbound
<p>New Stop Locations</p> <p>11</p>	<ul style="list-style-type: none"> • Highway 99 and W. 5th Avenue northbound • Highway 99 and W. 5th Avenue southbound • Highway 99 and Elmira Road northbound • Highway 99 and Elmira Road southbound • Highway 99 and Royal Avenue northbound • Highway 99 and Royal Avenue southbound • Barger Drive and Highway 99 westbound • Highway 99 and Barger Drive southbound • Barger Drive and N. Clarey Street westbound • Barger Drive and N. Clarey Street eastbound • Cubit Street north of Barger Drive northbound and southbound (terminus)
<p>Stops Eliminated</p> <p>16</p>	<ul style="list-style-type: none"> • Locations to be determined during final design

Source: CH2M et al. 2016.

the terminus layover location on the west side of Cubit Street. The terminus includes 2 layover spaces for 60-foot articulated buses. This layover facility includes a toilet.

Under the Enhanced Corridor Alternative, LTD would have 73 fixed-route service buses (mix of 40-foot and 60-foot buses) and 15 spares operating in the system, a reduction of 1 bus compared to the No-Build Alternative.

EmX Alternative

Operations

Roadway operations under the EmX Alternative would be similar to that of the No-Build Alternative with the following exceptions:

- To reduce delay for bus rapid transit (BRT) vehicles, transit queue jumps would alter traffic signal timing at the intersections of Highway 99 and Roosevelt Boulevard, Highway 99 and Royal Avenue, Highway 99 and Bethel Drive, and Highway 99 and Barger Drive
- Dual turn lanes at the intersection of Highway 99 and Roosevelt Boulevard would accommodate more traffic turning west onto Roosevelt Boulevard
- The number of general-purpose lanes would be reduced to construct BAT lanes, which would reduce vehicular capacity and allow right-turning vehicles only at the following locations:
 - » W. 7th Avenue, from W. 7th Place to Garfield Street
 - » Both directions on Highway 99 for approximately 0.15 miles approaching Roosevelt Boulevard
- Signal timing at some existing signalized intersections would be altered

Existing fixed-service bus operations under the EmX Alternative would be similar to operations under the No-Build Alternative, with the following exceptions:

- Route 41 would be replaced by Highway 99 EmX service
- Route 36 would be extended to provide connecting service from the terminus of West Eugene EmX to the Highway 99 Corridor terminus

BRT vehicles would primarily operate in mixed traffic, except at transit queue jump locations, bus-only left-turn lanes, and sections of BAT lanes on Highway 99. BRT vehicles would utilize the existing EmX infrastructure on W. 6th Avenue and W. 7th Avenue. Under the EmX Alternative, the EmX system would extend from Eugene Station northwest to the intersection of Barger Drive and Cubit Street.

EmX service is assumed to run from 6:45 a.m. to 11:30 p.m. weekdays, 7 a.m. to 11 p.m. Saturdays, and 8 a.m. to 8 p.m. Sundays. For purposes of this study, service frequencies are assumed to be 10 minutes during all periods.

The EmX Alternative would result in 1,074 additional average weekday BRT VMT and 50 additional average weekday BRT revenue hours as compared to the No-Build Alternative.

Capital Investments

The EmX Alternative would include the following roadway capital investments in addition to those of the No-Build Alternative (Figure 4-2):

- Convert 1 existing general-purpose lane to a BAT lane on the south side of W. 7th Avenue, from W. 7th Place to Garfield Street
- Construct transit queue jumps at the following intersections:
 - » Highway 99 and Roosevelt Boulevard
 - » Highway 99 and Royal Avenue
 - » Highway 99 and Bethel Drive
 - » Highway 99 and Barger Drive
- Construct BAT lanes in both directions on Highway 99 approaching Roosevelt Boulevard
- Construct dual northbound left-turn lanes from Highway 99 onto Roosevelt Boulevard westbound for auto traffic
- Construct a bus-only left-turn lane from Highway 99 northbound onto Barger Drive westbound
- Construct a new traffic signal at the intersection of the driveway north of Barger Drive and Cubit Street

- Reconstruct traffic signals at the following intersections:
 - » W. 7th Avenue and W. 7th Place
 - » Highway 99 and W. 5th Avenue
 - » Highway 99 and Roosevelt Boulevard
 - » Highway 99 and Royal Avenue
 - » Highway 99 and Fairfield Avenue
 - » Highway 99 and Bethel Drive
 - » Highway 99 and Barger Drive
- Widen Cubit Street to accommodate 2 layover spaces for 60-foot BRT vehicles

Bicycle and pedestrian investments include those listed under the No-Build Alternative plus the following:

- 8 new enhanced crossings at the following locations:
 - » W. 7th Avenue and W. 5th Avenue
 - » Highway 99 north of Elmira Road
 - » Highway 99 north of Richard Avenue
 - » Highway 99 south of Fairfield Avenue
 - » Highway 99 south of Pattison Street
 - » Highway 99 north of Pattison Street
 - » Barger Drive east of Century Drive
 - » Barger Drive east of Altamont Street
- Reconstruct sidewalks at some locations and replace curb ramps at all locations where construction occurs
- Construct new sidewalk on W. 6th Avenue from W. 5th Avenue to Garfield Street
- Restripe Highway 99 to create a buffered bicycle lane north of Roosevelt Boulevard to Barger Drive
- Construct a pedestrian bridge across the freight railroad line, from Highway 99 just north of Side Street east to Trainsong Park
- Restripe Barger Drive to create a buffered bicycle lane on the north side of Barger Drive from Highway 99 to Cubit Street
- Construct new sidewalk on the north side of Barger Drive from Highway 99 to near Century Drive

EmX stations would be spaced approximately 0.33 mile to 0.5 mile apart, except where existing station facilities and spacing would be used. EmX stations would have level boarding and tactile treatment to help facilitate BRT vehicle docking, boarding, and alighting of passengers. These stations would also include amenities like shelters, benches, trash receptacles, bicycle racks, and fare payment kiosks.

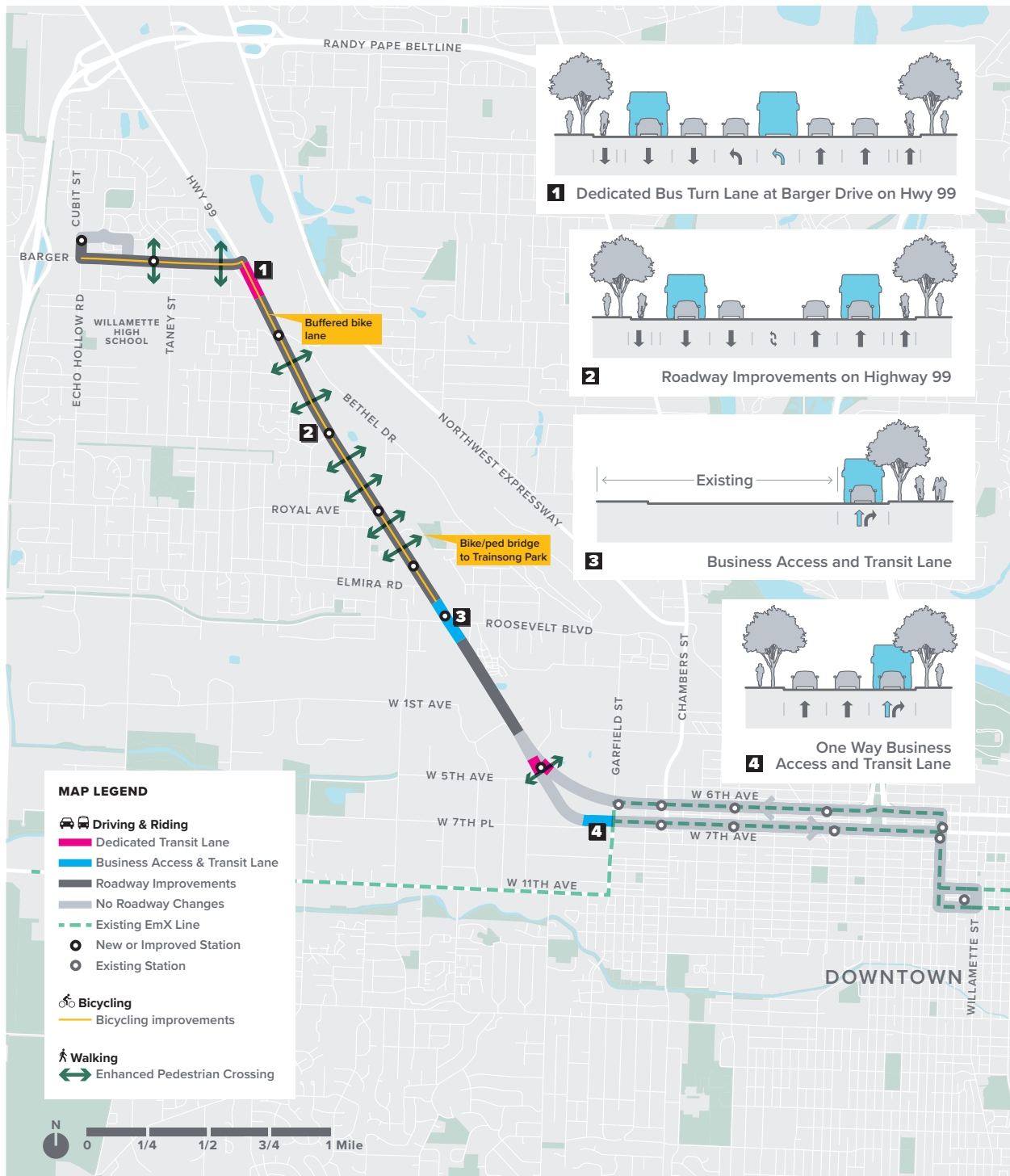
Under the EmX Alternative, there would be no changes from the No-Build Alternative for bus facilities, except for the removal of up to 24 bus stops due to replacement of fixed-route service with EmX service, which has greater station spacing. Under the EmX Alternative, 8 existing EmX stations would receive no capital investments and would be used with Highway 99 EmX service and 14 new EmX stations would be constructed (Table 4-4). A new stop on the east side of Cubit Street north of Barger Drive would be constructed for the extended Route 36, as described under the operation improvements for the EmX Alternative.

The corridor terminates north of the intersection of Barger Drive and Cubit Street with the final outbound station at the layover location north of this intersection. The BRT vehicle would layover at this location before picking up inbound passengers. BRT vehicles would reach this terminus by turning north onto Altamont Street from Barger Drive and traveling north to Aerial Way. BRT vehicles would turn west on Aerial Way from Altamont Street, then turn west on Wagner Street and south on Cubit Street, reaching the terminus layover location on the west side of Cubit Street. The terminus includes 2 layover spaces for BRT vehicles. This layover facility includes a toilet.

Under the EmX Alternative, 1 bus bay at Eugene Station would be improved to accommodate BRT vehicles.

Under the EmX Alternative, LTD would have 72 fixed-route service buses (mix of 40-foot and 60-foot buses) and 14 spares operating in the system, a reduction of 3 vehicles (includes 1 spare) as compared to the No-Build Alternative. LTD would have 23 BRT vehicles (60-foot articulated) and 6 spares operating in the system, an addition of 5 BRT vehicles (includes 2 spares) as compared to the No-Build Alternative.

Figure 4-2: Highway 99 Corridor EmX Alternative



Source: MovingAhead Project Team.

Table 4-4: Highway 99 Corridor EmX Alternative Stations

<p>Existing EmX Stations Remain – No Capital Investments</p> <p>8</p>	<ul style="list-style-type: none"> • W. 6th Avenue and Charnelton Street westbound • W. 7th Avenue and Charnelton Street eastbound • W. 6th Avenue and Monroe Street westbound • W. 7th Avenue and Monroe Street eastbound • W. 6th Avenue and Polk Street westbound • W. 7th Avenue and Polk Street eastbound • W. 6th Avenue and Chambers Street westbound • W. 7th Avenue and Chambers Street eastbound
<p>New EmX Station Locations</p> <p>14</p>	<ul style="list-style-type: none"> • Highway 99 and W. 5th Avenue northbound • Highway 99 and W. 5th Avenue southbound • Highway 99 and Roosevelt Boulevard northbound • Highway 99 and Roosevelt Boulevard southbound • Highway 99 and Elmira Street northbound • Highway 99 and Elmira Street southbound • Highway 99 and Royal Avenue northbound • Highway 99 and Royal Avenue southbound • Highway 99 and Fairfield Avenue northbound • Highway 99 and Fairfield Avenue southbound • Highway 99 and Bethel Drive northbound • Highway 99 and Bethel Drive southbound • Barger Drive between N. Clarey Street and Altamont Street westbound and eastbound • Cubit Street north of Barger Drive northbound and southbound (terminus)
<p>Stops Eliminated</p> <p>24</p>	<ul style="list-style-type: none"> • Locations to be determined during final design

Source: CH2M et al. 2016.

Table 4-5: Summary of Highway 99 Corridor Attributes of Alternatives

Corridor Attribute	No-Build	Enhanced Corridor	EmX
Annual Corridor Transit Trips ¹	9,638 / 9,365 trips	9,807 trips	10,406 trips
Annual Systemwide Transit Trips ²	46,410 trips	46,780 trips	47,300 trips
Change in Transit Trips Compared to No-Build	N/A	370 trips	890 trips
Average Transit Travel Time ³	29 minutes	19 minutes	17 minutes
Change in Transit Travel Time Compared to No-Build	N/A	-10 minutes	-12 minutes
Service Frequencies	15 to 60 minutes	15 minutes	10 minutes
Corridor Length (1-way, capital investments) ⁴	N/A	8.17 miles	7.83 miles
Corridor Length (round-trip miles)	10.5 miles	11.1 miles	10.5 miles
Exclusive / Priority Lanes (round-trip miles) ⁵	N/A	0.40 miles	2.30 miles
Percent Exclusive / Priority Lane of New Corridor	N/A	3.6%	21.9%
Transit Vehicles (operating systemwide)	74 buses 15 spare buses 19 BRT vehicles 5 spare BRT vehicles	73 buses 15 spare buses 19 BRT vehicles 5 spare BRT vehicles	72 buses 14 spare buses 23 BRT vehicles 6 spare BRT vehicles

Source: MovingAhead Project Team.

Notes:

- 1 Corridor transit trips are defined as any EmX or bus trip with at least 1 trip end in the corridor, excluding downtown or the University of Oregon. Highway 99 Corridor Enhanced Corridor and EmX Alternatives have different corridors because the routing in downtown is different - the Highway 99 Corridor Enhanced Corridor Alternative extends south to W. 11th Avenue/W. 13th Avenue and captures more traffic analysis zones. Corridor values for the Enhanced Corridor and EmX alternatives are therefore slightly different. 9,638 is the No-Build value for the Highway 99 Enhanced Corridor Alternative, and 9,365 represents the No-Build for the EmX Alternative. Source: DKS. Draft Transportation Technical Report. 2018.
- 2 Systemwide transit trips are defined as 1-way linked trips taken by a person from the trips origin to the trips destination, independent of the number of vehicles or transfers used to complete the trip. Source: DKS. Draft Transportation Technical Report. 2018.
- 3 Values represent average travel time for A.M. peak hour from Eugene Station to Corridor Terminus (in minutes). Source: LCOG. LCOG Regional Travel Demand Model. 2016.
- 4 This is the mileage of the corridor used to calculate the cost per corridor mile (not construction mile) and is the overall physical length of the corridor which does not correspond to the round-trip distance either bus or EmX service would travel on a corridor. Highway 99 Corridor alternative alignments differ between Eugene Station and Chambers Street, resulting in slightly different lengths.
- 5 Exclusive/priority lanes include round-trip miles of business access and transit lanes, bus-only lanes, and queue jumps.

Capital Cost Estimates

The potential cost of each alternative was estimated based on the concept design (Figure 4-3 and Table 4-5). Right of way (ROW), parking, utility relocations, and other impacts associated with the construction footprint were factored into the cost estimates. Capital cost estimates were based on historic construction bid data from other similar projects, including existing EmX corridors, and include escalation factors to bring costs to 2016 dollars and contingency costs. These planning-level cost estimates conform to FTA's Standardized Cost Categories for Small Starts capital projects.

The capital cost per mile is calculated in 2 different ways: cost per corridor mile length and cost per construction mile. The cost per corridor mile is based on the total capital cost divided by the round-trip distance the bus or BRT vehicle would travel on a corridor. The cost per construction mile is based on the total capital cost divided by the total combined length of construction areas for each direction of travel.

No-Build Alternative

No construction is anticipated as part of the MovingAhead project under the No-Build Alternative; therefore, no capital costs are anticipated.

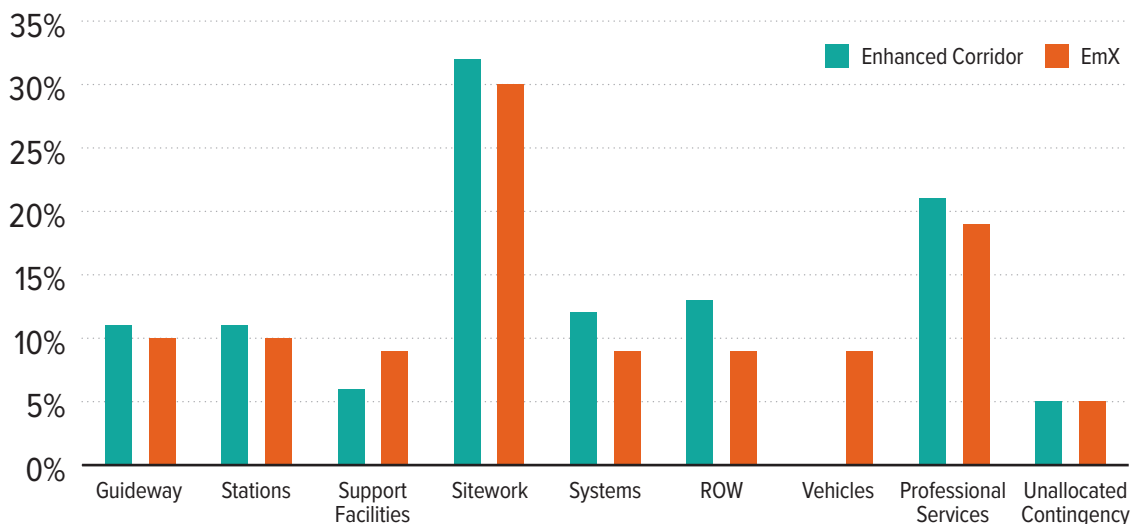
Enhanced Corridor and EmX Alternatives

Highway 99 Enhanced Corridor Alternative capital costs are estimated to be **\$38 million**, approximately **\$5.0 million/construction mile** with 7.6 miles of construction and **\$3.4 million/corridor mile** with 11.1 corridor miles.

The Highway 99 Corridor EmX Alternative capital costs are estimated to be **\$67 million**, approximately **\$9.0 million/construction mile** with 7.4 miles of construction and **\$6.4 million/corridor mile** with 10.5 corridor miles.

A primary contributor to costs for both build alternatives is the construction of a pedestrian bridge over railroad tracks at Side Street and Highway 99, an item unique to this corridor. The pedestrian and bicycle bridge is estimated to cost (pre-contingency) \$1.5 million. The retaining wall required to construct the northbound to eastbound right-turn movement at Roosevelt Boulevard also contributes a large amount to the cost.

Figure 4-3: Highway 99 Corridor Capital Investments by Cost Category



Source: MovingAhead Project Team.

Operating and Maintenance Cost Estimates

Operating and maintenance (O&M) costs are an important factor in the selection of a preferred investment package since they represent ongoing costs to be borne by LTD's operating budget.

No-Build Alternative

With 93 peak vehicles (74 buses, 19 BRT vehicles), 278,600 revenue hours, and 4,520,200 revenue miles, systemwide annual O&M costs for the No-Build Alternative total **\$52.8 million**. For more detail on O&M costs refer to Table 4-6.

Enhanced Corridor Alternative

Service level changes for the Highway 99 Corridor Enhanced Corridor Alternative reflect the operational efficiencies gained from capital and service design improvements that allow for more revenue miles per revenue hour (revenue hours decrease by 0.39% and revenue miles are increased by 1.78% over the

systemwide total). This improved cycle time allows the required number of peak vehicles to drop from 93 under the No-Build Alternative to 92 (73 buses, 19 BRT vehicles) under the Enhanced Corridor Alternative. These efficiencies would result in more daily trips serving the corridor for a systemwide annual cost of **\$52.7 million**, about \$0.1 million less than in the No-Build Alternative. For more detail on O&M costs refer to Table 4-6.

EmX Alternative

Revenue hours are modeled to increase by 4.95% and revenue miles would increase by 7.62%, with peak vehicles increasing from 93 under the No-Build Alternative to 95 (72 buses, 23 BRT vehicles) under the EmX Alternative. These changes would lead to systemwide annual O&M costs of **\$55.6 million**, or an increase of \$2.8 million over the No-Build Alternative. While this represents the largest O&M cost increase of any MovingAhead corridor alternative, it also represents the largest increase in corridor service. For more detail on O&M costs refer to Table 4-6.



Table 4-6: Summary of Highway 99 Corridor Cost Comparison of Alternatives

Corridor Attribute	No-Build	Enhanced Corridor	EmX
CAPITAL COST ESTIMATES (IN MILLIONS)			
Capital Cost ¹	N/A	\$38.0M	\$67.0M
Capital Cost /Corridor Mile	N/A	\$3.4M	\$6.4M
Capital Cost/Construction Mile	N/A	\$5.0M	\$9.0M
Percentage Pedestrian/Bicycle Costs (without contingency costs included)	N/A	30%	20%
OPERATING AND MAINTENANCE COST ESTIMATES			
Annual Systemwide Revenue Hours ²	278,600 hours	277,500 hours	292,500 hours
Annual Systemwide Miles	4,520,200 miles	4,600,800 miles	4,864,800 miles
Peak Transit Vehicles ³	93 vehicles	92 vehicles	95 vehicles
Annual LTD Operating Cost (in millions) ⁴	\$52.8M	\$52.7M	\$55.6M
Increase over No-Build	N/A	-\$0.1M	\$2.8M
Systemwide Operating Cost per Trip ⁵	\$3.79	\$3.76	\$3.92

Source: MovingAhead Project Team.

Notes:

- 1 The potential cost of each alternative was estimated based on the concept design. ROW, parking, utility, and other impacts associated with the construction footprint were factored into the cost estimates. Capital cost estimates were based on historic construction bid data from other similar projects, including existing EmX corridors in Lane County, and include escalation factors to bring costs to 2016 dollars and contingency costs. These planning-level cost estimates conform to FTA's Standardized Cost Categories for Small Starts capital projects. Values are in 2016 dollars. Source: CH2M. Draft Capital Cost Estimating Technical Report. 2017.
- 2 Revenue service refers to all scheduled time a transit vehicle spends serving passengers. In this case, revenue service is confined to in-service time (excluding layovers, which are included in "Revenue Service" figure reported to the National Transit Database(NTD)) in order to relate to modelling outputs for the alternatives which are in-service forecasts from the LCOG Regional Travel Demand Model (2016).
- 3 Peak Transit Vehicles are the number of buses and BRT vehicles in operation to meet maximum demand.
- 4 Estimated operating and maintenance (O&M) costs represent potential ongoing costs that will be borne by LTD once the transit project is implemented. O&M costs were estimated for the evaluated alternatives using a fully allocated cost model for 2035 operations in accordance with FTA methods for estimating O&M costs for Transit Projects. Total systemwide annual O&M costs are the sum of costs related to 3 service categories forecasted for each alternative: revenue hours, revenue miles, and peak transit vehicles. Source: LTD. Draft Operating and Maintenance Costs Technical Report. 2017.
- 5 Cost/Trip are total operating costs divided by annualized systemwide average weekday trips. Passenger annualization of 300 is calculated from LTD 2016 ridership data and is used to translate average weekday to annual trips.

Environmental Consequences and Mitigation

Chapter 3 of this AA provides background information about the environmental topics evaluated for each alternative. Reading Chapter 3 is recommended before reading the following summary of environmental consequences and mitigation for the Highway 99 Corridor.

In this section, potential benefits and impacts of each alternative are discussed by environmental topic. Where there are no distinguishable differences in impacts between alternatives, the summary is combined. Impacts that are similar across all corridors and alternatives are described in Chapter 3. Cumulative impacts are discussed only for those resources where the MovingAhead project has the potential to make a substantive contribution to cumulative impacts.

Potential environmental impacts and benefits of each alternative are summarized in Appendix C and detailed throughout this chapter by environmental discipline.

Acquisitions and Displacements

The majority of the Highway 99 Corridor west of the downtown area consists of privately-owned property used for commercial and industrial purposes.

No-Build Alternative

No acquisitions or displacements are anticipated under the No-Build Alternative since no construction would take place as part of the MovingAhead project under this alternative.

Enhanced Corridor and EmX Alternatives

Based upon the current design, both alternatives would require acquisitions of small strips of land along roadway frontages (partial acquisitions) to accommodate the proposed transit improvements (Table 4-7). The Enhanced Corridor Alternative would require 44 partial property acquisitions, comprising an estimated 1.3 acres, while the EmX Alternative would require 38 partial acquisitions, totaling 1.6 acres. No residences or businesses would be displaced under either of the Highway 99 Corridor build alternatives. Most land would be acquired from commercial and industrial parcels, as listed in Table 4-7. Both alternatives would also require acquisition from Trainsong Park (categorized as a public and institutional parcel in Table 4-7). After property impacts were revealed during the analysis, additional evaluation was conducted to determine other ways to avoid or minimize impacts at some properties; this effort is documented in the Addendum to the MovingAhead Alternatives Analysis Technical Reports Memorandum (CH2M 2017). As the design of the build alternatives progresses, design refinements to minimize impacts to private properties would be incorporated.

Neither alternative would require acquisition of a full property, however, both alternatives would impact off-street parking on 6 parcels and both alternatives would impact circulation on 1 commercial property that is currently vacant. It appears that a past business utilized a drive-through on the property. If that parcel were to become occupied before project construction and a drive-through were utilized on the property, the project impact would potentially result in the full acquisition of that commercial property and potential displacement of 1 business; as noted above, with design refinement this displacement can be avoided.

Table 4-7: Highway 99 Corridor Property Acquisition Impacts

		Enhanced Corridor	EmX
Partial Acquisitions	Commercial & Industrial	37	31
	Public & Institutional	2	2
	Residential	3	3
	Vacant Land	2	2
Full Acquisitions		0	0
Total Parcels Affected		44	38
Total Area of Acquisitions		1.3 acres	1.6 acres
Displacements		0	0
Parcels with Potential Parking and Access Impacts	Parking Impacts	6	6
	Driveway Closures	4	2
	Business access impacts: right-in or right-out turning movements	0	1
	Drive-Through Closures ^a	0	0

Source: CH2M. Draft Acquisitions and Displacements Technical Report. 2017.

Note:

- a There are no drive-through impacts on businesses currently in operation. Circulation on 1 commercial property that is currently vacant may be impacted. The commercial property appears to have had a drive-through business in the past.

Air Quality

The Eugene-Springfield region completed the federally required 20-year maintenance period in 2014 for carbon monoxide with no exceedances. As a result, no regional carbon monoxide hot spot air modeling or local air quality impacts analysis is required for transportation projects in the region. However, for informational purposes, a regional burden analysis was conducted for the MovingAhead project.

The focus of the air quality analysis was to evaluate the differences between the regional and subarea pollutant emissions generated under build alternatives versus emissions generated under the No-Build Alternative. This comparison shows the broad effects of the proposed alternatives.

No-Build Alternative

Under the future No-Build Alternative conditions, air quality in the Eugene-Springfield region is expected to continue to improve. Despite increases in VMT, air quality has continued to improve because of the improvements in vehicle technology and fuel types.

Enhanced Corridor and EmX Alternatives

When compared to the No-Build Alternative, the percent change in the overall level of pollutants is negligible, with percentage changes all less than 1% for impacts

(positive numbers) and improvements (negative numbers) (Table 4-8). The results of the Federal Transit Administration (FTA)-compliant air quality burden analysis show that the build alternatives received Medium to Low-Medium FTA ratings. Medium rated projects are predicted to have a negligible effect on air quality. Projects with ratings of Low-Medium and Low are predicted to have slight improvements in air quality. The EmX Alternative rates slightly higher than the Enhanced Corridor Alternative as it would result in more transit trips and fewer single occupancy vehicle trips.

Temporary air quality impacts associated with the construction of each build alternative are expected, and those impacts are predicted to be approximately the same regardless of the alternative selected. During construction, carbon monoxide and particulate matter are expected to increase due to heavy construction vehicles, lowered traffic speeds, earth excavation, and occasionally open burning.

Construction contractors are required to comply with state regulations which address visible emissions and nuisance requirements. Violations of the regulations can result in enforcement actions and fines. The regulations provide a list of reasonable precautions to be taken to avoid dust emissions. These control measures would be documented in the pollution control plan that the contractor is required to submit prior to construction.

Table 4-8: Highway 99 Corridor Percent Change in Air Quality from 2035 No-Build Alternative

Primary Pollutants	Enhanced Corridor	EmX
Carbon monoxide (CO)	-0.02%	-0.1%
Nitrous oxide (NOx)	0.00%	0.00%
Volatile organic compounds (VOC)	-0.02%	-0.1%
Particulate Matter – 2.5 microns in diameter (PM _{2.5})	0.00%	0.00%
Rating	Medium/Low-Medium	Low-Medium

Source: Michael Minor and Associates. Draft Air Quality Technical Report. 2017.

Community, Neighborhoods, and Environmental Justice

The Highway 99 Corridor goes through or touches 7 neighborhoods – the Downtown, Jefferson Westside, Whiteaker, Far West, West Eugene, Trainsong, and Bethel neighborhoods (Figure 4-4).

The study area for both build alternatives includes 2 additional neighborhoods: West University and the Industrial Corridor. In addition, the EmX Alternative study area reaches 1 additional neighborhood, River Road, however this neighborhood is substantially divided from the corridor by the Union Pacific Railroad yard.

Several social service organizations within the study area offer services to minority and low-income populations, including organizations that provide affordable housing and food. Within 0.25 mile of the Enhanced Corridor Alternative, there are 72 community and public facilities, including 1 affordable housing facility (West Town), 1 food bank (Food for Lane County), and 1 shelter. Within 0.5 mile of the EmX Alternative, there are 114 community and public facilities, including 2 affordable housing facilities (West Town and Firwood Apartments), 3 shelter facilities, and 1 food bank (Food for Lane County).

The study area includes major employment centers, tourist attractions, retail businesses, and colleges that generate trips to and from the area. Government services (for example, public schools) medical industries, grocery stores, food manufacturing, and auto wrecking and towing are the top employers. Many larger employers in the region are within 0.5 mile of the corridor. Total employment in Lane County is projected to increase by about 10% in the 10 year period from 2014 to 2024, with the greatest increase (about 16%) expected in education and health services, which are top employers in the Highway 99 Corridor.

No-Build Alternative

No construction is planned as part of the MovingAhead project under the No-Build Alternative, so this alternative would not result in negative impacts on neighborhoods, community facilities, or public services, nor would there be any disproportionately adverse impacts to

minority and/or low-income populations. The No-Build Alternative would also not likely result in any economic benefits associated with development in the area around stops or EmX stations. The No-Build Alternative would not improve transportation safety that could reduce the number of potential conflicts among people walking, biking, and driving to the same degree as the investments under the build alternatives. The No-Build Alternative would not include the construction of a pedestrian bridge over the freight railroad lines and would not increase connectivity between the Trainsong neighborhood and the services and amenities along Highway 99.

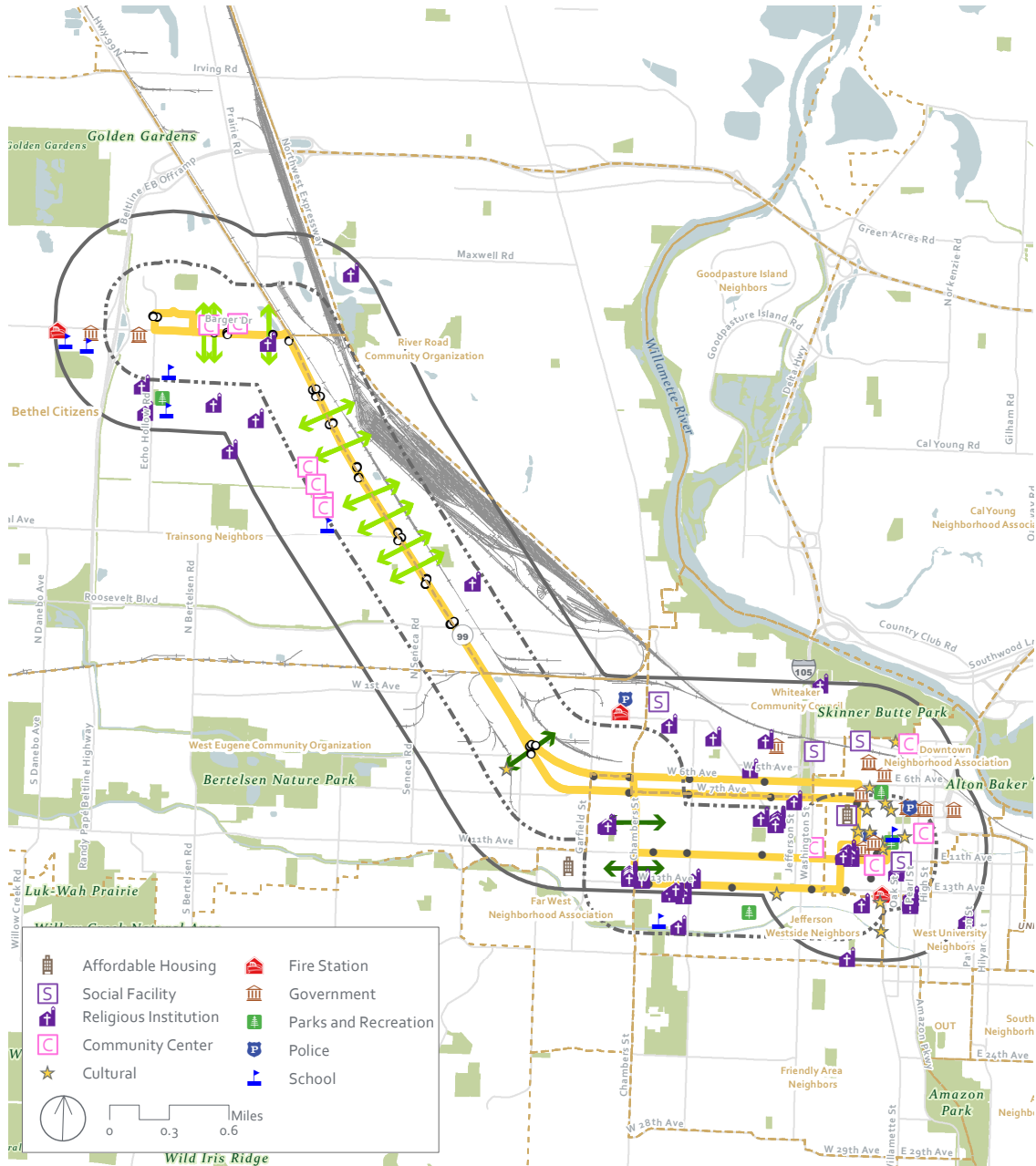
Enhanced Corridor and EmX Alternatives

Potential effects of the build alternatives include:

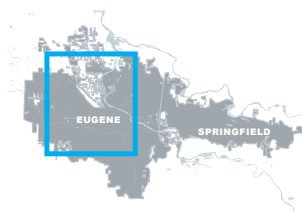
- **Neighborhoods.** Neither build alternative would adversely impact community character within the Highway 99 Corridor. A total of 1.3 acres of land would be acquired from 44 properties under the Enhanced Corridor Alternative and a total of 1.6 acres from 38 properties for the EmX Alternative. With design refinements and mitigation, no residences or businesses would be displaced under either alternative. Up to 14 medium and large street trees would be removed under the Enhanced Corridor Alternative and up to 40 medium and large street and landscape trees would be removed under the EmX Alternative. Tree removal would be mitigated through replanting.

Safety for people walking, using mobility devices, and biking in the corridor would be improved with 9 enhanced pedestrian crossings, 2 upgraded pedestrian crossings, and improved sidewalks under the Enhanced Corridor Alternative, and 8 enhanced crossings and improved sidewalks under the EmX Alternative. Both build alternatives would include construction of a pedestrian and bicycle bridge across the freight railroad connecting Highway 99 to the Trainsong neighborhood, which includes a concentration of minority and low-income residents. The new bridge would improve pedestrian and bicycle access to transit services for neighborhood residents, including minority and low-income populations. Pedestrian and bicycle investments would enhance

Figure 4-4: Highway 99 Corridor Community Resources



Locator Map



Legend

- Highway 99 Corridor
- EmX Alternative API
- Enhanced Corridor Alternative API
- Neighborhood
- ↔ New Pedestrian Crossing
- ↔ Enhanced Existing Pedestrian Crossing
- Existing Without Improvements
- Proposed or Existing with Improvements

Community Resources Highway 99 Corridor

Note: Both EmX and Enhanced Corridor Alternatives Shown



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Source: CH2M. Draft Community, Neighborhood, and Environmental Justice Technical Report. 2017.

connectivity for these modes, and the alternatives would not create any barriers to social interaction in neighborhoods near the Highway 99 Corridor.

Potential noise impacts might occur to 7 multi-family properties under the Enhanced Corridor Alternative or 13 multi-family and 6 single-family properties under the EmX Alternative; it is expected that all noise impacts could be mitigated.

- **Transportation and Accessibility.** Both build alternatives would increase transit accessibility and reliability for residents within the neighborhoods near the corridor. The presence of 19 new or enhanced stops (of 32 total stops) under the Enhanced Corridor Alternative or 14 new stations (of 22 total stations) under the EmX Alternative would not change the overall visual setting of any neighborhoods because the alternatives would be located on main arterials within an urban setting that already includes bus service. Both alternatives would increase connectivity to other transit connections in the downtown area including the West Eugene and Franklin EmX service. The improved reliability of transit service under both alternatives and reduced headways under the EmX Alternative could attract additional riders.
- **Community Facilities and Public Services.** Minor property acquisitions would be required from 3 community facilities under both alternatives: Alpine Cottages retirement center, Alpine Meadows Retirement Community Center, and Trainsong Park. Design refinement may be able to further avoid or reduce impacts to these facilities. These acquisitions would not be anticipated to remove access or change the overall use or functionality of these community facilities. Transit users would benefit from improved accessibility to these community facilities and others. No conflicts with emergency services are anticipated.
- **Economics.** The loss in property tax revenues to the City resulting from acquisition of privately owned land would be negligible under both build alternatives. Both alternatives would result in the removal of off-street parking stalls at 6 properties with a total of 50 off-street parking stalls removed under the Enhanced Corridor Alternative and 53 off-street parking stalls removed under the EmX Alternative.

After property impacts were revealed during the analysis, additional evaluation was conducted to determine other ways to avoid or minimize impacts at some properties; this effort is documented in the Addendum to the MovingAhead Alternatives Analysis Technical Reports Memorandum (CH2M 2017).

Both build alternatives would impact circulation on 1 commercial property that is currently vacant (the former Porky's Palace). It appears that a past business utilized a drive-through on the property. If that parcel were to become occupied before project construction and a drive-through were utilized on the property, the project impact would potentially result in the full acquisition of that commercial property and potential displacement of 1 business; as noted before; with design refinement this displacement can be avoided.

Construction of either build alternative would result in an increase in construction related jobs and expenditures in the corridor and community, with more jobs generated and greater expenditures anticipated under the EmX Alternative. Both build alternatives would improve accessibility to employment locations along the Highway 99 Corridor and in the downtown business district. The permanent infrastructure and increased transit frequency of the EmX Alternative would offer a greater improvement in transit reliability, which would lead to increased business exposure, and over time could support and foster accelerated rates of transit-oriented development (TOD) implementation in areas planned and designated for mixed-use and multi-family residential development to a greater degree than under the Enhanced Corridor Alternative.

- **Environmental Justice.** All of the identified adverse impacts under either build alternative can be mitigated or minimized to a low severity. None of the impacts to environmental justice populations would be greater in magnitude than impacts that would be experienced by non-minority and non-low-income populations within the study area. Because the build alternatives would result in primarily beneficial effects, and no adverse impacts are anticipated after mitigation, no disproportionate high and adverse impacts on minority and low-income populations are anticipated.

Impacts during construction would be similar for the Enhanced Corridor and EmX Alternatives, involving noise and dust from construction equipment. Although the length of construction is greater under the Enhanced Corridor Alternative (8.2 miles) compared to the EmX Alternative (7.8 miles), construction impacts are anticipated to be greater with the EmX Alternative because of the larger construction footprint related to EmX stations. The construction impacts would be short-term in nature and would typically end once construction is completed.

Cultural Resources

Archaeological (Below Ground) Resources

No archaeological sites are currently recorded within the area of potential effect (APE). Twenty-four previous investigations have been conducted within 1 mile of the APE. One site has been recorded within the broader 1-mile study area, along with some discoveries of isolated artifacts.

A pedestrian archaeological survey of the Highway 99 Corridor was conducted in September 2016. The surface survey inspected the proposed construction areas of the build alternatives. No prehistoric or demonstrably historical artifacts, features, or sites were observed during this surface survey. The development of commercial, industrial, and residential properties and their buried utilities infrastructure, along with the construction and maintenance of the Highway 99 and Barger Drive roadbeds, have likely damaged and disturbed much, if not all, of the ground in and along the Highway 99 Corridor. The potential for intact archaeological materials, surface or buried, in the Highway 99 Corridor is low.

Historic (Above Ground) Resources

The Highway 99 Corridor travels through an area that was, like most of the land surrounding Eugene, historically agricultural in character, and remained so until the construction of Highway 99. Businesses and services catering to auto travelers appeared along Highway 99 in the 1940s and 1950s, a number of which remain in place and in use within the APE for the project.

A historic records review and windshield survey of the corridor was conducted in September 2016. Forty-two historic resources that are eligible for listing on the National Register of Historic Places (NRHP) were identified in the Highway 99 Corridor APE, although none are formally listed on the NRHP. These resources would be protected under Section 106. There are no properties along this corridor that are listed by the City as City Landmarks.

No-Build Alternative

No impacts to historic or archaeological resources are anticipated because no construction would occur as part of the MovingAhead project under the No-Build Alternative.

Enhanced Corridor and EmX Alternatives

No impacts to archaeological resources are anticipated under either of the build alternatives because there are no identified resources in the APE and the likelihood of encountering any is low. Although no impacts to archaeological resources are anticipated, an Inadvertent Discovery Plan should be in place prior to construction. It would outline measures to be undertaken in the event of an unanticipated archaeological discovery.

Four historic resources and 1 resource grouping (a group of 4 adjacent resources) are anticipated to sustain direct, long-term impacts, including strip takes (partial property acquisitions), access changes, and construction of shelters/stations, under both build alternatives as listed in Table 4-9. Additional resources are anticipated to experience indirect impacts, including strip takes, access changes, visual effects, and construction of shelters/stations that affect the integrity of the property's location, setting, feeling, or association, under the build alternatives (Table 4-9). Aside from the direct and indirect impacts identified, it is assumed that there would be no additional short-term impacts (noise, air, access, etc.) to historic resources associated with construction because construction duration would be very short (ideally less than 2 weeks) in any given location.

Table 4-9: Impacts to Identified Historic Resources Along the Highway 99 Corridor

Historic Resource Address	Preliminary Eligibility Evaluation	Enhanced Corridor		EmX	
		Long-term Direct Impacts	Indirect/Cumulative Impacts	Long-term Direct Impacts	Indirect/Cumulative Impacts
450 Highway 99	Contributing/ altered	Strip Take	Access Change	Strip Take	EmX Station
595 Highway 99	Contributing	Strip Take	Visual Effect	Strip Take	Visual Effect
605 Highway 99	Contributing		Visual Effect		Visual Effect
723-795 Highway 99	Contributing	Enhanced Shelter Strip Take Access Change			EmX Station
780 Highway 99	Contributing	Strip Take		Strip Take	EmX Station
1175 Highway 99	Contributing		Enhanced Shelter Strip Take		EmX Station Strip Take
Bonneville Substation	Significant	Enhanced Shelter Strip Take Access Change		Emx Station Strip Take Access Change	
1740 Highway 99	Contributing		Strip Take		EmX Station

Source: Heritage Research Associates. Draft Cultural Resources Technical Report. 2017.

Notes:

- 1 Table does not include downtown, 6th, 7th, 11th, or 13th Avenue segments addressed in previous LTD studies and for which no changes are proposed. Table does not include historic resources that would not be impacted by either build alternative.
- 2 Strip takes are partial acquisitions of a property in which a small strip of land along the roadway frontage is acquired for transit investments.
- 3 Visual effects noted in the table reflect visual changes other than shelters or stations. Those with an asterisk (*) denote an effect from the elevated path to the pedestrian and bicycle bridge.

Ecosystems

The Highway 99 Corridor is located within a highly urbanized area consisting of residential, commercial and industrial development. These highly developed areas do not possess substantial habitat features and generally lack sensitive ecosystem features. Existing habitat conditions are conducive to plant and wildlife species that are commonly found in urban areas. Street and landscape trees along the corridor provide limited habitat for urban avian species. Areas that are not currently developed with hard structures or pavement are either landscaped or consist of small fields that are vegetated with weedy plant species.

There are no waterways located within the study area. The Highway 99 Corridor is located a minimum of 0.10 mile from Amazon Creek and 0.60 mile from the Willamette River. The nearest construction areas are located 0.22 mile from Amazon Creek and over 1 mile from the Willamette River.

Wetlands are mapped adjacent to the corridor, but not within areas where construction would occur. Prior to construction, detailed onsite wetland determination and delineation work would occur. It is possible that additional wetland areas may be identified at that time.

There is no designated critical habitat within the study area. The nearest designated critical habitat is for Chinook salmon located at the Willamette River, over 1 mile from construction limits. The minimum distance from the corridor to designated critical habitat for Willamette daisy is approximately 1.4 miles. No other designated critical habitat is located in the project vicinity.

A list of protected federal and state listed species documented as occurring in the project vicinity is presented in Chapter 3. None of these species are known to occur within the study area.

No-Build Alternative

The No-Build Alternative would not involve any construction activities associated with the MovingAhead project 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 species listed under the Endangered Species Act or designated critical habitat. The No-Build Alternative would not result in any long-term direct impacts to wetlands or waterways.

Enhanced Corridor and EmX Alternatives

Trees

Based on the assessment of potential impacts to street and landscape trees, a total of approximately 14 medium and large street trees and 0 landscape trees would be removed under the Enhanced Corridor Alternative outside of the charter tree boundary; and 31 medium and large street trees and 9 landscape trees would be removed under the EmX Alternative outside of the charter tree boundary, slightly reducing available habitat for avian species in the corridor under both alternatives (Table 4-10). Any tree removal would occur in accordance with local regulations and would be mitigated through replacement. Mitigation would offset any long-term direct impacts.

Fish

Both build alternatives would result in new, reconstructed, and adjoining impervious surface. Stormwater runoff from new impervious surfaces could reach fish bearing waterways. Under the Enhanced Corridor Alternative there would be approximately 171,100 square feet of impervious surface; the EmX Alternative would result in greater impervious surface with approximately 215,200 square feet of impervious surface. All of the new impervious surface would drain to Amazon Creek; stormwater runoff would then travel over 25 miles before reaching the Willamette River where listed fish and designated critical habitat are located. The build alternatives would incorporate a number of protective measures that would minimize effects to fish. Runoff from the increase in impervious surface would be required to meet ODOT or the City's stormwater design standards, depending on the roadway jurisdiction, as well as Oregon Department of Environmental Quality (DEQ) standards. Stormwater treatment would remove pollutants, minimize erosion, and control the flow so that the build alternatives would not significantly impact threatened fish species or designated critical habitat.

Potential cumulative stormwater effects to Amazon Creek and downstream designated critical habitat in the Willamette River would be mitigated by meeting ODOT, City, and DEQ stormwater design standards.

Construction activities would result in short-term changes to water quality that could affect fish species and their habitat, such as the potential for increased sediment transport to waterways. Because erosion prevention and sediment control measures would be implemented during construction, none of these effects would significantly impact fish or their habitat.

Wetlands

While documented wetlands are located in close proximity the Highway 99 Corridor, construction is not proposed near the mapped wetlands under either build alternative, so no long-term direct impacts to mapped wetlands, including changes to wetland functions and

quality, are anticipated. Construction of the either build alternative would not cause any changes to the hydrology of mapped wetlands or encroach on any wetland buffers or conservation setbacks.

Similarly, since construction is not proposed near documented wetlands, there would be no short-term construction-related degradation of wetland quality or adverse changes in wetland functions.

Critical Habitat

The build alternatives would not result in the destruction or adverse modification of critical habitat or suitable habitat, nor would they result in a “take” of federal or state listed species.

Since there is no designated critical habitat or listed species documented within the study area, no indirect or cumulative effects or short-term construction-related impacts to designated terrestrial critical habitat or listed species are anticipated under either build alternative.

Table 4-10: Highway 99 Corridor Ecosystem Impacts

	Enhanced Corridor	EmX
Trees	<ul style="list-style-type: none"> Removal of 14 medium and large trees Slight reduction in avian habitat 	<ul style="list-style-type: none"> Removal of 40 medium and large trees Slight reduction in avian habitat
Fish	<ul style="list-style-type: none"> Construction of 171,100 SF of impervious surface Increase in stormwater runoff 	<ul style="list-style-type: none"> Construction of 215,200 SF of impervious surface Increase in stormwater runoff
Wetlands	No impact	No impact
Critical Habitat	<ul style="list-style-type: none"> No adverse impact No "take" of federal or state-listed species 	<ul style="list-style-type: none"> No adverse impact No "take" of federal or state-listed species

Source: Environmental Science & Assessment, LLC. Draft Ecosystems Technical Report. 2017.

Energy, Sustainability and Greenhouse Gas

Along the Highway 99 Corridor, energy is consumed primarily for residential, commercial, and transportation purposes. Transportation energy for motor vehicles is primarily provided by direct combustion of petroleum fuels, with lesser contributions from compressed natural gas and electricity. Given the continued gains in technology for increasing energy efficiency, energy consumption is not expected to be a factor for determining the preferred mode alternatives.

No-Build Alternative

Under the No-Build Alternative vehicle miles traveled, congestion, and energy use are expected to increase. Energy consumption and greenhouse gas (GHG) emissions are expected to be higher at congested intersections. There is limited potential for sufficient mode shifts from motor vehicles to transit to improve energy use and sustainability. The No-Build Alternative is inconsistent with applicable goals and policies related to GHG reductions and sustainability.

This alternative would not involve any construction activities associated with this project and, therefore, would not require any energy for construction activities.

Enhanced Corridor and EmX Alternatives

The long-term direct impacts of the build alternatives include negligible changes to direct energy consumption as shown in Table 4-11. The Enhanced Corridor Alternative would use slightly more energy than the No-Build Alternative in 2035, while the EmX Alternative would result in slightly less energy use than the No-Build and Enhanced Corridor Alternatives.

The Enhanced Corridor and EmX Alternatives would be in compliance with both the City’s and LTD’s sustainability policies.

All required mitigation measures related to energy and GHG emissions, such as preserving or replanting trees and minimizing traffic obstructions, would be specified in LTD’s construction contracting documents.

Overall, future energy use does not differentiate the 3 alternatives and impacts of the build alternatives on direct and indirect energy consumption. The changes in regionwide energy consumption are negligible for the alternatives due to continued increases in fuel efficiency over the next 20 years. Given the continued gains in technology for increasing energy efficiency, energy consumption is not expected to be a factor for determining the preferred mode alternative. The impacts of the build alternatives are not large enough in to warrant additional mitigation measures.

Table 4-11: Highway 99 Corridor Percent Change in 2035 Regionwide Energy Impacts (Btu) from the No-Build Alternative

Energy Type	Enhanced Corridor	EmX
Direct Energy ^a	0.001%	-0.018%
CO2e Equivalent Energy ^b	0.003%	-0.011%
Maintenance Energy ^c	0.015%	0.022%
Total	0.001%	-0.011%

Source: DKS. Draft Energy and Sustainability Technical Report. 2017.

Notes:

- a Direct energy represents energy consumed for operation of transit service.
- b CO2e equivalent energy represents greenhouse gas emissions generated by operation of transit service.
- c Maintenance energy represents energy consumed indirectly for the products and operations necessary to keep the transit system operable.

Geology and Seismic

A review of geologic conditions in the Highway 99 Corridor shows that the nearest active fault line or zone is approximately 26 miles north, the area elevation is too high to be subject to tsunami inundation, no significant waterbodies are near enough to cause concerns about seiche inundation, and volcanic activity is not considered a significant concern.

No-Build Alternative

The main geologic hazards that could potentially affect operation and maintenance of the No-Build

Alternative include erosion, high shrink-swell and hydric soils, landslides, ground motion, and liquefaction, as described in Table 4-12.

Enhanced Corridor and EmX Alternatives

Long-term impacts for the build alternatives would be related to geologic and seismic hazards that already exist; these hazards are the same as for the No-Build except for the segments of the Highway 99 Corridor where the Enhanced Corridor alignment is different (Table 4-12).

Table 4-12: Highway 99 Corridor Existing Geologic Hazards

Hazard	No-Build	Enhanced Corridor	EmX
Erosion	<ul style="list-style-type: none"> Low wind erosion susceptibility Low to moderate water erosion susceptibility 		
Problematic Soil Properties	High shrink-swell and hydric soils: <ul style="list-style-type: none"> From the Wagner Street and Cubit Street intersection to the Altamont Street and Aerial Way intersection Along W. 7th Avenue from Garfield Street to Chamber Street 	High shrink-swell and hydric soils: <ul style="list-style-type: none"> From the Wagner Street and Cubit Street intersection to the Altamont Street and Aerial Way intersection Along W. 7th Avenue from Garfield Street to Chamber Street From the W. 12th Avenue and Chamber Street intersection to the W. 11th Avenue and Taylor Street intersection 	High shrink-swell and hydric soils: <ul style="list-style-type: none"> From the Wagner Street and Cubit Street intersection to the Altamont Street and Aerial Way intersection Along W. 7th Avenue from Garfield Street to Chamber Street
Landslides	Moderate (landsliding possible) to high (landsliding likely): <ul style="list-style-type: none"> Highway 99 between W. 5th Avenue and Roosevelt Boulevard south 		
Ground Motion	Strong to very strong ground-shaking zone		
Liquefaction	Moderate liquefaction hazard zone: <ul style="list-style-type: none"> From the W. 6th Avenue and Adams Street intersection to Eugene Station From the W. 7th Avenue and Blair Boulevard intersection to Eugene Station 	Moderate liquefaction hazard zone: <ul style="list-style-type: none"> From the W. 12th Avenue and Chambers Street intersection to Eugene Station From the W. 11th Avenue and Taylor Street intersection to Eugene Station 	Moderate liquefaction hazard zone: <ul style="list-style-type: none"> From the W. 6th Avenue and Adams Street intersection to Eugene Station From the W. 7th Avenue and Blair Boulevard intersection to Eugene Station

Source: CH2M. Draft Geology and Seismic Technical Report. 2017.

Hazardous Materials

A history of industrial land uses along Highway 99 and the use and storage of hazardous materials for those uses has led to a corridor with a number of affected sites that federal or state regulatory agencies have recorded on 1 or more hazardous materials lists.

There are 0 high-risk and 90 medium-risk hazardous materials sites recorded within the study area of the Enhanced Corridor Alternative and 2 high-risk and 111 medium-risk hazardous materials sites within the study area of the EmX Alternative.

No-Build Alternative

No project-related construction activities would occur under the No-Build Alternative, so there would be no impacts to hazardous materials because there would be no handling of or exposure to existing contaminants, and no existing contaminants would be remediated.

Enhanced Corridor and EmX Alternatives

None of the recorded high and medium-risk hazardous materials sites would be affected by construction of the Enhanced Corridor Alternative, so there would be no impacts to hazardous materials under this alternative, and no existing sites would need to be remediated as part of the project (Table 4-13).

Construction activities under the EmX Alternative could potentially require ground disturbance at 2 high-risk sites, leading to potential exposure to hazardous materials. The acquired portions of these sites would be remediated, resulting in a long-term benefit to the community.

Table 4-13: Highway 99 Corridor Number of Hazardous Sites on Potentially Impacted Tax Lots

Hazardous Sites on Potentially Impacted Tax Lots	No-Build	Enhanced Corridor	EmX
High Risk	0	0	2
Medium Risk	0	0	0

Source: CH2M. Draft Hazardous Materials Technical Report. 2017.

Land Use and Prime Farmland

Near downtown Eugene, the Highway 99 Corridor is characterized by high-density residential areas. Farther north and west, land use transitions to industrial and commercial uses west of Garfield Street along Highway 99, and then to areas of commercial and multi-family residential along Barger Drive.

No-Build Alternative

No property would be acquired under the No-Build Alternative, and no temporary construction easements would be needed since no construction activities would occur as part of the MovingAhead project.

The No-Build Alternative would not result in direct impacts to prime farmlands, or agricultural or forest uses subject to Oregon Statewide Planning Goals 3 (Agricultural Lands) or 4 (Forest Lands).

The No-Build Alternative would be inconsistent with many local, regional, and state land use and transportation policies in the Eugene 2035 TSP, the Metro Plan, TransPlan, and Envision Eugene because it would not institute a BRT system connecting the region's highest growth centers and it would not encourage increased density and TOD along Key Transit Corridors.

Enhanced Corridor and EmX Alternatives

Overall, direct impacts to land use would be limited because the proposed investments of the build alternatives would be located primarily within existing transportation ROWs and the total land area that would be converted from existing land uses to a transportation use is minor compared to the total land available in the City.

Under the Enhanced Corridor Alternative, partial acquisitions from 44 parcels, totaling 1.3 acres, would be required to facilitate roadway widening and enhanced multimodal investments. Under the EmX Alternative, partial acquisitions from 38 parcels, totaling 1.6 acres would be required, more total acreage than under the Enhanced Corridor Alternative because dedicated transit lanes and EmX stations would require greater roadway widths. Most of the land that would be acquired and converted to a transportation use under both build alternatives is zoned Mixed-Use (Table 4-14).

The presence of EmX would support more development, decrease the need for automobile parking, and support a wider mix of uses as compared to the No-Build and Enhanced Corridor Alternatives.

Neither of the build alternatives would result in direct impacts to prime farmlands, or agricultural or forest uses subject to Oregon Statewide Planning Goals 3 (Agricultural Lands) or 4 (Forest Lands). No direct impacts to prime farmland subject to the Farmland Protection Policy Act (FPPA) would occur under either of the build alternatives.

Operation of the build alternatives also has the potential to contribute to beneficial indirect impacts to land use as a result of TOD. Lands that may be supportive of TOD development are identified in Table 4-15. Greater areas of Mixed-Use and Multi-Family Residential zoning contribute to a greater likelihood that TOD would occur within an area of potential impact. Any new development or redevelopment would need to be consistent with existing zoning and to comply with any requirements associated with overlays.

Construction of the build alternatives would require temporary construction easements beyond the property acquisition needed to construct the alternatives, which could result in additional impacts to properties located along the corridor. These easements would be temporary and the affected areas would be returned to preconstruction conditions upon completion of construction. Additional information about compensation for property acquisition and temporary easements is addressed in the Draft Acquisitions and Displacements Technical Report (CH2M 2017).

Generally, the Enhanced Corridor Alternative would be consistent with the goals and policies on improving multimodal transportation contained in the Metro Plan, Regional Transportation Plan (RTP), TransPlan, Envision Eugene, and the Eugene 2035 TSP. This alternative would not be fully consistent with the RTP (Transportation System Improvement [TSI] Transit Policy #2) and the Metro Plan (Policy F.19) because the Enhanced Corridor Alternative would not implement a BRT system. However, the Enhanced Corridor Alternative would implement lower capital-cost transit investments consistent with the intent of these goals and policies

Table 4-14: Highway 99 Corridor Potential Permanent Conversion of Land to Transportation-Related Use

Land Use Zoning	Enhanced Corridor (ac)	EmX (ac)
Commercial	0	0
Industrial	< 0.1	< 0.1
Office	0	0
Institution	0.3	0.3
Single-Family Residential	0.1	0.1
Multi-Family Residential ^a	< 0.1	< 0.1
Agriculture / Forest / Natural Resources	0	0
Mixed-Use ^a	0.9	1.2
Special Area Zone (Non-Mixed Use)	0	0
Total Potential Permanent Conversion^b	1.3	1.6
Total Acres TOD Supportive Lands^a	1.0	1.3

Source: CH2M. Draft Land Use and Prime Farmland Technical Report. 2017.

Notes:

- a Lands zoned Mixed-Use and Multi-Family Residential would likely be supported to a greater degree by transportation improvements proposed under the build alternatives and have been aggregated together as “TOD Supportive Lands”
- b Total may be greater or less than the sum of the parts due to rounding.

and would not preclude the implementation of an EmX Alternative in the future.

The EmX Alternative would be consistent with all existing local, regional, and state land use and transportation policies of the Metro Plan, TransPlan, RTP, the Eugene 2035 TSP, and Envision Eugene because this alternative would institute a BRT system connecting the region’s highest growth centers. Both build alternatives would serve the Highway 99 Key Transit Corridor identified in Envision Eugene.

Table 4-15: Highway 99 Corridor Transit Supportive Lands

Zoning Type	Enhanced Corridor	EmX
Mixed-Use	561 acres	947 acres
Vacant ^a	19 acres	43 acres
Multi-Family Residential	177 acres	353 acres
Vacant ^a	6 acres	31 acres

Source: CH2M. Draft Land Use and Prime Farmland Technical Report. 2017.

Note:

- a Vacant lands are captured in the Mixed-Use and Multi-Family Residential totals.

Noise and Vibration

Land use in downtown Eugene is mainly commercial, with some intermixed multi- and single-family residences. The alignment for the Enhanced Corridor and EmX Alternatives differs between Eugene Station and Chambers Street. Where the Highway 99 Corridor Enhanced Corridor Alternative extends west to Chambers Street, land use becomes predominantly single-family residences. Both alternatives follow the same alignment from Chambers Street west to the corridor terminus. The main noise source for both alternatives in the east end of the corridor is traffic on major arterial roadways throughout the downtown area.

In the west end of the corridor, where the alignment extends northwest along Highway 99, land use is primarily commercial and light industrial south of Roosevelt Boulevard. North of Roosevelt Boulevard, land use on the east side of the alignment continues to be commercial and industrial. However, to the west, land use also includes single-family residences and hotels. Noise levels in this part of the corridor are dominated by traffic on Highway 99, as well as by nearby commercial and industrial activities.

No-Build Alternative

Under the No-Build Alternative, no noise or vibration impacts are anticipated because there would be no project related changes to the corridor.

Enhanced Corridor and EmX Alternatives

Operation of the Enhanced Corridor Alternative would result in noise impacts to 7 multi-family properties as a result of increased transit vehicle traffic in closer proximity to noise sensitive properties (Table 4-16). Similarly, increased transit vehicle traffic in closer proximity to noise sensitive properties under the EmX Alternative would potentially cause noise impacts to 6 single-family and 13 multi-family properties. Neither alternative is anticipated to result in vibration impacts.

During final design, all impacts and potential mitigation measures would be reviewed for verification; the most appropriate mitigation measures would be determined in consultation with the affected property owners.

Under the build alternatives, during construction of the proposed project investments, noise and vibration levels in the project corridor may increase due to normal construction activities. However, daytime construction noise is exempt from provisions contained in the City of Eugene Municipal Code. Under the City of Eugene Municipal Code noise ordinance, project construction could be performed during the allowable hours of 7:00 a.m. to 7:00 p.m. Construction related noise is exempt from code provisions if construction is performed during the allowable hours. No construction noise impacts are predicted for any alternative constructed during allowable hours. If construction was planned outside of the allowable hours, the project would be required to obtain a noise variance from local jurisdictions. As part of the variance process, a construction noise analysis would be performed; the construction specifications would contain limitations, if any, specific to the night work proposed and potential construction noise impacts.

Table 4-16: Highway 99 Corridor Potential Noise and Vibration Impacts

Number of Properties Potentially Impacted	No-Build	Enhanced Corridor	EmX
Noise	0	7	19
Vibration	0	0	0

Source: Michael Minor and Associates. Draft Noise and Vibration Technical Report. 2017.

Parklands, Recreation Areas and Section 6(f) Resources

Within the Highway 99 Corridor study area, there is 1 community park, 8 neighborhood parks, 2 urban plazas, 1 special use facility, and the Amazon Active Transportation Corridor (Figure 4-5 and Table 4-17). Three of these resources are located within 200 feet of the Enhanced Corridor alignment: McNail-Riley House, Lincoln School Park, and Trainsong Park (Table 4-17); 2 resources are located within 200 feet of the EmX alignment: Washington Jefferson Park and Trainsong Park. Washington Jefferson Park received funding from the Land and Water Conservation Fund (LWCF), so it is protected under Section 6(f).

No-Build Alternative

The No-Build Alternative would not impact parklands, recreation areas, or Section 6(f) resources because there would be no construction or change in the transportation system as a result of the MovingAhead project.

Enhanced Corridor and EmX Alternatives

Beneficial effects of the build alternatives would include increased access to the parks within the study area and along the corridor through more frequent and reliable transit service. In addition, bicycle and pedestrian connectivity would be enhanced with new pedestrian crossings along the corridor, new or improved sidewalks and bicycle facilities, and the new bicycle and pedestrian bridge that would provide more direct access to Trainsong Park.

Under the build alternatives, transit service related to parks and recreation resources within 200 feet of the construction footprint of the build alternatives would be as follows:

- Transit service to the McNail-Riley House and Lincoln School Park would be more frequent under the Enhanced Corridor Alternative than the fixed-route service under the No-Build Alternative. This park is more than 200 feet from the alignment of the EmX Alternative
- The proposed pedestrian and bicycle bridge connecting Highway 99 to Trainsong Park would provide new bicycle/pedestrian access to transit service on Highway 99 from Trainsong Park, which does not exist under the No-Build Alternative

- Transit service to the Washington Jefferson Park would not change under the EmX Alternative; this park is more than 200 feet from the Enhanced Corridor Alternative

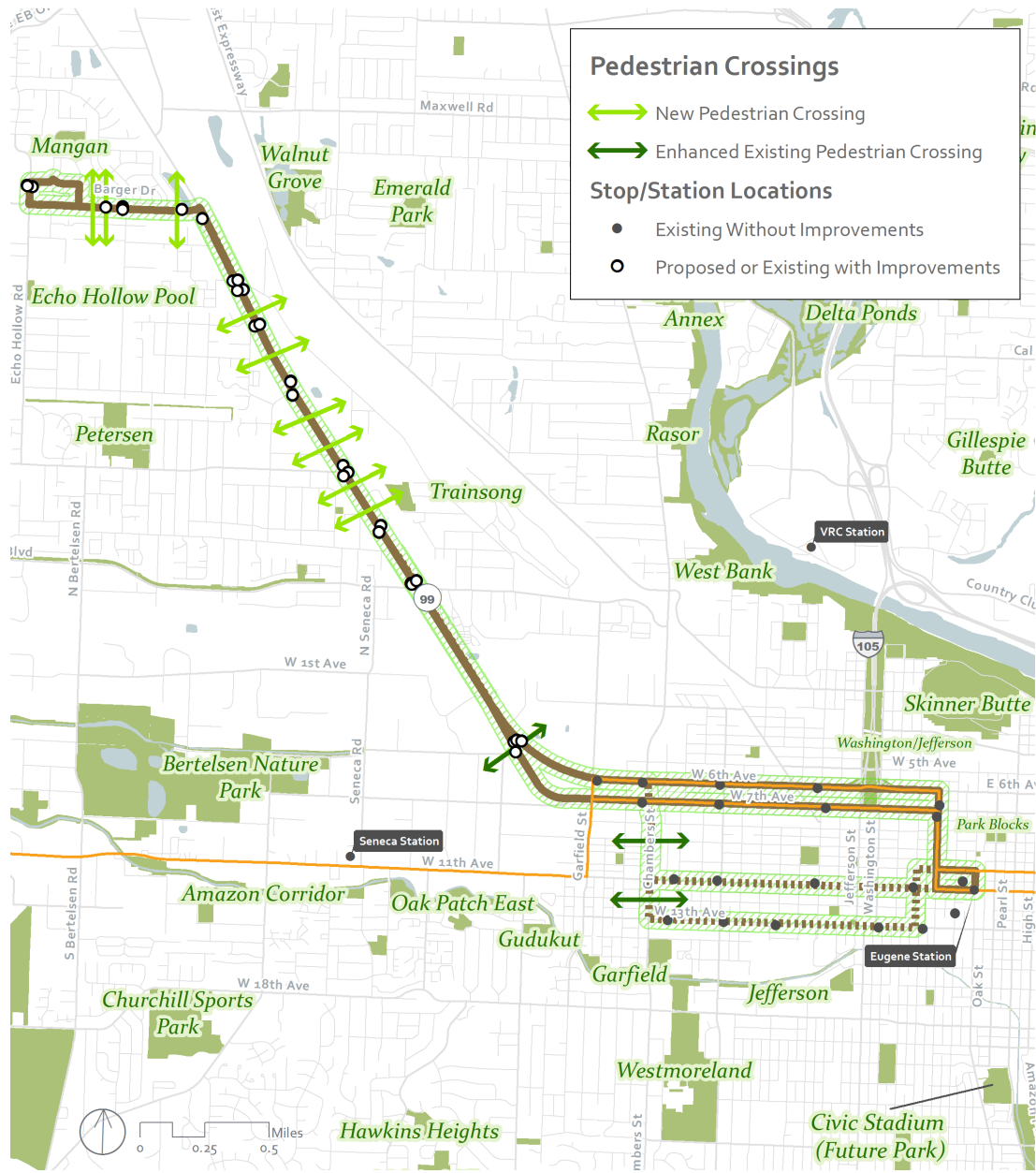
No adverse impacts to the McNail-Riley House or Lincoln School Park are anticipated under the Enhanced Corridor Alternative because there would be no roadway construction near any of the facilities. A traffic signal would be reconfigured at the intersection of Jefferson Street and W. 13th Avenue near the McNail-Riley House. However, any construction would be limited to within the road ROW.

Construction of the proposed bicycle and pedestrian bridge over the railroad would require conversion of approximately 0.09 acre of parkland along the outer edge of the western boundary of the 5-acre Trainsong Park under both build alternatives. This grassed area would no longer be available for recreational purposes. This acquisition would not affect the continued viability, integrity, usage, or value of the park, nor would they degrade the recreational experience. The pedestrian and bicycle bridge would provide new access between the park and the proposed high capacity transit service in the Highway 99 Corridor. During the final design phase, designers would further explore ways to avoid or minimize acquisitions from parks. Where acquisitions are required, LTD and the City would coordinate to determine the most effective measures for compensation or enhancements. An additional 0.06 acre of parkland in Trainsong Park would be needed in a temporary construction easement and would be unavailable for park use during construction.

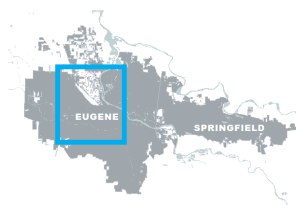
No adverse impacts to the Washington Jefferson Park are anticipated under the EmX Alternative because there would be no roadway investments near any of the park facilities.

Short-term effects from construction activities would be mitigated through coordination of construction timing with the City's Parks and Open Space Division to avoid or reduce disruption for park users, including providing advanced notice of construction activities to park users, signage for pedestrian and bicycle detours, and barriers and flagging for safety. No impacts to Section 6(f) resources from either of the build alternatives are anticipated.

Figure 4-5: Highway 99 Corridor Parks and Recreation Resources



Locator Map



Legend

- Highway 99 Corridor EmX Alternative
- Highway 99 Corridor Enhanced Corridor Alternative
- Highway 99 Corridor 200 ft Buffer
- 2035 No-Build EmX
- Road
- Water
- Park

Parks & Recreation Areas Highway 99 Corridor

Note: Both EmX and Enhanced Corridor Alternatives Shown



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Source: CH2M. Draft Parklands, Recreation Areas, and Section 6(f) Technical Report. 2017.

Table 4-17: Highway 99 Corridor Parks and Recreation Resources within 0.25 mile

Name	Facility Type	Approximate Distance from Corridor	Ownership and Management	Site Features and Characteristics	Potential Views of Corridor	LWCF or Similar Grant Funding?
McNail-Riley House	Special Use	Within 200 feet	City of Eugene	Large main room, parlor, kitchen	Yes ^a	No
Lincoln School Park	Neighborhood Pocket Park	Within 200 feet	City of Eugene	Basketball, picnic tables, play area, sand volleyball	No	No
Washington Jefferson	Community / Metropolitan Park	Within 200 feet	ODOT / City of Eugene	Basketball, shelter, picnic tables, play area, restrooms	Yes ^b	Yes
Trainsong	Neighborhood Park	Within 200 feet	City of Eugene	Ball fields, basketball, picnic tables, play area, skatepark	No	No
Monroe	Neighborhood Park	0.08 mile	City of Eugene	Basketball, picnic tables, play field	No	No
Gilbert	Neighborhood Park	0.09 mile	City of Eugene	Picnic tables, play area	No	No
Broadway Plaza	Urban Plaza	0.10 mile	City of Eugene	Performance space, public art	No	No
Scobert Gardens	Neighborhood Park	0.11 mile	City of Eugene	Play area	No	No
Martin Luther King, Jr.	Neighborhood Park	0.11 mile	City of Eugene	Basketball, play area, playfield	No	No
Park Blocks	Urban Plaza	0.14 mile	City of Eugene	Picnic tables, public art, performance space	No	No
Mangan	Neighborhood Park	0.18 mile	City of Eugene	Basketball, play area	No	No
Jefferson	Neighborhood Park	0.20 mile	City of Eugene	Undeveloped	No	No
Amazon Active Transportation Corridor	Greenway / Multi-use Trail	0.22 mile	City of Eugene / private property	Fern Ridge Path (multi-use recreational path)	No	No

Source: CH2M. Draft Parklands, Recreation Areas, and Section 6(f) Technical Report. 2017.

Notes:

a McNail-Riley House is only visible from the Enhanced Corridor Alternative.

b Washington Jefferson Park is only visible from the EmX Alternative.

Section 4(f) Resources

Park and recreation resources protected under Section 4(f) and located within 350 feet of the Enhanced Corridor Alternative include: McNail-Riley House, Lincoln School Park, and Trainsong Park. Washington Jefferson Park and Trainsong Park are located within 350 feet of the EmX Alternative (Table 4-18). There are no wildlife or waterfowl refuges within 350 feet of either of the build alternatives.

As described in the cultural resources topic, a review of historic records and a windshield survey of the Highway 99 Corridor resulted in the identification of 42 resources potentially eligible for listing on the NRHP and thus protected under Section 4(f) (see Section 4(f) Technical Report for a complete list of eligible resources). None are formally listed on the NRHP at present.

No-Build Alternative

The No-Build Alternative would not impact Section 4(f) resources as there would be no construction that would occur related to the MovingAhead project.

Enhanced Corridor and EmX Alternatives

Both of the build alternatives would construct a pedestrian and bicycle bridge from Trainsong Park to

Highway 99, which would result in a *de minimis* impact to this park. Impacts would include:

- Permanent incorporation of approximately 0.09 acre of parkland which does not contain any recreational features or attributes
- Temporary occupancy of 0.6 acre of land to install the pedestrian bridge and minor increases in noise and dust during construction; this temporary occupancy would satisfy the conditions required such that it would not constitute a use under Section 4(f)
- No activities, features, or attributes of would be permanently impacted by project actions nor would temporary construction actions at the park permanently or temporarily interfere with visitors using the park
- A preliminary conclusion that project actions would not adversely affect the features, attributes, or activities that qualify Trainsong Park for Section 4(f) protection; as such, project actions would likely result in a Section 4(f) *de minimis* impact to Trainsong Park, consistent with 23 Code of Federal Regulations (CFR) 774.17

None of the other parks and recreation resources protected under Section 4(f) would be impacted by either of the build alternatives. The Enhanced Corridor Alternative is not anticipated to have any direct or

Table 4-18: Highway 99 Corridor Section 4(f) Park and Recreation Resources

Source Name	Location	Official with Jurisdiction	Section 4(f) Qualifying Description
McNail-Riley House	Jefferson Street and W. 13th Avenue, Eugene	City of Eugene	Community meeting facility
Lincoln School Park	W. 12th Avenue and Madison Street, Eugene	City of Eugene	Municipal park (basketball, picnic tables, play area, sand volleyball)
Trainsong Park	2775 Edison Street, Eugene	City of Eugene	Municipal park (ballfields, basketball, picnic tables, play area, skatepark)
Washington Jefferson Park	W. 6th and W. 7th Avenues, Eugene	City of Eugene	Skatepark, a basketball court, and horseshoe pits

Source: CH2M. Draft Section 4(f) Technical Report. 2017.

indirect impacts to Lincoln School Park or the McNail-Riley House because there would be no roadway or other infrastructure modifications in the immediate vicinity of these parks. The EmX Alternative is not anticipated to have any direct or indirect impacts to Washington Jefferson Park because there would be no capital investments at the existing EmX stations near the park (W. 6th Avenue/Monroe Street and W. 7th Avenue/Monroe Street). Neither build alternative would result in temporary impacts, nor would the proximity impacts (noise or visual) to any of the parks be so severe as to substantially impair those activities, features, or attributes that qualify the resource for protection under Section 4(f). The improved reliability of transit service to parks would enhance accessibility for the park users.

Eight of the historic resources along the Highway 99 Corridor would potentially be directly and/or indirectly affected by the build alternatives through property acquisition, impacts on access, station/shelter construction, and/or visual effects, as described in the cultural resource section of this chapter.

No historic resources would be removed to construct either of the build alternatives. Further, neither build alternative would alter, directly or indirectly, any characteristics of a historic property that qualify the property for inclusion in the NRHP in a manner that would diminish the integrity of the property's location, design, setting, materials, workmanship, feeling, or association. Therefore, the Enhanced Corridor and EmX Alternatives are not anticipated to have an adverse effect on any Section 106 resources, and project actions under either build alternative would likely result in a *de minimis* impact to the 8 affected historic properties under Section 4(f).

Street and Landscape Trees

Much of the Highway 99 Corridor is next to areas with industrial and commercial/retail land uses that generally do not contain much landscaping. However, some properties do have street trees in planting strips between sidewalks and Highway 99 and Highway 99 contains a few medians planted with trees. The greatest concentration of street and landscape trees along the Highway 99 Corridor is at the northwestern end along Barger Drive and Echo Hollow Road.

No-Build Alternative

No impacts to trees are anticipated under the No-Build Alternative.

Enhanced Corridor and EmX Alternatives

Under the Enhanced Corridor Alternative approximately 14 medium to large street trees and 0 medium to large landscape trees would be potentially removed. Under the EmX Alternative approximately 31 medium to large street trees and 7 to 9 medium to large landscape trees would be potentially removed. No trees within the Charter Tree boundary are anticipated to be removed under either build alternative (Table 4-19). Under the build alternatives, proposed sidewalks that would potentially impact existing street trees would be wide enough to incorporate a landscape strip into which new street trees would be planted. Removed street trees would be mitigated by replanting trees at a ratio of at least 1 tree planted for each tree removed or as otherwise required by City Code. The selection of tree species, specific location, and provision of adequate soil conditions for tree mitigation would be coordinated with the City Urban Forestry staff.

The intermittent nature of construction proposed under the build alternatives would reduce the risk of potential impacts to street and landscape trees as construction would not occur along the entire corridor, just in limited locations near proposed investments. Under the

Enhanced Corridor and EmX Alternatives, most of the construction requiring significant excavation adjacent to street and landscape trees would be confined to intersections and enhanced stop and station areas, so the root zones of most trees in the Highway 99 Corridor would be avoided. LTD would require the construction contractor to develop a Tree Protection Plan before construction.

Under the build alternatives, potential short-term construction-related impacts to street and landscape trees might occur along Highway 99 at Roosevelt Boulevard because of intersection widening and modifications. The existing median and its associated street trees on the north side of the intersection would be preserved but excavation would take place adjacent to them.

Additional potential short-term construction-related impacts to landscape trees under the EmX Alternative would be expected in the following location:

- North side of Barger Road where sidewalk construction would be adjacent to mature landscape trees on private property, excavation and construction equipment might damage these trees or require that they be limbed

Table 4-19: Highway 99 Corridor Number of Medium and Large Trees Potentially Removed

	Enhanced Corridor	EmX
INSIDE THE CHARTER TREE BOUNDARY^a		
Street Trees	n/a	n/a
Landscape Trees	n/a	n/a
OUTSIDE THE CHARTER TREE BOUNDARY		
Street Trees	14 trees	31 trees
Landscape Trees	0 trees	7 to 9 trees

Source: CH2M. Draft Street and Landscape Tree Technical Report. 2017.

Note:

- a The construction footprint of both Highway 99 Corridor build alternatives is located outside of the Charter Tree boundary.

Transportation and Transit

Highway 99 is owned and managed by ODOT. The City owns and manages the other roadways in the corridor. Typically, intersections with a collision rate above or near 1 crash per million entering vehicles are flagged for consideration of safety improvements. Five corridor intersections were identified as having higher densities of crashes. None of the corridor segments (roadway sections between intersections) had collision rates that would typically warrant consideration of safety improvements. During the existing p.m. peak hour, mobility standards were met at all study intersections.

For a more detailed evaluation of transportation impacts and benefits for all corridors and alternatives please refer to Chapter 9.

No-Build Alternative

Under the No-Build Alternative investments planned in the Eugene 2035 TSP, such as the addition of the shared use path along Highway 99, would improve pedestrian and bicycle access along the corridor, however, connectivity to planned roadway, bicycle or pedestrian projects would not change. No investments would be made to the existing transportation system as part of the MovingAhead project. Traffic delay is anticipated to worsen by 2035 and 1 study intersection would not meet the current mobility standards adopted as part of the Eugene 2035 TSP. There would be limited potential to encourage travelers to change their travel mode from motor vehicle travel to transit and limited potential to support locally adopted transportation policies.

Enhanced Corridor and EmX Alternatives

The build alternatives would improve the pedestrian and bicycle network with the installation of new or improved sidewalks, a new pedestrian bridge over the railroad tracks parallel to Highway 99, enhanced pedestrian crossings, upgraded pedestrian crossings, and new or improved bicycle lanes, as listed in Table 4-20. Travel reliability would be enhanced by the proposed time allocated for transit vehicles to travel through intersections with traffic signals (called bus phases) at 4 intersections under the Enhanced Corridor Alternative and 5 intersections under the EmX Alternative and transit signal priority at all signals on the corridor. The

Enhanced Corridor Alternative would offer moderate safety improvements due to BAT lanes and increased crossing opportunities for people biking, walking and using mobility devices. The EmX Alternative would result in significant safety improvements due to BAT lanes, buffered bicycle lanes, and increased pedestrian crossing opportunities. However, to the extent that streets are widened, this can increase how much people walking across the street are exposed to auto traffic.

In-vehicle transit travel time would improve by 10 minutes (1-way inbound) during the a.m. peak hour compared to the No-Build Alternative under the Enhanced Corridor Alternative, and by 12 minutes under the EmX Alternative (Table 4-21). The build alternatives have greater potential for increased transit reliability compared to the No-Build Alternative due to 3.6% more transit exclusive/priority lanes for the Enhanced Corridor Alternative and 21.9% more transit exclusive/priority lanes for the EmX Alternative. Average weekday systemwide transit ridership would be expected

to increase by 370 trips (0.8 %) (1-way linked trips) under the Enhanced Corridor Alternative (Table 4-22). Increases in ridership under the EmX Alternative would be even greater at 890 trips (1.9%).

Local traffic operations would improve at the Highway 99 and Roosevelt Boulevard intersection under both alternatives. The Enhanced Corridor Alternative would include installation of a northbound right-turn lane, while the EmX Alternative would include a dual northbound left-turn lane. Both alternatives would improve safety at the 6th Avenue and Garfield Street intersection due to a small decrease in motor vehicle traffic. There would be a safety benefit based on an increase in transit ridership (and parallel decrease in motor vehicle travel) and a reduction in VMT (see Chapter 9), which could reduce fatal and serious injury crashes.

Both build alternatives would result in removal of off-street parking stalls and the closure of driveways, as

Table 4-20: Highway 99 Corridor Transportation Impacts and Benefits

Measure	Enhanced Corridor	EmX
New/improved sidewalks	1.26 miles	1.37 miles
New/improved bicycle facilities	0.13 mile	3.98 miles
New pedestrian/bicycle bridge	1	1
New enhanced crossings	9	8
New upgraded crossings	2	0
Replaced existing enhanced crossings	0	0
Potential off-street parking spaces removed	50	53
Potential on-street parking spaces removed	0	0
Potential driveway closures	4	2
Potential business access impacts: right-in or right-out turning movements	0	1
Potential drive-through closures	0	0
Percent of corridor with exclusive/priority lanes	3.6%	21.9%

Source: DKS. Draft Transportation Technical Report. 2018.

listed in Table 4-20. One vacant commercial property's (the former Porky's Palace) on-site circulation would be impacted with the installation of a southbound bus pullout or EmX station on Highway 99 just south of Royal Avenue. Through design refinement, full on-site circulation can be maintained. Opportunities to further reduce or avoid impacts would be evaluated in more detail during design refinement. After property impacts were revealed during the analysis, additional evaluation was conducted to determine other ways to

avoid or minimize impacts at some properties; this effort is documented in the Addendum to the MovingAhead Alternatives Analysis Technical Reports Memorandum (CH2M 2017).

Mitigation measures, such as limiting the length of single lane closures, detour signage, and maintaining business access, would be needed during construction, and would require early, frequent, and ongoing communication among LTD, the City, contractors, and affected property owners and tenants.

Table 4-21: Highway 99 Corridor 2035 Auto and Transit Travel Times (a.m. Peak Hour)

Measure	Highway 99 Corridor Travel Time to Eugene Station from Cubit Street /Barger Drive					
	Auto	Transit				
	No-Build, Enhanced Corridor, and EmX	No-Build	Enhanced Corridor		EmX	
	Time	Time	Time	Change from No-Build Alternative	Time	Change from No-Build Alternative
Time in Vehicle	12 minutes	29 minutes	19 minutes	-10 minutes	17 minutes	-12 minutes

Source: DKS. Draft Transportation Technical Report. 2018..

Table 4-22: Highway 99 Corridor Average Weekday 2035 Systemwide Ridership

Measure	No-Build	Enhanced Corridor	EmX
Total Systemwide Transit Trips ^a	46,410	46,780	47,300
Change from No-Build	N/A	370	890
% Change from No-Build	N/A	0.8%	1.9%

Source: DKS. Draft Transportation Technical Report. 2018.

Note:

a Systemwide transit trips are defined as 1-way linked trips taken by a person from the trip's origin to the trip's destination, independent of the number of vehicles or transfers used to complete the trip.

Utilities

Underground utilities within the Highway 99 Corridor include cables for telecommunication and energy; pipes for natural gas, water, sanitary sewer, and stormwater; fiber-optic lines; and access points (manholes and vaults) for all types of utilities. Aboveground utilities include CenturyLink telephone poles, Eugene Water and Electric Board (EWEB) power poles, and traffic signals and street lights and their associated conduit and controls.

Three large 115 kV transmission lines operated by the Bonneville Power Administration (BPA) cross Highway 99 north of Fairfield Avenue en route to their facility at the northeast corner of the Highway 99 and Fairfield Avenue intersection.

No-Build Alternative

The No-Build Alternative would have no adverse or beneficial long-term impacts to utility infrastructure as no capital investments would be constructed for the MovingAhead project.

Enhanced Corridor and EmX Alternatives

Table 4-23 summarizes the potential impacts to major utilities in the Highway 99 Corridor that would occur under the build alternatives. Both build alternatives propose the construction of new signals in this corridor, which would require additional infrastructure (e.g. electrical connections). Final design documentation would detail replacement and design of this infrastructure.

No construction would impact the BPA transmission lines directly under either build alternative, but some sidewalk reconstruction, stop or station construction, and signal reconstruction would occur adjacent to these facilities. Coordination with BPA would be necessary during construction to ensure appropriate clearance distances are maintained from these lines and any facility infrastructure associated with them.

Table 4-23: Highway 99 Corridor Potential Utility Impacts

Measure	Enhanced Corridor	EmX
Major sanitary sewer line	0	1
Major storm sewer line	1	1
Major electrical line	7	7
Major water line	1	1
New or modified traffic signals	30	16

Source: CH2M. Draft Utilities Technical Report. 2017.

Visual and Aesthetic Resources

The Highway 99 Corridor is typified by a variety of street and landscape trees and a mixture of land uses with a range of visual character types. The northern part of the corridor along Highway 99 and Barger Drive contains the area with the most residential visual character. Most of the remainder of the Highway 99 Corridor passes through areas with a mixture of land uses and visual character types such as commercial, retail, and industrial. Street and landscape trees are relatively sparse along this portion of the corridor.

Downtown Eugene has a more urban visual character than the portions of the study corridor that extend beyond the downtown core. The portions of downtown Eugene within the study corridor are characterized by level terrain and a north-to-south and east-to-west grid pattern. Much of downtown Eugene contains mature street and landscape trees, particularly areas that are within the 1915 city limits. Within this area, the study corridor is often lined with older residential and commercial buildings and mature street and landscape trees that form canopies over the streets in some locations. Large, mature trees and canopies along streets produce a very distinctive visual character.

No-Build Alternative

No impacts to visual and aesthetic resources would be expected under the No-Build Alternative for the Highway 99 Corridor as no construction would take place in association with the MovingAhead project.

Enhanced Corridor and EmX Alternatives

The Enhanced Corridor and EmX Alternatives follow separate alignments from Eugene Station to Garfield Street, but would have similar impacts to visual and aesthetic resources northwest of Garfield Street because both alternatives would require construction along the same portions of the Highway 99 Corridor. Both alternatives would require the removal of street and landscape trees, which would change the visual character of areas adjacent to them.

Under the Enhanced Corridor, up to 14 medium and large trees would be removed from the northern portion of the corridor; 9 of these trees would be in the vicinity of Cubit Street between Barger Drive and Wagner Street. Under the EmX Alternative up to 31 large and medium street trees and 7 to 9 landscape trees would be removed, with 22 trees being removed along Barger Drive between Echo Hollow Road/Cubit Street



and Empire Park Drive. Table 4-24 identifies the degree of potential visual change in visual character that would result from construction of the build alternatives. Further detail on this assessment is provided in the Visual and Aesthetic Resources Technical Report (CH2M 2017).

With the build alternatives, in almost all locations, proposed sidewalks in areas where street trees would be impacted would be wide enough to incorporate a landscape strip into which new street trees could be planted. As discussed in the street and landscape trees section of this chapter, removed street trees would be replanted at a ratio of at least 1 tree planted for each tree removed or as otherwise required by City Code and coordinating with the City Urban Forestry staff. With this mitigation, no long-term significant adverse impacts to visual character are anticipated.

Beneficial effects of the build alternatives would include replacing trees that are not on the City-approved species list, are nearing their maximum lifespan, or are difficult to maintain. The replanted trees would contribute to a more unified appearing corridor, as could investments such as new sidewalks, bus stops or EmX stations, landscaping, and enhanced and upgraded pedestrian crossings proposed under the build alternatives.

There is 1 elevated proposed multimodal project investment included under both build alternatives for the Highway 99 Corridor: the pedestrian and bicycle bridge, which would pass over railroad tracks and offer elevated views of the surrounding area. The new bridge would add a vivid new element to the corridor and offer people elevated views of the surrounding area.

Because of the larger construction footprint, the EmX Alternative would offer more opportunities to provide landscaping along portions of the corridor currently without landscaping than the Enhanced Corridor Alternative with its smaller construction footprint. The additional landscaping of the EmX Alternative would enhance the visual character of portions of the corridors with no current landscaping. The EmX Alternative would also have more project components, such as pedestrian crossings and EmX stations, which would provide more visual unity along the corridor than the Enhanced Corridor Alternative.

Table 4-24: Highway 99 Corridor Potential Change to Visual Character

Alternative	Length of Potential Change in Visual Character
ENHANCED CORRIDOR	
High	0.4 mile
Moderate	0.5 mile
Low / No Impact	15.5 miles
Corridor Length^a	16.4 miles
EmX	
High	0.4 mile
Moderate	0.5 mile
Low / No Impact	15.5 miles
Corridor Length^a	16.4 miles

Source: CH2M. Draft Visual and Aesthetic Resources Technical Report. 2017.

Note:

- a Corridor length for this analysis is greater than the round-trip corridor length reported in other sections because visual impacts may affect both sides of the street. One -way streets with potential impacts on both sides increase the corridor length with potential visual impacts to be greater than the length of the corridor.

Water Quality and Hydrology

The study area includes the receiving waterways and floodplains of stormwater runoff into the existing storm sewer system and conveyed to either Amazon Creek or the Willamette River.

No-Build Alternative

Under the No-Build Alternative, upgrades to Bethel Drive and Barger Drive are anticipated as part of other programmed projects not associated with the MovingAhead project. The resulting increase in impervious area is currently unknown. Additional non-pollutant generating impervious surfaces (such as bicycle paths and sidewalks) are also anticipated from programmed projects not associated with MovingAhead. Although surfaces such as sidewalks and bicycle paths are subject to depositional pollutants, these are systemic pollutants and not associated with specific pollution

sources such as vehicles. No cumulative impacts are expected as a result of the No-Build Alternative.

Enhanced Corridor and EmX Alternatives

The primary impact of the Enhanced Corridor Alternative is an increase or reconstruction of 171,100 square feet (SF) of impervious area in the Amazon Creek drainage basin, of which 64,800 SF would be new roadway and sidewalk (Table 4-25). The 171,100 SF of impervious area would constitute 0.05% of the impervious area in the creek's drainage basin defined for this project. The EmX Alternative would add or reconstruct more impervious area, 215,200 SF (including 92,900 SF for roadway and sidewalk), which constitutes 0.06% of the impervious area in the Amazon Creek drainage. Although parts of the corridor drain to the Willamette River, no new impervious area is expected to be developed in the Willamette River drainage basin under either build alternative.

Table 4-25: Highway 99 Corridor Existing and New Impervious Surface Quantities

Drainage Basin	Existing Impervious Area	Enhanced Corridor		EmX	
		Total New and Reconstructed Impervious Area / Percent of Impervious Area ^a	New Roadway and Sidewalk Impervious Area / Percent of Impervious Area ^a	Total New and Reconstructed Impervious Area / Percent of Impervious Area ^a	New Roadway and Sidewalk Impervious Area / Percent of Impervious Area ^a
Amazon Creek	334,939,461 SF	171,100 SF 0.05%	64,800 SF 0.02%	215,200 SF 0.06%	92,900SF 0.02%
Willamette River	462,920,832 SF	0 SF 0.00%	0 SF 0.00%	0 SF 0.00%	0 SF 0.00%
Total	797,860,293 SF	171,100 SF 0.02%	64,800 SF 0.02%	215,200 SF 0.03%	92,900 SF 0.02%

Source: CH2M. Draft Water Quality, Floodplain, and Hydrology Technical Report. 2017.

Note:

a Total impervious area in drainage basin

No direct impacts on either the Amazon Creek or Willamette River floodplains are expected as the result of either of the build alternatives as no structures are anticipated in the streams.

With mitigation measures, such as water quality and flow control facilities, there would be a net water quality improvement associated with the reconstructed impervious areas and the impacts of the new impervious area would be reduced.

No short-term or construction impacts are expected in the floodplains of Amazon Creek and the Willamette River as a result of either of the build alternatives.

Four locations, common to both build alternatives, were identified for potential water quality and flow control facilities for runoff prior to discharge to Amazon Creek. The following locations were selected based on the construction footprint and hydrology:

- W. 6th Avenue and W. 7th Avenue
- Highway 99 and Fairfield Avenue
- Highway 99 and Barger Drive
- Ruskin Street and Barger Drive

Cumulative effects in the corridor may occur if the 30th Avenue to Lane Community College (LCC) Corridor is also developed because it would also impact the Amazon Creek drainage basin. As much as 269,600 SF of new or reconstructed impervious area may be added in the Amazon Creek drainage basin if both corridors are developed with Enhanced Corridor Alternatives or 366,600 SF if developed with EmX Alternatives. This would constitute 0.08% or 0.11% of the impervious area in the Amazon Creek Basin, respectively.

Cumulative effects on both the quantity and quality of runoff may result from the development of 2 or more of the corridor alternatives because all affected watercourses eventually reach the Willamette River. However, due to the large drainage area and high amounts of existing impervious area in the Willamette River Basin, the cumulative effects are likely to be minimal.

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Chapter 5: River Road Corridor

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INTRODUCTION TO THE CORRIDOR CHAPTERS

Before reading this chapter, please read **Chapter 3**, which introduces the corridor-specific chapters (Chapters 4 through 8) with background information about the environmental topics evaluated for each alternative

Corridor Overview

The River Road Corridor begins at the Eugene Station, travels through downtown, then extends north along River Road where it terminates at the Santa Clara Community Transit Center (intersection of Hunsaker Lane and River Road). River Road is identified as a key corridor in Envision Eugene and the Eugene 2035 Transportation System Plan (Eugene 2035 TSP) – 1 of 6 corridors intended for multi-modal planning with frequent transit service (defined as 15-minute or better service frequency) connecting downtown Eugene with numerous core commercial areas. This corridor is approximately 10.3 round trip miles.

Near downtown Eugene, the River Road Corridor is characterized by high-density residential and commercial areas. The alignment from the Northwest Expressway to the corridor terminus at Santa Clara Community Transit Center is characterized by single-family residential and multi-family residential, with a commercial area located at the intersection of River Road and the Randy Papé Beltline Highway. Refer to Table 5-1 for River Road Corridor demographic data and Table 5-2 for River Road Corridor household data.

Generally, between Eugene Station and Chambers Street, the River Road Corridor build alternatives follow separate alignments to connect downtown to River Road. The Enhanced Corridor Alternative would run alternating schedules and routes for outbound and inbound service. Outbound service to River Road and the Santa Clara Community Transit Center would

Corridor Length

10.3 miles round trip (No-Build, Enhanced Corridor, EmX)

Transit and Average Daily Ridership on Existing Transit Routes

🚌 51 Santa Clara	=	1,250 riders/day
🚌 52 Irving	=	970 riders/day
🚌 55 North Park	=	270 riders/day

Employment

Labor Force 16 Years Old and Older:

18,108 people (Enhanced Corridor)
22,525 people (EmX)

Number of Jobs:

18,746 jobs (Enhanced Corridor)
27,784 jobs (EmX)

Major Employers: Fred Meyer, Eugene Community Based Outpatient Clinic, USPS Eugene, City of Eugene, Lane County

Population

34,986 residents (Enhanced Corridor)
43,925 residents (EmX)

Neighborhoods

- » Downtown Neighborhood Association
- » Far West Neighborhood Association
- » Jefferson Westside Neighbors
- » River Road Community Organization
- » Santa Clara Community Organization
- » Trainsong Neighbors
- » West Eugene Community Organization
- » West University Neighbors
- » Whiteaker Community Council

alternate on 1 of 2 routes: Washington Street/ W. 1st Avenue/Railroad Boulevard and W. 5th Avenue/ Blair Boulevard/W. 2nd Avenue/Chambers Street. Inbound service from the Santa Clara Transit Center would alternate on 1 of 2 routes: Railroad Boulevard/ W. 1st Avenue/Jefferson Street/W. 5th Avenue or Chambers Street/W. 2nd Avenue/Blair Boulevard/ W. 5th Avenue. The Enhanced Corridor routing for both outbound and inbound service near the Eugene Station would be the same: Olive Street and W. 5th Avenue.

The EmX Alternative outbound and inbound service would use Charnelton Street, W. 6th Avenue, W. 7th Avenue, Chambers Street, and River Road between Eugene Station and the Santa Clara Community Transit Center. The majority of the corridor length, from the intersection of River Road and Railroad Boulevard/ Northwest Expressway to the Santa Clara Community Transit Center, is shared-by both build alternatives.

River Road is currently a heavily traveled roadway owned and managed by the City of Eugene (City) with an average daily traffic (ADT) volume of more than 32,000 vehicles near its intersection with the Randy Papé Beltline Highway.

Table 5-1: River Road Corridor Demographic Data (2015 Estimates)

Area	Non-Minority Population	Minority Population				Limited English Proficiency	Population from Whom Poverty Determined	Median Household Income	Unemployment
	White Alone	Hispanic or Latino ^a	African American	Asian	Others ^b				
Enhanced Corridor	79.5%	9.9%	1.5%	2.8%	6.4%	3.3%	30.7%	\$33,911	13.1%
EmX	80.3%	9.0%	1.3%	3.4%	6.0%	2.7%	35.2%	\$31,153	12.8%
City of Eugene	77.5%	10.6%	1.7%	3.6%	6.7%	3.9%	24.4%	\$42,715	6.0%
Lane County	82.6%	8.5%	1.2%	2.3%	3.8%	3.0%	20.4%	\$43,685	6.6%
Central Lane Metropolitan Planning Organization	--	--	--	--	--	--	23.0%	\$40,400 ^c	6.6%

Source: CH2M. Draft Community, Neighborhood, and Environmental Justice Technical Report. 2017.

Notes:

- a Hispanic / Latino is defined as a person of Mexican, Puerto Rican, Cuban, Central or South American, or other Spanish culture or origin, regardless of race.
- b Others is a combination of the categories American Indian or Alaskan Native, Hawaiian or Pacific Islander, some other race, and 2 or more races.
- c Median income is calculated by taking the average of the Equity and Opportunity Assessment (EOA) median income levels for Lane County (\$42,621), Eugene (\$41,326), and Springfield (\$37,255).

Table 5-2: River Road Corridor Household Data (2015 Estimates)

Area	Total Population	Population Under 18	Population Over 65	Owner/ Renter Occupied Housing	Average Household Size	Households with No Vehicle
Enhanced Corridor	34,986	5.3%	7.7%	34.9%/ 65.1%	1.8	20.5%
EmX	50,323	11.4%	6.1%	32.7%/ 67.3%	1.8	19.6%
City of Eugene	158,131	18.0%	13.6%	48.9%/ 51.1%	2.3	11.4%
Lane County	354,764	19.4%	16.2%	59.3%/ 40.7%	2.4	8.4%
Central Lane Metropolitan Planning Organization	251,721	20.0%	15.0% ^a	55.0%/ 45.0%	2.4	10.0%

Source: CH2M. Draft Community, Neighborhood, and Environmental Justice Technical Report. 2017.

Note:

a Percentage represents population 60 and over.



Alternatives Considered and Dismissed

During design development, 1 other alignment option and 2 other terminus options were considered but eliminated from advancing for further study. The options considered and reasons for eliminating them are summarized below:

- The River Road Corridor EmX Alternative considered a center running bus rapid transit (BRT) alignment option traveling on River Road. This alignment option was eliminated from consideration because of the high level of potential traffic impacts, access restrictions, and property impacts from wider intersections
- The River Road Corridor Enhanced Corridor and EmX Alternatives considered a terminus option between Irvington Drive and Wilkes Drive. This terminus option was eliminated from consideration because it would not have supported more intensive land use developments, there was no property available in the area, and the cost to extend transit service to that intersection would be offset by the small increase in ridership
- The River Road Corridor Enhanced Corridor and EmX Alternatives considered a terminus option at River Loop. This terminus option was eliminated from consideration because it would not have supported more intensive land use developments, there was no property available in the area, and the cost to extend transit service to that intersection would be offset by the small increase in ridership

Alternatives Advanced

This section summarizes the 3 River Road Corridor alternatives advanced for further evaluation in this Alternatives Analysis (AA) report. Table 5-6 at the end of this section summarizes the attributes of these alternatives. A more comprehensive description of the alternatives is provided in the Draft MovingAhead Level 2 Definition of Alternatives (CH2M et al. 2016).

Other planned operation and capital investments that would occur regardless of which alternative is selected for the MovingAhead project are considered in the analysis of each of the alternatives. Some of these planned investments have already taken place since the original definition and modeling of the alternatives for the MovingAhead project in 2016.

No-Build Alternative

Operations

Roadway operations would be the same as current conditions on River Road. There are no planned operations improvements in the corridor as part of the MovingAhead project.

River Road would continue to have 2 travel lanes in each direction and a center turn lane.

Under the No-Build Alternative, River Road Corridor would continue to be served primarily by Lane Transit District (LTD) Routes 51 and 52, operating with 30-minute frequencies during the peak and off-peak periods. Routes 51 and 52 would operate with staggered schedules, such that service would effectively operate with 15-minute frequencies along most of the corridor during peak and off-peak periods. In addition, Route 55 would continue serving areas along and to the west of River Road. This route would be extended on River Road to terminate at the new Santa Clara Community Transit Center and would have 60-minute frequencies all day.

The No-Build Alternative would not include EmX service on River Road. For the 2035 planning year, the No-Build Alternative would include the following existing and planned EmX lines:

- Franklin EmX
- Gateway EmX

- West Eugene EmX
- Anticipated EmX service on Main Street in Springfield from Springfield Station to Thurston Station (see Chapter 1 for more discussion about this project)

The Franklin and West Eugene EmX lines would continue to serve the downtown Eugene terminus of this corridor. Frequencies drop to 30 minutes during evenings.

Capital Investments

The No-Build Alternative would not include capital investments on River Road as part of the MovingAhead project. This alternative includes existing roadway, bicycle, pedestrian, and transit facilities in the corridor, as well as planned investments in the Eugene 2035 TSP.

The Eugene 2035 TSP includes the following transportation investments planned along or adjacent to the corridor:

- Upgrade the Hunsaker Lane/Beaver Street to urban collector standards, including 2 travel lanes, a center turn lane, bicycle lanes, sidewalks on both sides of the road, and planting strips from River Road to Division Avenue
- Add bicycle boulevards on Ruby Avenue, Horn Lane, Arbor Drive, and Park Avenue
- Add sidewalks on Hunsaker Lane, Howard Avenue, and Hilliard Lane
- Add protected bicycle lanes on River Road from the Northwest Expressway to Division Avenue

Enhanced Corridor Alternative

Operations

Roadway operations under the Enhanced Corridor Alternative would be similar to that of the No-Build Alternative, with the following exceptions:

- Construction of a right-turn lane on River Road northbound at the intersection with Railroad Boulevard would improve right-turning movements for vehicles
- Business access and transit (BAT) lanes would be constructed at certain locations and available for buses and right-turning vehicles only

- Signal timing at some existing signalized intersections would be altered to reduce delay for buses

Buses would primarily operate in mixed traffic, except at transit queue jump locations, bus-only turn lanes, and sections of BAT lanes on River Road. Enhanced Corridor service would run from 6:45 a.m. to 11:30 p.m. weekdays, 7 a.m. to 11 p.m. Saturdays, and 8 a.m. to 8 p.m. Sundays. For purposes of this analysis, service frequencies are assumed to be 15 minutes during all periods.

Existing fixed-service bus operations on Routes 51 and 52 would be replaced by Enhanced Corridor Service. Operations for Route 55 would be similar to operations under the No-Build Alternative.

The Enhanced Corridor Alternative would result in 206 additional average weekday bus vehicle miles traveled (VMT) and 0 additional average weekday revenue hours as compared to the No-Build Alternative.

Capital Investments

The Enhanced Corridor Alternative would include the following roadway capital investments in addition to those listed under the No-Build Alternative (Figure 5-1):

- Construct a right-turn lane on River Road northbound at the intersection with Railroad Boulevard for turning vehicles. This lane would also be used as a queue jump for buses
- Reconstruct the traffic signal at River Road and Silver Lane
- Construct northbound BAT lane approaching Silver Lane
- Construct BAT lanes in both directions from the south Randy Papé Beltline Highway ramp terminal to Silver Lane; buses would travel in mixed traffic under the interchange itself
- Construct a BAT lane north of Randy Papé Beltline Highway ramp terminal heading north to Division Avenue

Bicycle and pedestrian investments include those listed under the No-Build Alternative plus the following:

- One replaced existing enhanced crossing at River Road and Knoop Lane

Figure 5-1: River Road Corridor Enhanced Corridor Alternative



Source: MovingAhead Project Team.

Table 5-3: River Road Corridor Enhanced Corridor Alternative Bus Stops

<p>Existing Stops Remain – No Capital Investments</p> <p>31</p>	<ul style="list-style-type: none"> • Eugene Station • Olive Street and W. 8th Avenue northbound • Olive Street and W. 7th Avenue southbound • W. 5th Avenue and Olive Street westbound • W. 5th Avenue and Olive Street eastbound • W. 5th Avenue and Lawrence Street westbound • W. 5th Avenue and Washington Street eastbound • Washington Street and W. 5th Avenue northbound • Jefferson Street and W. 4th Avenue southbound • Washington Street and W. 3rd Avenue northbound • Jefferson Street and W. 1st Avenue southbound • W. 1st Avenue and Adams Street westbound • W. 1st Avenue and Monroe Street eastbound • W. 1st Avenue and N. Jackson Street westbound • W. 1st Avenue and N. Jackson Street eastbound • Railroad Boulevard and N. Polk Street northbound 	<ul style="list-style-type: none"> • Railroad Boulevard and N. Polk Street southbound • Railroad Boulevard and Cross Street northbound • Railroad Boulevard and Cross Street southbound • W. 5th Avenue and Madison Street eastbound • W. 5th Avenue and Monroe Street westbound • W. 5th Avenue and Adams Street eastbound • Blair Boulevard and W. 4th Avenue northbound • Blair Boulevard and W. 4th Avenue southbound • Blair Boulevard and W. 2nd Avenue southbound • W. 2nd Avenue and Blair Boulevard westbound • W. 2nd Avenue and Taylor Street westbound • W. 2nd Avenue and Taylor Street eastbound • W. 2nd Avenue and Chambers Street eastbound • Chambers Street and W. 2nd Avenue northbound • Santa Clara Community Transit Center (terminus)
<p>New Stop Locations</p> <p>28</p>	<ul style="list-style-type: none"> • Chambers Street and W. 2nd Avenue northbound • Chambers Street and W. 1st Avenue southbound • River Road and Northwest Expressway northbound • River Road and Northwest Expressway southbound • River Road and Hansen Lane northbound • River Road and Hansen Lane southbound • River Road and Knoop Lane northbound • River Road and Knoop Lane southbound • River Road and Park Avenue northbound • River Road and Park Avenue southbound • River Road and Elkay Drive northbound • River Road and Elkay Drive southbound 	<ul style="list-style-type: none"> • River Road and Hilliard Lane northbound • River Road and Hilliard Lane southbound • River Road and Horn Lane northbound • River Road and Horn Lane southbound • River Road and Merry Lane northbound • River Road and Merry Lane southbound • River Road and Howard Avenue northbound • River Road and Howard Avenue southbound • River Road and Maxwell Road northbound • River Road and Maxwell Road southbound • River Road and Corliss Lane northbound • River Road and Corliss Lane southbound • River Road and Silver Lane northbound • River Road and Silver Lane southbound • River Road and Division Avenue northbound • River Road and Division Avenue southbound
<p>Stops Eliminated</p> <p>5</p>	<ul style="list-style-type: none"> • Locations to be determined during final design 	

Source: CH2M et al. 2016.

- Six new enhanced crossings at the following locations:
 - » River Road and Briarcliff Drive
 - » River Road and Hansen Lane
 - » River Road and Elkay Drive
 - » River Road and Merry Lane
 - » River Road and Corliss Lane
 - » River Road and Division Avenue
- Reconstruct sidewalks at some locations and replace curb ramps at all locations where construction occurs
- Construct sidewalk bulb outs (extending into the roadway) at some stops to allow buses to stop without leaving the travel lane

Bus stops would be spaced approximately 0.25 mile apart, except where existing bus stops and spacing would be used. Some stops would be improved with seating and shelters. Between the Eugene Station and the W. 2nd Avenue and River Road intersection, buses would use existing roadway and bus stops without capital investments. Due to increased stop spacing 5 existing bus stops in the corridor would be eliminated under this alternative as compared to the No-Build Alternative.

Under the Enhanced Corridor Alternative, 31 existing stops would be used for the enhanced bus service, but would not receive capital investments; and 28 new stop locations would be constructed (Table 5-3).

The corridor terminates north of Randy Papé Beltline Highway at the new Santa Clara Community Transit Center.

Under the Enhanced Corridor Alternative, LTD would have 72 fixed-route service buses (mix of 40-foot and 60-foot buses) and 14 spares operating in the system, a reduction of 3 buses compared to the No-Build Alternative.

EmX Alternative

Operations

Roadway operations under the EmX Alternative would be similar to that of the No-Build Alternative with the following exceptions:

- Construction of right-turn lane onto Railroad Boulevard would improve right-turning movements for vehicles
- The number of general-purpose lanes would be reduced to construct BAT lanes, which would reduce vehicular capacity and allow buses and right-turning vehicles only on River Road from Northwest Expressway to approximately Kourt Drive
- New bus-only lanes in both directions between Corliss Lane and the Randy Papé Beltline Highway would improve BRT vehicle travel times on River Road
- Signal timing at some existing signalized intersections would be altered to reduce delay for BRT vehicles

Existing fixed-service bus operations under the EmX Alternative would be different from operations under the No-Build Alternative. These changes would include:

- Routes 51, 52, and 55 would be replaced by EmX service and Route 50 (described below)
- Frequencies on Route 40 would be modified during the a.m. and p.m. peak to 15 minutes (Route 40 serves 6th Avenue, Blair Boulevard, 2nd Avenue, and a short section of Chambers Street before traveling west up Roosevelt Boulevard)
- A new fixed-service route, Route 50 “River Road Connector,” would be added with 30-minute frequencies all day and would serve portions of Route 51, 52, and 55 (Route 50 would primarily serve the residential area on the west side of River Road)

BRT vehicles would primarily operate in mixed traffic, except at transit queue jump locations, exclusive bus lanes, bus-only left-turn lanes, and sections of BAT lanes on River Road. BRT vehicles would utilize the existing EmX infrastructure on W. 6th and W. 7th Avenues. Under the EmX Alternative, the EmX system would extend from Eugene Station northwest to the Santa Clara Community Transit Center.

EmX service is assumed to run from 6:45 a.m. to 11:30 p.m. weekdays, 7 a.m. to 11 p.m. Saturdays, and 8 a.m. to 8 p.m. Sundays. For purposes of this study, service frequencies are assumed to be 10 minutes during all periods.

The EmX Alternative would result in 1,072 additional average weekday BRT VMT and 52 additional average weekday BRT revenue hours as compared to the No-Build Alternative.

Capital Investments

The EmX Alternative would include the following roadway capital investments in addition to those of the No-Build Alternative (Figure 5-2):

- Construct a northbound right-turn lane from River Road to Railroad Boulevard to facilitate vehicles turnings onto Railroad Boulevard; this lane would also be used as a queue jump for buses
- Repurpose existing outside general-purpose lanes to BAT lanes on River Road:
 - » Northbound from Briarcliff Drive to Kourt Drive
 - » Southbound from Kourt Drive to Northwest Expressway
- Construct new BAT lanes on River Road in both directions from the north side of the Randy Papé Beltline Highway intersection to Division Avenue
- Construct new center-running bus-only lanes on River Road in both direction from Corliss Lane to the south side of the Randy Papé Beltline Highway intersection
- Construct a new bus-only left-turn lane on Hunsaker Lane westbound to River Road southbound to facilitate left turns onto River Road
- Reconstruct traffic signals at the following intersections:
 - » River Road and Silver Lane
 - » River Road and southern ramp terminal at the Randy Papé Beltline Highway interchange
 - » River Road and northern ramp terminal at the Randy Papé Beltline Highway interchange
 - » River Road and Division Avenue
 - » River Road and Hunsaker Lane

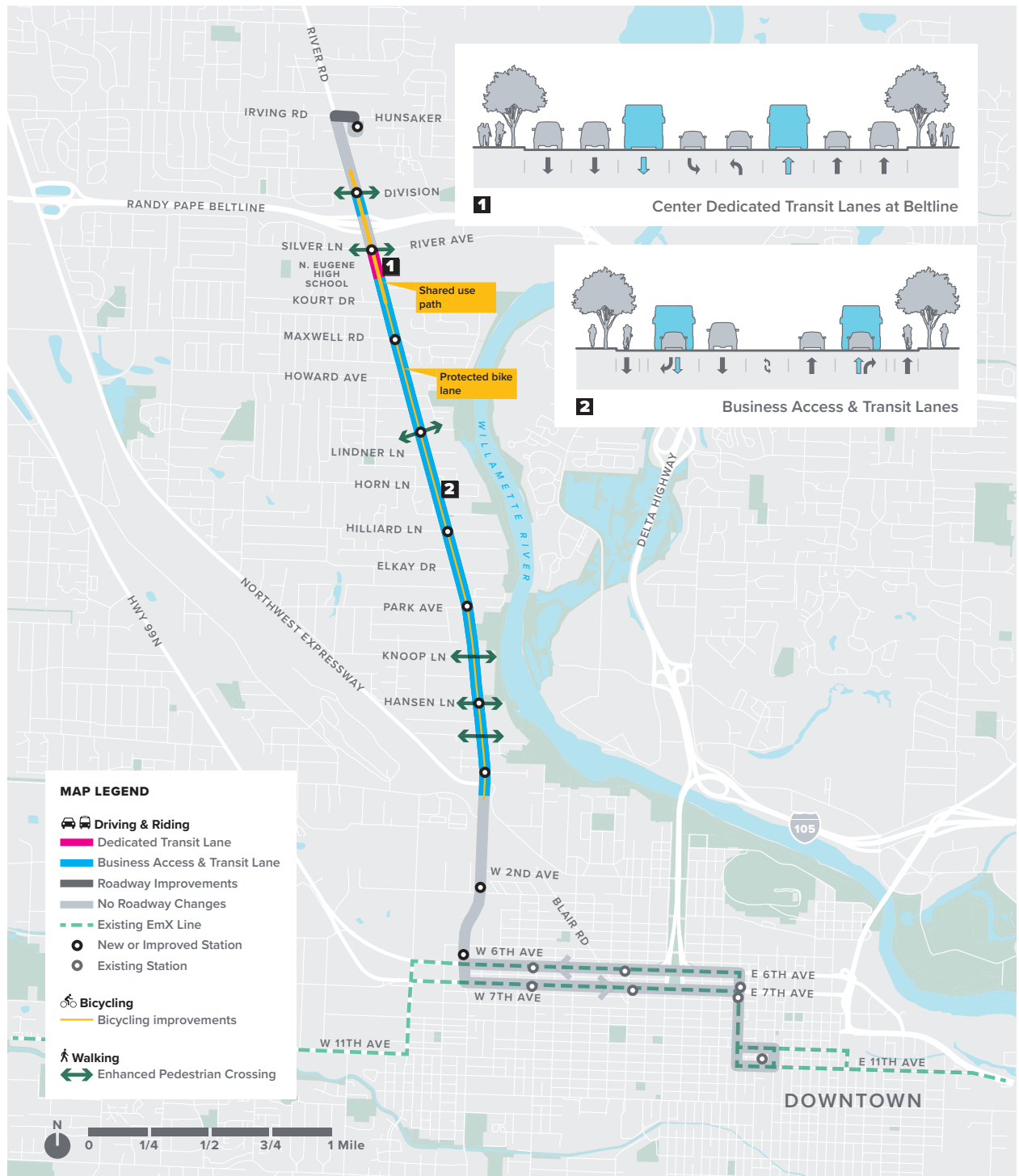
Bicycle and pedestrian investments include those listed under the No-Build Alternative plus the following:

- One replaced existing enhanced crossing at River Road and Knoop Lane
- Four new enhanced crossings at the following locations:
 - » River Road and Briarcliff Drive
 - » River Road and Hansen Lane
 - » River Road and Merry Lane
 - » River Road and Division Avenue
- Reconstruct sidewalks at some locations and replace curb ramps at all locations where construction occurs
- Route bicycle lanes behind EmX Stations and away from travel lanes on River Road to reduce bicycle, vehicle, and BRT vehicle conflicts
- Restripe River Road to create a protected bicycle lane on both sides of River Road from Northwest Expressway north to Silver Lane (requires narrowing travel lanes)
- Replace existing bicycle lane with shared-use path on both sides of River Road from Silver Lane to Division Avenue
- Construct a new eastbound bicycle lane on Hunsaker Lane adjacent to corridor terminus

EmX stations would be spaced approximately 0.33 to 0.5 mile apart, except where existing station facilities and spacing would be used. EmX stations would have level boarding and tactile treatment to help facilitate BRT vehicle docking and boarding and alighting of passengers, as well as amenities like shelters, benches, trash receptacles, bicycle racks, and fare payment kiosks.

Under the EmX Alternative, there would be no changes from the No-Build Alternative for bus facilities, except for the removal of up to 36 bus stops due to replacement of fixed-route service with EmX service, which has greater station spacing. Seven existing EmX stations would receive no capital investments and would be used with River Road EmX service and 20 new EmX stations would be constructed (Table 5-4).

Figure 5-2: River Road Corridor EmX Alternative



Source: MovingAhead Project Team.

The corridor terminates north of Randy Papé Beltline Highway at the new Santa Clara Community Transit Center. The BRT vehicle would layover at this location before picking up inbound passengers.

Under the EmX Alternative, 1 bus bay at Eugene Station would be improved to accommodate BRT vehicles. Under the EmX Alternative, LTD would have

72 fixed-route service buses (mix of 40-foot and 60-foot buses) and 14 spares operating in the system, a reduction of 3 vehicles (includes 1 spare) as compared to the No-Build Alternative. LTD would have 23 BRT vehicles (60-foot articulated) and 6 spares operating in the system, an addition of 5 BRT vehicles (includes 2 spares) as compared to the No-Build Alternative.

Table 5-4: River Road Corridor EmX Alternative Stations

<p>Existing EmX Stations Remain – No Capital Investments</p> <p>7</p>	<ul style="list-style-type: none"> W. 6th Avenue and Charnelton Street westbound W. 7th Avenue and Charnelton Street eastbound W. 6th Avenue and Monroe Street westbound W. 7th Avenue and Monroe Street eastbound W. 6th Avenue and Polk Street westbound W. 7th Avenue and Polk Street eastbound Santa Clara Community Transit Center
<p>New EmX Station Locations</p> <p>20</p>	<ul style="list-style-type: none"> Chambers Street and W. 6th Avenue northbound Chambers Street and W. 6th Avenue southbound Chambers Street and W. 2nd Avenue northbound Chambers Street and W. 2nd Avenue southbound River Road and Northwest Expressway northbound River Road and Northwest Expressway southbound River Road and Hansen Lane northbound River Road and Hansen Lane southbound River Road and Park Avenue northbound River Road and Park Avenue southbound River Road and Hilliard Lane northbound River Road and Hilliard Lane southbound River Road and Merry Lane northbound River Road and Merry Lane southbound River Road and Maxwell Road northbound River Road and Maxwell Road southbound River Road and Silver Lane northbound River Road and Silver Lane southbound River Road and Division Avenue northbound River Road and Division Avenue southbound
<p>Stops Eliminated</p> <p>36</p>	<ul style="list-style-type: none"> Locations to be determined during final design

Source: CH2M et al. 2016.

Table 5-5: Summary of River Road Corridor Attributes of Alternatives

Corridor Attribute	No-Build	Enhanced Corridor	EmX
Annual Corridor Transit Trips ¹	9,575 trips	9,645 trips	10,615 trips
Annual Systemwide Transit Trips ²	46,410 trips	46,520 trips	47,230 trips
Change in Transit Trips Compared to No-Build	N/A	110 trips	820 trips
Average Transit Travel Time ³	26 minutes	21 minutes	18 minutes
Change in Transit Travel Time Compared to No-Build	N/A	-5 minutes	-8 minutes
Corridor Length (1-way, capital investments) ⁴	N/A	7.06 miles	6.86 miles
Corridor Length (round-trip miles)	10.3 miles	10.3 miles	10.3 miles
Exclusive / Priority Lanes (round-trip miles) ⁵	N/A	0.29 miles	5.99 miles
Percent Exclusive / Priority Lane of New Corridor	N/A	2.8%	58.1%
Transit Vehicles (operating systemwide)	74 buses 15 spare buses 19 BRT vehicles 5 spare BRT vehicles	72 buses 14 spare buses 19 BRT vehicles 5 spare BRT vehicles	72 buses 14 spare buses 23 BRT vehicles 6 spare BRT vehicles

Source: MovingAhead Project Team.

Notes:

- 1 Corridor transit trips are defined as any EmX or bus trip with at least 1 trip end in the corridor, excluding downtown or the University of Oregon. Source: DKS. Draft Transportation Technical Report. 2018.
- 2 Systemwide transit trips are defined as 1-way linked trips taken by a person from the trips origin to the trips destination, independent of the number of vehicles or transfers used to complete the trip. Source: DKS. Draft Transportation Technical Report. 2018.
- 3 Values represent average travel time for A.M. peak hour from Eugene Station to Corridor Terminus (in minutes). Source: LCOG. LCOG Regional Travel Demand Model. 2016.
- 4 This is the mileage of the corridor used to calculate the cost per corridor mile (not construction mile) and is the overall physical length of the corridor which does not correspond to the round-trip distance either bus or EmX service would travel on a corridor. River Road Corridor alternative alignments differ between Eugene Station and intersection of River Road. and Railroad Boulevard, resulting in slightly different lengths.
- 5 Exclusive/priority lanes include round-trip miles of business access and transit lanes, bus-only lanes, and queue jumps.

Capital Cost Estimates

The potential cost of each alternative was estimated based on the concept design (Figure 5-3 and Table 5-6). Right of way (ROW), parking, utility relocations, and other impacts associated with the construction footprint were factored into the cost estimates. Capital cost estimates were based on historic construction bid data from other similar projects, including existing EmX corridors, and include escalation factors to bring costs to 2016 dollars and contingency costs. These planning-level cost estimates conform to FTA’s Standardized Cost Categories for Small Starts capital projects.

The capital cost per mile is calculated in 2 different ways: cost per corridor mile length and cost per construction mile. The cost per corridor mile is based on the total capital cost divided by the round-trip distance either the bus or BRT vehicles would travel on a corridor. The cost per construction mile is based on the total capital cost divided by the total combined length of construction areas for each direction of travel.

No-Build Alternative

No construction is anticipated as part of the MovingAhead project under the No-Build Alternative, therefore, no capital costs are anticipated.

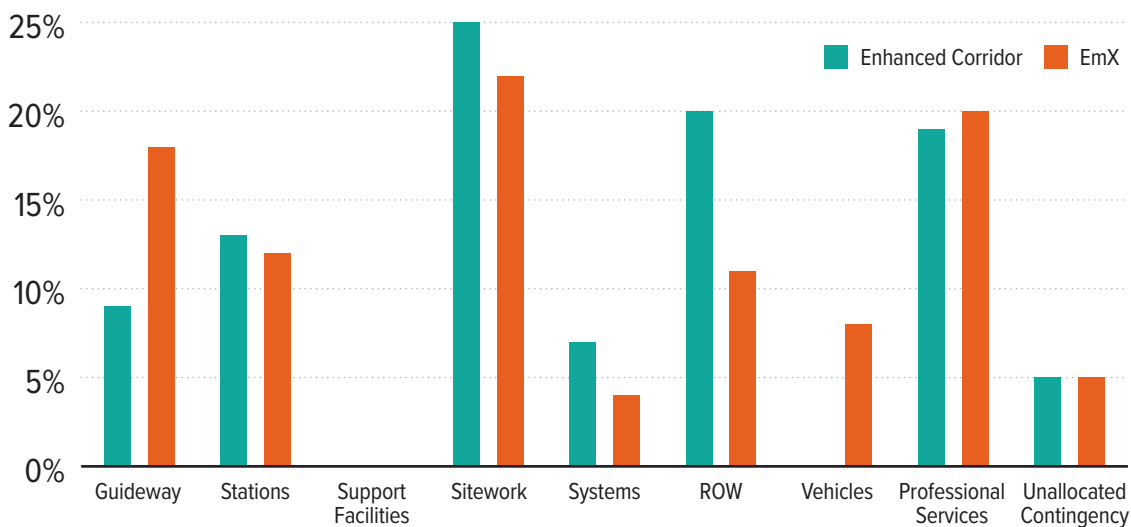
Enhanced Corridor and EmX Alternatives

River Road Enhanced Corridor Alternative capital costs are estimated to be **\$24 million**, approximately **\$4.0 million/construction mile** with 6.0 miles of construction and **\$2.3 million/corridor mile** with 10.3 corridor miles.

The River Road Corridor EmX Alternative capital costs are estimated to be **\$78 million**, approximately **\$12.0 million/construction mile** with 6.5 miles of construction and **\$7.6 million/corridor mile** with 10.3 corridor miles.

A primary contributor to costs for both build alternatives is sitework. The ROW costs for the River Road build alternatives are amongst the highest percentage of overall cost to construct of all of the corridors due to proposed potential full acquisitions near the Randy Papé Beltline.

Figure 5-3: River Road Corridor Capital Cost Investments by Cost Category



Source: MovingAhead Project Team.

Operating and Maintenance Cost Estimates

Operating and maintenance (O&M) costs are an important factor in the selection of a preferred investment package since they represent ongoing costs to be borne by LTD's operating budget.

No-Build Alternative

With 93 peak vehicles (74 buses, 19 BRT vehicles), 278,600 revenue hours, and 4,520,200 revenue miles, systemwide annual O&M costs for the No-Build Alternative total **\$52.8 million**. For more detail on O&M costs refer to Table 5-6.

Enhanced Corridor Alternative

Service level changes for the River Road Corridor Enhanced Corridor Alternative reflect the operational efficiencies gained from capital and service design improvements that allow for more revenue miles per

revenue hour (revenue hours decrease by 0.39% and revenue miles are increased by 0.60% over the systemwide total). This improved cycle time allows the required number of peak vehicles to drop from 93 under the No-Build Alternative to 91 (72 buses, 19 BRT vehicles) under the Enhanced Corridor Alternative. These efficiencies would result in more daily trips serving the corridor for a systemwide annual cost of **\$52.2 million**, about \$0.6 million less than in the No-Build Alternative. For more detail on O&M costs refer to Table 5-6.

EmX Alternative

Revenue hours are modeled to increase by 2.51% and revenue miles would increase by 4.96%, with peak vehicles increasing from 93 under the No-Build Alternative to 95 (72 buses, 23 BRT vehicles) under the EmX Alternative. These changes would lead to systemwide annual O&M costs of **\$54.8 million**, or an increase of \$2.0 million over the No-Build Alternative. For more detail on O&M costs refer to Table 5-6.



Table 5-6: Summary of River Road Corridor Cost Comparison of Alternatives

Corridor Attribute	No-Build	Enhanced Corridor	EmX
CAPITAL COST ESTIMATES (IN MILLIONS)			
Capital Cost ¹	N/A	\$24.0M	\$78.0M
Capital Cost /Corridor Mile	N/A	\$2.3M	\$7.6M
Capital Cost/Construction Mile	N/A	\$4.0M	\$12.0M
Percentage Pedestrian/Bicycle Costs (without contingency costs included)	N/A	11%	5%
OPERATING AND MAINTENANCE COST ESTIMATES			
Annual Systemwide Revenue Hours ²	278,600 hours	277,500 hours	285,600 hours
Annual Systemwide Miles	4,520,200 miles	4,547,400 miles	4,744,400 miles
Peak Transit Vehicles ³	93 vehicles	90 vehicles	95 vehicles
Annual LTD Operating Cost (in millions) ⁴	\$52.8M	\$52.2M	\$54.8M
Increase over No-Build	N/A	-\$.6M	\$2.M
Systemwide Operating Cost per Trip ⁵	\$3.79	\$3.74	\$3.87

Source: MovingAhead Project Team.

Notes:

- 1 Values are in 2016 dollars. Source: CH2M. Draft Capital Cost Estimating Technical Report. 2017.
- 2 Revenue service refers to all scheduled time a transit vehicle spends serving passengers. In this case, revenue service is confined to in-service time (excluding layovers, which are included in "Revenue Service" figure reported to the National Transit Database(NTD)) in order to relate to modelling outputs for the alternatives which are in-service forecasts from the LCOG Regional Travel Demand Model (2016).
- 3 Peak Transit Vehicles are the number of buses and BRT vehicles in operation to meet maximum demand.
- 4 Cost forecasts are the product of a fully allocated cost model in 2016 dollars. In general, transportation costs are allocated on a per revenue hour basis, fleet maintenance costs are allocated per revenue mile, and all other administrative and support costs are allocated per peak vehicle. Source: LTD. Draft Operating and Maintenance Costs Technical Report. 2017.
- 5 Cost/Trip are total operating costs divided by annualized systemwide average weekday trips. Passenger annualization of 300 is calculated from LTD 2016 ridership data and is used to translate average weekday to annual trips.

Environmental Consequences and Mitigation

Chapter 3 of this AA provides background information about the environmental topics evaluated for each alternative. Reading Chapter 3 is recommended before reading the summary of environmental consequences and mitigation for the River Road Corridor.

In this section, potential benefits and impacts of each alternative are discussed by environmental topic. Where there are no distinguishable differences in impacts between alternatives, the summary is combined. Impacts that are similar across all corridors and alternatives are described in Chapter 3. Cumulative impacts are discussed only for those resources where the MovingAhead project has the potential to make a substantive contribution to cumulative impacts.

Potential environmental impacts and benefits of each alternative are summarized in Appendix C and detailed throughout this chapter by environmental discipline.

Acquisitions and Displacements

The majority of the River Road Corridor, outside of downtown Eugene and north of the Northwest Expressway, consists primarily of commercial, and single-family residential, interspersed with apartments and townhomes.

No-Build Alternative

No acquisitions or displacements are anticipated under the No-Build Alternative since no construction would take place as part of the MovingAhead project under this alternative.

Enhanced Corridor and EmX Alternatives

Based upon the current design, both alternatives would require acquisitions of small strips of land along roadway frontages (partial acquisitions), as well as acquisition of full properties (full acquisitions) to accommodate the proposed transit improvements (Table 5-7). The Enhanced Corridor Alternative would require 3 partial and 2 full property acquisitions from commercial and industrial parcels, comprising an estimated 1.3 acres. The EmX Alternative would require 37 partial and 3 full property acquisitions from commercial and industrial, public and institutional, and residential parcels, comprising an estimated 2.2 acres. Both River Road Corridor build alternatives have the potential to displace businesses. With mitigation some business properties would avoid displacement under the River Road build alternatives. After property impacts were revealed during the analysis, additional evaluation was conducted to determine other ways to avoid or minimize impacts at some properties; this effort is documented in the Addendum to the MovingAhead Alternatives Analysis Technical Reports Memorandum (CH2M 2017). As the design of the build alternatives progresses, design refinements to minimize impacts to private properties would be incorporated.

Property acquisition would impact off-street parking for 1 parcel under the Enhanced Corridor Alternative and for 7 parcels under the EmX Alternative. In addition, drive-through circulation would be impacted at 4 commercial properties under the Enhanced Corridor Alternative and 6 commercial properties under the EmX Alternative. These impacts would potentially result in the full acquisition of 2 commercial properties and displacement of up to 4 businesses under the Enhanced Corridor Alternative and 3 full acquisitions and 6 business displacements under the EmX Alternative.

Table 5-7: River Road Corridor Property Acquisition Impacts

		Enhanced Corridor	EmX
Partial Acquisitions	Commercial & Industrial	3	22
	Public & Institutional	0	1
	Residential	0	12
	Vacant Land	0	2
Full Acquisitions	Commercial & Industrial	2	3
Total Parcels Affected		5	40
Total Area of Acquisitions		1.3 acres	2.2 acres
Displacements		4 businesses	6 businesses
Parcels with Potential Parking and Access Impacts	Parking Impacts	1	7
	Driveway Closures	0	6
	Business access impacts: right-in or right-out turning movements	0	0
	Drive-Through Closures ^a	4	6

Source: CH2M. Draft Acquisitions and Displacements Technical Report. 2017.

Note:

a Drive-through impacts may potentially lead to full acquisitions if impacts are unable to be mitigated through design alterations.

Air Quality

The Eugene-Springfield region completed the federally required 20-year maintenance period in 2014 for carbon monoxide with no exceedances. As a result, no regional carbon monoxide hot spot air modeling or local air quality impacts analysis is required for transportation projects in the region. However, for informational purposes, a regional burden analysis was conducted for the MovingAhead project.

The focus of the air quality analysis was to evaluate the differences between the regional and subarea pollutant emissions generated under build alternatives versus emissions generated under the No-Build Alternative. This comparison shows the broad effects of the proposed alternatives.

No-Build Alternative

Under the future No-Build Alternative conditions, air quality in the Eugene-Springfield region is expected to continue to improve. Despite increases in VMT, air quality has continued to improve because of the improvements in vehicle technology and fuel types.

Enhanced Corridor and EmX Alternatives

When compared to the No-Build Alternative, the percent change in the overall level of pollutants is negligible,

with percentage changes all less than 1% for impacts (positive numbers) and improvements (negative numbers) (Table 5-8). The results of the Federal Transit Administration (FTA)-compliant air quality burden analysis show that the build alternatives received Medium to Low-Medium ratings. Medium rated projects are predicted to have a negligible effect on air quality. Projects with ratings of Low-Medium and Low are predicted to have slight improvements in air quality. (Table 5-8).

Temporary air quality impacts associated with the construction of each build alternative are expected, and those impacts are predicted to be approximately the same regardless of the alternative selected. During construction, carbon monoxide and particulate matter are expected to increase due to heavy construction vehicles, lowered traffic speeds, earth excavation, and occasionally open burning.

Construction contractors are required to comply with state regulations which address visible emissions and nuisance requirements. Violations of the regulations can result in enforcement actions and fines. The regulations provide a list of reasonable precautions to be taken to avoid dust emissions. These control measures would be documented in the pollution control plan that the contractor is required to submit prior to construction.

Table 5-8: River Road Corridor Percent Change in Air Quality from 2035 No-Build Alternative

Primary Pollutants	Enhanced Corridor	EmX
Carbon monoxide (CO)	-0.01%	-0.2%
Nitrous oxide (NOx)	-0.01%	0.02%
Volatile organic compounds (VOC)	-0.01%	-0.1%
Particulate Matter – 2.5 microns in diameter (PM _{2.5})	-0.01%	0.01%
Rating	Low-Medium	Medium / Low-Medium

Source: Michael Minor and Associates. Draft Air Quality Technical Report. 2017.

Community, Neighborhoods, and Environmental Justice

The River Road Corridor Enhanced Corridor Alternative goes through or touches 5 neighborhoods: the Downtown, Whiteaker, Trainsong, River Road and Santa Clara neighborhoods (Figure 5-4). The Enhanced Corridor Alternative study area includes 2 additional neighborhoods: Jefferson Westside and West Eugene.

The EmX Alternative travels through or touches the same neighborhoods as the Enhanced Corridor Alternative plus 2 additional neighborhoods: West University and Far West. Neighborhood associations that fall within the study area of both build alternatives but are located on the east side of the Willamette River were excluded from the analysis because the river prevents access to those neighborhoods from the River Road Corridor.

Several social service organizations within the study area offer services to minority and low-income populations, including organizations that provide affordable housing and food. Within 0.25 mile of the Enhanced Corridor Alternative, there are 71 community and public facilities, including 1 affordable housing facility (West Town), 1 food bank (Food for Lane County), and 3 shelters. Within 0.5 mile of the EmX Alternative, there are 114 community and public facilities, including 2 affordable housing facilities (West Town and Firwood Apartments), 3 shelter facilities, and 1 food bank (Food for Lane County).

The study area includes major employment centers, tourist attractions, retail businesses, and colleges that generate trips to and from the area. Government services (for example, public schools) and medical industries are the top employers. Many large employers in the region are within 0.5 mile of the corridor. Total employment in Lane County is projected to increase by about 10% in the 10 year period from 2014 to 2024, with the greatest increase (about 16%) expected in education and health services, which are top employers in the River Road Corridor.

No-Build Alternative

No construction is planned as part of the MovingAhead project under the No-Build Alternative, so this alternative would not result in negative impacts on neighborhoods,

community facilities, or public services, nor would there be any disproportionately adverse impacts to minority and/or low-income populations. The No-Build Alternative would also not likely result in any economic benefits associated with development in the area around stops or EmX stations. The No-Build Alternative would not improve transportation safety that could reduce the number of potential conflicts among people walking, biking, and driving to the same degree as the investments under the build alternatives.

Enhanced Corridor and EmX Alternatives

Potential effects of the build alternatives include:

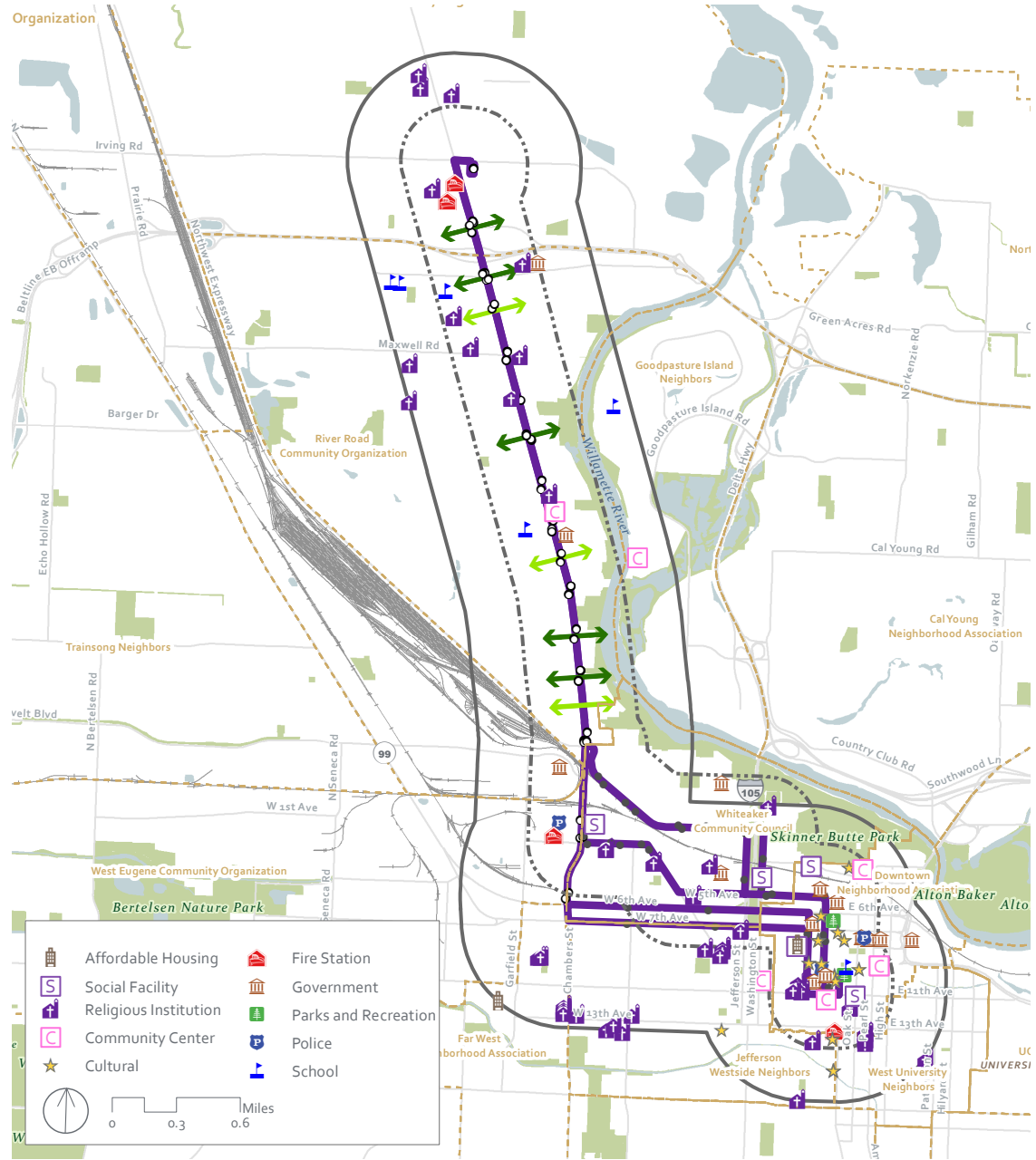
- **Neighborhoods.** Neither build alternative would adversely impact community character within the River Road Corridor. A total of 1.3 acres of land would potentially be acquired from 5 parcels under the Enhanced Corridor Alternative, and a total of 2.2 acres from 40 parcels for the EmX Alternative. There would be potential displacement of 4 businesses under the Enhanced Corridor Alternative and 6 businesses under the EmX Alternative. Mitigation may be possible at some locations to further avoid or minimize impacts at some properties. These mitigations are outlined in Addendum to MovingAhead Alternatives Analysis Technical Reports Memorandum (CH2M 2017).

Up to 13 medium and large street trees would be removed under the Enhanced Corridor Alternative and up to 118 medium and large street trees would be removed under the EmX Alternative. Tree removal would be mitigated through replanting.

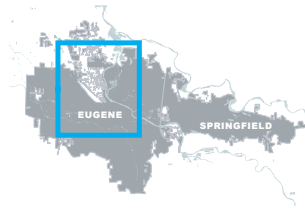
Safety for people walking, using mobility devices, and biking in the corridor would be improved with 6 new enhanced pedestrian crossings, 1 replaced enhanced pedestrian crossing, and improved sidewalks under the Enhanced Corridor Alternative, and 4 new enhanced crossings, 1 replaced enhanced pedestrian crossing, and improved sidewalks under the EmX Alternative.

No noise impacts are expected under the Enhanced Corridor Alternative. Potential noise impacts might occur to 2 single-family properties under the EmX Alternative; it is expected that all noise impacts can be mitigated.

Figure 5-4: River Road Corridor Community Resources



Locator Map



Legend

- River Road
- EmX API
- Enhanced Corridor API
- Neighborhood
- New Pedestrian Crossing
- Enhanced Existing Pedestrian Crossing
- Existing Without Improvements
- Proposed or Existing with Improvements

Community Resources River Road Corridor

Note: Both EmX and Enhanced Corridor Alternatives Shown



Document Path: C:\Users\KH033771\Projects\MovingAhead\GIS\MapFiles\Social_Facilities\Level2_Corridor_EnviroAnalysis_Social\Level2_CorridorExtent_CommFacRR_ECandEmX.mxd

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Source: CH2M. Draft Community, Neighborhood, and Environmental Justice Technical Report. 2017.

- **Transportation and Accessibility.** Both build alternatives would increase transit accessibility and reliability for residents within the neighborhoods near the corridor and increase accessibility for persons going to and from the Veterans Administration Clinic. The presence of 28 new or enhanced stops (of 59 total stops) under the Enhanced Corridor Alternative or 20 new EmX stations (of 27 total stations) under the EmX Alternative would not change the overall visual setting of any neighborhoods because the alternatives are located on main arterials within an urban setting that already includes bus service. Both alternatives would increase connectivity to other transit connections in the downtown area including the West Eugene and Franklin EmX service. The improved reliability of transit service under both alternatives and reduced headways under both alternatives could attract additional riders.
- **Community Facilities and Public Services.** Minor property acquisition and a small temporary construction easement would be required from West Bank Park under the EmX Alternative, and a small temporary construction easement from River Road Annex Community Center could be required under the Enhanced Corridor Alternative. Design refinement could further avoid or reduce impacts to these facilities. Transit users would benefit from improved accessibility to these community facilities and others (such as the Veterans Administration Clinic). No conflicts with emergency services are anticipated.
- **Economics.** The loss in property tax revenues to the City resulting from acquisition of privately owned land would be negligible under both build alternatives. The Enhanced Corridor Alternative would result in the removal of 2 off-street parking stalls at 1 property, while the EmX Alternative would result in removal of 31 off-street parking stalls at 7 properties. There may be drive-through impacts at up to 4 commercial properties resulting in potential displacement of 4 businesses under the Enhanced Corridor Alternative, and at up to 6 properties resulting in potential displacement of 6 businesses under the Enhanced Corridor Alternative. After property impacts were revealed during the analysis, additional evaluation was conducted to determine other ways to avoid or minimize impacts at some properties; this effort is

documented in the Addendum to the MovingAhead Alternatives Analysis Technical Reports Memorandum (CH2M 2017).

Construction of either build alternative would result in an increase in construction-related jobs and expenditures in the corridor and community with more jobs generated and greater expenditures anticipated under the EmX Alternative. Both build alternatives would improve accessibility to employment locations along the River Road Corridor and in the downtown business district. The permanent infrastructure and increased transit frequency of the EmX Alternative would offer a greater improvement in transit reliability, which would lead to increased business exposure, and over time could support and foster accelerated rates of transit-oriented development (TOD) implementation in areas planned and designated for mixed-use and multi-family residential development to a greater degree than under the Enhanced Corridor Alternative.

- **Environmental Justice.** All of the identified adverse impacts under either build alternative can be mitigated or minimized to a low severity. None of the impacts to environmental justice populations would be greater in magnitude than impacts that would be experienced by non-minority and non-low-income populations within the study area. Because the build alternatives would result in primarily beneficial effects, and no adverse impacts are anticipated after mitigation, no disproportionate high and adverse impacts on minority and low-income populations are anticipated.

Impacts during construction would be similar for the Enhanced Corridor and EmX Alternatives, involving noise and dust from construction equipment. Impacts would be greater with the EmX Alternative than with the Enhanced Corridor Alternative because of the larger construction footprint related to EmX stations and longer linear construction. The construction impacts would be short-term in nature and would typically end once construction is completed.

The EmX Alternative would not result in long-term negative changes in neighborhood quality, cause barriers to social interaction, or adversely affect community facilities because the build alternatives

would be located primarily within the existing roadway ROW, (including enhanced access to community facilities and parks), and would improve pedestrian and bicycle facilities. In addition, the build alternatives would increase connectivity to other transit connections in the downtown area.

Cultural Resources

Archaeological (Below Ground) Resources

No archaeological sites are currently recorded within the area of potential effect (APE). Thirty previous investigations have been conducted within 1 mile of the APE, 4 of which crossed into the APE. Three archaeological sites have been recorded within the broader 1-mile study area.

A pedestrian archaeological survey of the River Road Corridor was conducted in September 2016. The surface survey inspected the proposed construction areas of the build alternatives. No prehistoric or demonstrably historical artifacts, features, or sites were observed during this surface survey. River Road has been a well-used transportation route for over 150 years and the immediate River Road area has been subject to continual population growth and residential development since the 1920s, with suburban residential and commercial development increasing substantially in the 1950s. With this continual development, River Road itself has been resurfaced and widened several times, adjoining sidewalks and driveways have been built and revised, and the underlying buried utility infrastructure has been installed and augmented. This ongoing development of the streets has very likely displaced and disturbed most, if not all, of the ground along the River Road Corridor. The potential for intact archaeological materials, surface or buried, in the River Road Corridor is low.

Historic (Above Ground) Resources

River Road follows the historic western path of the 1846 Applegate Trail, used by early settlers to enter the Willamette Valley from the south. From that time until well into the 20th century, the River Road area was agricultural in nature. River Road served as the Pacific Highway until 1936. Neighborhoods were platted to

accommodate the growing population, and the early agricultural character slowly shifted to that of suburbia, although remnants of the region's agrarian history can still be seen in scattered orchard remnants, outbuildings, and open spaces.

A historic records review and windshield survey of the corridor was conducted in September 2016. Seventy-five resources that are eligible for listing on the National Register of Historic Places (NRHP) were identified in the River Road Corridor APE, although none are formally listed on the NRHP. These resources would be protected under Section 106. Four of the eligible historic properties along this corridor are listed as City Landmarks by the City. These City Landmarks are all single-family residences, located at 370, 390, 405, and 1410 River Road.

No-Build Alternative

No impacts to historic or archaeological resources are anticipated because no construction would occur as part of the MovingAhead project under the No-Build Alternative.

Enhanced Corridor and EmX Alternatives

No impacts to archaeological resources are anticipated under either of the build alternatives because there are no identified resources in the APE and the likelihood of encountering any is low. Although no impacts to archaeological or cultural resources are anticipated, an Inadvertent Discovery Plan should be in place prior to construction. It would outline measures to be undertaken in the event of an unanticipated archaeological discovery.

Four historic resources are anticipated to be affected by direct, long-term impacts, including strip takes (partial property acquisitions), access changes, and construction of shelters/stations and planting strips, under the Enhanced Corridor Alternative as listed in Table 5-9; 12 resources would be directly affected by the EmX Alternative. Additional resources are anticipated to experience indirect impacts, including strip takes, access changes, and construction of shelters/stations that affect the integrity of the property's location, setting, feeling, or association, under the build alternatives (Table 5-9). Aside from the direct and indirect impacts identified, it

Table 5-9: Impacts to Identified Historic Resources Along the River Road Corridor

Historic Resource Address	Preliminary Eligibility Evaluation	Enhanced Corridor		EmX	
		Long-term Direct Impacts	Indirect/Cumulative Impacts	Long-term Direct Impacts	Indirect/Cumulative Impacts
285 River Road	Contributing		Enhanced Shelter		EmX Station
470 River Road	Contributing		Enhanced Shelter	EmX Station Strip Take	
480 River Road	Contributing	Enhanced Shelter Planting Strip		EmX Station Strip Take	
485 River Road	Contributing		Enhanced Shelter		EmX Station
65 Hansen Lane	Contributing		Enhanced Shelter		EmX Station
100 Hansen Lane	Contributing		Enhanced Shelter	EmX Station Strip Take	
501/505 River Road	Contributing				EmX Station
610 River Road	Contributing		Enhanced Shelter		
22 Park Avenue	Contributing	Enhanced Shelter Planting Strip		EmX Station Strip Take	
805 River Road	Contributing		Enhanced Shelter Access Affected		
901 River Road	Contributing	Strip Take	Enhanced Shelter		
930 River Road	Contributing		Enhanced Shelter		
931 River Road	Contributing		Enhanced Shelter		
940 River Road	Contributing		Enhanced Shelter		
1015 River Road	Contributing		Enhanced Shelter		EmX Station
1020 River Road	Contributing		Enhanced Shelter Access Affected	EmX Station	
1030 River Road	Contributing		Enhanced Shelter	EmX Station Access Affected	

Table 5-9: Impacts to Identified Historic Resources Along the River Road Corridor (cont'd)

Historic Resource Address	Preliminary Eligibility Evaluation	Enhanced Corridor		EmX	
		Long-term Direct Impacts	Indirect/Cumulative Impacts	Long-term Direct Impacts	Indirect/Cumulative Impacts
49 Arbor Drive	Contributing		Enhanced Shelter		
1298 River Road	Contributing		Enhanced Shelter		EmX Station
1318 River Road	Contributing	Enhanced Shelter	Enhanced Shelter	Strip Take Access Affected	EmX Station
1350 River Road	Contributing		Enhanced Shelter	Strip Take Access Affected	
1353 River Road	Contributing				EmX Station
1580 River Road	Contributing		Enhanced Shelter		
1707 River Road	Contributing		Enhanced Shelter	EmX Station Strip Take	
1920 River Road	Contributing		Enhanced Shelter		
1925 River Road	Contributing		Enhanced Shelter	Strip Take	
1950 River Road	Contributing				

Source: Heritage Research Associates. Draft Cultural Resources Technical Report. 2017.

Notes:

- 1 Table does not include downtown, 6th, 7th, 11th, or 13th Avenue segments addressed in previous LTD studies and for which no changes are proposed. Table does not include historic resources that would not be impacted by either build alternative.
- 2 Strip takes are partial acquisitions of a property in which a small strip of land along the roadway frontage is acquired for transit investments.

is assumed that there would be no additional short-term impacts (noise, air, access, etc.) to historic resources associated with construction because construction duration would be very short (ideally less than 2 weeks) in any given location.

Ecosystems

The River Road Corridor is located within a highly urbanized area consisting of residential, commercial and industrial development. The highly developed areas do not possess substantial habitat features and generally lack sensitive ecosystem features. Existing habitat conditions are conducive to plant and wildlife species that are commonly found in urban areas. Street and landscape trees along the corridor provide limited habitat for urban avian species. Areas that are not currently developed with hard structures or pavement are either landscaped or consist of small fields that are vegetated with weedy plant species.

There are no waterways located within the study area. The River Road Corridor is located a minimum of 0.12 mile from the Willamette River and 0.26 mile from the Amazon Creek. The nearest construction areas are located 0.12 mile from the Willamette River and 0.60 mile from the Amazon Creek.

There are no wetlands mapped within or adjacent to the River Road Corridor. Prior to construction, detailed onsite wetland determination and delineation work would occur. It is possible that additional wetland areas may be identified at that time.

There is no designated critical habitat within the study area. The nearest critical habitat is for Chinook salmon located at the Willamette River at least 0.12 mile from construction limits. The minimum distance from the corridor to designated critical habitat for Willamette daisy is approximately 1.8 miles. No other designated critical habitat is located in the project vicinity.

A list of protected federal and state listed species documented as occurring in the project vicinity is presented in Chapter 3. None of these species are known to occur within the study area.

No-Build Alternative

The No-Build Alternative would not involve any construction activities associated with the MovingAhead project 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 species listed under the Endangered Species Act or designated critical habitat. The No-Build Alternative would not result in any long-term direct impacts to wetlands or waterways.

Enhanced Corridor and EmX Alternatives

Trees

Based on the assessment of potential impacts to street and landscape trees, up to 13 medium and large street trees outside of the Charter Tree Boundary would be removed under the Enhanced Corridor Alternative; under the EmX Alternative, 14 street trees within the Charter Tree boundary and up to 118 street trees outside of the boundary would be removed, slightly reducing available habitat for avian species in the corridor under both alternatives (Table 5-10). Any tree removal would occur in accordance with local regulations and would be mitigated through replacement. Mitigation would offset any long-term direct impacts.

Fish

Both build alternatives would result in construction of new, reconstructed and adjoining impervious surface. Stormwater runoff from new impervious surfaces could reach fish bearing waterways. Under the Enhanced Corridor Alternative there would be approximately 109,600 square feet (SF) of impervious surface, of which approximately 81,200 SF would drain to Spring Creek and the remaining 28,400 SF would drain to the Willamette River. The EmX Alternative would result in greater impervious surface with approximately 748,900 SF of impervious surface, of which approximately 188,300 SF would drain to Spring Creek, 557,600 SF would drain to the Willamette River. Additionally, 1,100 SF or 2,900 SF of reconstructed, non pollutant generating impervious area would drain to Amazon Creek under the Enhanced Corridor or EmX Alternatives, respectively.

Runoff from new impervious surfaces draining to Spring Creek would travel over 6 miles before reaching the Willamette River where listed fish species and designated critical habitat are located. Runoff from the increase in impervious surface would be required to meet Oregon Department of Transportation (ODOT)'s or the City's stormwater design standards, depending on the roadway jurisdiction, as well as Oregon Department of Environmental Quality (DEQ) standards. Stormwater treatment would remove pollutants, minimize erosion, and control the flow so that the build alternatives would not significantly impact threatened fish species or designated critical habitat.

Potential cumulative stormwater effects to Spring Creek and designated critical habitat in the Willamette River would be mitigated by meeting ODOT, City, and DEQ stormwater design standards.

Construction activities would result in short-term changes to water quality that could affect fish species and their habitat, such as the potential for sediment transport to waterways. Because erosion prevention and sediment control measures would be implemented, none of these effects would be significant.

Wetlands

The River Road Corridor is not located close to documented wetlands. Further, construction is not proposed near mapped wetlands under either build alternative, so no long-term direct impacts to mapped wetlands, including wetland functions and quality, are anticipated. Construction of either build alternative would not cause any changes to the hydrology of mapped wetlands or encroach on any wetland buffers or conservation setbacks.

Similarly, since construction is not proposed near documented wetlands, there would be no short-term construction-related degradation of wetland quality or adverse changes in wetland functions.

Critical Habitat

The build alternatives would not result in the destruction or adverse modification of critical habitat, suitable habitat, nor would they result in a "take" of federal or state listed species.

Since there is no designated critical habitat or listed species documented within the study area, no indirect or cumulative effects or short-term construction-related impacts to designated terrestrial critical habitat or listed species are anticipated under either build alternative.

Table 5-10: River Road Corridor Ecosystem Impacts

	Enhanced Corridor	EmX
Trees	<ul style="list-style-type: none"> Removal of up to 13 medium and large trees Slight reduction in avian habitat 	<ul style="list-style-type: none"> Removal of up to 132 medium and large trees Slight reduction in avian habitat
Fish	<ul style="list-style-type: none"> Construction of 109,600 SF of impervious surface Increase in stormwater runoff 	<ul style="list-style-type: none"> Construction of 748,900 SF of impervious surface Increase in stormwater runoff
Wetlands	No impact	No impact
Critical Habitat	<ul style="list-style-type: none"> No adverse impact No "take" of federal or state-listed species 	<ul style="list-style-type: none"> No adverse impact No "take" of federal or state-listed species

Source: Environmental Science & Assessment, LLC. Draft Ecosystems Technical Report. 2017.

Energy, Sustainability and Greenhouse Gas

Along the River Road Corridor, energy is consumed primarily for residential, commercial, and transportation purposes. Transportation energy for motor vehicles is primarily provided by direct combustion of petroleum fuels, with lesser contributions from compressed natural gas and electricity. Given the continued gains in technology for increasing energy efficiency, energy consumption is not expected to be a factor for determining the preferred mode alternatives.

No-Build Alternative

Under the No-Build Alternative VMT, congestion, and energy use are expected to increase. Energy consumption and greenhouse gas (GHG) emissions are expected to be higher at congested intersections. There is limited potential for sufficient mode shifts from motor vehicles to transit to improve energy use and sustainability. The No-Build Alternative is inconsistent with applicable goals and policies related to GHG reductions and sustainability.

This alternative would not involve any construction activities associated with this project and, therefore, would not require any energy for construction activities.

Enhanced Corridor and EmX Alternatives

The long-term direct impacts of the proposed build alternatives include negligible changes to direct energy consumption as shown in Table 5-11. The EmX Alternative would use slightly more energy than the No-Build Alternative in 2035, while the Enhanced Corridor Alternative would result in slightly less energy use than the No-Build and EmX Alternatives.

The Enhanced Corridor and EmX Alternatives would be in compliance with both the City's and LTD's sustainability policies.

All required mitigation measures related to energy and GHG emissions, such as preserving or replanting trees and minimizing traffic obstructions, would be specified in LTD's construction contracting documents.

Overall, future energy use does not differentiate the 3 alternatives on direct and indirect energy consumption. The changes in regionwide energy consumption are negligible for the alternatives due to continued increases in fuel efficiency over the next 20 years. Given the continued gains in technology for increasing energy efficiency, energy consumption is not expected to be a factor for determining the preferred mode alternative. The impacts of the build alternatives are not large enough to warrant additional mitigation measures.

Table 5-11: River Road Corridor Percent Change in 2035 Regionwide Energy Impacts (Btu) from the No-Build Alternative

Energy Type	Enhanced Corridor	EmX
Direct Energy ^a	-0.007%	0.023%
CO2e Equivalent Energy ^b	-0.006%	0.031%
Maintenance Energy ^c	-0.003%	0.070%
Total	-0.006%	0.031%

Source: DKS. Draft Energy and Sustainability Technical Report. 2017.

Notes:

- a Direct energy represents energy consumed for operation of transit service.
- b CO2e equivalent energy represents greenhouse gas emissions generated by operation of transit service.
- c Maintenance energy represents energy consumed indirectly for the products and operations necessary to keep the transit system operable.

Geology and Seismic

A review of geologic conditions in the River Road Corridor shows that there are no mapped active faults or fault zones close to the corridor, the area is too high to be subject to tsunami inundation, and volcanic activity is not considered a significant concern. There is a remote potential that a seismic event could lead to failure of upstream dams near to the Willamette River, causing uncontrolled release of water, raising water levels in the Willamette River, and causing inundation to portions of the River Road Corridor in lower-lying areas and near stream crossings.

No-Build Alternative

The main geologic hazards that could potentially affect operation and maintenance of the No-Build Alternative include erosion, landslides, ground motion, and liquefaction, as described in Table 5-12.

Enhanced Corridor and EmX Alternatives

Long-term impacts for the build alternatives would be related to geologic and seismic hazards that already exist; these hazards are the same as for the No-Build except for the segments of the River Road Corridor where the alignment of the build alternatives differ (Table 5-12).

Table 5-12: River Road Corridor Existing Geologic Hazards

Hazard	No-Build	Enhanced Corridor	EmX
Erosion	<ul style="list-style-type: none"> • Low wind erosion susceptibility • Low water erosion susceptibility 		
Problematic Soil Properties	No high shrink-swell and hydric soils mapped in the corridor		
Landslides	Moderate (landsliding possible) to high (landsliding likely) <ul style="list-style-type: none"> • Chambers Street between W. 2nd Avenue and Northwest Expressway • River Road at the Randy Papé Beltline Highway interchange 	Moderate (landsliding possible) to high (landsliding likely) <ul style="list-style-type: none"> • Chambers Street between W. 2nd Avenue and the Northwest Expressway • River Road at the Randy Papé Beltline Highway interchange • Jefferson Street and Washington Street, between W. 5th Avenue and W. 1st Avenue 	Moderate (landsliding possible) to high (landsliding likely) <ul style="list-style-type: none"> • Chambers Street between W. 2nd Avenue and the Northwest Expressway • River Road at the Randy Papé Beltline Highway interchange
Ground Motion	Strong to very strong ground-shaking zone		
Liquefaction	Moderate liquefaction hazard zone: <ul style="list-style-type: none"> • From Irving Road to the Roosevelt Boulevard and Chambers Street intersection • From the W. 6th Avenue and Adams Street intersection to Eugene Station • From the W. 7th Avenue and Blair Boulevard intersection to Eugene Station 	Moderate liquefaction hazard zone: <ul style="list-style-type: none"> • From Irving Road to the Roosevelt Boulevard and Chambers Street intersection • From the W. 5th Avenue and Adams Street intersection to Eugene Station • From the W. 1st Avenue and Jefferson Street intersection to Eugene Station 	Moderate liquefaction hazard zone: <ul style="list-style-type: none"> • Chambers Street between W. 2nd Avenue and Northwest Expressway • River Road at Randy Papé Beltline Highway interchange • Jefferson Street and Washington Street, between W. 5th Avenue and W. 1st Avenue

Source: CH2M. Draft Geology and Seismic Technical Report. 2017.

Hazardous Materials

Land uses along the River Road Corridor are primarily commercial and residential. The use and storage of hazardous materials for these types of land uses is typically not high. There are 0 high-risk and 101 medium-risk hazardous materials sites recorded within the study area of the Enhanced Corridor Alternative and 1 high-risk and 106 medium-risk hazardous materials sites within the study area of the EmX Alternative.

No-Build Alternative

No project-related construction activities would occur under the No-Build Alternative, so there would be no impacts to hazardous materials because there would be no handling of or exposure to existing contaminants, and no existing contaminants would be remediated.

Enhanced Corridor and EmX Alternatives

None of the recorded high and medium-risk hazardous materials sites would be affected by construction of the Enhanced Corridor Alternative, so there would be no impacts to hazardous materials under this alternative, and no existing sites would be remediated as part of the project (Table 5-13).

Construction activities under the EmX Alternative could potentially require ground disturbance at 1 high-risk site, leading to potential exposure to hazardous materials. The acquired portions of this site would be remediated, resulting in a long-term benefit to the community.

Table 5-13: River Road Corridor Number of Hazardous Sites on Potentially Impacted Tax Lots

Hazardous Sites on Potentially Impacted Tax Lots	No-Build	Enhanced Corridor	EmX
High Risk	0	0	1
Medium Risk	0	0	0

Source: CH2M. Draft Hazardous Materials Technical Report. 2017.

Land Use and Prime Farmland

Land use on the River Road Corridor, outside of downtown Eugene and north of the Northwest Expressway, consists primarily of commercial, single-family residential, and service uses, interspersed with apartments and townhomes.

No-Build Alternative

No property would be acquired under the No-Build Alternative, and no temporary construction easements would be needed since no construction activities would occur as part of the MovingAhead project.

The No-Build Alternative would not result in direct impacts to prime farmlands, or agricultural or forest uses subject to Oregon Statewide Planning Goals 3 (Agricultural Lands) or 4 (Forest Lands).

The No-Build Alternative would be inconsistent with many local, regional, and state land use and transportation policies in the Eugene 2035 TSP, the Metro Plan, TransPlan, and Envision Eugene because it would not institute a BRT system connecting the region's highest growth centers and it would not encourage increased density and TOD along Key Transit Corridors.

Enhanced Corridor and EmX Alternatives

Overall, direct impacts to land use would be limited because the proposed investments of the build alternatives would be located primarily within existing transportation ROWs and the total area that would be converted from existing land uses to a transportation use is minor compared to the total land available in the City.

Under the Enhanced Corridor Alternative, 3 partial acquisitions and 2 full acquisitions, totaling 1.3 acres, would be required to facilitate roadway widening and enhanced multimodal investments. Under the EmX Alternative, 37 partial acquisitions and 3 full acquisitions, totaling 2.2 acres would be required, more total acreage than under the Enhanced Corridor Alternative because dedicated transit lanes and EmX stations would require greater roadway widths. Most of the land that would be acquired and converted to a transportation use under both build alternatives is zoned Mixed-Use (Table 5-14).

The presence of EmX would support more development, decrease the need for automobile parking, and support a wider mix of uses as compared to the No-Build and Enhanced Corridor Alternatives.

Neither of the build alternatives would result in direct impacts to prime farmlands, or agricultural or forest uses subject to Oregon Statewide Planning Goals 3 (Agricultural Lands) or 4 (Forest Lands). No direct impacts to prime farmland subject to the Farmland Protection Policy Act (FPPA) would occur under either of the build alternatives.

Operation of the build alternatives also has the potential to contribute to beneficial indirect impacts as a result of TOD. Lands that may be supportive of TOD development are identified in Table 5-15. Greater areas of Mixed-Use and Multi-Family Residential zoning contribute to a greater likelihood that TOD would occur within an area of potential impact. Any new development or redevelopment would need to be consistent with existing zoning and to comply with any requirements associated with overlays.

Construction of the build alternatives would require temporary construction easements beyond the property acquisition needed to construct the alternatives, which could result in additional impacts to properties located along the corridor. These easements would be temporary and the areas affected would be returned to preconstruction conditions upon completion of construction. Additional information about compensation for property acquisition and temporary easements is addressed in the Draft Acquisitions and Displacements Technical Report (CH2M 2017).

Generally, the Enhanced Corridor Alternative would be consistent with the goals and policies on improving multimodal transportation contained in the Metro Plan, Regional Transportation Plan (RTP), TransPlan, Envision Eugene, and the Eugene 2035 TSP. This alternative would not be fully consistent with the RTP (Transportation System Improvement [TSI] Transit Policy #2) and the Metro Plan (Policy F.19) because the Enhanced Corridor Alternative would not implement a BRT system. However, the Enhanced Corridor Alternative would implement lower capital-cost transit investments consistent with the intent of these goals and policies

Table 5-14: River Road Corridor Potential Permanent Conversion of Land to Transportation-Related Use

Land Use Zoning	Enhanced Corridor (ac)	EmX (ac)
Commercial	0	0
Industrial	0	0
Office	0	< 0.1
Institution	0	< 0.1
Single-Family Residential	< 0.1	< 0.1
Multi-Family Residential ^a	0	< 0.1
Agriculture / Forest / Natural Resources	0	0
Mixed-Use ^a	1.2	2.2
Special Area Zone (Non-Mixed Use)	0	0
Total Potential Permanent Conversion^b	1.3	2.2
Total Acres TOD Supportive Lands^a	1.2	2.2

Source: CH2M. Draft Land Use and Prime Farmland Technical Report. 2017.

Notes: Potential impacts are based on current conceptual designs. Design refinements could change the total amount converted and the zoning category.

a Lands zoned Mixed-Use and Multi-Family Residential would likely be supported to a greater degree by transportation investments proposed under the build alternatives and have been aggregated together as “TOD Supportive Lands”

b Total may be greater or less than the sum of the parts due to rounding.

and would not preclude the implementation of an EmX Alternative in the future.

The EmX Alternative would be consistent with all existing local, regional, and state land use and transportation policies of the Metro Plan, TransPlan, RTP, the Eugene 2035 TSP, and Envision Eugene because it would institute a BRT system connecting the region’s highest growth centers. Both build alternatives would serve the River Road Key Transit Corridor identified in Envision Eugene.

Table 5-15: River Road Corridor Transit Supportive Lands

Zoning Type	Enhanced Corridor	EmX
Mixed-Use	421 acres	978 acres
Vacant ^a	37 acres	59 acres
Multi-Family Residential	167 acres	389 acres
Vacant ^a	8 acres	32 acres

Source: CH2M. Draft Land Use and Prime Farmland Technical Report. 2017.

Note:

a Vacant lands are captured in the Mixed-Use and Multi-Family Residential totals.

Noise and Vibration

Land use in downtown Eugene is mainly commercial, with some intermixed multi- and single-family residences, and continues that way until Chambers Street. Along Chambers Street, there are also some light industrial uses. The main noise source in the southern end of the River Road Corridor is traffic on major arterial roadways throughout the downtown area. Nearby commercial and industrial activities also contribute to noise at this end of the corridor.

As the alignments for the build alternatives extend north from the intersection of River Road and the Northwest Expressway, land use in both corridors is primarily single-family residential and multi-family residential. There is a commercial area located at the intersection of River Road and the Randy-Papé Beltline Highway; from that area to the Santa Clara Community Transit Center (intersection of Hunsaker Lane and River Road), land use is once again a mix of residential and commercial. Noise levels from the intersection of River Road and the Northwest Expressway to the Santa Clara Community Transit Center are dominated by traffic on River Road and the Randy-Papé Beltline, as well as nearby commercial and industrial activities.

No-Build Alternative

Under the No-Build Alternative, no noise or vibration impacts are anticipated because there would be no project related changes to the corridor.

Enhanced Corridor and EmX Alternatives

Operation of the Enhanced Corridor Alternative is not predicted to have any noise impacts to noise sensitive properties (Table 5-16). Increased transit vehicle traffic in closer proximity to noise sensitive properties under the EmX Alternative would potentially cause noise impacts to 2 single-family properties. Neither alternative is anticipated to result in vibration impacts.

During final design, all impacts and potential mitigation measures would be reviewed for verification; the most appropriate mitigation measures would be determined in consultation with the affected property owners.

Under the build alternatives, during construction of the proposed project investments, noise and vibration levels in the project corridor may increase due to normal construction activities. However, daytime construction noise is exempt from provisions contained in the City of Eugene Municipal Code. Under the City of Eugene Municipal Code noise ordinance, project construction could be performed during the allowable hours of 7:00 a.m. to 7:00 p.m. No construction noise impacts are predicted for any alternative if construction is performed during the allowable hours. If construction was planned outside of the allowable hours, the project would be required to obtain a noise variance from local jurisdictions. As part of the variance process, a construction noise analysis would be performed; the construction specifications would contain limitations, if any, specific to the night work proposed and potential construction noise impacts.

Table 5-16: River Road Corridor Potential Noise and Vibration Impacts

Number of Properties Potentially Impacted	No-Build	Enhanced Corridor	EmX
Noise	0	0	2
Vibration	0	0	0

Source: Michael Minor and Associates. Draft Noise and Vibration Technical Report. 2017.

Parklands, Recreation Areas and Section 6(f) Resources

Within the River Road Corridor study area, there are 2 community parks, 3 neighborhood parks, 2 urban plazas, 1 special use facility, and 2 parks that are natural areas and part of the Willamette River Natural Area (Figure 5-5). Five of these resources are within 200 feet of River Road Corridor under the Enhanced Corridor Alternative and 4 are within 200 feet under the EmX Alternative: Washington Jefferson Park, Scobert Gardens, West Bank Park, Razor Park, and the River Road Park Annex (Table 5-17). Washington Jefferson Park, Scobert Gardens (Enhanced Corridor Alternative only), and West Bank Park received funding from the Land and Water Conservation Fund (LWCF), so they are protected under Section 6(f).

No-Build Alternative

The No-Build Alternative would not impact parklands, recreation areas, or Section 6(f) resources because there would be no construction, operation or change in the transportation system as a result of the MovingAhead project.

Enhanced Corridor and EmX Alternatives

Beneficial effects of the build alternatives would include increased access to the parks within the study area and along the corridor through more frequent and reliable transit service. In addition, bicycle and pedestrian connectivity would be enhanced with the new or replaced pedestrian crossings, and new or improved sidewalks along the corridor. The EmX Alternative would also include new or improved bicycle facilities.

Under the build alternatives, transit service related to parks and recreation resources within 200 feet of the construction footprint of the build alternatives would be as follows:

- Transit service to the Washington Jefferson Park would not change under the Enhanced Corridor Alternative; under the EmX Alternative, it would change from Route 51/52 to Route 50 and service would be comparable to No-Build Alternative.
- Transit service to Scobert Gardens would have longer hours, but not more frequency, under the Enhanced

Corridor Alternative. This park is more than 200 feet from the alignment of the EmX Alternative.

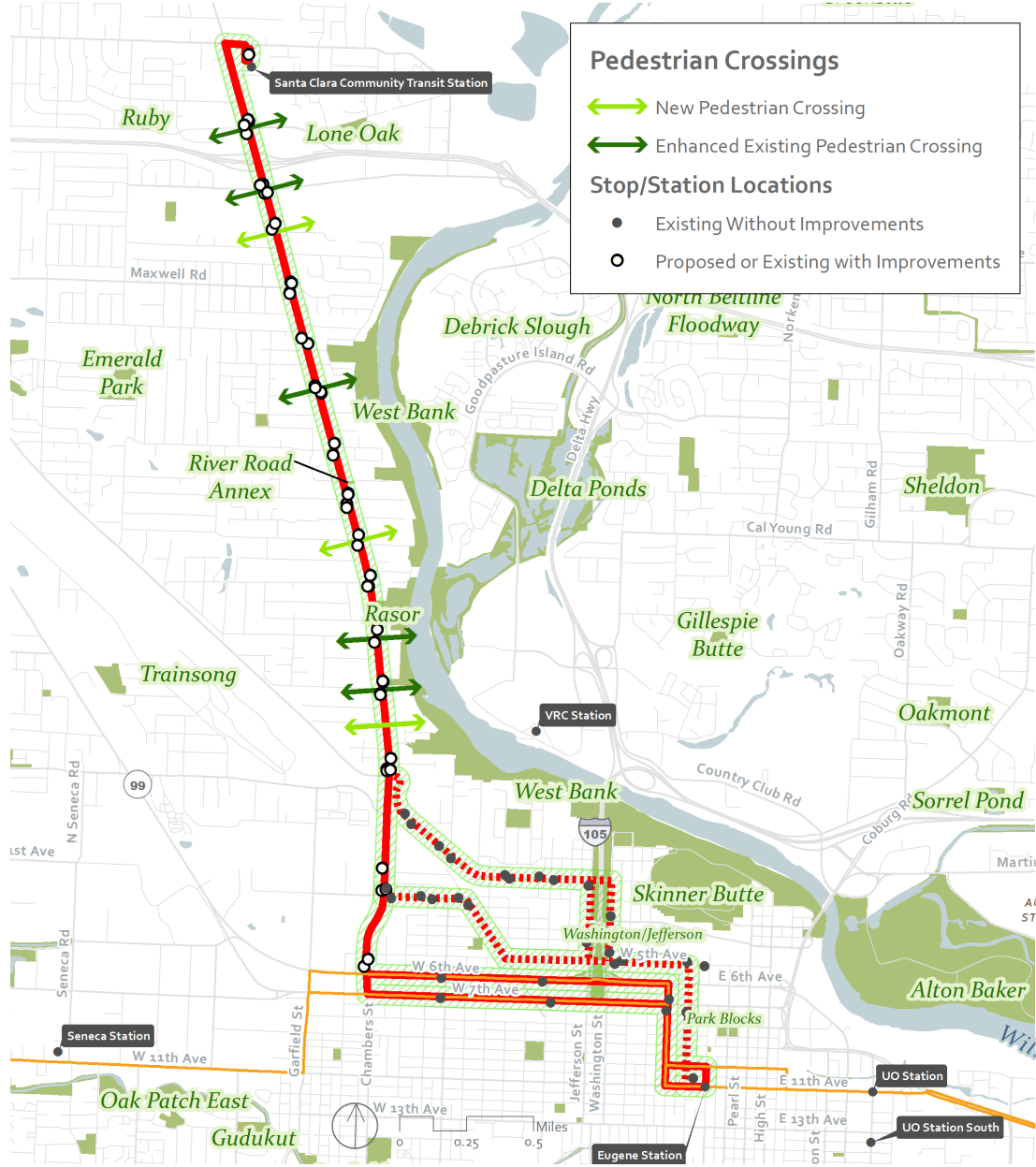
- Transit service to West Bank Park, Razor Park, and River Road Park Annex would not change under the Enhanced Corridor Alternative; transit service would have increased frequency under the EmX Alternative.
- Bicycle and pedestrian access to West Bank Park and Razor Park would improve with the enhanced pedestrian crossings at Hansen Lane and Knoop Lane. Under the EmX Alternative, a protected bicycle lane would also be constructed along River Road between Railroad Boulevard and Kourt Drive.

Under the Enhanced Corridor Alternative, temporary construction easements may be needed from Razor Park and River Road Park Annex to accommodate construction activities. The easements would be less than 0.01 acre on each park and would make that land unavailable for park use during construction. No adverse impacts to other parks are anticipated under the Enhanced Corridor Alternative because any investments near those parks would occur within the ROW.

Less than 0.01 acre of West Bank Park is located within the construction footprint of a EmX station and bicycle lane under the EmX Alternative; efforts would be made to avoid this potential impact through design refinement. West Bank Park received LWCF funding so acquisition of property from this park could trigger a Section 6(f) conversion proposal, requiring coordination with Eugene Parks and Open Space Division, Oregon Parks and Recreation Department (OPRD), and the National Park Service (NPS). The area of impact would not affect the continued viability, integrity, usage, or value of the park, nor would it degrade the recreational experience. An additional 0.01 acre of parkland in West Bank Park would be needed in a temporary construction easement and would be unavailable for park use during construction. No adverse impacts to other parks are anticipated under the EmX Alternative because any investments near those parks would occur within the ROW.

Short-term effects from construction activities would be mitigated through coordination of construction timing with the City's Parks and Open Space Division to avoid or reduce disruption activities for park users, including providing advanced notice of construction

Figure 5-5: River Road Corridor Parks and Recreation Resources



Locator Map



Legend

- River Road Corridor EmX Alternative
- - - - River Road Corridor Enhanced Corridor Alternative
- River Road Corridor 200 ft Buffer
- 2035 No-Build EmX
- Road
- Water
- Park

Parks & Recreation Areas
River Road Corridor

Note: Both EmX and Enhanced Corridor Alternatives Shown



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Source: CH2M. Draft Parklands, Recreation Areas, and Section 6(f) Technical Report. 2017.

Table 5-17: River Road Corridor Parks and Recreation Resources within 0.25 mile

Name	Facility Type	Approximate Distance from Corridor	Ownership and Management	Site Features and Characteristics	Potential Views of Corridor	LWCF or Similar Grant Funding?
Washington Jefferson	Community / Metropolitan Park	Within 200 feet	ODOT / City of Eugene	Basketball, shelter, picnic tables, play area, restrooms	Yes	Yes
Scobert Gardens	Neighborhood Park	Within 200 feet	City of Eugene	Play area	Yes ^a	Yes ^b
West Bank	Willamette River Natural Area	Within 200 feet	City of Eugene	Fishing, off street bicycle / pedestrian path	Yes	Yes
Rasor	Willamette River Natural Area	Within 200 feet	City of Eugene	Bicycle / pedestrian path	Yes	No
River Road Park Annex	Special Use	Within 200 feet	River Road Park and Recreation	Community gathering	Yes	No
Broadway Plaza	Urban Plaza	0.10 mile	City of Eugene	Performance space, public art	No	No
Maurie Jacobs	Community / Metropolitan Park	0.12 mile	City of Eugene	Community garden, performance space, picnic tables, soccer field	No	No
Park Blocks	Urban Plaza	0.14 mile	City of Eugene	Picnic tables, public art, performance space	No	No
Sladden	Neighborhood Park	0.20 mile	City of Eugene	Basketball, disc golf, picnic tables	No	No
Rosetta	Neighborhood Park	0.23 mile	City of Eugene	Picnic tables, street trees, play area	No	No

Source: CH2M. Draft Parklands, Recreation Areas, and Section 6(f) Technical Report. 2017.

Notes:

a Scobert Gardens is only visible from the Enhanced Corridor Alternative.

b This park received a Community Development Block Grant. Such grants do not qualify under Section (6f) protection.

activities to park users, signage for pedestrian and bicycle detours, and barriers and flagging for safety. No impacts to Section 6(f) resources from either of the build alternatives are anticipated.

Section 4(f) Resources

Park and recreation resources located within 350 feet of River Road Corridor include: Washington Jefferson Park, Scobert Gardens (Enhanced Corridor Alternative only), West Bank Park, Razor Park, and the River Road Park Annex. There are no wildlife or waterfowl refuges within 350 feet of the corridor.

As described in the cultural resources topic, a review of historic records and a windshield survey of the River Road Corridor resulted in the identification of 75 resources potentially eligible for listing on the NRHP and thus protected under Section 4(f) (see Section 4(f) Technical Report for a complete list of eligible resources). None are formally listed on the NRHP at present, but 4 are listed as City Landmarks.

No-Build Alternative

The No-Build Alternative would not impact Section 4(f) resources as there would be no construction that would occur related to the MovingAhead project.

Enhanced Corridor and EmX Alternatives

Under the Enhanced Corridor Alternative, temporary construction easements may be needed from Razor Park and River Road Park Annex. The easements would be less than 0.01 acre on each park and would make that land unavailable for park use during construction. These temporary occupancies would satisfy the conditions required such that they would not constitute a use under Section 4(f).

The EmX Alternative would install an EmX station and bicycle lane along the street frontage of West Bank Park that would result in:

- Permanent incorporation of less than 0.01 acre of parkland, which does not contain any recreational features or attributes
- Temporary occupancy of land to install the new EmX Station and bicycle lane and minor increases in noise and dust during construction; this temporary occupancy would satisfy the conditions required such that it would not constitute a use under Section 4(f)
- No activities, features, or attributes would be permanently impacted by project actions nor would temporary construction actions at the park permanently or temporarily interfere with visitors using the park

Table 5-18: River Road Corridor Section 4(f) Park and Recreation Resources

Source Name	Location	Official with Jurisdiction	Section 4(f) Qualifying Description
Washington Jefferson Park	W. 6th and W. 7th Avenues, Eugene	City of Eugene	Skatepark, a basketball court, and horseshoe pits
Scobert Gardens	1180 W. 4th Avenue, Eugene	City of Eugene	Municipal park (playground)
West Bank Park	Stephens Drive and Stults Avenue, Eugene	City of Eugene	Municipal park (fishing, off-street bicycle path / pedestrian path)
River Road Annex	1055 River Road, Eugene	City of Eugene	Community events and programs
Razor Park	River Road and Park Avenue, Eugene	City of Eugene	Municipal park (off-street bicycle / pedestrian path)

Source: CH2M. Draft Section 4(f) Technical Report. 2017.

- A preliminary conclusion that project actions would not adversely affect the features, attributes, or activities that qualify West Bank Park for Section 4(f) protection; as such, project actions under the River Road Corridor EmX Alternative would likely result in a Section 4(f) *de minimis* impact to West Bank Park, consistent with 23 Code of Federal Regulations (CFR) 774.17

None of the other parks and recreation resources protected under Section 4(f) would be impacted by either of the build alternatives. Neither build alternative would result in temporary impacts, nor would the proximity impacts (noise or visual) to any of the parks be so severe as to substantially impair those activities, features, or attributes that qualify the resource for protection under Section 4(f). The improved reliability of transit service to parks would enhance accessibility for the park users.

Twenty-four of the identified historic resources would potentially be directly and/or indirectly affected by

the Enhanced Corridor Alternative through property acquisition, impacts on access, station/shelter construction, and/or planting strip construction, as described in the cultural resource section of this chapter. Under the EmX Alternative, 19 historic resources would be directly and/or indirectly affected.

No historic resources are anticipated to be removed to construct either of the build alternatives. Further, neither build alternative would alter, directly or indirectly, any characteristics of a historic property that qualify the property for inclusion in the NRHP in a manner that would diminish the integrity of the property's location, design, setting, materials, workmanship, feeling, or association. Therefore, the Enhanced Corridor and EmX Alternatives are not anticipated to have an adverse effect on any Section 106 resources, and project actions under either build alternative would likely result in a *de minimis* impact determination to the 24 or 19 affected historic resources, respectively, under Section 4(f).



Street and Landscape Trees

Street and landscape trees are common along most of the length of the River Road Corridor. Numerous places along River Road have mature canopies formed by street trees that line the edges of the road, sidewalks, and landscape trees on adjacent properties. The tree canopy continues east and west along many streets that intersect River Road, particularly north of the Northwest Expressway. City Urban Forestry staff members have identified some street trees along this corridor from Railroad Boulevard to Silver Lane as trees not on the approved species list that are approaching their maximum life, are in poor health, and require extensive maintenance.

No-Build Alternative

No impacts to trees are anticipated under the No-Build Alternative.

Enhanced Corridor and EmX Alternatives

Under the Enhanced Corridor Alternative up to 13 medium to large street trees and 0 medium to large landscape trees would be potentially removed outside of the Charter Tree boundary; no trees within the Charter Tree boundary would be removed. Under the EmX Alternative up to 118 medium to large street trees and 7 to 9 medium to large landscape trees outside of the Charter Tree boundary and 14 trees within the Charter Tree boundary would be potentially removed (Table 5-19). Under the build alternatives, proposed sidewalks that would potentially impact existing street trees would be wide enough to incorporate a landscape strip into which new street trees could be planted. Removed street trees would be mitigated by replanting trees at a ratio of at least 1 tree planted for each tree removed or as otherwise required by City Code. The selection of tree species, specific location, and provision of adequate soil conditions for tree mitigation would be coordinated with the City Urban Forestry staff.

The intermittent nature of construction proposed under the build alternatives would reduce the risk of potential impacts to street and landscape trees as construction would not occur along the entire corridor, just in limited locations near proposed investments. Under the Enhanced Corridor and EmX Alternatives, most of the

construction requiring significant excavation adjacent to street and landscape trees would be confined to intersections, BAT lanes, and enhanced stop and station areas, so the root zones of trees in the River Road Corridor would be avoided as much as possible. LTD would require the construction contractor to develop a Tree Protection Plan before construction.

No significant short-term impacts on Charter Trees, Heritage Trees, or existing street and landscape trees would be expected under the Enhanced Corridor Alternative.

Potential short-term construction-related impacts to street trees could occur under the EmX Alternative in the following location:

- River Road between Railroad Boulevard and Owosso Drive because of construction of BAT lanes within the existing roadway

Table 5-19: River Road Corridor Number of Medium and Large Trees Potentially Removed

	Enhanced Corridor	EmX
INSIDE THE CHARTER TREE BOUNDARY		
Street Trees	0 trees	14 trees
Landscape Trees	0 trees	0 trees
OUTSIDE THE CHARTER TREE BOUNDARY		
Street Trees	9 to 13 trees	98 to 118 trees
Landscape Trees	0 trees	0 trees

Source: CH2M. Draft Street and Landscape Tree Technical Report. 2017.

Transportation and Transit

The River Road Corridor is owned by the City with the exception of W. 6th Avenue between Madison Street and Chambers Street and W. 7th Avenue between Chambers Street to Washington Street, which are ODOT facilities. A jurisdictional transfer to the city is in process for these roadway segments. The entire corridor is classified as a major arterial. Typically, intersections with a collision rate above or near 1 crash per million entering vehicles are flagged for consideration of safety improvements. Based on high collision rates, 2 intersections, the Chambers Street/W. 7th Avenue and the River Road/Irving Road intersections, have been highlighted for consideration of safety improvements on the River Road Corridor. During the existing p.m. peak hour, mobility standards were not met at 2 study intersections, Chambers Street and W. 6th Avenue, and Chambers Street and W. 7th Avenue.

For a more detailed evaluation of transportation impacts and benefits for all corridors and alternatives please refer to Chapter 9.

No-Build Alternative

Under the No-Build Alternative investments planned in the Eugene 2035 TSP, would improve pedestrian and bicycle access along the River Road Corridor, however, connectivity to planned roadway, bicycle or pedestrian projects would not change. No investments would be made to the existing transportation system as part of the MovingAhead project. Traffic delay is anticipated to worsen by 2035 and 3 study intersections would not meet the current mobility standards adopted as part of the Eugene 2035 TSP.

There would be limited potential to encourage travelers to change their travel mode from motor vehicle travel to transit and limited potential to support locally adopted transportation policies.

Enhanced Corridor and EmX Alternatives

The build alternatives would improve the pedestrian and bicycle network with the installation of new or improved sidewalks and enhanced pedestrian crossings (rectangular rapid flashing beacon or Pedestrian Hybrid Beacon). The Enhanced Corridor Alternative would not improve bicycle facilities compared to the No-Build

Alternative; however, the EmX Alternative would include approximately 5 miles of new or improved bicycle lanes. Travel reliability would be enhanced by the proposed time allocated for transit vehicles to travel through intersections with traffic signals (called bus phases) at 1 intersection under each of the build alternatives and transit signal priority at all signals on the corridor. The Enhanced Corridor Alternative would offer moderate safety improvements due to BAT lanes and increased crossing opportunities for people biking, walking and using mobility devices. The EmX Alternative would result in significant safety improvements due to BAT lanes, buffered bicycle lanes, and increased pedestrian crossing opportunities.

In-vehicle transit travel time would improve by 5 minutes (1-way inbound) during the a.m. peak hour compared to the No-Build Alternative under the Enhanced Corridor Alternative, and by 8 minutes under the EmX Alternative (Table 5-20). The build alternatives have greater potential for increased transit reliability compared to the No-Build Alternative due to 2.8% more transit exclusive/priority lanes for the Enhanced Corridor Alternative and 58.1% more transit exclusive/priority lanes for the EmX Alternative.

Average weekday systemwide transit ridership would increase by 110 (0.2%) (1-way linked trips) under the Enhanced Corridor (Table 5-21). Increases in ridership under the EmX would be even greater at 820 trips (1.8%).

There would be no substantial change in vehicle delay under the Enhanced Corridor Alternative compared to the No-Build Alternative and 2035 conditions would not meet mobility standards at the same 2 intersections (Chambers Street/W. 6th Avenue and Chambers Street/W. 7th Avenue) as under the No-Build Alternative. Under the EmX Alternative 2035 local traffic operations would improve at the Chambers Street/W. 7th Avenue intersection due to a small decrease in motor vehicle traffic, as compared to the No-Build and Enhanced Corridor Alternatives. Local traffic operations at the Chambers Street/W. 6th Avenue intersection would be similar to the No-Build and Enhanced Corridor Alternatives. Local traffic operations in 2035 would slightly degrade at the River Road/Randy Papé Beltline eastbound on-ramp due to the addition of the new

Table 5-20: River Road Corridor 2035 Auto and Transit Travel Times (a.m. Peak Hour)

Measure	River Road Corridor Travel Time to Eugene Station from Santa Clara Community Transit Center					
	Auto	Transit				
	No-Build, Enhanced Corridor, and EmX	No-Build	Enhanced Corridor		EmX	
		Time	Time	Time	Change from No-Build Alternative	Time
Time in Vehicle	10 minutes	26 minutes	21 minutes	-5 minutes	18 minutes	-8 minutes

Source: DKS. Draft Transportation Technical Report. 2018.

Table 5-21: River Road Corridor Average Weekday 2035 Systemwide Ridership

Measure	No-Build	Enhanced Corridor	EmX
Total Systemwide Transit Trips ^a	46,410	46,520	47,230
Change from No-Build	N/A	110	820
% Change from No-Build	N/A	0.2%	1.8%

Source: DKS. Draft Transportation Technical Report. 2018.

Note:

- a Systemwide transit trips are defined as 1-way linked trips taken by a person from the trip's origin to the trip's destination, independent of the number of vehicles or transfers used to complete the trip.

center-running bus-only lanes on River Road in both directions; and River Road/Maxwell Road intersections due to the conversion of a general-purpose travel lane to a BAT lane under the EmX Alternative. For both build alternatives there would be a safety benefit based on an increase in transit ridership (and parallel decrease in motor vehicle travel) and a reduction in VMT (see Chapter 9), which could reduce fatal and serious injury crashes.

Both build alternatives would result in removal of off-street parking stalls, as listed in Table 5-22. Further, both the Enhanced Corridor and EmX Alternatives would require changes to on-site circulation that would result in displacement of up to 4 or 6 businesses with drive-

throughs, respectively. Opportunities to further reduce or avoid impacts would be evaluated in more detail during design refinement. After property impacts were revealed during the analysis, additional evaluation was conducted to determine other ways to avoid or minimize impacts at some properties; this effort is documented in the Addendum to the MovingAhead Alternatives Analysis Technical Reports Memorandum (CH2M 2017).

Mitigation measures such as limiting the length of single lane closures, detour signage, and maintaining business access, would be needed during construction, and would require early, frequent, and ongoing communication among LTD, the City, contractors, and affected property owners and tenants.

Table 5-22: River Road Corridor Transportation Impacts and Benefits

Measure	Enhanced Corridor	EmX
New/improved sidewalks	0.76 mile	1.28 miles
New/improved bicycle facilities	0 miles	5.03 miles
New enhanced crossings	6	4
New upgraded crossings	0	0
Replaced existing enhanced crossings	1	1
Potential off street parking spaces removed	2	31
Potential on street parking spaces removed	0	0
Potential driveway closures	0	6
Potential business access impacts: right-in or right-out turning movements	0	0
Potential drive-through closures	4	6
Percent of corridor with exclusive/priority lanes	2.8%	58.1%

Source: DKS. Draft Transportation Technical Report. 2018.

Utilities

Underground utilities within the River Road Corridor include cables for telecommunication and energy; pipes for natural gas, water, sanitary sewer, and stormwater; fiber-optic lines; and access points (manholes and vaults) for all types of utilities. Aboveground utilities include CenturyLink telephone poles, Eugene Water and Electric Board (EWEB) power poles, and traffic signals and street lights and their associated conduit and controls.

NW Natural operates an underground natural gas transmission line with visible aboveground structures at River Road north of the Randy Papé Beltline Highway.

No-Build Alternative

The No-Build Alternative would have no adverse or beneficial long-term impacts to utility infrastructure as no capital investments would be constructed for the MovingAhead project.

Enhanced Corridor and EmX Alternatives

Table 5-23 summarizes the potential impacts to major utilities in the River Road Corridor that would occur under the build alternatives. Both build alternatives propose the construction of new signals in this corridor, which would require additional infrastructure (e.g. electrical connections). Final design documentation would detail replacement and design of this infrastructure. The Enhanced Corridor Alternative would not impact the NW Natural gas transmission line; however, the EmX Alternative proposes a shared-use path near 1 of the structures for this line. Mitigation to reduce this impact would include design refinements in coordination with NW Natural and other stakeholders to ensure this piece of critical infrastructure would not be impacted as its relocation might prove to be cost and schedule prohibitive.

Table 5-23: River Road Corridor Potential Utility Impacts

Measure	Enhanced Corridor	EmX
Major sanitary sewer line	3	3
Major storm sewer line	0	1
Major electrical line	5	9
Major water line	1	2
New or modified traffic signals	14	16
Gas transmission line	0	1

Source: CH2M. Draft Utilities Technical Report. 2017.

Visual and Aesthetic Resources

The River Road Corridor is typified by a variety of street and landscape trees and a mixture of land uses with a range of visual character types. Much of the corridor is strongly residential in character with established neighborhoods composed of single-family dwellings and occasional multi-family developments. River Road also passes a number of commercial retail land uses that typically consist of large utilitarian buildings set back from the road and surrounded by ample parking lots. These developments have a visual character typical of automobile-oriented commercial retail establishments. South of the Northwest Expressway, River Road passes through industrial and commercial areas on its way to the western part of downtown Eugene.

Downtown Eugene has a more urban visual character than the portions of the study corridor that extend beyond the downtown core. The portions of downtown Eugene within the study corridor are characterized by level terrain and a north-to-south and east-to-west grid pattern. Much of downtown Eugene contains mature street and landscape trees, particularly areas that are within the 1915 city limits. Within this area, the study corridor is often lined with older residential and commercial buildings and mature street and landscape trees that form canopies over the streets in some locations. Large, mature trees and canopies along streets produce a very distinctive visual character.

No-Build Alternative

No impacts to visual and aesthetic resources would be expected under the No-Build Alternative for the River Road Corridor as no construction would take place in association with the MovingAhead project.

Enhanced Corridor and EmX Alternatives

The Enhanced Corridor and EmX Alternatives follow separate alignments from Eugene Station to the River Road/Railroad Boulevard intersection, but would have similar impacts to visual and aesthetic resources north of Railroad Boulevard because both alternatives would require construction along the same portions of the River Road Corridor. Both alternatives would require

the removal of street and landscape trees, which would change the visual character of areas adjacent to them.

Under the Enhanced Corridor Alternative, up to 13 medium and large street trees between Ruby and Santa Clara Avenues would be potentially removed. Up to 132 medium and large street trees would be removed under the EmX Alternative; areas where concentrations of street trees would be potentially removed include: River Road between Randy Pape Beltline and Santa Clara Avenue (up to 19 trees), River Road between Horn Lane and Maxwell Road (up to 33 trees), and River Road between Hawthorne Avenue and Elkay Drive (up to 47 trees). No landscape trees are anticipated to be removed under either alternative. Table 5-24 identifies the degree of potential change in visual character that would result from construction of the build alternatives. Further detail on this assessment is provided in the Visual and Aesthetic Resources Technical Report (CH2M 2017).

With the build alternatives, in almost all locations, proposed sidewalks in areas where street trees would be impacted would be wide enough to incorporate a landscape strip into which new street trees could be planted. As discussed in the street and landscape trees section of this chapter, removed street trees would be replanted at a ratio of at least 1 tree planted for each tree removed or as otherwise required by City Code and coordinating with the City Urban Forestry staff. With this mitigation, no long-term significant adverse impacts to visual character are anticipated.

Beneficial effects of the build alternatives would include replacing trees that are not on the City-approved species list, are nearing their maximum lifespan, or are difficult to maintain. The replanted trees would contribute to a more unified appearing corridor, as could investments such as new sidewalks, bus stops or EmX stations, landscaping, and enhanced pedestrian crossings proposed under the build alternatives.

Because of the larger construction footprint, the EmX Alternative would offer more opportunities to provide landscaping along portions of the corridor currently without landscaping than the Enhanced Corridor Alternative with its smaller construction footprint. The

additional landscaping of the EmX Alternative would enhance the visual character of portions of the corridors with no current landscaping. The EmX Alternative would also have more project components, such as pedestrian crossings and EmX stations, which would provide more visual unity along the corridor than the Enhanced Corridor Alternative.

Table 5-24: River Road Corridor Potential Change to Visual Character

Alternative	Length of Potential Change in Visual Character
ENHANCED CORRIDOR	
High	0.6 mile
Moderate	0.5 mile
Low / No Impact	13.0 miles
Corridor Length^a	14.1 miles
EmX	
High	0.9 mile
Moderate	1.4 miles
Low / No Impact	11.5 miles
Corridor Length^a	13.8 miles

Source: CH2M. Draft Visual and Aesthetic Resources Technical Report. 2017.

Note:

- a Corridor length for this analysis is greater than the round-trip corridor length reported in other sections because visual impacts may affect both sides of the street. One-way streets with potential impacts on both sides increase the corridor length with potential visual impacts to be greater than the length of the corridor.

Water Quality and Hydrology

The study area includes the receiving waterways and floodplains of stormwater runoff into the existing storm sewer system and conveyed to Amazon Creek, Spring Creek, or the Willamette River.

No-Build Alternative

Under the No-Build Alternative, upgrades to Hunsaker Lane and Beaver Street are anticipated as part of other programmed projects not associated with the MovingAhead project. The resulting increase in impervious area, which would drain to Spring Creek, is currently unknown. Additional non-pollutant generating impervious surfaces (such as bicycle paths and sidewalks) are also anticipated from programmed projects not associated with MovingAhead. Although surfaces such as sidewalks and bicycle paths are subject to depositional pollutants, these are systemic pollutants and not associated with specific pollution sources such as vehicles. No cumulative impacts are expected as a result of the No-Build Alternative.

Enhanced Corridor and EmX Alternatives

The primary impact of the Enhanced Corridor Alternative is an increase or reconstruction of 109,600 SF of impervious surface, of which 81,200 SF would drain to Spring Creek, and 28,400 SF would drain to the Willamette River drainage basin. The new or reconstructed impervious surface area would constitute 0.01% of the total impervious area in both drainage basins combined, as listed in Table 5-25. This alternative would also add 1,100 SF of new and reconstructed, non-pollutant generating impervious surface to the Amazon Creek drainage basin, representing less than 0.01% of the total impervious surface in the drainage basin.

The primary impact of the EmX Alternative is an increase or reconstruction of 748,900 SF of impervious surface, of which 188,300 SF would drain to Spring Creek, and 557,600 SF would drain to the Willamette River drainage basin. The new or reconstructed impervious surface area would constitute 0.14% of the total impervious area in both drainage basins combined, as listed in Table 5-25. This alternative would also add 2,900 SF of new and reconstructed, non-pollutant generating impervious surface to the Amazon Creek drainage basin,

representing less than 0.01% of the total impervious surface in the drainage basin.

No direct impacts on Amazon Creek, Spring Creek, or the Willamette River floodplains are expected as the result of either build alternative.

With mitigation measures, such as water quality and flow control facilities, there would be a net water quality improvement associated with the reconstructed impervious areas and the impacts of the new impervious area would be reduced.

No short-term or construction impacts are expected in the floodplains of Spring Creek and the Willamette River as a result of either of the build alternatives.

Four locations, common to both build alternatives, were identified for potential water quality and flow control facilities for runoff prior to discharge to the Willamette

River and Spring Creek. The following locations were selected based on the construction footprint and hydrology:

- River Road and Horn Lane
- River Road and Maynard Avenue
- River Road and Silver Lane
- River Road and Hunsaker Lane

No cumulative effects are anticipated under either build alternative in the Spring Creek or Amazon Creek drainage basin. Cumulative effects on both the quantity and quality of runoff may result from the development of 2 or more of the corridor alternatives because all affected watercourses eventually reach the Willamette River. However, due to the large drainage area and high amounts of existing impervious area in the Willamette River Basin, the cumulative effects are likely to be minimal.

Table 5-25: River Road Corridor Existing and New Impervious Surface Quantities

Drainage Basin	Existing Impervious Area	Enhanced Corridor		EmX	
		Total New and Reconstructed Impervious Area / Percent of Impervious Area ^a	New Roadway and Sidewalk Impervious Area / Percent of Impervious Area ^a	Total New and Reconstructed Impervious Area / Percent of Impervious Area ^a	New Roadway and Sidewalk Impervious Area / Percent of Impervious Area ^a
Amazon Creek ^b	334,939,461 SF	1,100 SF <0.01%	0 SF 0.00%	2,900 SF <0.01%	0 SF 0.00%
Spring Creek	48,795,842 SF	81,200 SF 0.17%	2,000 SF <0.01%	188,300 SF 0.39%	4,200 SF <0.01%
Willamette River	462,920,832 SF	28,400 SF <0.01%	18,800 SF <0.01%	557,600 SF 0.12%	49,500 SF <0.01%
Total	846,656,135 SF	109,600 SF 0.01%	20,800 SF <0.01%	748,900 SF 0.14%	53,700 SF <0.01%

Source: CH2M. Draft Water Quality, Floodplain, and Hydrology Technical Report. 2017.

Note:

a Total impervious area in drainage basin

b Non-pollutant generating surface only

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Chapter 6: 30th Avenue to LCC Corridor

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INTRODUCTION TO THE CORRIDOR CHAPTERS

Before reading this chapter, please read **Chapter 3**, which introduces the corridor-specific chapters (Chapters 4 through 8) with background information about the environmental topics evaluated for each alternative

Corridor Overview

The 30th Avenue to Lane Community College (LCC) Corridor begins at Eugene Station and travels south along Pearl Street (outbound) to Amazon Parkway, then on E. 30th Avenue to its terminus at the LCC Station. The return trip travels on Oak Street (inbound), which is the northbound couplet to Pearl Street. South Willamette (which is adjacent to the corridor) is identified as a key corridor in Envision Eugene and the Eugene 2035 Transportation System Plan (Eugene 2035 TSP) – 1 of 6 corridors intended for multi-modal planning with frequent transit service (defined as 15-minute or better service frequency) connecting downtown Eugene with numerous core commercial areas. This corridor is approximately 10.2 round trip miles.

Near downtown Eugene, the 30th Avenue to LCC Corridor is characterized by high-density residential and commercial areas. South of downtown Eugene, existing land uses along the corridor consist primarily of small-scale offices, retail, and apartments, which transition south of W. 18th Avenue to single-family homes, parklands, and athletic fields, and again transition near Spring Boulevard to woodlands. Key land uses include LCC, Amazon Park, and the former Civic Stadium site. Refer to Table 6-1 for 30th Avenue to LCC Corridor demographic data and Table 6-2 for 30th Avenue to LCC Corridor household data.

The 30th Avenue to LCC Corridor build alternatives follow the same alignment to connect downtown Eugene to the LCC terminus.

Corridor Length

10.2 miles round trip (No-Build, Enhanced Corridor, EmX)

Transit and Average Daily Ridership on Existing Transit Routes

81 LCC/Harris	=	473 riders/day
82 LCC/Pearl	=	1,330 riders/day
92 Lowell	=	90 riders/day

Employment

Labor Force 16 Years Old and Older:

16,119 people (Enhanced Corridor)
22,713 people (EmX)

Number of Jobs:

14,792 jobs (Enhanced Corridor)
23,674 jobs (EmX)

Major Employers: Lane Community College, University of Oregon, South Eugene High School, City of Eugene, Lane County, New Horizons Adult Care, Venture Data, Robert Half Corporation

Population

30,231 residents (Enhanced Corridor)
45,271 residents (EmX)

Neighborhoods

- » Amazon Neighbors Association
- » Crest Drive Citizens Association
- » Downtown Neighborhood Association
- » Fairmount Neighbors
- » Friendly Area Neighbors
- » Jefferson Westside Neighbors
- » Laurel Hill Valley Citizens
- » South University Neighborhood Association
- » Southeast Neighbors
- » University of Oregon Campus
- » West University Neighbors
- » Whiteaker Community Council

The roadways that comprise the 30th Avenue to LCC Corridor are owned by the City of Eugene (City) except for E. 30th Avenue from Spring Boulevard to LCC and Gonyea Road, which are owned by Lane County. The entire City portion of the corridor is classified as a minor arterial; the Lane County portion of 30th Avenue is an

urban minor arterial and Gonyea Road is a rural major collector. The average daily traffic (ADT) volume along the corridor ranges from 9,200 vehicles (along Amazon Parkway between E. 27th Avenue and E. 29th Avenue) to 18,100 vehicles (along E. 30th Avenue between Hilyard Street and Harris Street).

Table 6-1: 30th Avenue to LCC Corridor Demographic Data (2015 Estimates)

Area	Non-Minority Population	Minority Population				Limited English Proficiency	Population from Whom Poverty Determined	Median Household Income	Unemployment
	White Alone	Hispanic or Latino ^a	African American	Asian	Others ^b				
Enhanced Corridor	80.8%	6.3%	1.9%	6.3%	4.7%	1.7%	39.9%	\$38,068	8.9%
EmX	79.9%	6.6%	1.6%	7.0%	4.8%	1.7%	40.4%	\$35,659	9.7%
City of Eugene	77.5%	10.6%	1.7%	3.6%	6.7%	3.9%	24.4%	\$42,715	6.0%
Lane County	82.6%	8.5%	1.2%	2.3%	3.8%	3.0%	20.4%	\$43,685	6.6%
Central Lane Metropolitan Planning Organization	--	--	--	--	--	--	23.0%	\$40,400 ^c	6.6%

Source: CH2M. Draft Community, Neighborhood, and Environmental Justice Technical Report. 2017.

Notes:

- a Hispanic / Latino is defined as a person of Mexican, Puerto Rican, Cuban, Central or South American, or other Spanish culture or origin, regardless of race.
- b Others is a combination of the categories American Indian or Alaskan Native, Hawaiian or Pacific Islander, some other race, and 2 or more races.
- c Median income is calculated by taking the average of the Equity and Opportunity Assessment (EOA) median income levels for Lane County (\$42,621), Eugene (\$41,326), and Springfield (\$37,255).

Table 6-2: 30th Avenue to LCC Corridor Household Data (2015 Estimates)

Area	Total Population	Population Under 18	Population Over 65	Owner/ Renter Occupied Housing	Average Household Size	Households with No Vehicle
Enhanced Corridor	30,231	6.0%	12.5%	32.5% / 67.5%	1.8	17.5%
EmX	45,271	27.6%	11.3%	31.6% / 68.4%	1.7	18.8%
City of Eugene	158,131	18.0%	13.6%	48.9% / 51.1%	2.3	11.4%
Lane County	354,764	19.4%	16.2%	59.3% / 40.7%	2.4	8.4%
Central Lane Metropolitan Planning Organization	251,721	20.0%	15.0% ^a	55.0% / 45.0%	2.4	10.0%

Source: CH2M. Draft Community, Neighborhood, and Environmental Justice Technical Report. 2017.

Note:

a Percentage represents population 60 and over.



Alternatives Considered and Dismissed

During design development, 5 other alignment options were considered but eliminated from advancing for further study. The options considered and reasons for eliminating them are summarized below:

- The 30th Avenue to LCC Corridor Enhanced Corridor and EmX Alternatives considered an alignment option traveling on the Patterson Street and Hilyard Street couplet. This alignment option was eliminated from consideration because it does not serve key land uses along Willamette Street as well as Amazon Parkway and would not provide a direct connection to Eugene Station
- The 30th Avenue to LCC Corridor Enhanced Corridor and EmX Alternatives considered an alignment option traveling on Willamette Street up to 19th Avenue. This alignment option was eliminated from consideration because it would not offer opportunities for exclusivity because of constrained right of way (ROW) and would serve similar land uses to the Oak Street and Pearl Street couplet
- The 30th Avenue to LCC Corridor EmX Alternative considered an alignment option traveling in an exclusive 2-way transitway on Amazon Parkway. This alignment option was eliminated from consideration because of high impacts to parkland resources
- The 30th Avenue to LCC Corridor EmX Alternative considered an alignment option traveling in an exclusive transitway on 30th Avenue from University Street to LCC. This alignment option was eliminated from consideration because it would not improve transit travel time or reliability, and high construction cost estimates
- The 30th Avenue to LCC Corridor Enhanced Corridor and EmX Alternatives considered an alignment option traveling on the Oak Street and High Street couplet. This alignment option was eliminated from consideration because it does not serve key land uses along Willamette Street as well as Amazon Parkway, would require out of direction travel resulting in slower transit travel times, and would create transfers between various transit routes to Eugene Station

Alternatives Advanced

This section summarizes the 30th Avenue to LCC Corridor alternatives advanced for further evaluation in this Alternatives Analysis (AA) report. Table 6-6 at the end of this section summarizes the attributes of these alternatives. A more comprehensive description of the alternatives is provided in the Draft MovingAhead Level 2 Definition of Alternatives (CH2M et al. 2016).

No-Build Alternative

Operations

Roadway operations would be the same as or similar to existing conditions on corridor roadways (Oak and Pearl Streets, Amazon Parkway, and E. 30th Avenue). There are no planned operations improvements in the corridor.

Amazon Parkway would generally have 1 travel lane in each direction, and E. 30th Avenue would continue to have 2 travel lanes in each direction with turn lanes.

Under the No-Build Alternative, Lane Transit District (LTD) Routes 81, 82, and 92 would continue to serve the 30th Avenue to LCC Corridor. Route 82 would operate with 10-minute frequencies during peak periods and 15-minute frequencies during off-peak periods, providing service to Eugene Station. Route 81 would have 30-minute frequencies all day, providing service to the University of Oregon. Route 92 would provide 3 daily round trips between LCC and downtown Eugene.

The No-Build Alternative would not include EmX service on Amazon Parkway or 30th Avenue. For the 2035

planning year, the No-Build Alternative would include the following EmX lines:

- Franklin EmX
- Gateway EmX
- West Eugene EmX
- Anticipated EmX service on Main Street in Springfield from Springfield Station to Thurston Station (see Chapter 1 for more discussion about this project)

The Franklin and West Eugene EmX lines would continue to serve the downtown Eugene terminus of this corridor.

Capital Investments

The No-Build Alternative would not include capital investments on Amazon Parkway or 30th Avenue as part of the MovingAhead project. This alternative includes existing roadway, bicycle, pedestrian, and transit facilities in the corridor, as well as planned investments in the Eugene 2035 TSP. There would be no additional major bus capital investments under the No-Build Alternative.

The Eugene 2035 TSP includes the following transportation investments planned along or adjacent to the corridor:

- Bicycle boulevard on Alder Street from E. 17th Street south to E. 30th Avenue (and continuing south on Kincaid Street to E. 39th Street)

Enhanced Corridor Alternative

Operations

Roadway operations under the Enhanced Corridor Alternative would be similar to that of the No-Build Alternative, with the following exceptions:

- Some on-street parking would be eliminated on Oak and Pearl Streets to accommodate a buffered bicycle lane; new on-street parking would be added at select locations

- The extension of E. 20th Avenue would increase roadway connectivity for vehicles
- Every traffic signal on the corridor would receive transit signal priority to reduce delay for buses; however, none of the traffic signals would provide exclusive bus signal phasing

Installation of 4 new traffic signals would improve traffic operations at those intersections. Buses would primarily operate in mixed traffic. Enhanced Corridor service would run from 6:45 a.m. to 11:30 p.m. weekdays, 7 a.m. to 11 p.m. Saturdays, and 8 a.m. to 8 p.m. Sundays. For purposes of this analysis, service frequencies are assumed to be 15 minutes during all periods.

Existing fixed-service bus operations on Routes 81 and 82 would be replaced by Enhanced Corridor service, which would decrease transit service frequency in this corridor. Operations on Route 92 would remain the same as the No-Build Alternative. Additional evaluation of service routing would be completed to mitigate service reductions and ridership decreases if this alternative were advanced.

The Enhanced Corridor Alternative would result in 206 additional average weekday bus vehicle miles traveled (VMT) and 0 additional average weekday revenue hours as compared to the No-Build Alternative.

High Street Cycle Track

Construction of a 2-way cycle track on High Street from E. 10th Avenue connecting to the Amazon Multi-Use Path at E. 19th Avenue was originally planned as part of the EmX Alternative; however, the City has been able to fund and advance this bicycle investment separate from the MovingAhead project. Construction of this project may eliminate the need for the striped buffered bicycle lane on Pearl and Oak Streets as part of the Enhanced Corridor Alternative.

Capital Investments

Capital investments under the Enhanced Corridor Alternative would include enhanced pedestrian crossings; investments to existing bus stops and the construction of new stops; and traffic signal reconstruction (Figure 6-1).

New roadway investments would include the following:

- Remove up to 101 on-street parking spaces to create a buffered bicycle lane on:
 - » Pearl Street from E. 12th Avenue to E. 19th Avenue
 - » Oak Street from E. 12th Avenue to E. 20th Avenue
- Add up to 32 new on-street parking along Oak and Pearl Streets (partially replacing the on-street parking spaces that would be removed)
- Extend E. 20th Avenue from Oak Street to Amazon Parkway as a 60-foot-wide street (with cross section to be determined through City development review)
- Construct new traffic signals at the following locations:
 - » Oak Street and the extension of E. 20th Avenue
 - » Amazon Parkway and the extension of E. 20th Avenue
 - » Amazon Parkway and driveway of the former Civic Stadium site
 - » E. 30th Avenue and University Street

Bicycle and pedestrian investments include those listed under the No-Build Alternative plus the following:

- One new enhanced crossing at Amazon Parkway and E. 27th Avenue
- Two replaced enhanced crossings at the following locations:
 - » Amazon Parkway at the driveway of the Civic Stadium site (replaces existing pedestrian bridge over Amazon Parkway which would be decommissioned under this alternative)
 - » E. 30th Avenue and University Street
- Decommission existing pedestrian bridge over Amazon Parkway between South Eugene High School and the Civic Stadium site (would be replaced with enhanced crossing)

- Reconstruct sidewalks at some locations and replace curb ramps at all locations where construction occurs
- Construct sidewalk bulb outs (extending into the roadway) at stops to allow buses to stop without leaving the travel lane
- Stripe a buffered bicycle lane on:
 - » Pearl Street from E. 11th Avenue to E. 19th Avenue
 - » Oak Street from E. 11th Avenue to E. 20th Avenue

Construction of a 2-way cycle track on High Street from E. 10th Avenue connecting to the Amazon Multi-Use Path at E. 19th Avenue was originally planned as part of the EmX Alternative, however, the City has been able to fund and advance this bicycle investment separate from the MovingAhead project. Construction of this project may eliminate the need for the striped buffered bicycle lane on Pearl and Oak Streets as part of the Enhanced Corridor Alternative.

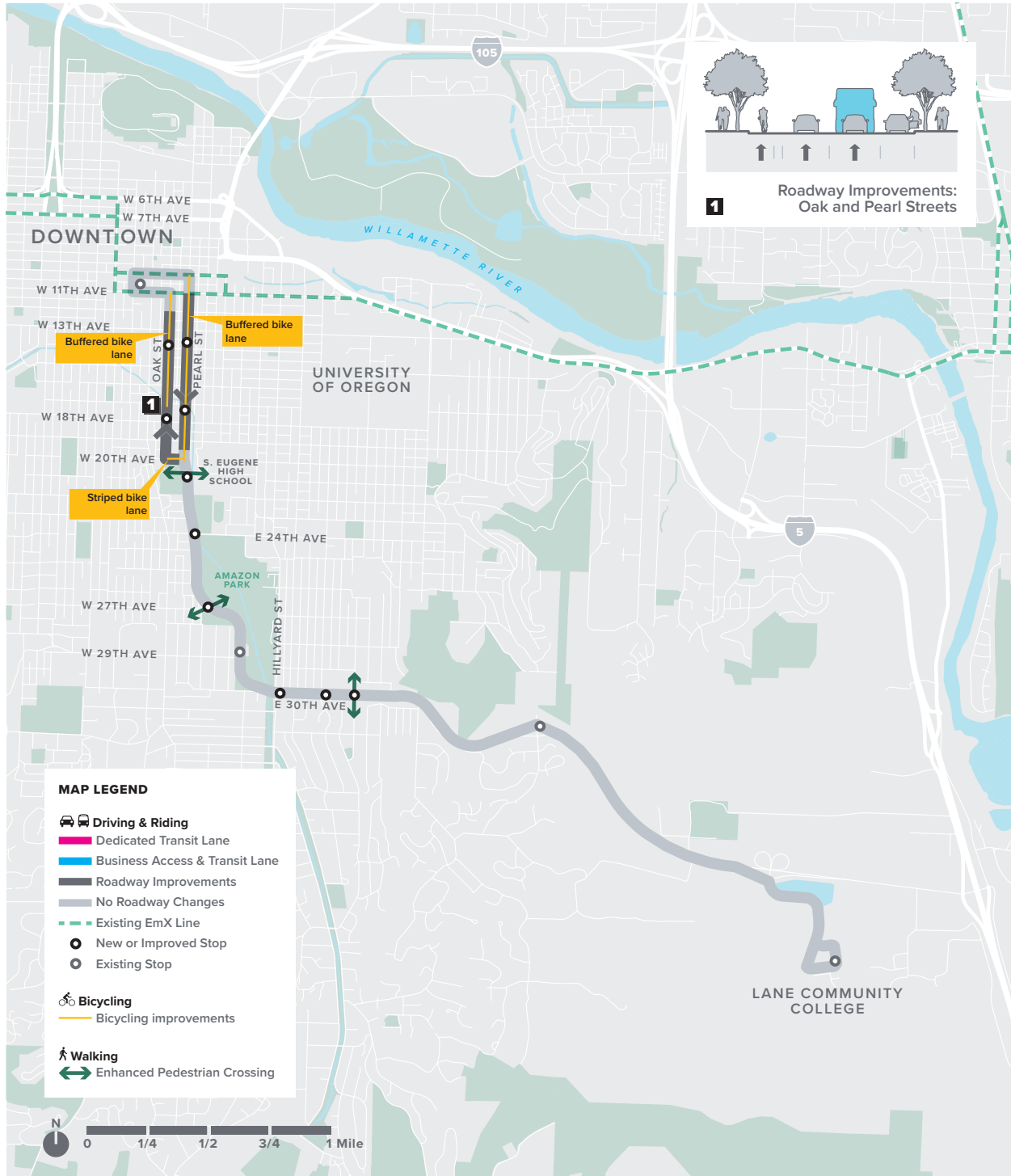
Bus stops would be spaced approximately 0.25 mile to 0.33 mile apart, except where existing bus stops and spacing would be used. Some stops would be improved with seating and shelters. Due to increased stop spacing and the elimination of Routes 81 and 82, 30 existing bus stops in the corridor would be eliminated under this alternative as compared to the No-Build Alternative.

Under the Enhanced Corridor Alternative, 4 existing stops would be used for the enhanced bus service, but would not receive capital investments; 6 existing stop locations would receive capital investments; and, 11 new stop locations would be constructed (Table 6-3).

The corridor terminates at LCC. The bus would layover at this location before picking up inbound passengers. The terminus includes 3 existing layover spaces for 60-foot articulated buses. An operator bathroom facility would be constructed at this layover facility.

Under the Enhanced Corridor Alternative, LTD would have 71 fixed-route service buses (mix of 40-foot and 60-foot buses) and 14 spares operating in the system, a reduction of 4 buses and 1 spare compared to the No-Build Alternative.

Figure 6-1: 30th Avenue to LCC Corridor Enhanced Corridor Alternative



Source: MovingAhead Project Team.

Table 6-3: 30th Avenue to LCC Corridor Enhanced Corridor Alternative Bus Stops

<p>Existing Stops Remain – No Capital Investments</p> <p>4</p>	<ul style="list-style-type: none"> • Eugene Station • Amazon Station • Spring Boulevard and E. 30th Avenue eastbound • Spring Boulevard and E. 30th Avenue westbound
<p>Existing Stops Remain – Receive Capital Investments</p> <p>6</p>	<ul style="list-style-type: none"> • Amazon Parkway and E. 24th Avenue eastbound • Amazon Parkway and E. 24th Avenue westbound • E. 30th Avenue and Harris Street eastbound • E. 30th Avenue and University Street westbound • E. 30th Avenue and University Street eastbound • LCC Terminus (operator restroom facility is added)
<p>New Stop Locations</p> <p>11</p>	<ul style="list-style-type: none"> • Oak Street and E. 14th Avenue northbound • Pearl Street and E. 14th Avenue southbound • Pearl Street and E. 17th Avenue southbound • Oak Street and E. 18th Avenue northbound • Amazon Parkway and the former Civic Stadium site driveway northbound • Amazon Parkway and the former Civic Stadium site driveway southbound • Amazon Parkway and E. 27th Avenue northbound • Amazon Parkway and E. 27th Avenue southbound • E. 30th Avenue and Hilyard Street westbound • E. 30th Avenue and Hilyard Street eastbound • E. 30th Avenue and Harris Street westbound
<p>Stops Eliminated</p> <p>30</p>	<ul style="list-style-type: none"> • Locations to be determined during final design

Source: CH2M et al. 2016.

EmX Alternative

Operations

Roadway operations under the EmX Alternative would be similar to that of the No-Build Alternative with the following exceptions:

- Every traffic signal on the corridor would receive transit signal priority to reduce delay for bus rapid transit (BRT) vehicles
- One traffic signal at Pearl Street/E. 19th Avenue would include a transit queue jump, providing exclusive transit signal phasing allowing transit vehicles to safely enter traffic flow or travel through the intersection
- The number of general-purpose lanes would be reduced to construct a business access and transit (BAT) lane on Pearl Street, which would reduce vehicular capacity and allow right-turning vehicles only
- Up to 79 on-street parking spaces on Oak and Pearl Streets would be eliminated between approximately 12th and 19th Avenues; up to 7 new on-street parking spaces would be added at select locations
- The extension of E. 20th Avenue from Oak Street to Amazon Parkway would increase roadway connectivity for vehicles
- Installation of 4 new traffic signals would improve traffic operations at those intersections
- Prohibition of eastbound to northbound turning movements from E. 30th Avenue onto Hilyard Street would affect traffic operations at this intersection

Existing fixed-service bus operations on Routes 81 and 82 would be replaced by EmX service. Operations on Route 92 would remain the same as the No-Build Alternative.

BRT vehicles would primarily operate in mixed traffic, except at transit queue jump locations, bus-only left-turn lanes, and sections of BAT lanes on Oak and Pearl Streets. Under the EmX Alternative, the EmX system would extend from Eugene Station south to LCC.

EmX service is assumed to run from 6:45 a.m. to 11:30 p.m. weekdays, 7 a.m. to 11 p.m. Saturdays, and 8 a.m. to 8 p.m. Sundays. For purposes of this analysis, service frequencies are assumed to be 10 minutes during all periods.

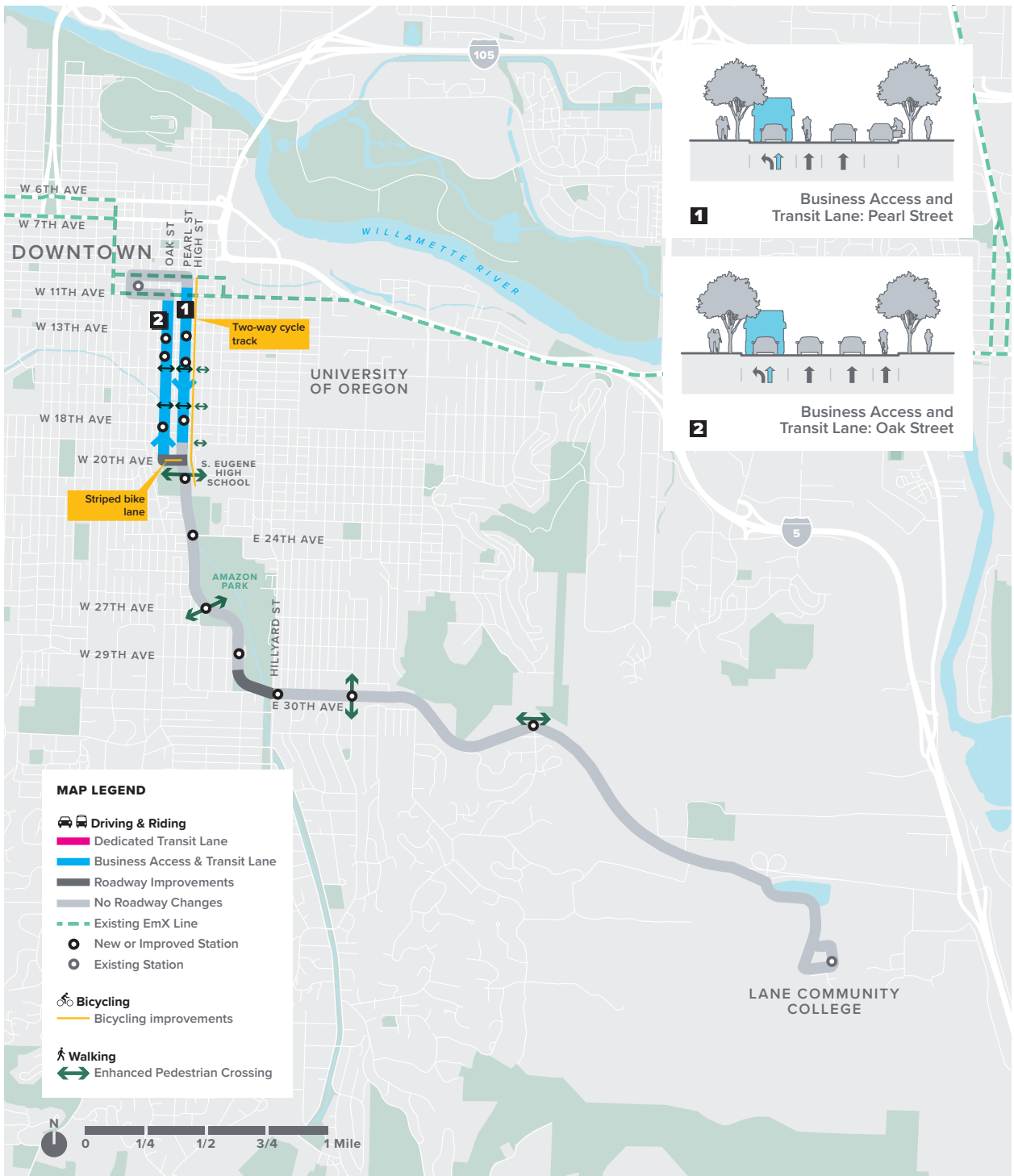
The EmX Alternative would result in 1,052 additional average weekday BRT VMT and 50 additional average weekday BRT revenue hours as compared to the No-Build Alternative.

Capital Investments

The EmX Alternative would include the following roadway capital investments in addition to those of the No-Build Alternative (Figure 6-2):

- Remove a general-purpose lane on Pearl Street from E. 10th Avenue to E. 19th Avenue to construct a BAT lane
- Remove on-street parking on Oak Street from E. 20th Avenue to E. 11th Avenue to construct a BAT lane
- Add new on-street parking along Oak and Pearl Streets (partially replacing the existing on-street parking removed)
- Extend E. 20th Avenue from Oak Street to Amazon Parkway as a 60-foot-wide street (with cross section to be determined through City development review)
- Construct new traffic signals at:
 - » Oak Street and the extension of E. 20th Avenue
 - » Amazon Parkway and the extension of E. 20th Avenue
 - » Amazon Parkway and the driveway of the former Civic Stadium site
 - » E. 30th Avenue and University Street
- Construct transit queue jump at the intersection of E. 19th Avenue and Pearl Street
- Construct new left-turn lane from Amazon Parkway to westbound E. 20th Avenue
- Extend existing bus-only turn lane on Amazon Parkway into Amazon Station to accommodate 2 articulated BRT vehicles

Figure 6-2: 30th Avenue to LCC Corridor EmX Alternative



Source: MovingAhead Project Team.

Bicycle and pedestrian investments include those listed under the No-Build Alternative plus the following:

- Two replaced enhanced crossings at the following locations:
 - » Amazon Parkway at the driveway of the Civic Stadium site (replaces existing pedestrian bridge over Amazon Parkway which would be decommissioned under this alternative)
 - » E. 30th Avenue and University Street
- Eight new enhanced crossings at the following locations:
 - » Pearl Street and E. 15th Avenue
 - » Oak Street and E. 15th Avenue
 - » High Street and E. 15th Avenue
 - » Pearl Street and E. 17th Avenue
 - » Oak Street and E. 17th Avenue
 - » High Street and E. 17th Avenue
 - » High Street and E. 19th Avenue
 - » Amazon Parkway at E. 27th Avenue
- Reconstruct sidewalks at some locations and replace curb ramps at all locations where construction occurs

Construction of a 2-way cycle track on High Street from E. 10th Avenue connecting to the Amazon Multi-Use Path at E. 19th Avenue was originally planned as part of the EmX Alternative; however, the City has been able to fund and advance this bicycle investment separate from the MovingAhead project.

EmX stations would be spaced approximately 0.33 mile to 0.5 mile apart, except where existing station facilities and spacing would be used. EmX stations would have level boarding and tactile treatment to help facilitate BRT vehicle docking and boarding and alighting of passengers, as well as amenities like shelters, benches, trash receptacles, bicycle racks, and fare payment kiosks.

Under the EmX Alternative, there would be no changes from the No-Build Alternative for bus facilities, except for the removal of up to 30 bus stops due to replacement of fixed-route service with EmX service, which has greater station spacing. Under the EmX Alternative, 20 new EmX stations would be constructed (Table 6-4).

The corridor terminates at LCC. BRT vehicles would layover at this location before picking up inbound passengers. The terminus includes 2 layover spaces for BRT vehicles. An operator bathroom facility would be constructed at this layover facility.

Under the EmX Alternative, 1 bus bay at Eugene Station and 2 bus bays at Amazon Station would be improved to accommodate BRT vehicles.

Under the EmX Alternative, LTD would have 68 fixed-route service buses (mix of 40-foot and 60-foot buses) and 14 spares operating in the system, a reduction of 7 vehicles (includes 1 spare) as compared to the No-Build Alternative. LTD would have 22 BRT vehicles (60-foot articulated) and 6 spares operating in the system, an addition of 4 BRT vehicles (includes 1 spare) as compared to the No-Build Alternative.

Table 6-4: 30th Avenue to LCC Corridor EmX Alternative Stations

<p>Existing EmX Stations Remain – No Capital Investments</p> <p>1</p>	<ul style="list-style-type: none"> • Eugene Station
<p>New EmX Station Locations</p> <p>21</p>	<ul style="list-style-type: none"> • Oak Street and E. 13th Avenue northbound • Pearl Street and E. 13th Avenue southbound • Oak Street and E. 15th Avenue northbound • Pearl Street and E. 15th Avenue southbound • Oak Street and E. 18th Avenue northbound • Pearl Street and E. 18th Avenue southbound • Amazon Parkway and the former Civic Stadium site driveway northbound • Amazon Parkway and the former Civic Stadium site driveway southbound • Amazon Parkway and E. 24th Avenue northbound • Amazon Parkway and E. 24th Avenue southbound • Amazon Parkway and E. 27th Avenue northbound • Amazon Parkway and E. 27th Avenue southbound • Amazon Station (2 stations) • E. 30th Avenue and Hilyard Street westbound • E. 30th Avenue and Hilyard Street eastbound • E. 30th Avenue and University Street westbound • E. 30th Avenue and University Street eastbound • Spring Boulevard westbound and E. 30th Avenue • Spring Boulevard eastbound and E. 30th Avenue • LCC Terminus (including operator restroom facility)
<p>Stops Eliminated</p> <p>30</p>	<ul style="list-style-type: none"> • Locations to be determined during final design

Source: CH2M et al. 2016.

Table 6-5: Summary of 30th Avenue to LCC Corridor Attributes of Alternatives

Corridor Attribute	No-Build	Enhanced Corridor	EmX
Annual Corridor Transit Trips ¹	10,850 trips	10,720 trips	11,575 trips
Annual Systemwide Transit Trips ²	46,410 trips	46,310 trips	47,070 trips
Change in Transit Trips Compared to No-Build	N/A	-100 trips	660 trips
Average Transit Travel Time ³	17 minutes	16 minutes	15 minutes
Change in Transit Travel Time Compared to No-Build	N/A	-1 minute	-2 minutes
Corridor Length (1-way, capital investments) ⁴	N/A	6.3 miles	6.3 miles
Corridor Length (round-trip miles)	10.2 miles	10.2 miles	10.2 miles
Exclusive / Priority Lanes (round-trip miles) ⁵	N/A	N/A	1.37 miles
Percent Exclusive / Priority Lane of New Corridor	N/A	0%	13.4%
Transit Vehicles (operating systemwide)	74 buses 15 spare buses 19 BRT vehicles 5 spare BRT vehicles	71 buses 14 spare buses 19 BRT vehicles 5 spare BRT vehicles	68 buses 14 spare buses 22 BRT vehicles 6 spare BRT vehicles

Source: MovingAhead Project Team.

Notes:

- 1 Corridor transit trips are defined as any EmX or bus trip with at least 1 trip end in the corridor, excluding downtown or the University of Oregon. Source: DKS. Draft Transportation Technical Report. 2018.
- 2 Systemwide transit trips are defined as 1-way linked trips taken by a person from the trips origin to the trips destination, independent of the number of vehicles or transfers used to complete the trip. Source: DKS. Draft Transportation Technical Report. 2018.
- 3 Values represent average travel time for A.M. peak hour from Eugene Station to Corridor Terminus (in minutes). Source: LCOG. LCOG Regional Travel Demand Model. 2016.
- 4 This is the mileage of the corridor used to calculate the cost per corridor mile (not construction mile) and is the overall physical length of the corridor which does not correspond to the round-trip distance either bus or EmX service would travel on a corridor.
- 5 Exclusive/priority lanes include round-trip miles of business access and transit lanes, bus-only lanes, and queue jumps.

Capital Cost Estimates

The potential cost of each alternative was estimated based on the concept design (Figure 6-3 and Table 6-6). ROW, parking, utility relocations, and other impacts associated with the construction footprint were factored into the cost estimates. Capital cost estimates were based on historic construction bid data from other similar projects, including existing EmX corridors, and include escalation factors to bring costs to 2016 dollars and contingency costs. These planning-level cost estimates conform to FTA's Standardized Cost Categories for Small Starts capital projects.

The capital cost per mile is calculated in 2 different ways: cost per corridor mile length and cost per construction mile. The cost per corridor mile is based on the total capital cost divided by the round-trip distance the bus or BRT vehicle would travel on a corridor. The cost per construction mile is based on the total capital cost divided by the total combined length of construction areas for each direction of travel.

No-Build Alternative

No construction is anticipated as part of the MovingAhead project under the No-Build Alternative, therefore, no capital costs are anticipated.

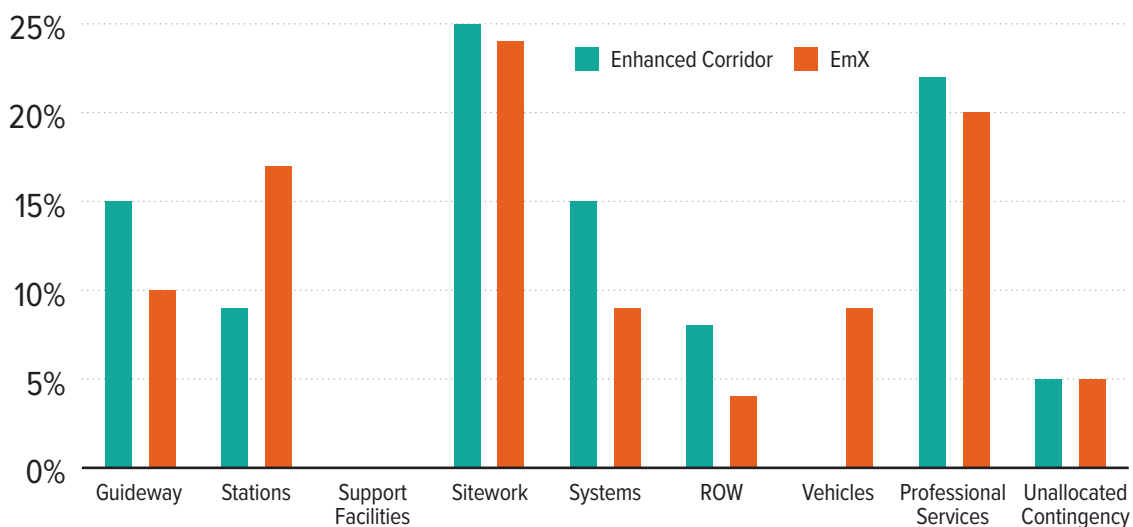
Enhanced Corridor and EmX Alternatives

30th Avenue to LCC Enhanced Corridor Alternative capital costs are estimated to be **\$21 million**, approximately **\$3.4 million/construction mile** with 6.3 miles of construction and **\$2.1 million/corridor mile** with 10.2 corridor miles.

30th Avenue to LCC Corridor EmX Alternative capital costs are estimated to be **\$53 million**, approximately **\$8.5 million/construction mile** with 6.3 miles of construction and **\$5.2 million/corridor mile** with 10.2 corridor miles.

Both the Enhanced Corridor and EmX Alternatives assume constructing an extension of E. 20th Avenue from Oak Street to Amazon Parkway, which contributes to a high mixed-traffic guideway (segments of roads where the transit vehicle travels in traffic with other vehicles) category cost relative to other corridors. Reconstruction of portions of Oak and Pearl Streets in downtown Eugene to accommodate concrete BAT lanes increases the cost of the EmX Alternative guideway category relative to the Enhanced Corridor Alternative guideway category, as shown in Figure 6-3. Despite these substantive guideway improvements, this cost category represents only a small percentage of the overall project cost for either alternative. More details about specific costs in the cost categories are provided in Chapter 10 of this AA.

Figure 6-3: 30th Avenue to LCC Corridor Capital Investments by Cost Category



Source: MovingAhead Project Team.

Operating and Maintenance Cost Estimates

Operating and maintenance (O&M) costs are an important factor in the selection of a preferred investment package since they represent ongoing costs to be borne by LTD's operating budget.

No-Build Alternative

With 93 peak vehicles (74 buses, 19 BRT vehicles), 278,600 revenue hours, and 4,520,200 revenue miles, systemwide annual O&M costs for the No-Build Alternative total **\$52.8 million**. For more detail on O&M costs refer to Table 6-6.

Enhanced Corridor Alternative

Service level changes for the 30th Avenue to LCC Corridor Enhanced Corridor Alternative reflect the operational efficiencies gained from capital and service design improvements that allow for more revenue miles per revenue hour (revenue hours decrease by 0.39% and revenue miles are increased by 1.00% over the systemwide total). This improved cycle time allows

the required number of peak vehicles to drop from 93 under the No-Build Alternative to 90 (71 buses, 19 BRT vehicles) under the Enhanced Corridor Alternative. These efficiencies would result in a systemwide annual cost of **\$52.3 million**, about \$0.5 million less than under the No-Build Alternative. For more detail on O&M costs refer to Table 6-6.

The analysis revealed service impacts as a result of replacing Route 81 service with Enhanced Corridor service. If this alternative is advanced to project development, additional service changes would be evaluated to determine most appropriate service design.

EmX Alternative

Revenue hours are modeled to increase by 1.22% and revenue miles would increase by 3.40%, with peak vehicles decreasing from 93 under the No-Build Alternative to 90 (68 buses, 22 BRT vehicles) under the EmX Alternative. These changes would lead to systemwide annual O&M costs of **\$53.3 million**, or an increase of \$0.5 million over the No-Build Alternative. For more detail on O&M costs refer to Table 6-6.



Table 6-6: Summary of 30th Avenue to LCC Corridor Cost Comparison of Alternatives

Corridor Attribute	No-Build	Enhanced Corridor	EmX
CAPITAL COST ESTIMATES (IN MILLIONS)			
Capital Cost ¹	N/A	\$21.0M	\$53.0M
Capital Cost /Corridor Mile	N/A	\$2.1M	\$5.2M
Capital Cost/Construction Mile	N/A	\$3.4M	\$8.5M
Percentage Pedestrian/Bicycle Costs (without contingency costs included)	N/A	8%	7%
OPERATING AND MAINTENANCE COST ESTIMATES			
Annual Systemwide Revenue Hours ²	278,600 hours	277,500 hours	282,000 hours
Annual Systemwide Miles	4,520,200 miles	4,565,400 miles	4,674,100 miles
Peak Transit Vehicles ³	93 vehicles	90 vehicles	90 vehicles
Annual LTD Operating Cost (in millions) ⁴	\$52.8M	\$52.3M	\$53.3M
Increase over No-Build	N/A	-\$.5M	\$.5M
Systemwide Operating Cost per Trip ⁵	\$3.79	\$3.76	\$3.77

Source: MovingAhead Project Team.

Notes:

- 1 Values are in 2016 dollars. Source: CH2M. Draft Capital Cost Estimating Technical Report. 2017.
- 2 Revenue service refers to all scheduled time a transit vehicle spends serving passengers. In this case, revenue service is confined to in-service time (excluding layovers, which are included in "Revenue Service" figure reported to the National Transit Database(NTD)) in order to relate to modelling outputs for the alternatives which are in-service forecasts from the LCOG Regional Travel Demand Model (2016).
- 3 Peak Transit Vehicles are the number of buses and BRT vehicles in operation to meet maximum demand.
- 4 Estimated operating and maintenance (O&M) costs represent potential ongoing costs that will be borne by LTD once the transit project is implemented. O&M costs were estimated for the evaluated alternatives using a fully allocated cost model for 2035 operations in accordance with FTA methods for estimating O&M costs for Transit Projects. Total systemwide annual O&M costs are the sum of costs related to 3 service categories forecasted for each alternative: revenue hours, revenue miles, and peak transit vehicles. Source: LTD. Draft Operating and Maintenance Costs Technical Report. 2017.
- 5 Cost/Trip are total operating costs divided by annualized systemwide average weekday trips. Passenger annualization of 300 is calculated from LTD 2016 ridership data and is used to translate average weekday to annual trips.

Environmental Consequences and Mitigation

Chapter 3 of this AA provides background information about the environmental topics evaluated for each alternative. Reading Chapter 3 is recommended before reading the summary of environmental consequences and mitigation for the 30th Avenue to LCC Corridor.

In this section, potential benefits and impacts of each alternative are discussed by environmental topic. Where there are no distinguishable differences in impacts between alternatives, the summary is combined. Impacts that are similar across all corridors and alternatives are described in Chapter 3. Cumulative impacts are discussed only for those resources where the MovingAhead project has the potential to make a substantive contribution to cumulative impacts.

Potential environmental impacts and benefits of each alternative are summarized in Appendix C and detailed throughout this chapter by environmental discipline.

Acquisitions and Displacements

The 30th Avenue to LCC Corridor is comprised of offices, commercial centers, and multi-family residential near the downtown then transitions to lower density residential south of W. 18th Avenue, and sparsely developed single-family residential and vacant undeveloped lands east of Spring Boulevard. The southern segment of this corridor also includes larger areas of parks and open space.

No-Build Alternative

No acquisitions or displacements are anticipated under the No-Build Alternative since no construction would take place as part of the MovingAhead project under this alternative.

Enhanced Corridor and EmX Alternatives

Based upon the current design, both alternatives would require acquisitions of small strips of land along roadway frontages (partial acquisitions) to accommodate the proposed transit improvements (Table 6-7). The Enhanced Corridor Alternative would require 13 partial property acquisitions, comprising an estimated 0.4 acre, while the EmX Alternative would require 20 partial property acquisitions, comprising an estimated 0.5 acre. No residences or businesses would be displaced under either of the 30th Avenue to LCC Corridor build alternatives. After property impacts were revealed during the analysis, additional evaluation was conducted to determine other ways to avoid or minimize impacts at some properties; this effort is documented in the Addendum to the MovingAhead Alternatives Analysis Technical Reports Memorandum (CH2M 2017). As the design of the build alternatives progresses, design refinements to minimize impacts to private properties would be incorporated. Property acquisition would impact off-street parking for 2 parcels under the EmX Alternative; neither alternative would have an impact on drive-through circulation for commercial properties.

Table 6-7: 30th Avenue to LCC Corridor Property Acquisition Impacts

		Enhanced Corridor	EmX
Partial Acquisitions	Commercial & Industrial	6	12
	Public & Institutional	5	5
	Residential	1	2
	Vacant Land	1	1
Full Acquisitions		0	0
Total Parcels Affected		13	20
Total Area of Acquisitions		0.4 acre	0.5 acre
Displacements		0	0
Parcels with Potential Parking and Access Impacts	Parking Impacts	0	2
	Driveway Closures	0	3
	Business access impacts: right-in or right-out turning movements	0	0
	Drive-Through Closures	0	0

Source: CH2M. Draft Acquisitions and Displacements Technical Report. 2017.



Air Quality

The Eugene-Springfield region completed the federally required 20-year maintenance period in 2014 for carbon monoxide with no exceedances. As a result, no regional carbon monoxide hot spot air modeling or local air quality impacts analysis is required for transportation projects in the region. However, for informational purposes, a regional burden analysis was conducted for the MovingAhead project.

The focus of the air quality analysis was to evaluate the differences between the regional and subarea pollutant emissions generated under build alternatives versus emissions generated under the No-Build Alternative. This comparison shows the broad effects of the proposed alternatives.

No-Build Alternative

Under the future No-Build Alternative conditions, air quality in the Eugene-Springfield region is expected to continue to improve. Despite increases in VMT, air quality has continued to improve because of the improvements in vehicle technology and fuel types.

Enhanced Corridor and EmX Alternatives

When compared to the No-Build Alternative, the percent change in the overall level of pollutants is negligible, with percentage changes all less than 1 % for impacts

(positive numbers) and improvements (negative numbers) (Table 6-8). The results of the Federal Transit Administration (FTA)-compliant air quality burden analysis show that the build alternatives received Medium to Low-Medium ratings. Medium rated projects are predicted to have a negligible effect on air quality. Projects with ratings of Low-Medium and Low are predicted to have slight improvements in air quality. The EmX Alternative rates slightly better than the Enhanced Corridor Alternative as it would result in more transit trips and fewer single occupancy vehicle trips.

Temporary air quality impacts associated with the construction of each build alternative are expected, and those impacts are predicted to be approximately the same regardless of the alternative selected. During construction, carbon monoxide and particulate matter are expected to increase due to heavy construction vehicles, lowered traffic speeds, earth excavation, and occasionally open burning.

Construction contractors are required to comply with state regulations which address visible emissions and nuisance requirements. Violations of the regulations can result in enforcement actions and fines. The regulations provide a list of reasonable precautions to be taken to avoid dust emissions. These control measures would be documented in the pollution control plan that the contractor is required to submit prior to construction.

Table 6-8: 30th Avenue to LCC Corridor Percent Change in Air Quality from 2035 No-Build Alternative

Primary Pollutants	Enhanced Corridor	EmX
Carbon monoxide (CO)	0.01%	-0.02%
Nitrous oxide (NOx)	0.00%	0.00%
Volatile organic compounds (VOC)	0.01%	-0.01%
Particulate Matter – 2.5 microns in diameter (PM _{2.5})	0.01%	-0.01%
Rating	Medium	Low-Medium

Source: Michael Minor and Associates. Draft Air Quality Technical Report. 2017.

Community, Neighborhoods, and Environmental Justice

The 30th Avenue to LCC Corridor goes through or touches 7 neighborhoods: the Downtown, West University, Friendly Area, Amazon, Southeast, Fairmount, and Laurel Hill Valley neighborhoods, before continuing into unincorporated Lane County (Figure 6-4).

The study area for both build alternatives includes 2 additional neighborhoods: Jefferson Westside and South University. The study area for the Enhanced Corridor Alternative also includes the University of Oregon Campus, and Whiteaker neighborhoods.

Several social service organizations within the study area offer services to minority and low-income populations, including organizations that provide affordable housing and food. Within 0.25 mile of the Enhanced Corridor Alternative, there are 53 community and public facilities, including 1 affordable housing facility (West Town), 2 shelter facilities (including St. Vincent de Paul's First Place Family Center), and 1 food bank (Food for Lane County). Within 0.5 mile of the EmX Alternative, there are 114 community and public facilities, including 2 affordable housing facilities (West Town and Firwood Apartments), 2 shelter facilities.

The study area includes major employment centers, tourist attractions, retail businesses, and colleges that generate trips to and from the area. Government services (for example, public schools, LCC, and the University of Oregon), medical industries, telephone data collection, and staffing agencies are the top employers. Many large employers in the region are within 0.5 mile of the corridor. Total employment in Lane County is projected to increase by about 10% in the 10 year period from 2014 to 2024, with the greatest increase (about 16%) expected in education and health services, which are top employers in the corridor.

No-Build Alternative

No construction is planned as part of the MovingAhead project under the No-Build Alternative, so this alternative would not result in negative impacts on neighborhoods, community facilities, or public services, nor would there be any disproportionately adverse impacts to minority and/or low-income populations. The No Build Alternative would also not likely result in any economic benefits associated with development in the area around stops or EmX stations. The No-Build Alternative would not improve transportation safety that could reduce the number of potential conflicts among people walking, biking, and driving to the same degree as the investments under the build alternatives.

Enhanced Corridor and EmX Alternatives

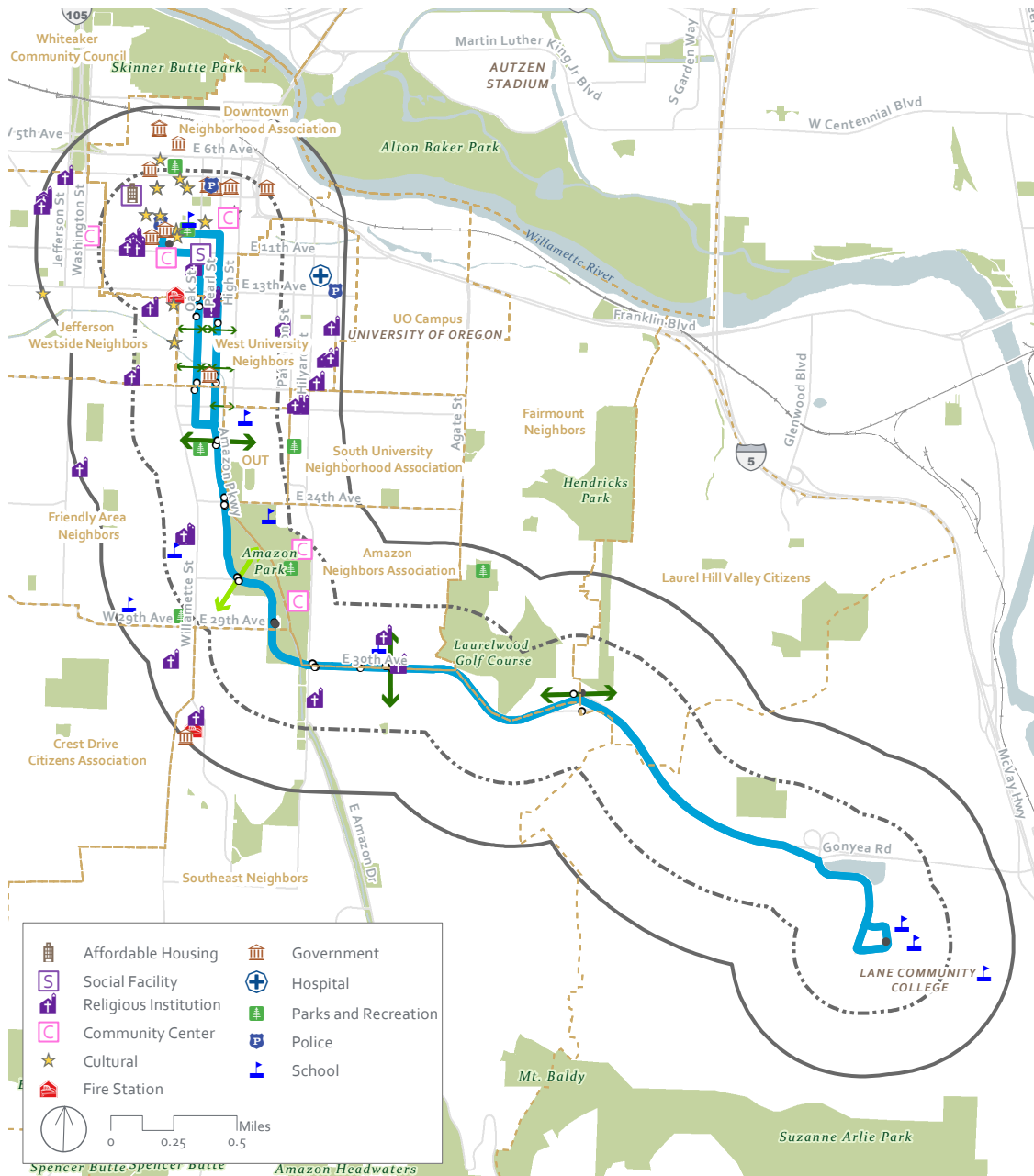
Potential effects of the build alternatives include:

- **Neighborhoods.** Neither build alternative would adversely impact community character. A total of 0.4 acre of land would potentially be acquired from 13 parcels (partial acquisitions) under the Enhanced Corridor Alternative, and a total of 0.5 acre from 20 parcels (partial acquisitions) for the EmX Alternative. No businesses or residences would be displaced under either alternative. Mitigation may be possible at some locations to further avoid or minimize impacts at some properties. These mitigations are outlined in Addendum to MovingAhead Alternatives Analysis Technical Reports Memorandum (CH2M 2017).

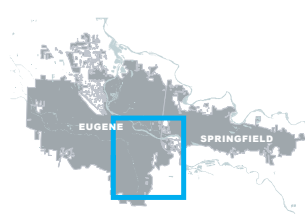
Up to 54 medium and large street trees and 4 medium and large landscape trees would be removed under the Enhanced Corridor Alternative and up to 98 street trees and 4 landscape trees would be removed under the EmX Alternative. Tree removal would be mitigated through replanting.

Safety for people walking, using mobility devices, and biking in the corridor would be improved with 1 new enhanced crossing and 2 replaced existing enhanced crossings, and improved sidewalks and bicycle facilities under the Enhanced Corridor Alternative, and 8 new enhanced crossings, 2 replaced existing enhanced crossings, and improved sidewalks and bicycle facilities under the EmX Alternative. No potential noise impacts are expected under the

Figure 6-4: 30th Avenue to LCC Corridor Community Resources



Locator Map



Legend

- 30th Ave/LCC Corridor
- EmX Alternative API
- Enhanced Corridor Alternative API
- Neighborhood
- ↔ New Pedestrian Crossing
- ↔ Enhanced Existing Pedestrian Crossing
- Existing Without Improvements
- Proposed or Existing with Improvements

Community Resources
30th Ave/LCC Corridor

Note: Both EmX and Enhanced Corridor Alternatives Shown



Document Path: C:\Users\KH033777\Projects\MovingAhead\GIS\MapFiles\Social_Facilities\Level2_Corridor_EnviroAnalysis_Social\CorridorExtent_CommFac30thEC.mxd

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Source: CH2M. Draft Community, Neighborhood, and Environmental Justice Technical Report. 2017.

Enhanced Corridor Alternative. Potential noise impacts might occur at 9 properties (single-family, multi-family, hotel, and church properties) under the EmX Alternative; it is expected that all can be mitigated.

- **Transportation and Accessibility.** Both build alternatives would increase transit accessibility and reliability for residents within the neighborhoods near the corridor. The presence of 17 new or enhanced stops (of 21 total stops) under the Enhanced Corridor Alternative or 21 new stations (of 22 total stations) under the EmX Alternative would not change the overall visual setting of any neighborhoods because the alternatives are located on main arterials within an urban setting that already includes bus service. Both alternatives would increase connectivity to other transit connections in the downtown area including the West Eugene and Franklin EmX service. The improved reliability of transit service under both alternatives and reduced headways under the EmX Alternative could attract additional riders.
- **Community Facilities and Public Services.** Minor property acquisitions and temporary construction easements would be required from South Eugene High School, LCC, the Proposed Civic Stadium Park, and Amazon Park under the Enhanced Corridor Alternative. Under the EmX Alternative, minor acquisitions and temporary construction easements would be required from Camus Ridge Elementary School in addition to South Eugene High School, LCC, the Proposed Civic Stadium Park, and Amazon Park. Design refinement could further avoid or reduce impacts to these facilities. Transit users would benefit from improved accessibility to these facilities. No conflicts with emergency services are anticipated.
- **Economics.** The loss in property tax revenues to the City resulting from acquisition of privately owned land would be negligible under both build alternatives. The Enhanced Corridor Alternative would decrease transit service frequency in this corridor, which could negatively affect businesses by making access less convenient for customers. This change might reduce ridership and overall accessibility to businesses.

The Enhanced Corridor Alternative would result in the removal of no off-street parking stalls and 69 on-street parking stalls (after mitigation), while the EmX

Alternative would result in the removal of 16 off-street parking stalls and 140 on-street parking stalls (after mitigation). Efforts to avoid and minimize impacts to parking are documented in the Addendum to MovingAhead Alternatives Analysis Technical Reports Memorandum (CH2M 2017).

Construction of either build alternative would result in an increase in construction related jobs and expenditures in the corridor and community with more jobs generated and greater expenditures anticipated under the EmX Alternative. Both build alternatives would improve accessibility to employment locations along the 30th Avenue to LCC Corridor and in the downtown business district. The permanent infrastructure and increased transit frequency of the EmX Alternative would offer a greater improvement in transit reliability, which would lead to increased business exposure, and over time could support and foster accelerated rates of transit-oriented development (TOD) implementation in areas planned and designated for mixed-use and multi-family residential development to a greater degree than under the Enhanced Corridor Alternative.

- **Environmental Justice.** All of the identified adverse impacts under either build alternative can be mitigated or minimized to a low severity. None of the impacts to environmental justice populations would be greater in magnitude than impacts that would be experienced by non-minority and non-low-income populations within the study area. Because the build alternatives would result in primarily beneficial effects, and no adverse impacts are anticipated after mitigation, no disproportionate high and adverse impacts on minority and low-income populations are anticipated.

Impacts during construction would be similar for the Enhanced Corridor and EmX Alternatives, involving noise and dust from construction equipment. Impacts would be greater with the EmX Alternatives than with the Enhanced Corridor Alternative because of the larger construction footprint related to EmX stations and longer linear construction. The construction impacts would be short-term in nature and would typically end once construction is completed.

Cultural Resources

Archaeological (Below Ground) Resources

No archaeological sites are currently recorded within the area of potential effect (APE). Forty-four previous investigations have been conducted within 1 mile of the APE, 1 of which included portions of the APE. Eleven archaeological sites have been recorded within the broader 1-mile study area.

A pedestrian archaeological survey of the 30th Avenue to LCC Corridor was conducted in September 2016. The surface survey inspected the proposed construction areas of the build alternatives. No prehistoric or demonstrably historical artifacts, features, or sites were observed during this surface survey. Oak and Pearl Streets are part of the long-standing street grid of central Eugene. The makeup of this neighborhood has shifted over time and is currently mainly commercial with some residential properties, with an eclectic mix of older and newer structures. Development and redevelopment of the properties, with associated changes to adjoining sidewalks, driveways, and the underlying buried utility infrastructure has very likely disturbed most, if not all, of the ground along the city streets. Development and street investments along E. 30th Avenue have similarly disturbed the ground in this area. Less soil disturbance has likely occurred along Amazon Parkway, but even here disturbance likely occurred in clearing and grading the road area, which may have included cutting some depression areas for water runoff and constructing portions of the raised roadbed. The potential for intact archaeological materials, surface or buried, in the 30th Avenue to LCC Corridor is low.

Historic (Above Ground) Resources

South of the downtown core, the region between Willamette and Hilyard Streets is bisected by Amazon Creek, which was prone to seasonal flooding. Because of this, much of the land in south Eugene immediately adjacent to Amazon Creek remained undeveloped until the mid-20th century, when the U.S. Army Corps of Engineers manipulated the waterway for flood control purposes.

LCC, located at the southeastern end of 30th Avenue, was founded in 1964, and much of the residential development along 30th between Hilyard Street and LCC occurred during the late 1950s through the early 1970s.

A historic records review and windshield survey of the corridor was conducted in September 2016. Eighty-nine resources that are potentially eligible for listing on the National Register of Historic Places were identified in the 30th Avenue to LCC Corridor. These resources would be protected under Section 106. There are 4 historic resources that are formally listed on the National Register of Historic Places (NRHP) and 2 City Landmarks recognized along the corridor. The 2 City Landmarks include 1143 Oak Street, a converted fraternity house that is now used as a multi-unit residential structure, and 1412 Pearl Street, a converted residential structure now used for commercial purposes.

No-Build Alternative

No impacts to historic or archaeological resources are anticipated because no construction would occur as part of the MovingAhead project under the No-Build Alternative.

Enhanced Corridor and EmX Alternatives

No impacts to archaeological resources are anticipated under either of the build alternatives because there are no identified resources in the APE and the likelihood of encountering any is low. Although no impacts to archaeological resources are anticipated, an Inadvertent Discovery Plan should be in place prior to construction. It would outline measures to be undertaken in the event of an unanticipated archaeological discovery.

Three historic resources may be affected by direct, long-term impacts, including strip takes (partial property acquisitions), and construction of shelters and planting strips under the Enhanced Corridor Alternative; 4 historic resources would be directly affected by construction of stations and strip takes under the EmX Alternative. Additional resources are anticipated to experience indirect impacts, including strip takes, access changes,

and construction of shelters/stations that affect the integrity of the property’s location, setting, feeling, or association, under the build alternatives (Table 6-9). Aside from the direct and indirect impacts identified, it is assumed that there would be no additional short-term

impacts (noise, air, access, etc.) to historic resources associated with construction because construction duration would be very short (ideally less than 2 weeks) in any given location.

Table 6-9: Impacts to Identified Historic Resources Along the 30th Avenue to LCC Corridor

Historic Resource Address	Preliminary Eligibility Evaluation	Enhanced Corridor		EmX	
		Long-term Direct Impacts	Indirect/Cumulative Impacts	Long-term Direct Impacts	Indirect/Cumulative Impacts
112 E. 13th Ave	Contributing		Planting Strip		
1290 Oak St	Contributing		Planting Strip		
1330 Oak St	Contributing			EmX Station Strip Take	
1339 Oak St	Contributing		Planting Strip		EmX Station
1348 Oak St	Contributing			EmX Station Strip Take	
1358 Oak St	Contributing				EmX Station
1372 Oak St	Contributing		Enhanced Shelter		
1390 Oak St	Contributing		Enhanced Shelter		
1483 Oak St	Contributing		Planting Strip		
1815 Oak St	Contributing				EmX Station
1210 Pearl St	Contributing		Planting Strip		
1234 Pearl St	Contributing		Planting Strip		
1264 Pearl St	Contributing		Planting Strip		
1280 Pearl St	Contributing		Planting Strip		
1290 Pearl St	Contributing		Planting Strip		
1300 Pearl St	Contributing		Planting Strip		EmX Station
1361 Pearl St	Contributing		Enhanced Shelter		
1375 Pearl St	Contributing		Enhanced Shelter		
1389 Pearl St	Contributing		Enhanced Shelter		
1390 Pearl St	Contributing	Enhanced Shelter	Planting Strip		
1412 Pearl St	Contributing / City Landmark		Planting Strip		
1430 Pearl St	Contributing		Planting Strip		
1442 Pearl St	Contributing		Planting Strip		EmX Station

Table 6-9: Impacts to Identified Historic Resources Along the 30th Avenue to LCC Corridor (cont'd)

Historic Resource Address	Preliminary Eligibility Evaluation	Enhanced Corridor		EmX	
		Long-term Direct Impacts	Indirect/Cumulative Impacts	Long-term Direct Impacts	Indirect/Cumulative Impacts
1454 Pearl St	Contributing				EmX Station
1478 Pearl St	Contributing				EmX Station
1492 Pearl St	Contributing				EmX Station
1570 Pearl St	Contributing	Strip Take			
1598 Pearl St	Contributing	Strip Take			
1733 Pearl St	Contributing				EmX Station
1940 Pearl St	Contributing		Planting Strip		
74 E. 18th Ave	Contributing				
1150 E. 29th Ave	Contributing/ Significant		Enhanced Shelter		EmX Station
3015 University St	Contributing		Enhanced Shelter		
3005 Harris St	Contributing		Enhanced Shelter		

Source: Heritage Research Associates. Draft Cultural Resources Technical Report. 2017.

Notes:

- 1 Table does not include downtown, 6th, 7th, 11th, or 13th Avenue segments addressed in previous LTD studies and for which no changes are proposed. Table does not include historic resources that would not be impacted by either build alternative
- 2 Strip takes are partial acquisitions of a property in which a small strip of land along the roadway frontage is acquired for transit investments.

Ecosystems

The northern part of the 30th Avenue to LCC Corridor is located within a highly urbanized area consisting of residential and commercial development. The southern part is located within a less developed and wooded corridor along E. 30th Avenue. The southern terminus is located within LCC.

The highly developed areas do not possess substantial habitat features and generally lack sensitive ecosystem features. Existing habitat conditions are conducive to plant and wildlife species that are commonly found in urban areas.

Waterways within the study area include Amazon Creek and Russel Creek. The project corridor is located a minimum of 0.43 mile from the Willamette River. Construction of the build alternatives is proposed immediately adjacent to Amazon Creek and at a minimum of 0.43 mile from the Willamette River and 0.25 mile from Russel Creek. Portions of Amazon Creek have a 60-foot Riparian Corridor setback, as required by the City.

Wetlands are mapped adjacent to the 30th Avenue to LCC Corridor. Prior to construction, detailed onsite wetland determination and delineation work would occur. It is possible that additional wetland areas may be identified at that time.

There is no designated critical habitat within the study area. The nearest designated critical habitat is for Chinook salmon located at the Willamette River at least 0.43 mile from construction limits. The minimum distance from the corridor to designated critical habitat for Willamette daisy is approximately 3.0 miles. Although Bradshaw's lomatium (*Lomatium bradshawii*) is not documented as occurring, in the study area, it is documented as occurring immediately adjacent to the study area.

A list of protected federal and state listed species documented as occurring in the project vicinity is presented in Chapter 3. No other listed species are known to occur within or immediately adjacent to the study area.

No-Build Alternative

The No-Build Alternative would not involve any construction activities associated with the MovingAhead project 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 species listed under the Endangered Species Act or designated critical habitat. The No-Build Alternative would not result in any long-term direct impacts to wetlands or waterways.

Enhanced Corridor and EmX Alternatives

Trees

Based on the assessment of potential impacts to street and landscape trees, within the Charter Tree boundary, up to 54 medium and large street trees under the Enhanced Corridor Alternative and up to 98 street trees would be removed under the EmX Alternative, slightly reducing available habitat for avian species in the corridor under both alternatives (Table 6-10). Under both alternatives, up to an additional 4 medium and large landscape trees would be removed outside of the Charter Tree boundary. Any tree removal would occur in accordance with local regulations and would be mitigated through replacement. Mitigation would offset any long-term direct impacts.

Fish

Both build alternatives would result in new, reconstructed, and adjoining impervious surface. Stormwater runoff from new impervious surfaces could reach fish bearing waterways. The Enhanced Corridor Alternative would result in 110,800 square feet (SF) of new, reconstructed and adjoining impervious surface, of which approximately 98,500 SF would drain to Amazon Creek and the remaining 12,300 SF would drain to the Willamette River. The EmX Alternative would result in greater impervious surface with approximately 209,300 SF of impervious surface, of which approximately 151,400 SF would drain to Amazon Creek, 56,200 SF would drain to the Willamette River, and the remaining 1,700 SF would drain to Russel Creek. The runoff draining to Amazon Creek would travel

over 25 miles before reaching the Willamette River where listed fish and designated critical habitat are located. Runoff from the increase in impervious surface would be required to meet the Oregon Department of Transportation (ODOT)'s or the City's stormwater design standards, depending on the roadway jurisdiction, as well as Oregon Department of Environmental Quality (DEQ) standards. Stormwater treatment would remove pollutants, minimize erosion, and control the flow so that the build alternatives would not significantly impact threatened fish species or designated critical habitat.

Potential cumulative stormwater effects to the Amazon Creek and downstream designated critical habitat in the Willamette River would be mitigated by meeting the required stormwater standards.

Construction activities would result in short-term changes to water quality that could affect fish species and their habitat, such as the potential for sediment transport to waterways. Because erosion prevention and sediment control measures would be implemented, none of these effects would be significant.

Wetlands

While wetlands are mapped adjacent to the 30th Avenue to LCC Corridor, construction of either build alternative is not anticipated to result in long-term direct impacts to mapped wetlands. However, proposed transit facilities would be located adjacent to wetlands and a population of Bradshaw's lomatium, which is a wetlands species and listed as an endangered species. After selection of an alternative and during the final design phase, a formal wetland delineation would be conducted to definitively locate the wetland boundaries and follow up surveys for Bradshaw's lomatium would be required prior to construction to ensure no impacts to the species would occur as a result of project construction.

If either of the build alternatives are advanced to project development, the transit facility would be further analyzed to avoid and minimize impacts to wetlands and listed species. The transit facility under either build alternative would be designed and constructed to avoid long-term impacts to identified wetlands and listed species. It is critical that no changes to the hydrology of the wetland occur since that could impact the

Table 6-10: 30th Avenue to LCC Corridor Ecosystem Impacts

	Enhanced Corridor	EmX
Trees	<ul style="list-style-type: none"> Removal of up to 58 medium and large trees Slight reduction in avian habitat 	<ul style="list-style-type: none"> Removal of up to 102 medium and large trees Slight reduction in avian habitat
Fish	<ul style="list-style-type: none"> Construction of 110,800 SF of impervious surface Increase in stormwater runoff 	<ul style="list-style-type: none"> Construction of 209,300 SF of impervious surface Increase in stormwater runoff
Wetlands	<ul style="list-style-type: none"> Potential loss of conservation setback area Potential short-term degradation of wetland quality or function Potential disruption of habitat for Bradshaw's lomatium 	<ul style="list-style-type: none"> Potential loss of conservation setback area Potential short-term degradation of wetland quality or function Potential disruption of habitat for Bradshaw's lomatium
Critical Habitat	<ul style="list-style-type: none"> No adverse impact No "take" of federal or state-listed species 	<ul style="list-style-type: none"> No adverse impact No "take" of federal or state-listed species

Source: Environmental Science & Assessment, LLC. Draft Ecosystems Technical Report. 2017.

suitability of the existing rare plant habitat. No changes to wetland hydrology are anticipated. However, without best management practices (BMPs) and mitigation measures, long-term impacts could occur to the wetland and endangered species habitat due to the proposed stop/station location. In addition to potential changes in habitat conditions, minor losses of potential habitat that could be occupied by endangered plants in the future could occur. The wetlands are subject to the City's Water Resources Conservation overlay zone and have a 50-foot conservation setback. Construction of the proposed transit facilities would likely encroach into the conservation setback associated with the wetlands. If there is any loss of conservation setback area, it would be a long-term impact.

Short-term construction-related degradation of wetland quality or adverse changes in wetland functions could occur during construction of either build alternative due to the close proximity to known wetlands. The extent of construction would be tightly contained to avoid impacts. Through utilization of BMPs, none of these effects would be significant. In addition, construction of the proposed stop/station is also likely to result in short-term construction-related impacts to the conservation setback area associated with the wetlands.

If impacts to wetlands are unavoidable, mitigation may be required in accordance with state and federal regulations.

Critical Habitat

Although Bradshaw's lomatium and critical habit is not documented as occurring in the study area, it is the only listed species and critical habitat documented as occurring immediately adjacent to the study area. As noted earlier, during final design additional analysis would be required to ensure no impacts to the species would occur as a result of project construction.

The build alternatives would not result in the destruction or adverse modification of critical habitat, suitable habitat or "take" of federal or state listed species. With the exception of the Bradshaw's lomatium habitat described above, construction would be primarily limited to highly urbanized areas with existing habitat conditions that are conducive to plant and wildlife species that are commonly found in urban areas. There is no construction proposed as part of the build alternatives that would occur in the less developed southern part of the corridor.

With the exception of the Bradshaw's lomatium habitat discussed above, indirect and cumulative effects of the build alternatives would not result in destruction or adverse modification of terrestrial habitats for listed species.

Energy, Sustainability and Greenhouse Gas

Along the 30th Avenue to LCC Corridor, energy is consumed primarily for residential, commercial, and transportation purposes. Transportation energy for motor vehicles is primarily provided by direct combustion of petroleum fuels, with lesser contributions from compressed natural gas and electricity. Given the continued gains in technology for increasing energy efficiency, energy consumption is not expected to be a factor for determining the preferred mode alternatives.

No-Build Alternative

Under the No-Build Alternative VMT, congestion, and energy use are expected to increase. Energy consumption and greenhouse gas (GHG) emissions are expected to be higher at congested intersections. There is limited potential for sufficient mode shifts from motor vehicles to transit to improve energy use and sustainability. The No-Build Alternative is inconsistent with applicable goals and policies related to GHG reductions and sustainability.

This alternative would not involve any construction activities associated with this project and, therefore, would not require any energy for construction activities.

Enhanced Corridor and EmX Alternatives

The long-term direct impacts of the proposed build alternatives include negligible changes to direct energy consumption as shown in Table 6-11. The EmX Alternative would use slightly less energy than the No-Build Alternative in 2035, while the Enhanced Corridor Alternative would result in slightly more energy use than the No-Build and EmX Alternatives.

The Enhanced Corridor and EmX Alternatives would be in compliance with both the City's and LTD's sustainability policies.

All required mitigation measures related to energy and GHG emissions, such as preserving or replanting trees and minimizing traffic obstructions, would be specified in LTD's construction contracting documents.

Overall, future energy use does not differentiate the 3 alternatives on direct and indirect energy consumption. The changes in regionwide energy consumption are negligible for the alternatives due to continued increases in fuel efficiency over the next 20 years. Given the continued gains in technology for increasing energy efficiency, energy consumption is not expected to be a factor for determining the preferred mode alternative. The impacts of the build alternatives are not large enough to warrant additional mitigation measures.

Table 6-11: 30th Avenue to LCC Corridor Percent Change in 2035 Regionwide Energy Impacts (Btu) from the No-Build Alternative

Energy Type	Enhanced Corridor	EmX
Direct Energy ^a	0.003%	-0.004%
CO2e Equivalent Energy ^b	0.002%	-0.002%
Maintenance Energy ^c	0.004%	0.009%
Total	0.002%	-0.002%

Source: DKS. Draft Energy and Sustainability Technical Report. 2017.

Notes:

- a Direct energy represents energy consumed for operation of transit service.
- b CO2e equivalent energy represents greenhouse gas emissions generated by operation of transit service.
- c Maintenance energy represents energy consumed indirectly for the products and operations necessary to keep the transit system operable.

Geology and Seismic

A review of geologic conditions in the 30th Avenue to LCC Corridor shows that there are no mapped active faults or fault zones close to the corridor, the area is too high to be subject to tsunami inundation, no significant waterbodies are near enough to cause concerns about seiche inundation, and volcanic activity is not considered a significant concern.

No-Build Alternative

The main geologic hazards that could potentially affect operation and maintenance of the No-Build Alternative include erosion, landslides, ground motion, and liquefaction, as described in Table 6-12.

Enhanced Corridor and EmX Alternatives

Long-term impacts for the build alternatives would be related to geologic and seismic hazards that already exist; these hazards are the same as for the No-Build Alternative (Table 6-12).

Table 6-12: 30th Avenue to LCC Corridor Existing Geologic Hazards

Hazard	No-Build	Enhanced Corridor	EmX
Erosion	<ul style="list-style-type: none"> • Low to moderate wind erosion susceptibility • Low water erosion susceptibility 		
Problematic Soil Properties	<p>High shrink-swell and hydric soils:</p> <ul style="list-style-type: none"> • From the Oak Street and E. 14th Avenue intersection, and from the Pearl Street and E. 15th Avenue intersection to the E. 30th Avenue and Kincaid Street intersection • Approximately 800 feet north of the E. 30th Avenue and Forest Boulevard intersection • Along Gonyea Road to LCC 		
Landslides	<p>Moderate (landsliding possible) to high (landsliding likely):</p> <ul style="list-style-type: none"> • Between the Amazon Parkway and E. 29th Avenue intersection and LCC Station. <p>Very high (existing landslide):</p> <ul style="list-style-type: none"> • Along E. 30th Avenue at the Spring Boulevard interchange 		
Ground Motion	Strong ground-shaking zone		
Liquefaction	<p>Moderate liquefaction hazard zone:</p> <ul style="list-style-type: none"> • From the Eugene Station to the E. 30th Avenue and Alder Street intersection <p>High liquefaction hazard zone:</p> <ul style="list-style-type: none"> • From 0.5 mile before to 0.3 mile after the E. 30th Avenue and Spring Boulevard intersection 		

Source: CH2M. Draft Geology and Seismic Technical Report. 2017.

Hazardous Materials

Land uses along the 30th Avenue to LCC Corridor are primarily office, commercial and residential. The use and storage of hazardous materials for these types of uses is typically low. There are 1 high-risk and 52 medium-risk hazardous materials sites recorded within the study area of the Enhanced Corridor Alternative and 4 high-risk and 51 medium-risk hazardous materials sites within the study area of the EmX Alternative.

No-Build Alternative

No project-related construction activities would occur under the No-Build Alternative so there would be no

impacts to hazardous materials because there would be no handling of, or exposure to existing contaminants, and no existing contaminants would be remediated.

Enhanced Corridor and EmX Alternatives

Construction activities requiring ground disturbance and potentially leading to exposure to hazardous materials could occur at 1 recorded high-risk hazardous materials site under the Enhanced Corridor Alternative and at 4 high-risk sites under the EmX Alternative (Table 6-13). Acquired portions of any at-risk site would be investigated and remediated as appropriate, resulting in a long-term benefit to the community.

Table 6-13: 30th Avenue to LCC Corridor Number of Hazardous Sites on Potentially Impacted Tax Lots

Hazardous Sites on Potentially Impacted Tax Lots	No-Build	Enhanced Corridor	EmX
High Risk	0	1	4
Medium Risk	0	0	0

Source: CH2M. Draft Hazardous Materials Technical Report. 2017.

Land Use and Prime Farmland

Near downtown Eugene, the 30th Avenue to LCC Corridor is characterized by office, commercial and high-density residential areas. Heading south land uses transition to lower density residential south of W. 18th Avenue, and sparsely developed single-family residential and vacant undeveloped lands east of Spring Boulevard. This corridor terminates at LCC, a regional higher education facility. The southern segment of this corridor also includes larger areas of parks and open space.

No-Build Alternative

No property would be acquired under the No-Build Alternative, and no temporary construction easements would be needed since no construction activities would occur as part of the MovingAhead project.

The No-Build Alternative would not result in direct impacts to prime farmlands, or agricultural or forest uses subject to Oregon Statewide Planning Goals 3 (Agricultural Lands) or 4 (Forest Lands).

The No-Build Alternative would be inconsistent with many local, regional, and state land use and transportation policies in the Eugene 2035 TSP, the Metro Plan, TransPlan, and Envision Eugene because it would not institute a BRT system connecting the region's highest growth centers and it would not encourage increased density and TOD along Key Transit Corridors.

Enhanced Corridor and EmX Alternatives

Overall, direct impacts to land use are limited because the proposed investments of the build alternatives would be located primarily within existing transportation ROWs and the total area that would be converted from existing land uses to a transportation use is minor compared to the total land available in the City.

Under the Enhanced Corridor Alternative, 13 partial acquisitions, totaling 0.4 acre, would be required to facilitate roadway widening and enhanced multimodal investments. Under the EmX Alternative, 20 partial acquisitions, totaling 0.5 acre would be required, more total acreage than under the Enhanced Corridor Alternative because dedicated transit lanes and EmX

stations would require greater roadway widths. Most of the land that would be acquired and converted to a transportation use under both build alternatives is zoned Institution (Table 6-14).

The presence of EmX would support more development, decrease the need for automobile parking, and support a wider mix of uses as compared to the No-Build and Enhanced Corridor Alternatives.

Neither of the build alternatives would result in direct impacts to prime farmlands, or agricultural or forest uses subject to Oregon Statewide Planning Goals 3 (Agricultural Lands) or 4 (Forest Lands). No direct impacts to prime farmland subject to the Farmland Protection Policy Act (FPPA) would occur under the Enhanced Corridor Alternative.

Operation of the build alternatives also has the potential to contribute to beneficial indirect impacts as a result of TOD. Lands that may be supportive of TOD development are identified in Table 6-15. Greater areas of Mixed-Use and Multi-Family Residential zoning contribute to a greater likelihood that TOD would occur within an area of potential impact. Any new development or redevelopment would need to be consistent with existing zoning and to comply with any requirements associated with overlays.

Construction of the build alternatives would require temporary construction easements beyond the property acquisition needed to construct the alternatives, which could result in additional impacts to properties located along the corridor. These easements would be temporary and the areas affected would be returned to preconstruction conditions upon completion of construction. Additional information about compensation for property acquisition and temporary easements is addressed in the Draft Acquisitions and Displacements Technical Report (CH2M 2017).

Generally, the Enhanced Corridor Alternative would be consistent with the goals and policies on improving multimodal transportation contained in the Metro Plan, Regional Transportation Plan (RTP), TransPlan, Envision Eugene, and the Eugene 2035 TSP. This alternative would not be fully consistent with the RTP (Transportation System Improvement [TSI] Transit

Table 6-14: 30th Avenue to LCC Corridor Potential Permanent Conversion of Land to Transportation-Related Use

Land Use Zoning	Enhanced Corridor (ac)	EmX (ac)
Commercial	0	0
Industrial	0	0
Office	0	0
Institution	0.4	0.5
Single-Family Residential	0	< 0.1
Multi-Family Residential ^a	< 0.1	< 0.1
Agriculture / Forest / Natural Resources	0	0
Mixed-Use ^a	< 0.1	0.1
Special Area Zone (Non-Mixed Use)	0	0
Total Potential Permanent Conversion^b	0.4	0.5
Total Acres TOD Supportive Lands^a	< 0.1	0.1

Source: CH2M. Draft Land Use and Prime Farmland Technical Report. 2017.

Notes:

- a Lands zoned Mixed-Use and Multi-Family Residential would likely be supported to a greater degree by transportation investments proposed under the build alternatives and have been aggregated together as “TOD Supportive Lands”
- b Total may be greater or less than the sum of the parts due to rounding.

Policy #2) and the Metro Plan (Policy F.19) because the Enhanced Corridor Alternative would not implement a BRT system. However, the Enhanced Corridor Alternative would implement lower capital-cost transit investments consistent with the intent of these goals and policies and would not preclude the implementation of an EmX Alternative in the future.

The EmX Alternative would be consistent with existing local, regional, and state land use and transportation policies of the Metro Plan, TransPlan, RTP, the Eugene 2035 TSP, and Envision Eugene because it would institute a BRT system connecting the region’s highest growth centers.

Both build alternatives would serve the South Willamette Key Transit Corridor identified in Envision Eugene.

Table 6-15: 30th Avenue to LCC Corridor Transit Supportive Lands

Zoning Type	Enhanced Corridor	EmX
Mixed-Use	174 acres	367 acres
Vacant^a	3 acres	12 acres
Multi-Family Residential	100 acres	268 acres
Vacant^a	1 acre	4 acres

Source: CH2M. Draft Land Use and Prime Farmland Technical Report. 2017.

Note:

- a Vacant lands are captured in the Mixed-Use and Multi-Family Residential totals.

Noise and Vibration

Land use in downtown Eugene is mainly commercial, with some intermixed multi- and single-family residences. The main noise source for both alternatives in the northern end of the 30th Avenue to LCC Corridor is traffic on major arterial roadways throughout the downtown area.

As the build alternatives extend south from E. 20th Avenue, land use in both corridors is primarily single-family residential. In addition, key land uses on the corridor consist of the LCC, Amazon Park, and woodland areas located in Lane County. The corridor contains the Civic Stadium site, which is currently undergoing redevelopment. Noise levels south of the downtown area are dominated by traffic on Amazon Parkway and E. 30th Avenue.

No-Build Alternative

Under the No-Build Alternative, no noise or vibration impacts are anticipated because there would be no project related changes to the corridor.

Enhanced Corridor and EmX Alternatives

Operation of the Enhanced Corridor Alternative is not predicted to have any noise impacts to noise sensitive properties (Table 6-16). Increased transit vehicle traffic in closer proximity to noise sensitive properties under

the EmX Alternative would potentially cause noise impacts to 3 single-family properties, 4 multi-family properties, 1 hotel, and 1 church. Neither alternative is anticipated to result in vibration impacts. During final design, all impacts and potential mitigation measures would be reviewed for verification; the most appropriate mitigation measures would be determined in consultation with the affected property owners.

Under the build alternatives, during construction of the proposed project investments, noise and vibration levels in the project corridor may increase due to normal construction activities. However, daytime construction noise is exempt from provisions contained in the City of Eugene Municipal Code. Under the City of Eugene Municipal Code noise ordinance, project construction could be performed during the allowable hours of 7:00 a.m. to 7:00 p.m. Construction related noise is exempt from code provisions if construction is performed during the allowable hours. No construction noise impacts are predicted for any alternative if construction is performed during allowable hours. If construction was planned outside of the allowable hours, the project would be required to obtain a noise variance from local jurisdictions. As part of the variance process, a construction noise analysis would be performed; the construction specifications would contain limitations, if any, specific to the night work proposed and potential construction noise impacts.

Table 6-16: 30th Avenue to LCC Corridor Potential Noise and Vibration Impacts

Number of Properties Potentially Impacted	No-Build	Enhanced Corridor	EmX
Noise	0	0	9
Vibration	0	0	0

Source: Michael Minor and Associates. Draft Noise and Vibration Technical Report. 2017.

Parklands, Recreation Areas and Section 6(f) Resources

Within the 30th Avenue to LCC Corridor study area there is 1 community park, 1 neighborhood park, 2 urban plazas, the proposed Civic Stadium Park, and 2 special facilities (Figure 6-5). Three of these resources are within 200 feet of the alignment of the build alternatives: Amazon Park, the proposed Civic Stadium Park, and Laurelwood Golf Course; none of these facilities received funding from the Land and Water Conservation Fund (LWCF), so none are protected under Section 6(f).

No-Build Alternative

The No-Build Alternative would not impact parklands, recreation areas, or Section 6(f) resources because there would be no construction or change in the transportation system as a result of the MovingAhead project.

Beneficial effects of the build alternatives would include increased access to the parks within the study area and along the corridor through more frequent and reliable transit service. In addition, pedestrian connectivity would be enhanced with the new or replaced pedestrian crossings and new or improved sidewalks and bicycle facilities along the corridor.

Under the build alternatives, transit service related to parks and recreation resources within 200 feet of the construction footprint of the build alternatives would be as follows:

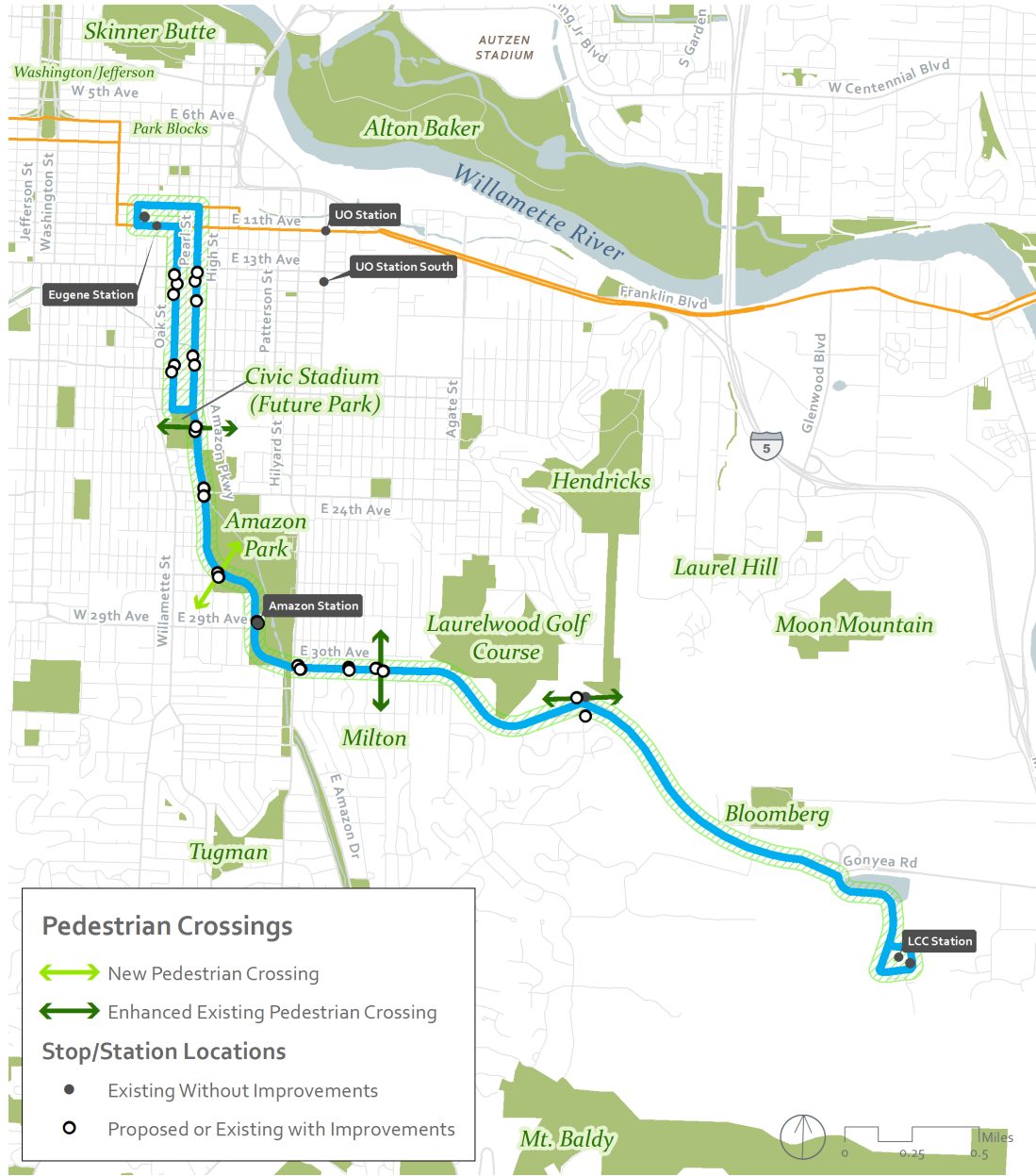
- Transit service to Amazon Park along Amazon Parkway and at the Amazon Station would be less frequent under the Enhanced Corridor Alternative and more frequent under the EmX Alternative than under the No-Build Alternative.
- Bicycle and pedestrian access to Amazon Park would improve with the enhanced pedestrian crossings at Amazon Parkway/E. 27th Avenue and Amazon Parkway/E. 20th Avenue under both alternatives. The crossing at E. 20th Avenue would replace the existing pedestrian bridge, which is not accessible under the Americans with Disabilities Act (ADA) and does not serve bicyclists.

- Construction of a new 2-way cycle track on High Street connecting downtown Eugene to the Amazon Multi-Use Path (part of Amazon Park) at E. 19th Avenue was originally planned as part of the EmX Alternative; however, the City has been able to fund and advance this bicycle investment separate from the MovingAhead project.
- Transit service along Amazon Parkway would serve the proposed Civic Stadium Park site under either alternative and would be more frequent than under the No-Build Alternative.
- Transit accessibility to the Laurelwood Golf Course would not change under either alternative; however, service would be less frequent under the Enhanced Corridor Alternative and more frequent under the EmX Alternative than under the No-Build Alternative.

Construction of the proposed transit improvements would require conversion of approximately 0.15 acre of land along the north and eastern edges of the proposed Civic Stadium Park under the Enhanced Corridor Alternative or 0.14 acre under the EmX Alternative. This grassed area would no longer be available for recreational purposes. Similarly, transit investments along Amazon Parkway would require acquisition of 0.11 acre of land under the Enhanced Corridor Alternative or 0.15 acre under the EmX Alternative. These acquisitions would not affect the continued viability, integrity, usage, or value of the parks, nor would they degrade the recreational experience. During the final design phase, designers would further explore ways to avoid or minimize acquisitions from parks. The specific area of impact in Amazon Park may change during future design phases if subsequent surveys discover protected plant species exist in or around this stop/station area. Where acquisitions are required, LTD and the City would coordinate to determine the most effective measures for compensation or enhancements.

Under both alternatives, temporary construction easements would also be needed. For the proposed Civic Stadium Park, these easements would be 0.11 acre and 0.16 acre for the Enhanced Corridor and EmX Alternatives, respectively; for Amazon Park the easements would be 0.35 acre and 0.54 acre. The easements would make that land unavailable for park use during construction.

Figure 6-5: 30th Avenue to LCC Corridor Parks and Recreation Resources



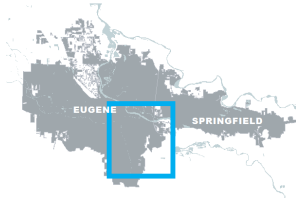
Pedestrian Crossings

- New Pedestrian Crossing
- Enhanced Existing Pedestrian Crossing

Stop/Station Locations

- Existing Without Improvements
- Proposed or Existing with Improvements

Locator Map



Legend

- 30th Ave/LCC Corridor
- 30th Ave/LCC Corridor 200 ft Buffer
- 2035 No-Build
- 2035 No-Build Buffer

Parks & Recreation Areas
30th Ave/LCC Corridor

Note: Both EmX and Enhanced Corridor Alternatives Shown



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Source: CH2M. Draft Parklands, Recreation Areas, and Section 6(f) Technical Report. 2017.

No adverse impacts to Laurelwood Golf Course are anticipated under either build alternative because any investments near that facility would occur within the ROW.

Short-term effects from construction activities would be mitigated through coordination of construction timing

with the City’s Parks and Open Space Division to avoid or reduce disruption for park users including providing advanced notice of construction activities to park users, signage for pedestrian and bicycle detours, and barriers and flagging for safety. No impacts to Section 6(f) resources from either of the build alternatives are anticipated.

Table 6-17: 30th Avenue to LCC Corridor Parks and Recreation Resources within 0.25 mile

Name	Facility Type	Approximate Distance from Corridor	Ownership and Management	Site Features and Characteristics	Potential Views of Corridor	LWCF or Similar Grant Funding?
Laurelwood Golf Course	Special Facility	Within 200 feet	City of Eugene / Private	Golf, performance space, trailheads	No	No
Amazon Park	Community / Metropolitan Park	Within 200 feet	City of Eugene	Ball fields, garden, performance space, picnic	Yes	No
Proposed Civic Stadium Park	Special Facility	Within 200 feet	Eugene Civic Alliance Non-profit	Sports and entertainment venue on historic Civic Stadium site	Yes	Unknown
Ribbon Trail	Natural Area	0.06 mile	City of Eugene	Trail and trailhead	No	No
Bloomberg	Special Facility	0.10 mile	City of Eugene	Undeveloped	No	No
Broadway Plaza (Kesey Square)	Urban Plaza	0.10 mile	City of Eugene	Performance space, public art	No	No
Park Blocks	Urban Plaza	0.14 mile	City of Eugene	Picnic tables, public art, performance space	No	No
Chanel Mulligan	Neighborhood Park	0.23 mile	City of Eugene	Performance space, picnic tables, play area	No	Yes ^a

Source: CH2M. Draft Parklands, Recreation Areas, and Section 6(f) Technical Report. 2017.

Note:

a This park is currently being reconstructed under a Community Development Block Grant. Such grants do not qualify under Section (6f) protection.

Section 4(f) Resources

Publicly-owned park and recreation resources located within 350 feet of the build alternatives include: Bloomberg Park, Ribbon Trail, Laurelwood Golf Course, and Amazon Park; the Civic Stadium Park is not publicly-owned.

There are no wildlife or waterfowl refuges within 350 feet of the corridor.

As described in the cultural resources topic, a review of historic records and a windshield survey of the 30th Avenue to LCC Corridor resulted in the identification of 4 resources that are formally listed on the NRHP, and 89 individual resources and 4 historic districts potentially eligible for listing on the NRHP, including 2 City Landmarks, all of which are protected under Section 4(f) (see Section 4(f) Technical Report for a complete list of eligible resources).

No-Build Alternative

The No-Build Alternative would not impact Section 4(f) resources as there would be no construction related to the MovingAhead project.

Enhanced Corridor and EmX Alternatives

Under the build alternatives installation of new sidewalks and stops/stations along Amazon Parkway would result in:

- Permanent incorporation of approximately 0.11 acre of parkland from Amazon Park under the Enhanced Corridor Alternative or 0.15 acre of parkland under the EmX Alternative; the parkland that would be acquired is located along the roadway and does not contain any recreational features or attributes
- Temporary occupancy of 0.35 acre of land in Amazon Park to install the new sidewalks and stops/stations under the Enhanced Corridor Alternative or 0.54 acre under the EmX Alternative; minor increases in noise and dust would occur at the park during construction; this temporary occupancy would satisfy the conditions required such that it would not constitute a use under Section 4(f)
- No activities, features, or attributes of Amazon Park would be permanently impacted by project actions nor would temporary construction actions at the park permanently or temporarily interfere with visitors using the park

Table 6-18: 30th Avenue to LCC Corridor Section 4(f) Park and Recreation Resources

Source Name	Location	Official with Jurisdiction	Section 4(f) Qualifying Description
Bloomberg	33000 Bloomberg Road, Eugene	ODOT / City of Eugene	Municipal park (basketball, picnic tables, play area)
Ribbon Trail	North-south trail between Hendricks Park and E. 30th Avenue, Eugene	City of Eugene	Municipal trail
Laurelwood Golf Course	2700 Columbia Street, Eugene	City of Eugene	Municipal golf course
Amazon Park	22 Amazon Parkway	City of Eugene	Municipal park (ball fields, garden, performance space, picnic)

Source: CH2M. Draft Section 4(f) Technical Report. 2017.

- A preliminary conclusion that project actions would not adversely affect the features, attributes, or activities that qualify Amazon Park for Section 4(f) protection; as such, project actions would likely result in a Section 4(f) *de minimis* impact to Amazon Park, consistent with 23 Code of Federal Regulations (CFR) 774.17

None of the other park and recreation resources protected under Section 4(f) would be impacted by either of the build alternatives because investments near these facilities would take place within the public ROW and would not require temporary or permanent use of park land. Neither build alternative would result in temporary impacts, nor would the proximity impacts (noise or visual) to any of the parks be so severe as to substantially impair those activities, features, or attributes that qualify the resource for protection under Section 4(f). The improved reliability of transit service to parks would enhance accessibility for the park users.

Twenty-five of the historic resources along the 30th Avenue to LCC Corridor would potentially be directly and/or indirectly affected by the Enhanced Corridor Alternative through property acquisition, or construction of stops/stations or planting strips; 14 historic resources would be directly and/or indirectly affected under the EmX Alternative as described in the cultural resources section of this chapter.

No historic resources are anticipated to be removed to construct either of the build alternatives. Further, neither build alternative would alter, directly or indirectly, any characteristics of a historic property that qualify the property for inclusion in the NRHP in a manner that would diminish the integrity of the property's location, design, setting, materials, workmanship, feeling, or association.

Therefore, the Enhanced Corridor and EmX Alternatives are not anticipated to have an adverse effect to any Section 106 resources, and project actions under either build alternative would likely result in a *de minimis* impact determination to the affected historic resources under Section 4(f).

Street and Landscape Trees

The species and ages of street and landscape trees planted along the portion of the 30th Avenue to LCC Corridor route that would pass through downtown Eugene via Oak and Pearl Streets are varied. Many medium and large street and landscape trees are mature and form wide canopies over streets, sidewalks, and adjacent properties in some areas. Street trees are found along parts of Amazon Parkway south of Civic Stadium and the western part of E. 30th Avenue. These street trees are not as old as most trees found downtown and generally do not form full canopies. Their generally younger ages reflect the later dates of development of the adjacent areas. The portion of the route east of the residential area that E. 30th Avenue passes through to just west of LCC is primarily undeveloped. Trees on the heavily vegetated lands adjacent to most of the road in this part of the corridor are a mix of coniferous and deciduous natives. There are few street trees within the road ROW in this part of the corridor.

No-Build Alternative

No impacts to trees are anticipated under the No-Build Alternative.

Enhanced Corridor and EmX Alternatives

Under the Enhanced Corridor Alternative up to 54 medium to large street trees and 0 medium to large landscape trees would be potentially removed within the Charter Tree boundary; up to 4 landscape trees would be removed outside of the Charter Tree boundary. Under the EmX Alternative up to 98 medium to large street trees and 0 medium to large landscape trees within the Charter Tree boundary and 4 trees outside of the Charter Tree boundary would be potentially removed (Table 6-19). Under the build alternatives, proposed sidewalks that would potentially impact existing street trees would be wide enough to incorporate a landscape strip into which new street trees could be planted. Removed street trees would be mitigated by replanting trees at a ratio of at least 1 tree planted for each tree

removed or as otherwise required by City Code. The selection of tree species, specific location, and provision of adequate soil conditions for tree mitigation would be coordinated with the City Urban Forestry staff. Removed landscape trees would be mitigated through tree replanting or replacement.

The intermittent nature of construction proposed under the build alternatives would reduce the risk of potential impacts to street and landscape trees as construction would not occur along the entire corridor, just in limited locations near proposed investments. Under the Enhanced Corridor Alternative, most of the construction requiring significant excavation adjacent to street and landscape trees would be confined to intersections and enhanced stop areas, so the root zones of most trees in the corridor would be avoided. Under the EmX Alternative there would be a greater probability of impacts to large trees because, in addition to intersection and EmX station investments, construction activities would include full-depth excavation of the existing roadway adjacent to planting strips to construct concrete BAT lanes in downtown Eugene; this type of deep construction could impact the root zones of adjacent trees. LTD would require the construction contractor to develop a Tree Protection Plan before construction.

Potential short-term construction-related impacts to street trees could occur under the EmX Alternative in the following locations:

- Within the downtown core of Eugene along Oak and Pearl Streets excavation to construct full-depth concrete BAT lanes could impact medium and large trees within the Charter Tree boundary; while the excavation and construction activities would be confined to the existing roadway, construction activities would occur adjacent to these potentially high-value trees
- At the intersection of E. 27th Avenue and Amazon Parkway construction of stations and sidewalk could impact an existing traffic island with 2 large trees

Table 6-19: 30th Avenue to LCC Corridor Number of Medium and Large Trees Potentially Removed

	Enhanced Corridor	EmX
INSIDE THE CHARTER TREE BOUNDARY		
Street Trees	49 to 54 trees	98 trees
Landscape Trees	0 trees	0 trees
OUTSIDE THE CHARTER TREE BOUNDARY		
Street Trees	0 trees	0 trees
Landscape Trees	2 to 4 trees	2 to 4 trees

Source: CH2M. Draft Street and Landscape Tree Technical Report, 2017.

Transportation and Transit

The roadways in the 30th Avenue to LCC Corridor are owned and managed by the City except for the east end of the corridor where E. 30th Avenue from Spring Boulevard to LCC is owned and managed by Lane County. None of the corridor intersections studied or roadway segments had collision rates that would typically warrant consideration of safety improvements. During the existing p.m. peak hour, mobility standards were met at all study intersections.

For a more detailed evaluation of transportation impacts and benefits for all corridors and alternatives please refer to Chapter 9.

No-Build Alternative

Under the No-Build Alternative investments planned in the Eugene 2035 TSP, would improve pedestrian and bicycle access along the 30th Avenue to LCC Corridor, however, connectivity to planned roadway, bicycle or pedestrian projects would not change. No investments would be made to the existing transportation system as part of the MovingAhead project. Although traffic delay is anticipated to worsen by 2035, all study intersections would meet the current mobility standards adopted as part of the Eugene 2035 TSP.

There would be limited potential to encourage travelers to change their travel mode from motor vehicle travel to transit and limited potential to support locally adopted transportation policies.

Enhanced Corridor and EmX Alternatives

The build alternatives would improve the pedestrian and bicycle network with the installation of new or improved sidewalks, enhanced pedestrian crossings, and new or improved bicycle lanes. There would not be bus phases at any signalized intersections under the Enhanced Corridor Alternative, but there would be transit signal priority at all signals on the corridor. Travel reliability would be enhanced under the EmX Alternative by the proposed time allocated for transit vehicles to travel through intersections with traffic signals (called bus phases) at 1 intersection, as well as transit signal priority at all signals on the corridor. The Enhanced Corridor Alternative would offer moderate safety improvements due to increased crossing opportunities and investments

in facilities for people biking, walking and using mobility devices including buffered bicycle lanes on Pearl and Oak Streets. The EmX Alternative would result in significant safety improvements due to BAT lanes, 2-way cycle track on High Street, and increased crossing opportunities.

In-vehicle transit travel time would improve by 1 minute (1-way inbound) during the a.m. peak hour over the full length of the corridor compared to the No-Build Alternative under the Enhanced Corridor Alternative, and by 2 minutes (1-way inbound) under the EmX Alternative (Table 6-20). The EmX Alternative has greater potential for increased transit reliability due to a 13.4% increase in transit exclusive/priority lanes compared to the No-Build Alternative.

Average weekday systemwide transit ridership would decrease by 100 (-0.2%) 1-way linked trips under the Enhanced Corridor Alternative compared to the No-Build Alternative (Table 6-21). This decrease in ridership would result from the elimination of Route 81 and Route 82. Additional evaluation of service routing would be completed to mitigate service reductions and ridership decreases if this alternative were advanced. Under the EmX Alternative, average weekday systemwide ridership would increase by 660 (1.4%) compared to the No-Build Alternative.

2035 local traffic operations would slightly degrade at the Oak Street/E. 11th Avenue intersection under the Enhanced Corridor Alternative due to the conversion of a travel lane to a buffered bicycle lane, but operations would still be within operating standards. Similarly, under the EmX Alternative 2035 local traffic operations would degrade at the Pearl Street/E. 11th Avenue intersection due to conversion of a general-purpose travel lane to a BAT lane, as compared to the No-Build and Enhanced Corridor Alternatives. There would be a safety benefit under the EmX Alternative based on an increase in transit ridership (and parallel decrease in motor vehicle travel) and a reduction in VMT (see Chapter 9) which could reduce fatal and serious injury crashes.

No off-street parking stalls would be affected by the Enhanced Corridor Alternative, but up to 69 on-street parking stalls (after mitigation) would be removed on Oak and Pearl Streets. The EmX Alternative would

remove up to 16 off-street parking stalls and 140 on-street parking stalls (after mitigation) on High, Oak, and Pearl Streets for the creation of BAT lanes and a 2-way cycle track on High Street. A parking occupancy survey was conducted on October 4 and October 5, 2016 on Pearl and Oak Streets, which found the average occupancy for all block faces combined was 51%. Under the EmX Alternative, 1 commercial and 2 residential driveways would be removed due to station placement. After property impacts were revealed during the analysis, additional evaluation was conducted to determine other ways to avoid or minimize

impacts at some properties; this effort is documented in the Addendum to the MovingAhead Alternatives Analysis Technical Reports Memorandum (CH2M 2017). Opportunities to further reduce or avoid impacts would be evaluated in more detail during design refinement.

Mitigation measures such as limiting the length of single lane closures, detour signage, and maintaining business access, would be needed during construction, and would require early, frequent, and ongoing communication among LTD, the City, contractors, and affected property owners and tenants.

Table 6-20: 30th Avenue to LCC Corridor 2035 Auto and Transit Travel Times (a.m. Peak Hour)

Measure	30th Avenue to LCC Corridor Travel Time to Eugene Station from LCC					
	Auto	Transit				
	No-Build, Enhanced Corridor, and EmX	No-Build	Enhanced Corridor		EmX	
	Time	Time	Time	Change from No-Build Alternative	Time	Change from No-Build Alternative
Time in Vehicle	11 minutes	17 minutes	16 minutes	-1 minute	15 minutes	-2 minutes

Source: DKS. Draft Transportation Technical Report. 2018.

Table 6-21: 30th Avenue to LCC Corridor Average Weekday 2035 Systemwide Ridership

Measure	No-Build	Enhanced Corridor	EmX
Total Systemwide Transit Trips^a	46,410	46,310	47,070
Change from No-Build	N/A	-100	660
% Change from No-Build	N/A	-0.2%	1.4%

Source: DKS. Draft Transportation Technical Report. 2018.

Note:

a Systemwide transit trips are defined as 1-way linked trips taken by a person from the trip's origin to the trip's destination, independent of the number of vehicles or transfers used to complete the trip.

Table 6-22: 30th Avenue to LCC Transportation Impacts and Benefits

Measure	Enhanced Corridor	EmX
New/improved sidewalks	0.67 mile	0.45 mile
New/improved bicycle facilities	1.38 miles	1.33 miles
New enhanced crossings	1	8
New upgraded crossings	0	0
Replaced existing enhanced crossings	2	2
Potential off-street parking spaces removed	0	16
Potential on-street parking spaces removed	69	140
Potential driveway closures	0	3
Potential business access impacts: right-in or right-out turning movements	0	0
Potential drive-through closures	0	0
Percent of corridor with exclusive/priority Lanes	0%	13.4%

Source: DKS. Draft Transportation Technical Report. 2018.

Utilities

Underground utilities within the 30th Avenue to LCC Corridor include cables for telecommunication and energy; pipes for natural gas, water, sanitary sewer, and stormwater; fiber-optic lines; steam lines; and access points (manholes and vaults) for all types of utilities. Aboveground utilities include CenturyLink telephone poles, Eugene Water and Electric Board (EWEB) power poles, and traffic signals and street lights and their associated conduit and controls.

No-Build Alternative

The No-Build Alternative would have no adverse or beneficial long-term impacts to utility infrastructure as no capital investments would be constructed for the MovingAhead project.

Enhanced Corridor and EmX Alternatives

Table 6-23 summarizes the number of potential impacts to major utilities in the 30th Avenue to LCC Corridor that would occur under the build alternatives. Both build alternatives propose the construction of new signals in this corridor, which would require additional infrastructure (e.g. electrical connections). Construction activities would be limited to the extent possible to avoid or minimize impacts to underground utilities. Final design documentation would detail replacement and design of this infrastructure.

Table 6-23: 30th Avenue to LCC Corridor Potential Utility Impacts

Measure	Enhanced Corridor	EmX
Major sanitary sewer line	3	3
Major storm sewer line	0	1
Major electrical line	3	10
Major water line	2	3
New or modified traffic signals	17	20
Steam lines	2	2

Source: CH2M. Draft Utilities Technical Report. 2017.

Visual and Aesthetic Resources

The 30th Avenue to LCC Corridor is typified by a variety of street and landscape trees and a mixture of land uses with a range of visual character types. Areas along Amazon Parkway, south of downtown Eugene, feature a landscaped median and street trees that reinforce the parkway visual character of this area. Around 30th Avenue, the corridor becomes largely residential before transitioning to an undeveloped/natural visual character flanked by heavily forested areas.

Downtown Eugene has a more urban visual character than the portions of the study corridor that extend beyond the downtown core. The portions of downtown Eugene within the study corridor are characterized by level terrain and a north-to-south and east-to-west grid pattern. Much of downtown Eugene contains mature street and landscape trees, particularly areas that are within the 1915 city limits. Within this area, the study corridor is often lined with older residential and commercial buildings and mature street and landscape trees that form canopies over the streets in some locations. Large, mature trees and canopies along streets produce a very distinctive visual character.

No-Build Alternative

No impacts to visual and aesthetic resources would be expected under the No-Build Alternative for the 30th Avenue to LCC Corridor as no construction would take place in association with the MovingAhead project.

Enhanced Corridor and EmX Alternatives

The removal of large and medium street and landscape trees under both alternatives would change the visual character of areas adjacent to them.

Inside the Charter Tree boundary, up to 54 medium and large street trees would be potentially removed under the Enhanced Corridor Alternative, and, up to 4 medium and large landscape trees would be removed outside of the boundary. The EmX Alternative would remove up to 98 street trees in the Charter Tree boundary and up to 4 landscape trees outside of the boundary. Table 6-24 identifies the degree of potential visual change in visual character that would result from construction of the

build alternatives. Further detail on this assessment is provided in the Visual and Aesthetic Resources Technical Report (CH2M 2017).

With the build alternatives, in almost all locations, proposed sidewalks in areas where street trees would be impacted would be wide enough to incorporate a landscape strip into which new street trees could be planted. As discussed in the street and landscape trees section of this chapter, removed street trees would replanting at a ratio of at least 1 tree planted for each tree removed or as otherwise required by City Code and coordinating with the City Urban Forestry staff. With this mitigation, no long-term significant adverse impacts to visual character are anticipated.

Beneficial effects of the build alternatives would include replacing trees that are not on the City-approved species list, are nearing their maximum lifespan, or are difficult to maintain. The replanted trees would contribute to a more unified appearing corridor, as would investments such as new sidewalks, bus stops or EmX stations, landscaping, and enhanced pedestrian crossings proposed under the build alternatives.

Under both build alternatives, the pedestrian bridge that spans Amazon Parkway between E. 19th Avenue and E. 24th Avenue would be demolished and replaced by a new at-grade crosswalk at the new signalized intersection just north of the existing bridge. During construction, the visual environment of the Amazon Parkway corridor would be changed by the presence of brightly-colored heavy construction equipment, including large cranes to remove the bridge span, as well as construction signage, and lighting. For the time when the roadway is closed, there would be no through traffic on Amazon Parkway (likely between E. 19th Avenue and E. 24th Avenue), which would be another visual change from existing conditions. These temporary visual changes would be visible from the South Eugene High School, Amazon Multi-Use Path and Adidas/Rexius Trail, the proposed Civic Stadium Site, portions of Amazon Park, and some of the residences and businesses nearby.

Because of the larger construction footprint, the EmX Alternative would offer more opportunities to provide

landscaping along portions of the corridor currently without landscaping than the Enhanced Corridor Alternative with its smaller construction footprint. The additional landscaping would enhance the visual character of portions of the corridors with no current landscaping. The EmX Alternative would also have more project components, such as pedestrian crossings and EmX stations, which would provide more visual unity along the corridor than the Enhanced Corridor Alternative.

Table 6-24: 30th Avenue to LCC Corridor Potential Change to Visual Character

Alternative	Length of Potential Change in Visual Character
ENHANCED CORRIDOR	
High	0.5 mile
Moderate	0.3 mile
Low / No Impact	11.7 miles
Corridor Length^a	12.5 miles
EmX	
High	1.0 mile
Moderate	0.7 mile
Low / No Impact	12.1 miles
Corridor Length^a	13.8 miles

Source: CH2M. Draft Visual and Aesthetic Resources Technical Report. 2017.

Note:

- a Corridor length for this analysis is greater than the round-trip corridor length reported in other sections because visual impacts may affect both sides of the street. One-way streets with potential impacts on both sides increase the corridor length with potential visual impacts to be greater than the length of the corridor.

Water Quality and Hydrology

The study area includes the receiving waterways and floodplains of stormwater runoff into the existing storm sewer system and conveyed to either Amazon Creek or the Willamette River.

No-Build Alternative

No increase in roadway impervious area is expected under the No-Build Alternative. Bicycle boulevard investments along Alder Street are not associated with the MovingAhead project. This project would add some impervious area, but it would not be pollutant generating and no water quality facilities would be required.

Enhanced Corridor and EmX Alternatives

The primary impact of the Enhanced Corridor Alternative is an increase or reconstruction of 98,500 SF of impervious area in the Amazon Creek drainage basin, and 12,300 SF in the Willamette River drainage basin. These new or reconstructed impervious surface areas represent less than 0.01% of the total impervious surface in both drainage basins. No new impervious surface is expected to drain into the Russel Creek drainage basin for this alternative.

The EmX Alternative would add or reconstruct 1,700 SF of impervious area in the Russel Creek drainage basin, 151,400 SF of impervious area in the Amazon Creek drainage basin, and 56,200 SF of impervious area in the Willamette River drainage basin. These new or reconstructed impervious surface areas represent less than 0.03% of the total impervious surface in each of the drainage basins, as listed in Table 6-25.

No direct impacts on the Russel Creek or Willamette River floodplains are expected as the result of the either alternative as no structures are anticipated in the streams. Under both alternatives construction of stops and stations as well as crossings near E. 17th Avenue would occur within the Amazon Creek floodplain which may cause some temporary short-term construction-related impacts to the floodplain, including increased turbidity and a change in runoff patterns. Protective measures would be required during construction to avoid or minimize impacts to the floodplain and

any impacts are expected to last only as long as the construction as no new permanent structures are anticipated in the floodplain.

With mitigation measures, such as water quality and flow control facilities, there would be a net water quality improvement associated with the reconstructed impervious areas and the impacts of the new impervious area would be reduced.

Four locations, common to both build alternatives, were identified for potential water quality and flow control facilities for runoff prior to discharge to Amazon Creek. The following locations were selected based on the construction footprint and hydrology:

- E. 11th Avenue and Pearl Street
- E. 19th Avenue and Pearl Street
- Amazon Parkway and Hilyard Street
- E. 30th Avenue and Spring Boulevard

Cumulative effects in the 30th Avenue to LCC Corridor may occur if the Highway 99 Corridor is also developed because it would also impact the Amazon Creek drainage basin. As much as 269,600 SF of new and reconstructed impervious area may be added to the Amazon Creek drainage basin if both corridors are developed with the Enhanced Corridor Alternative or 366,600 SF if developed with EmX Alternatives. This would constitute 0.08 % or 0.11% of the impervious area in the Amazon Creek basin, respectively.

No cumulative effects are expected in Russel Creek.

Cumulative effects on both the quantity and quality of runoff may result from the development of 2 or more of the corridor alternatives because all affected watercourses eventually reach the Willamette River. However, due to the large drainage area and high amounts of existing impervious area in the Willamette River basin, the cumulative effects are likely to be minimal.

Table 6-25: 30th Avenue to LCC Corridor Existing and New Impervious Surface Quantities

Drainage Basin	Existing Impervious Area	Enhanced Corridor		EmX	
		Total New and Reconstructed Impervious Area / Percent of Impervious Area ^a	New Roadway and Sidewalk Impervious Area / Percent of Impervious Area ^a	Total New and Reconstructed Impervious Area / Percent of Impervious Area ^a	New Roadway and Sidewalk Impervious Area / Percent of Impervious Area ^a
Russel Creek	2,753,912 SF	0 SF 0.00%	64,800 SF 0.02%	1,700 0.06%	0 SF 0.00%
Amazon Creek	334,939,461 SF	98,500 SF 0.03%	26,900 SF <0.01%	151,400 SF 0.05%	35,700 SF <0.01%
Willamette River	462,920,832 SF	12,300 SF <0.01%	0 SF 0.00%	56,200 SF 0.01%	0 SF 0.00%
Total	800,614,205 SF	110,800 SF 0.01%	26,900 SF 0.01%	209,300 SF 0.03%	35,700 SF 0.01%

Source: CH2M. Draft Water Quality, Floodplain, and Hydrology Technical Report. 2017.

Note:

a Total impervious area in drainage basin

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Chapter 7: Coburg Road Corridor

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INTRODUCTION TO THE CORRIDOR CHAPTERS

Before reading this chapter, please read **Chapter 3**, which introduces the corridor-specific chapters (Chapters 4 through 8) with background information about the environmental topics evaluated for each alternative

Corridor Overview

The Coburg Road Corridor begins at the Eugene Station and continues to Coburg Road using the Ferry Street Bridge. The corridor continues north on Coburg Road to Crescent Avenue, east on Crescent Avenue, south on Shadow View Drive, east on Chad Drive to Old Coburg Road, and south on N. Game Farm Road and Gateway Street to the existing Gateway Station at the Gateway Mall. Although service extends from N. Game Farm Road to the Gateway Station, capital investments proposed as part of the MovingAhead project would terminate at Interstate 5 (I-5). Coburg Road is identified as a key corridor in Envision Eugene and the Eugene 2035 Transportation System Plan (Eugene 2035 TSP) – 1 of 6 corridors intended for multi-modal planning with frequent transit service (defined as 15-minute or better service frequency) connecting downtown Eugene with numerous core commercial areas. This corridor is approximately 13.2 round trip miles.

Near downtown Eugene, the Coburg Road Corridor is characterized by high-density residential areas. Outside of downtown on the north side of the Ferry Street Bridge near the Interstate 105 (I-105) interchange, existing land uses are primarily mid-rise office buildings and automobile dealerships. North of the I-105 interchange, common land uses include commercial retail, parking areas, office buildings, single-family and multi-family residences, medical services, government services, and

Corridor Length

13.2 miles round trip (No-Build, Enhanced Corridor, EmX)

Transit and Average Daily Ridership on Existing Transit Routes

🚏 12 Gateway	=	1,076 riders/day
🚏 66 VRC/Coburg	=	1,362 riders/day
🚏 67 Coburg/VRC	=	1,204 riders/day
🚏 96 Coburg	=	93 riders/day

Employment

Labor Force 16 Years Old and Older:

19,558 people (Enhanced Corridor)

24,092 people (EmX)

Number of Jobs:

25,340 jobs (Enhanced Corridor)

36,147 jobs (EmX)

Major Employers: Costco, EWEB, Guard Publishing Company, Slocum Orthopedics, Levi Strauss, City of Eugene, Lane County, Veterans Administration Eugene Health Care Center

Population

40,929 residents (Enhanced Corridor)

50,189 residents (EmX)

Neighborhoods

- » Cal Young Neighborhood Association
- » Downtown Neighborhood Association
- » Harlow Neighbors
- » Jefferson Westside Neighbors
- » Northeast Neighbors
- » University of Oregon Campus
- » West University Neighbors
- » Whiteaker Community Council

areas of vacant land. Refer to Table 7-1 for Coburg Road Corridor demographic data and Table 7-2 for Coburg Road Corridor household data.

The Coburg Road Corridor build alternatives follow the same alignment to connect downtown Eugene to the Gateway Station.

The roadways that comprise the Coburg Road Corridor are owned by the City of Eugene (City) and the City of Springfield. E. 7th Avenue is classified as a major

arterial. Coburg Road is classified as a major arterial south of Crescent Avenue and a minor arterial north of Crescent Avenue. Other corridor roadways are classified as local, major collector, minor arterial, and major arterial. Roads in the corridor from I-5 to the corridor terminus at Gateway Station are owned by the City of Springfield. The average daily traffic (ADT) volume along the corridor ranges from 63,500 vehicles (Ferry Street Bridge) to 2,900 vehicles (along N. Game Farm Road to Gateway Street).

Table 7-1: Coburg Road Corridor Demographic Data (2015 Estimates)

Area	Non-Minority Population	Minority Population				Limited English Proficiency	Population from Whom Poverty Determined	Median Household Income	Unemployment
	White Alone	Hispanic or Latino ^a	African American	Asian	Others ^b				
Enhanced Corridor	84.6%	5.4%	0.9%	5.6%	8.9%	3.7%	31.0%	\$36,515	10.5%
EmX	84.6%	6.0%	1.0%	5.7%	8.7%	3.8%	32.5%	\$34,395	11.2%
City of Eugene	77.5%	10.6%	1.7%	3.6%	6.7%	3.9%	24.4%	\$42,715	6.0%
Lane County	82.6%	8.5%	1.2%	2.3%	3.8%	3.0%	20.4%	\$43,685	6.6%
Central Lane Metropolitan Planning Organization	--	--	--	--	--	--	23.0%	\$40,400 ^c	6.6%

Source: CH2M. Draft Community, Neighborhood, and Environmental Justice Technical Report. 2017.

Notes:

- a Hispanic / Latino is defined as a person of Mexican, Puerto Rican, Cuban, Central or South American, or other Spanish culture or origin, regardless of race.
- b Others is a combination of the categories American Indian or Alaskan Native, Hawaiian or Pacific Islander, some other race, and 2 or more races.
- c Median income is calculated by taking the average of the Equity and Opportunity Assessment (EOA) median income levels for Lane County (\$42,621), Eugene (\$41,326), and Springfield (\$37,255).

Table 7-2: Coburg Road Corridor Household Data (2015 Estimates)

Area	Total Population	Population Under 18	Population Over 65	Owner/ Renter Occupied Housing	Average Household Size	Households with No Vehicle
Enhanced Corridor	45,658	14.5%	14.1%	39.8%/ 60.2%	2.1	16.6%
EmX	52,503	13.4%	13.0%	37.0%/ 63.0%	2.0	17.7%
City of Eugene	158,131	18.0%	13.6%	48.9% / 51.1%	2.3	11.4%
Lane County	354,764	19.4%	16.25	59.3% / 40.7%	2.4	8.4%
Central Lane Metropolitan Planning Organization	251,721	20.0%	15.0% ^a	55.0% / 45.0%	2.4	10.0%

Source: CH2M. Draft Community, Neighborhood, and Environmental Justice Technical Report. 2017.

Note:

a Percentage represents population 60 and over.



Alternatives Considered and Dismissed

During design development 3 other alignment options were considered but eliminated from advancing for further study. The options considered and reasons for eliminating them are summarized below:

- The Coburg Road Corridor Enhanced Corridor and EmX Alternatives considered an alignment option to travel on Crescent Avenue until reaching N. Game Farm Road instead of turning onto Shadow View Drive and traveling on Chad Drive until reaching N. Game Farm Road. This alignment option was eliminated from consideration because it does not serve key land uses including the Veterans Affairs Hospital and new housing development
- The Coburg Road Corridor EmX Alternative considered an alignment option to travel on E. 8th Avenue to reach the Ferry Street Bridge instead of traveling on the E. 6th and E. 7th Avenue couplet. This alignment option was eliminated from consideration because it does not align with City goals for creating a “great street” on 8th Street that operates similarly to Broadway Street
- The Coburg Road Corridor EmX Alternative considered an alignment option that would repurpose an auto travel lane to a dedicated transit lane from the north end of the Ferry Street Bridge to the I-105 ramp. This alignment option was eliminated from consideration because it would impact I-105 operations

Alternatives Advanced

This section summarizes the 3 Coburg Road Corridor alternatives advanced for further evaluation in this Alternatives Analysis (AA) report. Table 7-5 at the end of this section summarizes the attributes of these alternatives. A more comprehensive description of the alternatives is provided in the Draft MovingAhead Level 2 Definition of Alternatives (CH2M et al. 2016).

No-Build Alternative

Operations

Roadway operations would be the same as existing conditions on Coburg Road, Crescent Avenue, Shadow View Drive, Chad Drive, and N. Game Farm Road. There are no planned operations improvements in the corridor.

Coburg Road would continue to have 2 travel lanes in each direction and a center turn lane or median for much of the length of the corridor. Crescent Avenue, Chad Drive, and N. Game Farm Road would continue to have 1 travel lane in each direction and a center turn lane.

Under the No-Build Alternative, Lane Transit District (LTD) Routes 12, 66, 67, and 96 would continue serving the Coburg Road Corridor. Route 12 would operate with 30-minute frequencies all day. Routes 66 and 67 would operate with 15-minute peak and off-peak frequencies, and 30-minute evening frequencies. Route 96 would run along Coburg Road and between Eugene Station and the City of Coburg, primarily serving commuters from the City of Coburg, and would operate with approximately 8 round trips per day.

The No-Build Alternative would not include EmX service on Coburg Road. For the 2035 planning year, the No-Build Alternative would include the following EmX lines:

- Franklin EmX
- Gateway EmX
- West Eugene EmX
- Anticipated EmX service on Main Street in Springfield from Springfield Station to Thurston Station (see Chapter 1 for more discussion about this project)

The Franklin and West Eugene EmX lines would continue to serve the downtown Eugene terminus of this corridor.

Capital Investments

The No-Build Alternative would not include capital investments on Coburg Road as part of the MovingAhead project. This alternative includes existing roadway, bicycle, pedestrian, and transit facilities in the corridor, as well as planned investments in the 2035 Eugene TSP. There would be no additional major bus capital investments under the No-Build Alternative.

The Eugene 2035 TSP has the following transportation investments planned along or adjacent to the corridor:

- Sidewalk investments on Crescent Avenue between Coburg Road and Suzanne Way/Tennyson Avenue

Enhanced Corridor Alternative

Operations

Roadway operations under the Enhanced Corridor Alternative would be similar to that of the No-Build Alternative, with the following exceptions:

- The business access and transit (BAT) lane on Coburg Road would be extended near I-105 and new BAT lanes at other locations would be available for right-turning vehicles only
- New turn lanes would improve traffic operations and reduce bus delay at the following intersections:
 - » Oakmont Way (northbound and southbound)
 - » Harlow Road (northbound)
 - » Willakenzie Road (northbound)
 - » Southern ramp terminals at the Randy Papé Beltline Highway interchange (northbound)
 - » Northern ramp terminals at the Randy Papé Beltline Highway interchange (northbound)
 - » Chad Drive (northbound)
 - » Crescent Avenue (northbound)
- Signal timing at some existing signalized intersection would be altered to reduce delay for buses
- Installation of 5 new traffic signals would improve traffic operations at those intersections
- A transit queue jump would reduce bus delay at the intersection of Coburg Road and Oakmont Way

Buses would primarily operate in mixed traffic, except at transit queue jump location, bus-only turn lanes, and sections of BAT lanes on Coburg Road near I-105. Enhanced Corridor service would run from 6:45 a.m. to 11:30 p.m. weekdays, 7 a.m. to 11 p.m. Saturdays, and 8 a.m. to 8 p.m. Sundays. For purposes of this analysis, service frequencies are assumed to be 15 minutes during all periods.

Existing fixed-service bus operations on Routes 66 and 67 would be replaced by Enhanced Corridor service. Route 12 would be modified to serve Valley River Center and Marcola Road, and a new Route 60 would be added to serve Valley River Center. Service on Route 96 would remain the same as the No-Build Alternative.

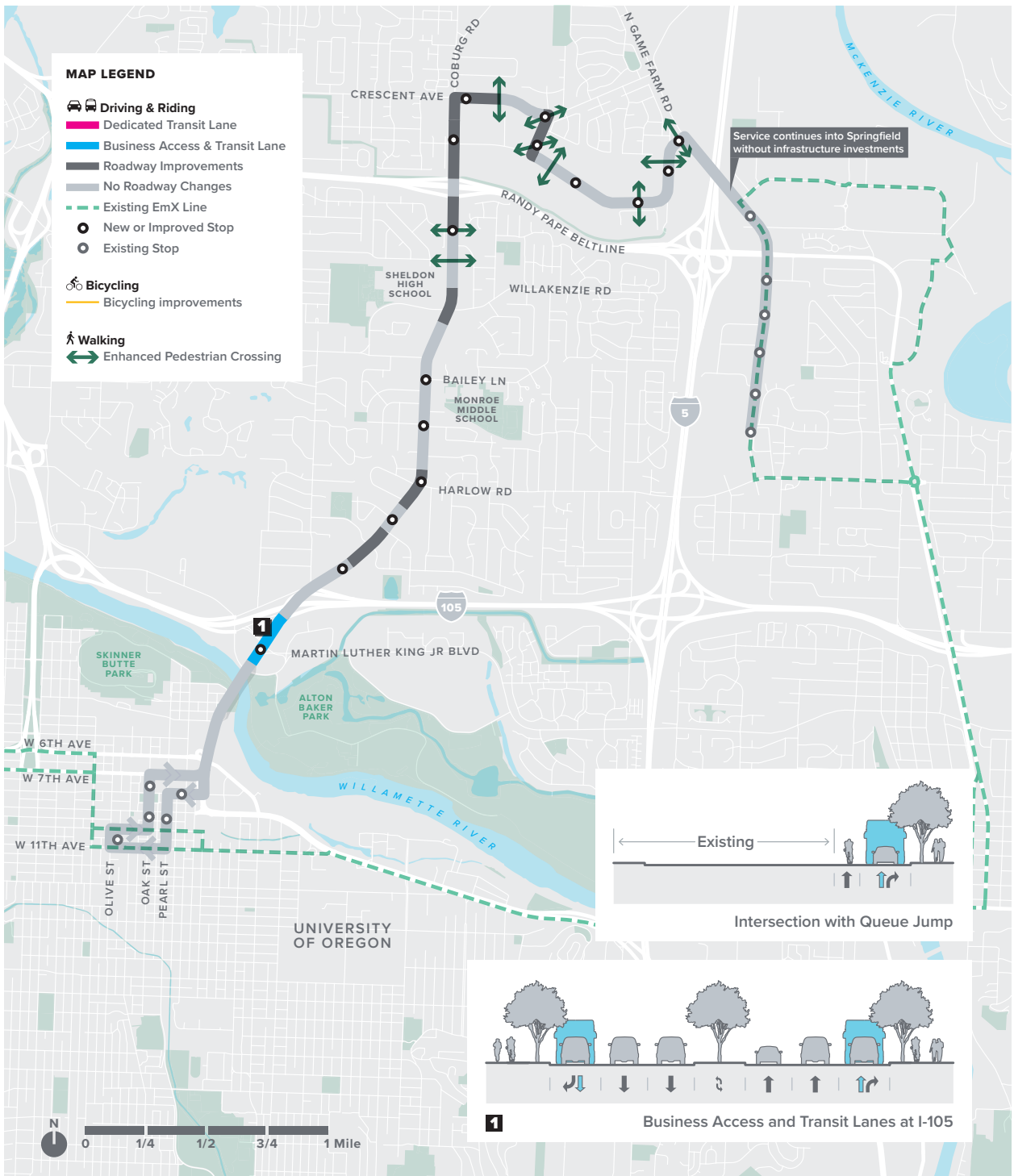
The Enhanced Corridor Alternative would result in 699 additional average weekday bus vehicle miles traveled and 13 additional average weekday revenue hours as compared to the No-Build Alternative.

Capital Investments

The Enhanced Corridor Alternative would include the following roadway capital investments in addition to those of the No-Build Alternative (Figure 7-1):

- Construct new traffic signals at the following locations:
 - » E. 4th Avenue on-ramp to Coburg Road
 - » Coburg Road and Elysium Avenue to facilitate pedestrian crossings
 - » Crescent Avenue and Shadow View Drive
 - » Shadow View Drive and Chad Drive
 - » Driveway of the Veteran's Affairs hospital site and Chad Drive (west of where Chad Drive curves north into Old Coburg Road)
- Reconstruct traffic signals at the following intersections:
 - » Coburg Road and Martin Luther King (MLK), Jr. Boulevard
 - » Coburg Road and the southern ramp terminals of the I-105 interchange
 - » Coburg Road and Harlow Road

Figure 7-1: Coburg Road Corridor Enhanced Corridor Alternative



Source: MovingAhead Project Team.

- » Coburg Road and Willakenzie Road
- » Southern and northern ramp terminals at the Randy Papé Beltline Highway interchange
- Add or extend right-turn lanes on Coburg Road to improve both bus and traffic movement at:
 - » Oakmont Way (northbound and southbound)
 - » Harlow Road (northbound)
 - » Willakenzie Road (northbound)
 - » Southern ramp terminals at the Randy Papé Beltline Highway interchange (northbound)
 - » Northern ramp terminals at the Randy Papé Beltline Highway interchange (northbound)
 - » Chad Drive (northbound)
 - » Crescent Avenue (northbound)
- Replace the existing landscaping strip and repurpose the right-turn lane along the west side of Coburg Road with a new southbound BAT lane on Coburg Road from Cedarwood Drive to just south of Country Club Road
- Extend the existing northbound BAT lane on Coburg Road from just south of the intersection of MLK, Jr. Boulevard to the southern I-105 ramp terminal
- Reconfigure the existing right-turn lane at the southern ramp terminal of the Randy Papé Beltline Highway interchange (northbound)
- Construct a new right-turn lane at the northern ramp terminal of the Randy Papé Beltline Highway interchange (southbound)
- Construct transit queue jump on Coburg Road at the Oakway Center driveway south of Oakmont Way to allow buses exiting the stop at this location to reenter traffic

Bicycle and pedestrian investments include those listed under the No-Build Alternative plus the following:

- Two new upgraded crossings at the following locations:
 - » Chad Drive and future driveway (east of KEZI 9 Station)
 - » Chad Drive west of N. Game Farm Road

- Seven new enhanced crossings at the following locations:
 - » Coburg Road and Jeppesen Acres Road
 - » Coburg Road and Elysium Avenue
 - » Coburg Road and Chad Drive
 - » Crescent Avenue and Tennyson Avenue
 - » Crescent Avenue and Shadow View Drive
 - » Chad Drive and Shadow View Drive
 - » Driveway of the Veteran’s Affairs Hospital site (west of where Chad Drive becomes Old Coburg Road)
- Reconstruct sidewalks at some locations and replace curb ramps at all locations where construction occurs
- Construct new sidewalk on Crescent Avenue from Coburg Road to Tennyson Avenue
- Construct sidewalk bulb outs (extending into the roadway) at some stops to allow buses to stop without leaving the travel lane

Bus stops would be spaced approximately 0.25 mile to 0.33 mile apart, except where existing bus stops and spacing would be used. Some stops would be improved with seating and shelters. Due to increased stop spacing, there would be 9 fewer bus stops in the corridor under this alternative as compared to the No-Build Alternative.

Under the Enhanced Corridor Alternative, 5 existing stops would be used for the enhanced bus service, but would not receive capital investments; 4 existing stop locations would receive capital investments; and 24 new stop locations would be constructed (Table 7-3).

The corridor terminates at the existing Gateway Station in the City of Springfield. The bus would pick up inbound passengers at this station. No capital investments would be made to the Gateway Station or any portion of the corridor east of I-5.

Under the Enhanced Corridor Alternative, LTD would have 76 fixed-route service buses (mix of 40-foot and 60-foot buses) and 15 spares operating in the system, an increase of 2 buses compared to the No-Build Alternative.

Table 7-3: Coburg Road Corridor Enhanced Corridor Alternative Bus Stops

<p>Existing Stops Remain – No Capital Investments</p> <p>5</p>	<ul style="list-style-type: none"> • Eugene Station • Oak Street and E. 7th Avenue northbound • Oak Street and Broadway northbound • Pearl Street and E. 10th Avenue southbound • E. 8th Avenue and High Street westbound 	
<p>Existing Stops Remain – Receive Capital Investments</p> <p>4</p>	<ul style="list-style-type: none"> • Crescent Avenue and Coburg Road eastbound • Crescent Avenue and Coburg Road westbound • Shadow View Drive and Crescent Avenue southbound • Crescent Avenue and Shadow View Drive westbound 	
<p>New Stop Locations</p> <p>24</p>	<ul style="list-style-type: none"> • Coburg Road and Country Club Road northbound • Coburg Road and Country Club Road southbound • Coburg Road between Oakway Road and Oakmont Way (Oakway Center driveway) northbound • Coburg Road between Oakway Road and Oakmont Way (Oakway Center driveway) southbound • Coburg Road and Frontier Drive northbound • Coburg Road and Frontier Drive southbound • Coburg Road and Harlow Road northbound • Coburg Road and Harlow Road southbound • Coburg Road and Tandy Turn northbound • Coburg Road and Tandy Turn southbound • Coburg Road and Bailey Lane northbound • Coburg Road and Bailey Lane southbound 	<ul style="list-style-type: none"> • Coburg Road and Elysium Avenue northbound • Coburg Road and Elysium Avenue southbound • Coburg Road and Chad Drive northbound • Coburg Road and Chad Drive southbound • Shadow View Drive north of Chad Drive northbound • Shadow View Drive north of Chad Drive southbound • Chad Drive and the Grainger Industrial Supply driveway (east of Shadow View Drive) eastbound • Chad Drive and the Grainger Industrial Supply driveway (east of Shadow View Drive) westbound • Chad Drive and the Veteran’s Affairs Hospital driveway eastbound • Chad Drive and the Veteran’s Affairs Hospital driveway westbound • Old Coburg and Game Farm Road eastbound • Old Coburg and Game Farm Road westbound
<p>Stops Eliminated</p> <p>9</p>	<ul style="list-style-type: none"> • Locations to be determined during final design 	

Source: CH2M et al. 2016.

EmX Alternative

Operations

Roadway operations under the EmX Alternative would be similar to that of the No-Build Alternative with the following exceptions:

- The extension of the BAT lane on Coburg Road near I-105 and new BAT lanes in downtown Eugene on W. 6th and 7th Avenues would be available for right-turning vehicles only
- The number of general-purpose lanes would be reduced to construct BAT lanes, which would reduce vehicular capacity and allow right-turning vehicles only at the following locations:
 - » E. 7th Avenue from Oak Street to High Street
 - » E. 6th Avenue from High Street to Pearl Street.
- New bus only lanes would improve bus rapid transit (BRT) vehicle travel times on Coburg Road at the following locations:
 - » Coburg Road from north of the Ferry Street Bridge to the southern ramp terminal of I-105
 - » Coburg Road from the southern ramp terminal of I-105 to north of the overcrossing of I-105
 - » Coburg Road from Elysium Avenue to Crescent Avenue
- New turn lanes would improve traffic operations and reduce bus delay at the intersections of:
 - » Coburg Road and Willakenzie Road
 - » Coburg Road and Crescent Avenue
- Sections of dedicated transit lanes on Coburg Road would eliminate left turns onto driveways at these locations; signals would allow u-turns at affected intersections
- Signal timing at some existing signalized intersections would be altered
- Installation of 6 new traffic signals would affect traffic operations at those intersections
- A new single bus-only “swap” lane would improve BRT vehicle travel times on Coburg Road on either side of Oakmont Way
- A transit queue jump would reduce bus delay at the intersection of Coburg Road and Harlow Road

Existing fixed-service bus operations on Routes 66 and 67 would be replaced by EmX service. Route 12 would be modified to serve Valley River Center and Marcola Road, and a new Route 60 would be added to serve Valley River Center. Service on Route 96 would remain the same as under the No-Build Alternative.

BRT vehicles would primarily operate in mixed traffic, except at transit queue jump locations, bus-only left-turn lanes, and sections of BAT lanes and dedicated transit lanes on Coburg Road. Under the EmX Alternative, the EmX system would extend from Eugene Station northeast to the Gateway Station.

EmX service is assumed to run from 6:45 a.m. to 11:30 p.m. weekdays, 7 a.m. to 11 p.m. Saturdays, and 8 a.m. to 8 p.m. Sundays. For purposes of this analysis, service frequencies are assumed to be 10 minutes during all periods.

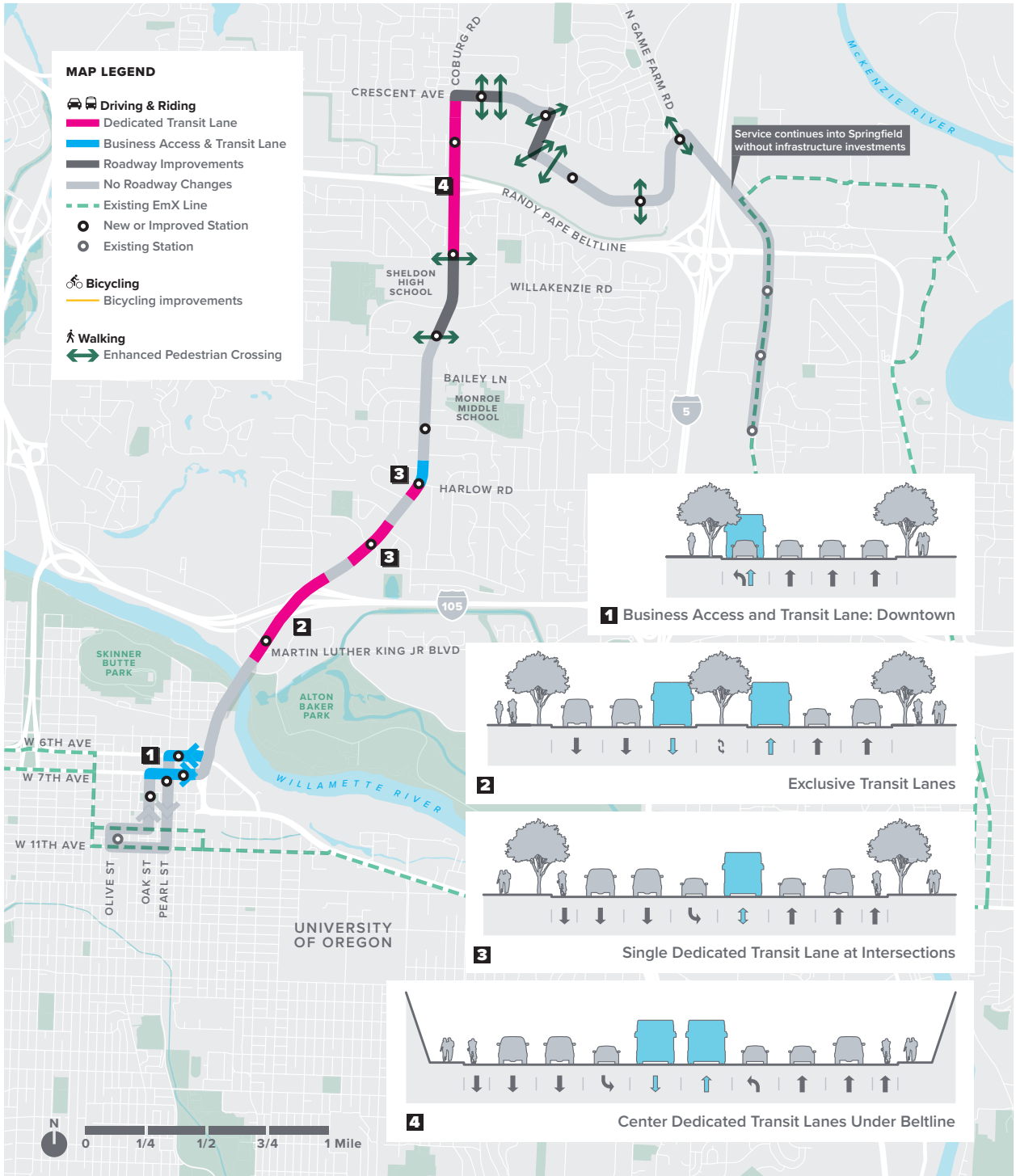
The EmX Alternative would result in 1,367 additional average weekday BRT VMT and 74 additional average weekday BRT revenue hours as compared to the No-Build Alternative.

Capital Investments

The EmX Alternative would include the following roadway capital investments in addition to those of the No-Build Alternative (Figure 7-2):

- Construct new traffic signals at the following intersections:
 - » E. 7th Avenue on-ramp to Coburg Road
 - » E. 4th Avenue on-ramp to Coburg Road
 - » Coburg Road and Elysium Avenue to facilitate transition into bus-only lane
 - » Crescent Avenue and Shadow View Drive
 - » Shadow View Drive and Chad Drive
 - » Driveway of the Veteran’s Affairs hospital site (west of where Chad Drive becomes Old Coburg Road)
- Reconstruct traffic signals at the following intersections:
 - » Coburg Road and MLK, Jr. Boulevard
 - » Coburg Road and the southern and northern ramp terminals of the I-105 interchange

Figure 7-2: Coburg Road Corridor EmX Alternative



Source: MovingAhead Project Team.

- » Coburg Road and Oakmont Way
- » Coburg Road and Harlow Road
- » Coburg Road and Willakenzie Road
- » Southern and northern ramp terminals at the Randy Papé Beltline Highway interchange
- » Coburg Road and Chad Drive
- » Coburg Road and Crescent Avenue
- Repurpose a general-purpose lane to a BAT lane on:
 - » E. 7th Avenue from Oak Street to High Street (eastbound)
 - » E. 6th Avenue from High Street to Pearl Street (westbound)
- Construct dual-direction (northbound and southbound), center-running bus-only lanes on Coburg Road from north of the Ferry Street Bridge to the southern ramp terminal of I-105 by repurposing an existing northbound travel lane and widening the roadway
- Construct a northbound, center-running bus-only lane on Coburg Road from the southern ramp terminal of I-105 to north of the overcrossing of I-105 by repurposing an existing northbound travel lane
- Convert the existing 2-way left-turn lane to a single bus-only “swap” lane on either side of Oakmont Way (the single bus-only swap lane would be used by northbound BRT vehicles approaching the intersection and southbound BRT vehicles approaching the intersection, with protected signal phasing at the intersection allowing BRT vehicles to swap into and out of mixed traffic)
- Repurpose existing general-purpose lanes for construction of a northbound bus-only lane and transit queue jump south of the intersection of Coburg Road and Harlow Road
- Construct a single northbound bus-only lane on Coburg Road from Pioneer Pike to Harlow Road
- Construct a southbound BAT lane with a transit queue jump from Turnbull Lane to Harlow Road
- Construct right-turn lanes northbound and southbound at the intersection of Coburg Road and Willakenzie Road

- Repurpose existing general-purpose lanes for construction of dual-direction (northbound and southbound), center-running bus-only lanes on Coburg Road from Elysium Avenue north to Crescent Avenue
- Construct a new bus-only left-turn lane on Crescent Avenue to facilitate bus turns onto Coburg Road southbound

Bicycle and pedestrian investments in addition to those of the No-Build Alternative include:

- Three new upgraded crossings at the following locations:
 - » Crescent Avenue and east of Tennyson Avenue
 - » Chad Drive and future driveway (east of KEZI 9 Station)
 - » Chad Drive west of N. Game Farm Road
- Nine new enhanced crossings at the following locations:
 - » Coburg Road and Harlow Road
 - » Coburg Road between Cal Young Road and Willakenzie Road
 - » Coburg Road and Jeppesen Acres Road
 - » Coburg Road and Elysium Avenue
 - » Coburg Road and Chad Drive
 - » Crescent Avenue between Coburg Road and Tennyson Avenue
 - » Crescent Avenue and Shadow View Drive
 - » Chad Drive and Shadow View Drive
 - » The driveway of the Veteran’s Affairs Hospital site (west of where Chad Drive becomes Old Coburg Road)
- Reconstruct sidewalks at some locations and replace curb ramps at all locations where construction occurs
- Construct new sidewalk on Crescent Avenue from Coburg Road to Tennyson Avenue

EmX stations would be spaced approximately 0.33 mile to 0.5 mile apart, except where existing station facilities and spacing would be used. EmX stations would have level boarding and tactile treatment to help facilitate BRT vehicle docking and boarding and alighting of

passengers, as well as amenities like shelters, benches, trash receptacles, bicycle racks, and fare payment kiosks.

Under the EmX Alternative, there would be no changes from the No-Build Alternative for bus facilities, except for the removal of up to 14 bus stops due to replacement of fixed-route service for Routes 66 and 67 with EmX service, which has greater station spacing. Under the EmX Alternative, 6 existing EmX stations would receive no capital investments and would be used with the Coburg Road EmX service, and 28 new EmX stations would be constructed (Table 7-4).

The corridor terminates at the existing Gateway Station in the City of Springfield. The BRT vehicle would pick

up inbound passengers at this station. No capital investments would be made to the Gateway Station or any portion of the corridor east of I-5.

Under the EmX Alternative, 1 bus bay at Eugene Station would be improved to accommodate BRT vehicles.

Under the EmX Alternative, LTD would have 72 fixed-route service buses (mix of 40-foot and 60-foot buses) and 14 spares operating in the system, a reduction of 3 vehicles (includes 1 spare) as compared to the No-Build Alternative. LTD would have 24 BRT vehicles (60-foot articulated) and 6 spares operating in the system, an addition of 6 BRT vehicles (includes 2 spares) as compared to the No-Build Alternative.



Table 7-4: Coburg Road Corridor EmX Alternative Stations

<p>Existing EmX Stations Remain – No Capital Investments</p> <p>6</p>	<ul style="list-style-type: none"> • Kruse Way Station Clockwise • Kruse Way Station Counter-Clockwise • Postal Way Station Clockwise • Postal Way Station Counter-Clockwise • Gateway Station Bay B • Gateway Station Bay C
<p>New EmX Station Locations</p> <p>28</p>	<ul style="list-style-type: none"> • Pearl Street north of E. 10th Avenue southbound • E. 11th Avenue between Pearl Street and Oak Street westbound • Oak Street south of E. 8th Avenue northbound • Pearl Street south of E. 7th Avenue southbound • E. 6th Avenue and High Street westbound • E. 7th Avenue and High Street eastbound • Coburg Road and Country Club Road northbound and southbound • Coburg Road and Oakmont Way northbound • Coburg Road and Oakmont Way southbound • Coburg Road and Harlow Road northbound • Coburg Road and Harlow Road southbound • Coburg Road and Tandy Turn northbound • Coburg Road and Tandy Turn southbound • Coburg Road between Cal Young Road and Willakenzie Road northbound • Coburg Road between Cal Young Road and Willakenzie Road southbound • Coburg Road and Jeppesen Acres Road northbound and southbound • Coburg Road and Chad Drive northbound • Coburg Road and Chad Drive southbound • Crescent Avenue between Coburg Road and Tennyson Avenue eastbound • Crescent Avenue between Coburg Road and Tennyson Avenue westbound • Shadow View Drive and Crescent Avenue southbound • Crescent Avenue and Shadow View Drive westbound • Chad Drive east of Shadow View Drive eastbound • Chad Drive east of Shadow View Drive westbound • Chad Drive and the Veteran's Affairs Hospital driveway eastbound • Chad Drive and the Veteran's Affairs Hospital driveway westbound • Old Coburg and Game Farm Road eastbound • Old Coburg and Game Farm Road westbound
<p>Stops Eliminated</p> <p>14</p>	<ul style="list-style-type: none"> • Locations to be determined during final design

Source: CH2M et al. 2016.

Table 7-5: Summary of Coburg Road Corridor Attributes of Alternatives

Corridor Attribute	No-Build	Enhanced Corridor	EmX
Annual Corridor Transit Trips ¹	10,060 trips	10,350 trips	11,200 trips
Annual Systemwide Transit Trips ²	46,410 trips	46,620 trips	47,270 trips
Change in Transit Trips Compared to No-Build	N/A	210 trips	860 trips
Average Transit Travel Time ³	18	13 minutes	13 minutes
Change in Transit Travel Time Compared to No-Build	N/A	-5 minutes	-5 minutes
Corridor Length (1-way, capital investments) ⁴	N/A	6.17 miles	6.25 miles
Corridor Length (round-trip miles)	13.2 miles	13.2 miles	13.2 miles
Exclusive / Priority Lanes (round-trip miles) ⁵	N/A	0.34 miles	1.82 miles
Percent Exclusive / Priority Lane of New Corridor	N/A	3.7%	16.6%
Transit Vehicles (operating systemwide)	74 buses 15 spare buses 19 BRT vehicles 5 spare BRT vehicles	76 buses 15 spare buses 19 BRT vehicles 5 spare BRT vehicles	72 buses 14 spare buses 24 BRT vehicles 6 spare BRT vehicles

Source: MovingAhead Project Team.

Notes:

- 1 Corridor transit trips are defined as any EmX or bus trip with at least 1 trip end in the corridor, excluding downtown or the University of Oregon. Source: DKS. Draft Transportation Technical Report. 2018.
- 2 Systemwide transit trips are defined as 1-way linked trips taken by a person from the trips origin to the trips destination, independent of the number of vehicles or transfers used to complete the trip. Source: DKS. Draft Transportation Technical Report. 2018.
- 3 Values represent average travel time for A.M. peak hour from Eugene Station to Corridor Terminus (in minutes). Source: LCOG. LCOG Regional Travel Demand Model. 2016.
- 4 This is the mileage of the corridor used to calculate the cost per corridor mile (not construction mile) and is the overall physical length of the corridor which does not correspond to the round-trip distance either bus or EmX service would travel on a corridor.
- 5 Exclusive/priority lanes include round-trip miles of business access and transit lanes, bus-only lanes, and queue jumps.

Capital Cost Estimates

The potential cost of each build alternative was estimated based on the concept design (Figure 7-3 and Table 7-6). Right of way (ROW), parking, utility relocations, and other impacts associated with the construction footprint were factored into the cost estimates. Capital cost estimates were based on historic construction bid data from other similar projects, including existing EmX corridors, and include escalation factors to bring costs to 2016 dollars and contingency costs. These planning-level cost estimates conform to FTA’s Standardized Cost Categories for Small Starts capital projects.

The capital cost per mile is calculated in 2 different ways: cost per corridor mile length and cost per construction mile. The cost per corridor mile is based on the total capital cost divided by the round-trip distance the bus or BRT vehicle would travel on a corridor. The cost per construction mile is based on the total capital cost divided by the total combined length of construction areas for each direction of travel.

No-Build Alternative

No construction is anticipated as part of the MovingAhead project under the No-Build Alternative, therefore, no capital costs are anticipated.

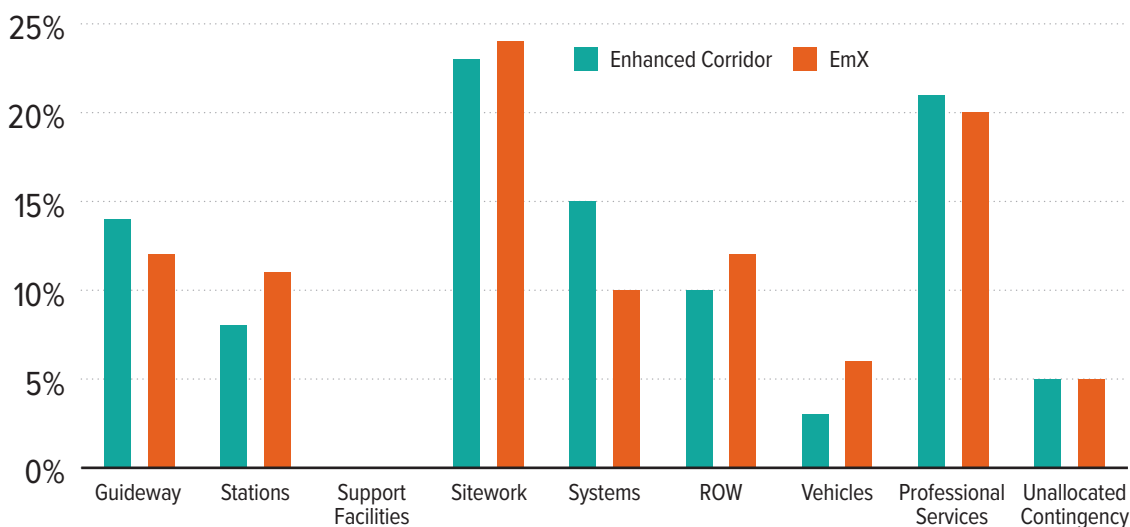
Enhanced Corridor and EmX Alternatives

Coburg Road Enhanced Corridor Alternative capital costs are estimated to be **\$41 million**, approximately **\$7 million/construction mile** with 6.2 miles of construction and **\$3.1 million/corridor mile** with 13.2 corridor miles.

The Coburg Road Corridor EmX Alternative capital costs are estimated to be **\$113 million**, approximately **\$18 million/construction mile** with 6.3 miles of construction and **\$8.6 million/corridor mile** with 13.2 corridor miles.

The Coburg Road Corridor has the greatest cost differential between its build alternatives. Although the estimated percent of total capital costs expended by cost category is similar between the build alternatives as illustrated in Figure 7-3, the difference in dollar amount is greater. The significant difference in investment in civil construction and roadway widening between the 2 alternatives causes this difference. The guideway (road segments where transit vehicles travel), sitework, and ROW components of the cost estimates show the greatest difference in investment and impact.

Figure 7-3: Coburg Road Corridor Capital Investments by Cost Category



Source: MovingAhead Project Team.

Operating and Maintenance Cost Estimates

Operating and maintenance (O&M) costs are an important factor in the selection of a preferred investment package since they represent ongoing costs to be borne by LTD's operating budget.

No-Build Alternative

With 93 peak vehicles (74 buses, 19 BRT vehicles), 278,600 revenue hours, and 4,520,200 revenue miles, systemwide annual O&M costs for the No-Build Alternative total **\$52.8 million**. For more detail on O&M costs refer to Table 7-6.

Enhanced Corridor Alternative

Service level changes for the Coburg Road Corridor Enhanced Corridor Alternative reflect the operational efficiencies gained from capital and service design improvements that allow for more revenue miles

per revenue hour (revenue hours decrease by 1.62% and revenue miles are decreased by 0.71% over the systemwide total). The required number of peak vehicles would increase from 93 under the No-Build Alternative to 95 (75 buses, 19 BRT vehicles) under the Enhanced Corridor Alternative. These efficiencies would result in more daily trips serving the corridor for a systemwide annual cost of **\$52.8 million**, about the same as the No-Build Alternative. For more detail on O&M costs refer to Table 7-6.

EmX Alternative

Revenue hours are modeled to increase by 1.54% and revenue miles would increase by 2.50%, with peak vehicles increasing from 93 under the No-Build Alternative to 96 (72 buses, 24 BRT vehicles) under the EmX Alternative. These changes would lead to systemwide annual O&M costs of **\$54.6 million**, or an increase of \$1.8 million over the No-Build Alternative. For more detail on O&M costs refer to Table 7-6.



Table 7-6: Summary of Coburg Road Corridor Cost Comparison of Alternatives

Corridor Attribute	No-Build	Enhanced Corridor	EmX
CAPITAL COST ESTIMATES (IN MILLIONS)			
Capital Cost ¹	N/A	\$41.0M	\$113.0M
Capital Cost /Corridor Mile	N/A	\$3.1M	\$8.6M
Capital Cost/Construction Mile	N/A	\$6.7M	\$18.1M
Percentage Pedestrian/Bicycle Costs (without contingency costs included)	N/A	10%	6%
OPERATING AND MAINTENANCE COST ESTIMATES			
Annual Systemwide Revenue Hours ²	278,600 hours	274,100 hours	282,900 hours
Annual Systemwide Miles	4,520,200 miles	4,487,800 miles	4,633,400 miles
Peak Transit Vehicles ³	93 vehicles	95 vehicles	96 vehicles
Annual LTD Operating Cost (in millions) ⁴	\$52.8M	\$52.8M	\$54.6M
Increase over No-Build	N/A	\$0.0M	\$1.8M
Systemwide Operating Cost per Trip ⁵	\$3.79	\$3.78	\$3.85

Source: MovingAhead Project Team.

Notes:

- 1 The potential cost of each alternative was estimated based on the concept design. ROW, parking, utility, and other impacts associated with the construction footprint were factored into the cost estimates. Capital cost estimates were based on historic construction bid data from other similar projects, including existing EmX corridors in Lane County, and include escalation factors to bring costs to 2016 dollars and contingency costs. These planning-level cost estimates conform to FTA's Standardized Cost Categories for Small Starts capital projects. Values are in 2016 dollars. Source: CH2M. Draft Capital Cost Estimating Technical Report. 2017.
- 2 Revenue service refers to all scheduled time a transit vehicle spends serving passengers. In this case, revenue service is confined to in-service time (excluding layovers, which are included in "Revenue Service" figure reported to the National Transit Database(NTD)) in order to relate to modelling outputs for the alternatives which are in-service forecasts from the LCOG Regional Travel Demand Model (2016).
- 3 Peak Transit Vehicles are the number of transit vehicles in operation to meet maximum demand.
- 4 Estimated operating and maintenance (O&M) costs represent potential ongoing costs that will be borne by LTD once the transit project is implemented. O&M costs were estimated for the evaluated alternatives using a fully allocated cost model for 2035 operations in accordance with FTA methods for estimating O&M costs for Transit Projects. Total systemwide annual O&M costs are the sum of costs related to 3 service categories forecasted for each alternative: revenue hours, revenue miles, and peak transit vehicles. Source: LTD. Draft Operating and Maintenance Costs Technical Report. 2017.
- 5 Cost/Trip are total operating costs divided by annualized systemwide average weekday trips. Passenger annualization of 300 is calculated from LTD 2016 ridership data and is used to translate average weekday to annual trips.

Environmental Consequences and Mitigation

Chapter 3 of this AA provides background information about the environmental topics evaluated for each alternative. Reading Chapter 3 is recommended before reading the summary of environmental consequences and mitigation for the Coburg Road Corridor.

In this section, potential benefits and impacts of each alternative are discussed by environmental topic. Where there are no distinguishable differences in impacts between alternatives, the summary is combined. Impacts that are similar across all corridors and alternatives are described in Chapter 3. Cumulative impacts are discussed only for those resources where the MovingAhead project has the potential to make a substantive contribution to cumulative impacts.

Potential environmental impacts and benefits of each alternative are summarized in Appendix C and detailed throughout this chapter by environmental discipline.

Acquisitions and Displacements

Outside of downtown Eugene, the Coburg Road Corridor is comprised of mid-rise office buildings and automobile dealerships near the Ferry Street Bridge and I-105. Heading north, the corridor transitions to commercial retail, parking areas, office buildings, and single-family residential.

No-Build Alternative

No acquisitions or displacements are anticipated under the No-Build Alternative since no construction would take place as part of the MovingAhead project under this alternative.

Enhanced Corridor and EmX Alternatives

Based upon the current design, both alternatives would require acquisitions of small strips of land along roadway frontages (partial acquisitions) to accommodate the proposed transit investments (Table 7-7). The Enhanced Corridor Alternative would require 47 partial property acquisitions, comprising an estimated 1.0 acre, while the EmX Alternative would require 71 partial acquisitions and 2 acquisitions of full properties (full acquisitions) from commercial properties, comprising an estimated 4.0 acres. Full property acquisitions under the EmX Alternative would result in displacement of 2 businesses. Under both alternatives land would be acquired from commercial and industrial, public and institutional, and residential parcels as listed in Table 7-7. After property impacts were revealed during the analysis, additional evaluation was conducted to determine other ways to avoid or minimize impacts at some properties; this effort is documented in the Addendum to the MovingAhead Alternatives Analysis Technical Reports Memorandum (CH2M 2017). As the design of the build alternatives progresses, design refinements to minimize impacts to private properties would be incorporated.

Property acquisition would impact off-street parking at 5 parcels under the Enhanced Corridor Alternative and 15 parcels under the EmX Alternative. Both alternatives would result in the closure of 1 residential driveway on a parcel with potential alternative access. In addition, the EmX Alternative would result in potential drive-through impacts on 2 commercial properties.

Mitigation options to avoid the potential full acquisition of properties and displacement of businesses are documented in the Addendum to MovingAhead Alternatives Analysis Technical Reports Memorandum (CH2M 2017).

Table 7-7: Coburg Road Corridor Property Acquisition Impacts

		Enhanced Corridor	EmX
Partial Acquisitions	Commercial & Industrial	20	35
	Public & Institutional	4	7
	Residential	23	29
	Vacant Land	0	0
Full Acquisitions	Commercial & Industrial	0	2
Total Parcels Affected		47	73
Total Area of Acquisitions		1.0 acre	4.0 acres
Displacements		0	2 businesses
Parcels with Potential Parking and Access Impacts	Parking Impacts	5	15
	Driveway Closures	1	1
	Business access impacts: right-in or right-out turning movements	4	7
	Drive-Through Closures ^a	0	2

Source: CH2M. Draft Acquisitions and Displacements Technical Report. 2017.

Note:

a Drive-through impacts may potentially lead to full acquisitions if impacts are unable to be mitigated through design alterations

Air Quality

The Eugene-Springfield region completed the federally required 20-year maintenance period in 2014 for carbon monoxide with no exceedances. As a result, no regional carbon monoxide hot spot air modeling or local air quality impacts analysis is required for transportation projects in the region. However, for informational purposes, a regional burden analysis was conducted for the MovingAhead project.

The focus of the air quality analysis was to evaluate the differences between the regional and subarea pollutant emissions generated under build alternatives versus emissions generated under the No-Build Alternative. This comparison shows the broad effects of the proposed alternatives.

No-Build Alternative

Under the future No-Build Alternative conditions, air quality in the Eugene-Springfield region is expected to continue to improve. Despite increases in VMT, air quality has continued to improve because of the improvements in vehicle technology and fuel types.

Enhanced Corridor and EmX Alternatives

When compared to the No-Build Alternative, the percent change in the overall level of pollutants is

negligible, with percentage changes all less than 1 % for impacts (positive numbers) and improvements (negative numbers) (Table 7-8). The results of the Federal Transit Administration (FTA)-compliant air quality burden analysis show that the build alternatives both received Low-Medium ratings. Projects with ratings of Low-Medium and Low are predicted to have slight improvements in air quality.

Temporary air quality impacts associated with the construction of each build alternative are expected, and those impacts are predicted to be approximately the same regardless of the alternative selected. During construction, carbon monoxide and particulate matter are expected to increase due to heavy construction vehicles, lowered traffic speeds, earth excavation, and occasionally open burning.

Construction contractors are required to comply with state regulations which address visible emissions and nuisance requirements. Violations of the regulations can result in enforcement actions and fines. The regulations provide a list of reasonable precautions to be taken to avoid dust emissions. These control measures would be documented in the pollution control plan that the contractor is required to submit prior to construction.

Table 7-8: Coburg Corridor Percent Change in Air Quality from 2035 No-Build Alternative

Primary Pollutants	Enhanced Corridor	EmX
Carbon monoxide (CO)	-0.01%	-0.02%
Nitrous oxide (NOx)	-0.02%	0.00%
Volatile organic compounds (VOC)	-0.02%	-0.02%
Particulate Matter – 2.5 microns in diameter (PM _{2.5})	-0.02%	-0.01%
Rating	Low-Medium	Low-Medium

Source: : Michael Minor and Associates. Draft Air Quality Technical Report. 2017.

Community, Neighborhoods, and Environmental Justice

The Coburg Road Corridor goes through or touches 4 neighborhoods – Downtown, Cal Young, Harlow, and Northeast (Figure 7-4).

The study area for both build alternatives includes 4 additional neighborhoods: the Jefferson Westside, Whiteaker, West University, and University of Oregon Campus.

Several social service organizations within the study area offer services to minority and low-income populations, including organizations that provide affordable housing and food. Within 0.25 mile of the Enhanced Corridor Alternative, there are 72 community and public facilities, 1 affordable housing facility (West Town), 1 food bank, and 1 shelter. Within 0.5 mile of the EmX Alternative, there are 99 community and public facilities, 1 affordable housing facility (West Town), 1 food bank (Food for Lane County), and 1 shelter.

The study area includes major employment centers, tourist attractions, retail businesses, and colleges that generate trips to and from the area. Government services (for example, public schools), and medical industries, telephone data collection, newspaper publisher, package delivery service, and clothing manufacturers are the top employers. Many large employers in the region are within 0.5 mile of the corridor. Total employment in Lane County is projected to increase by about 10% in the 10 year period from 2014 to 2024, with the greatest increase (about 16%) expected in education and health services, which are top employers in the corridor.

No-Build Alternative

No construction is planned as part of the MovingAhead project under the No-Build Alternative, so this alternative would not result in negative impacts on neighborhoods, community facilities, or public services, nor would there be any disproportionately adverse impacts to minority and/or low-income populations. The No Build Alternative would also not likely result in any economic benefits associated with development in the area around stops or stations. The No-Build Alternative would not improve transportation safety that could reduce the number of

potential conflicts among people walking, biking, and driving to the same degree as the investments under the build alternatives.

Enhanced Corridor and EmX Alternatives

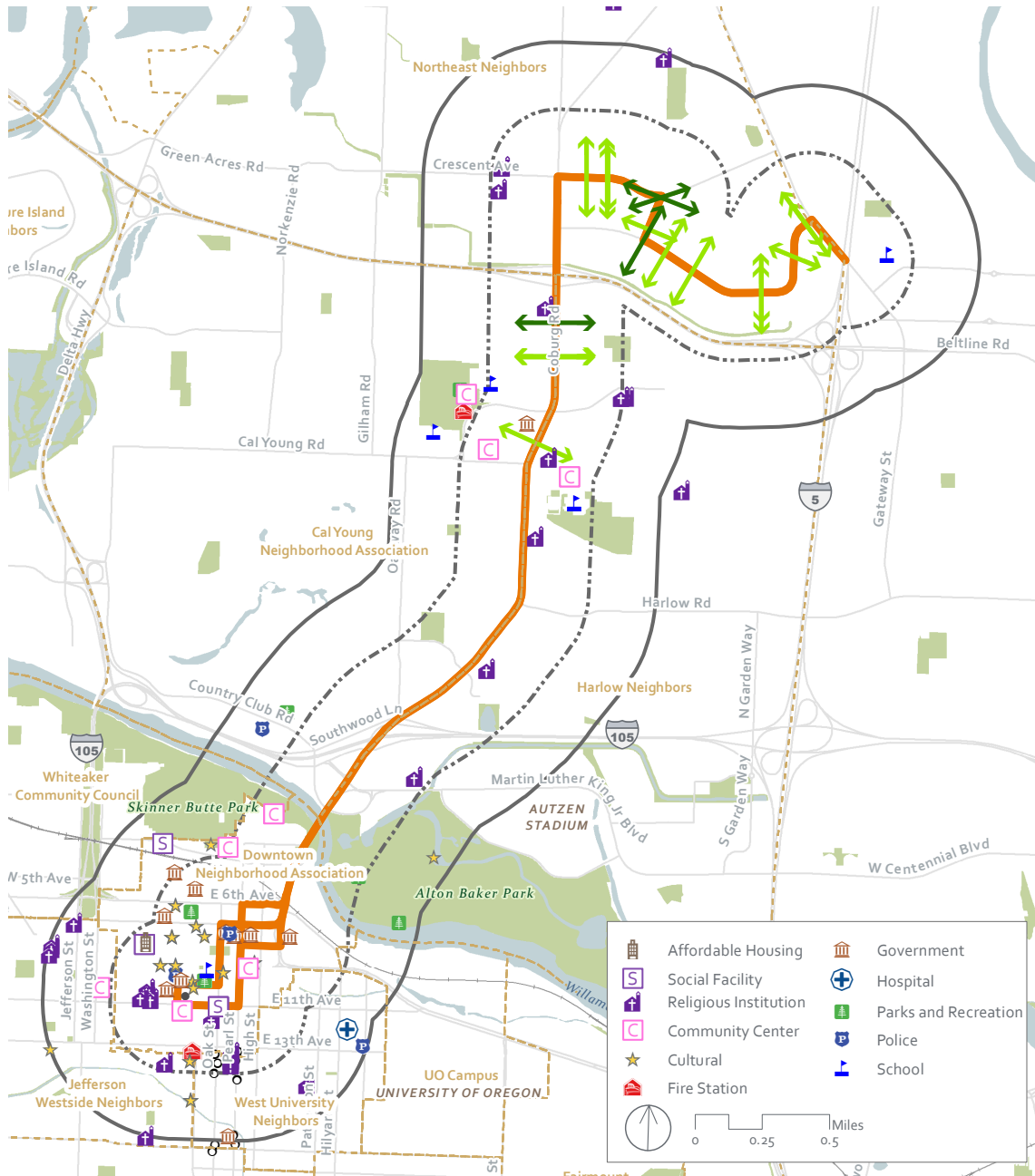
Potential effects of the build alternatives include:

- **Neighborhoods.** Neither build alternative would adversely impact community character within the Coburg Road Corridor. A total of 1.0 acre of land would be acquired from 47 properties under the Enhanced Corridor Alternative, and a total of 4.0 acres of land would be acquired from 73 properties under the EmX Alternative. The Enhanced Corridor would not displace any residences or businesses, but there would be potential displacement of 2 businesses under the EmX Alternative. Mitigation may be possible at some locations to further avoid or minimize impacts at some properties. These mitigations are outlined in the Addendum to MovingAhead Alternatives Analysis Technical Reports Memorandum (CH2M 2017). Up to 3 medium and large street trees and 6 landscape trees would be removed under the Enhanced Corridor, and up to 138 medium and large street trees and 11 landscape trees would be removed under the EmX Alternative. Tree removal would be mitigated through replanting.

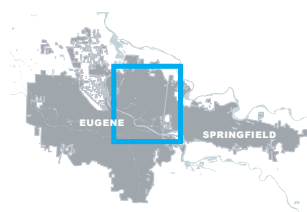
Safety for people walking, using mobility devices, and biking in the corridor would be improved with 2 upgraded pedestrian crossings and 7 enhanced pedestrian crossings, and improved sidewalks under the Enhanced Corridor Alternative, and 3 upgraded pedestrian crossings, 9 enhanced pedestrian crossings, improved sidewalks, and improved bicycle facilities under the EmX Alternative. The Enhanced Corridor Alternative is not expected to result in noise or vibration impacts. Potential noise impacts might occur to 39 single-family properties and 3 multi-family properties under the EmX Alternative; it is expected all noise impacts could be mitigated.

- **Transportation and Accessibility.** Both build alternatives would increase transit accessibility and reliability to residents within the neighborhoods near the corridor. The presence of 28 new or enhanced stops (of 33 total stops) under the Enhanced Corridor Alternative or 28 new or enhanced stations (of 34 total stations) under the EmX Alternative

Figure 7-4: Coburg Road Corridor Community Resources



Locator Map



Legend

- Coburg Road Corridor
- EmX Alternative API
- Enhanced Corridor Alternative API
- Neighborhood
- ↔ New Pedestrian Crossing
- ↔ Enhanced Existing Pedestrian Crossing
- Existing Without Improvements
- Proposed or Existing with Improvements

Community Resources
Coburg Road Corridor

Note: Both EmX and Enhanced Corridor Alternatives Shown



Document Path: C:\Users\KH033777\Projects\MovingAhead\GIS\MapFiles\Social_Facilities\Level2_Corridor_EnviroAnalysis_SocialIEJ_CorridorExtent_CommFacCoburg_ECandEmX.mxd

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Source: CH2M. Draft Community, Neighborhood, and Environmental Justice Technical Report. 2017.

would not change the overall visual setting of any neighborhoods because the alternatives are located on main arterials within an urban setting that already includes bus service. Both build alternatives would increase connectivity to other transit connections in the downtown area. The improved reliability of transit service under both build alternatives and the reduced headways under the EmX Alternative could attract additional riders.

- **Community Facilities and Public Services.** The Enhanced Corridor Alternative would not result in acquisition of any land from community or public facilities. Minor property acquisitions would affect 7 community facilities under the EmX Alternative, including acquisition of less than 0.01 acre and a temporary easement of an additional 0.01 acre from the downtown Park Blocks. Transit users would benefit from improved accessibility to community facilities in the corridor. No conflicts with emergency services are anticipated.
- **Economics.** The loss in property tax revenues to the City resulting from acquisition of privately owned land would be negligible under both build alternatives. The Enhanced Corridor Alternative would result in the removal of 67 off-street parking stalls at 5 properties, while the EmX Alternatives would result in removal of 128 off-street parking stalls at 15 properties. The Enhanced Corridor Alternative would close 1 residential driveway (on a parcel with potential alternative access) and would restrict ingress/egress at 4 properties to right-in and right-out movements only; this alternative would not result in any closures of drive-throughs. The EmX Alternative would require the closure of 1 residential driveway (on a parcel with potential alternative access), limit turning movements to right-in/right-out at 7 properties, and require the closure of 2 drive-throughs. The drive-through closures could result in the displacement of 2 businesses. After property impacts were revealed during the analysis, additional evaluation was conducted to determine other ways to avoid or minimize impacts at some properties; this effort is documented in the Addendum to the MovingAhead Alternatives Analysis Technical Reports Memorandum (CH2M 2017).

Construction of either build alternative would result in an increase in construction related jobs and expenditures in the corridor and community with more jobs generated and greater expenditures anticipated under the EmX Alternative. Both build alternatives would improve accessibility to employment locations along the Coburg Road Corridor and in the downtown business district. The permanent infrastructure and increased transit frequency of the EmX Alternative would offer a greater improvement in transit reliability, which would lead to increased business exposure, and over time could support and foster accelerated rates of transit-oriented development (TOD) implementation in areas planned and designated for mixed-use and multi-family residential development to a greater degree than under the Enhanced Corridor Alternative.

- **Environmental Justice.** All of the identified adverse impacts under either build alternative can be mitigated or minimized to a low severity. None of the impacts would be greater in magnitude than impacts to environmental justice populations that would be experienced by non-minority and non-low-income populations within the study area. Because the build alternatives would result in primarily beneficial effects, and no adverse impacts are anticipated after mitigation, no disproportionate high and adverse impacts on minority and low-income populations are anticipated.

Impacts during construction would be similar for the Enhanced Corridor and EmX Alternatives, involving noise and dust from construction equipment. Impacts would be greater with the EmX Alternative than with the Enhanced Corridor Alternative because of the larger construction footprint related to EmX stations and longer linear construction. The construction impacts would be short-term in nature and would typically end once construction is completed.

Cultural Resources

Archaeological (Below Ground) Resources

Four archaeological sites within the area of potential effect (APE) have recorded artifacts. Forty-nine archaeological investigations have previously been conducted within 1 mile of the APE, 12 of which included portions of the APE.

A pedestrian archaeological survey of the Coburg Road Corridor was conducted in September 2016. The surface survey inspected the proposed construction areas of the build alternatives. No prehistoric or demonstrably historical artifacts, features, or sites were observed during this surface survey. Coburg Road has been a transportation route for many years, and the adjoining lands have been developed and built upon for many years as well. The road has been resurfaced and widened; adjoining sidewalks and driveways have been built and revised; and the underlying buried utility infrastructure has been installed and augmented. This ongoing development has very likely disturbed most, if not all, of the ground along Coburg Road. The potential for intact archaeological materials, surface or buried, in the Coburg Road Corridor is low.

Historic (Above Ground) Resources

The Willakenzie area, the region north of the Willamette River on either side of Coburg Road, was historically agrarian in nature, having been initially settled and farmed starting in the 1850s. Urban development began spreading north after World War II. While few, if any, of the earliest buildings in the area remain, large tracts of 1940s through 1960s development—including platted neighborhoods—continue to characterize the Willakenzie area.

A historic records review and windshield survey of the corridor was conducted in September 2016. Twenty-three individual properties and 1 resource grouping potentially eligible for listing on the National Register

of Historic Places (NRHP) were identified in the Coburg Road Corridor. There are no historic resources that are formally listed on the NRHP. These resources would be protected under Section 106. There are no properties along this corridor that are listed by the City as City Landmarks.

No-Build Alternative

No impacts to historic or archaeological resources are anticipated because no construction would occur as part of the MovingAhead project under the No-Build Alternative.

Enhanced Corridor and EmX Alternatives

No impacts to archaeological resources are anticipated under either of the build alternatives because there are no identified resources in the APE and the likelihood of encountering any is low. Although no impacts to archaeological resources are anticipated, an Inadvertent Discovery Plan should be in place prior to construction. It would outline measures to be undertaken in the event of an unanticipated archaeological discovery.

Under the Enhanced Corridor Alternative, 7 historic resources may be affected by direct, long-term impacts, including strip takes (partial property acquisitions), and construction of shelters; under the EmX Alternative 7 historic resources and 1 potential historic district (a group of 11 adjacent resources) may be affected by direct long-term impacts, including strip takes, and construction of stations and planting strips. Additional resources are anticipated to experience indirect impacts, including strip takes, construction of shelters/stations, and visual effects that affect the integrity of the property's location, setting, feeling, or association, under the build alternatives (Table 7-9). Aside from the direct impacts noted above, it is assumed that there would be no additional short-term impacts (noise, air, access, etc.) to historic resources associated with construction.

Table 7-9: Impacts to Identified Historic Resources Along the Coburg Road Corridor

Historic Resource Address	Preliminary Eligibility Evaluation	Enhanced Corridor		EmX	
		Long-term Direct Impacts	Indirect/Cumulative Impacts	Long-term Direct Impacts	Indirect/Cumulative Impacts
11 Coburg Rd	Contributing				EmX Station
20 Coburg Rd	Contributing	Strip Take		Strip Take	EmX Station
West side Coburg Road, Frontier Drive to Bailey Lane	Contributing (potential district)		Enhanced Shelter Strip Take	EmX Station Strip Take	EmX Station Visual Effect
2344 Pioneer Pike	Contributing		Enhanced Shelter	EmX Station Strip Take	
780 Coburg Rd	Contributing				EmX Station Planing Strip
970 Coburg Rd	Contributing	Enhanced Shelter Strip Take		EmX Station Strip Take	
2692 Tandy Turn	Contributing	Strip Take	Enhanced Shelter	EmX Station Strip Take	
2693 Sharon Way	Contributing	Strip Take	Enhanced Shelter		
656 Cherry Dr	Contributing	Strip Take		EmX Station	
777 Coburg Rd	Contributing		Enhanced Shelter	EmX Station	
1209 Coburg Rd	Contributing	Enhanced Shelter Strip Take			
89355 N. Game Farm Road	Contributing	Enhanced Shelter Strip Take		EmX Station Strip Take	

Source: Heritage Research Associates. Draft Cultural Resources Technical Report. 2017.

Notes:

- 1 Table does not include downtown, 6th, 7th, 11th, or 13th Avenue segments addressed in previous LTD studies and for which no changes are proposed. Table does not include historic resources that would not be impacted by either build alternative.
- 2 Strip takes are partial acquisitions of a property in which a small strip of land along the roadway frontage is acquired for transit investments.
- 3 Visual effects noted in the table reflect visual changes other than shelters or stations.

Ecosystems

The Coburg Road Corridor is mostly located within a highly urbanized area consisting of residential and commercial development. The highly developed areas do not possess substantial habitat features and generally lack sensitive ecosystem features. Street and landscape trees along the corridor provide limited habitat for urban avian species. Existing habitat conditions are conducive to plant and wildlife species that are commonly found in urban areas. Areas that are not currently developed with hard structures or pavement are either landscaped or consist of fields that are vegetated with weedy plant species.

The corridor crosses the Willamette River at the Ferry Street Bridge. The nearest construction area for the build alternatives is located over 100 feet from the Willamette River. The City's Riparian Corridor setback from the Willamette River is 100 feet. No construction is proposed within the Willamette Greenway, an area of variable width on either side of the Willamette River that implements Statewide Planning Goal 15 and is protected by City Code. The Coburg Road Corridor also crosses the North Beltline Floodway, which does not have a setback requirement.

There are no wetlands mapped adjacent to the Coburg Road Corridor. Prior to construction, detailed onsite wetland determination and delineation work would occur. It is possible that additional wetland areas may be identified at that time.

Designated critical habitat for Chinook salmon is located at the Willamette River. The Coburg Road Corridor crosses the Willamette River and the nearest construction area is approximately 150 feet from the river. The minimum distance from the corridor to designated critical habitat for Willamette daisy is approximately 3 miles. No other designated critical habitat is located in the project vicinity.

A list of protected federal and state listed species documented as occurring in the project vicinity is presented in Chapter 3. None of these species are known to occur within the study area.

No-Build Alternative

The No-Build Alternative would not involve any construction activities associated with the MovingAhead project 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 species listed under the Endangered Species Act or designated critical habitat. The No-Build Alternative would not result in any long-term direct impacts to wetlands or waterways.

Enhanced Corridor and EmX Alternatives

Trees

Based on the assessment of potential impacts to street and landscape trees, up to 3 medium and large street trees and up to 6 medium and large landscape trees would potentially be removed under the Enhanced Corridor Alternative, slightly reducing available habitat for avian species in the corridor under both alternatives (Table 7-10); none of the tree impacts would occur within the Charter Tree boundary. Under the EmX Alternative, up to 100 street trees within the Charter Tree boundary would be removed and up 38 street trees and 11 landscape trees would be removed outside of the boundary, also slightly reducing avian habitat in the corridor. Any tree removal would occur in accordance with local regulations and would be mitigated through replacement. Mitigation would offset any long-term direct impacts.

Fish

Both build alternatives would result in construction of new, reconstructed, and adjoining impervious surfaces. Stormwater runoff from new impervious surfaces could reach fish bearing waterways. The Enhanced Corridor Alternative would result in 358,600 square feet (SF) of new, reconstructed and adjoining impervious surface, of which approximately 95,800 SF would drain to the Willamette River, 92,500 SF would drain to Debrick Slough, and 170,300 SF would drain to Dodson Slough. The EmX Alternative would result in 812,900 SF of new, reconstructed and adjoining impervious surface, of which approximately 102,300 SF would drain to the Willamette River, 177,600 SF would drain to Debrick Slough, and 533,000 SF would drain to Dodson

Slough. Runoff from the increase in impervious surface would be required to meet Oregon Department of Transportation (ODOT)'s or the City's stormwater design standards, depending on the roadway jurisdiction, as well as Oregon Department of Environmental Quality (DEQ) standards. Stormwater treatment would remove pollutants, minimize erosion, and control the flow so that the build alternatives would not significantly impact threatened fish species or designated critical habitat.

Potential cumulative stormwater effects to Debrick Slough, Dodson Slough and designated critical habitat in the Willamette River would be mitigated by meeting the required stormwater design standards.

Construction activities would result in short-term changes to water quality that could affect fish species and their habitat, such as potential for sediment transport to waterways. Because erosion prevention and sediment control measures would be implemented, none of these effects would be significant.

Wetlands

There are no wetlands mapped along the Coburg Road Corridor, so neither build alternative is anticipated to disrupt wetlands or result in long-term direct impacts to mapped wetlands, including changes to wetland functions and quality. Construction of either build alternative would not cause any changes to the hydrology of mapped wetlands or encroach on any wetland buffers or conservation setbacks.

Since construction is not proposed near currently wetlands, there would be no short-term construction-related degradation of wetland quality or adverse changes in wetland functions.

Critical Habitat

The build alternatives would not result in the destruction or adverse modification of critical habitat or suitable habitat, nor would they result in a "take" of federal or state listed species.

No indirect or cumulative effects or short-term construction-related impacts to designated terrestrial critical habitat or listed species are anticipated under either build alternative.

Table 7-10: Coburg Road Corridor Ecosystem Impacts

	Enhanced Corridor	EmX
Trees	<ul style="list-style-type: none"> Removal of up to 9 medium and large trees Slight reduction in avian habitat 	<ul style="list-style-type: none"> Removal of up to 149 medium and large trees Slight reduction in avian habitat
Fish	<ul style="list-style-type: none"> Construction of 358,600 SF of impervious surface Increase in stormwater runoff 	<ul style="list-style-type: none"> Construction of 812,900 SF of impervious surface Increase in stormwater runoff
Wetlands	No impacts	No impacts
Critical Habitat	<ul style="list-style-type: none"> No adverse impact No "take" of federal or state-listed species 	<ul style="list-style-type: none"> No adverse impact No "take" of federal or state-listed species

Source: Environmental Science & Assessment, LLC. Draft Ecosystems Technical Report. 2017.

Energy, Sustainability and Greenhouse Gas

Along the Coburg Road Corridor, energy is consumed primarily for residential, commercial, and transportation purposes. Transportation energy for motor vehicles is primarily provided by direct combustion of petroleum fuels, with lesser contributions from compressed natural gas and electricity. Given the continued gains in technology for increasing energy efficiency, energy consumption is not expected to be a factor for determining the preferred mode alternatives.

No-Build Alternative

Under the No-Build Alternative VMT, congestion, and energy use are expected to increase. Energy consumption and greenhouse gas (GHG) emissions are expected to be higher at congested intersections. There is limited potential for sufficient mode shifts from motor vehicles to transit to improve energy use and sustainability. The No-Build Alternative is inconsistent with applicable goals and policies related to GHG reductions and sustainability.

This alternative would not involve any construction activities associated with this project and, therefore, would not require any energy for construction activities.

Enhanced Corridor and EmX Alternatives

The long-term direct impacts of the proposed build alternatives include negligible changes to direct energy consumption as shown in Table 7-11. The EmX Alternative would use slightly more energy than the No-Build Alternative in 2035, while the Enhanced Corridor Alternative would result in slightly less energy use than the No-Build and EmX Alternatives.

The Enhanced Corridor and EmX Alternatives would be in compliance with both the City's and LTD's sustainability policies.

All required mitigation measures related to energy and GHG emissions, such as preserving or replanting trees and minimizing traffic obstructions, would be specified in LTD's construction contracting documents.

Overall, future energy use does not differentiate the 3 alternatives on direct and indirect energy consumption. The changes in regionwide energy consumption are negligible for the alternatives due to continued increases in fuel efficiency over the next 20 years. Given the continued gains in technology for increasing energy efficiency, energy consumption is not expected to be a factor for determining the preferred mode alternative. The impacts of the build alternatives are not large enough to warrant additional mitigation measures.

Table 7-11: Coburg Road Corridor Percent Change in 2035 Regionwide Energy Impacts (Btu) from the No-Build Alternative

Energy Type	Enhanced Corridor	EmX
Direct Energy ^a	-0.022%	-0.001%
CO2e Equivalent Energy ^b	-0.023%	0.002%
Maintenance Energy ^c	0.015%	0.018%
Total	-0.030%	0.003%

Source: DKS. Draft Energy and Sustainability Technical Report. 2017.

Notes:

- a Direct energy represents energy consumed for operation of transit service.
- b CO2e equivalent energy represents greenhouse gas emissions generated by operation of transit service.
- c Maintenance energy represents energy consumed indirectly for the products and operations necessary to keep the transit system operable.

Geology and Seismic

A review of geologic conditions in the Coburg Road Corridor shows that there are no mapped active faults or fault zones close to the corridor, the area is too high to be subject to tsunami inundation, no significant waterbodies are near enough to cause concerns about seiche inundation, and volcanic activity is not considered a significant concern.

No-Build Alternative

The main geologic hazards that could potentially affect operation and maintenance of the No-Build Alternative include erosion, landslides, ground motion, and liquefaction, as described in Table 7-12.

Enhanced Corridor and EmX Alternatives

Long-term impacts for the build alternatives would be related to geologic and seismic hazards that already exist; these hazards are the same as for the No-Build Alternative (Table 7-12).

Table 7-12: Coburg Road Corridor Existing Geologic Hazards

Hazard	No-Build	Enhanced Corridor	EmX
Erosion	<ul style="list-style-type: none"> • Low to moderate wind erosion susceptibility • Low to moderate water erosion susceptibility 		
Problematic Soil Properties	<p>High shrink-swell and hydric soils:</p> <ul style="list-style-type: none"> • At the Chad Drive and Shadow View Drive intersection • Between the Coburg Road and Crescent Avenue intersection and the Old Coburg Road and Chad Drive intersection • At the Coburg Road and Bailey Lane intersection • At approximately 200 feet south of the Coburg Road and Willakenzie Road intersection 		
Landslides	<p>Moderate (landsliding possible) to high (landsliding likely)</p> <ul style="list-style-type: none"> • Coburg Road at the Randy Papé Beltline Highway interchange • Coburg Road at the I-105 Highway interchange • Coburg Road from E. 4th Avenue to the MLK, Jr. Boulevard ramp 		
Ground Motion	Strong to very strong ground-shaking zone		
Liquefaction	<p>Moderate liquefaction hazard zone:</p> <ul style="list-style-type: none"> • From the Eugene Station to Pioneer Pike • Along N. Game Farm Road • Along Gateway Street 		

Source: CH2M. Draft Geology and Seismic Technical Report. 2017.

Hazardous Materials

The development of auto-oriented businesses such as automotive service and repair shops and gasoline stations combined with underground heating oil tanks and dry-cleaning businesses has led to a corridor with a number of affected sites that federal or state regulatory agencies have recorded on 1 or more hazardous materials lists.

There are 2 high-risk and 66 medium-risk hazardous materials sites recorded within the study area of the Enhanced Corridor Alternative and 3 high-risk and 65 medium-risk hazardous materials sites within the study area of the EmX Alternative.

No-Build Alternative

No project-related construction activities would occur under the No-Build Alternative so there would be no impacts to hazardous materials because there would be no handling of, or exposure to existing contaminants, and no existing contaminants would be remediated.

Enhanced Corridor and EmX Alternatives

Construction activities under the Enhanced Corridor Alternative would potentially require ground disturbance at 2 high-risk sites leading to potential exposure to hazardous materials; under the EmX Alternative 3 high-risk sites could be disturbed (Table 7-13). The acquired portions of the sites would be remediated, resulting in a long-term benefit to the community. However, no medium-risk sites are within the potentially affected tax lots under either alternative.

Table 7-13: Coburg Road Corridor Number of Hazardous Sites on Potentially Impacted Tax Lots

Hazardous Sites on Potentially Impacted Tax Lots	No-Build	Enhanced Corridor	EmX
High Risk	0	2	3
Medium Risk	0	0	0

Source: CH2M. Draft Hazardous Materials Technical Report. 2017.

Land Use and Prime Farmland

Near downtown Eugene, the Coburg Road Corridor is characterized by office, commercial and high-density residential areas. Outside of downtown on the north side of the Ferry Street Bridge near the I-105 interchange, existing land uses are primarily mid-rise office buildings and automobile dealerships. North of the I-105 intersection, common land uses include commercial retail, parking areas, office buildings, single-family and multi-family residences, medical services, government services, and areas of vacant land.

No-Build Alternative

No property would be acquired under the No-Build Alternative, and no temporary construction easements would be needed since no construction activities would occur as part of the MovingAhead project.

The No-Build Alternative would not result in direct impacts to prime farmlands, or agricultural or forest uses subject to Oregon Statewide Planning Goals 3 (Agricultural Lands) or 4 (Forest Lands).

The No-Build Alternative would be inconsistent with many local, regional, and state land use and transportation policies in the Eugene 2035 TSP, the Metro Plan, and Envision Eugene because it would not institute a BRT system connecting the region's highest growth centers and it would not encourage increased density and TOD along Key Transit Corridors.

Enhanced Corridor and EmX Alternatives

Overall, direct impacts to land use are limited because the proposed investments of the build alternatives would be located primarily within existing transportation ROWs and the total area that would be converted from existing land uses to a transportation use is minor compared to the total land available in the City.

Under the Enhanced Corridor Alternative, 47 partial acquisitions, totaling 1.0 acre, would be required to facilitate roadway widening and enhanced multimodal investments. Under the EmX Alternative, 71 partial acquisitions and 2 full acquisitions, totaling 4.0 acres would be required, more total acreage than under the Enhanced Corridor Alternative because dedicated transit lanes and EmX stations would require greater

roadway widths. Most of the land that would be acquired and converted to a transportation use under both build alternatives is zoned mixed-use or residential (Table 7-14).

The presence of EmX would support more development, decrease the need for automobile parking, and support a wider mix of uses as compared to the No-Build and Enhanced Corridor Alternatives.

Neither of the build alternatives would result in direct impacts to prime farmlands, or agricultural or forest uses subject to Oregon Statewide Planning Goals 3 (Agricultural Lands) or 4 (Forest Lands). No direct impacts to prime farmland subject to the Farmland Protection Policy Act (FPPA) would occur under the Enhanced Corridor Alternative.

Operation of the build alternatives also has the potential to contribute to beneficial indirect impacts as a result of TOD. Lands that may be supportive of TOD development are identified in Table 7-15. Greater areas of Mixed-Use and Multi-Family Residential zoning contribute to a greater likelihood that TOD would occur within an area of potential impact. Any new development or redevelopment would need to be consistent with existing zoning and to comply with any requirements associated with overlays.

Construction of the build alternatives would require temporary construction easements beyond the property acquisition needed to construct the alternatives, which could result in additional impacts to properties located along the corridor. These easements would be temporary and the areas affected would be returned to preconstruction conditions upon completion of construction. Additional information about compensation for property acquisition and temporary easements is addressed in the Draft Acquisitions and Displacements Technical Report (CH2M 2017).

Generally, the Enhanced Corridor Alternative would be consistent with the goals and policies on improving multimodal transportation contained in the Metro Plan, Regional Transportation Plan (RTP), TransPlan, Envision Eugene, and the Eugene 2035 TSP. This alternative would not be fully consistent with the RTP (Transportation System Improvement [TSI] Transit Policy #2) and the Metro Plan (Policy F.19) because the

Table 7-14: Coburg Road Corridor Potential Permanent Conversion of Land to Transportation-Related Use

Land Use Zoning	Enhanced Corridor (ac)	EmX (ac)
Commercial	0	< 0.1
Industrial	0	0
Office	< 0.1	0.1
Institution	0	< 0.1
Single-Family Residential	0.2	0.6
Multi-Family Residential ^a	0.2	0.7
Agriculture / Forest / Natural Resources	0	0
Mixed-Use ^a	0.5	2.4
Special Area Zone (Non-Mixed Use)	0	0
Total Potential Permanent Conversion^b	1.0	4.0
Total Acres TOD Supportive Lands^a	1.0	3.1

Source: CH2M. Draft Land Use and Prime Farmland Technical Report. 2017.

Notes:

- a Lands zoned Mixed-Use and Multi-Family Residential would likely be supported to a greater degree by transportation investments proposed under the build alternatives and have been aggregated together as “TOD Supportive Lands”
- b Total may be greater or less than the sum of the parts due to rounding.

Enhanced Corridor Alternative would not implement a BRT system. However, the Enhanced Corridor Alternative would implement lower capital-cost transit investments consistent with the intent of these goals and policies and would not preclude the implementation of an EmX Alternative in the future.

The EmX Alternative would be consistent with existing local, regional, and state land use and transportation policies of the Metro Plan, TransPlan, RTP, the Eugene 2035 TSP, and Envision Eugene because it would institute a BRT system connecting the region’s highest growth centers.

The build alternatives would serve the Coburg Road Key Transit Corridor identified in Envision Eugene.

Table 7-15: Coburg Road Corridor Transit Supportive Lands

Zoning Type	Enhanced Corridor	EmX
Mixed-Use	395 acres	627 acres
Vacant^a	23 acres	32 acres
Multi-Family Residential	138 acres	320 acres
Vacant^a	28 acres	48 acres

Source: CH2M. Draft Land Use and Prime Farmland Technical Report. 2017.

Note:

- a Vacant lands are captured in the Mixed-Use and Multi-Family Residential totals.

Noise and Vibration

Land use in downtown Eugene is mainly commercial, with some intermixed multi- and single-family residences. The main noise source for both alternatives in the southern end of the Coburg Road Corridor is traffic on major arterial roadways throughout the downtown area.

Key land uses throughout the Coburg Road Corridor include the Oakway Center, at the intersection of Oakway and Coburg Roads, and the shopping center at the intersection of Willakenzie and Coburg Roads. The recently completed Veterans Affairs Hospital and Crescent Village mixed-use development are also located within the north end of the corridor. North of Harlow Road there are many multi- and single-family residences. Noise levels north of the downtown area and the Ferry Street Bridge are dominated by traffic on Coburg Road and nearby commercial activities. Traffic on I-105, the Randy-Papé Beltline, and I-5 also affect noise levels where the alternatives pass near those roadways.

No-Build Alternative

Under the No-Build Alternative, no noise or vibration impacts are anticipated because there would be no project related changes to the corridor.

Enhanced Corridor and EmX Alternatives

Operation of the Enhanced Corridor Alternative is not predicted to have any noise impacts to noise-sensitive

properties (Table 7-16). Increased transit vehicle traffic in closer proximity to noise sensitive properties under the EmX Alternative would potentially cause noise impacts to 39 single-family properties, 3 multi-family properties, 1 hotel, 2 churches, and 1 school. Neither alternative is anticipated to result in vibration impacts.

During final design, all impacts and potential mitigation measures would be reviewed for verification; the most appropriate mitigation measures would be determined in consultation with the affected property owners.

Under the build alternatives, during construction of the proposed project investments, noise and vibration levels in the project corridor may increase due to normal construction activities. However, daytime construction noise is exempt from provisions contained in the City of Eugene Municipal Code. Under the City of Eugene Municipal Code noise ordinance, project construction could be performed during the allowable hours of 7:00 a.m. to 7:00 p.m. Construction related noise is exempt from code provisions if construction is performed during the allowable hours. No construction noise impacts are predicted for any alternative if construction is performed during the allowable hours. If construction was planned outside of the allowable hours, the project would be required to obtain a noise variance from local jurisdictions. As part of the variance process, a construction noise analysis would be performed; the construction specifications would contain limitations, if any, specific to the night work proposed and potential construction noise impacts.

Table 7-16: Coburg Road Corridor Potential Noise and Vibration Impacts

Number of Properties Potentially Impacted	No-Build	Enhanced Corridor	EmX
Noise	0	0	46
Vibration	0	0	0

Source: Michael Minor and Associates. Draft Noise and Vibration Technical Report. 2017.

Parklands, Recreation Areas and Section 6(f) Resources

Within the Coburg Road Corridor study area there is 1 community park, 2 neighborhood parks, 2 metropolitan parks, 2 urban plazas, and 1 natural area (Figure 7-5). Three of these resources are within 200 feet of the alignment of the build alternatives: the downtown Park Blocks, Skinner Butte Park, and Alton Baker Park (Table 7-17). Skinner Butte Park and Alton Baker Park received funding from the Land and Water Conservation Fund (LWCF), so they are protected under Section 6(f).

No-Build Alternative

The No-Build Alternative would not impact parklands, recreation areas, or Section 6(f) resources because there would be no construction or change in the transportation system as a result of the MovingAhead project.

Enhanced Corridor and EmX Alternatives

Beneficial effects of the build alternatives would include increased access to the parks along the corridor through more frequent and reliable transit service. In addition, bicycle and pedestrian connectivity would be enhanced with the new or enhanced pedestrian crossings along the corridor.

Under the build alternatives, transit service related to parks and recreation resources within 200 feet of the construction footprint of the build alternatives would be as follows:

- Transit service to the Park Blocks would be more frequent than the fixed-route service under the No-Build Alternative.
- Transit service to Skinner Butte Park would be more frequent than the fixed-route service under the No-Build Alternative, but park users would have to walk farther due to the proposed elimination of the bus stops at E. 2nd and 3rd Avenues.

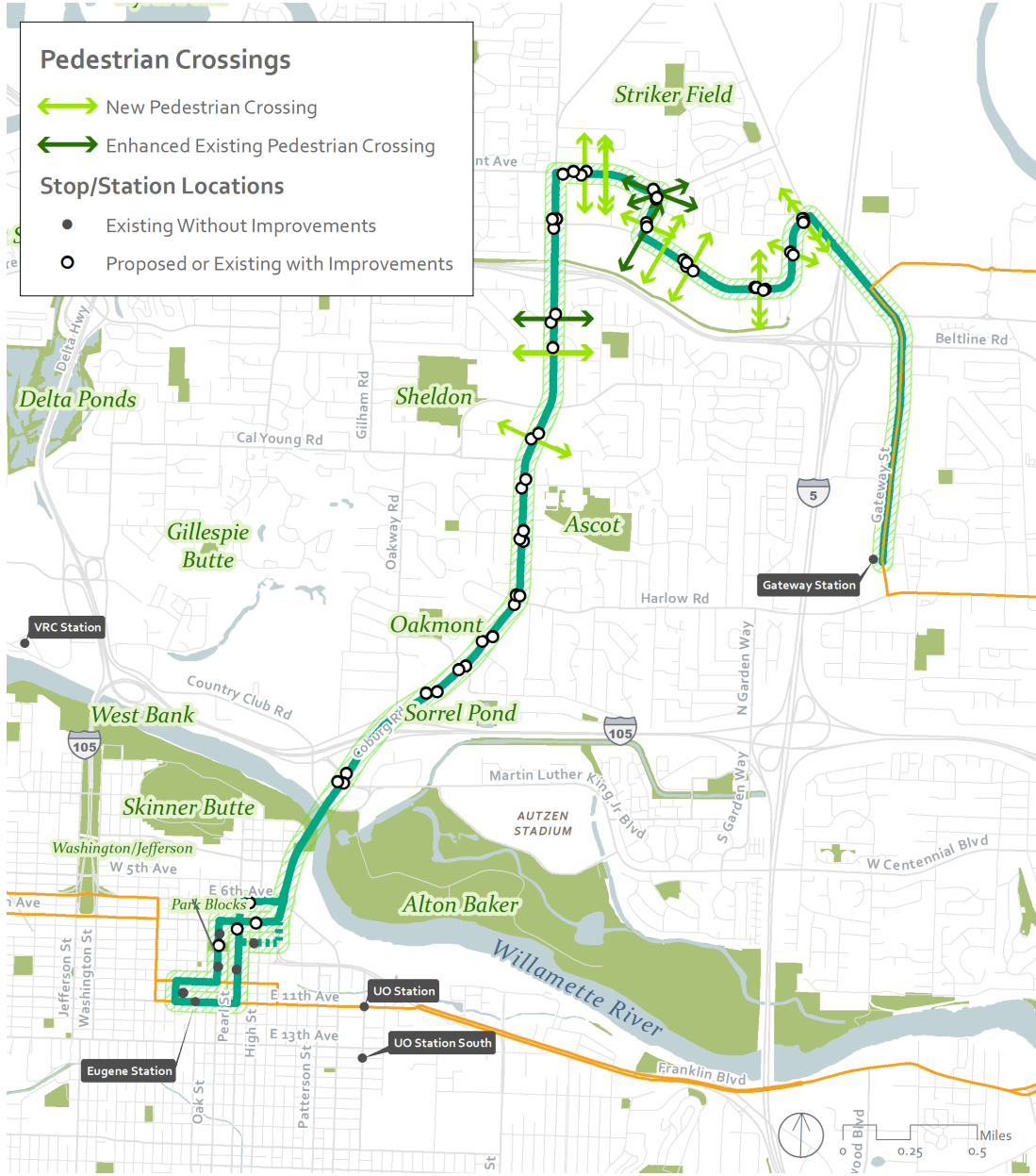
- Transit service to Alton Baker Park would be more frequent than the fixed-route service under the No-Build Alternative. Additionally, an enhanced shelter or EmX station would be constructed at Coburg Road and Country Club Road.

No adverse impacts to the Park Blocks, Skinner Butte Park, or Alton Baker Park are anticipated under the Enhanced Corridor Alternative because the existing road width near these resources would be maintained. No impacts to Skinner Butte or Alton Baker Park are anticipated under the EmX Alternative; however, less than 0.01 acre of land from the Park Blocks may need to be acquired to accommodate a proposed EmX station and sidewalk adjacent to the eastern block of the Park Blocks. Additionally, a temporary construction easement of less than 0.01 acre may be needed from the Park Blocks during construction activities. During the final design phase, designers would further explore avoiding or minimizing acquisitions from parks. Where acquisitions are required, LTD and the City would coordinate to determine the most effective measures for compensation or enhancements.

Short-term effects from construction activities would be mitigated through coordination of construction timing with the City's Parks and Open Space Division to avoid or reduce disruption for park users, including providing advanced notice of construction activities to park users, signage for pedestrian and bicycle detours, and barriers and flagging for safety.

No impacts to Section 6(f) resources from either of the build alternatives are anticipated.

Figure 7-5: Coburg Road Corridor Parks and Recreation Resources



Locator Map

Legend

Parks & Recreation Areas
Coburg Road Corridor



- Coburg Road Corridor EmX Alternative
- Coburg Road Corridor Enhanced Corridor Alternative
- Coburg Road Corridor 200 ft Buffer
- 2035 No-Build EmX
- Road
- Water
- Park

Note: Both EmX and Enhanced Corridor Alternatives Shown



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Source: CH2M. Draft Parklands, Recreation Areas, and Section 6(f) Technical Report. 2017.

Table 7-17: Coburg Road Corridor Parks and Recreation Resources within 0.25 mile

Name	Facility Type	Approximate Distance from Corridor	Ownership and Management	Site Features and Characteristics	Potential Views of Corridor	LWCF or Similar Grant Funding?
Park Blocks	Urban Plaza	Within 200 feet	City of Eugene	Picnic tables, public art, performance space	Yes	No
Skinner Butte	Metropolitan Park	Within 200 feet	City of Eugene	Ball fields, picnic tables, rock climbing, recreation center	Yes	Yes
Alton Baker	Metropolitan Park	Within 200 feet	City of Eugene	BMX track, boat launch, disc golf, dog park, picnic tables	Yes	Yes
Broadway Plaza	Urban Plaza	0.06 mile	City of Eugene	Performance space, public art	No	No
Ascot	Community Park	0.11 mile	City of Eugene	Ball fields, soccer field, track	No	No
Sorrel Pond	Natural Area	0.14 mile	City of Eugene	Looped path	No	No
Oakmont	Neighborhood Park	0.14 mile	City of Eugene	Basketball, picnic tables, play area	No	No
Willakenzie	Neighborhood Park	0.20 mile	City of Eugene	Looped path, picnic tables, play area	No	No

Source: CH2M. Draft Parklands, Recreation Areas, and Section 6(f) Technical Report. 2017.

Section 4(f) Resources

Park and recreation resources protected under Section 4(f) and located within 350 feet of the build alternatives include: the downtown Park Blocks, Skinner Butte Park, and Alton Baker Park (Table 7-18). There are no wildlife or waterfowl refuges within 350 feet of the corridor.

As described in the cultural resources topic, a review of historic records and a windshield survey of the Coburg Road Corridor resulted in the identification of 23 individual resources and 1 resource grouping potentially eligible for listing on the NRHP and thus protected under Section 4(f) (see Section 4(f) Technical Report for a complete list of eligible resources). None are formally listed on the NRHP at present.

No-Build Alternative

The No-Build Alternative would not impact Section 4(f) resources as there would be no construction related to the MovingAhead project.

Enhanced Corridor and EmX Alternatives

None of park and recreation resources protected under Section 4(f) would be impacted by the Enhanced Corridor Alternative. This alternative would not result in temporary impacts, nor would the proximity impacts (noise or visual) be so severe as to substantially impair those activities, features, or attributes that qualify the resource for protection under Section 4(f). The improved reliability of transit service to parks would enhance accessibility for the park users.

The EmX Alternative would construct an EmX station and sidewalk on Oak Street between Park Street and 8th Avenue along the street frontage of the Park Blocks that would result in:

- Permanent incorporation of less than 0.01 acre of parkland, which does not contain any recreational features or attributes; no activities, features, or attributes would be permanently impacted by project actions
- Temporary occupancy of land to install the new EmX station and sidewalk and minor increases in noise and dust during construction; this temporary occupancy

would satisfy the conditions required such that it would not constitute a use under Section 4(f)

- No activities, features, or attributes would be permanently impacted by project actions nor would temporary construction actions at the park permanently or temporarily interfere with visitors using the park
- A preliminary conclusion that project actions would not adversely affect the features, attributes, or activities that qualify the Park Blocks for Section 4(f) protection; as such, project actions under the EmX Alternative would likely result in a Section 4(f) *de minimis* impact to the Park Blocks, consistent with 23 Code of Federal Regulations (CFR) 774.17

The EmX Alternative is not anticipated to have any direct or indirect impacts to Skinner Butte Park or Alton Baker Park as it would not extend outside existing ROW in the vicinity of these resources. This alternative would also not result in temporary impacts, nor would the proximity impacts (noise or visual) be so severe as to substantially impair those activities, features, or attributes that qualify the resources for protection under Section 4(f).

Ten of the identified historic resources would be potentially directly and/or indirectly affected by the Enhanced Corridor Alternative through property acquisition, enhanced shelter construction, planting strip construction and/or visual effects. Under the EmX Alternative, 10 historic resources would be directly and/or indirectly affected.

No historic resources are anticipated to be removed to construct either of the build alternatives. Further, neither build alternative would alter, directly or indirectly, any characteristics of a historic property that qualify the property for inclusion in the NRHP in a manner that would diminish the integrity of the property's location, design, setting, materials, workmanship, feeling, or association.

Therefore, the Enhanced Corridor and EmX Alternatives are not anticipated to have an adverse effect on any Section 106 resources, and project actions under either build alternative would likely result in a *de minimis* impact determination to the 10 affected historic resources under Section 4(f).

Table 7-18: Coburg Road Corridor Section 4(f) Park and Recreation Resources

Source Name	Location	Official with Jurisdiction	Section 4(f) Qualifying Description
Park Blocks	Between 8th Avenue and Park Street, Eugene	City of Eugene	Municipal park (urban plaza, benches)
Skinner Butte Park	248 Cheshire Avenue, Eugene	City of Eugene	Municipal park (ball fields, fishing, trails, picnic tables, playground, informal sports / play fields, rock climbing, spray pad)
Alton Baker Park	200 Day Island Road, Eugene	City of Eugene	Municipal park (BMX track, disc golf, boat launch, fishing, trails, picnic tables, informal sports / play fields)

Source: CH2M. Draft Section 4(f) Technical Report. 2017.

Street and Landscape Trees

Commercial areas along the Coburg Road Corridor vary in the amount of landscaping due to different building footprints. Commercial areas set back from the road behind parking and planting strips between the sidewalk and street have sporadic street and landscape trees and landscaping. Older residential areas close to Coburg Road generally contain more mature landscaping and street and landscape trees. The greatest concentration of medium and large street and landscape trees along the Coburg Road Corridor is between the Randy Papé Beltline and I-105.

No-Build Alternative

No impacts to trees are anticipated under the No-Build Alternative.

Enhanced Corridor and EmX Alternatives

Under the Enhanced Corridor Alternative, no medium or large street or landscape trees within the Charter Tree boundary would be removed; outside of the Charter Tree boundary this alternative would remove 3 medium and large street trees and up to 6 medium and large landscape trees. Under the EmX Alternative, up to 100 street trees and 0 landscape trees would be removed within the Charter Tree boundary; outside of

the boundary up to 38 street trees and 11 landscape trees would be removed (Table 7-19). Under the build alternatives, proposed sidewalks that would potentially impact existing street trees would be wide enough to incorporate a landscape strip into which new street trees could be planted. Removed street trees would be mitigated by replanting trees at a ratio of at least 1 tree planted for each tree removed or as otherwise required by City Code. The selection of tree species, specific location, and provision of adequate soil conditions for tree mitigation would be coordinated with the City Urban Forestry staff.

The intermittent nature of construction proposed under the build alternatives would reduce the risk of potential impacts to street and landscape trees as construction would not occur along the entire corridor, just in limited locations near proposed investments. LTD would require the construction contractor to develop a Tree Protection Plan before construction.

Under both build alternatives, potential short-term construction-related impacts to street and landscape trees might occur in the following location:

- At the Coburg Road/Harlow Road intersection excavation would take place adjacent to street trees on the south side of the intersection, but the trees would be preserved

In addition, potential short-term construction-related impacts to street trees would also be expected in the following location under the EmX Alternative:

- In the median of Coburg Road between Country Club Road and I-105 Interchange because of construction activities directly adjacent to the median, including excavation for construction of concrete bus-exclusive lanes

Table 7-19: Coburg Road Corridor Number of Medium and Large Trees Potentially Removed

	Enhanced Corridor	EmX
INSIDE THE CHARTER TREE BOUNDARY		
Street Trees	0 trees	98 to 100 trees
Landscape Trees	0 trees	0 trees
OUTSIDE THE CHARTER TREE BOUNDARY		
Street Trees	3 trees	33 to 38 trees
Landscape Trees	4 to 6 trees	9 to 11 trees

Source: CH2M. Draft Street and Landscape Tree Technical Report, 2017.

Transportation and Transit

Coburg Road is owned and maintained by the City of Eugene. The City of Springfield owns roads east of I-5.

None of the corridor segments have collision rates that would typically warrant consideration of safety improvements. Typically, intersections with a collision rate above or near 1 crash per million entering vehicles are flagged for consideration of safety improvements. Higher densities of crashes were noted at signalized intersections between the Ferry Street Bridge and Oakway Road as well as around the Randy Papé Beltline ramps. During the existing p.m. peak hour, mobility standards were met at all study intersections.

For a more detailed evaluation of transportation impacts and benefits for all corridors and alternatives please refer to Chapter 9.

No-Build Alternative

Under the No-Build Alternative investments planned in the Eugene 2035 TSP, would improve pedestrian and bicycle access along the Coburg Road Corridor, however, connectivity to planned roadway, bicycle or pedestrian projects would not change. No investments would be made to the existing transportation system as part of the MovingAhead project. Traffic delay is anticipated to worsen by 2035 and 1 study intersection would not meet the current mobility standards adopted as part of the Eugene 2035 TSP.

There would be limited potential to encourage travelers to change their travel mode from motor vehicle travel to transit and limited potential to support locally adopted transportation policies.

Enhanced Corridor and EmX Alternatives

The build alternatives would improve the pedestrian and bicycle network with the installation of new or improved sidewalks, upgraded pedestrian crossings, and enhanced pedestrian crossings. Additionally, the EmX Alternative would include improved or new bicycle lanes, as listed in Table 7-20. Travel reliability would be enhanced under both alternatives by the proposed time allocated for transit vehicles to travel through intersections with traffic signals (called bus phases) at 3 intersections under the Enhanced Corridor Alternative

and 4 intersections under the EmX Alternative, and transit signal priority at all signals on the corridor. The Enhanced Corridor Alternative would offer moderate safety improvements due to BAT lanes and increased crossing opportunities and improvements in facilities for people biking, walking and using mobility devices. The EmX Alternative would result in significant safety improvements due to BAT lanes, buffered bicycle lanes, and increased crossing opportunities for pedestrians.

In-vehicle transit travel time would improve by 5 minutes (1-way inbound) during the a.m. peak hour compared to the No-Build Alternative for both build alternatives (Table 7-21). The EmX Alternative has greater potential for increased transit reliability due to a 16.6 % increase in transit exclusive/priority lanes compared to the No-Build Alternative.

Average weekday systemwide transit ridership would increase by 340 (0.5%) 1-way linked trips under the Enhanced Corridor Alternative compared to the No-Build Alternative (Table 7-22). Under the EmX Alternative,

average weekday ridership would increase by 860 (1.9%) compared to the No-Build Alternative.

Local traffic operations in 2035 would improve at the Coburg Road/Harlow Road and Coburg Road/eastbound Randy Papé Beltline on-ramp intersections due to the addition of northbound right-turn lanes with the Enhanced Corridor Alternative. Under the EmX Alternative, local traffic operations would degrade at the Coburg Road/Country Club Road/MLK, Jr. Boulevard and Coburg Road/Cedarwood Drive/I-105 eastbound on-ramp intersections due to the conversion of a northbound general-purpose travel lane to a transit only lane. There would be a safety benefit under both build alternatives based on an increase in transit ridership (and parallel decrease in motor vehicle travel) and a reduction in VMT (see Chapter 9), which could reduce fatal and serious injury crashes.

Up to 67 off-street parking stalls would be removed by the Enhanced Corridor Alternative, and up to 128 off-street parking stalls would be removed under

Table 7-20: Coburg Road Corridor Transportation Impacts and Benefits

Measure	Enhanced Corridor	EmX
New/improved sidewalks	1.43 miles.	2.80 miles
New/improved bicycle facilities	0.00 miles	0.36 miles
New enhanced crossings	7	9
New upgraded crossings	2	3
Replaced existing enhanced crossings	0	0
Potential off-street parking spaces removed	67	128
Potential on-street parking spaces removed	0	7
Potential driveway closures	1	1
Potential business access impacts: right-in or right-out turning movements	4	7
Potential drive-through closures	0	2
Percent of corridor with exclusive/priority lanes	3.7%	16.7%

Source: DKS. Draft Transportation Technical Report. 2018.

the EmX Alternative. In addition, the EmX Alternative would require removal of up to 7 on-street parking stalls. Both build alternatives would require the closure of 1 residential driveway; 4 business accesses under the Enhanced Corridor Alternative and 7 business accesses under the EmX Alternative would be limited to right-in and right-out access. The EmX Alternative would also require changes to on-site circulation, impacting 2 businesses with drive-throughs. After property impacts were revealed during the analysis, additional evaluation was conducted to determine other ways to avoid or minimize impacts at some properties; this effort

is documented in the Addendum to the MovingAhead Alternatives Analysis Technical Reports Memorandum (CH2M 2017). Opportunities to further reduce or avoid impacts would be evaluated in more detail during design refinement.

Mitigation measures, such as limiting the length of single lane closures, detour signage, and maintaining business access, would be needed during construction, and would require early, frequent, and ongoing communication among LTD, the City, contractors, and affected property owners and tenants.

Table 7-21: Coburg Road Corridor 2035 Auto and Transit Travel Times (a.m. Peak Hour)

Measure	Coburg Road Corridor Travel time to Eugene Station from Gateway Station					
	Auto	Transit				
	No-Build, Enhanced Corridor, and EmX	No-Build	Enhanced Corridor		EmX	
	Time	Time	Time	Change from No-Build Alternative	Time	Change from No-Build Alternative
Time in Vehicle	9 minutes	18 minutes	13 minutes	-5 minutes	13 minutes	-5 minutes

Source: DKS. Draft Transportation Technical Report. 2018.

Table 7-22: Coburg Road Corridor Average Weekday 2035 Systemwide Ridership

Measure	No-Build	Enhanced Corridor	EmX
Total Systemwide Transit Trips^a	46,410	46,620	47,270
Change from No-Build	N/A	340	860
% Change from No-Build	N/A	0.5%	1.9%

Source: DKS. Draft Transportation Technical Report. 2018.

Note:

a Systemwide transit trips are defined as 1-way linked trips taken by a person from the trip's origin to the trip's destination, independent of the number of vehicles or transfers used to complete the trip.

Utilities

Underground utilities within the Coburg Road Corridor include cables for telecommunication and energy; pipes for natural gas, water, sanitary sewer, and stormwater; fiber-optic lines; and access points (manholes and vaults) for all types of utilities. Aboveground utilities include CenturyLink telephone poles, Eugene Water and Electric Board (EWEB) power poles, and traffic signals and street lights and their associated conduit and controls.

A large gas transmission line runs beneath Coburg Road and throughout the corridor extents. Branches of this line are present at the intersection of Coburg Road and Harlow Road and the intersection of Coburg Road and Crescent Avenue.

No-Build Alternative

The No-Build Alternative would have no adverse or beneficial long-term impacts to utility infrastructure as no capital investments would be constructed for the MovingAhead project.

Enhanced Corridor and EmX Alternatives

Table 7-23 summarizes the potential impacts to major utilities in the Coburg Road Corridor that would occur under the build alternatives. Both build alternatives propose the construction of new signals in this corridor, which would require additional infrastructure (e.g. electrical connections). Final design documentation would detail replacement and design of this infrastructure.

The NW Natural gas transmission lines and associated structures running along Coburg Road, Harlow Road, and Crescent Avenue could potentially be in conflict with proposed investments under both build alternatives. Mitigation to reduce this impact would include design refinements in coordination with NW Natural and other stakeholders to ensure this piece of critical infrastructure would not be impacted as its relocation might prove to be cost and schedule prohibitive.

Table 7-23: Coburg Road Corridor Potential Utility Impacts

Measure	Enhanced Corridor	EmX
Major sanitary sewer line	2	2
Major storm sewer line	2	7
Major electrical line	14	17
Major water line	1	1
New or modified traffic signals	20	37
Gas Transmission Line	3	3

Source: CH2M. Draft Utilities Technical Report. 2017.

Visual and Aesthetic Resources

The visual character of the northern section of the Coburg Road Corridor is commercial/retail. This part of the corridor contains scattered street and landscape trees and some adjacent landscaping. The residential areas are a mixture of single and multi-family dwellings that present long stretches of areas along the corridor that have a residential visual character. Tall street and landscape trees provide a strong visual edge to this area and along with other landscaping, screen views from many of the residences of Coburg Road. From approximately Frontier Drive south to the end of the corridor, land use and visual character changes to commercial/retail and is similar in visual character to the northern section of the corridor.

Downtown Eugene has a more urban visual character than the portions of the study corridor that extend beyond the downtown core. The portions of downtown Eugene within the study corridor are characterized by level terrain and a north-to-south and east-to-west grid pattern. Much of downtown Eugene contains mature street and landscape trees, particularly areas that are within the 1915 city limits. Within this area, the study corridor is often lined with older residential and commercial buildings and mature street and landscape trees that form canopies over the streets in some locations. Large, mature trees and canopies along streets produce a very distinctive visual character.

No-Build Alternative

No impacts to visual and aesthetic resources would be expected under the No-Build Alternative for the Coburg Road Corridor as no construction would take place in association with the MovingAhead project.

Enhanced Corridor Alternative

The removal of large and medium street and landscape trees under both build alternatives would impact the visual character of areas adjacent to them.

Inside the Charter Tree boundary, no medium and large street or landscape trees would be removed under the Enhanced Corridor Alternative; outside of

the boundary up to 3 medium and large street and 6 landscape trees would be removed, primarily in the vicinity of Coburg Road and Pioneer Pike/Harlow Road. The EmX Alternative would remove up to 100 street trees and 0 landscape trees within the Charter Tree boundary, primarily along the corridor in downtown Eugene; outside of the boundary up to 38 street trees and 11 landscape trees would be removed. Table 7-24 identifies the degree of potential visual change in visual character that would result from construction of the build alternatives. Further detail on this assessment is provided in the Visual and Aesthetic Resources Technical Report (CH2M 2017).

Table 7-24: Coburg Road Corridor Potential Change to Visual Character

Alternative	Length of Potential Change in Visual Character
ENHANCED CORRIDOR	
High	0.2 miles
Moderate	0.9 miles
Low / No Impact	10.2 miles
Corridor Length^a	11.3 miles
EmX	
High	1.2 miles
Moderate	1.9 miles
Low / No Impact	9.7 miles
Corridor Length^a	12.8 miles

Source: CH2M. Draft Visual and Aesthetic Resources Technical Report. 2017.

Note:

- a Corridor length for this analysis is greater than the round-trip corridor length reported in other sections because visual impacts may affect both sides of the street. One-way streets with potential impacts on both sides increase the corridor length with potential visual impacts to be greater than the length of the corridor.

With the build alternatives, in almost all locations, proposed sidewalks in areas where street trees would be impacted would be wide enough to incorporate a landscape strip into which new street trees could be planted. Measures to mitigate tree removals are summarized in the street and landscape trees section of this chapter and detailed in the Street and Landscape Trees Technical Report. Removed street trees would be replanted at a ratio of at least 1 tree planted for each tree removed or as otherwise required by City Code and coordinating with the City Urban Forestry staff. With this mitigation, no long-term significant adverse impacts to visual character are anticipated.

Beneficial effects of the build alternatives would include replacing trees that are not on the City-approved species list, are nearing their maximum lifespan, or are difficult to maintain. The replanted trees would contribute to a more unified appearing corridor, as would investments such as new sidewalks, bus stops or EmX stations, landscaping, and enhanced and upgraded pedestrian crossings proposed under the build alternatives.

Because of the larger construction footprint, the EmX Alternative would offer more opportunities to provide landscaping along portions of the corridor currently without landscaping than the Enhanced Corridor Alternative with its smaller construction footprint. The additional landscaping would enhance the visual character of portions of the corridor with no current landscaping proposed under the build alternatives.

Water Quality and Hydrology

The study area includes the receiving waterways and floodplains of stormwater runoff into the existing storm sewer system and conveyed to Debrick Slough, Dodson Slough, or the Willamette River.

No-Build Alternative

No roadway projects are expected in the Coburg Road Corridor in the Eugene 2035 TSP, therefore no direct or cumulative impacts to water quality are expected from the No-Build Alternative.

Enhanced Corridor and EmX Alternatives

The Enhanced Corridor Alternative would increase or reconstruct 92,500 SF of impervious area in the Debrick Slough drainage basin, 170,300 SF in the Dodson Slough drainage basin, and 95,800 SF in the Willamette River drainage basin. These new or reconstructed impervious surface areas represent less than 1% of the total impervious surface in each of the drainage basins.

The EmX Alternative would add or reconstruct 177,600 SF of impervious surface in the Debrick Slough drainage basin, 533,000 SF in the Dodson Slough, and 102,300 SF in the Willamette River drainage basin. The new impervious surface area in the Debrick Slough basin represents 1.80% of the impervious surface in the basin, while the new or reconstructed impervious surface areas in the other basins represent less than 1% of the total impervious surface, as listed in Table 7-25.

Some construction would occur within the Willamette floodplain under both build alternatives, at the intersection of Coburg Road and Cedarwood Drive, and may result in temporary impacts such as changes in runoff patterns and sediment transport (turbidity). Impacts are expected to last only as long as construction. No construction impacts are expected in the floodplains of Debrick Slough or Dodson Slough.

With mitigation measures, such as water quality and flow control facilities, there would be a net water quality improvement associated with the reconstructed impervious areas and the impacts of the new impervious area would be reduced.

Three locations, common to both build alternatives, were identified for potential water quality and flow control facilities for runoff prior to discharge to waterways. The following locations were selected based on the construction footprint and hydrology:

- Coburg Road and Cedarwood Drive
- Coburg Road and Frontier Drive
- Coburg Road and Crescent Avenue

No cumulative impacts are expected in Debrick or Dodson Slough.

Cumulative effects on both the quantity and quality of runoff may result from the development of 2 or more of the corridor alternatives because all affected watercourses eventually reach the Willamette River. However, due to the large drainage area and high amounts of existing impervious area in the Willamette River Basin, the cumulative effects are likely to be minimal.

Table 7-25: Coburg Road Corridor Existing and New Impervious Surface Quantities

Drainage Basin	Existing Impervious Area	Enhanced Corridor		EmX	
		Total New and Reconstructed Impervious Area / Percent of Impervious Area ^a	New Roadway and Sidewalk Impervious Area / Percent of Impervious Area ^a	Total New and Reconstructed Impervious Area / Percent of Impervious Area ^a	New Roadway and Sidewalk Impervious Area / Percent of Impervious Area ^a
Debrick Slough	9,843,305 SF	92,500 SF 0.94%	22,500 SF 0.22%	177,600 SF 1.80%	0 SF 0.00%
Dodson Slough	122,850,073 SF	170,300SF 0.14%	95,700 SF 0.80%	533,000 SF 0.43%	32,900 SF 0.03%
Willamette River	462,920,832 SF	95,800 SF 0.02%	8,200 SF <0.01%	102,300 SF 0.02%	16,600 SF <0.01%
Total	595,614,210 SF	358,600 SF 0.06%	126,500 SF 0.02%	812,900 SF 0.14%	49,400 SF <0.01%

Source: CH2M. Draft Water Quality, Floodplain, and Hydrology Technical Report. 2017.

Note:

a Total impervious area in drainage basin

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Chapter 8: Martin Luther King, Jr. Boulevard Corridor

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INTRODUCTION TO THE CORRIDOR CHAPTERS

Before reading this chapter, please read **Chapter 3**, which introduces the corridor-specific chapters (Chapters 4 through 8) with background information about the environmental topics evaluated for each alternative

Corridor Overview

The Martin Luther King (MLK), Jr. Boulevard Corridor begins at the Eugene Station and travels through downtown on Oak and Pearl Streets and E. 7th and E. 8th Avenues. The corridor uses the Ferry Street Bridge to reach MLK, Jr. Boulevard and continues east on MLK, Jr. Boulevard past Autzen Stadium to Centennial Boulevard. Although transit service continues along Centennial Boulevard and into the City of Springfield, capital investments proposed as part of the MovingAhead project would terminate at Interstate 5 (I-5).

MLK, Jr. Boulevard is not identified in Envision Eugene or the Eugene 2035 Transportation System Plan (Eugene 2035 TSP) as a key corridor intended for multi-modal planning with frequent transit service (defined as 15-minute or better service frequency) connecting downtown Eugene with numerous core commercial areas. However, the MLK, Jr. Boulevard Corridor was advanced to this Alternatives Analysis (AA) report because it is identified in Lane Transit District's (LTD) Frequent Transit Network (FTN) and Bus Rapid Transit (BRT) System Plan; it provides a critical link between a key corridor (Coburg Road) and the Gateway EmX corridor; it serves an area developed with large public and institutional facilities (e.g., Autzen Stadium, the Federal Courthouse, and Lane County Juvenile Court); it has existing transit service with high ridership; and it provides additional east-west connectivity requested by the community. This corridor is approximately 6.0 round trip miles.

Corridor Length

6.0 miles round trip (No-Build, Enhanced Corridor)

Transit and Average Daily Ridership on Existing Transit Routes

🚌 13 Centennial	=	1,351 riders/day
🚌 79X UO/Kinsrow	=	1,093 riders/day

Employment

Labor Force 16 Years Old and Older:
12,867 people (Enhanced Corridor)

Number of Jobs:
15,051 jobs (Enhanced Corridor)

Major Employers: Lane County, Slocum Orthopedics

Population

26,459 residents (Enhanced Corridor)

Neighborhoods

- » Cal Young Neighborhood Association
- » Downtown Neighborhood Association
- » Harlow Neighbors
- » Jefferson Westside Neighbors
- » University of Oregon Campus
- » West University Neighbors
- » Whiteaker Community Council

Near downtown Eugene, the MLK, Jr. Boulevard Corridor is characterized by high-density residential and commercial areas. North of the Ferry Street Bridge the route enters a commercial area that includes automobile dealerships and large areas for parking. East of Coburg Road, the route passes Autzen Stadium and other University of Oregon athletic facilities that line the southern side of the route and parking, sports fields, and government and non-government organization facilities along the northern side. The scale of structures and open spaces in this area is large and monumental. Street trees help define the boulevard and provide an entry to the stadium area. The majority of the route passes

through a residential area east of Autzen Stadium that is primarily composed of multi-family residential developments on the northern and eastern side of MLK, Jr. Boulevard, and single-family residences on the southern side. This area has a residential character that is reinforced by street and landscape trees and landscaping on most properties. Refer to Table 8-1 for MLK, Jr. Boulevard Corridor demographic data and Table 8-2 for MLK, Jr. Boulevard Corridor household data.

Only 1 build alternative is proposed for the MLK, Jr. Boulevard Corridor, the Enhanced Corridor Alternative. MLK, Jr. Boulevard, between Coburg Road and the terminus for capital investments, is a minor arterial owned by the City of Eugene (City) with an average daily traffic (ADT) volume of 15,500 to 16,400 vehicles.

Table 8-1: MLK, Jr. Boulevard Corridor Demographic Data (2015 Estimates)

Area	Non-Minority Population	Minority Population				Limited English Proficiency	Population from Whom Poverty Determined	Median Household Income	Unemployment
	White Alone	Hispanic or Latino ^a	African American	Asian	Others ^b				
Enhanced Corridor	79.0%	6.0%	1.5%	8.0%	5.6%	1.8%	41.8%	\$28,540	9.5%
City of Eugene	77.5%	10.6%	1.7%	3.6%	6.7%	3.9%	24.4%	\$42,715	6.0%
Lane County	82.6%	8.5%	1.2%	2.3%	3.8%	3.0%	20.4%	\$43,685	6.6%
Central Lane Metropolitan Planning Organization	--	--	--	--	--	--	23.0%	\$40,400 ^c	6.6%

Source: CH2M. Draft Community, Neighborhood, and Environmental Justice Technical Report. 2017.

Notes:

- a Hispanic / Latino is defined as a person of Mexican, Puerto Rican, Cuban, Central or South American, or other Spanish culture or origin, regardless of race.
- b Others is a combination of the categories American Indian or Alaskan Native, Hawaiian or Pacific Islander, some other race, and 2 or more races.
- c Median income is calculated by taking the average of the Equity and Opportunity Assessment (EOA) median income levels for Lane County (\$42,621), Eugene (\$41,326), and Springfield (\$37,255).

Table 8-2: MLK, Jr. Boulevard Corridor Household Data (2015 Estimates)

Area	Total Population	Population Under 18	Population Over 65	Owner/ Renter Occupied Housing	Average Household Size	Households with No Vehicle
Enhanced Corridor	26,459	2.4%	24.6%	25.2% / 74.8%	1.6	20.8%
City of Eugene	158,131	18.0%	13.6%	48.9% / 51.1%	2.3	11.4%
Lane County	354,764	19.4%	16.25	59.3% / 40.7%	2.4	8.4%
Central Lane Metropolitan Planning Organization	251,721	20.0%	15.0% ^a	55.0% / 45.0%	2.4	10.0%

Source: CH2M. Draft Community, Neighborhood, and Environmental Justice Technical Report. 2017.

Note:

a Percentage represents population 60 and over.



Alternatives Considered and Dismissed

During design development 1 other alignment option was considered but eliminated from advancing for further study. The option considered and reasons for eliminating it are summarized below:

- The MLK, Jr. Boulevard Corridor Enhanced Corridor Alternative considered an alignment option with an

exclusive transitway near the University of Oregon's Autzen Stadium. This alignment option was eliminated from consideration because of the high level of property impacts associated with the transitway and traffic volumes did not warrant that level of infrastructure

Alternatives Advanced

This section summarizes the 2 MLK, Jr. Boulevard Corridor alternatives advanced for further evaluation in the AA. Table 8-4 at the end of this section summarizes the attributes of these alternatives. A more comprehensive description of the alternatives is provided in the Draft MovingAhead Level 2 Definition of Alternatives (CH2M et al. 2016).

No-Build Alternative

Operations

Roadway operations would be the same as current conditions from downtown Eugene to MLK, Jr. Boulevard. E. 7th Avenue would continue to have 4 1-way eastbound lanes and E. 8th Avenue would continue to be 1 lane in each direction. The Eugene 2035 TSP includes adding a center turn lane along sections of MLK, Jr. Boulevard from Club Road to Leo Harris Parkway as a planned investment, which would be constructed independent of the MovingAhead project. Other than planned investments, MLK, Jr. Boulevard would continue to have 2 lanes in each direction, with median turn lanes spaced throughout the corridor.

Under the No-Build Alternative, LTD Routes 13 and 79x would continue serving the MLK, Jr. Boulevard Corridor. Route 13 would operate along MLK, Jr. Boulevard with 30-minute frequencies all day. Route 79x is an express route operating between MLK, Jr. Boulevard and

University of Oregon Station that operates only when the University of Oregon is in session; this route would operate with frequencies of 10 minutes during peak periods and 15 minutes during off-peak periods when the University of Oregon is in session.

For the 2035 planning year, the No-Build Alternative would include the following EmX lines:

- Franklin EmX
- Gateway EmX
- West Eugene EmX
- Anticipated EmX service on Main Street in Springfield from Springfield Station to Thurston Station (see Chapter 1 for more discussion about this project)

Capital Investments

The No-Build Alternative would not include capital investments on MLK, Jr. Boulevard as part of the MovingAhead project. This alternative includes existing roadway, bicycle, pedestrian, and transit facilities in the corridor, as well as planned investments in the Eugene 2035 TSP.

The Eugene 2035 TSP includes the following transportation investments along the corridor:

- Add a center turn lane along sections of MLK, Jr. Boulevard from Club Road to Leo Harris Parkway

Enhanced Corridor Alternative

Operations

Roadway operations under the Enhanced Corridor Alternative would be similar to that of the No-Build Alternative, with the following exceptions:

- Signal timing at some existing signalized intersection would be altered to reduce delay for buses
- Construction of a new traffic signal at MLK, Jr. Boulevard and Leo Harris Parkway would improve traffic operations
- Business access and transit (BAT) lanes on MLK, Jr. Boulevard would be available to right-turning vehicles only, reducing the number of general-purpose lanes and vehicular capacity

Buses would primarily operate in mixed traffic, except at transit queue jump locations, bus-only turn lanes, and sections of BAT lanes on MLK, Jr. Boulevard. Enhanced Corridor service would run from 6:45 a.m. to 11:30 p.m. weekdays, 7 a.m. to 11 p.m. Saturdays, and 8 a.m. to 8 p.m. Sundays. For purposes of this analysis, service frequencies are assumed to be 15 minutes during all periods.

Existing fixed-service bus operations on Route 13 would be replaced by Enhanced Corridor service. Service on Route 79x would remain the same as the No-Build Alternative.

The Enhanced Corridor Alternative would result in 821 additional average weekday bus VMT and 37 additional average weekday revenue hours as compared to the No-Build Alternative.

Capital Investments

Capital investments under the Enhanced Corridor Alternative would include enhanced pedestrian crossings; investments to existing bus stops and the construction of new stops; construction of queue jumps at some intersections; traffic signal reconstruction; construction of bus-only left-turn lanes; BAT lanes, and roadway widening at some locations in the corridor (Figure 8-1).

New roadway investments would include the following:

- Construct a westbound bus-only left-turn lane at the intersection of MLK, Jr. Boulevard and Coburg Road

(for a total of 3 left-turn lanes) and 1 bus-only receiving lane on Coburg Road

- Construct a new traffic signal at the intersection of MLK, Jr. Boulevard and Leo Harris Parkway
- Reconstruct traffic signals at the following intersections:
 - » MLK, Jr. Boulevard and Coburg Road
 - » MLK, Jr. Boulevard and Club Road/Centennial Loop
- Convert existing general-purpose lanes to BAT lanes on:
 - » MLK, Jr. Boulevard from east of Club Road/Centennial Loop east to Marche Chase Drive (eastbound)
 - » MLK, Jr. Boulevard from Marche Chase Drive to Leo Harris Parkway (westbound)

Bicycle and pedestrian investments include those listed under the No-Build Alternative plus the following:

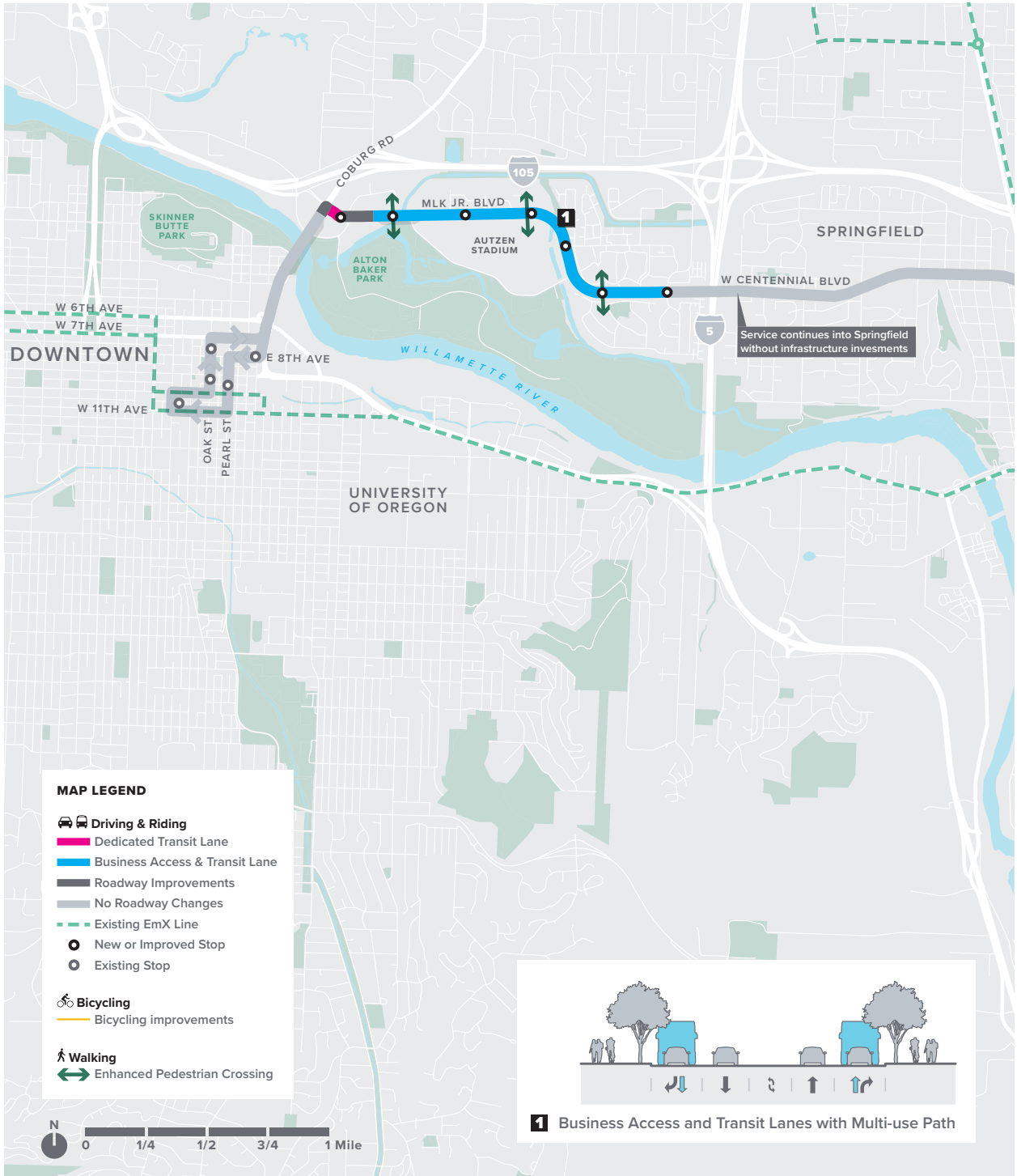
- 4 new enhanced crossings at the following locations:
 - » MLK, Jr. Boulevard at Centennial Loop east (near the trailhead to Alton Baker Park)
 - » MLK, Jr. Boulevard at Leo Harris Parkway
 - » MLK, Jr. Boulevard at the west PK Park entrance (west of Masonic Center driveway)
 - » MLK, Jr. Boulevard at Chevy Chase Street
- Reconstruct sidewalks at some locations and replace curb ramps at all locations where construction occurs

Bus stops would be spaced approximately 0.25 mile to 0.33 mile apart, except where existing bus stops and spacing would be used. Some stops would be improved with seating and shelters. Due to increased stop spacing, there would be 1 less bus stop in the corridor under this alternative as compared to the No-Build Alternative.

Under the Enhanced Corridor Alternative, 5 existing stops would be used for the enhanced bus service, but would not receive capital investments; 10 existing stop locations would receive capital investments; and 4 new stop locations would be constructed (Table 8-3).

Corridor investments terminate at I-5, though the bus would continue along Centennial Boulevard into the

Figure 8-1: MLK, Jr. Boulevard Corridor Enhanced Corridor Alternative



Source: MovingAhead Project Team.

Table 8-3: MLK, Jr. Boulevard Corridor Enhanced Corridor Alternative Bus Stops

<p>Existing Stops Remain – No Capital Investments</p> <p>5</p>	<ul style="list-style-type: none"> • Eugene Station • Oak Street and E. 7th Avenue northbound • Oak Street and Broadway northbound • Pearl Street and E. 10th Avenue southbound • E. 8th Avenue and High Street westbound
<p>Existing Stops Remain – Receive Capital Investments</p> <p>10</p>	<ul style="list-style-type: none"> • MLK, Jr. Boulevard west of Club Road eastbound • Coburg Road and Country Club Road southbound • MLK, Jr. Boulevard and Centennial Loop east eastbound • MLK, Jr. Boulevard and Centennial Loop east westbound • MLK, Jr. Boulevard and Kinsrow eastbound • MLK, Jr. Boulevard and Kinsrow westbound • MLK, Jr. Boulevard and Chevy Chase eastbound • MLK, Jr. Boulevard and Chevy Chase westbound • MLK, Jr. Boulevard and Lindley eastbound • MLK, Jr. Boulevard and Lindley westbound
<p>New Stop Locations</p> <p>4</p>	<ul style="list-style-type: none"> • MLK, Jr. Boulevard and Boy Scouts of America Oregon Trail Council driveway (east of Leo Harris Parkway) eastbound • MLK, Jr. Boulevard and Boy Scouts of America Oregon Trail Council driveway (east of Leo Harris Parkway) westbound • MLK, Jr. Boulevard and the PK Park driveway eastbound • MLK, Jr. Boulevard and the PK Park driveway westbound
<p>Stops Eliminated</p> <p>1</p>	<ul style="list-style-type: none"> • Locations to be determined during final design

Source: CH2M et al. 2016.

City of Springfield without capital investments. The transit service makes a loop from Centennial Boulevard along 21st Street to Mohawk Boulevard before returning westbound on Centennial Boulevard.

Under the Enhanced Corridor Alternative, LTD would have 75 fixed-route service buses (mix of 40-foot and 60-foot buses) and 15 spares operating in the system, an increase of 1 bus compared to the No-Build Alternative.

Table 8-4: Summary of MLK Jr. Boulevard Corridor Attributes of Alternatives

Corridor Attribute	No-Build	Enhanced Corridor
Annual Corridor Transit Trips ¹	10,120 trips	10,800 trips
Annual Systemwide Transit Trips ²	46,410 trips	47,030 trips
Change in Transit Trips Compared to No-Build	N/A	620 trips
Average Transit Travel Time ³	13 minutes	11 minutes
Change in Transit Travel Time Compared to No-Build	N/A	-2 minutes
Corridor Length (1-way, capital investments) ⁴	N/A	3.0 miles
Corridor Length (round-trip miles)	6.0 miles	6.0 miles
Exclusive / Priority Lanes (round-trip miles) ⁵	N/A	2.41 miles
Percent Exclusive / Priority Lane of New Corridor	N/A	25.10%
Transit Vehicles (operating systemwide)	74 buses 15 spare buses 19 BRT vehicles 5 spare BRT vehicles	75 buses 15 spare buses 19 BRT vehicles 5 spare BRT vehicles

Source: MovingAhead Project Team.

Notes:

- 1 Corridor transit trips are defined as any bus trip with at least 1 trip end in the corridor, excluding downtown or the University of Oregon. Source: DKS. Draft Transportation Technical Report. 2018.
- 2 Systemwide transit trips are defined as 1-way linked trips taken by a person from the trips origin to the trips destination, independent of the number of vehicles or transfers used to complete the trip. Source: DKS. Draft Transportation Technical Report. 2018.
- 3 Values represent average travel time for A.M. peak hour from Eugene Station to Corridor Terminus (in minutes). Source: LCOG. LCOG Regional Travel Demand Model. 2016.
- 4 This is the mileage of the corridor used to calculate the cost per corridor mile (not construction mile) and is the overall physical length of the corridor which does not correspond to the round-trip distance bus service would travel on a corridor.
- 5 Exclusive/priority lanes include round-trip miles of business access and transit lanes, bus-only lanes, and queue jumps.

Capital Cost Estimates

The potential cost of each alternative was estimated based on the concept design (Figure 8-2 and Table 8-5). Right of way (ROW), parking, utility relocations, and other impacts associated with the construction footprint were factored into the cost estimates. Capital cost estimates were based on historic construction bid data from other similar projects, including existing EmX corridors, and include escalation factors to bring costs to 2016 dollars and contingency costs. These planning-level cost estimates conform to FTA's Standardized Cost Categories for Small Starts capital projects.

The capital cost per mile is calculated in 2 different ways: cost per corridor mile length and cost per construction mile. The cost per corridor mile is based on the total capital cost divided by the round-trip distance the bus would travel on a corridor. The cost per construction mile is based on the total capital cost divided by the total combined length of construction areas for each direction of travel.

No-Build Alternative

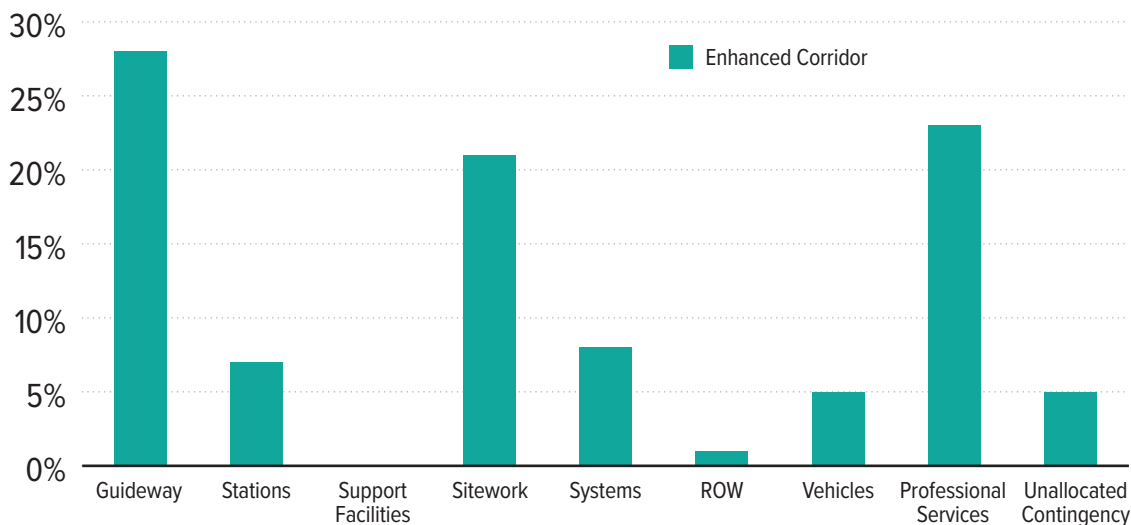
No construction is anticipated as part of the MovingAhead project under the No-Build Alternative; therefore, no capital costs are anticipated.

Enhanced Corridor

MLK, Jr. Boulevard Enhanced Corridor capital costs are estimated to be **\$21 million**, approximately **\$7.0 million/construction mile** with 3.0 miles of construction and **\$3.5 million/corridor mile** with 6.0 corridor miles.

As illustrated in Figure 8-2, the highest percentage cost category is guideway (road segments where transit vehicles travel) followed by professional services and sitework. This is due to the construction of concrete BAT lanes over almost the entirety of the corridor's construction footprint. ROW costs are low because the majority of the proposed work would occur within the existing ROW.

Figure 8-2: MLK, Jr. Boulevard Corridor Capital Investments by Cost Category



Source: MovingAhead Project Team.

Operation and Maintenance Cost Estimate

Operating and maintenance (O&M) costs are an important factor in the selection of a preferred investment package since they represent ongoing costs to be borne by LTD's operating budget.

No-Build Alternative

With 93 peak vehicles (74 buses, 19 BRT vehicles), 278,600 revenue hours, and 4,520,200 revenue miles, systemwide annual O&M costs for the No-Build Alternative total **\$52.8 million**. For more detail on O&M costs refer to Table 8-5.

Enhanced Corridor Alternative

Service level changes for the MLK, Jr. Boulevard Corridor Enhanced Corridor Alternative reflect the operational efficiencies gained from capital and service design improvements that allow for more revenue miles per revenue hour (revenue hours increase by 2.58% and revenue miles are increased by 2.94% over the systemwide total). The required number of peak vehicles would increase from 93 under the No-Build Alternative to 94 (75 buses, 19 BRT vehicles) under the Enhanced Corridor Alternative. These efficiencies would result in more daily trips serving the corridor for a systemwide annual cost of **\$53.9 million**, about \$1.1 million more than under the No-Build Alternative. For more detail on O&M costs refer to Table 8-5.



Table 8-5: Summary of MLK, Jr. Boulevard Corridor Cost Comparison of Alternatives

Corridor Attribute	No-Build	Enhanced Corridor
CAPITAL COST ESTIMATES (IN MILLIONS)		
Capital Cost ¹	N/A	\$21.0M
Capital Cost /Corridor Mile	N/A	\$3.5M
Capital Cost/Construction Mile	N/A	\$7.0M
Percentage Pedestrian/Bicycle Costs (without contingency costs included)	N/A	5%
OPERATING AND MAINTENANCE COST ESTIMATES		
Annual Systemwide Revenue Hours ²	278,600 hours	285,800 hours
Annual Systemwide Miles	4,520,200 miles	4,653,000 miles
Peak Transit Vehicles ³	93	94
Annual LTD Operating Cost (in millions) ⁴	\$52.8M	\$53.9M
Increase over No-Build	N/A	\$1.10M
Systemwide Operating Cost per Trip ⁵	\$3.79	\$3.82

Source: MovingAhead Project Team.

Notes:

- 1 Values are in 2016 dollars. Source: CH2M. Draft Capital Cost Estimating Technical Report. 2017.
- 2 Revenue service refers to all scheduled time a transit vehicle spends serving passengers. In this case, revenue service is confined to in-service time (excluding layovers, which are included in "Revenue Service" figure reported to the National Transit Database(NTD)) in order to relate to modelling outputs for the alternatives which are in-service forecasts from the LCOG Regional Travel Demand Model (2016).
- 3 Peak Transit Vehicles are the number of transit vehicles in operation to meet maximum demand.
- 4 Estimated operating and maintenance (O&M) costs represent potential ongoing costs that would be borne by LTD once the transit project is implemented. O&M costs were estimated for the evaluated alternatives using a fully allocated cost model for 2035 operations in accordance with FTA methods for estimating O&M costs for Transit Projects. Total systemwide annual O&M costs are the sum of costs related to 3 service categories forecasted for each alternative: revenue hours, revenue miles, and peak transit vehicles. Source: LTD. Draft Operating and Maintenance Costs Technical Report. 2017.
- 5 Cost/Trip are total operating costs divided by annualized systemwide average weekday trips. Passenger annualization of 300 is calculated from LTD 2016 ridership data and is used to translate average weekday to annual trips.

Environmental Consequences and Mitigation

Chapter 3 of this AA provides background information about the environmental topics evaluated for each alternative. Reading Chapter 3 is recommended before reading the summary of environmental consequences and mitigation for the MLK, Jr. Boulevard Corridor.

In this section, potential benefits and impacts of each alternative are discussed by environmental topic. Impacts that are similar across all corridors and alternatives are described in Chapter 3. Cumulative impacts are discussed only for those resources where the MovingAhead project has the potential to make a substantive contribution to cumulative impacts.

Potential environmental impacts and benefits of each alternative are summarized in Appendix C and detailed throughout this chapter by environmental discipline.

Acquisitions and Displacements

Outside of downtown Eugene, the MLK, Jr. Boulevard Corridor is composed primarily of retail, government, and recreational uses with residential uses along the east end of the corridor. Much of the residential uses on the north side of MLK, Jr. Boulevard are multi-family uses, including student housing for the University of Oregon, while residential uses on the south side of the roadway are primarily single-family residential uses.

No-Build Alternative

No acquisitions or displacements are anticipated under the No-Build Alternative since no construction would take place as part of the MovingAhead project under this alternative.

Enhanced Corridor Alternative

Based upon the current design, the Enhanced Corridor Alternative would require acquisition of small strips of land along roadway frontages (partial acquisitions) to accommodate the proposed transit improvements (Table 8-6). This alternative would require 6 partial property acquisitions, comprising less than 0.1 acre. No residences or businesses would be displaced under the Enhanced Corridor Alternative. Most of the land would be acquired from commercial and industrial parcels, as listed in Table 8-6. After property impacts were revealed during the analysis, additional evaluation was conducted to determine other ways to avoid or minimize impacts at some properties; this effort is documented in the Addendum to the MovingAhead Alternatives Analysis Technical Reports Memorandum (CH2M 2017). As the design of the build alternatives progresses, design refinements to minimize impacts to private properties would be incorporated.

The Enhanced Corridor Alternative would not have impacts to off-street parking or drive-throughs, and would not require closure of any driveways.

Table 8-6: MLK, Jr. Boulevard Corridor Property Acquisition Impacts

		Enhanced Corridor
Partial Acquisitions	Commercial & Industrial	4
	Public & Institutional	0
	Residential	2
	Vacant Land	0
Full Acquisitions		0
Total Parcels Affected		6
Total Area of Acquisitions		< 0.1 acre
Displacements		0
Parcels with Potential Parking and Access Impacts	Parking Impacts	0
	Driveway Closures	0
	Business access impacts: right-in or right-out turning movements	0
	Drive-Through Closures	0

Source: CH2M. Draft Acquisitions and Displacements Technical Report. 2017.

Air Quality

The Eugene-Springfield region completed the federally required 20-year maintenance period in 2014 for carbon monoxide with no exceedances. As a result, no regional carbon monoxide hot spot air modeling or local air quality impacts analysis is required for transportation projects in the region. However, for informational purposes, a regional burden analysis was conducted for the MovingAhead project.

The focus of the air quality analysis was to evaluate the differences between the regional and subarea pollutant emissions generated under the Enhanced Corridor Alternative versus emissions generated under the No-Build Alternative. This comparison shows the broad effects of the proposed alternative.

No-Build Alternative

Under the future No-Build Alternative conditions, air quality in the Eugene-Springfield region is expected to continue to improve. Despite increases in VMT, air quality has continued to improve because of the improvements in vehicle technology and fuel types.

Enhanced Corridor Alternative

When compared to the No-Build Alternative, the percent change in the overall level of pollutants is negligible, with percentage changes all less than 1 % for impacts (positive numbers) and improvements (negative numbers) (Table 8-7). The results of the Federal Transit Administration (FTA)-compliant air quality burden analysis show that the Enhanced Corridor Alternative received a Low-Medium rating. Projects with ratings of Low-Medium are predicted to have slight improvements in air quality.

Temporary air quality impacts associated with the construction of the Enhanced Corridor Alternative are expected. During construction, carbon monoxide and particulate matter are expected to increase. These increased emissions are due to heavy construction vehicles, lowered traffic speeds, earth excavation, and occasionally open burning. They create temporary impacts on the ambient air quality.

Construction contractors are required to comply with state regulations which address visible emissions and nuisance requirements. Violations of the regulations can result in enforcement actions and fines. The regulations provide a list of reasonable precautions to be taken to avoid dust emissions. These control measures would be documented in the pollution control plan that the contractor is required to submit prior to construction.

Table 8-7: MLK, Jr. Boulevard Corridor Percent Change in Air Quality from 2035 No-Build Alternative

Primary Pollutants	Enhanced Corridor
Carbon monoxide (CO)	-0.02%
Nitrous oxide (NOx)	0.00%
Volatile organic compounds (VOC)	-0.01%
Particulate Matter – 2.5 microns in diameter (PM _{2.5})	-0.01%
Rating	Low-Medium

Source: Michael Minor and Associates. Draft Air Quality Technical Report. 2017.

Community, Neighborhoods, and Environmental Justice

The MLK, Jr. Boulevard Corridor goes through or touches 3 neighborhoods: Downtown, Cal Young, and Harlow (Figure 8-3).

The Enhanced Corridor Alternative study area includes 4 additional neighborhoods: Jefferson Westside, University of Oregon Campus, West University, and Whiteaker.

Several social service organizations within the study area offer services to minority and low-income populations, including organizations that provide affordable housing and food. Within 0.25 mile of the Enhanced Corridor Alternative, there are 42 community and public facilities, 1 affordable housing facility (West Town), 2 shelter facilities, and 1 food bank (Food for Lane County).

The study area includes major employment centers, tourist attractions, retail businesses, and colleges that generate trips to and from the area. Government services (for example, Lane County), medical industries, and business services are the top employers in the corridor. Many large employers are within 0.5 mile of the corridor. Total employment in Lane County is projected to increase by about 10% in the 10 year period from 2014 to 2024, with the greatest increase (about 16%) expected in education and health services, which are top employers in the corridor.

No-Build Alternative

No construction is planned as part of the MovingAhead project under the No-Build Alternative, so this alternative would not result in negative impacts on neighborhoods, community facilities, or public services, nor would there be any disproportionately adverse impacts to minority and/or low-income populations. The No Build Alternative would also not likely result in any economic benefits associated with development in the area around stops. The No-Build Alternative would not improve transportation safety that could reduce the number of potential conflicts among people walking, biking, and driving to the same degree as the investments under the build alternative.

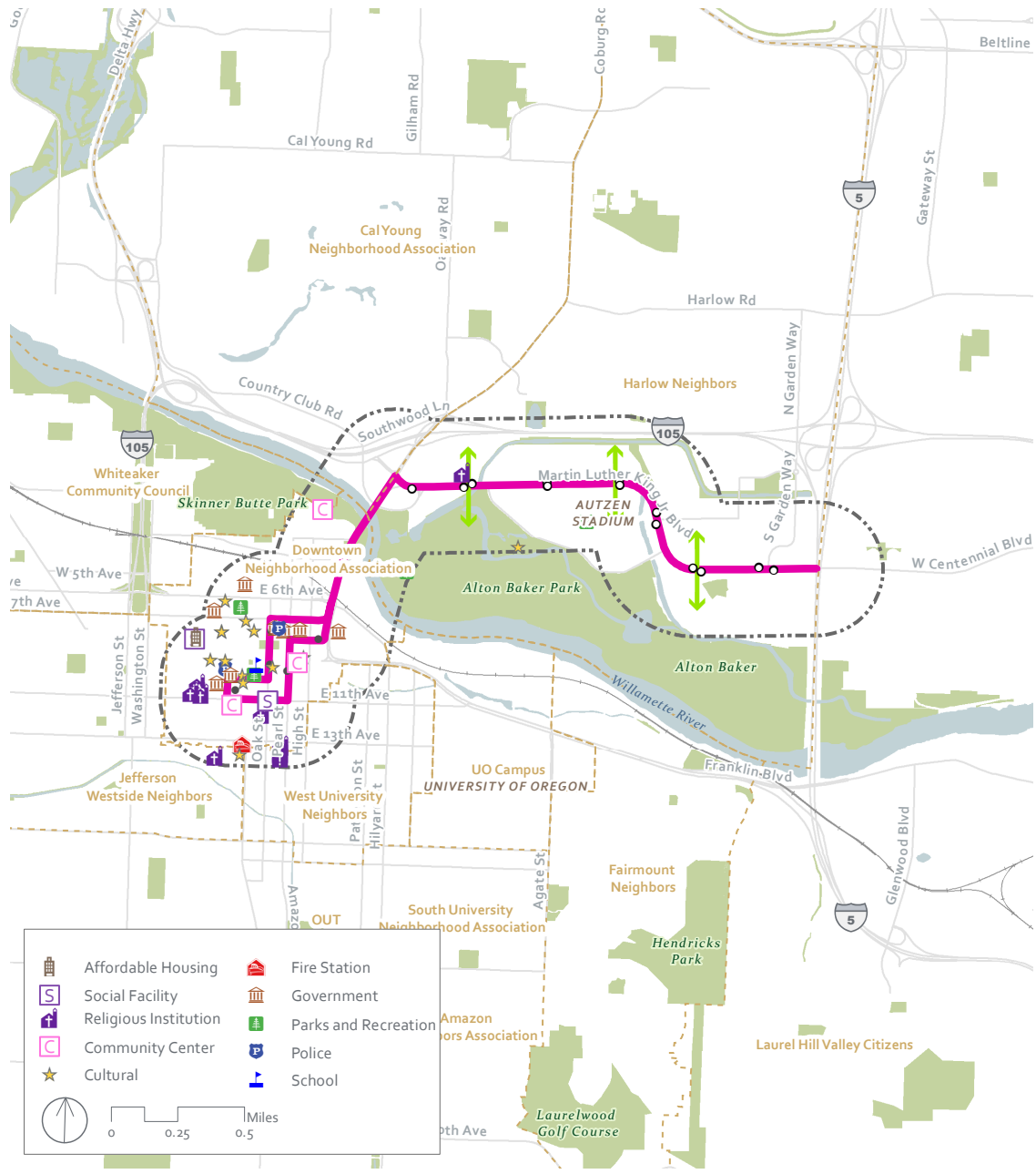
Enhanced Corridor Alternative

Potential effects of the Enhanced Corridor Alternative include:

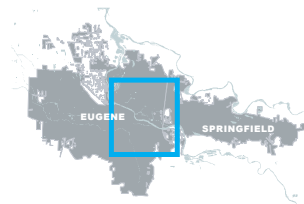
- **Neighborhoods.** The Enhanced Corridor Alternative would not adversely impact community character in the MLK, Jr. Boulevard Corridor. A total of less than 0.1 acre of land would potentially be acquired from 6 properties, but no residences or businesses would be displaced. Mitigation may be possible at some locations to further avoid or minimize impacts at some properties. These mitigations are outlined in Addendum to MovingAhead Alternatives Analysis Technical Reports Memorandum (CH2M 2017). Up to 9 medium and large street trees would be removed under this alternative. Tree removal would be mitigated through replanting.

Safety for people walking, using mobility devices, and biking in the corridor would be improved with 4 enhanced pedestrian crossings and improved sidewalks. Potential noise impacts might occur to 1 hotel; it is expected all noise impacts could be mitigated.
- **Transportation and Accessibility.** The Enhanced Corridor Alternative would increase transit accessibility and reliability to residents within the neighborhoods near the corridor. The presence of 14 new or enhanced stops (of 19 total stops) would not change the overall visual setting of any neighborhoods because this alternative is located on main arterials within an urban setting that already includes bus service. The Enhanced Corridor Alternative would increase connectivity to other transit connections in the downtown area. The improved reliability of transit service could attract additional riders.
- **Community Facilities and Public Services.** A small acquisition from the Masonic Lodge would be required under the Enhanced Corridor Alternative; no other property acquisitions would be required from community facilities. Users of these facilities would benefit from improved accessibility. No conflicts with emergency services are anticipated.
- **Economics.** The loss in property tax revenues to the City resulting from acquisition of privately owned land would be negligible under the Enhanced Corridor

Figure 8-3: MLK, Jr. Boulevard Corridor Community Resources



Locator Map



Legend

- Martin Luther King Jr Blvd
- Enhanced Corridor
- Neighborhood
- ↔ New Pedestrian Crossing
- Existing Without Improvements
- Proposed or Existing with Improvements

**Community Resources
Martin Luther King Jr. Blvd
Corridor
Enhanced Corridor**



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Source: CH2M. Draft Community, Neighborhood, and Environmental Justice Technical Report. 2017.

Alternative. The Enhanced Corridor Alternative would not result in the removal of any off-street parking stalls nor would it impact any drive-throughs or require closure of any driveways. Construction of this alternative would result in an increase in construction related jobs and expenditures in the corridor and community. This alternative would improve accessibility to employment locations along the MLK, Jr. Boulevard Corridor and the downtown business district.

- **Environmental Justice.** All of the identified adverse impacts under the Enhanced Corridor Alternative can be mitigated or minimized to a low severity. None

of the impacts would be greater in magnitude than impacts that would be experienced by non-minority and non-low-income populations within the study area. Because the Enhanced Corridor Alternative would result in primarily beneficial effects, and no adverse impacts are anticipated after mitigation, no disproportionate high and adverse impacts on minority and low-income populations are anticipated.

Impacts during construction for the Enhanced Corridor Alternative would involve noise and dust from construction equipment. The construction impacts would be short-term in nature and would typically end once construction is completed.



Cultural Resources

Archaeological (Below Ground) Resources

Two archaeological sites within the area of potential effect (APE) have recorded artifacts; an additional site is the location of the City's first African-American neighborhood. Fifty archaeological investigations have previously been conducted within 1 mile of the APE, 5 of which included portions of the APE.

A pedestrian archaeological survey of the MLK, Jr. Corridor was conducted in September 2016. The surface survey inspected the proposed construction areas of the Enhanced Corridor Alternative. No prehistoric or demonstrably historical artifacts, features, or sites were observed during this surface survey. MLK, Jr. Boulevard has been a transportation route for many years and the adjoining lands have been developed and built upon for decades as well. The road has been resurfaced and widened; adjoining sidewalks and driveways have been built and revised; and the underlying buried utility infrastructure has been installed and augmented. This ongoing development has very likely disturbed most, if not all, of the ground along MLK, Jr. Boulevard. The potential for intact archaeological materials, surface or buried, in the MLK, Jr. Boulevard Corridor is low.

Historic (Above Ground) Resources

Historically, through the mid-twentieth century, MLK, Jr. Boulevard traversed farm and orchard land, including the expansive Chase Gardens area to the east of present-day Autzen Stadium. Within the last 50 years, the area has developed to include residential neighborhoods, office developments, student apartment housing, and University of Oregon athletic facilities (including Autzen Stadium and PK Park), leaving little of its agricultural past visible on the landscape.

A historic records review and a windshield survey of the corridor were conducted in September 2016. Four historic resources potentially eligible for listing on the National Register of Historic Places (NRHP) were identified in the MLK, Jr. Boulevard Corridor, although none are formally listed on the NRHP. These resources would be protected under Section 106. There are no properties along this corridor that are listed by the City as City Landmarks.

No-Build Alternative

No impacts to historic or archaeological resources are anticipated because no construction would occur as part of the MovingAhead project under the No-Build Alternative.

Enhanced Corridor Alternative

No impacts to archaeological resources are anticipated because the area has been developed and redeveloped for many decades and the likelihood of encountering any resources is low.

Although no impacts to archaeological resources are anticipated, an Inadvertent Discovery Plan should be in place prior to construction. It would outline measures to be undertaken in the event of an unanticipated archaeological discovery.

No historic resources are anticipated to sustain direct or indirect impacts under this alternative. It is assumed that there would be no short-term impacts (noise, air, access, etc.) to historic resources associated with construction of the Enhanced Corridor Alternative.

Ecosystems

The MLK, Jr. Boulevard Corridor is located within a highly urbanized area consisting of residential and commercial development. The highly developed areas do not possess substantial habitat features and generally lack sensitive ecosystem features. Street and landscape trees along the corridor provide limited habitat for urban avian species. Existing habitat conditions are conducive to plant and wildlife species that are commonly found in urban areas.

The corridor crosses the Willamette River at the Ferry Street Bridge. The nearest construction area of the Enhanced Corridor Alternative is located approximately 150 feet from the Willamette River. The City's Riparian Corridor setback from the Willamette River is 100 feet. No construction is proposed within the Willamette Greenway, an area of variable width on either side of the Willamette River that implements Statewide Planning Goal 15 and is protected by City Code.

Wetlands are mapped adjacent to the MLK, Jr. Boulevard Corridor and, under City Code, are protected with varying setbacks up to 50 feet from the resource. Prior to construction, detailed onsite wetland determination and delineation work would occur. It is possible that additional wetland areas may be identified at that time.

Designated critical habitat for Chinook salmon is located at the Willamette River. The MLK, Jr. Boulevard Corridor crosses the Willamette River and the nearest construction area is approximately 150 feet from the river. The minimum distance from the corridor to designated critical habitat for Willamette daisy is approximately 3 miles. No other designated critical habitat is located in the project vicinity.

A list of protected federal and state listed species documented as occurring in the project vicinity is presented in Chapter 3. None of these species are known to occur within the study area.

No-Build Alternative

The No-Build Alternative would not involve any construction activities associated with the MovingAhead project 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 species listed under the Endangered Species Act or designated critical habitat. The No-Build Alternative would not result in any long-term direct impacts to wetlands or waterways.

Enhanced Corridor Alternative

Trees

The Enhanced Corridor Alternative would remove approximately 9 medium and large trees outside of the Charter Tree boundary, slightly reducing available habitat for avian species in the corridor (Table 8-8). Any tree removal would occur in accordance with local regulations and would be mitigated through replacement. Mitigation would offset any long-term direct impacts.

Fish

The Enhanced Corridor Alternative would result in construction of 325,300 square feet (SF) of new, reconstructed and adjoining impervious surface. Stormwater runoff from new impervious surfaces could reach fish bearing waterways. Approximately 70,800 SF of the impervious surface would drain to the Willamette River and 254,500 SF would drain to the Q Street Canal. Runoff from the increase in impervious surface would be required to meet the Oregon State Department of Transportation (ODOT)'s or the City's stormwater design standards, depending on the roadway jurisdiction, as well as Oregon Department of Environmental Quality (DEQ) standards. Stormwater treatment would remove pollutants, minimize erosion, and control the flow so that the Enhanced Corridor Alternative would not significantly impact threatened fish species or designated critical habitat.

Potential cumulative stormwater effects to Q Street Canal and designated critical habitat in the Willamette River would be mitigated by meeting ODOT, City, and DEQ stormwater design standards.

Construction activities would result in short-term changes to water quality that could affect fish species and their habitat, such as the potential for sediment transport to waterways. Because erosion prevention

and sediment control measures would be implemented, none of these effects would be significant.

Wetlands

While documented wetlands are located in close proximity to the MLK, Jr. Boulevard Corridor, construction activities for the Enhanced Corridor Alternative are not anticipated to result in long-term direct impacts to mapped wetlands, including changes to wetland functions or quality.

As designed, construction of new transit facilities between Centennial Loop and Leo Harris Parkway would result in encroachment into the 50-foot Water Resources Conservation setback on the Q Street Canal which would result in long-term direct impacts due to loss of setback area; however, design refinements could avoid impacts to the setback area. Construction activities within the setback would result in short-term construction-related impacts to the riparian corridor.

Critical Habitat

The Enhanced Corridor Alternative would not result in the destruction or adverse modification of critical habitat or suitable habitat, nor would it result in a “take” of federal or state listed species. Wetlands and waterways along the corridor provide habitat for wildlife, but long-term direct impacts to the wetlands and waterways are not anticipated.

No indirect or cumulative effects or short-term construction-related impacts to designated terrestrial critical habitat or listed species are anticipated.

Table 8-8: MLK, Jr. Boulevard Corridor Ecosystem Impacts

	Enhanced Corridor
Trees	<ul style="list-style-type: none"> • Removal of up to 9 medium and large trees • Slight reduction in avian habitat
Fish	<ul style="list-style-type: none"> • Construction of 325,300 SF of impervious surface • Increase in stormwater runoff
Wetlands	<ul style="list-style-type: none"> • No impacts to wetlands • Potential loss of Water Quality Conservation Setback area along Q Street Canal
Critical Habitat	<ul style="list-style-type: none"> • No adverse impact • No “take” of federal or state-listed species

Source: Environmental Science & Assessment, LLC. Draft Ecosystems Technical Report. 2017.

Energy, Sustainability and Greenhouse Gas

Along the Coburg Road Corridor, energy is consumed primarily for residential, commercial, and transportation purposes. Transportation energy for motor vehicles is primarily provided by direct combustion of petroleum fuels, with lesser contributions from compressed natural gas and electricity. Given the continued gains in technology for increasing energy efficiency, energy consumption is not expected to be a factor for determining the preferred mode alternatives.

No-Build Alternative

Under the No-Build Alternative VMT, congestion, and energy use are expected to increase. Energy consumption and greenhouse gas (GHG) emissions are expected to be higher at congested intersections. There is limited potential for sufficient mode shifts from motor vehicles to transit to improve energy use and sustainability. The No-Build Alternative is inconsistent with applicable goals and policies related to GHG reductions and sustainability.

Enhanced Corridor Alternative

The long-term direct impacts of the Enhanced Corridor Alternative include negligible changes to direct energy consumption as shown in Table 8-9. The Enhanced Corridor Alternative would use slightly more energy than the No-Build Alternative in 2035.

The Enhanced Corridor Alternative would be in compliance with both the City's and LTD's sustainability policies.

All required mitigation measures related to energy and GHG emissions, such as preserving or replanting trees and minimizing traffic obstructions, would be specified in LTD's construction contracting documents.

Overall, future energy use does not differentiate the 2 alternatives on direct and indirect energy consumption. The changes in regionwide energy consumption are negligible for the alternatives due to continued increases in fuel efficiency over the next 20 years. Given the continued gains in technology for increasing energy efficiency, energy consumption is not expected to be a factor for determining the preferred mode alternative. The impacts of the build alternative are not large enough to warrant additional mitigation measures.

Table 8-9: MLK, Jr. Boulevard Corridor Percent Change in 2035 Regionwide Energy Impacts (Btu) from the No-Build Alternative

Energy Type	Enhanced Corridor
Direct Energy ^a	0.003%
CO2e Equivalent Energy ^b	0.008%
Maintenance Energy ^c	0.028%
Total	0.008%

Source: DKS. Draft Energy and Sustainability Technical Report. 2017.

Notes:

- a Direct energy represents energy consumed for operation of transit service.
- b CO2e equivalent energy represents greenhouse gas emissions generated by operation of transit service.
- c Maintenance energy represents energy consumed indirectly for the products and operations necessary to keep the transit system operable.

Geology and Seismic

A review of geologic conditions in the MLK, Jr. Boulevard Corridor shows that there are no mapped active faults or fault zones close to the corridor, the area is too high to be subject to tsunami inundation, no significant waterbodies are near enough to cause concerns about seiche inundation, and volcanic activity is not considered a significant concern.

No-Build Alternative

The main geologic hazards that could potentially affect operation and maintenance of the No-Build Alternative include erosion, landslides, ground motion, and liquefaction, as described in Table 8-10.

Enhanced Corridor Alternative

Long-term impacts for the Enhanced Corridor Alternative would be related to geologic and seismic hazards that already exist; these hazards are the same as for the No-Build Alternative (Table 8-10).

Table 8-10: MLK, Jr. Boulevard Corridor Existing Geologic Hazards

Hazard	No-Build	Enhanced Corridor
Erosion	<ul style="list-style-type: none"> • Low to moderate wind erosion susceptibility • Low to moderate water erosion susceptibility 	
Problematic Soil Properties	High shrink-swell and hydric soils: <ul style="list-style-type: none"> • Along MLK, Jr. Boulevard from the driveway of PK Park to Leo Harris Parkway 	
Landslides	No historically active landslides have been identified within the MLK, Jr. Boulevard Corridor. The corridor is mapped as low to moderate landsliding hazard.	
Ground Motion	Strong to very strong ground-shaking zone	
Liquefaction	Moderate liquefaction hazard zone	

Source: CH2M. Draft Geology and Seismic Technical Report. 2017.

Hazardous Materials

The development of several auto-oriented businesses and the use and storage of hazardous materials for those uses has led to a corridor with a number of affected sites that federal or state regulatory agencies have recorded on 1 or more hazardous materials lists. There are 1 high-risk and 38 medium-risk hazardous materials sites recorded within the study area of the Enhanced Corridor Alternative.

No-Build Alternative

No project-related construction activities would occur under the No-Build Alternative so there would be no impacts to hazardous materials because there would be no handling of, or exposure to existing contaminants, and no existing contaminants would be remediated.

Enhanced Corridor Alternative

Construction activities under the Enhanced Corridor Alternative would potentially require ground disturbance at 1 high-risk site and 1 medium-risk site (Table 8-11). The acquired portions of the sites would be remediated, resulting in a long-term benefit to the community.

Table 8-11: MLK, Jr. Boulevard Corridor Number of Hazardous Sites on Potentially Impacted Tax Lots

Hazardous Sites on Potentially Impacted Tax Lots	No-Build	Enhanced Corridor
High Risk	0	1
Medium Risk	0	1

Source: CH2M. Draft Hazardous Materials Technical Report. 2017.

Land Use and Prime Farmland

Near downtown Eugene, the MLK, Jr. Boulevard Corridor is characterized by high-density residential areas. Across the Willamette River, the corridor is composed of retail, general services, government, and recreational uses, including Lane County Juvenile Court, Autzen Stadium, PK Park, and Alton Baker Park. The east end of the corridor is characterized by residential uses. Much of the residential uses on the north side of MLK, Jr. Boulevard are multi-family uses including student housing for the University of Oregon while residential uses on the south side of the roadway are primarily single-family residential uses.

No-Build Alternative

No property would be acquired under the No-Build Alternative, and no temporary construction easements would be needed since no construction activities would occur as part of the MovingAhead project.

The No-Build Alternative would not result in direct impacts to prime farmlands, or agricultural or forest uses subject to Oregon Statewide Planning Goals 3 (Agricultural Lands) or 4 (Forest Lands).

The No-Build Alternative would be inconsistent with many local, regional, and state land use and transportation policies in the Eugene 2035 TSP, the Metro Plan, and Envision Eugene because it would not institute a BRT system connecting the region's highest growth centers and it would not encourage increased density and transit oriented development (TOD) along Key Transit Corridors.

Enhanced Corridor Alternative

Overall, direct impacts to land use are limited because the proposed investments of the Enhanced Corridor Alternative would be located primarily within existing transportation ROWs and the total area converted from existing land uses to a transportation use is minor compared to the total land available in the City.

Under this alternative, partial acquisitions of 6 parcels totaling less than 0.1 acre would be required to facilitate roadway widening and enhanced multimodal investments. The land that would be acquired and converted to a transportation use is zoned residential or mixed-use.

The Enhanced Corridor Alternative would not result in any direct impacts to prime farmlands, or agricultural or forest uses subject to Oregon Statewide Planning Goals 3 (Agricultural Lands) or 4 (Forest Lands). No direct impacts to prime farmland subject to the Farmland Protection Policy Act (FPPA) would occur under the Enhanced Corridor Alternative.

Operation of the Enhanced Corridor Alternative also has the potential to contribute to beneficial indirect impacts as a result of TOD. Lands that may be supportive of TOD development are identified in Table 8-13. Greater areas of Mixed-Use and Multi-Family Residential zoning contribute to a greater likelihood that TOD would occur within an area of potential impact. Any new development or redevelopment would need to be consistent with existing zoning and to comply with any requirements associated with overlays.

Construction of the Enhanced Corridor Alternative would require temporary construction easements beyond the property acquisition needed to construct the alternative, which could result in additional impacts on properties located along the corridor. These easements would be temporary and the areas affected would be returned to preconstruction conditions upon completion of construction. Additional information about compensation for any temporary easements is addressed in the Draft Acquisitions and Displacements Technical Report (CH2M 2017).

Table 8-12: MLK, Jr. Boulevard Corridor Potential Permanent Conversion of Land to Transportation-Related Use

Land Use Zoning	Enhanced Corridor (ac)
Commercial	0
Industrial	0
Office	0
Institution	0
Single-Family Residential	< 0.1
Multi-Family Residential ^a	< 0.1
Agriculture / Forest / Natural Resources	0
Mixed-Use ^a	< 0.1
Special Area Zone (Non-Mixed Use)	0
Total Potential Permanent Conversion^b	<0.1
Total Acres TOD Supportive Lands^a	<0.1

Source: CH2M. Draft Land Use and Prime Farmland Technical Report. 2017.

Notes:

- a Lands zoned Mixed-Use and Multi-Family Residential would likely be supported to a greater degree by transportation investments proposed under the build alternatives and have been aggregated together as "TOD Supportive Lands"
- b Total may be greater or less than the sum of the parts due to rounding.

Generally, the Enhanced Corridor Alternative would be consistent with the goals and policies on improving multimodal transportation contained in the Metro Plan, Regional Transportation Plan (RTP), TransPlan, Envision Eugene, and the Eugene 2035 TSP. This alternative would not be fully consistent with the RTP (Transportation System Improvement [TSI] Transit Policy #2) and the Metro Plan (Policy F.19) because it would not implement a BRT system. However, the Enhanced Corridor Alternative would implement lower capital-cost transit improvements consistent with the intent of these goals and policies and would not preclude the implementation of an EmX Alternative in the future.

Table 8-13: MLK, Jr. Boulevard Corridor Transit Supportive Lands

Zoning Type	Enhanced Corridor
Mixed-Use	259 acres
Vacant ^a	14 acres
Multi-Family Residential	118 acres
Vacant ^a	12 acres

Source: CH2M. Draft Land Use and Prime Farmland Technical Report. 2017.

Note:

a Vacant lands are captured in the Mixed-Use and Multi-Family Residential totals.

Noise and Vibration

Land use in downtown Eugene is mainly commercial and government buildings (Lane County Circuit Court, City of Eugene, etc.). The main noise source in this portion of the MLK, Jr. Boulevard Corridor is traffic on major arterial roadways throughout the downtown area.

Key land uses in other portions of the corridor are the University of Oregon’s Autzen Stadium, student and multi-family housing (Duck Village), Papé Field, PK Baseball Park, Lane County Juvenile Court, and Alton Baker Park. Residential land uses predominate near I-5 at the far eastern edge of the corridor. Noise levels in the corridor north and east of the downtown area are dominated by traffic on Coburg Road and MLK, Jr. Boulevard. Commercial activities and sport activities also contribute to noise levels in these areas. Traffic on I-105 and I-5 also affect noise levels where the Enhanced Corridor Alternative passes near those roadways.

No-Build Alternative

Under the No-Build Alternative, no noise or vibration impacts are anticipated because there would be no project related changes to the corridor.

Enhanced Corridor Alternative

Increased transit vehicle traffic in closer proximity to noise sensitive properties under the Enhanced Corridor Alternative would potentially cause noise impacts to 1 hotel (Table 8-14). This alternative is not anticipated to result in vibration impacts.

During final design, all impacts and potential mitigation measures would be reviewed for verification and the most appropriate mitigation measures would be determined in consultation with the affected property owners.

Under the Enhanced Corridor Alternative, during construction of the proposed project investments, noise and vibration levels in the project corridor may increase due to normal construction activities. However, daytime construction noise is exempt from provisions contained in the City of Eugene Municipal Code. Under the City of Eugene Municipal Code noise ordinance, project construction could be performed during the allowable hours of 7:00 a.m. to 7:00 p.m. Construction related

noise is exempt from code provisions if construction is performed during the allowable hours. No construction noise impacts are predicted for if construction is performed during the allowable hours. If construction was planned outside of the allowable hours, the project would be required to obtain a noise variance from local jurisdictions. As part of the variance process, a construction noise analysis would be performed; the construction specifications would contain limitations, if any, specific to the night work proposed and potential construction noise impacts.

Table 8-14: MLK, Jr. Boulevard Corridor Potential Noise and Vibration Impacts

Number of Properties Potentially Impacted	No-Build	Enhanced Corridor
Noise	0	1
Vibration	0	0

Source: Michael Minor and Associates. Draft Noise and Vibration Technical Report. 2017.

Parklands, Recreation Areas and Section 6(f) Resources

Within the MLK, Jr. Boulevard Corridor study area, there are 2 metropolitan parks, 2 urban plazas, and 1 natural area (Figure 8-4). Three of these resources are within 200 feet of the alignment of the Enhanced Corridor Alternative: the Park Blocks, Skinner Butte Park, and Alton Baker Park (Table 8-15). Skinner Butte Park and Alton Baker Park received funding from the Land and Water Conservation Fund (LWCF), so they are protected under Section 6(f).

No-Build Alternative

The No-Build Alternative would not impact parklands, recreation areas, or Section 6(f) resources because there would be no construction or change in the transportation system as a result of the MovingAhead project.

Enhanced Corridor Alternative

Beneficial effects of the Enhanced Corridor Alternative would include increased access to the parks along the corridor through more frequent and reliable transit service. In addition, bicycle and pedestrian connectivity would be enhanced with the new or enhanced pedestrian crossings along the corridor.

Under the Enhanced Corridor Alternative, transit service related to parks and recreation resources within 200 feet of the construction footprint would be more frequent than the fixed-route service under the No-Build Alternative.

No adverse impacts to the Park Blocks or Skinner Butte Park or Alton Baker Park are anticipated as the existing road width near these resources would be maintained.

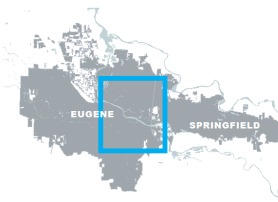
Short-term effects from construction activities would be mitigated through coordination of construction timing with the City's Parks and Open Space Division to avoid or reduce disruption for park users including providing advanced notice of construction activities to park users, signage for pedestrian and bicycle detours, and barriers and flagging for safety.

No impacts to Section 6(f) resources from any of the alternatives are anticipated.

Figure 8-4: MLK, Jr. Boulevard Corridor Parks and Recreation Resources



Locator Map



Legend

- Martin Luther King, Jr Blvd Corridor
- - - Martin Luther King, Jr Blvd Corridor continues east of I-5 as existing route #13
- Martin Luther King Jr Blvd 200 ft Buffer
- 2035 No-Build EmX
- Road
- Water
- Park

Parks & Recreation Areas
Martin Luther King, Jr Blvd Corridor

Note: Martin Luther King, Jr Blvd Corridor is an Enhanced Corridor Alternative Only.



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Source: CH2M. Draft Parklands, Recreation Areas, and Section 6(f) Technical Report. 2017.

Table 8-15: MLK, Jr. Boulevard Corridor Parks and Recreation Resources within 0.25 mile

Name	Facility Type	Approximate Distance from Corridor	Ownership and Management	Site Features and Characteristics	Potential Views of Corridor	LWCF or Similar Grant Funding?
Park Blocks	Urban Plaza	Within 200 feet	City of Eugene	Picnic tables, public art, performance space	No	No
Skinner Butte	Metropolitan Park	Within 200 feet	City of Eugene	Ball fields, picnic tables, rock climbing, recreation center	Yes	Yes
Alton Baker	Metropolitan Park	Within 200 feet	ODOT / City of Eugene	BMX track, boat launch, disc golf, dog park, picnic tables	Yes	Yes
Broadway Plaza	Urban Plaza	0.6 mile	City of Eugene	Performance space, public art	No	No
Sorrel Pond	Natural Area	0.22 mile	City of Eugene	Looped path	No	No

Source: CH2M. Draft Parklands, Recreation Areas, and Section 6(f) Technical Report. 2017.

Section 4(f) Resources

Park and recreation resources protected under Section 4(f) and located within 350 feet of the Enhanced Corridor Alternative include: the downtown Park Blocks, Skinner Butte Park, and Alton Baker Park. There are no wildlife or waterfowl refuges within 350 feet of the corridor.

As described in the cultural resources topic, a review of historic records and a windshield survey of along the MLK, Jr. Boulevard Corridor resulted in the identification of 4 historic resources potentially eligible for listing on the NRHP and thus protected under Section 4(f) (see Section 4(f) Technical Report for a complete list of eligible resources). None are formally listed on the NRHP at present.

No-Build Alternative

The No-Build Alternative would not impact Section 4(f) resources related to construction, operation, or maintenance of the MovingAhead project.

Enhanced Corridor Alternative

None of parks and recreation resources protected under Section 4(f) would be impacted by the Enhanced Corridor Alternative. This alternative would not result in temporary impacts, nor would the proximity impacts (noise or visual) be so severe as to substantially impair those activities, features, or attributes that qualify the resource for protection under Section 4(f). The improved reliability of transit service to parks would enhance accessibility for the park users.

No historic resources are anticipated to be removed to construct the Enhanced Corridor Alternative. Further, this alternative would not alter, directly or indirectly, any characteristics of a historic property that qualify the property for inclusion in the NRHP in a manner that would diminish the integrity of the property's location, design, setting, materials, workmanship, feeling, or association.

Therefore, the Enhanced Corridor Alternative is not anticipated to have an adverse effect on any Section 106 resources and would have “no use” on these resources under Section 4(f).

Table 8-16: MLK, Jr. Boulevard Corridor Section 4(f) Park and Recreation Resources

Source Name	Location	Official with Jurisdiction	Section 4(f) Qualifying Description
Park Blocks	Between 8th Avenue and Park Street, Eugene	City of Eugene	Municipal park (urban plaza, benches)
Skinner Butte Park	248 Cheshire Avenue, Eugene	City of Eugene	Municipal park (ballfields, fishing, trails, picnic tables, playground, informal sports / play fields, rock climbing, spray pad)
Alton Baker Park	200 Day Island Road, Eugene	City of Eugene	Municipal park (BMX track, dis golf, boat launch, fishing, trails, picnic tables, informal sports / play fields)

Source: CH2M. Draft Section 4(f) Technical Report. 2017.

Street and Landscape Trees

The MLK, Jr. Boulevard Corridor near the stadiums and athletic facilities consists of areas of street and landscape trees and landscaping along the roadway. The residential areas along the corridor feature more mature street and landscape trees and landscaping on adjacent properties. Near Coburg Road, the commercial areas primarily have street and landscape trees along the roadway and in parking lots.

No-Build Alternative

No impacts to trees are anticipated under the No-Build Alternative.

Enhanced Corridor Alternative

Under the Enhanced Corridor Alternative, no trees within the Charter Tree boundary would be impacted; outside of the boundary, up to 9 medium and large street trees and 0 landscape trees would be removed (Table 8-17). Proposed sidewalks that would potentially impact existing street trees would be wide enough to incorporate a landscape strip into which new street trees could be planted. Removed street trees would be mitigated by replanting trees at a ratio of at least 1 tree planted for each tree removed or as otherwise required by City Code. The selection of tree species, specific location, and provision of adequate soil conditions for tree mitigation would be coordinated with the City Urban Forestry staff.

The intermittent nature of construction proposed under the Enhanced Corridor Alternative would reduce the risk of potential impacts to street and landscape trees as construction would not occur along the entire corridor, just in limited locations near proposed investments. LTD would require the construction contractor to develop a Tree Protection Plan before construction.

Under the Enhanced Corridor Alternative, potential short-term construction-related impacts to street and landscape trees might occur in the following locations:

- Along MLK, Jr. Boulevard from 700 feet northwest of the intersection of Kinsrow Avenue and MLK, Jr. Boulevard to the intersection of MLK, Jr. Boulevard and Leo Harris Parkway for the construction of BAT lanes and a new traffic signal
- Along MLK, Jr. Boulevard from its intersection with Centennial Loop to its intersection with Marche Chase Drive for construction of BAT lanes within the existing roadway

Table 8-17: MLK, Jr. Boulevard Corridor Number of Medium and Large Trees Potentially Removed

	Enhanced Corridor
INSIDE THE CHARTER TREE BOUNDARY^a	
Street Trees	n/a
Landscape Trees	n/a
OUTSIDE THE CHARTER TREE BOUNDARY	
Street Trees	7 to 9 trees
Landscape Trees	0 trees

Source: CH2M. Draft Street and Landscape Tree Technical Report. 2017.

Note:

- a The construction footprint of the MLK, Jr. Boulevard Corridor build alternative is located outside of the Charter Tree boundary.

Transportation and Transit

MLK, Jr. Boulevard is owned and managed by the City. The majority of other roadways in the corridor are also owned and managed by the City. No corridor segments had collision rates that would warrant consideration of safety improvements. One intersection, at MLK, Jr. Boulevard and Kinsrow Avenue, had collision rates that would warrant consideration of safety improvements. During the p.m. peak hour, current mobility standards were met at all study intersections.

For a more detailed evaluation of transportation impacts and benefits for all corridors and alternatives please refer to Chapter 9.

No-Build Alternative

Under the No-Build Alternative investments planned in the Eugene 2035 TSP, would improve pedestrian and bicycle access along the MLK, Jr. Boulevard Corridor, however, connectivity to planned roadway, bicycle or pedestrian projects would not change. No investments would be made to the existing transportation system as part of the MovingAhead project. Although traffic delay is anticipated to worsen by 2035, all study intersections would meet the current mobility standards adopted as part of the Eugene 2035 TSP.

There would be limited potential to encourage travelers to change their travel mode shifts motor vehicle travel to transit and limited potential to support locally adopted transportation policies.

Enhanced Corridor Alternative

The Enhanced Corridor Alternative would improve the pedestrian and bicycle network with the installation of new or improved sidewalks and enhanced pedestrian crossings. There would not be bus phases at any signalized intersections under the Enhanced Corridor Alternative, but there would be transit signal priority at all signals on the corridor. The Enhanced Corridor Alternative would offer moderate safety improvements due to BAT lanes and increased crossing opportunities for people biking, walking and using mobility devices.

In-vehicle transit travel time would improve by 2 minutes (1-way inbound) during the a.m. peak hour compared

to the No-Build Alternative (Table 8-19). The Enhanced Corridor Alternative has a greater potential for increased transit reliability due to a 25.1% increase in transit exclusivity/priority lanes compared to the No-Build Alternative.

Average weekday systemwide transit ridership would increase by 620 (1.3%) 1-way linked trips compared to the No-Build Alternative (Table 8-20).

Local traffic operations in 2035 would improve at the MLK, Jr. Boulevard/Club Road/Centennial Loop intersection due to the installation of dedicated left-turn lanes, which would allow for more efficient signal phasing than the No-Build Alternative. There would be a safety benefit based on an increase in transit ridership (and parallel decrease in motor vehicle travel) and a reduction in VMT (see Chapter 9), which could reduce fatal and serious injury crashes.

Table 8-18: MLK, Jr. Boulevard Corridor Transportation Impacts and Benefits

Measure	Enhanced Corridor
New/Improved Sidewalks	0.45 mile
New/Improved Bicycle Facilities	0.00 mile
New enhanced crossings	4
Upgraded existing crossings	0
Replaced existing enhanced crossings	0
Potential # Off-Street Parking Spaces Removed	0
Potential # On-Street Parking Spaces Removed	0
Potential driveway closures	0
Potential drive-through closures	0
Percent of Corridor with Exclusive/Priority Lanes	25.1%

Source: DKS. Draft Transportation Technical Report. 2018.

No off-street or on-street parking stalls would be removed; and no driveways, or drive-throughs would be closed or converted to right-in/right-out only.

Mitigation measures such as limiting the length of single lane closures, detour signage, and maintaining

business access, would be needed during construction, and would require early, frequent, and ongoing communication among LTD, the City, contractors, and affected property owners and tenants.

Table 8-19: MLK, Jr. Boulevard Corridor 2035 Auto and Transit Travel Times (a.m. Peak Hour)

Measure	MLK, Jr. Boulevard Corridor Travel time to Eugene Station from Kinsrow Avenue/Commons			
	Auto	Transit		
	No-Build and Enhanced Corridor	No-Build	Enhanced Corridor	
	Time	Time	Time	Change from No-Build Alternative
Time in Vehicle	7 minutes	13 minutes	11 minutes	-2 minutes

Source: DKS. Draft Transportation Technical Report. 2018.

Table 8-20: MLK, Jr. Boulevard Corridor Average Weekday 2035 Systemwide Ridership

Measure	No-Build	Enhanced Corridor
Total Systemwide Transit Trips ^a	46,410	47,030
Change from No-Build	N/A	620
% Change from No-Build	N/A	1.3%

Source: DKS. Draft Transportation Technical Report. 2018.

Note:

a Systemwide transit trips are defined as 1-way linked trips taken by a person from the trip's origin to the trip's destination, independent of the number of vehicles or transfers used to complete the trip.

Utilities

Underground utilities within the MLK, Jr. Boulevard Corridor include cables for telecommunication and energy; pipes for natural gas, water, sanitary sewer, and stormwater; fiber-optic lines; and access points (manholes and vaults) for all types of utilities. Aboveground utilities include CenturyLink telephone poles, Eugene Water and Electric Board (EWEB) power poles, and traffic signals and street lights and their associated conduit and controls.

No-Build Alternative

The No-Build Alternative would have no adverse or beneficial long-term impacts to utility infrastructure as no capital improvements would be constructed for the MovingAhead project.

Enhanced Corridor Alternative

Table 8-21 summarizes the potential impacts to major utilities in the MLK, Jr. Boulevard Corridor that would occur under the Enhanced Corridor Alternative. This alternative proposes the construction of new signals in this corridor, which would require additional infrastructure (e.g. electrical connections). Final design documentation would detail replacement and design of this infrastructure.

Table 8-21: MLK, Jr. Boulevard Corridor Potential Utility Impacts

Measure	Enhanced Corridor
Major sanitary sewer line	1
Major storm sewer line	0
Major electrical line	6
Major water line	2
New or modified traffic signals	5
Gas transmission line	1

Source: CH2M. Draft Utilities Technical Report. 2017.

The Enhanced Corridor Alternative requires intersection widening and signal reconstruction activities at the Coburg Road and MLK, Jr. Boulevard intersection. A major natural gas transmission line runs parallel to Coburg Road. Mitigation to avoid any potential impact to the natural gas transmission line would include design refinements in coordination with NW Natural and other stakeholders to ensure this piece of critical infrastructure would not be impacted as its relocation might prove to be cost and schedule prohibitive.

Visual and Aesthetic Resources

The MLK, Jr. Boulevard Corridor passes through 3 distinct areas, each of which has a different visual character. The majority of the corridor passes through a residential area east of Autzen Stadium that is primarily composed of multi-family residential developments on the northern and eastern side of MLK, Jr. Boulevard, and single-family residences on the southern side. This area has a residential character that is reinforced by street and landscape trees and landscaping on most properties. The portion of the corridor that passes Autzen Stadium also passes other University of Oregon athletic facilities that line the southern side of the route and parking, sports fields, and government and non-government organization facilities along the northern side. The scale of structures and open spaces in this area is large and monumental. Street trees help define the boulevard and provide an entry to the stadium area. West of the stadium area, the corridor enters a commercial-retail area that includes automobile dealerships, retail stores, and large areas for parking.

No-Build Alternative

No impacts to visual and aesthetic resources would be expected under the No-Build Alternative for the MLK, Jr. Boulevard Corridor as no construction would take place in association with the MovingAhead project.

Enhanced Corridor Alternative

The removal of large and medium street and landscape trees would impact the visual character of the portion of the corridor where the trees would be removed. The Enhanced Corridor Alternative would remove up to 9 medium and large street trees from the eastern

portion of the corridor, outside of the Charter Tree boundary; no trees would be removed within the boundary. Table 8-22 identifies the degree of potential visual change in visual character that would result from construction of the Enhanced Corridor Alternative. Further detail on this assessment is provided in the Visual and Aesthetic Resources Technical Report (CH2M 2017).

With the Enhanced Corridor Alternative, in almost all locations, proposed sidewalks in areas where street trees would be impacted would be wide enough to incorporate a landscape strip into which new street trees could be planted. As discussed in the street and landscape trees section of this chapter, removed street trees would be replanted at a ratio of at least 1 tree planted for each tree removed or as otherwise required by City Code and coordinating with the City Urban Forestry staff. With this mitigation, no long-term significant adverse impacts to visual character are anticipated.

Beneficial effects of the Enhanced Corridor Alternative would include replacing trees that are not on the City-approved species list, are nearing their maximum

lifespan, or are difficult to maintain. The replanted trees would contribute to a more unified appearing corridor, as would investments such as new sidewalks, bus stops, landscaping, and enhanced pedestrian crossings proposed under the Enhanced Corridor Alternative.

Water Quality and Hydrology

The study area includes the receiving waterways and floodplains of stormwater runoff into the existing storm sewer system and conveyed to either the Q Street Canal or the Willamette River.

No-Build Alternative

No direct or cumulative impacts to water quality are expected from the No-Build Alternative.

Enhanced Corridor Alternative

The Enhanced Corridor Alternative would increase or reconstruct 254,500 SF of impervious area in the Q Street Canal drainage basin, which would constitute 1.34% of the impervious area in the canal's drainage basin, and 70,800 SF of impervious surface in the Willamette River drainage basin, which would constitute 0.02% of the total impervious surface in that drainage basin (Table 8-23).

The Enhanced Corridor Alternative would cross the Willamette River at the Ferry Street Bridge; no investments are expected to be made to the existing bridges and no impacts to the hydraulics of the Willamette River are anticipated.

The alternative would also cross the Q Street Canal using an existing bridge at Centennial Loop and a culvert near Kinsrow Avenue. No modifications are expected to either the bridge or culvert, and floodplain and hydraulic impacts to the Q Street Canal are not anticipated.

Much of the Enhanced Corridor Alternative falls within the floodplain of the Willamette River. Construction resulting from developed sidewalks, shelters, pullouts, and pedestrian crossings could result in temporary impacts such as a change in turbidity and runoff patterns. Impacts are expected to end when construction is completed.

Table 8-22: MLK, Jr. Boulevard Corridor Potential Change to Visual Character

Alternative	Length of Potential Change in Visual Character
ENHANCED CORRIDOR	
High	< 0.1 mile
Moderate	0.5 mile
Low / No Impact	7.0 miles
Corridor Length^a	7.6 miles

Source: CH2M. Draft Visual and Aesthetic Resources Technical Report. 2017.

Note:

- a Corridor length for this analysis is greater than the round-trip corridor length reported in other sections because visual impacts may affect both sides of the street. One-way streets with potential impacts on both sides increase the corridor length with potential visual impacts to be greater than the length of the corridor.

With mitigation measures, such as water quality and flow control facilities, there would be a net water quality improvement associated with the reconstructed impervious areas and the impacts of the new impervious area would be reduced.

Two locations were identified for potential water quality and flow control facilities for runoff prior to discharge to waterways. The following locations were selected based on the construction footprint and hydrology:

- MLK, Jr. Boulevard and Centennial Loop
- MLK, Jr. Boulevard and Kinsrow Avenue

No cumulative effects are expected in the Q Street Canal.

Cumulative effects on both the quantity and quality of runoff may result from the development of 2 or more of the corridor alternatives because all affected watercourses eventually reach the Willamette River. However, due to the large drainage area and high amounts of existing impervious area in the Willamette River Basin, the cumulative effects are likely to be minimal.

Table 8-23: MLK, Jr. Boulevard Corridor Existing and New Impervious Surface Quantities by Alternative

Drainage Basin	Existing Impervious Area	Enhanced Corridor	
		Total New and Reconstructed Impervious Area / Percent of Impervious Area ^a	New Roadway and Sidewalk Impervious Area / Percent of Impervious Area ^a
Q Street Canal	18,899,325 SF	254,500 SF 1.34%	2,200 SF 0.01%
Willamette River	462,920,832 SF	70,800 SF 0.02%	9,000 SF 0.01%
Total	481,820,157 SF	325,300 SF 0.06%	11,200 SF <0.01%

Source: CH2M. Draft Water Quality, Floodplain, and Hydrology Technical Report. 2017.

Note:

a Total impervious area in drainage basin

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Chapter 9: Transportation and Parking

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LEFT TURN
YIELD TO
ONCOMING
TRAFFIC

W 10TH

6103

EmX

PeaceHealth
Rides

PeaceHealth
Rides

PeaceHea

Overview

This chapter provides a summary of the multimodal transportation analysis related to the 5 study corridors:

- Highway 99
- River Road
- 30th Avenue to Lane Community College (LCC)
- Coburg Road
- Martin Luther King (MLK), Jr. Boulevard

The No-Build, Enhanced Corridor, and EmX Alternatives were evaluated to identify potential benefits and impacts related to the transit system and the street network. While Chapters 4 through 8 contain a summary of the transportation analysis for each corridor that focuses on the benefits and impacts of the corridor’s proposed alternatives, this chapter compares the transportation benefits and impacts of all of the proposed alternatives for all corridors to aid in prioritizing the package of investments that would be advanced for implementation by the City of Eugene (City) and Lane Transit District (LTD). Details of the transportation analysis are provided in the MovingAhead project’s Draft Transportation Technical Report (DKS 2018).

Multimodal Transportation Analysis

The multimodal transportation analysis for the MovingAhead project was based on a planning horizon year of 2035. The transportation analysis was based on a future 2035 street and active transportation network that included expected transportation investments identified in the Eugene 2035 Transportation System Plan (Eugene 2035 TSP), adopted July 2017. The transit analysis was based on a model of the 2035 operating characteristics of the transit system.

The goals and policies of the 2011 Central Lane Metropolitan Planning Organization (MPO) Regional Transportation Plan (RTP), 2015 updated Eugene-Springfield Metropolitan Area General Plan, the Eugene 2035 TSP, and the Envision Eugene Comprehensive Plan (Envision Eugene) identify the need to implement improved transportation systems that include public transit, pedestrian, and bicycle investments.

Eugene 2035 TSP – 5 Primary Goals

1. **Create an integrated transportation system** that is safe and efficient, supports the Metro Plan land use diagram, Envision Eugene, the City of Eugene target for a 50% reduction in fossil fuel consumption, and other City of Eugene land use and economic development goals to reduce reliance on single-occupancy automobiles, and enhance livability
2. Advance **regional sustainability** by providing a transportation system that improves economic vitality, environmental health, social equity, and overall well-being
3. Strengthen **community resilience** to changes in climate, increases in fossil fuel prices, and economic fluctuations by making the transportation networks diverse, adaptable, and not reliant on any single mode
4. Address the **transportation needs and safety** of all travelers, including people of all ages, abilities, races, ethnicities, and incomes; through transportation investments, respond to the needs of system users, be context sensitive, and distribute the benefits and impacts of transportation decisions fairly throughout the City of Eugene
5. By 2035, triple the percentage of **trips made on foot, by bicycle, and by transit** from 2014 levels

Environmental Consequences and Mitigation

The construction and operation of new high capacity transit routes can have both beneficial and adverse effects on the transit system and the street network. This section summarizes those effects and possible mitigation to offset any adverse effects.

Transit

Impacts and benefits of the MovingAhead project on transit would be reflected in the amount of service, travel times, system reliability, and ridership of the system.

Amount of Service

The total amount of transit service provided by each alternative in each corridor was measured by analyzing transit vehicle hours traveled (transit VHT), and transit vehicle miles traveled (transit VMT). The model assumed that fixed-route service would be provided by a mix of 40-foot and 60-foot buses while Enhanced Corridor and EmX service would be provided by 60-foot vehicles.

In general, the EmX Alternatives would result in a substantial increase in corridor transit capacity compared to the No-Build and Enhanced Corridor Alternatives. This is because the EmX Alternatives would have higher frequencies (10-minute service all day), translating into extra trips each hour of service throughout the day, and resulting in more vehicle hours and miles (transit VHT and VMT) than the other alternatives. In other words, relatively small changes in revenue hours and revenue miles traveled would result in a notable increase in the number of people that can be carried by transit vehicles throughout the day.

Key service differences between both build alternatives and the No-Build Alternative are the implementation of higher capacity vehicles (60-foot vehicles can carry up to 100 passengers), increased service frequency, and improved operational efficiencies of Enhanced Corridor or EmX service. Figure 9-1 and Table 9-1 present the annual transit VHT and VMT by alternative.

Travel Time

In general, in-vehicle transit travel time for both Enhanced Corridor and EmX Alternatives would be better than under the No-Build Alternative. Transit travel times are shown in Table 9-2.

Revenue Service

Revenue service refers to all scheduled time a transit vehicle spends serving passengers (revenue hours), as well as all distance traveled while providing that service (revenue miles).

Transit Vehicle Hours Traveled (Transit VHT)

The total hours the transit vehicle travels while in revenue service.

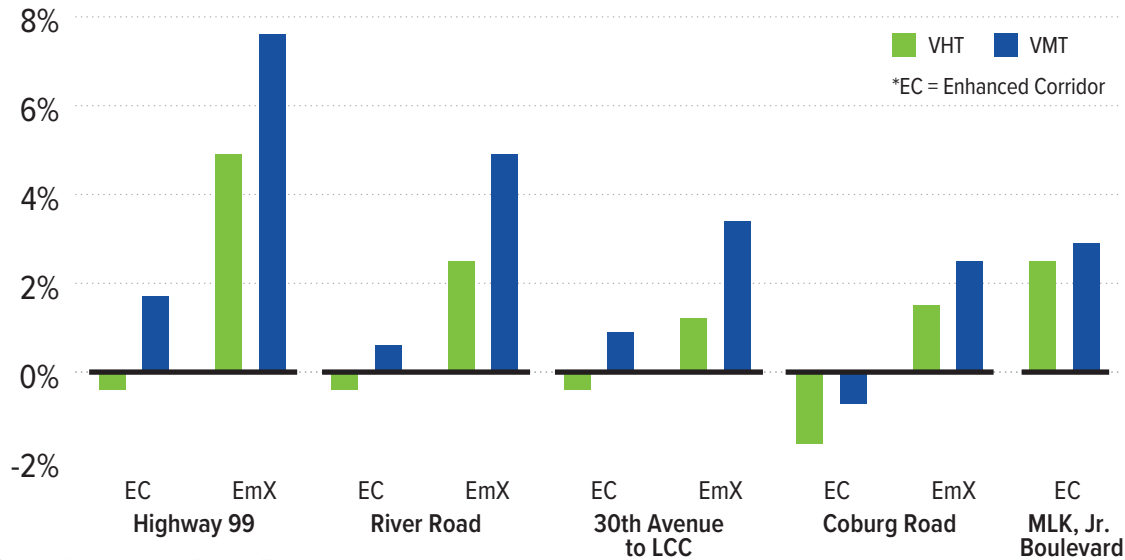
Transit Vehicle Miles Traveled (Transit VMT)

The total miles the transit vehicle travels while in revenue service.

Transit Vehicle Carrying Capacity

Transit travel time consists of time in the vehicle. The total number of seated and standing passengers that can be carried on a transit vehicle.

Figure 9-1: 2035 Systemwide Transit Service Change from No-Build Alternative



Source: MovingAhead Project Team.

Table 9-1: 2035 Systemwide Transit Service Characteristics

Corridor	Alternative	Annual Transit VHT (Revenue Hrs)	Percent Change in VHT over No-Build	Annual Transit VMT (Revenue Miles)	Percent Change in VMT over No-Build
Highway 99	No-Build	278,600	N/A	4,520,200	N/A
	Enhanced Corridor	277,500	-0.4%	4,600,800	1.8%
	EmX	292,500	5.0%	4,864,800	7.6%
River Road	No-Build	278,600	N/A	4,520,200	N/A
	Enhanced Corridor	277,500	-0.4%	4,547,400	0.6%
	EmX	285,600	2.5%	4,744,400	5.0%
30th Avenue to LCC	No-Build	278,600	N/A	4,520,200	N/A
	Enhanced Corridor	277,500	-0.4%	4,565,400	1.0%
	EmX	282,000	1.2%	4,674,100	3.4%
Coburg Road	No-Build	278,600	N/A	4,520,200	N/A
	Enhanced Corridor	274,100	-1.6%	4,487,800	-0.7%
	EmX	282,900	1.5%	4,633,400	2.5%
MLK, Jr. Boulevard	No-Build	278,600	N/A	4,520,200	N/A
	Enhanced Corridor	285,800	2.6%	4,653,000	2.9%

Source: MovingAhead Project Team.

In-Vehicle Transit Travel Time

The in-vehicle transit travel time to downtown Eugene from key locations within each corridor would be improved with both the Enhanced Corridor and EmX Alternatives as shown for the a.m. peak hour in Table 9-2. EmX Alternatives would include greater levels of capital and operational investments than the Enhanced Corridor Alternatives (e.g. business access and transit (BAT) lanes, exclusive transit lanes, queue jumps), and while these investments vary by corridor, they would produce travel time savings between 2 and 12 minutes compared to the No-Build Alternative. The Highway 99 Corridor EmX Alternative yields the largest travel time improvement compared to the No Build Alternative (41.4%) followed by the River Road Corridor

and Coburg Road Corridor EmX Alternatives (30.8% and 27.8%, respectively). Under the Enhanced Corridor Alternatives, where levels of capital investments are reduced compared to the EmX Alternatives, improvement in in-vehicle travel time generally would not be as substantial and travel time savings over the No Build Alternative would be smaller, between 1 and 10 minutes. Again, the Highway 99 Corridor Enhanced Corridor Alternative yields the largest travel time improvement compared to the No-Build Alternative (34.5%) followed by the Coburg Road Corridor and River Road Corridor Enhanced Corridor Alternatives (27.8% and 19.2%, respectively). For both build alternatives, travel time savings typically result from the addition of exclusive/priority lanes for transit vehicles and reduction in the number of stops and stations.

Table 9-2: 2035 Systemwide Transit Travel Times (a.m. Peak Hour)

Corridor	Alternative	In-vehicle Travel Time to Eugene Station ^a (minutes)
Highway 99 <i>(From Cubit/Barger)</i>	No-Build	29
	Enhanced Corridor	19
	EmX	17
River Road <i>(From Santa Clara Transit Center)</i>	No-Build	26
	Enhanced Corridor	21
	EmX	18
30th Avenue to LCC <i>(From LCC)</i>	No-Build	17
	Enhanced Corridor	16
	EmX	15
Coburg Road <i>(From Gateway Station)</i>	No-Build	18
	Enhanced Corridor	13
	EmX	13
MLK, Jr. Boulevard <i>(From Kinsrow/Commons)</i>	No-Build	13
	Enhanced Corridor	11

Source: MovingAhead Project Team.

Note:

a In-vehicle one-way transit travel times represent time spent in the transit vehicle.

Service Reliability

Service reliability is a measure of how well a transit system adheres to a schedule, maintains regular headways, and has a consistent travel time. The reliability of on-time service can have a significant effect on how attractive a transit system is to current and prospective riders. Reliability is influenced by a number of factors including transit priority, traffic conditions, transit exclusivity, passenger demand, and weather. Reliability measures used to compare the corridors and alternatives include:

- Total number of new round-trip miles
- Total number of exclusive and/or priority miles
- Percentage of new corridor exclusive or priority miles
- Number of intersections on the main transit route with transit priority treatment.

New Round-Trip Miles

One of the key factors in calculating travel time effects and service reliability is the number of new round-trip miles added to the system by the corridor alternatives.

Four of the five study corridors are similar in length (approximately 10 to 13 round-trip miles), longer than

LTD’s existing EmX corridors (4 to 9 round-trip miles), as shown in Figure 9-2. At 6.0 round-trip miles, the MLK, Jr. Boulevard Corridor is approximately half the length of the other corridors. Although longer routes that provide service to a community’s outer edges meet the needs of many transit users, longer route lengths often introduce more variables that can reduce service reliability.

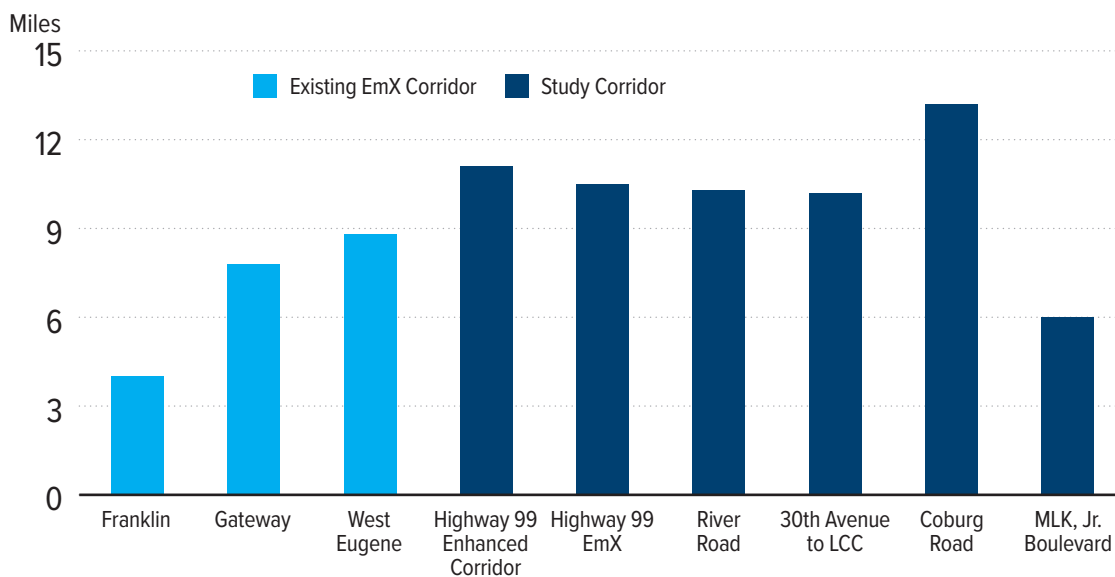
Transit Priority

Transit priority includes treatment at intersections, such as exclusive bus phases and transit signal priority. Exclusive bus phases provide a signal at lights that only transit vehicles can use. Transit signal priority can extend or truncate the green phase at a light when transit vehicles approach an intersection.

Transit Exclusivity

Transit exclusivity consists of exclusive lanes or right of way for transit vehicles (queue jumps, exclusive lanes) and lanes with transit priority (BAT lanes).

Figure 9-2: Round Trip Miles



Source: MovingAhead Project Team.

New Exclusive and/or Priority Lanes

One of the major contributing factors to reliable transit service is the length of exclusive lanes for transit or travel lanes that are prioritized for transit vehicles (such as BAT lanes and queue jump lanes). All of the EmX Alternatives would have some level of exclusive or priority operating lanes compared to the No Build

Alternative, the highest being EmX operations in the River Road Corridor, with 58% of the new corridor lanes being prioritized for transit vehicles, as shown in Table 9-3 and Figure 9-3. Additionally, the Highway 99 Corridor and River Road Corridor EmX Alternatives and both Coburg Road build alternatives would benefit from existing exclusive and/or priority lanes. All of

Table 9-3: Corridor Exclusive/Priority Lane Miles

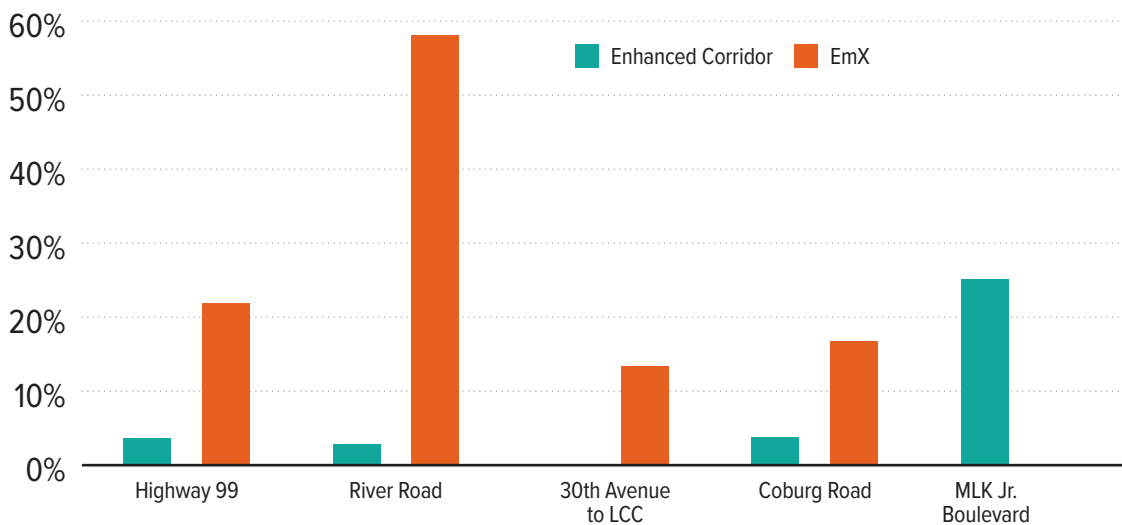
Corridor	Alternative	Existing Miles	New Miles	Percentage of Total Corridor Miles
Highway 99 ^a	Enhanced Corridor	0.00 miles	0.40 mile	3.6%
	EmX	1.90 miles	0.40 mile	21.9%
River Road ^a	Enhanced Corridor	0.00 miles	0.29 mile	2.8%
	EmX	1.68 miles	4.31 miles	58.1%
30th Avenue to LCC	Enhanced Corridor	0.00 miles	0.00 miles	0.0%
	EmX	0.00 miles	1.37 miles	13.4%
Coburg Road	Enhanced Corridor	0.16 miles	0.34 mile	3.7%
	EmX	0.16 miles	2.04 miles	16.7%
MLK, Jr. Boulevard	Enhanced Corridor	0.00 miles	2.41 miles	25.1%

Source: MovingAhead Project Team.

Note:

a For the Highway 99 and River Road Corridors, the route alignments are different for the Enhanced Corridor and EmX Alternatives, therefore, the existing miles of exclusive or priority lanes is different.

Figure 9-3: Percentage of Lane Miles Prioritized for Transit Vehicles



Source: MovingAhead Project Team.

the Enhanced Corridor Alternatives except for the 30th Avenue to LCC Corridor would have some travel lanes that are prioritized for transit vehicles, the highest being Enhanced Corridor operations on the MLK, Jr. Boulevard Corridor, with 25% of the new corridor lanes being prioritized for transit vehicles.

Main Transit Route Intersections with Transit Priority

Transit priority is an operational improvement that can be made to traffic intersections to reduce the amount of time transit vehicles spend at a traffic signal. Transit priority treatment includes several different methods to help improve travel times and reduce delays: exclusive bus phases, queue jumps, and transit signal priority.

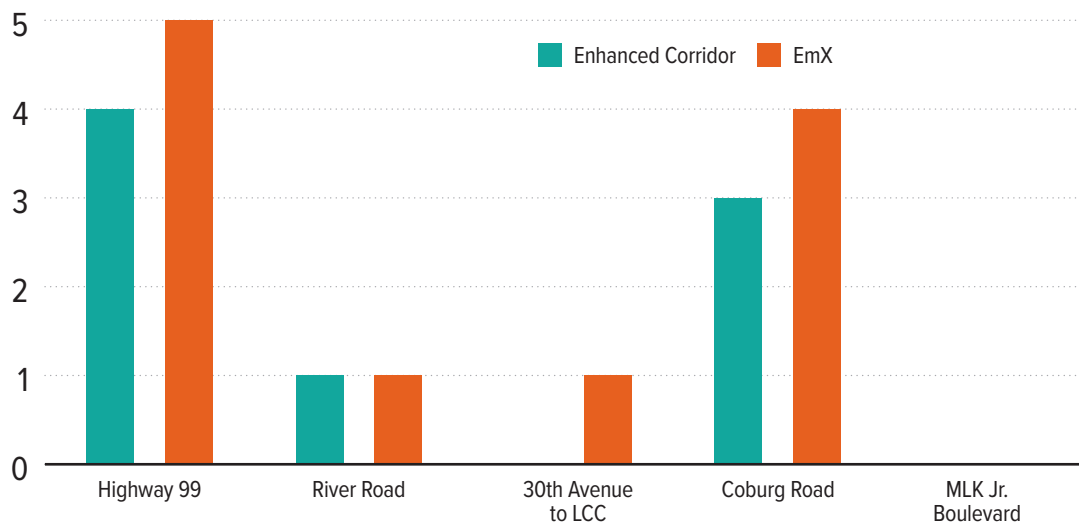
No exclusive bus phasing would be provided under the No-Build Alternative except for already planned changes as part of other projects or programs.

Exclusive bus phasing would be added under Enhanced Corridor and EmX Alternatives in the Highway 99, River Road, and Coburg Road Corridors, and under the EmX Alternative in the 30th Avenue to LCC Corridor

(Figure 9-4). No exclusive bus phasing would be provided under the MLK, Jr. Boulevard Enhanced Corridor Alternative.

Every signalized intersection for both the Enhanced Corridor and EmX Alternatives would implement transit signal priority, whereas the No-Build Alternative would not implement additional transit signal priority. In addition to transit signal priority at all intersections, Enhanced Corridor Alternatives would include bus phases at some signalized intersections. EmX Alternatives would use transit signal priority at all intersections and bus phases and queue jumps at some intersections. Compared to the No-Build Alternative, the Enhanced Corridor Alternatives would provide some priority treatment and the EmX Alternatives would provide substantially more priority treatment. With the implementation of transit priority treatments throughout the corridors, the Enhanced Corridor Alternatives can be expected to have more reliable travel times during peak periods and the EmX Alternative can be expected to have even greater travel time reliability during peak periods compared to the No-Build Alternative.

Figure 9-4: Number of Signals with Exclusive Bus Phase



Source: MovingAhead Project Team.

Transit Ridership

Transit ridership is a measure of how well-used a transit system is and how many people it is serving. Ridership is also a reflection of how much transit service is available, transit travel times, and service reliability.

In general, the Enhanced Corridor Alternatives would result in a slight increase in ridership, while the EmX Alternatives would result in a larger increase in ridership compared to the No-Build Alternative. Two ridership measures were used to compare the corridors and alternatives from a systemwide perspective and from a corridor perspective:

- Systemwide average weekday transit ridership
- Corridor ridership

Systemwide Average Weekday Transit Ridership

Transit ridership for the MovingAhead project is measured as the average number of weekday systemwide transit trips in 2035, with each trip defined as a 1-way trip taken by a person from an origin to a destination, independent of the number of vehicles or transfers used to complete the trip (a “linked trip”). Table 9-4 and Figure 9-5 show the number of systemwide transit trips for each alternative. Overall, the Enhanced Corridor Alternatives would result in an increase of less than 1% in systemwide transit trips compared to the No-Build Alternatives, except in the MLK, Jr. Boulevard Corridor, where systemwide transit trips would increase 1.3%. The 30th Avenue to LCC Corridor Enhanced Corridor Alternative would result in a 0.2% decrease in systemwide transit trips because this alternative would decrease the frequency of bus service along E. 30th Avenue.

Transit Trip

Transit trips are linked trips. Even if a passenger must make several transfers during a 1-way trip, the trip is counted as 1 linked trip on the system.

The EmX Alternatives would result in nearly a 2% increase in systemwide transit trips compared to the No-Build Alternative, as listed in Table 9-4.

Corridor Ridership

Corridor ridership is defined as any transit trip that is produced in and/or attracted to the corridor. Total corridor ridership for each alternative is shown in Table 9-4.

Overall, the River Road Corridor and Coburg Road Corridor EmX Alternatives would have the highest increase in corridor ridership compared to the No-Build Alternative, with more than a 10% increase as shown in Figure 9-6.

Of the Enhanced Corridor Alternatives, the MLK, Jr. Boulevard Corridor would have the highest increase (6.7%) in corridor ridership compared to the No-Build Alternative. The 30th Avenue to LCC Corridor Enhanced Corridor Alternative would result in a 1.2% decrease in corridor ridership compared to the No-Build Alternative because of the decreased frequency of bus service along E. 30th Avenue.

Table 9-4: Average Weekday 2035 Systemwide Ridership

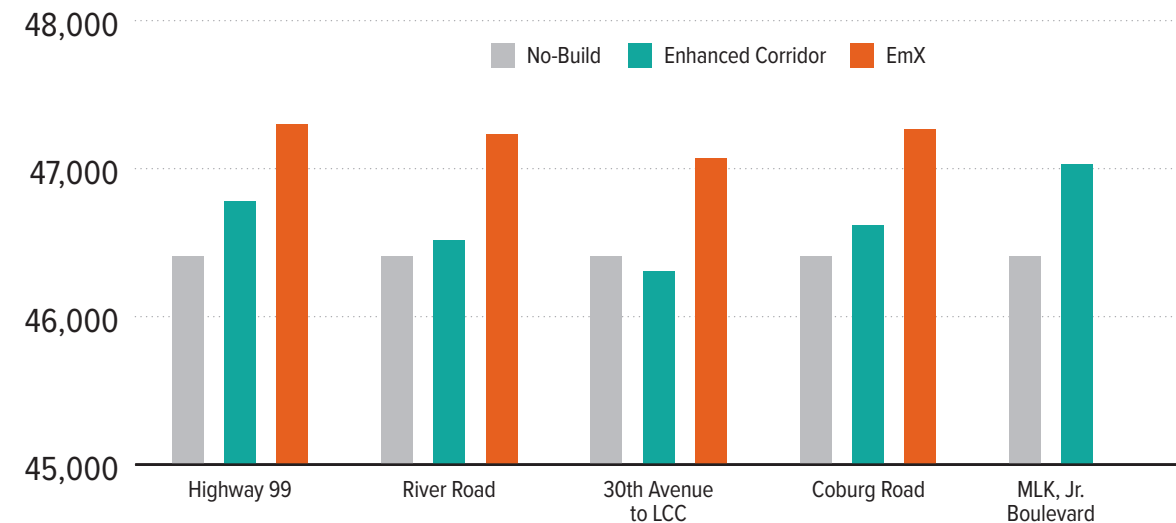
Corridor	Alternative	Systemwide Transit Trips		Corridor Transit Trips	
		Number of Trips ^a	% Change from No-Build	Number of Transit Trips	% Change from No-Build
Highway 99 ^b	No-Build	46,410	N/A	9,638	N/A
	Enhanced Corridor	46,780	0.8%	9,807	1.8%
	EmX	47,300	1.9%	10,406	8.0%
River Road ^c	No-Build	46,410	N/A	9,575	N/A
	Enhanced Corridor	46,520	0.2%	9,645	0.7%
	EmX	47,230	1.8%	10,615	10.9%
30th Avenue to LCC	No-Build	46,410	N/A	10,850	N/A
	Enhanced Corridor	46,310	-0.2%	10,720	-1.2%
	EmX	47,070	1.4%	11,575	6.7%
Coburg Road	No-Build	46,410	N/A	10,060	N/A
	Enhanced Corridor	46,620	0.5%	10,350	2.9%
	EmX	47,270	1.9%	11,200	11.3%
MLK, Jr. Boulevard	No-Build	46,410	N/A	10,120	N/A
	Enhanced Corridor	47,030	1.3%	10,800	6.7%

Source: MovingAhead Project Team.

Notes:

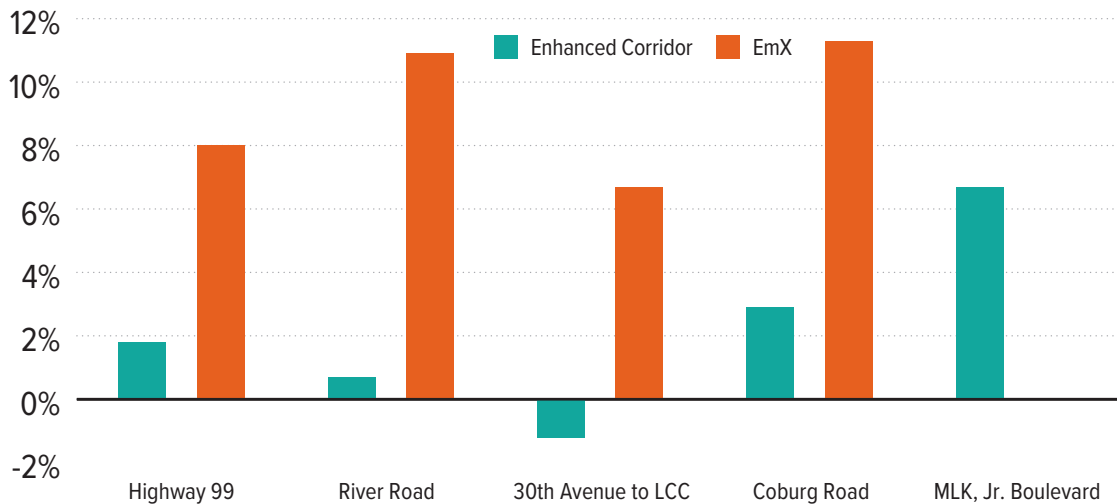
- a A systemwide transit trip is defined as a 1-way trips taken by a person from the trip’s origin to the trip’s destination, independent of the number of vehicles or transfers used to complete the trip.
- b Highway 99 Corridor Enhanced Corridor and EmX Alternatives have different alignments because the routing in downtown is different - the Highway 99 Corridor Enhanced Corridor Alternative extends south to 11th/13th Avenues and captures more transportation analysis zones (TAZs).
- c While the River Road Corridor Enhanced Corridor and EmX Alternatives have different alignments in downtown, the alignments are close enough together that the alternatives have the same buffer zones and TAZs.

Figure 9-5: Average Weekday 2035 Systemwide Ridership



Source: MovingAhead Project Team.

Figure 9-6: Average Weekday 2035 Corridor Ridership Percent Change from No-Build Alternative



Source: MovingAhead Project Team.

Streets

Alterations to the street network to accommodate transit investments proposed under the MovingAhead project would also result in changes to the function of those roadways for motor vehicles, bicycles, and pedestrians.

The Lane Council of Governments (LCOG) regional travel demand model was the primary source of VMT data used in the transportation analysis and served as the basis for estimated transportation impacts. The model used household travel survey data, land use estimates that consider population growth and expected development, and representations of the transportation network and programmed transportation investments as inputs to estimate travel times between origins and destinations across the region, expected mode choices (e.g., traveling by bus or car) and traffic volumes on the regional street network in both 2015 (base scenario) and 2035 (future design year). These traffic volumes were used to calculate regional VMT for cars, trucks, and buses, as well as motor vehicle turning movement volumes at study intersections during the p.m. peak hour for the No-Build, Enhanced Corridor, and EmX Alternatives.

Traffic Operations

The local traffic operations analysis assessed:

- Changes to operations at 44 study intersections during the p.m. peak period
- Changes to general-purpose traffic lanes and/or access, including converting existing travel lanes to bus-only or BAT lanes, installing new bus-only or BAT lanes, installing new vehicle turning lanes, and installing or replacing pedestrian crossings
- Impacts resulting from signal timing changes, including bus queue jumps and traffic signal phasing changes

The traffic operations analysis identified the impacts and benefits based on level of service (LOS A to F), volume-to-capacity (v/c) ratio, and average vehicle delay for various alternatives.

LOS and v/c ratios are commonly used thresholds for intersection operation and are often incorporated into agency mobility standards. According to the Eugene 2035 TSP, the citywide operating conditions for signalized intersections are proposed to become

LOS E except in the Eugene Downtown Traffic Impact Analysis Exempt Area where the operating standard remains LOS F. The City is seeking an amendment that would change operating conditions for some Oregon Department of Transportation (ODOT) signalized intersections in the city. The City is also in the process

of transferring jurisdiction of Highway 99 from ODOT to the City; this transfer is anticipated to be completed in summer of 2018. At the time of the analysis for this Alternatives Analysis (AA) report, the Eugene 2035 TSP had not been adopted and the City's requested amendment to modify mobility standards for ODOT facilities in the City had not been approved, therefore, study intersections were evaluated under both current and proposed operating standards.

Existing Traffic Volumes

Traffic volumes in the Eugene region were reviewed to determine how typical weekday traffic flows vary throughout the year. Peak traffic volumes occur during weekday p.m. peak hours (4:00 p.m. to 6:00 p.m.) while school is in session. The p.m. peak traffic period is representative of when people travel to and from work, run errands, and participate in social activities. The existing conditions analysis was based on motor vehicle turn movement counts collected between 2010 and 2016. The design hour volumes were determined based on an assessment of traffic count data and volume balancing efforts.

Average Vehicle Delay

Average vehicle delay is the amount of time loss that a vehicle experiences while crossing an intersection.

Level of Service (LOS)

Level of service (LOS) is a measure used by traffic engineers to determine the effectiveness of elements of transportation infrastructure. LOS is most commonly used to analyze highways, but the concept has also been applied to intersections, transit, and water supply.

Volume-to-Capacity (v/c) Ratio

Volume-to-capacity (v/c) ratio is used as 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.

Current Operating Standards

When evaluated under current operating standards, the number of study intersections failing to meet mobility standards during the p.m. peak hour would increase from 3 under existing conditions (2015) to 9 in 2035 for No-Build, Enhanced Corridor, and EmX Alternatives. Intersections failing to meet current mobility standards are listed below by corridor (numbers correspond to Table 9-5). If an intersection affects more than 1 corridor, the intersection is repeated under all applicable corridors.

Current Conditions (2015)

- River Road Corridor
 - » #16 Chambers Street/W. 7th Avenue
 - » #17 Chambers Street/W. 6th Avenue
- Coburg Road Corridor
 - » #31 Coburg Road/Cedarwood Drive/I-105 eastbound on-ramp

Future Conditions (2035)

- Highway 99 Corridor
 - » #4 Highway 99/Roosevelt Boulevard (No-Build, Enhanced Corridor, EmX)
 - » #6 W. 6th Avenue/Garfield Street (No-Build, Enhanced Corridor, EmX)
- River Road Corridor
 - » #4 Highway 99/Roosevelt Boulevard (No-Build, EmX)
 - » #16 Chambers Street/W. 7th Avenue (No-Build, Enhanced Corridor, EmX)
 - » #17 Chambers Street/W. 6th Avenue (No-Build, Enhanced Corridor, EmX)

- 30th Avenue to LCC Corridor
 - » #19 Pearl Street/E. 11th Avenue (EmX)
- Coburg Road Corridor
 - » #30 Coburg Road/Country Club Road/MLK, Jr. Boulevard (No-Build, Enhanced Corridor, EmX)
 - » #31 Coburg Road/Cedarwood Drive/I-105 eastbound on-ramp (No-Build, Enhanced Corridor, EmX)
 - » #32 Coburg Road/Oakwood Drive/I-105 westbound on-ramp (No-Build, Enhanced Corridor, EmX)
 - » #37 Coburg Road/ Randy Papé Beltline eastbound on-ramp (No-Build, Enhanced Corridor, EmX)
- MLK, Jr. Boulevard Corridor
 - » #30 Coburg Road/Country Club Road/MLK, Jr. Boulevard (No-Build, Enhanced Corridor)

Proposed Operating Standards

When evaluated under proposed operating standards, the number of study intersections that would fail to meet the operating standards identified in the Eugene 2035 TSP during the p.m. peak hour would increase from zero intersections (2015) to 4 for the No-Build Alternative, 2 for the Enhanced Corridor Alternatives, and 4 for the EmX Alternatives in 2035 (numbers correspond to Table 9-5):

- Highway 99 Corridor
 - » #4 Highway 99/Roosevelt Boulevard (No-Build, Enhanced Corridor)
- River Road Corridor
 - » #4 Highway 99/Roosevelt Boulevard (No-Build, EmX)
 - » #16 Chambers Street/W. 7th Avenue (No-Build)
 - » #17 Chambers Street/W. 6th Avenue (No-Build, Enhanced Corridor)
- Coburg Road Corridor
 - » #30 Coburg Road/Country Club Road/MLK, Jr. Boulevard (EmX)
 - » #31 Coburg Road/Cedarwood Drive/I-105 eastbound on-ramp (EmX)
 - » #37 Coburg Road/ Randy Papé Beltline eastbound on-ramp (No-Build, EmX)

Changes in Transportation-Related Standards

At the time of the transportation analysis for the MovingAhead project, several transportation-related plans and standards were in the process of being adopted. The analysis considered the current plans and standards in effect at the time of the analysis as well as proposed plans and standards. After the analysis was completed, the Eugene 2035 TSP was adopted and the City's proposed LOS standards went into effect. As of the writing of this AA, other transportation-related actions are still underway, such as the jurisdictional transfer of Highway 99 from ODOT to the City and alternative mobility standards for areas where City roads intersect with ODOT roads, such as River Road and Coburg Road with the Randy Pape Beltline and Coburg Road with I-105. These actions may occur while decision makers are in the process of selecting preferred investment options.

Projects like the MovingAhead project require years of planning and analysis. The process anticipates that plans and standards may change requiring updated analysis during the final design and permitting phase of the project. After the preferred investment options are selected and advanced into the final design and permitting phase, additional analysis will occur to ensure that project designs proposed for construction meet current plans and regulations.

Table 9-5: P.M. Peak Hour Study Intersection Performance

Study Intersection Number	Study Intersection	City of Eugene Operation Standard ^a	2015 Existing Conditions			2035 No-Build Alternative			2035 Enhanced Corridor Alternative			2035 EmX Alternative		
			LOS	Delay (sec)	v/c	LOS	Delay (sec)	v/c	LOS	Delay (sec)	v/c	LOS	Delay (sec)	v/c
HIGHWAY 99 CORRIDOR														
1	Hwy 99/Barger Drive	0.85/0.85	C	20.2	0.68	C	25.7	0.77	C	26.0	0.77	C	26.8	0.80
2	Hwy 99/Fairfield Avenue	0.85/0.85	A	7.2	0.57	B	13.8	0.56	B	14.2	0.57	B	14.0	0.57
3	Hwy 99/Royal Avenue	0.85/0.85	A	9.4	0.55	B	11.0	0.64	B	11.9	0.64	B	11.9	0.64
4	Hwy 99N/Roosevelt Boulevard	0.85/1.00	D	42.3	0.83	F	88.9	1.03	E	79.2	1.03	E	71.5	0.94
5	W. 7th Avenue/W. 5th Avenue	0.85/1.00	B	18.4	0.37	B	19.6	0.59	B	19.9	0.60	C	20.6	0.61
6	W. 6th Avenue/Garfield Street	0.85/1.00	B	14.2	0.77	C	32.8	0.98	C	27.9	0.95	C	27.0	0.95
7	W. 7th Avenue/Garfield Street	0.85/1.00	C	22.2	0.71	C	23.2	0.82	C	23.1	0.80	C	23.0	0.81
RIVER ROAD CORRIDOR														
8	River Road/Irving Road/Hunsaker Lane	LOS D/LOS E	C	21.7	0.72	D	37.0	0.95	D	38.0	0.96	D	40.4	1.00
9	River Road/Ruby Avenue/Division Avenue	LOS D/LOS E	C	29.7	0.71	C	34.1	0.82	C	28.6	0.84	D	35.3	0.81
10	River Road/Randy Papé Beltline westbound on-ramp	0.85/1.00	C	24.3	0.57	C	23.4	0.65	C	21.0	0.65	C	26.0	0.59
11	River Road/Randy Papé Beltline eastbound on-ramp	0.85/1.00	C	27.1	0.64	C	24.7	0.73	C	32.7	0.80	D	41.0	0.77
12	River Road/Silver Lane/River Avenue	LOS D/LOS E	C	24.5	0.64	C	28.0	0.71	C	26.5	0.65	C	25.5	0.69
13	River Road/Maxwell Road/E. Rosewood Avenue	LOS D/LOS E	B	10.8	0.57	B	16.4	0.66	B	16.6	0.67	C	31.6	0.85

Red = values do not meet current standards but do meet proposed standards

Orange = values do not meet future City of Eugene standards or current standards

Delay = average intersection delay in seconds

Table 9-5: P.M. Peak House Study Intersection Performance (cont'd)

Study Intersection Number	Study Intersection	City of Eugene Operation Standard ^a	2015 Existing Conditions			2035 No-Build Alternative			2035 Enhanced Corridor Alternative			2035 EmX Alternative		
			LOS	Delay (sec)	v/c	LOS	Delay (sec)	v/c	LOS	Delay (sec)	v/c	LOS	Delay (sec)	v/c
14	River Road/Horn Lane/ Arbor Drive	LOS D/ LOS E	A	6.1	0.46	A	5.9	0.47	A	5.9	0.47	A	8.5	0.63
15	River Road/Chambers Street/Northwest Expressway	LOS D/ LOS E	C	31.1	0.84	D	43.2	0.93	D	45.6	0.97	D	44.9	0.96
16	Chambers Street/W. 6th Avenue	0.85/ 1.00	C	31.1	0.87	D	42.8	1.01	D	46.4	1.00	D	44.8	1.00
17	Chambers Street/W. 7th Avenue	0.85/ 1.00	D	38.9	0.88	E	57.9	1.04	E	46.5	1.01	E	45.3	0.99
1	Hwy 99N/Barger Drive (EmX only)	0.85/ 0.85	C	20.2	0.68	C	25.7	0.77	-	-	-	C	25.3	0.77
2	Hwy 99N/Fairfield Avenue (EmX only)	0.85/ 0.85	A	7.2	0.57	B	13.8	0.56	-	-	-	B	13.4	0.58
3	Hwy 99N/Royal Avenue (EmX only)	0.85/ 0.85	A	9.4	0.55	B	11.0	0.64	-	-	-	B	10.9	0.63
4	Hwy 99N/Roosevelt Boulevard (EmX only)	0.85/ 1.00	D	42.3	0.83	F	88.9	1.03	-	-	-	F	91.0	1.04
30TH AVENUE TO LCC CORRIDOR														
18	Oak Street/E. 11th Avenue	LOS E/ LOS F	B	14.1	0.71	B	13.8	0.74	B	17.4	0.88	B	12.0	0.74
19	Pearl Street/E. 11th Avenue	LOS E/ LOS F	B	19.8	0.73	C	23.3	0.83	C	23.4	0.83	F	101.8	1.17
20	Oak Street/E. 13th Avenue	LOS E/ LOS F	B	14.1	0.59	B	14.6	0.63	B	15.5	0.63	B	16.0	0.63
21	Pearl Street/E. 13th Avenue	LOS E/ LOS F	B	10.2	0.55	B	10.1	0.62	B	10.1	0.62	B	13.9	0.89
22	Oak Street/E. 18th Avenue	LOS D/ LOS E	B	19.5	0.69	C	20.8	0.78	B	18.9	0.76	B	18.9	0.75
23	Pearl Street/E. 18th Avenue	LOS D/ LOS E	C	28.6	0.80	C	26.9	0.89	C	25.3	0.88	C	26.8	0.90
24	Amazon Parkway/E. 24th Avenue	LOS D/ LOS E	B	16.5	0.73	C	22.9	0.80	C	23.7	0.82	C	23.7	0.82

Red = values do not meet current standards but do meet proposed standards

Orange = values do not meet future City of Eugene standards or current standards

Delay = average intersection delay in seconds

Table 9-5: P.M. Peak House Study Intersection Performance (cont'd)

Study Intersection Number	Study Intersection	City of Eugene Operation Standard ^a	2015 Existing Conditions			2035 No-Build Alternative			2035 Enhanced Corridor Alternative			2035 EmX Alternative		
			LOS	Delay (sec)	v/c	LOS	Delay (sec)	v/c	LOS	Delay (sec)	v/c	LOS	Delay (sec)	v/c
25	Amazon Parkway/E. 29th Avenue	LOS D/ LOS E	C	27.9	0.73	D	39.1	0.76	D	39.8	0.78	D	39.9	0.78
26	Hilyard Street/Amazon Parkway/E. 30th Avenue	LOS D/ LOS E	D	36.9	0.82	D	53.5	0.96	D	52.1	0.95	D	52.2	0.95
COBURG ROAD CORRIDOR														
27	Pearl Street/E. 6th Avenue	LOS E/ LOS F	B	13.2	0.63	B	15.8	0.70	C	25.3	0.69	C	26.9	0.72
28	Pearl Street/E. 7th Avenue	LOS E/ LOS F	B	19.0	0.65	C	21.2	0.72	C	20.9	0.72	C	23.3	0.76
29	High Street/E. 7th Avenue	LOS E/ LOS F	B	17.3	0.74	B	16.3	0.74	B	18.7	0.73	C	23.4	0.88
30	Coburg Road/Country Club Road/MLK, Jr. Boulevard	LOS D/ LOS E	C	34.0	0.97	E	55.5	1.10	E	57.6	1.13	F	127.3	1.39
31	Coburg Road/Cedarwood Drive/I-105 Easbound on-ramp	0.85/ 1.00	C	27.4	0.86	D	36.0	0.96	D	39.3	0.98	E	68.8	1.15
32	Coburg Road/Oakway Road/I-105 westbound on-ramp	0.85/ 1.00	D	38.2	0.70	D	44.0	0.88	D	42.3	0.88	D	37.2	0.87
33	Coburg Road/Oakmont Way	LOS D/ LOS E	C	20.2	0.61	C	21.3	0.66	C	24.8	0.62	C	29.0	0.65
34	Coburg Road/Harlow Road/Pioneer Pike	LOS D/ LOS E	C	34.5	0.87	D	50.4	0.99	C	30.7	0.78	D	54.1	1.00
35	Coburg Road/Cal Young Road	LOS D/ LOS E	B	13.8	0.55	B	16.6	0.62	B	19.8	0.63	B	19.4	0.63
36	Coburg Road/Willakenzie Road	LOS D/ LOS E	C	30.3	0.71	D	41.4	0.86	D	42.6	0.87	D	41.9	0.85
37	Coburg Road/Randy Papé Beltline eastbound on-ramp	0.85/ 1.00	C	30.2	0.85	D	55.8	1.04	D	39.5	0.95	E	56.5	1.03

Red = values do not meet current standards but do meet proposed standards

Orange = values do not meet future City of Eugene standards or current standards

Delay = average intersection delay in seconds

Table 9-5: P.M. Peak House Study Intersection Performance (cont'd)

Study Intersection Number	Study Intersection	City of Eugene Operation Standard ^a	2015 Existing Conditions			2035 No-Build Alternative			2035 Enhanced Corridor Alternative			2035 EmX Alternative		
			LOS	Delay (sec)	v/c	LOS	Delay (sec)	v/c	LOS	Delay (sec)	v/c	LOS	Delay (sec)	v/c
38	Coburg Road/ Randy Papé Beltline westbound on-ramp	0.85/1.00	C	24.6	0.72	C	30.5	0.81	C	22.9	0.70	C	23.7	0.80
39	Coburg Road/Chad Drive	LOS D/ LOS E	D	39.5	0.75	C	29.8	0.88	C	32.0	0.89	D	50.5	1.18
40	Coburg Road/Crescent Avenue	LOS D/ LOS E	C	21.0	0.78	D	42.6	0.96	D	43.0	0.96	D	39.9	1.06
41	Gateway Street/ International Way	LOS D/ LOS E	C	31.8	0.68	C	33.9	0.82	C	26.0	0.80	C	26.0	0.80
MLK, JR. BOULEVARD CORRIDOR														
30	Coburg Road/Country Club Road/MLK, Jr. Boulevard	LOS D/ LOS E	C	34.0	0.97	E	55.5	1.10	E	60.1	1.10	-	-	-
42	MLK, Jr. Boulevard/Club Road/Centennial Loop Boulevard Corridor	LOS D/ LOS E	C	33.4	0.70	D	41.7	0.73	C	29.1	0.54	-	-	-
43	MLK, Jr. Boulevard/ Kinsrow Avenue	LOS D/ LOS E	A	5.3	0.52	B	12.4	0.46	B	18.1	0.59	-	-	-
44	MLK, Jr. Boulevard/ S. Garden Way	LOS D/ LOS E	B	12.6	0.53	B	19.6	0.64	C	20.1	0.65	-	-	-

Red = values do not meet current standards but do meet proposed standards
 Orange = values do not meet future City of Eugene standards or current standards
 Delay = average intersection delay in seconds

Source: DKS. Draft Transportation Analysis Technical Report. 2018.

Note:
 a Current/proposed operations standards for these facilities.

Circulation

Impacts to the motor vehicle circulation that would result from construction of the MovingAhead project were evaluated for each corridor. Examples of circulation changes include conversion between 1-way and 2-way streets, installation of traffic signals, and construction of new roadways.

No Build Alternative

For all corridors, the No-Build Alternative would retain existing roadway circulation except for transportation investments planned under other projects and programs. Motor vehicle circulation would not be affected under the No-Build Alternative in any corridor.

Enhanced Corridor and EmX Alternatives

The potential impacts and benefits of the build alternatives are summarized below by corridor.

Highway 99 Corridor

Changes to motor vehicle circulation under the build alternatives would include:

- Installation of new traffic signal at Cubit Street/WinCo Foods intersection (located 200 feet north of Barger Drive) to facilitate bus maneuvers leaving new station and entering southbound left-turn lane at Barger Drive, which would improve circulation for commercial shopping areas on both east and west sides of Cubit Street compared to No-Build Alternative
- Narrowed motor vehicle lane widths on Highway 99 between Roosevelt Boulevard and Barger Drive and on Barger Drive between Highway 99 and Ruskin Street to 10 feet in order to add buffered bicycle lane on both sides on Highway 99 and on south side of Barger Drive (EmX Alternative only), which would result in slower travel speeds (note that studies have shown no significant increase in risk from narrowed travel lanes)

Overall, there would be little difference in motor vehicle circulation under the build alternatives compared to the No-Build Alternative.

River Road Corridor

Changes to motor vehicle circulation under the build alternatives would include:

- Narrow motor vehicle lane widths on River Road between Northwest Expressway and Silver Lane in order to install protected bicycle lane on both sides of street (EmX Alternative only), which would result in slower travel speeds (note that studies have shown no significant increase in risk from narrowed travel lanes)

There would be no difference in motor vehicle circulation under the Enhanced Corridor Alternative and only a small difference in circulation under the EmX Alternative compared to No-Build Alternative.

30th Avenue to LCC Corridor

Changes to motor vehicle circulation under the build alternatives would include:

- Extension of 20th Avenue from Oak Street to Amazon Parkway as 60-foot-wide street (cross section to be determined) would increase street connectivity
- Roadway circulation would be impacted at Hilyard Street/Amazon Parkway intersection by prohibiting eastbound left-turn movement requiring drivers take an eastbound left turn 2 blocks to east, onto Kincaid Street, or 3 blocks to the east, onto Harris Street
- Installation of following 4 new traffic signals would improve roadway circulation:
 - » Oak Street/E. 20th Avenue
 - » Amazon Parkway/E. 20th Avenue
 - » Amazon Parkway/former Civic Stadium site driveway
 - » E. 30th Avenue/University Street

Overall, motor vehicle circulation would improve under the build alternatives compared to No-Build Alternative.

Coburg Road Corridor

Changes to motor vehicle circulation under the build alternatives would include:

- Installation of new traffic signals would improve circulation:
 - » E. 7th Avenue on-ramp to the Ferry Street Bridge (EmX Alternative only)
 - » E. 4th Avenue on-ramp to the Ferry Street Bridge
 - » Coburg Road/Elysium Avenue
 - » Crescent Avenue/Shadow View Drive
 - » Shadow View Drive/Chad Drive
 - » Chad Drive/driveway of Veteran's Affairs Hospital site

Overall, motor vehicle circulation would improve under the build alternatives compared to the No-Build Alternative.

MLK, Jr. Boulevard Corridor

Changes to motor vehicle circulation under the Enhanced Corridor Alternative would include:

- Installation of a new traffic signal at MLK, Jr. Boulevard/Leo Harris Parkway intersection

Overall, motor vehicle circulation would improve under the Enhanced Corridor Alternative compared to the No-Build Alternative.

Safety

The safety analysis conducted for this study evaluated:

- Intersection crashes
- Collision rates
- Density of crashes (areas with high numbers of reported collisions)
- Prevalence of crashes by type

Intersection crashes were gathered from the ODOT database for the last 5 full years of data (2010-2014). Crashes were grouped by severity and type at both the roadway segment and intersection levels and a segment collision rate was determined. Reported collisions were mapped to determine which areas along the study corridors had higher densities of collisions.

Corridors were also analyzed to determine which types of crashes were most prevalent. The resulting data was used to identify intersections and roadway segments for possible safety improvements under the MovingAhead project.

No-Build Alternative

Under the No-Build Alternative, each corridor would retain its existing roadway systems except for transportation investments planned under other projects and programs. Motor vehicle and pedestrian/bicycle safety would not be affected under the No-Build Alternative for any corridor.

Enhanced Corridor and EmX Alternatives

Overall, under the build alternatives, motor vehicle, bicycle, and pedestrian safety would be improved by the increase in crossing options and investment in facilities, except where noted below. Potential safety benefits and impacts associated with MovingAhead project investments under the build alternatives are summarized below.

Highway 99 Corridor

Safety improvements under the build alternatives would include:

- Installation of BAT lanes on Highway 99 approaching Roosevelt Boulevard (northbound and southbound) for both buses/bus rapid transit (BRT) vehicles and turning general-purpose vehicles would reduce potential vehicle conflicts, such as rear end collisions
- Installation of bus queue jumps that exclusively serve buses would eliminate merging conflicts between vehicles and buses/BRT vehicles
- Installation of dual northbound left-turn lanes from Highway 99 onto Roosevelt Boulevard westbound would reduce vehicle queue spillback from left-turn lanes into through lanes and possibly reduce vehicle conflicts (EmX Alternative only)
- Construction of a buffered bicycle lane would increase separation between motor vehicles and bicycles possibly reducing conflicts (EmX Alternative only)
- Installation of new or replaced enhanced pedestrian crossings (10 new for the Enhanced Corridor Alternative, 9 new for the EmX Alternative) and new

upgraded crossings (2 for the EmX Alternative) along corridor would improve opportunities for bicyclists and pedestrians to safely cross busy roadways

- Construction of new sidewalks and a pedestrian and bicycle bridge across the freight railroad line would improve pedestrian and bicycle safety

River Road Corridor

Safety improvements under the build alternatives would include:

- Construction of BAT lanes on River Road (Enhanced Corridor Alternative: northbound from Randy Papé Beltline eastbound on-ramp to Division Avenue, northbound and southbound between Randy Papé Beltline westbound on-ramp and Silver Lane; EmX Alternative: between Northwest Expressway and Kourt Drive) for both buses/BRT vehicles and turning general-purpose vehicles would reduce potential vehicle conflicts
- Construction of bus queue jump at River Road/ Railroad Boulevard (northbound) for buses and right-turning vehicles exclusively would eliminate merging conflict between vehicles and buses (Enhanced Corridor Alternative only)
- Construction of northbound right-turn lane from River Road onto Railroad Boulevard which could also be used as bus queue jump, would reduce potential vehicle conflicts and eliminate merging conflict between vehicles and buses (EmX Alternative only)
- Construction of center running transit lanes on River Road between Corliss Lane and Randy Papé Beltline Highway would possibly reduce angle crashes by restricting left-turn access into and out of driveways (EmX Alternative only)
- Construction of a protected bicycle lane on River Road between Northwest Expressway and Silver Lane would increase separation between motor vehicles and bicycles, reducing conflicts (EmX Alternative only)
- Routing bicycle lanes behind EmX stations and away from travel lanes on River Road would reduce bicycle, vehicle, and BRT vehicle conflicts (EmX Alternative only)

- Installation of new or replaced enhanced pedestrian crossings (6 new and 1 replaced under the Enhanced Corridor Alternative, 4 new and 1 replaced under the EmX Alternative) along the corridor would improve opportunities for bicyclists and pedestrians to cross River Road safely

30th Avenue to LCC Corridor

Safety improvements under the build alternatives would include:

- Construction of new or replaced enhanced pedestrian crossings (1 new and 2 replaced under the Enhanced Corridor Alternative, 8 new and 2 replaced under the EmX Alternative) along the corridor would improve opportunities for bicyclists and pedestrians to safely cross busy roadways
- Prohibition of eastbound left-turn movements from E. 30th Avenue onto Hilyard Street, possibly reducing rear end collisions for eastbound traffic
- Construction of BAT lanes along Pearl Street and Oak Street for both BRT vehicles and turning general-purpose vehicles would reduce potential vehicle conflicts (EmX Alternative only)
- Construction of new buffered bicycle lanes on Pearl Street and Oak Street would increase separation between motor vehicles and bicycles reducing conflicts (Enhanced Corridor Alternative only)
- Construction of a 2-way cycle track on High Street from E. 10th Avenue connecting to the Amazon Multi-Use Path at E. 19th Avenue was originally planned as part of the EmX Alternative; however, the City has been able to fund and advance this bicycle investment separate from the MovingAhead project. Construction of this project may eliminate the need for the striped buffered bicycle lane on Pearl and Oak Streets as part of the Enhanced Corridor Alternative.

Coburg Road Corridor

Safety improvements under the build alternatives would include:

- Construction of BAT lanes along Coburg Road (between I-105 and Country Club Road for the Enhanced Corridor Alternative; southbound BAT

lane on Coburg Road on southbound approach to Harlow Road and on E. 7th Avenue and E. 6th Avenue between Oak Street and High Street for the EmX Alternative) for both buses/BRT vehicles and turning general-purpose vehicles, reducing potential vehicle conflicts

- Installation of bus queue jumps on Coburg Road (at Country Club Road and Cedarwood Drive for the Enhanced Corridor Alternative, at Oakmont Way and Harlow Road for the EmX Alternative) exclusively for buses, eliminating the merging conflict between vehicles and buses
- Addition or extension of right-turn lanes on Coburg Road at Oakmont Way (northbound and southbound), Harlow Road (northbound), Willakenzie Road (northbound), Randy Papé Beltline eastbound on-ramp (northbound), Randy Papé Beltline westbound on-ramp (southbound), Chad Drive (northbound), and Crescent Avenue (northbound) possibly reduce potential vehicle conflicts such as rear end collisions (Enhanced Corridor Alternative only)
- Installation of center running transit lanes on Coburg Road between Elysium Avenue and Crescent Avenue and between Ferry Street Bridge and I-105 which would restrict left-turn access into and out of driveways, possibly reduce angle crashes (EmX Alternative only)
- Construction of new turn lanes on Coburg Road at Willakenzie Road and Crescent Avenue, reducing potential vehicle conflicts (EmX Alternative only)
- Installation of new traffic signals on Ferry Street Bridge at 4th Avenue and 7th Avenue, reduce merging conflicts for motor vehicles (EmX Alternative only)
- Construction of new or replaced enhanced pedestrian crossings (7 new and 2 replaced for the Enhanced Corridor Alternative, 9 new and 3 replaced for the EmX Alternative) and 2 new upgraded crossings (2 for the Enhanced Corridor Alternative and 3 for the EmX Alternative) along the corridor would improve opportunities for pedestrians to safely cross busy roadways

MLK, Jr. Boulevard Corridor

Safety improvements under the Enhanced Corridor Alternative would include:

- Construction of BAT lanes along MLK, Jr. Boulevard for both buses and turning general-purpose vehicles, reducing potential vehicle conflicts
- Construction of 4 new enhanced pedestrian crossings would improve opportunities for bicyclists and pedestrians to safely cross MLK, Jr. Boulevard
- Installation of a new traffic signal at MLK, Jr. Boulevard at Leo Harris Parkway would provide more protection for motor vehicles, pedestrians, and bicyclists crossing at intersection

Freight and Rail

Project alternatives were assessed for potential impacts to freight truck movements by examining the project's conceptual designs to determine:

- Proposed changes in truck travel patterns and/or access to and from commercial and industrial centers
- The number and percentage of truck loading zones that would be displaced and/or moved

All freight-carrying facilities changed by the alternatives would be designed to comply with the design standards of the owner of the roadway. ODOT's rules regarding Reduction of Vehicle Carrying Capacity (Oregon Revised Statutes [ORS] 366.215) state that the Oregon Transportation Commission (OTC) may not permanently reduce the vehicle-carrying capacity of an identified freight route. Exceptions for safety or access will be considered, and exceptions may be granted if the design is in Oregon's best interest and freight movement is not unreasonably impeded. Street markings (such as bicycle lane striping or on-street parking) are not considered a reduction of vehicle carrying capacity. If the project had the potential for a reduction of vehicle-carrying capacity, a stakeholder forum would be convened after identification of the preferred investment package to review the project description and provide advice to ODOT and the OTC, which would be taken into consideration.

Impacts to rail movements that would result from the alternatives were assessed by examining the project's conceptual designs to determine any proposed transit facilities that would cross the existing rail lines. All proposed new crossings and proposed modifications or closures of existing freight rail line crossings would fall under the jurisdiction of the ODOT Rail Division and the Federal Railroad Administration (FRA). Also, all new, modified or closed crossings would require the approval of the owner and operator of the affected freight rail line.

No-Build Alternative

For all corridors, the No-Build Alternative would retain existing freight routes and access, so it would not be expected to impact freight truck or rail movements.

Enhanced Corridor and EmX Alternatives

The potential impacts and benefits of the build alternatives are summarized below by corridor.

Highway 99 Corridor

Highway 99, W. 6th Avenue, and W. 7th Avenue are classified as national freight routes, and ODOT designates them as a Reduction Review Route, which requires the review of any proposed changes on these facilities to determine if there would be a reduction of vehicle-carrying capacity (ODOT 2015).

The build alternatives would result in the following impacts to freight truck and rail movements in the Highway 99 Corridor:

- Installation of enhanced pedestrian crossings with raised medians and other raised medians on Highway 99, W. 6th Avenue, and W. 7th Avenue could cause a slight increase in freight travel times along the corridor and would require ODOT Motor Carrier Division approval
- Commercial driveways adjacent to enhanced pedestrian crossings would have a reduced left-turn deceleration area, resulting in potential increased delays of less than 10 seconds for freight accessing the driveways or for freight traveling along Highway 99 Corridor:
 - » Northwest Self Storage
 - » Maxxum Marine

- » Karsten Homes/Dutch Brothers
- » US Bank
- » Cars and Trucks R-U's
- » Gilbert Shopping Center
- » Family Housing Program
- » Storage Facility (vacant)
- » Best Economy Inn Motel
- » EMDG Sales
- » Car Quest Auto Parts

- Construction of a new pedestrian bridge over a freight railroad line would require approval from ODOT Rail Division, FRA, and the owner of railroad tracks to determine construction-related effects and mitigation

River Road Corridor

River Road is not classified as a state or national freight route, however, W. 6th Avenue and W. 7th Avenue are classified as national freight routes, and ODOT designates them as a Reduction Review Route, which requires the review of any proposed changes on these facilities to determine if there would be a reduction of vehicle-carrying capacity (ODOT 2015).

The build alternatives would result in the following impacts to freight truck and rail movements in the River Road Corridor:

- Installation of new and replaced enhanced pedestrian crossings with raised medians on River Road could cause a slight increase in freight travel times along corridor
- Commercial driveways adjacent to enhanced pedestrian crossings would have reduced left-turn deceleration area, resulting in potential increased delays of less than 10 seconds for freight accessing the driveway or for freight traveling along River Road Corridor:
 - » Emerald Shopping Center (Enhanced Corridor)
 - » Dollar Tree (EmX)
- Installation of a pedestrian island on the south side of the River Road/Division Avenue intersection may impact westbound left-turning freight movements from Division Avenue onto River Road

30th Avenue to LCC Corridor

E. 30th Avenue, Oak Street, and Pearl Street are owned by the City and are not designated state or national freight routes. E. 30th Avenue east of Spring Boulevard to LCC is owned by Lane County and is not a designated state or national freight route. There are no rail lines within this corridor's study area. Investments under the build alternatives would occur in areas not typically used by freight, therefore, neither of the build alternatives is expected to impact freight truck or rail movement.

Coburg Road Corridor

Coburg Road is owned by the City and is not designated as a state or national freight route. The Coburg Road Corridor build alternatives would use a portion of E. 6th Avenue (for the EmX Alternative only) and E. 7th Avenue (for both alternatives) which are both owned by the City and are designated as a national freight route. I-105, which crosses the Coburg Road Corridor, is part of the national highway system and is classified as a freight route. The Randy Papé Beltline, crosses the Coburg Road Corridor, is a state highway and is classified as a freight route.

The Enhanced Corridor Alternative does not propose investments on any state or national freight route and, therefore, would not be expected to impact freight truck movement.

The EmX Alternative would result in the following impacts to freight truck and rail movements in the Coburg Road Corridor:

- Installing a BAT lane on W. 7th Avenue between Oak Street and High Street and on W. 6th Avenue between High Street and Pearl Street may impact freight truck movement by increasing delay on W. 6th Avenue and W. 7th Avenue near the Ferry Street Bridge

- Bus signal phasing and constructing a center-running transit lane on Coburg Road north of the Ferry Street Bridge to the Cedarwood Drive/I-105 eastbound on-ramp may impact freight truck movement by increasing delay on Coburg Road near I-105 eastbound on-ramps
- Commercial driveways for businesses located adjacent to proposed pedestrian crossings would have reduced left-turn deceleration area, resulting in potential increased delays of less than 10 seconds for freight accessing driveways or for freight traveling along Coburg Road Corridor:
 - » Rite Aid Shopping Center
 - » Eugene Smiles

MLK, Jr. Boulevard Corridor

Coburg Road and MLK, Jr. Boulevard are owned by the City and are not designated as state or national freight routes. The MLK, Jr. Boulevard Corridor uses a portion of E. 7th Avenue and is a designated freight route. I-105, which intersects the MLK, Jr. Boulevard Corridor, is part of the national highway system and is classified as a freight route. The Enhanced Corridor Alternative would result in the following impacts to freight truck and rail movements in the MLK, Jr. Boulevard:

- Installation of enhanced pedestrian crossings with raised medians on MLK, Jr. Boulevard could cause slight increase in freight travel times along the corridor

Parking and Access

The transportation analysis evaluated the potential effects of proposed alternatives on on-street parking, off-street parking, drive-throughs, parking lot circulation, and driveway access to properties.

The evaluation identified on-street parking facilities that would be potentially impacted by the alternatives (Figure 9-7). Where the design would impact on-street parking, an assessment was made of current on-street parking utilization rates. In order to measure these parking utilization rates, parking occupancy was collected on 2 different days at hourly intervals over a 4-hour period during the highest parking demand time for the particular corridors (i.e., during evening hours in a residential corridor, during business hours in a commercial corridor).

Off-street parking impacts, drive-through impacts or closures, and parking lot circulation impacts were identified for each corridor based on the preliminary

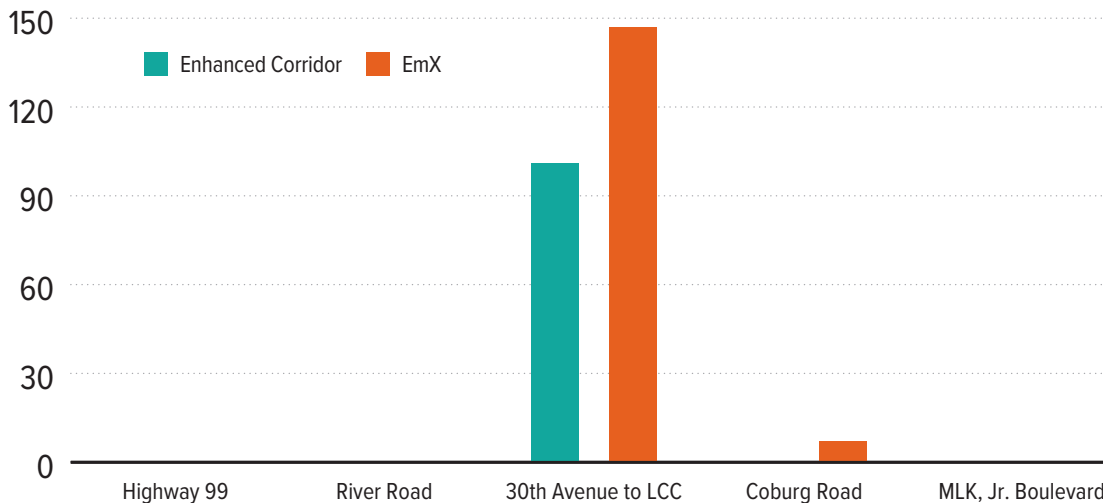
design drawings. The number of off-street parking impacts by corridor and alternative is illustrated in Figure 9-8.

Access impacts, including driveway closures and changes to right-in/right-out driveway turning movements were identified for each corridor. In addition, driveways, side streets, or alleys that would have a reduced left-turn deceleration area or impacts to a 2-stage left-turn due to the installation of median islands were identified for each corridor.

Two-Stage Left Turn

A 2-stage left turn means that motor vehicles make a left turn from a side street onto the mainline by first crossing one direction of traffic by turning into a median lane, then waiting until the other direction is clear before pulling into the through lanes

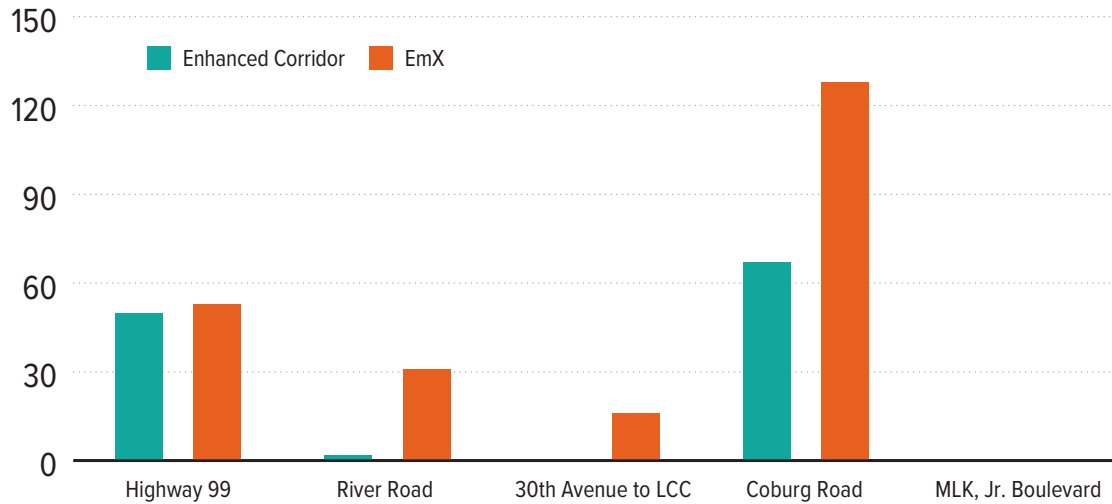
Figure 9-7: On-Street Parking Impacts



Source: Source: MovingAhead Project Team.

Notes: Under the 30th Avenue to LCC Corridor EmX Alternative, 68 on-street parking spaces on High Street would be removed as a result of the High Street Cycle Track. After the analysis was completed, the City of Eugene obtained funding to advance the High Street Cycle Track project ahead of any MovingAhead projects. "If the High Street Cycle Track project proceeds ahead of and outside of the MovingAhead projects, then the number of potential on-street parking impacts under the EmX Alternative would be reduced from 140 parking spaces to 72 parking spaces.

Figure 9-8: Off-Street Parking Impacts



Source: MovingAhead Project Team.

No-Build Alternative

For all corridors, the No-Build Alternative would not change existing on-street or off-street parking and would not affect property access because no transit investments would be constructed.

Enhanced Corridor and EmX Alternatives

The potential impacts and benefits of the build alternatives are summarized below by corridor.

Highway 99 Corridor

Impacts to parking and access under the build alternatives would include:

- No impacts to on-street parking (Figure 9-7)
- Removal of off-street parking spaces (50 spaces under the Enhanced Corridor Alternative; 53 spaces under the EmX Alternative; Figure 9-8 and Table 9-6)
- Closure of 1 single-family residential driveway on the southwest corner of Barger Drive and Taney Street in order to install a station platform; this access point does not service any covered parking and residence currently has 2 other access points, both on Taney Street (Enhanced Corridor only)

Table 9-6: Highway 99 Corridor Off-Street Parking Impacts

	Enhanced Corridor	EmX
Residential Driveway	4	-
WinCo	12	12
Shopping Center	10	9
Ace Buyers	-	12
Wheeler Dealer	6	-
Porky's Palace (Closed)	12 ^a	12 ^a
Battery X-Change	6	6
Patty's	-	2
Total Parking Spaces Removed	50	53

Source: MovingAhead Project Team.

Note:

^a Mitigation is available that would potentially eliminate parking impacts.

- A new bus pullout on the southwest corner of Highway 99 and Royal Avenue impacts access and circulation at former Porky’s Palace by preventing vehicles in parking lot from being able to drive around east and north sides of building; mitigation that would maintain full on-site circulation is available
- Driveways adjacent to enhanced pedestrian crossings would have reduced left-turn deceleration area, resulting in potential increased delays for motor vehicles accessing the driveways or traveling along Highway 99 at up to 3 residential driveways and up to 13 commercial driveways
- Installation of refuge islands would have potential impacts to motor vehicles performing 2-stage left turns at up to 5 commercial or institutional driveways, up to 2 residential driveways, and up to 5 side streets

River Road Corridor

Impacts to parking and access under the build alternatives would include:

- No impacts to on-street parking (Figure 9-7)
- Removal of off-street parking spaces (2 spaces under the Enhanced Corridor Alternative, 31 spaces under the EmX Alternative; Figure 9-8 and Table 9-7)
- No access point closures on the project corridor (Enhanced Corridor only)
- Circulation impacts for drive-through businesses:
 - » Carl’s Jr. (west side River Road north of Silver Lane)
 - » Arby’s (west side River Road north of Silver Lane)
 - » Lube It USA (southwest corner of River Road/Silver Lane intersection)
 - » US Bank (northeast corner of River Road/Randy Papé Beltline westbound off-ramp)
 - » Espresso Express (west side River Road between Kourt Drive and Silver Lane) (EmX Alternative only)
 - » Key Bank (west side River Road between Kourt Drive and Silver Lane) (EmX Alternative only)
- Access and circulation at the Govinda’s Vegetarian Buffet would be impacted by new bus pullout on southwest corner of River Road and Hilliard Lane which would prevent vehicles in parking lot from being able to drive around east and north sides of building (EmX Alternative only)

Table 9-7: River Road Corridor Off-Street Parking Impacts

	Enhanced Corridor	EmX
Gentle Dental	-	10
Arby’s	2	2
Bi-Mart	-	4
Pacific Continental Bank	-	3
Chen’s Happy Garden	-	1
Vacant Building (River Road between Corliss Lane and Silver Lane)	-	1
Crescent Automotive	-	10
Total Parking Spaces Removed	2	31

Source: MovingAhead Project Team.

- Driveways, alleys, or side streets adjacent to proposed enhanced pedestrian crossings would have reduced left-turn deceleration area, resulting in potential increased delays for motor vehicles accessing driveways or traveling along River Road at up to 1 commercial driveway, up to 10 residential driveways, up to 2 side streets
- Installation of refuge islands would have potential impacts to motor vehicles performing 2-stage left turns at up to 4 side streets

30th Avenue to LCC Corridor

Impacts to parking and access under the build alternatives would include:

- Removal of on-street parking spaces on Oak and Pearl Streets to create a buffered bicycle lane under the Enhanced Corridor Alternative or BAT lanes under the EmX Alternative and creation of some new on-street parking spaces; average occupancy rate of spaces in these areas is 55% (Table 9-8); advancing the High Street 2-way cycle track project under City program

Table 9-8: 30th Avenue to LCC Corridor On-Street Parking Impacts on Oak and Pearl Streets

Block Face	Oak Street				Pearl Street			
	Existing Spaces	Percent Occupied	Change in Parking Spaces		Existing Spaces	Percent Occupied	Change in Parking Spaces	
			Enhanced Corridor	EmX			Enhanced Corridor	EmX
11th Avenue to 12th Avenue ^a	16	N/A	-6	-6	1	N/A	-	1
12th Avenue to 13th Avenue	13	8%	-10	-7	10	60%	-6	-
13th Avenue to 14th Avenue	15	20%	-13	-15	5	80%	-3	-
14th Avenue to 15th Avenue	11	64%	-9	-11	10	50%	-8	-
15th Avenue to 16th Avenue	17	88%	-9	-17	3	33%	-	-
16th Avenue to 17th Avenue	11	9%	-4	-4	NP	N/A	+10	-
17th Avenue to 18th Avenue	NP	N/A	-	-	NP	N/A	-	-
18th Avenue to 19th Avenue	15	94%	-7	-7	5	0%	+7	+7
19th Avenue to 20th Avenue	11	82%	-11	-11	NP	N/A	-	-
Subtotals (by street)	105	N/A	-69	-78	34	N/A	+2	+6
Net On-Street Parking Total			36	27			36	40

NP = No Parking

Source: MovingAhead Project Team.

Note:

a A parking count to determine percent occupied was not performed for the 11th Avenue to 12th Avenue block face.

may eliminate the need for the striped buffered bicycle lane on Pearl and Oak Streets as part of the Enhanced Corridor Alternative

- No impact to off-street parking, access, or circulation (Figure 9-8) (Enhanced Corridor Alternative only)
- Removal of 16 off-street parking spaces (Figure 9-8 and Table 9-9) (EmX Alternative only)
- Driveway closures or relocations (EmX only):
 - » Key Bank driveway located on E. 30th Avenue just east of Hilyard Street, would be removed or relocated by BRT station (2 other driveways provide access to site)
 - » 2 residential driveways located on west side of Oak Street just south of E. 13th Avenue, would be removed or relocated by BRT station

Table 9-9: 30th Avenue to LCC Corridor Off-Street Parking Impacts

	Enhanced Corridor	EmX
Albertsons	-	11
Starbucks	-	5
Total Parking Spaces Removed	0	16

Source: MovingAhead Project Team.

Coburg Road Corridor

Impacts to parking and access under the build alternatives would include:

- Removal of on-street parking under the EmX Alternative only (Figure 9-7):
 - » West side of Pearl Street between Broadway and W. 10th Avenue (3 spaces)
 - » East side of Oak Street between Broadway and E. 8th Avenue (4 spaces)
- Removal of off-street parking spaces (67 spaces for the Enhanced Corridor Alternative, 128 spaces for the EmX Alternative; Figure 9-8 and Table 9-10)
- Driveway closure or relocation at 1 residential location
- Installation of northbound right-turn lane and removal of a left-turn lane under the Enhanced Corridor Alternative or installation of center running transit lanes under the EmX Alternative would limit accesses to right-in/right-out only for the following locations:
 - » Office Depot/Shopko Shopping Center (EmX only)
 - » Eugene Swim and Tennis Club (EmX only)
 - » Quality Research Associates
 - » Vacant Lot (Coburg north of Elysium Avenue)
 - » Trauma Healing Project
 - » Our Saviour’s Lutheran Church
 - » Westminster Presbyterian Church (EmX Alternative only)
- Driveways or side streets located adjacent to enhanced pedestrian crossings would have reduced left-turn deceleration area, resulting in potential increased delays for motor vehicles accessing driveways or traveling along Coburg Road Corridor at up to 2 commercial driveways and 1 side street
- Installation of median refuge islands would have potential impacts to motor vehicles performing 2-stage left turn out of up to 1 commercial driveway, 1 residential driveway, and up to 3 side streets

- Circulation impacts for 2 drive-through businesses (EmX Alternative only):
 - » Taco Bell (northeast corner of Coburg Road/Chad Drive)
 - » Oregon Community Credit Union (southeast corner of Coburg Road/Chad Drive)

Table 9-10: Coburg Road Corridor Off-Street Parking Impacts

	Enhanced Corridor	EmX
Eugene Swim and Tennis Center	-	2
Office Depot/Shopko	-	26
Taco Bell	-	8
Oregon Community Credit Union	-	2
Papa’s Pizza	12	12
Fountain Villa Apartments	-	10
The Hamptons Apartments	15	15
Farmers Insurance	-	2
Reliable Credit Association	-	1
Hawaiian Time	-	8
H&R Block	4	4
Jiffy Lube	1	1
MetroPCS	-	1
Albertson’s	-	1
Kendall Subaru	35 ^a	35 ^a
Total Parking Spaces Removed	67	128

Source: MovingAhead Project Team.

Note:

- a Parking lot would require reconfiguration to reduce impacts to 10 off-street spaces removed.

MLK, Jr. Boulevard Corridor

Impacts to parking and access under the Enhanced Corridor Alternative would include:

- No impacts to on-street or off-street parking (Figure 9-7 and Figure 9-8)
- Driveway adjacent to enhanced pedestrian crossing would have reduced left-turn deceleration area, resulting in potential increased delays for motor vehicles accessing driveways or traveling along corridor at up to 1 institutional driveway
- Installation of median refuge islands would have potential impacts to motor vehicles performing 2-stage left turn out of up to 1 institutional driveway and 1 side street

Emergency Vehicle Flow and Access

The project team coordinated with the following emergency service providers to identify whether the proposed investments would create any issues or concerns related to emergency vehicle flow and access:

- Eugene Springfield Fire
- Eugene Police Department
- Lane County Sheriff's Office
- Lane Fire Authority
- Santa Clara Fire Department

No-Build Alternative

Emergency vehicle flow and access would not change as a result of the MovingAhead project under the No-Build Alternative in any corridor.

Enhanced Corridor and EmX Alternatives

In general, no significant concerns were raised about the expansion of the transit system or the proposed multimodal investments under the Enhanced Corridor or EmX Alternatives. However, emergency service providers did raise some key issues for consideration in designing proposed investments:

- During emergency responses, automobile drivers who pull to the right into the curbside transit lane may create conflicts for emergency vehicles that are attempting to use the curbside transit lane to avoid traffic congestion

- Unlike fire and ambulance services, police cannot pre-empt traffic signals, including signals that control BRT vehicles, which makes it even more critical for transit operators to observe police vehicles in addition to signal systems to avoid conflicts with emergency responders
- Where general-purpose travel lanes have been narrowed or reduced in number, police have observed increased congestion and/or delay
- Changes in lane configurations and travel patterns for turning and through lanes could result in confusion amongst drivers about how different travel lanes are intended to be used
- There appear to be fewer rear-end collisions involving passenger vehicles striking buses and BRT vehicles in exclusive lanes (or BAT lanes shared only with turning traffic)
- General traffic congestion is increasing and responders wonder whether or not the proposed investments would make the congestion worse
- Emergency vehicles must yield to people walking and biking, which can create a conflict near transit stops/stations where there is high pedestrian and bicycling activity

Emergency service providers would have an opportunity to review more detailed designs after a preferred package of investments is identified. LTD and the City would continue to coordinate with these providers to address concerns and issues during design refinement.

Bicycles and Pedestrians

The transportation analysis evaluated proposed pedestrian and bicycle investments.

A qualitative assessment of existing and proposed pedestrian and bicycle facilities was performed, based on procedures outlined in ODOT's Analysis Procedures Manual (ODOT 2016). Factors such as sidewalk width, separation from vehicle traffic, number of driveways, and vehicle speeds were used to evaluate the quality of the pedestrian facilities; frequency of designated pedestrian crossings and sidewalk connectivity were also evaluated. Factors such as bicycle lane width, presence of a buffer, outside vehicle lane width, vehicle volume and speed, heavy truck volume, and pavement

quality were used to evaluate the quality of the bicycle facilities; frequency of designated bicycle crossings and connectivity to existing and planned bicycle facilities were also evaluated.

No-Build Alternative

No changes to existing bicycle and pedestrian facilities would occur as part of the MovingAhead project under the No-Build Alternative. There would be no new pedestrian crossings constructed or replaced, no new or improved sidewalks or bicycle lanes installed, and no other pedestrian and bicycle facilities constructed or replaced.

Enhanced Corridor and EmX Alternatives

The number of proposed new or replaced enhanced and upgraded pedestrian crossings is summarized by corridor and alternative in Figure 9-9. The Highway 99 Corridor Enhanced Corridor Alternative, 30th Avenue to LCC Corridor EmX Alternative, and Coburg Road EmX Alternative would install the greatest total number of crossings, while the 30th Avenue to LCC Corridor and MLK, Jr. Boulevard Corridor Enhanced Corridor Alternatives would install the fewest number of crossings.

The total length of proposed new and reconstructed sidewalks that would be installed under each of the build alternatives is summarized in Figure 9-10. The Coburg Road Corridor EmX Alternative would install the greatest total amount of new and reconstructed sidewalk (2.8 miles), while the MLK, Jr. Boulevard Corridor Enhanced Corridor Alternative would provide the least amount of new or improved sidewalk (0.5 mile). Both of the Highway 99 Corridor build alternatives would include the construction of a new pedestrian and bicycle bridge over the railroad between the Trainsong neighborhood and Highway 99; the length of this new bridge is not included in the calculations for new and improved sidewalks. Both of the 30th Avenue to LCC Corridor build alternatives would decommission the existing pedestrian bridge over Amazon Parkway located south of the E. 19th Avenue intersection and install an at-grade, American with Disabilities Act (ADA)-accessible enhanced crossing.

The total length of proposed new and reconstructed bicycle facilities that would be installed under each of the build alternatives is summarized in Figure 9-11.

Enhanced vs Upgraded Crossings

Upgraded and enhanced pedestrian crossings are included as part of both Enhanced Corridor and EmX Alternatives. New crossings are generally located at areas where there is no legal pedestrian crossing (often at mid-block locations away from intersections). Upgraded crossings consist of installing Americans with Disabilities Act (ADA) ramps and possibly pedestrian crossing islands and/or crosswalk striping. In addition to the infrastructure included as part of an upgraded crossing, enhanced crossings can also consist of installing either a flashing yellow indication (flashing beacon) or yellow, red, flashing red indication (pedestrian hybrid beacon) along the corridor to warn vehicles of a pedestrian crossing.

Upgraded Crossing

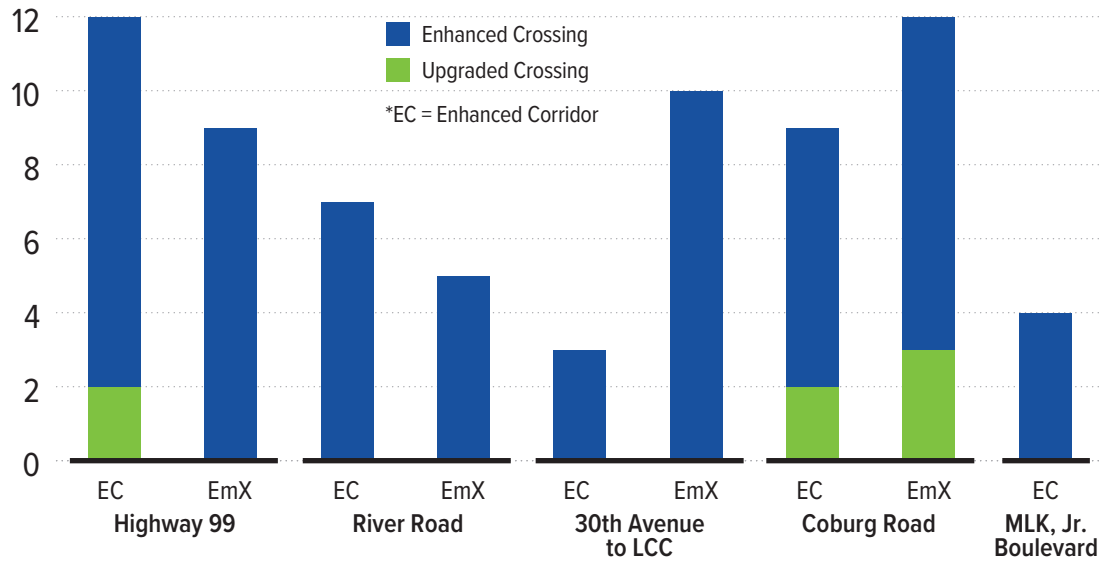


Enhanced Crossing



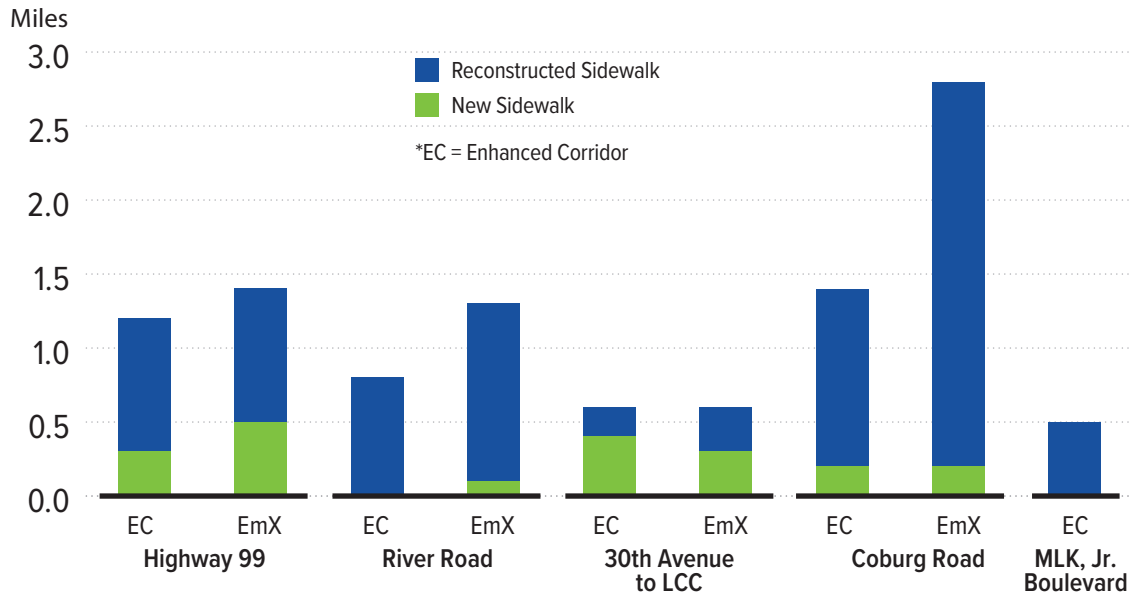
The River Road Corridor EmX Alternative would install the greatest amount of new or improved bicycle lanes (5.0 miles), while the River Road, Coburg Road, and MLK, Jr. Boulevard Enhanced Corridor Alternatives would not include any new or improved bicycle lanes.

Figure 9-9: Enhanced and Upgraded Pedestrian Crossings



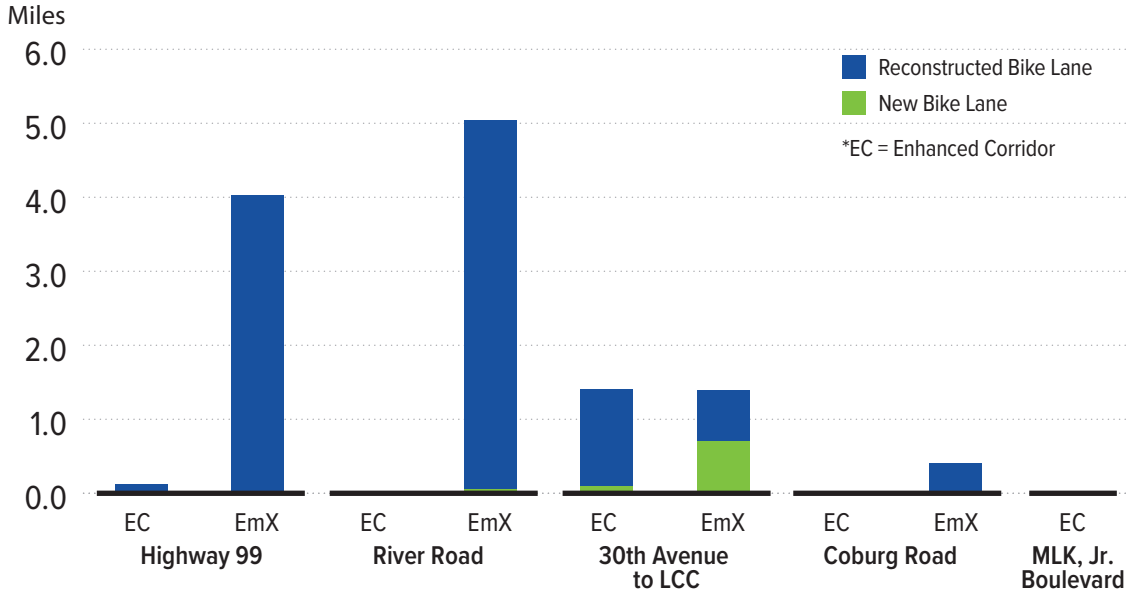
Source: : Source: MovingAhead Project Team.

Figure 9-10: Total Length of New and Reconstructed Sidewalks



Source: : Source: MovingAhead Project Team.

Figure 9-11: Total Length of New and Reconstructed Bicycle Lanes



Source: : Source: MovingAhead Project Team.



Plan Consistency

The alternatives were evaluated for consistency with local plans, including the transit policies and goals outlined in:

- LTD Long-Range Transit Plan (2014)
- Envision Eugene (2017)
- Eugene 2035 TSP (2017)
- Central Lane MPO RTP (2017)

No-Build Alternative

The No-Build Alternative would generally be inconsistent with local and regional transportation and land use policies and plans because it would not encourage increased density and transit-oriented development (TOD) along the study corridors, would not add investments to the corridors that help make service more reliable, and would not include new BRT system elements.

For 3 of the 5 corridors, the No-Build Alternative would not meet the Frequent Transit Network (FTN) goals of providing frequent service on key transit corridors

Envision Eugene (2017)

Envision Eugene (City of Eugene, 2012) outlines a path forward to meet current and future needs under a single unified community vision. This vision consists of 7 pillars that reflect Eugene's community values. These pillars are:

- » Economic opportunities,
- » Affordable housing,
- » Climate change/energy resiliency,
- » Compact urban development and efficient transportation options,
- » Neighborhood livability,
- » Natural resources, and
- » Adaptable/flexible/collaborative implementation.

The City of Eugene identified investment in public transportation along Key Transit Corridors as an opportunity to assist in achieving its vision.

(Table 9-11). In the 30th Avenue to LCC Corridor, the No-Build Alternative would be consistent with the FTN goal of providing frequent service on E. 30th Avenue, as it would run 3 routes on the corridor (Routes 81, 82, and 92), and these routes combine to provide 10-minute frequencies during peak periods and 15-minute frequencies during off-peak periods. Similarly, for the

LTD Long-Range Transit Plan (2014)

The LTD Long-Range Transit Plan (2014) identifies a current and proposed frequent transit network (FTN) for the Eugene-Springfield region and outlines the following characteristics for FTN corridors:

- » Enables a well-connected network that provides regional circulation
- » Compatible with and supportive of adjacent urban design goals
- » Operates 7 days a week in select corridors
- » Service hours are appropriate for the economic and social context of the area served
- » Coverage consists of at least 16 hours a day, and area riders' trip origins or destinations are within ¼ mile straight line distance
- » Average frequency of 15 minutes or better
- » Transit service is reliable and runs on schedule
- » Transit stations are high quality with amenities, including bicycle and pedestrian connections to stations and end-of-trip facilities, such as bicycle parking and bicycle share

The Long-Range Transit Plan identifies elements of a BRT plan, defining it as the "highest level of service available within the FTN, and is a permanent, integrated system that uses buses or specialized vehicles on roadways or dedicated lanes to efficiently transport passengers" (LTD 2014). BRT system elements include branded multi-door 60-foot-long BRT vehicles, enhanced stations with level boarding platforms instead of bus stops, off-board fare collection, transit signal priority, wider stop spacing, and 10-minute service frequencies. BRT service is intended to improve transit speed, reliability, and ridership.

Coburg Road Corridor, this alternative would meet the FTN goal of providing frequent service on Coburg Road between the Ferry Street Bridge and Chad Drive through the combined frequencies of Routes 66 and 67.

Enhanced Corridor and EmX Alternatives

For all corridors, the Enhanced Corridor and EmX Alternatives would meet the FTN goals by providing frequent service on the study corridors, installing transit priority at signalized intersections, and adding BAT lanes and transit queue jumps to help make service more reliable and run on schedule. For the 30th Avenue to LCC Corridor Enhanced Corridor, service would be less frequent than under the No-Build Alternative.

The Enhanced Corridor Alternatives would not include the majority of BRT system elements identified in the LTD Long-Range Transit Plan; the EmX Alternatives would include most of the BRT system elements.

In most corridors, the Enhanced Corridor Alternatives would moderately support the goals of Envision Eugene and the Eugene 2035 TSP by slightly improving transit mode share and increasing pedestrian mode share through investments in pedestrian infrastructure. However, they would not provide enough bicycle facility investments to help increase bicycle mode share over the No-Build Alternative. The EmX Alternatives would support these goals to a greater extent by improving transit mode share and increasing pedestrian and

Table 9-11: Summary of Plan Consistency

Corridor	Alternative	LTD Long-Range Transit Plan		Envision Eugene	Central Lane MPO Regional Transportation Plan	Eugene 2035 TSP
		FTN Goal	BRT System			
Highway 99	No-Build	○	○	○	○	○
	Enhanced Corridor	●	◐	◐	◐	◐
	EmX	●	◑	●	●	●
River Road	No-Build	○	○	○	○	○
	Enhanced Corridor	●	◐	◐	◐	◐
	EmX	●	◑	●	●	●
30th Avenue to LCC	No-Build	●	○	○	○	○
	Enhanced Corridor	◐	◐	◐	◐	◐
	EmX	●	◑	●	◐	◐
Coburg Road	No-Build	●	○	○	○	○
	Enhanced Corridor	●	◐	◐	◐	◐
	EmX	●	●	●	●	◐
MLK, Jr. Boulevard	No-Build	○	○	○	○	○
	Enhanced Corridor	●	◐	◐	◐	◐

Source: MovingAhead Project Team.



bicycle mode share through investments in pedestrian and bicycle infrastructure. The 30th Avenue to LCC Corridor Enhanced Corridor Alternative would not improve transit mode share due to the decrease in service frequency as described earlier.

Overall, the Enhanced Corridor Alternatives would be generally, but not entirely, consistent with applicable polices and plans, while the EmX Alternatives would be consistent with most of the applicable plans and policies, providing frequent transit service, increasing transit share, and supporting more areas planned for TOD. Consistency of the individual corridors with each of the plans and their associated goals is described in detail in the MovingAhead Project's Draft Transportation Technical Report (DKS 2018).

Construction-Related Impacts and Mitigation Measures

Construction of the multimodal investments in the study corridors would inevitably result in temporary impacts to the corridor alignments and major intersecting side streets during construction. Short-term impacts would include construction truck traffic, lane closures, detour routes, and modifications to sidewalks and bicycle lanes.

No-Build Alternative

Under the No-Build Alternative, no construction would take place as part of the MovingAhead project, so no short-term construction impacts would occur.

Enhanced Corridor and EmX Alternatives

For both the Enhanced Corridor and EmX Alternatives, LTD anticipates a total construction period of approximately 18 months. The first several months would be preliminary low-impact work, such as surveying and staging. Constructing the investments would take approximately 6 to 10 months total of heavy construction (street demolition and reconstruction), but that work would be spread over 2 summer construction seasons due to the difficulty of working during winter weather. All construction activities would occur within public right of way (ROW) and temporary construction easements that would be acquired prior to construction. The

contractor would typically work in contained segments of 5 to 10 blocks on 1 side of the street at a time. Shorter construction segments would be used in locations with higher than normal driveway density, allowing the contractor to complete the work within an individual segment quickly so it can be reopened 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 2- to 4-week period for each segment.

LTD and the contractor would carefully plan construction to minimize potential impacts to businesses, roadway users, and surrounding communities. 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 the City's noise restrictions; work in residential areas would be completed during the day to comply with these 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 to reduce impacts to the adjacent businesses and their customers if such activities would be consistent with the City's night construction requirements.

Construction truck traffic needed to construct the build alternatives is anticipated to be moderate in locations where traffic signals would be constructed or modified, where there would be roadway widening or median construction, or where new or replaced pedestrian enhanced crossings would be constructed. Construction truck traffic is anticipated to be limited in locations where minor signal modifications or sidewalk reconstruction would be occurring.

On side streets, lane closures are anticipated to be limited to intersections with the main corridor roadway (e.g. Highway 99). For the main corridor roadways, lane

closures are anticipated to be limited to intersection locations with signal modifications. The construction impacts for EmX Alternatives would be more extensive than the Enhanced Corridor Alternatives, with long-length lane closures (longer than 500 feet) for main roadway locations where corridor restriping, BAT lanes, or exclusive transitways would be constructed and for more intersection impacts due to new signal construction and signal modifications.

Short-term lane closures, anticipated for Enhanced Corridor Alternatives, are anticipated on main roadway locations where new stops/stations and other scattered investments would be constructed.

Detour routes for motor vehicles would not be necessary under either of the build alternatives because full road closures are not anticipated during construction of any corridor. Some short duration traffic rerouting may be necessary at some intersections during construction. Emergency vehicle access would be provided at all times throughout the construction process.

Sidewalk and bicycle lane construction would affect pedestrians and bicyclists. Construction of the investments along the length of the corridor could require demolition and reconstruction of existing curbs, gutters, sidewalks, and other pedestrian and bicycle facilities. If existing routes require temporary closures, appropriate rerouting and signage would be used.

Mitigation measures for short-term construction impacts would require early, frequent, and ongoing communication among LTD, contractors, and affected property owners/tenants. Mitigation measures would be identified prior to construction and would be specified in LTD's construction contracting documents. Potential measures could include, but would not be limited to:

- Coordination of construction timing, staging, and signage by LTD's designated staff liaison(s) in consultation with the affected property owners/tenants to minimize business and residential disruptions
- Speed zone reductions within the construction zone, closed or narrow lanes, and temporary driveway relocation

- Use of variable message signs, the LTD website, and local news sources to provide roadway users with advance notice of current or pending construction activities and alternate routes

Short-term construction impacts unique to the Highway 99 and 30th Avenue to LCC Corridors are summarized below.

Highway 99 Corridor

Enhanced Corridor and EmX Alternatives

- Construction of a new pedestrian and bicycle bridge over rail lines would require longer construction periods and would result in short-term access, noise, vibration, and dust impacts to businesses, residents, and Trainsong Park

30th Avenue to LCC Corridor

Enhanced Corridor and EmX Alternatives

- Decommissioning the existing pedestrian bridge over Amazon Parkway to install an at-grade, ADA-accessible enhanced crossing would require a longer construction period and would result in short-term access, noise, vibration, and dust impacts to businesses and residents in the area and users of the Amazon Parkway/E. 19th Avenue intersection

Mitigation Measures for Long-Term Impacts

A range of mitigation measures were considered to offset long-term impacts that would potentially result from construction of the Enhanced Corridor and EmX Alternatives. Measures considered included changes to intersection geometry, traffic signal control, traffic signal timing, or adding vehicle or bicycle lanes. After property impacts were revealed during the alternatives analysis, additional evaluation was conducted to determine other ways to avoid or minimize impacts at some properties; this effort is documented in the Addendum to the MovingAhead Alternatives Analysis Technical Reports Memorandum (CH2M 2017). As the design of the build alternatives progresses, design refinements to minimize impacts to private properties would be incorporated.

Mitigation measures for long-term direct impacts specific to individual corridors are summarized below. Potential mitigation measures for short-term construction-related impacts are the same for all corridors and are described in the construction-related impacts section of this chapter.

Highway 99 Corridor

Because roadway and intersection operations under the Highway 99 Corridor Enhanced Corridor and EmX Alternatives would be no worse than traffic operations under the No-Build Alternative in 2035, mitigation measures due to traffic operations would not be necessary.

The former Porky's Palace (closed) onsite circulation would be impacted with the installation of a southbound bus pullout on Highway 99 just south of Royal Avenue. In order to mitigate this impact, it is recommended that the bus pullout be located approximately 40 feet south of where it is currently shown. This would maintain full on-site circulation. Refer to the Addendum to MovingAhead Alternatives Analysis Technical Reports Memorandum (CH2M 2017) for additional information on potential parking, acquisitions, and tree impacts mitigation.

River Road Corridor

Because roadway and intersection operations under the River Road Corridor Enhanced Corridor and EmX Alternatives would not be significantly impacted compared to operations under the No-Build Alternative in 2035, mitigation measures due to traffic operations would not be necessary.

30th Avenue to LCC Corridor

Because roadway and intersection operations under the 30th Avenue to LCC Corridor Enhanced Corridor Alternative would be no worse than traffic operations under the No-Build Alternative in 2035, mitigation measures due to traffic operations would not be necessary.

The 30th Avenue to LCC Corridor EmX Alternative operations analysis identified that the Pearl Street/E. 11th Avenue intersection would have significant local traffic impacts and further degrade traffic operations compared to the 2035 No-Build conditions if evaluated under current operating standards; with identified mitigation measures, this intersection would meet current operating standards. Under the proposed operating standards, no mitigation would be required at this intersection. At the time of the analysis for this AA, the Eugene 2035 TSP had not been adopted, therefore, study intersections were evaluated under both current and proposed operating standards.

The loss of on-street parking on Oak and Pearl Streets for both the Enhanced Corridor and EmX Alternatives and on High Street for the EmX Alternative would be mitigated with the addition of on-street parking spaces on Oak and Pearl Streets at other nearby locations, thereby reducing the total potential loss of on-street parking (Table 9-8).

Construction of a 2-way cycle track on High Street from E. 10th Avenue connecting to the Amazon Multi-Use Path at E. 19th Avenue was originally planned as part of the EmX Alternative; however, the City has been able to fund and advance this bicycle investment separate from the MovingAhead project. Construction of this project would reduce the number of on-street parking spaces lost on Pearl, Oak, and High Streets.

Coburg Road Corridor

The Enhanced Corridor Alternative operations analysis identified that the Coburg Road/Cedarwood Drive/I-105 eastbound on-ramp intersection would degrade, when compared to the 2035 No-Build conditions, slightly if evaluated under current operating standards, but would meet proposed operating standards. No mitigation is recommended at this intersection, because the operating conditions would not be significantly impacted.

The EmX Alternative operations analysis identified 2 intersections that would have significant local traffic impacts and further degrade traffic operations compared to the 2035 No-Build conditions. Impacts to the Coburg Road/Country Club Road/MLK, Jr. Boulevard intersection would be mitigated by converting a northbound general-purpose lane to a BAT lane for bus and vehicles turning left at Oakway Road. Impacts to the Coburg Road/Cedarwood Drive/I-105 eastbound on-ramp intersection would be mitigated by converting a northbound general-purpose lane to a BAT lane for buses and vehicles turning left at Oakway Road.

Installation of a northbound right-turn lane at the Coburg Road/Randy Papé Beltline eastbound on-ramp under the Enhanced Corridor Alternative or installation of center running transit lanes under the EmX Alternative would limit several accesses on Coburg Road to right-in/right-out only access. This change would be mitigated by providing:

- A southbound u-turn movement at the Coburg Road/Elysium Avenue intersection
- At least 150 foot southbound left-turn lane at Coburg Road/Elysium Avenue to accommodate u-turn volume
- A northbound u-turn movement at the Coburg Road/Randy Papé Beltline westbound on-ramp intersection

MLK, Jr. Boulevard Corridor

Because traffic operations under the MLK, Jr. Boulevard Corridor Enhanced Corridor Alternative would be no worse than traffic operations under the No-Build Alternative in 2035, mitigation measures due to traffic operations would not be necessary.

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Chapter 10: Costs and Financial Analysis

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Overview

Based on LTD's current cost structure, this chapter provides a comparative description of the financial and funding characteristics of the alternatives considered in this Alternatives Analysis (AA) report. This chapter includes analysis of capital costs and operation and

maintenance (O&M) costs. It also discusses systemwide considerations, including implications of advancing more than 1 corridor alternative and strategic funding considerations. Table 10-1 summarizes the capital and O&M costs for all corridor alternatives.

Costs and Financial Analysis Overview

Capital Cost Estimates

Estimated capital costs encompass all project development costs, including design services, property acquisition, vehicle purchases, and construction.

Capital Costing Methodology and Analysis by Category

FTA's method to standardize the approach for estimating capital costs on transit Small Starts projects is called Standardized Cost Categories (SCC). The cost estimates for the MovingAhead project's AA use and conform to the June 2016 Small Starts spreadsheets and method, breaking down the capital cost estimates into 9 specific categories as shown in Figure 10-1:

1. **Guideway and Track Elements** include bus lane or busway (section of the road exclusively for buses) elements. Items in this cost category are a major contributor to overall project cost in the most reconstruction-intensive alternatives, such as the River Road Corridor EmX Alternative (18% of total costs) and Coburg Road Corridor EmX Alternative (12% of total costs). Enhanced Corridor Alternatives generally would have lower costs in this category because there would be less investment in construction of dedicated bus lanes for these alternatives.
2. **Stations/Transit Stops** include EmX stations, Enhanced Corridor stops, and station area amenities. The level of investment in stations under EmX Alternatives would be significantly higher than

investments in stops under Enhanced Corridor Alternatives. On average, there is almost a \$7 million difference between Enhanced Corridor Alternatives' stop costs and EmX Alternatives' station costs for each corridor where both alternatives were evaluated. For those corridors that would have less investment in guideway and other infrastructure, such as the Highway 99 Corridor alternatives, the difference in costs between build alternatives is largely due to EmX stations versus Enhanced Corridor stops.

3. **Support Facilities** include maintenance bays, storage areas, and dispatch facilities needed to support a given level of transit operations systemwide. Taken alone, no single corridor requires costs in this category. See "Maintenance Facility Expansion" in the next section for a discussion of the system-level thresholds and estimated costs for facility improvements needed for the implementation of multiple corridors.
4. **Sitework** encompasses all work outside of the busway. This work can be categorized as 3 major elements of work: roadway widening, signal reconstruction, and sidewalk reconstruction. Operator break facility construction costs, and bicycle and pedestrian accommodations are also included under this cost category. Costs would be significantly higher for EmX Alternatives because cost assumptions include reconstructing more Americans with Disabilities (ADA) ramps along the corridors, landscaping, and lighting. For both

Table 10-1: Summary of Corridor Cost and Service Level Comparisons to No-Build by Alternative¹

Alternatives	Transit Travel Time Change ²	Capital Cost ³	Capital Cost per Construction Mile ⁴	Annual Transit VHT Change (Revenue Hours) ⁵	Annual Transit VMT Change (Revenue Miles) ⁶	Annual O&M Cost Change ⁷	Annual Ridership Change ⁸	Cost/Trip Change ⁹
HIGHWAY 99 CORRIDOR								
Enhanced Corridor	-10 minutes	\$38.0M	\$5.0M	-1,100	+80,600	-\$0.1M	+111,000	-\$0.04
EmX	-12 minutes	\$67.0M	\$9.0M	+13,800	+344,600	\$2.8M	+267,000	\$0.12
RIVER ROAD CORRIDOR								
Enhanced Corridor	-5 minutes	\$24.0M	\$4.0M	-1,100	+27,200	-\$0.6M	+33,000	-\$0.06
EmX	-8 minutes	\$78.0M	\$12.0M	+7,000	+224,200	\$2.0M	+246,000	\$0.07
30TH AVENUE TO LANE COMMUNITY COLLEGE (LCC) CORRIDOR								
Enhanced Corridor	-1 minute	\$21.0M	\$3.4M	-1,100	+45,200	-\$0.5M	-30,000	-\$0.04
EmX	-2 minutes	\$53.0M	\$8.5M	+3,400	+153,900	\$0.5M	+198,000	-\$0.03
COBURG ROAD CORRIDOR								
Enhanced Corridor	-5 minutes	\$41.0M	\$6.7M	-4,500	-32,400	\$0.0M	+63,000	-\$0.02
EmX	-5 minutes	\$113.0M	\$18.1M	+4,300	+113,200	\$1.8M	+258,000	\$0.05
MARTIN LUTHER KING (MLK), JR. BOULEVARD CORRIDOR								
Enhanced Corridor	-2 minutes	\$21.0M	\$7.0M	+7,200	+132,800	\$1.1M	+186,000	\$0.02

Source: MovingAhead Project Team.

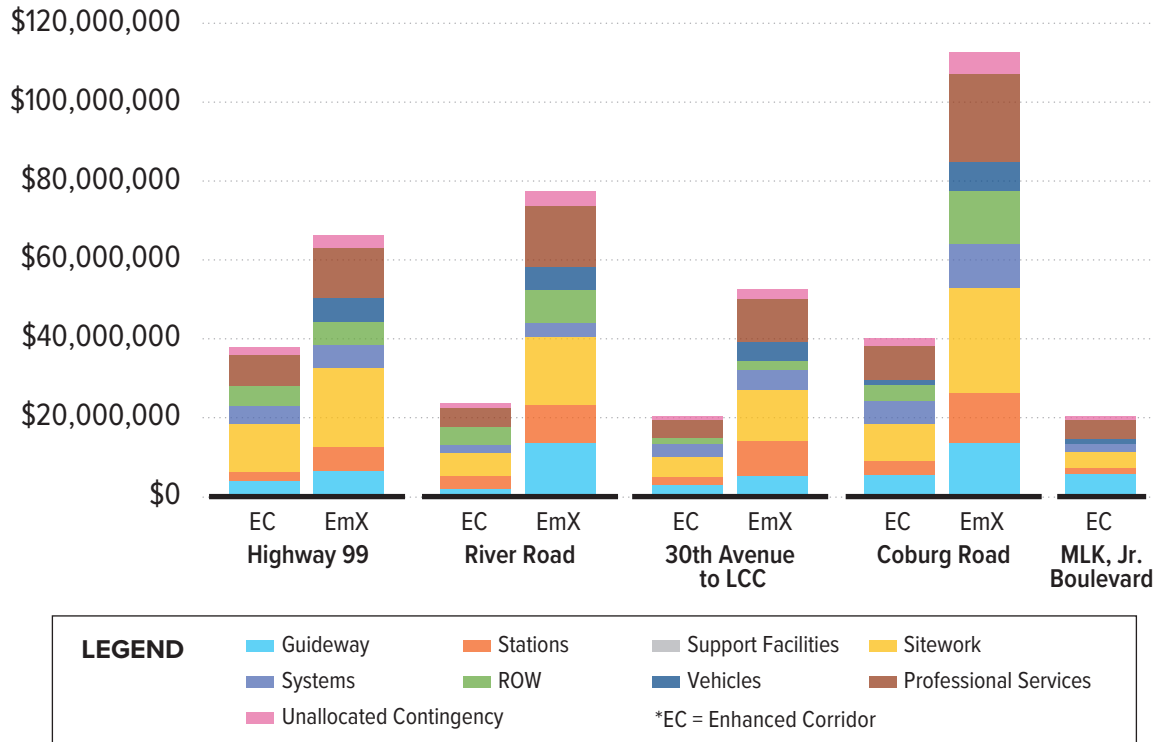
Notes:

- Alternative values are subtracted from No-Build values to determine change from No-Build for each category. Actual No-Build values can be found in summary tables for corridor sections in Chapter 9.
- Travel times describe in-vehicle transit travel times from Eugene Station to corridor terminus during A.M. peak hour. Source: LCOG. LCOG Regional Travel Demand Model. 2016.
- Values represent estimated cost of capital improvements for the alternatives. The No-Build has no capital cost.
- The mileage of the corridor used to calculate the cost per construction mile is the overall physical length of the corridor and does not correspond to the round-trip distance either bus or EmX service would travel on a corridor. Values are in 2016 dollars. Source: Draft Capital Cost Estimating Technical Report. 2016.
- Transit VHT = Vehicle hours traveled in revenue service. Revenue service refers to all scheduled time a transit vehicle spends serving passengers. In this case, revenue service is confined to in-service time (excluding layovers, which are included in "Revenue" figures reported to the National Transit Database(NTD)) in order to relate to modelling outputs for the alternatives which are in-service forecasts from the LCOG Regional Travel Demand Model (2016).
- Transit VMT = Vehicle miles traveled in revenue service.
- Cost forecasts are the product of a fully allocated and fully variable cost model for 2035 in 2016 dollars and based on LTD's current cost structure. In general, transportation costs are allocated on a per revenue hour basis, fleet maintenance costs are allocated per revenue mile, and all other administrative and support costs are allocated per peak vehicle. Source: LTD. Draft Operating and Maintenance Costs Technical Report. 2017.
- Systemwide transit trips are defined as 1-way linked trips taken by a person from the trips origin to the trips destination, independent of the number of vehicles or transfers used to complete the trip. Source: DKS. Draft Transportation Technical Report. 2018. Passenger annualization of 300 is calculated from LTD 2016 ridership data and is used to translate average weekday to annual trips. Source: LTD. Draft Operating and Maintenance Costs Technical Report. 2017..
- Cost/Trip Change is total operating costs divided by annualized systemwide linked trips.

Enhanced Corridor and EmX Alternatives, sitework costs are estimated to be, on average, about 25% of total project costs.

5. **Systems** include the installation of conduit, vaults, and conductor/fiber-optic information technology (IT) systems necessary to provide the communications backbone for such items as closed-circuit television cameras, next bus reader boards, and intercoms on the station platforms. The systems category also includes the cost of constructing and modifying traffic signals to provide transit signal priority to transit vehicles on each corridor. This category has a great cost differential between Enhanced Corridor and EmX Alternatives due to the differing assumption of investment in continuous fiber connections between alternatives. This cost category may fluctuate as design progresses because signal priority and modifications at most signals along the corridors, which may not be feasible or necessary, have been assumed in preliminary cost estimates.
6. **Right of Way (ROW)** costs, also called acquisitions, are estimated by calculating the approximate area of property outside of the existing ROW that would need to be acquired to build a given alternative. The acquisition area needed (and the associated cost) is dependent on the type and level of investment along a corridor and the concentration of improvements requiring ROW widening. Depending on the alternative selected, this cost varies widely from 1% of the overall cost (Martin Luther King (MLK), Jr. Boulevard Corridor Enhanced Corridor Alternative) to 20% of the overall cost (River Road Corridor Enhanced Corridor Alternative). The Coburg Road EmX Alternative has the highest overall cost in this category (almost 12%, over \$13.4 million) because of the number and estimated value of ROW acquisitions.
7. **Revenue Vehicle** costs are based upon the number of vehicles required to provide the peak level of service and the additional cost required for purchasing revenue vehicles to meet modeled peak service required for each corridor alternative. The cost estimates assume bus rapid transit (BRT) vehicles would be used for EmX service, 60-foot articulated buses would be used for Enhanced Corridor service, and 40-foot standard vehicles or 60-foot articulated vehicles (depending on ridership demand) would be used for bus service throughout the rest of the system.
8. **Professional Services** include costs for design and engineering, construction management, permitting, and agency administration necessary to complete the project. The costs are based on a percentage of construction costs with allocated contingencies. Professional services average about 20% of the total capital costs for both Enhanced Corridor and EmX Alternatives.
9. **Contingencies** are divided into 2 types, allocated and unallocated. Allocated contingencies reflect the amount of risk for each of the project cost categories at a given design level. Unallocated contingencies apply to the project budget as a whole and are intended to cover unexpected changes in project scope, higher than predicted inflation, and similar items that the designer could not identify at this level of development. At the concept design level, the combined allocated and unallocated contingency typically totals about 30% of the project cost estimate.

Figure 10-1: Estimated Capital Costs by Category and Alternative



Source: MovingAhead Project Team.

Pedestrian and Bicycle Improvements

Pedestrian and bicycle improvements, as a proportion of materials and construction costs for build alternatives, range from 5% to 11% on 4 of the 5 corridors. A higher proportion of overall project cost is attributed to pedestrian and bicycle improvements for the Highway 99 Corridor build alternatives due to the proposed construction of a pedestrian and bicycle bridge connecting Highway 99 to the Trainsong neighborhood. The construction costs related to this bridge increase the overall proportion of improvements dedicated to pedestrian and bicycle facilities for that corridor to 30% for the Enhanced Corridor Alternative and 20% for the EmX Alternative.

In general, EmX Alternatives would invest more capital in pedestrian and bicycle improvements, but that cost is a lower overall percentage of the total project cost than for Enhanced Corridor Alternatives. This is generally because EmX Alternatives propose more roadway reconstruction and have higher costs associated with stations, signals, and other construction in addition to construction or reconstruction of pedestrian and bicycle facilities.

Capital Costs for Multiple Corridor Implementation

Maintenance Facility Expansion

The existing Lane Transit District (LTD) maintenance facility can accommodate projected vehicle needs for service anticipated under the No-Build Alternative with the capacity for 5 additional 60-foot articulated vehicles. If any combination of Enhanced Corridor and EmX Alternatives advanced to construction requires acquisition of 6 or more vehicles, the existing maintenance facility would require expansion to accommodate this fleet. If 2 additional maintenance bays were added to the existing facility that could accommodate 60-foot articulated vehicles, LTD's Glenwood location could accommodate the full MovingAhead EmX system build-out. The cost to add the 2 maintenance bays is estimated to be \$2.5 million in 2016 dollars (LTD 2016). Expansion of the bus wash, fuel island, or bus parking lot are not required to accommodate any of the MovingAhead investment packages.

O&M Cost Estimates

O&M costs represent ongoing costs that would be borne by LTD once the transit project is implemented. O&M costs were estimated for the alternatives using a fully allocated cost model of LTD's current cost structure forecasted for 2035 operations.

In general, differences in O&M costs between the build alternatives and the No-Build Alternative are directly related to the systemwide revenue service levels and peak transit vehicles of each alternative, which differ depending on the details of each corridor alternative.

O&M costs for all Enhanced Corridor Alternatives, except for the MLK, Jr. Enhanced Corridor Alternative, result in O&M costs that are lower than or equal to the O&M costs of the No-Build Alternative. The primary reason for this is that as vehicle cycle-time (the time it takes for a vehicle to make a round-trip) is decreased (due to shorter layover times and faster travel times) and the number of peak transit vehicles required to serve the system as a whole is decreased. This scenario also results in more revenue miles per revenue hour.

Under the Enhanced Corridor Alternatives, capital improvements are operational in their focus and are intended to protect travel times while providing 15-minute service frequency. With higher service frequency, in some cases, the Enhanced Corridor Alternatives are able to eliminate redundant service or align routes to better serve their markets. This may lead to passengers having to make more transfers. These transfers would take place at stops with improved amenities between routes and with increased frequencies leading to faster and more comfortable cross-town connections.

The EmX Alternatives require larger O&M increases over the No-Build Alternative because they involve larger increases to service levels than the Enhanced Corridor Alternatives (10-minute EmX versus 15 minute Enhanced Corridor service frequencies). O&M cost increases over the No-Build Alternative for EmX Alternatives range from a low of \$0.5 million (30th Avenue to Lane Community College (LCC) Corridor) to a high of \$2.8 million (Highway 99 Corridor).

The benefits of EmX investments would extend beyond operational considerations, providing a permanence for economic development and a level of transit service frequency and reliability that is expected to increase transit system ridership. These capital investments (including sections of exclusive transit lanes) would protect LTD's investment in travel times and increased service by ensuring that as congestion on these key corridors increases, O&M costs do not also go up. The EmX Alternatives may also lead to increased transfer activity. EmX stations would provide a protected place to wait for service with increased frequencies leading to faster and more comfortable cross-town connections.

Revenue Service

Revenue service refers to all scheduled time a transit vehicle spends serving passengers (**Revenue hours**), as well as all distance traveled while providing that service (**Revenue miles**).

O&M Costing Methodology

Total systemwide annual O&M costs are the sum of costs allocated to 3 service categories forecasted for each alternative: revenue hours, revenue miles, and peak transit vehicles.

The fully allocated cost model used LTD's FY2016 cost structure to create a base year allocation of O&M funds and correlated those to revenue service levels from the same year. Revenue service increments from the base year provided by LTD were used to create an allocation of O&M costs for that year. The model uses the number of vehicles in operation needed to meet maximum demand to allocate base year expenses for administrative costs that were not directly linked to service levels.

O&M Costs for Multiple Corridor Implementation

One of the primary goals of the MovingAhead project is to facilitate an investment decision-making process to select 1 or more corridors for near-term investment in improved transit service and other multimodal improvements. If more than 1 corridor is selected for investments, the system-level impacts of implementing 2 or more alternatives would need to be considered. It is not anticipated that O&M costs for an individual corridor would change noticeably even if it were interlined (2 or more transit routes served by the same vehicle to more efficiently provide service and reduce transfers) with another corridor operating the same service. Therefore, O&M costs for multiple corridors may be calculated by adding O&M costs of 2 or more alternatives.

Funding O&M Costs

O&M cost estimates represent the level of investment in the LTD system required to deliver similar levels of transit service to different areas of Eugene. Across corridors, costs differ based on geography, existing infrastructure, the effect that changes to infrastructure are expected to make on transit service efficiency (running time), and the LTD service currently available in each corridor. For each revenue source supporting LTD's O&M needs, assumptions have been made using historic trends and an analysis of future conditions to project future changes in revenue.

O&M costs for opening day (2024) for each individual alternative are forecasted to cost less than the projected revenue. Note that implementation of service operations on more than 1 corridor as part of an investment package may need to be phased, depending on available O&M funding. As discussed further below, uncertainties associated with revenue sources may require a lower initial level of service in the opening year.

House Bill 2017 Revenue

In July 2017, the Oregon Legislature created the state's first ever dedicated funding source for public transit operations: Keep Oregon Moving (House Bill 2017). LTD is expected to receive approximately \$7 million annually through the Statewide Transportation Improvement Fund to be spent on transit service investments throughout Lane County.

The new program is a permanent, dedicated fund that does not require future reauthorization. The funding may be used for any transit investment including new services, increased frequency, and capital needs. The legislature did require, however, that agencies explain how funding has been used to address 6 specific categories:

- 1) Increased frequency of bus service in communities with a high percentage of low-income households
- 2) Procurement of buses that are powered by natural gas or electricity for use in areas with a population of 200,000 or more
- 3) Implementation of programs to reduce fares for public transportation in communities with a high percentage of low-income individuals
- 4) Expansion of bus routes and bus services to reach communities with a high percentage of low-income individuals
- 5) Improvement in the frequency and reliability of service connections between communities inside and outside of the (agency's) service area
- 6) Coordination between public transportation service providers to reduce fragmentation in the provision of transportation services

In consideration of the ongoing rule making around this funding source and its application(s), this financial analysis does not consider future revenues derived from House Bill 2017 applied to MovingAhead alternatives. That said, House Bill 2017 revenues may be a viable source for capital or operating costs for project(s) identified through the MovingAhead process, and in particular for those corridors that serve a high percentage of low-income households.

Risk and Uncertainty

Capital and Operating Shortfall

For every transit project, LTD evaluates the amount of additional revenues needed to make the project alternatives financially feasible. An alternative is considered financially feasible if (1) project capital revenues are sufficient to meet the capital costs required to construct the alternative; and, (2) ongoing revenues are sufficient to meet the estimated total system costs plus maintain a beginning-year working capital reserve of at least \$3 million (per LTD policy).

Capital Cost Uncertainty

The project capital cost estimates were prepared based on concept designs that are approximately 3% complete. This level of design unavoidably includes many unknowns that can affect project costs. LTD included industry-standard contingencies in its cost estimates to account for such unknowns: 10 to 35% of each SCC in allocated contingencies and 5% of total capital cost estimates in unallocated contingencies.

Despite the large contingency allocation and LTD's extensive EmX experience, it is possible that capital costs would exceed estimates. If that occurs, LTD could reduce project costs and/or obtain additional revenue. Reducing project costs could be accomplished through value engineering (review of new or existing products during the design phase to reduce costs) or by reducing or eliminating some project elements. Eliminating project elements would introduce additional risks, since the project was developed with extensive public participation, review by elected officials, and participation and approvals by the Federal Transit Administration (FTA). In addition, the concept designs

were 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.

Capital Funding Uncertainty

Federal funding levels are uncertain and difficult to anticipate. Though currently uninterrupted at the program level, Capital Improvement Grants (CIGs), including Small Starts, are now more competitive than ever, creating uncertainty in their availability and very likely requiring a higher percentage of non-federal matching funds. MovingAhead assumes a 50% share of Small Starts funding. This is consistent with current federal budget assumptions which create a 51% cap on federal share for CIG projects. Thus, the ability of LTD and the City of Eugene (City) to secure funding partnerships at the local and state levels are increasingly important for the implementation of large capital projects where transit is a central component.

Operating Cost and Funding Uncertainty

A transit project's estimated general fund revenues and costs are based on a series of assumptions regarding the availability and growth rates of funding sources and future costs. While operating cost estimates for MovingAhead alternatives 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 funding needed for operations.

Revenue projections create the greatest uncertainty. Payroll taxes make up the largest portion of LTD's general fund revenues, and while long-term growth is highly likely for this revenue source, 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. Without adjusting for inflation, LTD estimates payroll tax revenues to grow 3% annually.

MovingAhead’s modeling and assumptions are based on a planning horizon of 20 years (2035), so a fully variable approach has been used to estimate costs for the alternatives and to allow for the uncertainty of estimating costs in the long term. In the shorter term, it is usually appropriate to assume that variable costs (primarily costs linked to hours and miles) are sufficient to provide the associated level of service described for design alternatives, while fixed costs that are primarily made up of administrative costs not directly involved in operating or maintaining the fleet of a system, are considered to be held constant across the alternatives. Approximately 35% (\$14.1 million) of LTD’s operating expenses for 2016 may be considered fixed costs in the short term; however, all costs are considered variable for the purposes of this long-term forecast. In the uncertainty of opening year conditions and transit operations, the higher estimates of costs generated by the fully variable cost-model approach is a conservative approach.

Given LTD’s 11-year experience with EmX operations, it is unlikely that operating costs inherent to BRT operations would 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. The build alternatives 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 whether or not a build alternative is implemented.

Implementation

To implement a funding plan successfully, LTD in partnership with the City will:

- Refine and finalize capital cost estimates as the project design moves forward
- Update revenue projections on an annual basis, include House Bill 2017 as a source of operational funds, and refine estimates for opening year
- Identify and begin the process to secure sources of non-FTA funds
- For preferred mode alternatives eligible for Small Starts funds, begin the process to secure approval of Small Starts funds from the FTA



Strategic O&M Funding Considerations

As described earlier, LTD's primary source of operating revenue is the payroll tax. This source of revenue is highly sensitive to the economic health of the region. For this reason, actual revenues available for opening day service may vary depending on the state of the economy. The implications of this are that service levels on opening day may be lower than assumed in current forecasts.

O&M funding requirements for operation of the 10-minute frequencies assumed in EmX Alternatives represent significant investments in service, which may exceed the current level of underlying demand in a given corridor. If this were the case, it would mean that the community's transit resources are not being deployed efficiently and it could challenge LTD's ability to sustain that level of operations.

In that context, a key strategic consideration for the implementation of either Enhanced Corridor or EmX

operations would be matching the appropriate level of service to the strength of the underlying transit market along a given corridor. As the densities of housing and employment start to reach the levels anticipated in Envision Eugene, increases in transit service levels can be considered. Initial service frequencies for Enhanced Corridor and EmX corridors would at a minimum meet LTD's Frequent Transit Network (FTN) threshold of 15-minute headways. Increases in frequency would be determined based on meeting productivity standards measured in terms of boardings per revenue hour of service.

Overall, O&M costs may be a factor in how much service can be added in the early years of implementation. However, the relatively small differences in operating costs do not provide a technical basis for differentiating among the EmX Alternatives on that factor alone.

Strategic Capital Funding Considerations

MovingAhead represents a significant investment in transit, pedestrian, and bicycle improvements that would positively impact much of the community. Advancing the MovingAhead project requires strategic consideration of potential local, state, and federal funding options, and local partnerships to meet its considerable capital requirements.

There is clearly an advantage in using local funds to leverage other funding in meeting MovingAhead capital requirements, since that would increase the total funding available for projects. Typically, transit corridor projects, such as those planned as part of MovingAhead, have been funded with the assistance of the FTA's CIG Program, which funds Small Starts projects. The Small Starts program has been an important source of funding for LTD, having financed nearly 80% of the Gateway EmX and West Eugene EmX Extension (WEEE) projects. The current status of the program, however, is uncertain. No

new Small Starts projects were funded for federal fiscal year 2018. \$400 million was allocated to funding Small Starts projects in fiscal year 2019. Given this uncertainty, as well as the fact that MovingAhead includes significant non-transit improvements, the approach to meeting MovingAhead's capital requirements must consider a wide range of other funding sources. The changing funding environment also suggests that the financing plan for MovingAhead be nimble in order to react quickly and appropriately to funding program changes and opportunities.

Strategic funding considerations for MovingAhead are to:

- Identify corridors that would compete best for FTA Small Starts funding
- Consider a demonstration proposal for FTA's Program of Interrelated Projects

- Seek other federal and state funding opportunities
- Consider multi-modal projects that create synergistic funding options
- Consider improvements implemented on a systemwide basis, prioritizing improvements that have the greatest return on investment
- Develop additional sources of local funds that can be used to match federal grants and/or to fund MovingAhead corridors or elements

FTA Small Starts Program

The Fixing America's Surface Transportation (FAST) Act, enacted in December 2015, reauthorized the Fixed Guideway CIG Program that funds Small Starts grants. The legislation specifies that Small Starts projects must have a total estimated capital cost of \$300 million or less, and must be seeking less than \$100 million in Section 5309 CIG program funds. The maximum CIG share is 80%, however FTA typically awards a smaller share. Current Small Starts program guidance provides a higher financial rating for projects that include 50% local funding (FTA 2016). While federal funds may be used as local match, the total federal funds applied to the project (both CIG funding and any other federal funding that may be used as local match) may not exceed 80%.

LTD received more than \$127 million in FTA CIG funding through the Small Starts program for building its second and third major BRT projects: Pioneer Parkway (2011) and WEEE (2017). The Franklin Corridor (2007) pre-dated Small Starts and received federal funding through a congressional earmark.

While there may be some uncertainty regarding the CIG program, the New Starts (for larger transit projects with a total project capital cost less than \$300 million) and Small Starts (costs less than \$100 million) programs have historically enjoyed strong congressional support, so the assumption is that the programs will continue to be available and MovingAhead should be prepared to take advantage of Small Starts funding. That said, it is very likely that the Small Starts program will be more competitive than it has in the past, in part due to the backlog of projects that were not funded in 2017. It is recommended that:

- MovingAhead corridors should be analyzed to determine the likely rating for Small Starts funding. FTA rates Small Starts based on 9 criteria (6 performance criteria and 3 financial criteria). It is possible to predict the ratings of many of the criteria with the information that has been developed as part of the MovingAhead project documentation. The potential rating of each corridor can assist in determining corridor(s) to propose for Small Starts funding.
- Consideration could also be given to defining Enhanced Corridor projects in such a way that they would qualify as Small Starts projects. As currently defined, Enhanced Corridor projects have 3 of the 4 required elements (minimum 15-minute frequency, enhanced stations, and transit signal priority) to qualify as Corridor-Based BRT as defined by FTA. The fourth requirement is branding. Enhanced Corridors could be branded as a unique LTD service or branded as EmX, understanding that they may not have all the elements of current EmX service. Defining Enhanced Corridor Alternatives in a manner that would qualify them for FTA Small Starts provides more flexibility in consideration of funding options.
- Consideration should be given to combining corridors into a single Small Starts project. FTA is unlikely to look favorably on an agency submitting 2 or more corridors within a single funding cycle, so there may be an advantage in combining 2 corridors into a single project. The corridors should be logically connected to provide crosstown service. Possibilities includes a River Road – 30th Avenue to LCC combination or a Highway 99 – 30th Avenue to LCC pairing.

Program of Interrelated Projects

The FAST Act of 2015 expanded the Program of Interrelated Projects (POIP), which had been available for New Starts projects, to the Small Starts program. As described by FTA, POIP is the simultaneous development of 2 or more fixed guideway, capital projects, Small Starts projects, or core capacity improvement projects. As such, it would seem tailor-made for MovingAhead, which envisions advancing several transit corridor projects within a short time frame.

To date, FTA has not issued rule-making for POIP and no agency has used the POIP process. If LTD were to pursue POIP, LTD would likely propose it as a demonstration of the POIP. FTA may see LTD and MovingAhead as an attractive option as a test case for POIP, given that LTD has an established track record in being able to deliver corridor transit projects and the total cost for the MovingAhead package is relatively modest (likely less than the maximum cost for a single Small Starts project).

Other State and Federal Funding

Given the uncertainty of FTA Small Starts funding and the likelihood that Small Starts would pay for a smaller percentage of project cost, even for projects funded through the program, it is necessary to look at other funding options. State funding options include lottery funds (which were used for the WEEE project) or direct state appropriations. Federal options include other FTA formula and discretionary grants as well as Transportation Investment Generating Economic Recovery (TIGER) grants.

None of the options provide easy or obvious funding choices. In addition, funding options change over time. As the project proceeds and once an investment package and implementation schedule has been developed, a concerted effort should be made to evaluate available state and federal funding options.

Multi-Modal Funding Options

Since MovingAhead includes transit, bicycle, pedestrian, and safety improvements, it makes sense to expand funding options to those that are not strictly transit-oriented. It may be that comprehensive corridor improvements, such as those envisioned by MovingAhead, provide additional funding opportunities. The TIGER grants, for example, would look more favorable on a multi-modal project, especially if the combination of improvements support economic development. State programs such as ConnectOregon could be used for the bicycle and pedestrian elements of a MovingAhead project, and All Roads Transportation Safety (ARTS) funding could be used to address safety improvements associated with a corridor.

Systemwide Improvements

While MovingAhead has studied 5 corridors and the transit, bicycle, pedestrian, and safety improvements are described on a corridor by corridor basis, it is also possible to consider implementing certain improvements across all 5 corridors. For example, transit signal priority could be implemented on all 5 corridors simultaneously. Similarly, a bicycle enhancement project could implement bicycle improvements across all 5 corridors (and perhaps elsewhere). There are 2 reasons for considering this approach: first, a discipline-specific effort could be more efficient by achieving economy of scale; second, this approach could take advantage of a targeted funding source, such as funding limited to pedestrian and bicycle improvements.

Another advantage of systemwide improvements is that they could result in benefits to multiple corridors within a short period of time. For example, the implementation of transit signal priority would result in immediate rider and operational benefits through reduced bus travel time in advance of a more comprehensive corridor project.

Local Funding

Whatever funding sources are identified for MovingAhead, it is certain that local (non-federal) funding would be needed. It is very likely that the local funding contribution would be a significantly higher percentage of the cost than LTD has experienced with the first 3 EmX projects. Identification of local sources of revenue would need to look beyond LTD generated funds. Funding partnerships with the City, the Oregon Department of Transportation (ODOT), and other partner agencies should be explored. This approach has been used successfully in many other communities to advance corridor projects. As part of MovingAhead decision-making, it is recommended that a task force of LTD and partner agency staff be established to evaluate and recommend potential funding sources.

Financial Conclusions by Corridor

Highway 99 Corridor

O&M Cost Estimates

Service level changes for the Highway 99 Corridor Enhanced Corridor Alternative reflect the operational efficiencies gained from capital and service design improvements that would allow for more revenue miles per revenue hour (revenue hours would decrease by 0.39% while revenue miles would increase by 1.78% over the systemwide total). This improved cycle time (the time it takes the transit vehicle to make a full run in a single direction of travel) would allow the required number of peak vehicles to drop from 93 under the No-Build Alternative to 92 under the Enhanced Corridor Alternative. These efficiencies could result in more daily trips serving the corridor for about \$0.1 million less annually than the O&M costs of the No-Build Alternative (\$52.8 million), as shown in Table 10-2.

For the Highway 99 Corridor EmX Alternative, revenue hours would increase by 4.95% and revenue miles would increase by 7.62% as a result of an increase in the service frequency. Peak transit vehicles would increase from 93 under the No-Build Alternative to 95 under the EmX Alternative. These changes would lead to an increase to total O&M costs of \$2.8 million annually over the No-Build Alternative. This is the largest increase in corridor service of any of the MovingAhead alternatives.

Capital Cost Estimates

The Highway 99 Corridor Enhanced Corridor Alternative would require \$38.0 million of local funding if the project was not eligible for a Small Starts grant. If the project is eligible for a Small Starts grant, it could require 50% (\$19.0 million) of local matching funding, as shown in Table 10-2.

The Highway 99 Corridor EmX Alternative would require \$33.5 million to meet a 50% level of local matching funds for Small Starts.

The proposed pedestrian and bicycle bridge over the railroad tracks to the Trainsong neighborhood could also qualify for additional funding opportunities from the Federal Railroad Administration (FRA) or ConnectOregon. Other bicycle and pedestrian enhancements (such as new or enhanced crossings, curb ramps, new sidewalks, or improved or new bicycle facilities) may be eligible for other local, state, or federal funding.

River Road Corridor

O&M Cost Estimates

Service level changes for the River Road Corridor Enhanced Corridor Alternative reflect the operational efficiencies gained from capital and service design improvements that would allow for more revenue miles per revenue hour (revenue hours would decrease by 0.39% while revenue miles would increase by 0.60% over the systemwide total). This improved cycle time would allow the required number of peak transit vehicles to drop from 93 under the No-Build Alternative to 90 under the Enhanced Corridor Alternative. These efficiencies could result in more daily trips serving the corridor for about \$0.6 million less annually than the O&M costs of the No-Build Alternative, as shown in Table 10-2.

For the River Road Corridor EmX Alternative, revenue hours would increase by 2.51% and revenue miles would increase by 4.96% as a result of increased service frequency. Peak transit vehicles would increase from 93 under the No-Build Alternative to 95 under the EmX Alternative. These changes would lead to an increase of \$2.0 million annually over the No-Build Alternative.

Capital Cost Estimates

The River Road Corridor Enhanced Corridor Alternative would require \$24.0 million of local funding if the project was not eligible for a Small Starts grant. If the project is eligible for a Small Starts grant, it could require 50% (\$12.0 million) of local matching funding, as shown in Table 10-2.

The River Road Corridor EmX Alternative would require \$39.0 million to meet a 50% level of local matching funds for Small Starts.

Because the corridor includes an interchange with the Randy Papé Beltline Highway, ODOT might be a potential funding partner. Other bicycle and pedestrian enhancements (such as new or enhanced crossings, curb ramps, new sidewalks, or improved or new bicycle facilities) might be eligible for other local, state, or federal funding.

30th Avenue to LCC Corridor

O&M Cost Estimates

Service level changes for the 30th Avenue to LCC Corridor Enhanced Corridor Alternative reflect the operational efficiencies gained from capital and service design improvements that allow for more revenue miles per revenue hour (revenue hours would decrease by 0.39% while revenue miles would increase by 1.0% over the systemwide total). This improved cycle time would allow the required number of peak transit vehicles to drop from 93 under the No-Build Alternative to 90 under the Enhanced Corridor Alternative. These efficiencies could result in more daily trips serving the corridor for about \$0.5 million less annually than the O&M cost of the No-Build Alternative, as shown in Table 10-2.

For the 30th Avenue to LCC Corridor EmX Alternative, revenue hours would increase by 1.22% and revenue miles would increase by 2.5% as a result of increased service frequency. Due to improved efficiencies, peak transit vehicles would also decrease in this alternative from 93 under the No-Build Alternative to 90 under the EmX Alternative. These changes would lead to an

increase of \$0.5 million annually over the No-Build Alternative. This alternative would result in the lowest additional O&M cost required for any of the EmX Alternatives.

Capital Cost Estimates

The 30th Avenue to LCC Corridor Enhanced Corridor Alternative would require \$21.0 million of local funding if the project was not eligible for a Small Starts grant. If the project is eligible for a Small Starts grant, it could require 50% (\$10.5 million) of local matching funding, as shown in Table 10-2.

The 30th Avenue to LCC Corridor EmX Alternative would require \$26.5 million to meet a 50% level of local matching funds for Small Starts.

Because much of this corridor is on a county facility, Lane County might be a potential funding partner. Other bicycle and pedestrian enhancements (such as new or enhanced crossings, curb ramps, new sidewalks, or improved or new bicycle facilities) might be eligible for other local, state, or federal funding.

Coburg Road Corridor

O&M Cost Estimates

Service level changes for the Coburg Road Corridor Enhanced Corridor Alternative reflect the operational efficiencies gained from capital and service design improvements that would allow for slightly more revenue miles per revenue hour (revenue hours decrease by 1.62% and revenue miles decrease by 0.72%). Unlike other Enhanced Corridor Alternatives, peak transit vehicles would increase from 93 under the No-Build Alternative to 95 under the Enhanced Corridor Alternative. Taken together, these changes could result in more daily trips serving the corridor for a total O&M annual cost that is similar to the No-Build Alternative, as shown in Table 10-2.

For the Coburg Road Corridor EmX Alternative, revenue hours would increase by 1.54% and revenue miles would increase by 2.5% as a result of increased service

frequency. Peak transit vehicles would also increase in this alternative, from 93 under the No-Build Alternative to 96 under the EmX Alternative. These changes would lead to an increase of \$1.8 million annually over the No-Build Alternative.

Capital Cost Estimates

The Coburg Road Corridor Enhanced Corridor Alternative would require \$41.0 million of local funding if the project was not eligible for a Small Starts grant. If the project is eligible for a Small Starts grant, it could require 50% (\$20.5 million) of local matching funding, as shown in Table 10-2.

The Coburg Road Corridor EmX Alternative would require \$56.5 million to meet a 50% level of local matching funds for Small Starts.

Because the corridor includes an interchange with the Randy Papé Beltline Highway, ODOT might be a potential funding partner. Other bicycle and pedestrian enhancements (such as new or enhanced crossings, curb ramps, new sidewalks, or improved or new bicycle facilities) might be eligible for other local, state, or federal funding.

MLK, Jr. Boulevard Corridor

O&M Cost Estimates

The MLK, Jr. Boulevard Corridor Enhanced Corridor Alternative would include the largest net increase in revenue service of any Enhanced Corridor Alternative (although not of any EmX Alternative) with the addition of 7,200 revenue hours, which is a 2.58% increase from the No-Build Alternative. Revenue miles would increase by 132,000 miles annually, a 2.94% increase over the No-Build Alternative. The number of peak transit vehicles would increase by 1 vehicle, which when combined with the increase to revenue service, would result in a systemwide O&M cost increase of \$1.1 million annually over the No-Build Alternative, as shown in Table 10-2.

Capital Cost Estimates

The MLK, Jr. Boulevard Corridor Enhanced Corridor Alternative would require \$21.0 million of local funding if the project was not eligible for a Small Starts grant. If the project is eligible for a Small Starts grant, it could require 50% (\$10.5 million) of local matching funding, as shown in Table 10-2.

Other bicycle and pedestrian enhancements (such as new or enhanced crossings, curb ramps, new sidewalks, or improved or new bicycle facilities) might be eligible for other local, state, or federal funding.

Table 10-2: Summary of Corridor Costs and Service Levels

Alternatives	Annual Transit VHT ¹		Annual Transit VMT ²		Peak Transit Vehicles ³		Total O&M Cost ⁴	Total Capital Cost ⁵	Local Funding Requirement 50% Local Match ⁶
	Hours	Cost	Miles	Cost	Vehicles	Cost			
NO-BUILD (2035)									
	278,600	\$23.6M	4,520,200	\$10.5M	93	\$18.7M	\$52.8M		
HIGHWAY 99 CORRIDOR									
Enhanced Corridor	277,500	\$23.5M	4,600,800	\$10.7M	92	\$18.5M	\$52.7M	\$38.0M	\$19.0M
EmX	292,400	\$24.8M	4,864,800	\$11.6M	95	\$19.2M	\$55.6M	\$67.0M	\$33.5M
RIVER ROAD CORRIDOR									
Enhanced Corridor	277,500	\$23.5M	4,547,400	\$10.6M	90	\$18.1M	\$52.2M	\$24.0M	\$12.0M
EmX	285,600	\$24.2M	4,744,400	\$11.3M	95	\$19.3M	\$54.8M	\$78.0M	\$39.0M
30TH AVENUE TO LANE COMMUNITY COLLEGE (LCC) CORRIDOR									
Enhanced Corridor	277,500	\$23.5M	4,565,400	\$10.6M	90	\$18.2M	\$52.3M	\$21.0M	\$10.5M
EmX	282,000	\$23.9M	4,674,100	\$11.2M	90	\$18.2M	\$53.3M	\$53.0M	\$26.5M
COBURG ROAD CORRIDOR									
Enhanced Corridor	274,100	\$23.2M	4,487,800	\$10.5M	95	\$19.1M	\$52.8M	\$41.0M	\$20.5M
EmX	282,900	\$24.0M	4,633,400	\$11.2M	96	\$19.4M	\$54.6M	\$113.0M	\$56.5M
MARTIN LUTHER KING (MLK), JR. BOULEVARD CORRIDOR									
Enhanced Corridor	285,800	\$24.2M	4,653,000	\$10.8M	94	\$18.9M	\$53.9M	\$21M	\$10.5M

Source: MovingAhead Project Team.

Notes:

- 1 Annual Transit VHT = Vehicle hours traveled in revenue service. Revenue service refers to all scheduled time a transit vehicle spends serving passengers. In this case, revenue service is confined to in-service time (excluding layovers, which are included in “Revenue” figures reported to the National Transit Database(NTD)) in order to relate to modelling outputs for the alternatives which are in-service forecasts from the LCOG Regional Travel Demand Model (2016).
- 2 Transit VMT = Vehicle miles traveled in revenue service. Source: “LCOG. LCOG Regional Travel Demand Model. 2016.
- 3 Peak transit vehicles are the number of buses and BRT vehicles necessary to support service during peak periods. A fully allocated cost model uses peak transit vehicles as a proxy for the overall size of the system, and allocates all expenses for the administration and support of the transit system outside of Operations, Operations Training, and Maintenance departments. In addition, costs related to transfers to support LTD’s paratransit and rural services, and insurance for the district are allocated to peak transit vehicles. Source: “LCOG. LCOG Regional Travel Demand Model. 2016.
- 4 Cost forecasts are the product of a fully allocated and fully variable cost model for 2035 in 2016 dollars and based on LTD’s current cost structure. In general, transportation costs are allocated on a per revenue hour basis, fleet maintenance costs are allocated per revenue mile, and all other administrative and support costs are allocated per peak vehicle. Source: LTD. Draft Operating and Maintenance Costs Technical Report. 2017.
- 5 Values represent estimated cost of capital improvements for the alternatives. The No-Build has no capital cost. Values are in 2016 dollars. Source: CH2M. Draft Capital Cost Estimating Technical Report. 2017.
- 6 Values describe potential local matching funds for MovingAhead build alternatives if Small Starts funding for current capital project designs at a 50% FTA/LTD split.

Systemwide Considerations

Investment Packages

The MovingAhead project proposes to extend multimodal improvements in 5 key corridors throughout Eugene.

For each of the environmental disciplines considered in the AA report (Chapter 4 – Chapter 8), each of the alternatives was evaluated individually to determine which would work best for the corridors and their communities. Similarly, the previous section of this financial analysis chapter examines modeled service levels, ridership, and costs at the corridor level so that the relative costs and funding opportunities for the build alternatives may be considered.

The most viable alternatives will be evaluated in combination to determine which package of improvements would work best for the corridor, the transportation system, and the community and could be implemented in the near term. Multiple packages will be developed and evaluated, and will include different combinations of Enhanced Corridor, EmX, and No-Build Alternatives. The LTD Board of Directors and Eugene City Council will consider the findings of this AA along with input from the community to select a preferred package of multimodal investments.

The approach to combining the MovingAhead corridors into investment packages yields several financial advantages. It allows for a comprehensive and orderly plan for funding the corridors capital and O&M costs, instead of the one-corridor-at-a-time approach that is typically used. This approach can also take advantage of combining corridors and/or types of corridor enhancements in a manner that results in more efficient implementation or can use unique funding options.

O&M Funding Risk and Uncertainty of Investment Packages

System benefits improve as MovingAhead alternatives are considered in combination, however the degree of uncertainty for available resources to fund LTD's ongoing O&M costs also grows as the number of alternatives considered to be implemented increases.

Multiple corridors implemented through a package of investments would, in most cases, need to be phased in over time as resource and conditions warrant. LTD will need to conduct a detailed financial analysis to consider the ongoing O&M expense, if multiple alternatives are prioritized, that reflect updated economic conditions and assumptions for future years, systemwide service levels, and revenue projections.

Analysis of Investment Packages

A separate report will be completed following the selection of a preferred package of multimodal investments. The report will document the analysis of packages, community engagement, and the decision-making process for selection of a preferred package of multimodal investments.

Appendix A: Glossary: Acronyms/Abbreviations and Definitions

Acronyms and Abbreviations

AA	Alternatives Analysis	Eugene 2035 TSP	Eugene 2035 Transportation System Plan (City of Eugene, 2017)
ADA	Americans with Disabilities Act	EWEB	Eugene Water and Electric Board
ADT	Average Daily Traffic	FAST Act	Fixing America’s Surface Transportation Act
APC	Alternative Plan Concepts	FOE	Finding of Effect
APE	Area of Potential Effect	FPPA	Farmland Protection Policy Act, 7 U.S.C. 4201-4209 and 7 CFR 658
ARTS	All Roads Transportation Safety Program	FRA	Federal Railroad Administration
ASLA	American Society of Landscape Architects	FTA	Federal Transit Administration
BAT	Business Access and Transit	FTN	Frequent Transit Network
BEST	Better Eugene-Springfield Transportation	GHG	Greenhouse Gas
BMP	Best Management Practice	GIS	Geographic Information System
BPA	Bonneville Power Administration	I-105	Interstate 105
BRT	Bus Rapid Transit	I-5	Interstate 5
Btu	British Thermal Unit	HACSA	Housing and Community Service Agencies of Lane County
CFR	Code of Federal Regulations	ISA	International Society of Arboriculture
CIG	Capital Investment Grant	IT	Information Technology
CIP	Capital Improvement Program	LCC	Lane Community College
City	City of Eugene, Oregon	LCOG	Lane Council of Governments
CO	Carbon Monoxide	LEP	Limited English Proficiency
CO2e	Carbon Dioxide Equivalent	LGAC	Eugene Chamber Local Government Affairs Council
Corps	U.S. Army Corps of Engineers	LOS	Level of Service
DEQ	Oregon Department of Environmental Quality		
EmX	Emerald Express, Lane Transit District’s Bus Rapid Transit System		
Envision Eugene	Envision Eugene: A Community Vision for 2032 (City of Eugene, 2012)		

LPA	Locally Preferred Alternative	RTP	Regional Transportation Plan (Central Lane MPO, 2011, December); the RTP includes the Financially Constrained Roadway Projects List
LTD	Lane Transit District	SCC	Standard Cost Categories
LWCF	Land and Water Conservation Fund	SF	Square Foot
Metro Plan	Metro Plan: Eugene-Springfield Metropolitan Area General Plan (LCOG, 1987, updated 2015)	SPC	Strategic Planning Committee
MLK, Jr.	Martin Luther King, Junior	TASC	Technical Advisory Sub-Committee
MPC	Metropolitan Policy Committee	TCE	Temporary Construction Easement
MPO	Metropolitan Planning Organization	TIGER	Transportation Investment Generating Economic Recovery grants
NEPA	National Environmental Policy Act, 42 U.S.C. 4231-4347	TMDL	Total Maximum Daily Load
NFA	No Further Action	TOD	Transit-Oriented Development
NHPA	National Historic Preservation Act	TPC	Transportation Planning Committee
NOx	Nitrous Oxides	TransPlan	Eugene-Springfield Transportation System Plan (adopted 2001)
NPS	Department of Interior's National Park Service	TSI	Transportation System Improvement
NRHP	National Register of Historic Places	UST	Underground Storage Tank
NTD	National Transit Database	v/c	Volume-to-Capacity
O&M	Operations and Maintenance	VHT	Vehicle Hours Traveled
ODOT	Oregon Department of Transportation	VMT	Vehicle Miles Traveled
OPRD	Oregon Parks and Recreation Department	VOC	Volatile Organic Compound
ORS	Oregon Revised Statutes	WEEE	West Eugene EmX Extension
OTC	Oregon Transportation Commission		
PMT	Project Management Team		
POIP	Program of Interrelated Projects		
ROW	Right of Way		
RSS	Rich Site Summary (or Really Simple Syndication)		

Definitions

303(d) Water Quality Limited Streams

303(d) water quality limited streams do not meet the water quality standard for certain pollutants. Under the federal Clean Water Act, once it is determined that a water quality standard is not met, a total maximum daily load (TMDL) is established to allocate pollutant load reductions to restore water quality and meet water quality standards.

Accessibility

The extent to which facilities are barrier free and useable for all persons with or without disabilities.

Action

An “action,” a federal term, is the construction or reconstruction, including associated activities, of a transportation facility. For the purposes of this Handbook, the terms “project,” “proposal” and “action” are used interchangeably unless otherwise specified. An action may be categorized as a “categorical exclusion” or a “major federal action.”

Adverse Effect

Adverse effects are the totality of significant individual or cumulative human health or environmental effects, including interrelated social and economic effects, which may include, but are not limited to: bodily impairment, infirmity, illness or death; air, noise, and water pollution and soil contamination; destruction or disruption of built or natural resources; destruction or diminution of aesthetic values; destruction or disruption of community cohesion or a community’s economic vitality; destruction or disruption of the availability of public and private facilities and services; vibration; adverse employment effects; displacement of persons, businesses, farms, or nonprofit organizations; increased traffic congestion, isolation, exclusion or separation of minority or low-income individuals within a given community or from the broader community; and the denial of, reduction in, or significant delay in the receipt of, benefits of Department of Transportation programs, policies, or activities.

Alignment

The streets that the transit vehicle would follow from the beginning of the trip to the end of the trip.

Alternatives Analysis

The process of evaluating the costs, benefits and impacts of a range of transportation alternatives designed to address mobility problems and other locally defined objectives in a defined transportation corridor, and for determining which particular investment strategy should be advanced for more focused study and development. The Alternatives Analysis (AA) process provides a foundation for effective decision making.

Area of Potential Effect (APE)

A term used in Section 106 to describe the area in which historic resources may be affected by a federal undertaking.

Area of Potential Impact (API)

The geographic area or areas within which the proposed alternative may directly or indirectly cause beneficial or adverse changes. The Area of Potential Impact (API) may vary in size depending on the mode alternative as well as the specific environmental discipline.

Average Vehicle Delay

Average vehicle delay is the amount of time loss that a vehicle experiences while crossing an intersection.

Boarding

Boarding is a term used in transit to account for passengers of public transit systems. One person getting on a transit vehicle equals one boarding. In many cases individuals will have to transfer to an additional transit vehicle to reach their destination and may well use transit for the return trip. Therefore, a single rider may account for several transit boardings in one day.

Bus Rapid Transit (BRT)

A transit mode that combines the quality of rail transit and the flexibility of buses. It can operate on bus lanes, HOV lanes, expressways, or ordinary streets. The vehicles are designed to allow rapid passenger loading and unloading, with more doors than ordinary buses.

Business Access and Transit Lane (BAT Lane)

A business access and transit (BAT) lane is reserved for buses and right-turning vehicles only. BAT lanes allow access to businesses and residences while improving bus reliability and reducing transit travel time. BAT lanes also enhance the capacity of the remaining travel lanes by removing buses from general traffic. BAT lanes are restricted to transit vehicles except where vehicles enter or exit adjacent property or where they need to make a right turn at an intersection. Typically, only buses are allowed to use the lane to cross an intersecting street. In general, a BAT lane is separated from general-purpose lanes by a paint stripe and signage.

Bus-Only Lanes

Bus-only lanes are reserved for transit. Bus-only lanes may be located in the median of the street or, in some cases, in the outside travel lanes. Other vehicles are typically allowed to cross bus-only lanes only at signalized intersections.

Busway

Exclusive freeway lane for buses and carpools.

Btu

Btu stands for British thermal unit, which is a standard unit of energy. A Btu represents the amount of thermal energy necessary to raise the temperature of 1 pound of pure liquid water by 1 degree Fahrenheit at the temperature at which water has its greatest density (39 degrees Fahrenheit). Using Btu allows us to convert physical units of measure to a common unit of measurement for analysis.

Canvassing

Door-to-door visits to businesses and residents located adjacent to the project to share and gather information.

Capital Improvements Program

A Capital Improvement Plan or Program (CIP) is a short-range plan, usually four to 10 years, which identifies capital projects and equipment purchases, provides a planning schedule and identifies options for funding projects in the program.

Charter Tree

A tree defined by the Eugene Charter (City of Eugene, 2002, updated 2008) as "... (a living, standing, woody plant having a trunk 25 inches in circumference at a point 4 ½ feet above mean ground level at the base of the trunk) of at least fifty years of age within publicly owned rights of way for streets, roads, freeways, throughways, and thoroughfares and within those portions of the city which were in the incorporated boundaries of the city as of January 1, 1915, shall be designated historic street trees and recognized as objects of high historic value and significance in the history of the city and deserving of maintenance and protection." These trees have special historic importance to the City and require special processes be followed if their removal is proposed, including a public vote on the project proposing the removal.

Charter Tree Boundary

Defined by the Eugene Charter (City of Eugene, 2002, updated 2008) as "...those portions of the city which were in the incorporated boundaries of the city as of January 1, 1915." Trees within this boundary may, if they meet certain criteria, be granted the special title and protective status of a Charter Tree, defined above.

City of Eugene Zoning Classifications

All land in Eugene has been zoned to provide areas suitable for certain types of development, including residential, commercial, employment / industrial, public land, and mixed use. The zoning of a specific property is indicated by a code (such as I-3 for Heavy Industrial or PL for Public Land). The most current zoning designation for a property can be found through the City of Eugene's Planning Division. For certain types of impacts, the AA considers the zoning of the property or area.

CO₂e

CO₂e is an abbreviation for carbon dioxide equivalent, which is a standard unit for measuring GHG emissions. The CO₂e allows for the conversion of different greenhouse gases into a common unit of measurement for analysis.

CO₂e Equivalent Energy

CO₂e equivalent energy represents greenhouse gas emissions generated by operation of transit service.

Collector Streets

Collector streets provide a balance of both access and circulation within and between residential and commercial / industrial areas. Collector streets 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.

Corridor

A broad geographical band that follows a general directional flow connecting major sources of trips that may contain a number of streets, highways and transit route alignments. For the MovingAhead project, there are five corridors evaluated in this AA report.

De Minimis Impact

A *de minimis* impact is one that, after taking into account avoidance, minimization, mitigation and enhancement measures, results in no adverse effect to the activities, features, or attributes qualifying a park, recreation area, or refuge for protection under Section (4). For historic properties, a *de minimis* impact determination is made if the Federal Transit Administration (FTA) makes a determination for a property of "No Adverse Effect" or "No Historic Properties Affected" through agency consultation and public input under Section 106, and the SHPO concurs with that determination.

Design Concepts

Design concepts include transit lane configurations (mixed traffic or transit lanes), stop or station locations, landscape and stormwater treatment, and new or revised bicycle and pedestrian facilities.

Direct Energy

Direct energy represents energy consumed for operation of transit service.

Effects

Effects include ecological, aesthetic, historic, cultural, economic, social, or health, whether direct, indirect, cumulative, or short-term construction related. Effects may also include those resulting from actions that may have both beneficial and detrimental effects, even if on balance the agency believes that the effect will be beneficial. Effects include: (1) direct effects that are caused by the action and occur at the same time and place; (2) indirect effects that are caused by the action and are later in time or farther removed in distance but are still reasonably foreseeable and may include growth-inducing effects and other effects related to induced changes in the pattern of land use; population density or growth rate; and related effects on air and water and other natural systems, including ecosystems; (3) cumulative effects that are caused by the action in combination with other past, present and future actions; and (4) construction-related effects that are caused during the construction of the action, are short-term or temporary in nature, and the duration is limited only to the period of construction and the effects cease once construction is completed.

EmX

Lane Transit District’s Bus Rapid Transit System, pronounced “MX”, short for Emerald Express.

Enhanced Crossing

Enhanced crossings consist of installing Americans with Disabilities Act (ADA) ramps and possibly pedestrian crossing islands and/or crosswalk striping. They can also consist of installing either a flashing yellow indicator (flashing beacon) or yellow, red, flashing red indicator (pedestrian hybrid beacon) along the corridor to warn vehicles of a pedestrian crossing.

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.

Envision Eugene

The City of Eugene’s Comprehensive Plan (latest draft or as adopted). Envision Eugene includes a determination of the best way to accommodate the community’s projected needs over the next 20 years.

Evaluation Criteria

Evaluation criteria are the factors used to determine how well each of the proposed multimodal alternatives would meet the project’s Goals and Objectives. The Evaluation Criteria require a mix of quantitative data and qualitative assessment. The resulting data are used to measure the effectiveness of proposed multimodal alternatives and to assist in comparing and contrasting each of the alternatives to select a preferred alternative.

Farmland Protection Policy Act (FPPA)

A 1981 law passed by Congress that seeks to minimize the impact of federal programs and spending that contribute to the conversion of farmland to non-agricultural uses..

Fatal Flaw Screening

The purpose of a Fatal Flaw Screening is to identify alternatives that will not work for one reason or another (e.g., environmental, economic, community). By using a Fatal Flaw Screening process to eliminate alternatives that are not likely to be viable, a project can avoid wasting time or money studying options that are not viable and focus on alternatives and solutions that have the greatest probability of meeting the community’s needs (e.g., environmentally acceptable, economically efficient, implementable).

Fixed Guideway System

A system of vehicles that can operate only on its own guideway constructed for that purpose (e.g., rapid rail, light rail). Federal usage in funding legislation also includes exclusive right of way bus operations, trolley coaches and ferryboats as “fixed guideway” transit.

Fixed Route

Service provided on a repetitive, fixed-schedule basis along a specific route with vehicles stopping to pick up and deliver passengers at set stops and stations; each fixed-route trip serves the same origins and destinations, unlike demand responsive transit service, rideshare, or taxicabs.

Full Acquisition

Acquisition of an entire parcel or property comprised of more than one parcel.

Geographic Information System (GIS)

Data management software tool that enables data to be displayed geographically (i.e., as maps).

Goals and Objectives

Goals and objectives define the project's desired outcome and reflect community values. Goals and objectives are built from the project's Purpose and Need Statement.

Guideway

A transit right of way separated from general purpose vehicles.

Headway

Time interval between transit vehicles passing the same point while moving in the same direction on a particular route.

Heritage Tree

The City of Eugene Urban Forest Management Plan (City of Eugene Public Works Department Maintenance Division, 1992) defines "Heritage Trees" as: "Any tree of exceptional value to our community based on its size (relative to species), history, location, or species, or any combination of these criteria." Such a tree cannot be removed "except when otherwise necessary for the public health, safety, or welfare."

Hydrology

Refers to the flow of water including its volume, where it drains and how quickly it flows.

Impacts

A term to describe the positive or negative effects upon the natural or built environments as a result of an action (i.e., project). Also see "Effects" definition.

Interlining

Two or more transit routes served by the same vehicle to more efficiently provide service and reduce transfers

Key Transit Corridors

Corridors identified in Envision Eugene that promote compact urban development and efficient transportation options and are supported by frequent transit service.

Landscape Tree

A living, standing, woody plant having a trunk that exists on private property.

Layover Time

Time built into a schedule between arrival at the end of a route and the departure for the return trip, used for the recovery of delays and preparation for the return trip.

Level of Service (LOS)

Level of service (LOS) is a measure used by traffic engineers to determine the effectiveness of elements of transportation infrastructure. LOS uses an A (least delay) to F (most delay) rating and is most commonly used to analyze roadway intersections.

Limited English Proficiency (LEP)

A characteristic of individuals who do not speak English as their primary language and have limited ability to read, write, speak, and/or understand English. LEP individuals may be competent in English for certain types of communication (such as, speaking or understanding), but still be LEP for other purposes (such as, reading or writing).

Liquefaction

A phenomenon associated with earthquakes in which sandy to silty, water saturated soils behave like fluids. As seismic waves pass through saturated soil, the structure of the soil distorts, and spaces between soil particles collapse, causing ground failure.

Locally Preferred Alternative (LPA)

The LPA is the corridor option that is deemed by local decision-makers to best meet the project's Purpose and Need and related goals and objectives. This could be the "No-Build" alternative or one of the build alternatives.

Locally Preferred Alternative (LPA)

The LPA is the corridor option that is deemed by local decision-makers to best meet the project's Purpose and Need and related goals and objectives. This could be the "No-Build" alternative or one of the build alternatives.

Low-Income Persons

Those whose median household income is at or below the Department of Health and Human Services' poverty guidelines based on household size. The guidelines are used for administrative purposes to determine financial eligibility for various programs. The household income threshold varies by jurisdiction and is reviewed each year and updated as appropriate. In 2018, for a four-person household with two related children, the poverty threshold for Eugene, Oregon is \$25,100 / year.

Maintenance Energy

Maintenance energy represents energy consumed indirectly for the products and operations necessary to keep the transit system operable.

Maintenance Facility

A facility used to clean, inspect, repair and maintain transit vehicles, as well as to store them when they are not in use.

Major Arterial

Major arterial streets 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.

Metro Plan

The Metro Plan is the official long-range comprehensive plan (public policy document) of the metropolitan Lane County and the cities of Eugene and Springfield. The Metro Plan sets forth general planning policies and land use allocations and serves as the basis for the coordinated development of programs concerning the use and conservation of physical resources, furtherance of assets, and development or redevelopment of the metropolitan area.

Metro Plan Land Use Designations

Land use designations in the Metro Plan are projected future land uses and provide direction for decisions pertaining to appropriate reuse (redevelopment), urbanization of vacant parcels, and additional use of underdeveloped parcels.

Metropolitan Planning Organization (MPO)

The organization designated by local elected officials as being responsible for carrying out the urban transportation and other planning processes for an area.

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.

Minority

A person who is one or more of the following:

- Black: a person having origins in any of the black racial groups of Africa
- Hispanic or Latino: a person of Mexican, Puerto Rican, Cuban, Central or South American, or other Spanish culture or origin, regardless of race
- Asian American: a person having origins in any of the original peoples of the Far East, Southeast Asia, or the Indian subcontinent
- American Indian and Alaskan Native: a person having origins in any of the original people of North America, South America (including Central America), and who maintains cultural identification through tribal affiliation or community recognition
- Native Hawaiian and Other Pacific Islander: people having origins in any of the original peoples of Hawaii, Guam, Samoa, or other Pacific Islands

Mitigation

A means to avoid, minimize, rectify, or reduce an impact, and in some cases, to compensate for an impact.

Mixed-Traffic

Segments of roads where the transit vehicle travels in traffic with other vehicles.

Modal Split

A term which describes how many people use alternative forms of transportation. Frequently used to describe the percentage of people using private automobiles as opposed to the percentage using public transportation. Modal split can also be used to describe travelers using other modes of transportation such as biking or walking.

Mode

The form of travel distinguished by operational characteristics. For the MovingAhead project, modes considered are No-Build (existing regular bus service), Enhanced Corridor (enhanced bus service with some multimodal investments), and EmX (BRT service with more multimodal investments).

MovingAhead Project

In the MovingAhead project, the City of Eugene and LTD are working with regional partners and the community to determine which improvements are needed on some of our most important streets for people using transit, and facilities for people walking, biking and using mobility devices. MovingAhead will prioritize transit, walking, biking, and ADA accessibility projects along these corridors so that they can be funded and built in the near-term.

Multimodal

Multimodal refers to the consideration of multiple transportation modes. For the MovingAhead project, multimodal refers to Corridors that support various transportation modes including vehicles, buses, walking and cycling.

National Environmental Policy Act of 1969 (NEPA)

A comprehensive federal law requiring analysis of the environmental impacts of federal actions such as the construction of transportation projects. The type of environmental documentation required depends on the anticipated level of adverse impacts and/or public controversy. Every major federal action significantly affecting the quality of the human environment requires preparation of an Environmental Impact Statement (EIS).

New Starts

Federal funding granted under Section 3(i) of the Federal Transit Act. These discretionary funds are made available for construction of a new fixed guideway system or extension of any existing fixed guideway system, based on several performance measures and the degree of local financial commitment.

No Action or No-Build Alternative

An alternative that is used as the basis to measure the impacts and benefits of the other alternative(s) in an environmental assessment or other National Environmental Policy Act (NEPA) action. The No-Build alternative consists of the existing conditions, plus any improvements which have been identified in the Statewide Transportation Improvement Program (STIP).

Nodal Development

A strategy to encourage compact, mixed-use development that act as a hub for residents living in the node as well as people in nearby communities.

Noise-Sensitive Uses

The FTA has determined noise-sensitive uses or “receivers” based on community reaction to noise and on change in noise exposure. Noise-sensitive land uses are grouped into 3 categories:

- Where quiet is essential for the intended purpose, such as outdoor amphitheaters, concert pavilions or NRHP landmarks with significant outdoor space.
- Buildings where people normally sleep such as homes, hospitals, and hotels.
- Institutional uses where it is important to avoid interference with activities such as schools, libraries, theaters and churches.

Off-Peak Period

Non-rush periods of the day when travel activity is generally lower and less transit service is scheduled.

Park and Ride

Designated parking areas for automobile drivers who then board transit vehicles from these locations.

Partial Acquisition Acquisition of a portion of a property, often a small strip of land along a roadway frontage.

Peak Hour

The hour of the day in which the maximum demand for transportation service is experienced (refers to private automobiles and transit vehicles).

Peak Period

Weekday morning and afternoon time periods when travel activity is generally higher and transit riding is heaviest.

Purpose and Need

The project Purpose and Need provides a framework for developing and screening alternatives. The purpose is a broad statement of the project’s transportation objectives. The need is a detailed explanation of existing conditions that need to be changed or problems that need to be fixed.

Queuing

Refers to the line of vehicles waiting at an intersection. This typically occurs at signalized intersections.

Regulatory Agency

An agency empowered to issue or deny permits.

Revenue Hours

Hours of transit service available for carrying paying riders.

Revenue Miles

Distance traveled while providing transit service to paying riders.

Revenue Service

Revenue service refers to all scheduled time a transit vehicle spends serving passengers (revenue hours), as well as all distance traveled while providing that service (revenue miles).

Ridership

The number of rides taken by people using a public transportation system in a given time period.

Right of way (ROW)

Publicly owned land that is used for transportation purposes.

Section 106

Section 106 of the National Historic Preservation Act of 1966 requires federal agencies to take into account the effects of their undertakings on historic resources (including archaeological resources), and afford the Advisory Council on Historic Preservation a reasonable opportunity to comment (36 CFR 800.5).

Section 36 CFR 63 Determinations of Eligibility

This federal law provides criteria to determine eligibility for inclusion on the National Register of Historic Places.

Section 4(f) Resources

Section 4(f) of the U.S. Department of Transportation Act of 1966, 49 United States Code 303(c), is a federal law that protects publicly owned, significant parks, recreation areas, wildlife and / or waterfowl refuges, as well as significant historic sites, whether publicly or privately owned. Section 4(f) requirements apply to all transportation projects that require funding or other approvals by the U.S. Department of Transportation (USDOT). As a USDOT agency, the Federal Transit Administration (FTA) must comply with Section 4(f).

Section 6(f) Resources

Section 6(f) properties are recreation resources that received funds from the Land and Water Conservation Fund (LWCF) Act. Land purchased with LWCF grants cannot be converted to a non-recreation use without coordination with the Department of Interior's National Park Service (NPS) and mitigation that includes replacing the quality and quantity of land used. Converting any portion of these lands follows Title 36, Code of Federal Regulations (CFR), Section 59.3 of the Land and Water Conservation Fund Program.

Sitework

Sitework encompasses all work outside of the busway. This work can be categorized as 3 major elements of work: roadway widening, signal reconstruction, and sidewalk reconstruction. Operator break facility construction costs, and bicycle and pedestrian accommodations are also included in sitework.

Springfield 2030

Currently underway, this update to the City of Springfield's Comprehensive Plan will guide and support attainment of the community's livability and economic prosperity goals and redevelopment priorities.

Stakeholder

A person, group, or organization with an interest in or concern about the project.

Strategy

An intended action or series of actions which when implemented achieves the stated goal.

Strip Take

Partial property acquisition of a strip of land along a roadway frontage.

Street Tree

A living, standing, woody plant having a trunk that exists in the public right of way.

Study Area

The area within which evaluation of impacts is conducted. The study area for particular resources will vary based on the decisions being made and the type of resource(s) being evaluated.

Tabling

Project members staffing a table at a community event to engage attendees; sharing project information and soliciting feedback.

Throughput

The number of users being served at any time by the transportation system.

Title VI of the Civil Rights Act of 1964

This policy authorizes and directs the appropriate federal departments and agencies to take action to ensure that discrimination on the grounds of race, color, or national origin shall not occur in connection with programs and activities receiving federal financial assistance.

Trade-Offs Analysis

A trade-offs analysis is intended to aid in the decision-making process by evaluating the trade-offs of different alternatives. For the purpose of the MovingAhead project, the Trade-Offs Analysis looks at both the evaluation of alternatives within each individual corridor, and also evaluates different potential investment packages of corridor improvements for near-term investment and implementation.

Transit Exclusivity

Transit exclusivity consists of exclusive lanes or right of way for transit vehicles (queue jumps, exclusive lanes) and lanes with transit priority (BAT lanes).

Transit Oriented Development (TOD) or Nodal Development

Compact, mixed-use developments situated at or around transit stops. TOD encourages transit ridership, while discouraging sprawl, improving air quality and helping to coordinate a new type of community for residents.

Transit Signal Priority

Transit priority includes treatment at intersections, such as exclusive bus phases and transit signal priority. Exclusive bus phases provide a signal at lights that only transit vehicles can use. Transit signal priority can extend or truncate the green phase at a light when transit vehicles approach an intersection.

Transit Queue Jumps

Transit queue jumps are bus-only lanes approaching intersections to allow buses by-pass vehicles waiting at the intersection, proceed through signals and merge into regular travel lanes ahead of other vehicles. Signals typically provide a phase specifically for buses that is used before the signal phase for the through traffic. Transit queue jumps reduce delay at signals and improve the operational efficiency of the transit system.

Transit System

An organization (public or private) providing local or regional multi-occupancy-vehicle passenger service. Organizations that provide service under contract to another agency are generally not counted as separate systems.

Transit Trip

Transit trips are linked, one-way trips. Even if a passenger must make several transfers during a one-way trip, the trip is counted as 1 linked trip on the system.

Transit Vehicle Hours Traveled (Transit VHT)

The total hours the transit vehicle travels while in revenue service.

Transit Vehicle Miles Traveled (Transit VMT)

The total miles the transit vehicle travels while in revenue service.

Transit Vehicle Carrying Capacity

The total number of seated and standing passengers that can be carried on a transit vehicle.

Transitway

A transit priority lane, possibly using concrete pavement, with or without physical separation, traversable by general-purpose vehicles at signalized intersections.

Two-Stage Left Turn

A 2-stage left turn means that motor vehicles make a left turn from a side street onto the mainline by first crossing one direction of traffic by turning into a median lane, then waiting until the other direction is clear before pulling into the through lanes

Upgraded Crossing

Upgraded crossings consist of installing Americans with Disabilities Act (ADA) ramps and possibly pedestrian crossing islands and/or crosswalk striping.

Vibration-Sensitive Uses

The FTA has determined vibration-sensitive uses or “receivers” based on community reaction to vibration and on change in vibration levels. Vibration-sensitive land uses are grouped into 3 categories:

- Buildings where vibration would interfere with operations within the building such as concert halls, or manufacturing facilities, research buildings or hospitals with vibration-sensitive equipment.
- Buildings where people normally sleep such as homes, hospitals, and hotels.
- Institutional uses where it is important to avoid interference with activities such as schools, churches, institutions, and quiet offices.

Visual Character

A term used to provide an objective description of a viewed landscape that considers and describes the various natural and human-built elements that can be seen.

Volume-to-Capacity (v/c) Ratio

Used as 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 approaches or exceeds 1.00), congestion exists.

Water Quality

Refers to the characteristics of the water, such as its temperature and oxygen levels, how clear it is, and whether it contains pollutants.

WEEE

West Eugene EmX Extension is the name of LTD’s project extending bus rapid transit service from downtown Eugene into west Eugene. The new 5-mile extension of service included investments in facilities for transit, bicyclists, pedestrians, stormwater management, and safety. The new EmX line is called EmX West and opened in 2017.

Appendix B: Discipline Technical Reports Preparers and Reviewers

Discipline	Firm
TECHNICAL EVALUATION UPDATES, ALTERNATIVES ANALYSIS AND SELECTION OF PREFERRED INVESTMENT PACKAGE	
Acquisitions and Displacements	LTD
Alternatives Analysis editor	LTD, City of Eugene, Wannamaker Consulting, WSP
Alternatives Analysis graphics and photos	JLA, LTD, Wannamaker, WSP
Alternatives Analysis report	LTD, Wannamaker, WSP
Community, Neighborhoods, and Environmental Justice	LTD, WSP
Existing Bridge Removal and New Bridge Construction Impacts	WSP
Financial Analysis	LTD
GIS support	LTD, WSP
Land Use and Farmland	LTD
Parklands, Recreation Areas and Section 6(f)	LTD, WSP
Street and Landscape Trees	LTD
Transportation	DKS
Travel Demand Modeling	CH2M
PRELIMINARY SCREENING AND TECHNICAL EVALUATIONS	
Acquisitions	CH2M
Air Quality	Michael Minor & Associates
Capital Cost Estimating	CH2M
Community, Neighborhoods, and Environmental Justice	CH2M
Cultural Resources	Heritage Research Associates
Ecosystems	Environmental Science & Assessment
Energy and Sustainability	DKS
Fatal Flaw Screening	Cities of Eugene and Springfield, LCOG, LTD
Financial Analysis	CH2M
Geology and Seismic	CH2M
Hazardous Materials and Waste	CH2M
Land Use and Farmland	CH2M
Level 1 Screening Evaluation	CH2M, City of Eugene, DKS, LTD, Wannamaker Consulting
Noise and Vibration	Michael Minor & Associates
Operations and maintenance cost estimating	LTD
Parklands, Recreation Areas, Section 6(f)	CH2M
Section 4(f)	CH2M
Street and Landscape Trees	CH2M
Utilities	CH2M
Transportation	DKS
Visual and Aesthetic Resources	CH2M
Water Quality and Hydrology	CH2M
General GIS support	CH2M
Technical Reports editor	CH2M

Appendix C: Summary of Impacts by Corridor

Table C-1: Summary of Highway 99 Corridor Potential Benefits and Impacts by Alternative

	No-Build Alternative	Enhanced Corridor Alternative	EmX Alternative
ACQUISITIONS AND DISPLACEMENTS			
Impacts / Benefits	<ul style="list-style-type: none"> No planned property acquisitions. 	<ul style="list-style-type: none"> No significant adverse impacts; however, property acquisitions and parking impacts will occur, including up to: <ul style="list-style-type: none"> » 44 partial property acquisitions (1.3 acres): all are relatively minor strips from tax lot frontages. » 50 off-street parking spaces eliminated at 6 properties. Circulation impacts at 1 vacant commercial property that may necessitate a full acquisition if the property becomes occupied prior to construction of the project. Partial access closures at up to 4 properties. 	<ul style="list-style-type: none"> No significant adverse impacts; however, property acquisitions and parking impacts will occur, including up to: <ul style="list-style-type: none"> » 38 partial property acquisitions (1.6 acres): all are relatively minor strips from tax lot frontages. » 53 off-street parking spaces eliminated at 6 properties. Circulation impacts at 1 vacant commercial property that may necessitate a full acquisition if the property becomes occupied prior to construction of the project. Access modifications at 1 commercial property and partial access closures at up to 2 properties.
Potential Mitigation Measures	None	<ul style="list-style-type: none"> During final design, consider design refinements that avoid or further minimize site-specific property impacts. If possible, avoid potential full acquisition of 1 commercial property through design refinement. If practical, during final design, consider design refinements to avoid or further minimize off-street parking loss such as parking lot redesign/restriping or other design refinements. Pay property owners at fair market value for the property acquired, consistent with state and federal law. Any owners or tenants displaced would be eligible for relocation assistance as specified in the Uniform Relocation Act. 	<ul style="list-style-type: none"> During final design, consider design refinements that avoid or further minimize site-specific property impacts. If possible, avoid potential full acquisition of 1 commercial property through design refinement. If practical, during final design, consider design refinements to avoid or further minimize off-street parking loss such as parking lot redesign/restriping or other design refinements. Pay property owners at fair market value for the property acquired, consistent with state and federal law. Any owners or tenants displaced would be eligible for relocation assistance as specified in the Uniform Relocation Act.
AIR QUALITY			
Impacts / Benefits	<ul style="list-style-type: none"> No predicted exceedances of relevant air quality standards in 2035. 	<ul style="list-style-type: none"> No predicted exceedances of relevant air quality standards in 2035. Modeling did not show significant differences between this alternative and the No-Build Alternative. During construction, temporary increases in emissions and fugitive dust are expected. 	<ul style="list-style-type: none"> No predicted exceedances of relevant air quality standards in 2035. Modeling did not show significant differences in long-term air quality or emissions between this alternative and the No-Build Alternative. During construction, temporary increases in emissions and fugitive dust are expected.
Potential Mitigation Measures	None	<p>Require construction contractors to:</p> <ul style="list-style-type: none"> Take reasonable precautions to avoid fugitive dust emissions during construction. Comply with local and state air pollution control regulations during construction. Use air quality BMPs during construction. 	<p>Require construction contractors to:</p> <ul style="list-style-type: none"> Take reasonable precautions to avoid fugitive dust emissions during construction. Comply with local and state air pollution control regulations during construction. Use air quality BMPs during construction.

Table C-1: Summary of Highway 99 Corridor Potential Benefits and Impacts by Alternative

	No-Build Alternative	Enhanced Corridor Alternative	EmX Alternative
COMMUNITY, NEIGHBORHOODS, AND ENVIRONMENTAL JUSTICE			
Impacts / Benefits	<ul style="list-style-type: none"> • Would not result in any impacts on neighborhoods, community facilities, or public services. • Would not result in any economic benefits associated with development in the areas around stations. 	<ul style="list-style-type: none"> • Improved pedestrian, bicycle, and transit options would improve connectivity to neighborhoods and access to community facilities. • Construction of a pedestrian bridge across freight railroad would improve non-motorized connections to the Trainsong Neighborhood, which would benefit neighborhood residents including minority and low-income populations. • Loss of up to 50 off-street parking spaces at 6 properties. • Would affect access or drive-through at 1 property, which is currently vacant. This could be potential displacement if property becomes occupied. • Property acquisition impacts would affect 44 properties for total of 1.3 acres. • Removal of up to 14 medium and large trees along the corridor. • Minor property acquisition would affect 3 community facilities. • No disproportionate high and adverse impacts on minority and low-income populations anticipated. • Temporary noise, dust, vibration, and disruption in access to properties would occur if any roadway or lane closures were required or as result of construction equipment blocking access. • Temporary increases in noise and vibration could temporarily affect existing neighborhood noise levels where construction is adjacent or in close proximity to community facilities and public service locations (<i>see Noise and Vibration section</i>). • Purchase of goods and services to construct planned projects, and construction jobs created would result in short-term economic benefits. • Beneficial indirect impacts for neighborhoods with any new development include creating new meeting places for area residents, and new opportunities to live and work near transit. These indirect benefits would be likely to affect a zone of approximately 0.25 mile around the Enhanced Corridor Alternative stops only if zoning permits, development interest is present, and land area is available. 	<ul style="list-style-type: none"> • Same connectivity benefits as Enhanced Corridor Alternative, but to a greater degree because of increased reliability • Construction of pedestrian bridge across freight railroad would improve non-motorized connections to Trainsong Neighborhood, which would benefit neighborhood residents including minority and low-income populations • Loss of up to 53 off-street parking spaces at 6 properties and would affect left-turn access at 14 driveways. • Would affect access or drive-through at 1 property, which is currently vacant. This could be potential displacement if property becomes occupied. • Would restrict 1 business driveway to right-in right-out turning movements. • Property impacts would affect 38 properties for total of 1.6 acres. • Removal of up to 31 medium and large street trees and up to 9 medium and large landscape trees. • Minor property acquisitions would affect 3 community facilities. • No disproportionate high and adverse impacts on minority and low-income populations anticipated. • Temporary noise, dust, vibration, and disruption in access to properties would occur if any roadway or lane closures were required or as result of construction equipment blocking access. • Temporary increases in noise and vibration could temporarily affect existing neighborhood noise levels where construction is adjacent or in close proximity to community facilities and public service locations (<i>see Noise and Vibration section</i>). • Purchase of goods and services to construct planned projects, and construction jobs created would result in short-term economic benefits. • Beneficial indirect impacts for neighborhoods with any new development include creating new meeting places for area residents, and new opportunities to live and work near transit. These indirect benefits would be likely to affect a zone of approximately 0.50 mile around the EmX Alternative stations only if zoning permits, development interest is present, and land area is available.

Table C-1: Summary of Highway 99 Corridor Potential Benefits and Impacts by Alternative

	No-Build Alternative	Enhanced Corridor Alternative	EmX Alternative
Potential Mitigation Measures	None	<ul style="list-style-type: none"> Mitigate anticipated construction-related disruption through implementation of the following methods where possible: flagging and signage, proper staging of equipment, maintaining access to adjacent businesses during normal operating hours, preparing and implementing a traffic detour plan, and a communication and construction update plan. Ensure emergency response vehicles have adequate passage throughout corridor during construction period. During final design, seek to further avoid or minimize property acquisitions and off-street parking impacts. Compensate affected property owners with fair market value according to federal regulations and guidance. 	<ul style="list-style-type: none"> Mitigate anticipated construction-related disruption through implementation of the following methods where possible: flagging and signage, proper staging of equipment, maintaining access to adjacent businesses during normal operating hours, preparing and implementing a traffic detour plan, and a communication and construction update plan. Ensure emergency response vehicles have adequate passage throughout corridor during construction period. During final design, seek to further avoid or minimize property acquisitions and off-street parking impacts. Compensate affected property owners with fair market value according to federal regulations and guidance.
CULTURAL RESOURCES			
Impacts / Benefits	None	<ul style="list-style-type: none"> Potential direct impacts to 4 individual resources and 1 grouping. Potential indirect impacts to 5 resources. Adverse impacts are unlikely because potential effects are anticipated to be avoided through project design. 	<ul style="list-style-type: none"> Potential direct impacts to 4 resources. Potential indirect impacts to 6 individual resources and 1 grouping. Adverse impacts are unlikely because potential effects are anticipated to be avoided through project design.
Potential Mitigation Measures	None	<ul style="list-style-type: none"> During final design, consider measures to avoid or further minimize ROW acquisitions. Where practical, move stop locations away from historic resources. As appropriate and in coordination with regulating agencies, prepare mitigation plan under MOA to offset impacts (interpretation, documentation, etc.). 	<ul style="list-style-type: none"> During final design, consider measures to avoid or further minimize ROW acquisitions. Where practical, move station locations away from historic resources. As appropriate and in coordination with regulating agencies, prepare mitigation plan under MOA to offset impacts (interpretation, documentation, etc.).
ECOSYSTEMS			
Impacts / Benefits	None	<ul style="list-style-type: none"> Increased runoff from 171,124 ft² of new, reconstructed, and adjoining impervious surface. Tree removal resulting in a temporary loss of urban avian habitat. Construction activities would temporarily increase potential to increase sediment transport to waterways. More efficient transit system than No-Build, potentially resulting in less pollutant loading. 	<ul style="list-style-type: none"> Increased runoff from 215,198 ft² of new, reconstructed, and adjoining impervious surface. Tree removal resulting in a temporary loss of urban avian habitat. Construction activities would temporarily increase potential to increase sediment transport to waterways. More efficient transit system than No-Build, potentially resulting in less pollutant loading.
Potential Mitigation Measures	None	<ul style="list-style-type: none"> Comply with applicable local and state water quality treatment standards. Design the project to minimize new pollution-generating impervious surface as much as practicable. 	<ul style="list-style-type: none"> Comply with applicable local and state water quality treatment standards. Design the project to minimize new pollution-generating impervious surface as much as practicable.

Table C-1: Summary of Highway 99 Corridor Potential Benefits and Impacts by Alternative

	No-Build Alternative	Enhanced Corridor Alternative	EmX Alternative
		<ul style="list-style-type: none"> Replace removed street trees at least one for one with species approved by City of Eugene arborists. Replace disturbed landscape trees and landscaping where feasible. Comply with Migratory Bird Treaty Act by avoiding tree removal during nesting season. Utilize BMPs to avoid or minimize impacts to waterways and aquatic species. Avoid wetland impacts by conducting additional wetland determination/delineation and design refinement. 	<ul style="list-style-type: none"> Replace removed street trees at least one for one with species approved by City of Eugene arborists. Replace disturbed landscape trees and landscaping where feasible. Comply with Migratory Bird Treaty Act by avoiding tree removal during nesting season. Utilize BMPs to avoid or minimize impacts to waterways and aquatic species. Avoid wetland impacts by conducting additional wetland determination/delineation and design refinement.
ENERGY, SUSTAINABILITY AND GHG			
Impacts / Benefits	<ul style="list-style-type: none"> Limited potential for sufficient mode shifts away from motor vehicle travel to transit to improve energy use and sustainability. Limited potential for future reduction in indirect energy consumption. 	<ul style="list-style-type: none"> Systemwide reduction in VMT of 0.016% as compared to No-Build Alternative. Systemwide increase in energy consumption of .001% as compared to No-Build. Systemwide increase in GHG emissions of .003% compared to No-Build. Systemwide increase in maintenance and repair energy of 0.015% compared to No-Build. Temporary increase in construction-related energy use and emissions. Cement used for bus stops would require less maintenance than asphalt over time. Project would create jobs and related economic benefits. 	<ul style="list-style-type: none"> Systemwide reduction in VMT of 0.050% as compared to No-Build Alternative. Systemwide reduction in energy consumption of 0.011% as compared to No-Build. Systemwide reduction in GHG emissions of 0.011% as compared to No-Build. Systemwide increase in maintenance and repair energy of 0.022% compared to No-Build. Temporary increase in construction-related energy use and emissions. Cement used for bus/BRT vehicle lanes and stations would require less maintenance than asphalt over time. Project would create jobs and related economic benefits.
Potential Mitigation Measures	None	None	None
GEOLOGY AND SEISMIC			
Impacts / Benefits	<ul style="list-style-type: none"> Impacts would be associated with planned improvements in Eugene TSP that are expected to be developed in Corridor, even without building proposed project. Transportation infrastructure, including transit, within corridor would be affected by slope instability and seismic hazards identified for build alternatives. 	<ul style="list-style-type: none"> Long-term impacts related to geologic and seismic hazards already exist and are the same as for the No-Build Alternative. Proposed project would be within seismically active area but project would meet seismic design standards to minimize the long-term risks to system. Overall risk of impacts because of constructing in landslide hazard areas would be limited for section of Highway 99 between W. 5th Avenue and Roosevelt Boulevard south that has been mapped as moderate (landsliding possible) to high (landsliding likely). 	<ul style="list-style-type: none"> Long-term impacts related to geologic and seismic hazards already exist and are the same as for the No-Build Alternative. Proposed project would be within seismically active area but project would meet seismic design standards to minimize the long-term risks to system. Overall risk of impacts because of constructing in landslide hazard areas would be limited for section of Highway 99 between W. 5th Avenue and Roosevelt Boulevard south that has been mapped as moderate (landsliding possible) to high (landsliding likely).

Table C-1: Summary of Highway 99 Corridor Potential Benefits and Impacts by Alternative

	No-Build Alternative	Enhanced Corridor Alternative	EmX Alternative
		<ul style="list-style-type: none"> Major source of construction vibration and noises would be pile driving, if pile system would be considered for foundation of proposed pedestrian bridge across freight railroad line during project's final design phase. Area of embankment fill and regrading would be anticipated at intersection of Highway 99 and Roosevelt Boulevard and during final design, detailed evaluations would be conducted and, where appropriate, methods of stabilization would be developed. 	<ul style="list-style-type: none"> Major source of construction vibration and noises would be pile driving, if pile system would be considered for foundation of proposed pedestrian bridge across freight railroad line during project's final design phase. Area of embankment fill and regrading would be anticipated at intersection of Highway 99 and Roosevelt Boulevard and during final design, detailed evaluations would be conducted and, where appropriate, methods of stabilization would be developed.
Potential Mitigation Measures	None	<ul style="list-style-type: none"> Detailed study during final design would confirm degree of geologic risk and at sites where geologic conditions were not suitable, appropriate design and construction measures would be implemented to avoid potential effects and geologic risks during operations. Engineering design standards and best management practices would be used to avoid and minimize potential construction impacts. 	<ul style="list-style-type: none"> Detailed study during final design would confirm degree of geologic risk and at sites where geologic conditions were not suitable, appropriate design and construction measures would be implemented to avoid potential effects and geologic risks during operations. Engineering design standards and best management practices would be used to avoid and minimize potential construction impacts.
HAZARDOUS MATERIALS			
Impacts / Benefits	<ul style="list-style-type: none"> Projects proposed under other programs would generate comparable mix and quantity of hazardous materials proportional to magnitude of improvements. Contaminated sites could affect these improvement projects. In areas where no construction is proposed under other programs, would not remediate existing contaminants. 	<ul style="list-style-type: none"> Extent of long-term operation impacts associated with acquisition of properties that are source of contamination would be defined more specifically during subsequent design refinement. Not expected to change number of hazardous materials sites along corridor, although it is likely to result in removal of some contaminated soils and groundwater which, if disposed of outside of the API, would have positive effect on overall environmental conditions within general vicinity. Would not potentially affect any high-risk sites nor any of the 90 medium-risk sites located within corridor API. Construction could inadvertently disturb sites with previously undocumented contamination or could affect known sites with contaminated media. 	<ul style="list-style-type: none"> Extent of long-term operation impacts associated with acquisition of properties that are source of contamination would be defined more specifically during subsequent design refinement. Not expected to change number of hazardous materials sites along corridor, although it is likely to result in removal of some contaminated soils and groundwater which, if disposed of outside of the API, would have positive effect on overall environmental conditions within general vicinity. Could potentially affect 2 high-risk sites. None of the 111 medium-risk sites are within potentially affected tax lots. Construction could inadvertently disturb sites with previously undocumented contamination or could affect known sites with contaminated media.
Potential Mitigation Measures	None	<ul style="list-style-type: none"> During final design and permitting phase, perform Phase I Environmental Site Assessment and Phase II Environmental Site Assessment, if appropriate, as part of due diligence to confirm presence or absence of contaminated environmental media at properties proposed for partial or full acquisition. 	<ul style="list-style-type: none"> During final design and permitting phase, perform Phase I Environmental Site Assessment and Phase II Environmental Site Assessment, if appropriate, as part of due diligence to confirm presence or absence of contaminated environmental media at properties proposed for partial or full acquisition.

Table C-1: Summary of Highway 99 Corridor Potential Benefits and Impacts by Alternative

	No-Build Alternative	Enhanced Corridor Alternative	EmX Alternative
		<ul style="list-style-type: none"> Use construction BMPs that minimize disturbance or release of contaminated media. Prepare and use comprehensive contaminated media management, safety, and environmental response contingency plans, as appropriate, to mitigate direct and indirect impacts from potential release of hazardous substances. Managing and disposing of hazardous or contaminated materials in accordance with applicable local, state and federal regulations. 	<ul style="list-style-type: none"> Use construction BMPs that minimize disturbance or release of contaminated media. Prepare and use comprehensive contaminated media management, safety, and environmental response contingency plans, as appropriate, to mitigate direct and indirect impacts from potential release of hazardous substances. Managing and disposing of hazardous or contaminated materials in accordance with applicable local, state and federal regulations.
LAND USE, PRIME FARMLANDS			
Impacts / Benefits	<ul style="list-style-type: none"> Inconsistent with adopted goals and policies. Transit would not serve all Key Transit Corridors in a manner consistent with local and regional planning policy. 	<ul style="list-style-type: none"> No significant adverse impacts. Generally consistent with most area plans and local land use regulations. Beneficial effects include transit serving Key Transit Corridors in a manner consistent with local and regional planning policy. Conversion of up to approximately 1.3 acres to a transportation-related use. Remove up to 50 off-street parking spaces. No prime farmlands impacts. TOD could occur under this alternative, but potentially not to the same degree or intensity as with the EmX Alternative. 	<ul style="list-style-type: none"> No significant adverse impacts. Consistent with area plans and local land use regulations. Beneficial effects include transit serving Key Transit Corridors in a manner consistent with local and regional planning policy. Conversion of up to approximately 1.6 acres to a transportation-related use. Remove up to 53 off-street parking spaces. No prime farmlands impacts. EmX Alternative would better support and foster accelerated rates of TOD implementation in places that local and regional land use planning documents have designated for Mixed-Use and Multi-Family Residential development than No-Build or Enhanced Corridor Alternatives.
Potential Mitigation Measures	None	<ul style="list-style-type: none"> During final design, consider design modifications which could minimize property acquisition and conversion of land uses to a transportation-related use. During final design, consider refinements to avoid or further minimize off-street parking loss through parking lot redesign/restriping or other design refinements. 	<ul style="list-style-type: none"> During final design, consider design modifications which could minimize property acquisition and conversion of land uses to a transportation-related use. During final design, consider refinements to avoid or further minimize off-street parking loss through parking lot redesign/restriping or other design refinements.
NOISE AND VIBRATION			
Impacts / Benefits	None	<ul style="list-style-type: none"> No significant adverse impacts, however, potential noise impacts on up to 7 multi-family properties based on current guidance in the FTA Manual. No vibration impacts anticipated. 	<ul style="list-style-type: none"> No significant adverse impacts, however, potential noise impacts on up to 19 single family and multi-family properties based on current guidance in the FTA Manual. No vibration impacts anticipated.

Table C-1: Summary of Highway 99 Corridor Potential Benefits and Impacts by Alternative

	No-Build Alternative	Enhanced Corridor Alternative	EmX Alternative
Potential Mitigation Measures	None	<ul style="list-style-type: none"> Where applicable, detailed mitigation planning will be developed in the NEPA documentation phase of the project in accordance with the FTA criteria. 	<ul style="list-style-type: none"> Where applicable, detailed mitigation planning will be developed in the NEPA documentation phase of the project in accordance with the FTA criteria.
PARKLANDS AND RECREATION AREAS			
Impacts / Benefits	None	<ul style="list-style-type: none"> No significant adverse impacts. Improved transit access to all park resources within the corridor with 2 new upgraded and 9 new enhanced bicycle and pedestrian crossings and some increased service frequencies during off-peak hours. New bicycle / pedestrian bridge constructed across rail line, from Highway 99 to Trainsong Park would provide new transit access, which does not exist under the No-Build Alternative. New bicycle / pedestrian bridge over rail line would require approximately, 0.15 acre of property from Trainsong Park, which would no longer be available for recreational purposes, but would not affect continued viability, integrity, usage, or value of the park, nor would it degrade recreational experience. Construction of bicycle / pedestrian bridge between Highway 99 and Trainsong Park would result in minor, short-term, construction-related impacts on Trainsong Park such as short-term, minor increases in noise, dust, and visual intrusion. No Section 6(f) resources would be affected. 	<ul style="list-style-type: none"> No significant adverse impacts. Transit access improved to park resources all along corridor with 8 new enhanced bicycle and pedestrian crossings, increased service frequencies, and new EmX stations. New bicycle / pedestrian bridge constructed across rail line, from Highway 99 to Trainsong Park, would provide new transit access, which does not exist under the No-Build Alternative. New bicycle / pedestrian bridge over rail line would require approximately, 0.15 acre of property from Trainsong Park, which would no longer be available for recreational purposes but would not affect continued viability, integrity, usage, or value of the park, nor would it degrade recreational experience. Construction of bicycle / pedestrian bridge between Highway 99 and Trainsong Park would result in minor, short-term, construction-related impacts on Trainsong Park such as short-term, minor increases in noise, dust, and visual intrusion. No Section 6(f) resources would be affected.
Potential Mitigation Measures	None	<ul style="list-style-type: none"> Where possible, mitigate short-term, minor impacts from construction through coordination of construction timing with Eugene Parks and Open Space Division to avoid or reduce disruptive activities for users of parks and recreation resources and provide adequate barriers and flagging for construction of bicycle / pedestrian bridge to Trainsong Park. Permanent loss of Trainsong Park property would be mitigated, first by further exploring avoidance during subsequent design development phases and, if avoidance is not practical, then in coordination with City consider compensation or enhancing remaining park property consistent with City's park plans. 	<ul style="list-style-type: none"> Where possible, mitigate short-term, minor impacts from construction through coordination of construction timing with Eugene Parks and Open Space Division to avoid or reduce disruptive activities for users of parks and recreation resources and provide adequate barriers and flagging for construction of bicycle / pedestrian bridge to Trainsong Park. Permanent loss of Trainsong Park property would be mitigated, first by further exploring avoidance during subsequent design development phases and, if avoidance is not practical, then in coordination with City consider compensation or enhancing remaining park property consistent with City's park plans.

Table C-1: Summary of Highway 99 Corridor Potential Benefits and Impacts by Alternative

	No-Build Alternative	Enhanced Corridor Alternative	EmX Alternative
SECTION 4(F) RESOURCES			
Impacts / Benefits	None	<ul style="list-style-type: none"> Permanent incorporation of 0.09 acre of parkland from Trainsong Park to construct a pedestrian bridge. Temporary occupancy of Trainsong Park to install pedestrian bridge. Historic resources affected: <ul style="list-style-type: none"> » 3 directly affected » 3 indirectly affected » 2 both directly and indirectly affected Potential <i>de minimis</i> use anticipated: <ul style="list-style-type: none"> » Trainsong Park » 8 Historic Resources 	<ul style="list-style-type: none"> Permanent incorporation of 0.09 acre of parkland from Trainsong Park to construct a pedestrian bridge. Temporary occupancy of Trainsong Park to install pedestrian bridge. Historic resources affected: <ul style="list-style-type: none"> » 1 directly affected » 4 indirectly affected » 3 both directly and indirectly affected Potential <i>de minimis</i> use anticipated: <ul style="list-style-type: none"> » Trainsong Park » 8 Historic Resources
Potential Mitigation Measures	None	<ul style="list-style-type: none"> If mitigation of park property cannot be avoided or further minimized, mitigation would include enhancement of park property through coordination with Eugene Parks and Open Space division and the City's Full 30 Year Vision for Parks and Recreation Capital Projects List with Draft Priorities (City of Eugene, 2017, March 8). In accordance with 23 CFR 774, prepare detailed impacts analyses, determine detailed minimization, compensatory and mitigation measures with concurrence from the agency of jurisdiction over the resources, allow for public review and make a final determination. LTD would seek a <i>de minimis</i> impact determination for resources affected by project actions. 	<ul style="list-style-type: none"> If mitigation of park property cannot be avoided or further minimized, mitigation would include enhancement of park property through coordination with Eugene Parks and Open Space division and the City's Full 30 Year Vision for Parks and Recreation Capital Projects List with Draft Priorities (City of Eugene, 2017, March 8). In accordance with 23 CFR 774, prepare detailed impacts analyses, determine detailed minimization, compensatory and mitigation measures with concurrence from the agency of jurisdiction over the resources, allow for public review and make a final determination. LTD would seek a <i>de minimis</i> impact determination for resources affected by project actions.
STREET AND LANDSCAPE TREES			
(NOTE: STREET TREES ARE LOCATED IN PUBLIC RIGHT-OF-WAY AND LANDSCAPE TREES ARE LOCATED ON PRIVATE PROPERTY.)			
Impacts / Benefits	None	<ul style="list-style-type: none"> No Charter or Heritage trees to be removed. Up to 14 medium and large street trees removed. No landscape trees removed. Existing median street trees at Highway 99 / Roosevelt Boulevard might have short-term impacts because of intersection widening and modifications. 	<ul style="list-style-type: none"> No Charter or Heritage trees to be removed. Up to 31 medium and large street trees removed. Up to 9 landscape trees removed. Existing median street trees at Highway 99 / Roosevelt Boulevard might have short-term impacts because of intersection widening and modifications. Existing landscape trees on north side of Barger Drive might have short-term impacts where sidewalk construction would be adjacent to mature landscape trees on private property.

Table C-1: Summary of Highway 99 Corridor Potential Benefits and Impacts by Alternative

	No-Build Alternative	Enhanced Corridor Alternative	EmX Alternative
Potential Mitigation Measures	None	<ul style="list-style-type: none"> Replant removed street trees in new sidewalk landscaping strips at a ratio of at least 1:1 in coordination with City Urban Forestry staff. Develop a Tree Protection Plan before construction and use BMPs for tree protection during construction. Classify large trees at Roosevelt Boulevard and on Barger Drive. Where practical, adjust design to avoid impacts to these large trees depending on classification during design refinement. 	<ul style="list-style-type: none"> Replant removed street trees in new sidewalk landscaping strips at a ratio of at least 1:1 in coordination with City Urban Forestry staff. Replant removed landscape trees where appropriate through coordination with individual property owners. Develop a Tree Protection Plan before construction and use BMPs for tree protection during construction. Classify large trees at Roosevelt Boulevard and on Barger Drive. Where practical, adjust design to avoid impacts to these large trees depending on classification during design refinement.

TRANSPORTATION AND TRANSIT

Impacts / Benefits	<ul style="list-style-type: none"> No benefit or impact to: <ul style="list-style-type: none"> » roadway capacity » safety » circulation Limited potential: <ul style="list-style-type: none"> » for mode shifts away from motor vehicle travel to transit to reduce single occupancy vehicle trips. » to support locally adopted transportation policies. » to improve connectivity to bicycle or pedestrian facilities. Intersection mobility standards would not be met at 1 intersection under proposed standards. 	<ul style="list-style-type: none"> Improved in-vehicle transit travel time by 10 minutes during the a.m. peak hour inbound compared to No-Build. Some potential for increased transit reliability due to 3.6% increase in transit exclusivity/priority lanes compared to No-Build. Increased average weekday systemwide transit ridership by 370 (0.8%) compared to No-Build. Increased average weekday corridor boardings by 450 compared to No Build. Local traffic operations would improve at 2 intersections. Mobility standards would not be met at 1 intersection under proposed standards. Installation of 6,650 feet (1.26 miles) of new or improved sidewalks on the 11.1 mile corridor, a new pedestrian bridge over heavy rail tracks, 10 new enhanced pedestrian / bike crossings, and 2 new upgraded pedestrian / bike crossings would enhance multi-modal access along the corridor. Moderate safety improvements due to BAT lanes and increased crossing opportunities for bikes and pedestrians. Up to 50 off-street parking stalls impacted, 4 driveway closures, and internal circulation impacts at the Porky’s Palace (closed) site (mitigation is available for Porky’s Palace impacts). Temporary construction-related vehicle delay and bicycle and pedestrian detours. 	<ul style="list-style-type: none"> Improved in-vehicle transit travel time by 12 minutes during the a.m. peak hour over the full length of the corridor compared to No-Build. Greatest potential for increased transit reliability due to 21.9% increase in transit exclusivity/priority lanes compared to No-Build. Increased average weekday systemwide transit ridership by 890 (1.9%) compared to No-Build. Increased average weekday corridor boardings by 1,750 compared to No Build. Local traffic operations would improve at 2 intersections. All intersections would meet proposed mobility standards. Installation of 7,250 feet (1.37 miles) of new or improved sidewalks on the 10.5 mile corridor, a new pedestrian bridge over heavy rail tracks, 21,000 feet (3.98 miles) of improved bike lanes, and 9 new enhanced pedestrian / bike crossings would enhance multi-modal access along the corridor. Greatest safety improvements due to BAT lanes, buffered bike lanes, and increased crossing opportunities for bikes and pedestrians. Up to 53 off-street parking stalls impacted, 2 driveway closures and internal circulation impacts at Porky’s Palace (mitigation is available for Porky’s Palace impacts). Temporary construction-related vehicle delay and bicycle and pedestrian detours.
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Table C-1: Summary of Highway 99 Corridor Potential Benefits and Impacts by Alternative

	No-Build Alternative	Enhanced Corridor Alternative	EmX Alternative
Potential Mitigation Measures	None	<ul style="list-style-type: none"> • During final design, if practical, relocate bus pullout to avoid or minimize impacts to former Porky’s Palace site. • During final design, where possible, use design refinements to avoid or further minimize impacts to off-street parking, circulation, and drive-throughs. • Plan construction to minimize potential impacts where possible to businesses, roadway users, and surrounding communities using a variety of techniques that may include: <ul style="list-style-type: none"> » Limit length of single lane closures. » Work on one side of road at a time. » Construct in shorter segments in locations with high driveway density. » Consider night-time construction hours in areas with greatest number of businesses to further reduce business and traffic disruptions. » Maintain business access points during construction and provide appropriate signage. » As appropriate, use variable message signs to provide road users with advance notice of current or pending construction activities and alternate routes. 	<ul style="list-style-type: none"> • During final design, if practical, relocate bus pullout to avoid or minimize impacts to former Porky’s Palace site. • During final design, where possible, use design refinements to avoid or further minimize impacts to off-street parking, circulation, and drive-throughs. • Plan construction to minimize potential impacts where possible to businesses, roadway users, and surrounding communities using a variety of techniques that may include: <ul style="list-style-type: none"> » Limit length of single lane closures. » Work on one side of road at a time. » Construct in shorter segments in locations with high driveway density. » Consider night-time construction hours in areas with greatest number of businesses to further reduce business and traffic disruptions. » Maintain business access points during construction and provide appropriate signage. » As appropriate, use variable message signs to provide road users with advance notice of current or pending construction activities and alternate routes.
UTILITIES			
Impacts / Benefits	None	<ul style="list-style-type: none"> • Replacement and/or relocation of aging utility infrastructure would provide potential indirect benefit. • Short-term service disruptions during construction. 	<ul style="list-style-type: none"> • Beneficial effect of constructing new fiber connections along length of corridor is improved quality of service, customer safety and operational efficiency. Network bandwidth provided over fiber enables the District to operate HD cameras for monitoring of platforms/stations, deliver real-time information to platform-based display panels and management of platform/stations amenities from a central location for example lighting, irrigation, ticket vending machines, and audio systems. • Replacement and/or relocation of aging utility infrastructure would provide potential indirect benefit. • Short-term service disruptions during construction.

Table C-1: Summary of Highway 99 Corridor Potential Benefits and Impacts by Alternative

	No-Build Alternative	Enhanced Corridor Alternative	EmX Alternative
Potential Mitigation Measures	None	<ul style="list-style-type: none"> • Modify project design, where feasible, to avoid and minimize impacts to utilities. • Coordinate with utility providers early and throughout design and construction process. • Use environmental BMPs during construction and relocation to mitigate potential hazards. • Notify businesses and residences, as appropriate, for extended service disruptions. 	<ul style="list-style-type: none"> • Modify project design, where feasible, to avoid and minimize impacts to utilities. • Coordinate with utility providers early and throughout design and construction process. • Use environmental BMPs during construction and relocation to mitigate potential hazards. • Notify businesses and residences, as appropriate, for extended service disruptions.
VISUAL AND AESTHETIC RESOURCES			
Impacts / Benefits	None	<ul style="list-style-type: none"> • Up to 14 trees removed. • 0.9 mile of high to moderate potential to change visual character of scattered areas along corridor. • Replanted trees could be selected to develop a more visually unified corridor. • 10 new enhanced and 2 new upgraded bicycle and pedestrian crossings would assist in visually unifying the corridor. • Proposed Trainsong Bridge would add new vivid visual element to the corridor and serve as an elevated viewing platform. • Construction activities and equipment would temporarily alter the appearance of the corridor, particularly in areas where existing trees would need to be removed. 	<ul style="list-style-type: none"> • Up to 40 trees removed. • 0.9 mile of high to moderate potential change to visual character of scattered areas along corridor. • Replanted trees could be selected to develop a more visually unified corridor. • 9 new enhanced bicycle and pedestrian crossings would assist in visually unifying the corridor. • Proposed Trainsong Bridge would add new vivid visual element to the corridor and serve as an elevated viewing platform. • 14 new EmX stations would be constructed, which would assist in visually unifying the corridor. • Construction activities and equipment would temporarily alter the appearance of the corridor, particularly in areas where existing trees would need to be removed.
Potential Mitigation Measures	None	<ul style="list-style-type: none"> • Replace all removed street trees at a ratio of at least one tree planted for one tree removed or as otherwise required by Eugene Code and coordinated with City Urban Forestry staff on tree species, planting locations, and soil conditions per City standards. • Replace removed landscape trees where possible through coordination with individual property owners. • Develop a Tree Protection Plan before construction and use BMPs for tree protection during construction. • Classify large trees at Roosevelt Boulevard and on Barger Drive. Where practical, adjust design to avoid impacts to these large trees depending on classification during design refinement. 	<ul style="list-style-type: none"> • Replace all removed street trees at a ratio of at least one tree planted for one tree removed or as otherwise required by Eugene Code and coordinated with City Urban Forestry staff on tree species, planting locations, and soil conditions per City standards. • Replace removed landscape trees where possible through coordination with individual property owners. • Develop a Tree Protection Plan before construction and use BMPs for tree protection during construction. • Classify large trees at Roosevelt Boulevard and on Barger Drive. Where practical, adjust design to avoid impacts to these large trees depending on classification during design refinement.

Table C-1: Summary of Highway 99 Corridor Potential Benefits and Impacts by Alternative

	No-Build Alternative	Enhanced Corridor Alternative	EmX Alternative
WATER QUALITY			
Impacts / Benefits	<ul style="list-style-type: none"> New and reconstructed impervious area for constructed projects identified in Draft Eugene 2035 TSP. Potential for temporary construction-related sediment release related to TSP projects. 	<ul style="list-style-type: none"> 171,124 ft² of new and reconstructed impervious area in Amazon Creek Basin, of which 64,824 ft² would be new roadway and sidewalk. No direct impacts to either Amazon Creek or Willamette River floodplains. Potential for temporary construction-related sediment release. With mitigation measures, such as water quality and flow control facilities, there would be net water quality improvement associated with reconstructed impervious areas and impacts of new impervious area would be reduced. 	<ul style="list-style-type: none"> 215,198 ft² of new and reconstructed impervious area in Amazon Creek Basin, of which 92,902 ft² would be new roadway and sidewalk. No direct impacts to either Amazon Creek or Willamette River floodplains. Temporary potential for construction-related sediment release. With mitigation measures, such as water quality and flow control facilities, there would be net water quality improvement associated with reconstructed impervious areas and impacts of new impervious area would be reduced.
Potential Mitigation Measures	<ul style="list-style-type: none"> Water quality and flow control facilities located near major areas of construction. Erosion control and sediment prevention activities. 	<ul style="list-style-type: none"> Comply with applicable local, state and federal water quality treatment standards and regulations, Implement vegetated and mechanical stormwater runoff treatment BMPs, as appropriate and approved by regulating agencies. To decrease overall impacts, construct water quality and flow control facilities at the following possible intersections, as appropriate and approved by regulating agencies: <ul style="list-style-type: none"> » W. 6th Avenue and W. 7th Avenue » Highway 99 and Fairfield Avenue » Highway 99 and Barger Drive » Ruskin Street and Barger Drive Implement temporary erosion and sediment control activities to lessen impacts to project surroundings during construction. 	<ul style="list-style-type: none"> Comply with applicable local, state and federal water quality treatment standards and regulations, Implement vegetated and mechanical stormwater runoff treatment BMPs, as appropriate and approved by regulating agencies. To decrease overall impacts, construct water quality and flow control facilities at the following possible intersections, as appropriate and approved by regulating agencies: <ul style="list-style-type: none"> » W. 6th Avenue and W. 7th Avenue » Highway 99 and Fairfield Avenue » Highway 99 and Barger Drive » Ruskin Street and Barger Drive Implement temporary erosion and sediment control activities to lessen impacts to project surroundings during construction.

Table C-2: Summary of River Road Corridor Potential Benefits and Impacts by Alternative

	No-Build Alternative	Enhanced Corridor Alternative	EmX Alternative
ACQUISITIONS AND DISPLACEMENTS			
Impacts / Benefits	<ul style="list-style-type: none"> No planned property acquisitions. 	<ul style="list-style-type: none"> No significant adverse impacts, however, property acquisitions and parking impacts will occur, including up to: <ul style="list-style-type: none"> 3 partial property acquisitions (0.2 acre): all are relatively minor strips from tax lot frontages. 2 full property acquisitions (1.1 acres) (commercial properties). 2 off-street parking spaces would be eliminated at 1 property. 4 businesses would be displaced as a result of the closure of 4 drive-throughs, including 2 fast food restaurants, 1 auto repair business, and 1 bank. 	<ul style="list-style-type: none"> No significant adverse impacts, however, property acquisitions and parking impacts will occur, including up to: <ul style="list-style-type: none"> 37 partial property acquisitions (0.6 acre): all are relatively minor strips from tax lot frontages. 3 full property acquisitions (1.6 acres) (commercial properties). 31 off-street parking spaces would be eliminated at 7 properties. Partial access closures at 6 properties. 6 businesses would be displaced as a result of the closure of 6 drive-throughs, including 1 coffee shop, 1 auto repair business, 2 fast food restaurants, and 2 banks.
Potential Mitigation Measures	None	<ul style="list-style-type: none"> During final design, consider design refinements that avoid or further minimize site-specific property impacts. During final design, consider design refinement and strategies listed in the Addendum to MovingAhead Alternatives Analysis Technical Reports Memo to avoid full acquisition of properties. If practical, during final design, consider design refinements to avoid or further minimize off-street parking loss such as parking lot redesign/restriping or other design refinements. Pay property owners at fair market value for the property acquired, consistent with state and federal law. Any owners or tenants displaced would be eligible for relocation assistance as specified in the Uniform Relocation Act. 	<ul style="list-style-type: none"> During final design, consider design refinements that avoid or further minimize site-specific property impacts During final design, consider design refinement and strategies listed in the Addendum to MovingAhead Alternatives Analysis Technical Reports Memo to avoid full acquisition of properties If practical, during final design, consider design refinements to avoid or further minimize off-street parking loss such as parking lot redesign/restriping or other design refinements. Pay property owners at fair market value for the property acquired, consistent with state and federal law. Any owners or tenants displaced would be eligible for relocation assistance as specified in the Uniform Relocation Act.
AIR QUALITY			
Impacts / Benefits	<ul style="list-style-type: none"> No predicted exceedances of relevant air quality standards in 2035. 	<ul style="list-style-type: none"> No predicted exceedances of relevant air quality standards in 2035. Modeling did not show significant differences between this alternative and the No-Build Alternative. During construction, temporary increase in emissions and fugitive dust are expected. 	<ul style="list-style-type: none"> No predicted exceedances of relevant air quality standards in 2035. Modeling did not show significant differences between this alternative and the No-Build Alternative. During construction, temporary increase in emissions and fugitive dust are expected.
Potential Mitigation Measures	None	<p>Require construction contractors to:</p> <ul style="list-style-type: none"> Take reasonable precautions to avoid fugitive dust emissions during construction. Comply with local and state air pollution control regulations during construction. Use air quality BMPs during construction. 	<p>Require construction contractors to:</p> <ul style="list-style-type: none"> Take reasonable precautions to avoid fugitive dust emissions during construction. Comply with local and state air pollution control regulations during construction. Use air quality BMPs during construction.

Table C-2: Summary of River Road Corridor Potential Benefits and Impacts by Alternative

	No-Build Alternative	Enhanced Corridor Alternative	EmX Alternative
COMMUNITY, NEIGHBORHOODS, ENVIRONMENTAL JUSTICE			
Impacts / Benefits	<ul style="list-style-type: none"> • Would not result in any impacts on neighborhoods, community facilities, or public services. • Would not result in any economic benefits associated with development in the areas around stations. 	<ul style="list-style-type: none"> • Improved pedestrian, bicycle, and transit options would improve connectivity to neighborhoods and access to community facilities. • Would result in loss of up to 2 off-street parking spaces at 1 properties. • Would affect circulation or drive-through at 4 properties. • Property acquisition impacts would affect 5 properties for total of 1.3 acres. • Would potentially displace 4 businesses. • Removal of up to 13 medium and large street trees. • No potential noise impacts. • No property acquisition effects to community facilities. • No disproportionate high and adverse impacts on minority and low-income populations anticipated. • Temporary noise, dust, vibration, and disruption in access to properties would occur if any roadway or lane closures were required or as result of construction equipment blocking access. • Temporary increases in noise and vibration could temporarily affect existing neighborhood noise levels where construction is adjacent or in close proximity to community facilities and public service locations (see Noise and Vibration section). • Purchase of goods and services to construct planned projects, and construction jobs created would result in short-term economic benefits. • Beneficial indirect impacts for neighborhoods with any new development include creating new meeting places for area residents, and new opportunities to live and work near transit. These indirect benefits would be likely to affect a zone of approximately 0.25 mile around the Enhanced Corridor Alternative stops only if zoning permits, development interest is present, and land area is available. 	<ul style="list-style-type: none"> • Same connectivity benefits as Enhanced Corridor Alternative, but to a greater degree because of increased reliability. • Would result in loss of up to 31 off-street parking spaces at 7 properties. • Would affect circulation or drive-through at 6 properties. • Property acquisition impacts would affect 40 properties for total of 2.2 acres. • Would potentially displace 6 businesses. • Removal of up to 132 medium and large street trees. • Potential noise impacts on up to 2 properties, but mitigation can likely eliminate impacts. • Minor property acquisitions would affect 3 community facilities. • Could affect 1 high-risk hazardous material site. • No disproportionate high and adverse impacts on minority and low-income populations anticipated. • Temporary noise, dust, vibration, and disruption in access to properties would occur if any roadway or lane closures were required or as result of construction equipment blocking access. • Temporary increases in noise and vibration could temporarily affect existing neighborhood noise levels where construction is adjacent or in close proximity to community facilities and public service locations (see Noise and Vibration section). • Purchase of goods and services to construct planned projects, and construction jobs created would result in short-term economic benefits. • Beneficial indirect impacts for neighborhoods with any new development include creating new meeting places for area residents, and new opportunities to live and work near transit. These indirect benefits would be likely to affect a zone of approximately 0.50 mile around the EmX Alternative stations only if zoning permits, development interest is present, and land area is available.

Table C-2: Summary of River Road Corridor Potential Benefits and Impacts by Alternative

	No-Build Alternative	Enhanced Corridor Alternative	EmX Alternative
Potential Mitigation Measures	None	<ul style="list-style-type: none"> Mitigate anticipated construction-related disruption through implementation of the following methods where possible: flagging and signage, proper staging of equipment, maintaining access to adjacent businesses during normal operating hours, preparing and implementing a traffic detour plan, and a communication and construction update plan. Ensure emergency response vehicles have adequate passage throughout corridor during construction period. During final design, seek to further avoid or minimize property acquisitions and off-street parking impacts. Compensate affected property owners with fair market value according to federal regulations and guidance. Compensate affected property owners with fair market value according to federal regulations and guidance. Street tree removals replanted at a ratio of at least 1:1 in coordination with City Urban Forestry staff. 	<ul style="list-style-type: none"> Mitigate anticipated construction-related disruption through implementation of the following methods where possible: flagging and signage, proper staging of equipment, maintaining access to adjacent businesses during normal operating hours, preparing and implementing a traffic detour plan, and a communication and construction update plan. Ensure emergency response vehicles have adequate passage throughout corridor during construction period. During final design, seek to further avoid or minimize property acquisitions and off-street parking impacts. Compensate affected property owners with fair market value according to federal regulations and guidance. Compensate affected property owners with fair market value according to federal regulations and guidance. Street tree removals replanted at a ratio of at least 1:1 in coordination with City Urban Forestry staff.
CULTURAL RESOURCES			
Impacts / Benefits	None	<ul style="list-style-type: none"> Potential direct impacts to 4 resources. Potential indirect impacts to 22 resources. Adverse impacts are unlikely because potential effects are anticipated to be avoided through project design. 	<ul style="list-style-type: none"> Potential direct impacts to 12 resources. Potential indirect impacts to 8 resources. Adverse impacts are unlikely because potential effects are anticipated to be avoided through project design.
Potential Mitigation Measures	None	<ul style="list-style-type: none"> During final design, consider measures to avoid or further minimize ROW acquisitions. Where practical, move stop locations away from historic resources. As appropriate and in coordination with regulating agencies, prepare mitigation plan under MOA to offset impacts (interpretation, documentation, etc.). 	<ul style="list-style-type: none"> During final design, consider measures to avoid or further minimize ROW acquisitions. Where practical, move station locations away from historic resources. As appropriate and in coordination with regulating agencies, prepare mitigation plan under MOA to offset impacts (interpretation, documentation, etc.).
ECOSYSTEMS			
Impacts / Benefits	None	<ul style="list-style-type: none"> Runoff from 109,573 ft² of new, reconstructed, and adjoining impervious surface. Tree removal resulting in a temporary loss of urban avian habitat. Construction activities would temporarily increase potential to increase sediment transport to waterways. More efficient transit system than No-Build, potentially resulting in less pollutant loading. 	<ul style="list-style-type: none"> Runoff from 748,850 ft² of new, reconstructed, and adjoining impervious surface. Tree removal resulting in a temporary loss of urban avian habitat. Construction activities would temporarily increase potential to increase sediment transport to waterways. More efficient transit system than No-Build, potentially resulting in less pollutant loading.

Table C-2: Summary of River Road Corridor Potential Benefits and Impacts by Alternative

	No-Build Alternative	Enhanced Corridor Alternative	EmX Alternative
Potential Mitigation Measures	None	<ul style="list-style-type: none"> Comply with applicable local and state water quality treatment standards. Design the project to minimize new pollution-generating impervious surface as much as practicable. Replace removed street trees at least one for one with species approved by City of Eugene arborists. Replace disturbed landscape trees and landscaping where feasible. Comply with Migratory Bird Treaty Act by avoiding tree removal during nesting season. Utilize BMPs to avoid or minimize impacts to waterways and aquatic species. Avoid wetland impacts by conducting additional wetland determination/ delineation and design refinement. 	<ul style="list-style-type: none"> Comply with applicable local and state water quality treatment standards. Design the project to minimize new pollution-generating impervious surface as much as practicable. Replace removed street trees at least one for one with species approved by City of Eugene arborists. Replace disturbed landscape trees and landscaping where feasible. Comply with Migratory Bird Treaty Act by avoiding tree removal during nesting season. Utilize BMPs to avoid or minimize impacts to waterways and aquatic species. Avoid wetland impacts by conducting additional wetland determination/ delineation and design refinement.

ENERGY, SUSTAINABILITY AND GHG

Impacts / Benefits	<ul style="list-style-type: none"> Limited potential for sufficient mode shifts away from motor vehicle travel to transit to improve energy use and sustainability. Limited potential for future reduction in indirect energy consumption. 	<ul style="list-style-type: none"> Systemwide reduction in VMT of 0.010% as compared to No-Build Alternative. Systemwide reduction in energy consumption of .007% as compared to No-Build. Systemwide reduction in GHG emissions of .006% compared to No-Build. Systemwide reduction in maintenance and repair energy of 0.003% compared to No-Build. Temporary increase in construction-related energy use and emissions. Cement used for bus stops would require less maintenance than asphalt over time. Project would create jobs and related economic benefits. 	<ul style="list-style-type: none"> Systemwide reduction in VMT of 0.010% as compared to No-Build Alternative. Systemwide increase in energy consumption of 0.031% as compared to No-Build. Systemwide increase in GHG emissions of 0.031% as compared to No-Build. Systemwide increase in maintenance and repair energy of 0.070% compared to No-Build. Temporary increase in construction-related energy use and emissions. Cement used for bus/BRT vehicle lanes and stations would require less maintenance than asphalt over time. Project would create jobs and related economic benefits.
Potential Mitigation Measures	None	None	None

GEOLOGY AND SEISMIC

Impacts / Benefits	<ul style="list-style-type: none"> Impacts would be associated with planned improvements in Eugene TSP that are expected to be developed in Corridor, even without building proposed project. 	<ul style="list-style-type: none"> Long-term impacts related to geologic and seismic hazards already exist and are the same as for the No-Build Alternative. Proposed project would be within seismically active area but project would meet seismic design standards to minimize the long-term risks to system. 	<ul style="list-style-type: none"> Long-term impacts related to geologic and seismic hazards already exist and are the same as for the No-Build Alternative. Proposed project would be within seismically active area but project would meet seismic design standards to minimize the long-term risks to system.
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Table C-2: Summary of River Road Corridor Potential Benefits and Impacts by Alternative

	No-Build Alternative	Enhanced Corridor Alternative	EmX Alternative
	<ul style="list-style-type: none"> Transportation infrastructure, including transit, within corridor would be affected by slope instability and seismic hazards identified for build alternatives. 	<ul style="list-style-type: none"> Overall risk of impacts because of constructing in landslide hazard areas would be limited for sections of Chambers Street between W. 2nd Avenue and the Northwest Expressway and River Road at the Randy Papé Beltline Highway interchange that have been mapped as moderate (landsliding possible) to high (landsliding likely). Major source of construction vibration and noises would be from vibratory rollers and jack hammers. Settlements from new earth loads would be expected to be negligible. Risk of impact to utilities and buried structures would be considered low. Potential soil excavation volumes are expected to would be minor. 	<ul style="list-style-type: none"> Overall risk of impacts because of constructing in landslide hazard areas would be limited for sections of Chambers Street between W. 2nd Avenue and the Northwest Expressway and River Road at the Randy Papé Beltline Highway interchange that have been mapped as moderate (landsliding possible) to high (landsliding likely). Major source of construction vibration and noises would be from vibratory rollers and jack hammers. Settlements from new earth loads would be expected to be negligible. Risk of impact to utilities and buried structures would be considered low. Potential soil excavation volumes are expected to would be minor.
Potential Mitigation Measures	None	<ul style="list-style-type: none"> Detailed study during final design would confirm degree of geologic risk and at sites where geologic conditions were not suitable, appropriate design and construction measures would be implemented to avoid potential effects and geologic risks during operations. Engineering design standards and best management practices would be used to avoid and minimize potential construction impacts. 	<ul style="list-style-type: none"> Detailed study during final design would confirm degree of geologic risk and at sites where geologic conditions were not suitable, appropriate design and construction measures would be implemented to avoid potential effects and geologic risks during operations. Engineering design standards and best management practices would be used to avoid and minimize potential construction impacts.
HAZARDOUS MATERIALS			
Impacts / Benefits	<ul style="list-style-type: none"> Projects proposed under other programs would generate comparable mix and quantity of hazardous materials proportional to magnitude of improvements. Contaminated sites could affect these improvement projects. In areas where no construction is proposed under other programs, would not remediate existing contaminants. 	<ul style="list-style-type: none"> Extent of long-term operation impacts associated with acquisition of properties that are source of contamination would be defined more specifically during subsequent design refinement. Not expected to change number of hazardous materials sites along corridor, although it is likely to result in removal of some contaminated soils and groundwater which, if disposed of outside of the API, would have positive effect on overall environmental conditions within general vicinity. Would not potentially affect any high-risk sites nor any of the 101 medium-risk sites located within corridor API. Construction could inadvertently disturb sites with previously undocumented contamination or could affect known sites with contaminated media. 	<ul style="list-style-type: none"> Extent of long-term operation impacts associated with acquisition of properties that are source of contamination would be defined more specifically during subsequent design refinement. Not expected to change number of hazardous materials sites along corridor, although it is likely to result in removal of some contaminated soils and groundwater which, if disposed of outside of the API, would have positive effect on overall environmental conditions within general vicinity. Could potentially affect 1 high-risk site. None of the 106 medium-risk sites located within the API are within potentially affected tax lots.

Table C-2: Summary of River Road Corridor Potential Benefits and Impacts by Alternative

	No-Build Alternative	Enhanced Corridor Alternative	EmX Alternative
Potential Mitigation Measures	None	<ul style="list-style-type: none"> • During final design and permitting phase, perform Phase I Environmental Site Assessment and Phase II Environmental Site Assessment, if appropriate, as part of due diligence to confirm presence or absence of contaminated environmental media at properties proposed for partial or full acquisition. • Use construction BMPs that minimize disturbance or release of contaminated media. • Prepare and use comprehensive contaminated media management, safety, and environmental response contingency plans, as appropriate, to mitigate direct and indirect impacts from potential release of hazardous substances. • Managing and disposing of hazardous or contaminated materials in accordance with applicable local, state and federal regulations. 	<ul style="list-style-type: none"> • During final design and permitting phase, perform Phase I Environmental Site Assessment and Phase II Environmental Site Assessment, if appropriate, as part of due diligence to confirm presence or absence of contaminated environmental media at properties proposed for partial or full acquisition. • Use construction BMPs that minimize disturbance or release of contaminated media. • Prepare and use comprehensive contaminated media management, safety, and environmental response contingency plans, as appropriate, to mitigate direct and indirect impacts from potential release of hazardous substances. • Managing and disposing of hazardous or contaminated materials in accordance with applicable local, state and federal regulations.
LAND USE, PRIME FARMLANDS			
Impacts / Benefits	<ul style="list-style-type: none"> • Inconsistent with adopted goals and policies. • Transit would not serve all Key Transit Corridors in a manner consistent with local and regional planning policy. 	<ul style="list-style-type: none"> • No significant adverse impacts. • Generally consistent with most area plans and local land use regulations. • Beneficial effects include transit serving Key Transit Corridors in a manner consistent with local and regional planning policy. • Conversion of up to approximately 1.3 acres to a transportation-related use. • Eliminate up to 2 off-street parking spaces. • No prime farmlands impacts. • TOD could occur under this alternative, but potentially not to the same degree or intensity as with the EmX Alternative. 	<ul style="list-style-type: none"> • No significant adverse impacts. • Consistent with area plans and local land use regulations. • Beneficial effects include transit serving Key Transit Corridors in a manner consistent with local and regional planning policy. • Conversion of up to approximately 2.2 acres to a transportation-related use. • Eliminate up to 31 off-street parking spaces. • EmX Alternative would better support and foster accelerated rates of TOD implementation in places that local and regional land use planning documents have designated for Mixed-Use and Multi-Family Residential development than No-Build or Enhanced Corridor Alternatives.
Potential Mitigation Measures	None	<ul style="list-style-type: none"> • During final design, consider design modifications which could minimize property acquisition and conversion of land uses to a transportation-related use. • During final design, consider refinements to avoid or further minimize off-street parking loss through parking lot redesign/restriping or other design refinements. 	<ul style="list-style-type: none"> • During final design, consider design modifications which could minimize property acquisition and conversion of land uses to a transportation-related use. • During final design, consider refinements to avoid or further minimize off-street parking loss through parking lot redesign/restriping or other design refinements.

Table C-2: Summary of River Road Corridor Potential Benefits and Impacts by Alternative

	No-Build Alternative	Enhanced Corridor Alternative	EmX Alternative
NOISE AND VIBRATION			
Impacts / Benefits	None	<ul style="list-style-type: none"> No noise impacts anticipated. No vibration impacts anticipated. 	<ul style="list-style-type: none"> No significant adverse impacts, however, potential noise impacts on up to 2 single family properties. No vibration impacts anticipated.
Potential Mitigation Measures	None	<ul style="list-style-type: none"> None required, however, during final design, should noise and vibration impacts be discovered, where applicable, detailed mitigation planning will be developed in the NEPA documentation phase of the project in accordance with the FTA criteria. 	<ul style="list-style-type: none"> Where applicable, detailed mitigation planning will be developed in the NEPA documentation phase of the project in accordance with the FTA criteria.
PARKLANDS AND RECREATION AREAS			
Impacts / Benefits	None	<ul style="list-style-type: none"> No significant adverse impacts. Transit accessibility improved all along corridor with 6 new and 1 replaced enhanced bicycle and pedestrian crossings, improvements to existing bus stops, and construction of new stops. Increased frequency of transit service near Scobert Gardens. Enhanced bicycle/pedestrian crossings would improve access to West Bank Park and Razor Park. Construction of sidewalk and enhanced shelter could require acquisition of 0.03 acre of West Bank Park, though there would not be a loss of park amenities. Construction along the outer edges of the western boundary of West Bank and Razor Parks could result in users of the parks experiencing short-term, minor increases in noise, dust, and visual intrusion. 	<ul style="list-style-type: none"> No significant adverse impacts. Transit accessibility improved all along corridor with 4 new and 1 replaced enhanced bicycle and pedestrian crossings and new EmX stations. Transit reliability improved with construction of queue jumps at some intersections, BAT lanes, and traffic signal reconstruction. Increased frequency of transit service near West Bank Park, Razor Park, and River Road Park. Enhanced bicycle/pedestrian crossings would improve access to West Bank Park and Razor Park. Construction of a sidewalk and EmX station could require acquisition of 0.06 acre of West Bank Park, though there would not be a loss of park amenities. Construction of a bike lane could require 0.09 acre of Razor Park, though there would not be a loss of park amenities. Construction along the outer edges of the western boundary of West Bank and Razor Parks could result in users of the parks experiencing short-term, minor increases in noise, dust, and visual intrusion.
Potential Mitigation Measures	None	<ul style="list-style-type: none"> Where possible, mitigate short-term, minor impacts from construction through coordination of construction timing with Eugene Parks and Open Space Division to avoid or reduce disruptive activities for users of parks and recreation resources. Permanent loss of West Bank Park property would be mitigated, first by further exploring avoidance during subsequent design development phases and, if avoidance is not practical, then in coordination with City consider compensation or enhancing remaining park property consistent with City's park plans. 	<ul style="list-style-type: none"> Where possible, mitigate short-term, minor impacts from construction through coordination of construction timing with Eugene Parks and Open Space Division to avoid or reduce disruptive activities for users of parks and recreation resources. Permanent loss of Razor Park and West Bank Park property would be mitigated, first by further exploring avoidance during subsequent design development phases and, if avoidance is not practical, then in coordination with City consider compensation or enhancing remaining park property consistent with City's park plans.

Table C-2: Summary of River Road Corridor Potential Benefits and Impacts by Alternative

	No-Build Alternative	Enhanced Corridor Alternative	EmX Alternative
SECTION 4(F) RESOURCES			
Impacts / Benefits	None	<ul style="list-style-type: none"> • Permanent incorporation of 0.03 acre of parkland from West Bank Park to construct a new shelter and sidewalk. • Temporary occupancy of West Bank Park to install a bus shelter and sidewalk. • No activities, features, or attributes would be permanently impacted by project actions nor would temporary construction actions at the park permanently or temporarily interfere with visitors using the park. • Historic resources affected: <ul style="list-style-type: none"> » 2 directly affected » 20 indirectly affected » 2 both directly and indirectly affected • Potential <i>de minimis</i> use anticipated: <ul style="list-style-type: none"> » West Bank Park » 24 Historic Resources 	<ul style="list-style-type: none"> • Permanent incorporation of 0.06 acre of parkland from West Bank Park to construct an EmX station and bike lane. • Permanent incorporation of 0.09 acre of parkland from Razor Park to install a bike lane. • Temporary occupancy of West Bank Park to install an EmX station and bike lane. • Temporary occupancy of Razor Park to install a bike lane. • No activities, features, or attributes would be permanently impacted by project actions nor would temporary construction actions at the park permanently or temporarily interfere with visitors using the park. • Historic resources affected: <ul style="list-style-type: none"> » 11 directly affected » 7 indirectly affected » 1 both directly and indirectly affected • Potential <i>de minimis</i> use anticipated: <ul style="list-style-type: none"> » West Bank Park » Razor Park » 8 Historic Resources
Potential Mitigation Measures	None	<ul style="list-style-type: none"> • If mitigation of park property cannot be avoided or further minimized, mitigation would include enhancement of park property through coordination with Eugene Parks and Open Space division and the City's Full 30 Year Vision for Parks and Recreation Capital Projects List with Draft Priorities (City of Eugene, 2017, March 8). • In accordance with 23 CFR 774, prepare detailed impacts analyses, determine detailed minimization, compensatory and mitigation measures with concurrence from the agency of jurisdiction over the resources, allow for public review and make a final determination. LTD would seek a <i>de minimis</i> impact determination for resources affected by project actions. 	<ul style="list-style-type: none"> • If mitigation of park property cannot be avoided or further minimized, mitigation would include enhancement of park property through coordination with Eugene Parks and Open Space division and the City's Full 30 Year Vision for Parks and Recreation Capital Projects List with Draft Priorities (City of Eugene, 2017, March 8). • In accordance with 23 CFR 774, prepare detailed impacts analyses, determine detailed minimization, compensatory and mitigation measures with concurrence from the agency of jurisdiction over the resources, allow for public review and make a final determination. LTD would seek a <i>de minimis</i> impact determination for resources affected by project actions.
STREET AND LANDSCAPE TREES			
Impacts / Benefits	None	<ul style="list-style-type: none"> • No Charter or Heritage trees to be removed. • Up to 13 medium and large street trees removed. • No landscape trees anticipated to be removed. 	<ul style="list-style-type: none"> • No Charter or Heritage trees to be removed. • Up to 142 medium and large street trees may be removed. • No landscape trees anticipated to be removed.

Table C-2: Summary of River Road Corridor Potential Benefits and Impacts by Alternative

	No-Build Alternative	Enhanced Corridor Alternative	EmX Alternative
			<ul style="list-style-type: none"> Multi-use path proposed on River Road between Silver Lane and Division Avenue would preclude replacement of displaced street trees along this stretch, resulting in permanent loss of street trees in this area for a length of approximately 900 feet. Other locations would be identified for mitigation planting to offset loss of trees in this area. Potential for root-zone impacts on existing street and landscape trees, because of construction of BAT lanes within existing River Road roadway between Railroad Boulevard and Owosso Drive. Potential for some minor short-term impacts on street and landscape trees directly adjacent to station construction.
Potential Mitigation Measures	None	<ul style="list-style-type: none"> Replant removed street trees in new sidewalk landscaping strips at a ratio of at least 1:1 in coordination with City Urban Forestry staff. Develop a Tree Protection Plan before construction and use BMPs for tree protection during construction. 	<ul style="list-style-type: none"> Replant removed street trees in new sidewalk landscaping strips at a ratio of at least 1:1 in coordination with City Urban Forestry staff. Develop a Tree Protection Plan before construction and use BMPs for tree protection during construction.
TRANSPORTATION AND TRANSIT			
Impacts / Benefits	<ul style="list-style-type: none"> No benefit or impact to: <ul style="list-style-type: none"> » roadway capacity » safety » circulation. Limited potential: <ul style="list-style-type: none"> » for mode shifts away from motor vehicle travel to transit to reduce single occupancy vehicle trips. » to support locally adopted transportation policies. » to improve connectivity to bicycle or pedestrian facilities. Intersection mobility standards would not be met at 2 intersections under proposed standards. 	<ul style="list-style-type: none"> Improved in-vehicle transit travel time by 5 minutes during the a.m. peak hour inbound compared to No-Build. Some potential for increased transit reliability due to 2.8% increase in transit exclusive/priority lanes compared to No-Build. Increased average weekday systemwide transit ridership by 110 (0.2%) compared to No-Build. Increased average weekday corridor boardings by 50 compared to No Build. Intersection mobility standards would not be met at 2 intersections under proposed standards. Installation of 4,000 feet (0.76 mile) of new or improved sidewalks on the 10.3-mile corridor, 6 new and 1 replaced enhanced pedestrian/bike crossings. Moderate safety improvements due to BAT lanes and increased crossing opportunities for bikes and pedestrians. Up to 2 off-street parking stalls impacted and 4 drive-through closures. Temporary construction-related vehicle delay and bicycle and pedestrian detours. 	<ul style="list-style-type: none"> Improved in-vehicle transit travel time by 8 minutes during the a.m. peak hour over the full length of the corridor compared to No-Build. Greatest potential for increased transit reliability due to 58.1% increase in transit exclusive / priority lanes compared to No Build. Increased average weekday systemwide transit ridership by 820 (1.8%) compared to No-Build. Increased average weekday corridor boardings by 1,750 compared to No Build. Local traffic operations would improve at 1 intersection, however, traffic operations would degrade slightly at 2 intersections. Mobility standards would not be met at 2 intersections under proposed standards. Installation of 6,740 feet (1.26 miles) of new or improved sidewalks on the 10.3 mile corridor, 26,920 feet (5.09 miles) of improved bike lanes, and 4 new and 1 replaced enhanced pedestrian/bike crossings.

Table C-2: Summary of River Road Corridor Potential Benefits and Impacts by Alternative

	No-Build Alternative	Enhanced Corridor Alternative	EmX Alternative
Potential Mitigation Measures	None	<ul style="list-style-type: none"> • During final design, where possible, use design refinements to avoid or further minimize impacts to off-street parking, circulation, and drive-throughs. • Plan construction to minimize potential impacts where possible to businesses, roadway users, and surrounding communities using a variety of techniques that may include: <ul style="list-style-type: none"> » Limit length of single lane closures. » Work on one side of road at a time. » Construct in shorter segments in locations with high driveway density. » Consider night-time construction hours in areas with greatest number of businesses to further reduce business and traffic disruptions. » Maintain business access points during construction and provide appropriate signage. • As appropriate, use variable message signs to provide road users with advance notice of current or pending construction activities and alternate routes. 	<ul style="list-style-type: none"> • Greatest safety improvements due to BAT lanes, buffered bike lanes, and increased crossing opportunities for bikes and pedestrians. • Up to 31 off-street parking stalls impacted, 6 driveway closures, and 6 drive-through closures. • Temporary construction-related vehicle delay and bicycle and pedestrian detours. • During final design, where possible, use design refinements to avoid or further minimize impacts to off-street parking, circulation, and drive-throughs. • Plan construction to minimize potential impacts where possible to businesses, roadway users, and surrounding communities using a variety of techniques that may include: <ul style="list-style-type: none"> » Limit length of single lane closures. » Work on one side of road at a time. » Construct in shorter segments in locations with high driveway density. » Consider night-time construction hours in areas with greatest number of businesses to further reduce business and traffic disruptions. » Maintain business access points during construction and provide appropriate signage. • As appropriate, use variable message signs to provide road users with advance notice of current or pending construction activities and alternate routes.
UTILITIES			
Impacts / Benefits	None	<ul style="list-style-type: none"> • Replacement and/or relocation of aging utility infrastructure would provide a potential indirect benefit. • Short-term service disruptions during construction. 	<ul style="list-style-type: none"> • Beneficial effect of constructing new fiber connections along length of corridor is improved quality of service, customer safety and operational efficiency. Network bandwidth provided over fiber enables the District to operate HD cameras for monitoring of platforms/stations, deliver real-time information to platform-based display panels and management of platform/stations amenities from a central location for example lighting, irrigation, ticket vending machines, and audio systems. • Replacement and/or relocation of aging utility infrastructure would provide a potential indirect benefit. • Short-term service disruptions during construction.

Table C-2: Summary of River Road Corridor Potential Benefits and Impacts by Alternative

	No-Build Alternative	Enhanced Corridor Alternative	EmX Alternative
Potential Mitigation Measures	None	<ul style="list-style-type: none"> • Modify project design, where feasible, to avoid and minimize impacts to utilities. • Coordinate with utility providers early and throughout design and construction process/. • Use environmental BMPs during construction and relocation to mitigate potential hazards. • Notify businesses and residences, as appropriate, for extended service disruptions. 	<ul style="list-style-type: none"> • Modify project design, where feasible, to avoid and minimize impacts to utilities. • During final design, design refinement would be necessary to avoid impacts to NW Natural gas transmission line near proposed multi-use path. • Coordinate with utility providers early and throughout design and construction process. • Use environmental BMPs during construction and relocation to mitigate potential hazards. • Notify businesses and residences, as appropriate, for extended service disruptions.
VISUAL AND AESTHETIC RESOURCES			
Impacts / Benefits	None	<ul style="list-style-type: none"> • Up to 13 street trees removed. • 1.1 mile of high to moderate potential to change visual character of scattered areas along corridor. • Replanted trees could be selected to develop a more visually unified corridor. • 5 enhanced and 3 upgraded bicycle and pedestrian crossings would assist in visually unifying the corridor. • Construction activities and equipment would temporarily alter the appearance of the corridor, particularly in areas where existing trees would need to be removed. 	<ul style="list-style-type: none"> • Up to 142 street trees removed. • 2.3 miles of high to moderate potential change to visual character of scattered areas along corridor. • Replanted trees could be selected to develop a more visually unified corridor. • 5 enhanced bicycle and pedestrian crossings would assist in visually unifying the corridor. • 20 new EmX stations would be constructed, which would assist in visually unifying the corridor. • Construction activities and equipment would temporarily alter the appearance of the corridor, particularly in areas where existing trees would need to be removed.
Potential Mitigation Measures	None	<ul style="list-style-type: none"> • Replace all removed street trees at ratio of at least one tree planted for one tree removed or as otherwise required by Eugene Code and coordinated with City Urban Forestry staff on tree species, planting locations, and soil conditions per City standards. • If during final design there is potential to remove landscape trees, then replace through coordination with individual property owners. • Develop a Tree Protection Plan before construction and use BMPs for tree protection during construction. 	<ul style="list-style-type: none"> • Replace all removed street trees at ratio of at least one tree planted for one tree removed or as otherwise required by Eugene Code and coordinated with City Urban Forestry staff on tree species, planting locations, and soil conditions per City standards. • If during final design there is potential to remove landscape trees, then replace through coordination with individual property owners. • Develop a Tree Protection Plan before construction and use BMPs for tree protection during construction.

Table C-2: Summary of River Road Corridor Potential Benefits and Impacts by Alternative

	No-Build Alternative	Enhanced Corridor Alternative	EmX Alternative
WATER QUALITY			
Impacts / Benefits	<ul style="list-style-type: none"> New and reconstructed impervious area per the Draft Eugene 2035 TSP. 	<ul style="list-style-type: none"> 109,573 ft² of new and reconstructed impervious area in Amazon Creek, Spring Creek and Willamette River drainage basins, of which 20,757 ft² would be new roadway and sidewalk. No direct impacts on Spring Creek or Willamette River floodplains. Potential for temporary construction-related sediment release. With mitigation measures, such as water quality and flow control facilities, there would be net water quality improvement associated with reconstructed impervious areas and impacts of new impervious area would be reduced. 	<ul style="list-style-type: none"> 748,850 ft² of new and reconstructed impervious area in Amazon Creek, Spring Creek and Willamette River drainage basins, of which 53,723 ft² would be new roadway and sidewalk. No direct impacts on Spring Creek or Willamette River floodplains. Potential for temporary construction-related sediment release. With mitigation measures, such as water quality and flow control facilities, there would be net water quality improvement associated with reconstructed impervious areas and impacts of new impervious area would be reduced.
Potential Mitigation Measures	<ul style="list-style-type: none"> Water quality and flow control facilities located near major areas of construction. Erosion control and sediment prevention activities. 	<ul style="list-style-type: none"> Comply with applicable local, state and federal water quality treatment standards and regulations. Implement vegetated and mechanical stormwater runoff treatment BMPs, as appropriate and approved by regulating agencies. To decrease overall impacts, construct water quality and flow control facilities at the following possible intersections, as appropriate and approved by regulating agencies: <ul style="list-style-type: none"> River Road and Horn Lane River Road and Maynard Avenue River Road and Silver Lane River Road and Hunsaker Lane Implement temporary erosion and sediment control activities to lessen impacts to project surroundings during construction. 	<ul style="list-style-type: none"> Comply with applicable local, state and federal water quality treatment standards and regulations. Implement vegetated and mechanical stormwater runoff treatment BMPs, as appropriate and approved by regulating agencies. To decrease overall impacts, construct water quality and flow control facilities at the following possible intersections, as appropriate and approved by regulating agencies: <ul style="list-style-type: none"> River Road and Horn Lane River Road and Maynard Avenue River Road and Silver Lane River Road and Hunsaker Lane Implement temporary erosion and sediment control activities to lessen impacts to project surroundings during construction.

Table C-3: Summary of 30th Avenue to LCC Corridor Potential Benefits and Impacts by Alternative

	No-Build Alternative	Enhanced Corridor Alternative	EmX Alternative
ACQUISITIONS AND DISPLACEMENTS			
Impacts / Benefits	<ul style="list-style-type: none"> No planned property acquisitions. 	<ul style="list-style-type: none"> No significant adverse impacts; however, property acquisitions and parking impacts will occur, including up to: <ul style="list-style-type: none"> » 13 partial property acquisitions (0.4 acre): all are relatively minor strips from tax lot frontages. » No impacts to off-street parking. No circulation impacts or partial access closures. 	<ul style="list-style-type: none"> No significant adverse impacts; however, property acquisitions and parking impacts will occur, including up to: <ul style="list-style-type: none"> » 20 partial property acquisitions (0.5 acre): all are relatively minor strips from tax lot frontages. » 16 off-street parking spaces eliminated at 2 properties. Partial access closures at up to 3 properties.
Potential Mitigation Measures	None	<ul style="list-style-type: none"> During final design, consider design refinements that avoid or further minimize site-specific property impacts. Pay property owners at fair market value for the property acquired, consistent with state and federal law. Any owners or tenants displaced would be eligible for relocation assistance as specified in the Uniform Relocation Act. 	<ul style="list-style-type: none"> During final design, consider design refinements that avoid or further minimize site-specific property impacts. If practical, during final design, consider design refinements to avoid or further minimize off-street parking loss such as parking lot redesign/restriping or other design refinements. Pay property owners at fair market value for the property acquired, consistent with state and federal law. Any owners or tenants displaced would be eligible for relocation assistance as specified in the Uniform Relocation Act.
AIR QUALITY			
Impacts / Benefits	<ul style="list-style-type: none"> No predicted exceedances of relevant air quality standards in 2035. 	<ul style="list-style-type: none"> No predicted exceedances of relevant air quality standards in 2035. Modeling did not show significant differences between this alternative and the No-Build Alternative. During construction, temporary increases in emissions and fugitive dust are expected. 	<ul style="list-style-type: none"> No predicted exceedances of relevant air quality standards in 2035. Modeling did not show significant differences between this alternative and the No-Build Alternative. During construction, temporary increases in emissions and fugitive dust are expected.
Potential Mitigation Measures	None	<p>Require construction contractors to:</p> <ul style="list-style-type: none"> Take reasonable precautions to avoid fugitive dust emissions during construction. Comply with local and state air pollution control regulations during construction. Use air quality BMPs during construction. 	<p>Require construction contractors to:</p> <ul style="list-style-type: none"> Take reasonable precautions to avoid fugitive dust emissions during construction. Comply with local and state air pollution control regulations during construction. Use air quality BMPs during construction.

Table C-3: Summary of 30th Avenue to LCC Corridor Potential Benefits and Impacts by Alternative

	No-Build Alternative	Enhanced Corridor Alternative	EmX Alternative
COMMUNITY, NEIGHBORHOODS, AND ENVIRONMENTAL JUSTICE			
Impacts / Benefits	<ul style="list-style-type: none"> • Would not result in any impacts on neighborhoods, community facilities, or public services. • Would not result in any economic benefits associated with development in the areas around stations. 	<ul style="list-style-type: none"> • Improved pedestrian, bicycle, and transit options would improve connectivity to neighborhoods and access to community facilities. • Moderate safety improvements to motor vehicles, bikes, and pedestrians located within and adjacent to neighborhoods. • No conflicts with emergency services are anticipated. • Would result in loss of up to 69 on-street parking stalls. • Property impacts would affect 13 properties for total of 0.4 acre. • Remove up to 54 medium and large street trees and 4 medium and large landscape trees along the corridor. • No potential noise impacts. • Minor property acquisition would affect 5 community facilities. • Could affect 1 high-risk hazardous material site. • No disproportionate high and adverse impacts on minority and low-income populations anticipated. • Temporary noise, dust, vibration, and disruption in access to properties would occur if any roadway or lane closures were required or as result of construction equipment blocking access. • Temporary increases in noise and vibration could temporarily affect existing neighborhood noise levels where construction is adjacent or in close proximity to community facilities and public service locations (see Noise and Vibration section). • Purchase of goods and services to construct planned projects, and construction jobs created would result in short-term economic benefits. • Beneficial indirect impacts for neighborhoods with any new development include creating new meeting places for area residents, and new opportunities to live and work near transit. These indirect benefits would be likely to affect a zone of approximately 0.25 mile around the Enhanced Corridor Alternative stops only if zoning permits, development interest is present, and land area is available. 	<ul style="list-style-type: none"> • Same benefits as Enhanced Corridor Alternative, but to a greater degree because of increased reliability. • No conflicts with emergency services are anticipated. • Would result in loss of up to 16 off-street parking spaces at 2 properties. • Would result in loss of up to 140 on-street parking stalls. However, if High Street Cycle Track project is constructed outside of this project, then the potential on-street parking loss would be reduced to 72 spaces. • Property impacts would affect 20 properties for total of 0.5 acre. • Remove up to 98 medium and large street trees and 4 medium and large landscape trees. • Potential noise impacts on up to 9 properties, but mitigation can likely eliminate impacts. • Minor property acquisitions would affect 5 community facilities. • Could affect 4 high-risk hazardous material sites. • No disproportionate high and adverse impacts on minority and low-income populations anticipated. • Temporary noise, dust, vibration, and disruption in access to properties would occur if any roadway or lane closures were required or as result of construction equipment blocking access. • Temporary increases in noise and vibration could temporarily affect existing neighborhood noise levels where construction is adjacent or in close proximity to community facilities and public service locations (see Noise and Vibration section). • Purchase of goods and services to construct planned projects, and construction jobs created would result in short-term economic benefits. • Beneficial indirect impacts for neighborhoods with any new development include creating new meeting places for area residents, and new opportunities to live and work near transit. These indirect benefits would be likely to affect a zone of approximately 0.50 mile around the EmX Alternative stations only if zoning permits, development interest is present, and land area is available.

Table C-3: Summary of 30th Avenue to LCC Corridor Potential Benefits and Impacts by Alternative

	No-Build Alternative	Enhanced Corridor Alternative	EmX Alternative
Potential Mitigation Measures	None	<ul style="list-style-type: none"> Mitigate anticipated construction-related disruption through implementation of the following methods where possible: flagging and signage, proper staging of equipment, maintaining access to adjacent businesses during normal operating hours, preparing and implementing a traffic detour plan, and a communication and construction update plan. Ensure emergency response vehicles have adequate passage throughout corridor during construction period. During final design, seek to further avoid or minimize property acquisitions and off-street parking impacts. Compensate affected property owners with fair market value according to federal regulations and guidance. Compensate affected property owners with fair market value according to federal regulations and guidance. Street tree removals replanted at a ratio of at least 1:1 in coordination with City Urban Forestry staff. 	<ul style="list-style-type: none"> Mitigate anticipated construction-related disruption through implementation of the following methods where possible: flagging and signage, proper staging of equipment, maintaining access to adjacent businesses during normal operating hours, preparing and implementing a traffic detour plan, and a communication and construction update plan. Ensure emergency response vehicles have adequate passage throughout corridor during construction period. During final design, seek to further avoid or minimize property acquisitions and off-street parking impacts. Compensate affected property owners with fair market value according to federal regulations and guidance. Compensate affected property owners with fair market value according to federal regulations and guidance. Street tree removals replanted at a ratio of at least 1:1 in coordination with City Urban Forestry staff.
CULTURAL RESOURCES			
Impacts / Benefits	None	<ul style="list-style-type: none"> Potential direct impacts to 3 resources. Potential indirect impacts to 23 resources. Adverse impacts are unlikely because potential effects are anticipated to be avoided through project design. 	<ul style="list-style-type: none"> Potential direct impacts to 4 resources. Potential indirect impacts to 10 resources. Adverse impacts are unlikely because potential effects are anticipated to be avoided through project design.
Potential Mitigation Measures	None	<ul style="list-style-type: none"> During final design, consider measures to avoid or further minimize ROW acquisitions. Where practical, move stop locations away from historic resources. As appropriate and in coordination with regulating agencies, prepare mitigation plan under MOA to offset impacts (interpretation, documentation, etc.). 	<ul style="list-style-type: none"> During final design, consider measures to avoid or further minimize ROW acquisitions. Where practical, move station locations away from historic resources. As appropriate and in coordination with regulating agencies, prepare mitigation plan under MOA to offset impacts (interpretation, documentation, etc.).
ECOSYSTEMS			
Impacts / Benefits	None	<ul style="list-style-type: none"> Runoff from 110,800 ft² of new, reconstructed, and adjoining impervious surface. Likely encroachment of wetland conservation setback near station areas. Potential loss of habitat for Bradshaw's Lomatium. Tree removal resulting in a temporary loss of urban avian habitat. Construction activities would temporarily increase potential to increase sediment transport to waterways. More efficient transit system than No-Build, potentially resulting in less pollutant loading. 	<ul style="list-style-type: none"> Runoff from 209,300 ft² of new, reconstructed, and adjoining impervious surface. Likely encroachment of wetland conservation setback near station areas. Potential loss of habitat for Bradshaw's Lomatium. Tree removal resulting in a temporary loss of urban avian habitat. Construction activities would temporarily increase potential to increase sediment transport to waterways. More efficient transit system than No-Build, potentially resulting in less pollutant loading.

Table C-3: Summary of 30th Avenue to LCC Corridor Potential Benefits and Impacts by Alternative

	No-Build Alternative	Enhanced Corridor Alternative	EmX Alternative
Potential Mitigation Measures	None	<ul style="list-style-type: none"> Comply with applicable local and state water quality treatment standards. Design the project to minimize new pollution-generating impervious surface as much as practicable. Replace removed street trees at least one for one with species approved by City of Eugene arborists. Replace disturbed landscape trees and landscaping where feasible. Comply with Migratory Bird Treaty Act by avoiding tree removal during nesting season. Utilize BMPs to avoid or minimize impacts to waterways and aquatic species. Avoid wetland impacts by conducting additional wetland determination/delineation and design refinement. Avoid impacts to Bradshaw's Lomatium by conducting additional delineation of species, design refinement, and BMPs during construction. 	<ul style="list-style-type: none"> Comply with applicable local and state water quality treatment standards. Design the project to minimize new pollution-generating impervious surface as much as practicable. Replace removed street trees at least one for one with species approved by City of Eugene arborists. Replace disturbed landscape trees and landscaping where feasible. Comply with Migratory Bird Treaty Act by avoiding tree removal during nesting season. Utilize BMPs to avoid or minimize impacts to waterways and aquatic species. Avoid wetland impacts by conducting additional wetland determination/delineation and design refinement. Avoid impacts to Bradshaw's Lomatium by conducting additional delineation of species, design refinement, and BMPs during construction.

ENERGY, SUSTAINABILITY AND GHG

Impacts / Benefits	<ul style="list-style-type: none"> Limited potential for sufficient mode shifts away from motor vehicle travel to transit to improve energy use and sustainability. Limited potential for future reduction in indirect energy consumption. 	<ul style="list-style-type: none"> Systemwide increase in VMT of 0.010% as compared to No-Build Alternative. Systemwide increase in energy consumption of 0.003% as compared to No-Build. Systemwide increase in GHG emissions of 0.002% compared to No-Build. Systemwide increase in maintenance and repair energy of 0.004% compared to No-Build. Temporary increase in construction-related energy use and emissions. Cement used for bus stops would require less maintenance than asphalt over time. Project would create jobs and related economic benefits. 	<ul style="list-style-type: none"> Systemwide reduction in VMT of 0.013% as compared to No-Build Alternative. Systemwide reduction in energy consumption of 0.004% as compared to No-Build. Systemwide increase in GHG emissions of 0.031% as compared to No-Build. Systemwide increase in maintenance and repair energy of 0.002% compared to No-Build. Temporary increase in construction-related energy use and emissions. Cement used for bus stops would require less maintenance than asphalt over time. Project would create jobs and related economic benefits.
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Potential Mitigation Measures	None	None	None
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GEOLOGY AND SEISMIC

Impacts / Benefits	<ul style="list-style-type: none"> Impacts would be associated with planned improvements in Eugene TSP that are expected to be developed in Corridor, even without building proposed project. 	<ul style="list-style-type: none"> Long-term impacts related to geologic and seismic hazards already exist and are the same as for the No-Build Alternative. Proposed project would be within seismically active area but project would meet seismic design standards to minimize the long-term risks to system. 	<ul style="list-style-type: none"> Long-term impacts related to geologic and seismic hazards already exist and are the same as for the No-Build Alternative. Proposed project would be within seismically active area but project would meet seismic design standards to minimize the long-term risks to system.
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Table C-3: Summary of 30th Avenue to LCC Corridor Potential Benefits and Impacts by Alternative

	No-Build Alternative	Enhanced Corridor Alternative	EmX Alternative
	<ul style="list-style-type: none"> Transportation infrastructure, including transit, within corridor would be affected by slope instability and seismic hazards identified for build alternatives. 	<ul style="list-style-type: none"> Overall risk of impacts because of constructing in landslide hazard areas would be limited for sections between Amazon Parkway and E. 29th Avenue intersection and LCC Station that has been mapped as moderate (landsliding possible) to high (landsliding likely), particularly on 30th Avenue at the Spring Boulevard interchange that has been mapped as very high (existing landslide). Major source of construction vibration and noises would be from vibratory rollers and jack hammers. Settlements from new earth loads would be expected to be negligible. Risk of impact to utilities and buried structures would be considered low. Potential soil excavation volumes are expected to be minor. 	<ul style="list-style-type: none"> Overall risk of impacts because of constructing in landslide hazard areas would be limited for sections between Amazon Parkway and E. 29th Avenue intersection and LCC Station that has been mapped as moderate (landsliding possible) to high (landsliding likely), particularly on 30th Avenue at the Spring Boulevard interchange that has been mapped as very high (existing landslide). Major source of construction vibration and noises would be from vibratory rollers and jack hammers. Settlements from new earth loads would be expected to be negligible. Risk of impact to utilities and buried structures would be considered low. Potential soil excavation volumes are expected to be minor.
Potential Mitigation Measures	None	<ul style="list-style-type: none"> Detailed study during final design would confirm degree of geologic risk and at sites where geologic conditions were not suitable, appropriate design and construction measures would be implemented to avoid potential effects and geologic risks during operations. Engineering design standards and best management practices would be used to avoid and minimize potential construction impacts. 	<ul style="list-style-type: none"> Detailed study during final design would confirm degree of geologic risk and at sites where geologic conditions were not suitable, appropriate design and construction measures would be implemented to avoid potential effects and geologic risks during operations. Engineering design standards and best management practices would be used to avoid and minimize potential construction impacts.
HAZARDOUS MATERIALS			
Impacts / Benefits	<ul style="list-style-type: none"> Projects proposed under other programs would generate comparable mix and quantity of hazardous materials proportional to magnitude of improvements. Contaminated sites could affect these improvement projects in areas where no construction is proposed under other programs, would not remediate existing contaminants. 	<ul style="list-style-type: none"> Extent of long-term operation impacts associated with acquisition of properties that are source of contamination would be defined more specifically during subsequent design refinement. Not expected to change number of hazardous materials sites along corridor, although it is likely to result in removal of some contaminated soils and groundwater which, if disposed of outside of the API, would have positive effect on overall environmental conditions within general vicinity. Could potentially affect 1 high risk site. No medium-risk sites located within the API are within potentially affected tax lots. Construction could inadvertently disturb sites with previously undocumented contamination or could affect known sites with contaminated media. 	<ul style="list-style-type: none"> Extent of long-term operation impacts associated with acquisition of properties that are source of contamination would be defined more specifically during subsequent design refinement. Not expected to change number of hazardous materials sites along corridor, although it is likely to result in removal of some contaminated soils and groundwater which, if disposed of outside of the API, would have positive effect on overall environmental conditions within general vicinity. Could potentially affect 4 high-risk sites. No medium-risk sites located within the API are within potentially affected tax lots. Construction could inadvertently disturb sites with previously undocumented contamination or could affect known sites with contaminated media.

Table C-3: Summary of 30th Avenue to LCC Corridor Potential Benefits and Impacts by Alternative

	No-Build Alternative	Enhanced Corridor Alternative	EmX Alternative
Potential Mitigation Measures	None	<ul style="list-style-type: none"> • During final design and permitting phase, perform Phase I Environmental Site Assessment and Phase II Environmental Site Assessment, if appropriate, as part of due diligence to confirm presence or absence of contaminated environmental media at properties proposed for partial or full acquisition. • Use construction BMPs that minimize disturbance or release of contaminated media. • Prepare and use comprehensive contaminated media management, safety, and environmental response contingency plans, as appropriate, to mitigate direct and indirect impacts from potential release of hazardous substances. • Managing and disposing of hazardous or contaminated materials in accordance with applicable local, state and federal regulations. 	<ul style="list-style-type: none"> • During final design and permitting phase, perform Phase I Environmental Site Assessment and Phase II Environmental Site Assessment, if appropriate, as part of due diligence to confirm presence or absence of contaminated environmental media at properties proposed for partial or full acquisition. • Use construction BMPs that minimize disturbance or release of contaminated media. • Prepare and use comprehensive contaminated media management, safety, and environmental response contingency plans, as appropriate, to mitigate direct and indirect impacts from potential release of hazardous substances. • Managing and disposing of hazardous or contaminated materials in accordance with applicable local, state and federal regulations.
LAND USE, PRIME FARMLANDS			
Impacts / Benefits	<ul style="list-style-type: none"> • Inconsistent with adopted goals and policies. • Transit would not serve all Key Transit Corridors in a manner consistent with local and regional planning policy. 	<ul style="list-style-type: none"> • No significant adverse impacts. • Generally consistent with most area plans and local land use regulations. • Beneficial effects include transit serving Key Transit Corridors in a manner consistent with local and regional planning policy. • Conversion of up to approximately 0.4 acre to a transportation-related use. • No prime farmlands impacts. • TOD could occur under this alternative, but potentially not to the same degree or intensity as with the EmX Alternative. • No off-street parking spaces removed. • Remove up to 69 on-street parking spaces. 	<ul style="list-style-type: none"> • No significant adverse impacts. • Consistent with area plans and local land use regulations. • Beneficial effects include transit serving Key Transit Corridors in a manner consistent with local and regional planning policy. • Conversion of up to approximately 0.5 acre to a transportation-related use. • No prime farmlands impacts. • EmX Alternative would better support and foster accelerated rates of TOD implementation in places that local and regional land use planning documents have designated for Mixed-Use and Multi-Family Residential development than No-Build or Enhanced Corridor Alternatives. • Remove up to 16 off-street parking spaces. • Remove up to 140 on-street parking spaces. • Potential to close up to 3 driveways.
Potential Mitigation Measures	None	<ul style="list-style-type: none"> • During final design, consider design modifications which could minimize property acquisition and conversion of land uses to a transportation-related use. • During final design, consider refinements to avoid or further minimize off-street parking loss through parking lot redesign/restriping or other design refinements. 	<ul style="list-style-type: none"> • During final design, consider design modifications which could minimize property acquisition and conversion of land uses to a transportation-related use. • During final design, consider refinements to avoid or further minimize off-street parking loss through parking lot redesign/restriping or other design refinements.

Table C-3: Summary of 30th Avenue to LCC Corridor Potential Benefits and Impacts by Alternative

	No-Build Alternative	Enhanced Corridor Alternative	EmX Alternative
NOISE AND VIBRATION			
Impacts / Benefits	None	<ul style="list-style-type: none"> No noise impacts anticipated. No vibration impacts anticipated. 	<ul style="list-style-type: none"> Potential noise impacts on up to 9 single family and multi-family properties. No vibration impacts anticipated.
Potential Mitigation Measures	None	<ul style="list-style-type: none"> Where applicable, detailed mitigation planning will be developed in the NEPA documentation phase of the project in accordance with the FTA criteria. 	<ul style="list-style-type: none"> Where applicable, detailed mitigation planning will be developed in the NEPA documentation phase of the project in accordance with the FTA criteria.
PARKLANDS AND RECREATION AREAS			
Impacts / Benefits	None	<ul style="list-style-type: none"> No significant adverse impacts. Transit accessibility improved all along corridor with 1 new and 2 replaced enhanced bicycle and pedestrian crossings, improvements to existing bus stops, and construction of new stops. Transit service would be less frequent to Amazon Park and Laurelwood Golf Course compared to the No Build alternative. Construction of sidewalk and enhanced shelter could require acquisition of up to 0.15 acre of the proposed privately-owned Civic Stadium site, though there would not be a loss of amenities. Construction of sidewalk and enhanced shelter could require acquisition of up to 0.11 acre of Amazon Park, though there would not be a loss of park amenities. Construction along Amazon Parkway could result in users of Amazon Park and the proposed Civic Stadium experiencing short-term, minor increases in noise, dust, and visual intrusion. 	<ul style="list-style-type: none"> No significant adverse impacts. Transit accessibility improved all along corridor with 8 new and 2 replaced enhanced bicycle and pedestrian crossings, improvements to existing bus stops, and construction of new stops. Construction of sidewalk and enhanced shelter could require acquisition of up to 0.14 acre of the proposed privately-owned Civic Stadium site, though there would not be a loss of amenities. Construction of sidewalk and enhanced shelter could require acquisition of up to 0.15 acre of Amazon Park, though there would not be a loss of park amenities. Construction along Amazon Parkway could result in users of Amazon Park and the proposed Civic Stadium experiencing short-term, minor increases in noise, dust, and visual intrusion.
Potential Mitigation Measures	None	<ul style="list-style-type: none"> Where possible, mitigate short-term, minor impacts from construction through coordination of construction timing with Eugene Parks and Open Space Division to avoid or reduce disruptive activities for users of parks and recreation resources. Permanent loss of Amazon Park property would be mitigated, first by further exploring avoidance during subsequent design development phases and, if avoidance is not practical, then in coordination with City consider compensation or enhancing remaining park property consistent with City's park plans. 	<ul style="list-style-type: none"> Where possible, mitigate short-term, minor impacts from construction through coordination of construction timing with Eugene Parks and Open Space Division to avoid or reduce disruptive activities for users of parks and recreation resources. Permanent loss of Amazon Park property would be mitigated, first by further exploring avoidance during subsequent design development phases and, if avoidance is not practical, then in coordination with City consider compensation or enhancing remaining park property consistent with City's park plans.

Table C-3: Summary of 30th Avenue to LCC Corridor Potential Benefits and Impacts by Alternative

	No-Build Alternative	Enhanced Corridor Alternative	EmX Alternative
SECTION 4(F) RESOURCES			
Impacts / Benefits	None	<ul style="list-style-type: none"> • Permanent incorporation of 0.11 acre of parkland from Amazon Park to construct a new shelter and sidewalk. • Temporary occupancy of Amazon Park site to install shelters and sidewalks. • No activities, features, or attributes would be permanently impacted by project actions nor would temporary construction actions at the park permanently or temporarily interfere with visitors using the park. • Historic resources affected: <ul style="list-style-type: none"> » 2 directly affected » 22 indirectly affected » 1 both directly and indirectly affected • Potential <i>de minimis</i> use anticipated: <ul style="list-style-type: none"> » Amazon Park 	<ul style="list-style-type: none"> • Permanent incorporation of 0.15 acre of parkland from Amazon Park to construct a new shelter and sidewalk. • Temporary occupancy of Amazon Park to install shelters and sidewalks. • No activities, features, or attributes would be permanently impacted by project actions nor would temporary construction actions at the park permanently or temporarily interfere with visitors using the park. • Historic resources affected: <ul style="list-style-type: none"> » 11 directly affected » 7 indirectly affected » 1 both directly and indirectly affected • Potential <i>de minimis</i> use anticipated: <ul style="list-style-type: none"> » Amazon Park
Potential Mitigation Measures	None	<ul style="list-style-type: none"> • If mitigation of park property cannot be avoided or further minimized, mitigation would include enhancement of park property through coordination with Eugene Parks and Open Space division and the City's Full 30 Year Vision for Parks and Recreation Capital Projects List with Draft Priorities (City of Eugene, 2017, March 8). • In accordance with 23 CFR 774, prepare detailed impacts analyses, determine detailed minimization, compensatory and mitigation measures with concurrence from the agency of jurisdiction over the resources, allow for public review and make a final determination. LTD would seek a <i>de minimis</i> impact determination for resources affected by project actions. 	<ul style="list-style-type: none"> • If mitigation of park property cannot be avoided or further minimized, mitigation would include enhancement of park property through coordination with Eugene Parks and Open Space division and the City's Full 30 Year Vision for Parks and Recreation Capital Projects List with Draft Priorities (City of Eugene, 2017, March 8). • In accordance with 23 CFR 774, prepare detailed impacts analyses, determine detailed minimization, compensatory and mitigation measures with concurrence from the agency of jurisdiction over the resources, allow for public review and make a final determination. LTD would seek a <i>de minimis</i> impact determination for resources affected by project actions.
STREET AND LANDSCAPE TREES			
Impacts / Benefits	None	<ul style="list-style-type: none"> • No Charter or Heritage trees to be removed. • Up to 54 medium and large street trees removed. • Up to 4 medium and large landscape trees removed. 	<ul style="list-style-type: none"> • No Charter or Heritage trees to be removed. • Up to 54 medium and large street trees removed. • Up to 4 medium and large landscape trees removed. • Potential for root-zone impacts on existing street and landscape trees, because of construction of BAT lanes in along Oak Street, Pearl Street, and at the intersection of E. 27th Avenue and Amazon Parkway.

Table C-3: Summary of 30th Avenue to LCC Corridor Potential Benefits and Impacts by Alternative

	No-Build Alternative	Enhanced Corridor Alternative	EmX Alternative
Potential Mitigation Measures	None	<ul style="list-style-type: none"> • Replant removed street trees in new sidewalk landscaping strips at a ratio of at least 1:1 in coordination with City Urban Forestry staff. • Replant removed landscape trees where appropriate through coordination with individual property owners. • Develop a Tree Protection Plan before construction and use BMPs for tree protection during construction. 	<ul style="list-style-type: none"> • Replant removed street trees in new sidewalk landscaping strips at a ratio of at least 1:1 in coordination with City Urban Forestry staff. • Replant removed landscape trees where appropriate through coordination with individual property owners. • Develop a Tree Protection Plan before construction and use BMPs for tree protection during construction.
TRANSPORTATION AND TRANSIT			
Impacts / Benefits	<ul style="list-style-type: none"> • No benefit or impact to: <ul style="list-style-type: none"> » roadway capacity » safety » circulation • Limited potential: <ul style="list-style-type: none"> » for mode shifts away from motor vehicle travel to transit to reduce single occupancy vehicle trips. » to support locally adopted transportation policies. » to improve connectivity to bicycle or pedestrian facilities. • Intersection mobility standards would be met at all intersections under proposed standards. 	<ul style="list-style-type: none"> • Improved in-vehicle transit travel time by 1 minutes during the a.m. peak hour inbound compared to No-Build. • Reduced average weekday systemwide transit ridership by 100 (-0.2%) compared to No-Build. • Reduced average weekday corridor boardings by 150 compared to No Build. • Intersection mobility standards would be met at all intersections under proposed standards. • Installation of 3,520 feet (0.67 mile) of new or improved sidewalks on the 10.2-mile corridor, 7,300 feet (1.38 miles) of new or improved bicycle lanes, and 1 new and 2 replaced enhanced pedestrian/bike crossings. • Moderate safety improvements due to increased crossing opportunities for bikes and pedestrians. • Up to 69 on-street parking stalls impacted. • Temporary construction-related vehicle delay and bicycle and pedestrian detours. 	<ul style="list-style-type: none"> • Improved in-vehicle transit travel time by 2 minutes during the a.m. peak hour over the full length of the corridor compared to No-Build. • Greatest potential for increased transit reliability due to 13.4% increase in transit exclusive / priority lanes compared to No Build. • Increased average weekday systemwide transit ridership by 660 (1.4%) compared to No-Build. • Increased average weekday corridor boardings by 1,400 compared to No Build. • Mobility standards would be met at all intersections under proposed standards. • Installation of 2,930 feet (0.55 mile) of new or improved sidewalks on the 10.2 mile corridor, 7,040 feet (1.34 miles) of improved bike lanes, and 8 new and 2 replaced enhanced pedestrian/bike crossings. • Greatest safety improvements due to BAT lanes, buffered bike lanes, and increased crossing opportunities for bikes and pedestrians. • Up to 16 off-street parking stalls impacted, 140 on-street parking stalls impacted, and 3 driveway closures. However, if High Street Cycle Track project is constructed outside of this project, then the potential on-street parking loss would be reduced to 72 spaces. • Temporary construction-related vehicle delay and bicycle and pedestrian detours.
Potential Mitigation Measures	None	<ul style="list-style-type: none"> • During final design, where possible, use design refinements to avoid or further minimize impacts to off-street parking, circulation, and drive-throughs. 	<ul style="list-style-type: none"> • During final design, where possible, use design refinements to avoid or further minimize impacts to off-street parking, circulation, and drive-throughs.

Table C-3: Summary of 30th Avenue to LCC Corridor Potential Benefits and Impacts by Alternative

	No-Build Alternative	Enhanced Corridor Alternative	EmX Alternative
		<ul style="list-style-type: none"> Plan construction to minimize potential impacts where possible to businesses, roadway users, and surrounding communities using a variety of techniques that may include: <ul style="list-style-type: none"> » Limit length of single lane closures. » Work on one side of road at a time. » Construct in shorter segments in locations with high driveway density. » Consider night-time construction hours in areas with greatest number of businesses to further reduce business and traffic disruptions. » Maintain business access points during construction and provide appropriate signage. As appropriate, use variable message signs to provide road users with advance notice of current or pending construction activities and alternate routes. 	<ul style="list-style-type: none"> Plan construction to minimize potential impacts where possible to businesses, roadway users, and surrounding communities using a variety of techniques that may include: <ul style="list-style-type: none"> » Limit length of single lane closures. » Work on one side of road at a time. » Construct in shorter segments in locations with high driveway density. » Consider night-time construction hours in areas with greatest number of businesses to further reduce business and traffic disruptions. » Maintain business access points during construction and provide appropriate signage. As appropriate, use variable message signs to provide road users with advance notice of current or pending construction activities and alternate routes.
UTILITIES			
Impacts / Benefits	None	<ul style="list-style-type: none"> Replacement and/or relocation of aging utility infrastructure would provide a potential indirect benefit. Short-term service disruptions during construction. 	<ul style="list-style-type: none"> Beneficial effect of constructing new fiber connections along length of corridor is improved quality of service, customer safety and operational efficiency. Network bandwidth provided over fiber enables the District to operate HD cameras for monitoring of platforms/stations, deliver real-time information to platform-based display panels and management of platform/stations amenities from a central location for example lighting, irrigation, ticket vending machines, and audio systems. Replacement and/or relocation of aging utility infrastructure would provide a potential indirect benefit. Short-term service disruptions during construction.
Potential Mitigation Measures	None	<ul style="list-style-type: none"> Modify project design, where feasible, to avoid and minimize impacts to utilities. Coordinate with utility providers early and throughout design and construction process. Use environmental BMPs during construction and relocation to mitigate potential hazards. Notify businesses and residences, as appropriate, for extended service disruptions. 	<ul style="list-style-type: none"> Modify project design, where feasible, to avoid and minimize impacts to utilities. Coordinate with utility providers early and throughout design and construction process. Use environmental BMPs during construction and relocation to mitigate potential hazards. Notify businesses and residences, as appropriate, for extended service disruptions.

Table C-3: Summary of 30th Avenue to LCC Corridor Potential Benefits and Impacts by Alternative

	No-Build Alternative	Enhanced Corridor Alternative	EmX Alternative
VISUAL AND AESTHETIC RESOURCES			
Long-Term Direct Impacts / Benefits	None	<ul style="list-style-type: none"> Up to 54 street trees and 4 landscape trees removed. 0.8 mile of high to moderate potential to change visual character of scattered areas along corridor. Replanted trees could be selected to develop a more visually unified corridor. 1 new and 2 replaced enhanced bicycle and pedestrian crossings would assist in visually unifying the corridor. Construction activities and equipment would temporarily alter the appearance of the corridor, particularly in areas where existing trees would need to be removed. 	<ul style="list-style-type: none"> Up to 98 street trees and 4 landscape trees removed. 1.7 miles of high to moderate potential change to visual character of scattered areas along corridor. Replanted trees could be selected to develop a more visually unified corridor. 8 new and 2 replaced enhanced bicycle and pedestrian crossings would assist in visually unifying the corridor. 21 new EmX stations would be constructed, which would assist in visually unifying the corridor. Construction activities and equipment would temporarily alter the appearance of the corridor, particularly in areas where existing trees would need to be removed.
Potential Mitigation Measures	None	<ul style="list-style-type: none"> Replace all removed street trees at ratio of at least one tree planted for one tree removed or as otherwise required by Eugene Code and coordinated with City Urban Forestry staff on tree species, planting locations, and soil conditions per City standards. Replace removed landscape trees where possible through coordination with individual property owners. Develop a Tree Protection Plan before construction and use BMPs for tree protection during construction. 	<ul style="list-style-type: none"> Replace all removed street trees at ratio of at least one tree planted for one tree removed or as otherwise required by Eugene Code and coordinated with City Urban Forestry staff on tree species, planting locations, and soil conditions per City standards. Replace removed landscape trees where possible through coordination with individual property owners. Develop a Tree Protection Plan before construction and use BMPs for tree protection during construction.
WATER QUALITY			
Long-Term Direct Impacts / Benefits	<ul style="list-style-type: none"> New and reconstructed impervious area per the Draft Eugene 2035 TSP. 	<ul style="list-style-type: none"> 110,800 ft² of new and reconstructed impervious area in the Amazon Creek and Willamette River Basins, of which 26,900 ft² would be new roadway and sidewalk. No direct impacts on Willamette River floodplain. Potential for temporary construction-related sediment release. Potential short-term construction related impacts to Amazon Creek floodplain due to construction of stations and crossings near 17th Avenue. With mitigation measures, such as water quality and flow control facilities, there would be net water quality improvement associated with reconstructed impervious areas and impacts of new impervious area would be reduced. 	<ul style="list-style-type: none"> 209,300 ft² of new and reconstructed impervious area in the Amazon Creek and Willamette River Basins, of which 35,700 ft² would be new roadway and sidewalk. No direct impacts on Willamette River floodplain. Potential for temporary construction-related sediment release. Potential short-term construction related impacts to Amazon Creek floodplain due to construction of stations and crossings near 17th Avenue. With mitigation measures, such as water quality and flow control facilities, there would be net water quality improvement associated with reconstructed impervious areas and impacts of new impervious area would be reduced.

Table C-3: Summary of 30th Avenue to LCC Corridor Potential Benefits and Impacts by Alternative

	No-Build Alternative	Enhanced Corridor Alternative	EmX Alternative
Potential Mitigation Measures	<ul style="list-style-type: none"> • Water quality and flow control facilities located near major areas of construction. • Erosion control and sediment prevention activities. 	<ul style="list-style-type: none"> • Comply with applicable local, state and federal water quality treatment standards and regulations. • Implement vegetated and mechanical stormwater runoff treatment BMPs, as appropriate and approved by regulating agencies. • To decrease overall impacts, construct water quality and flow control facilities at the following possible intersections, as appropriate and approved by regulating agencies: <ul style="list-style-type: none"> » 11th Avenue and Pearl Street » 19th Avenue and Pearl Street » Amazon Parkway and Hilyard Street » E. 30th Avenue and Spring Boulevard • Implement temporary erosion and sediment control activities to lessen impacts to project surroundings during construction. 	<ul style="list-style-type: none"> • Comply with applicable local, state and federal water quality treatment standards and regulations. • Implement vegetated and mechanical stormwater runoff treatment BMPs, as appropriate and approved by regulating agencies. • To decrease overall impacts, construct water quality and flow control facilities at the following possible intersections, as appropriate and approved by regulating agencies: <ul style="list-style-type: none"> » 11th Avenue and Pearl Street » 19th Avenue and Pearl Street » Amazon Parkway and Hilyard Street » E. 30th Avenue and Spring Boulevard • Implement temporary erosion and sediment control activities to lessen impacts to project surroundings during construction.

Table C-4: Summary of Coburg Road Corridor Potential Benefits and Impacts by Alternative

	No-Build Alternative	Enhanced Corridor Alternative	EmX Alternative
ACQUISITIONS AND DISPLACEMENTS			
Impacts / Benefits	<ul style="list-style-type: none"> No planned property acquisitions. 	<ul style="list-style-type: none"> No significant adverse impacts, however, property acquisitions and parking impacts will occur, including up to: <ul style="list-style-type: none"> » 47 partial property acquisitions (1.0 acre): most are relatively minor strips from tax lot frontages. » 67 off-street parking spaces would be eliminated at 5 properties. Partial access closures at 1 residential property with alternative access. 	<ul style="list-style-type: none"> No significant adverse impacts, however, property acquisitions and parking impacts will occur, including up to: <ul style="list-style-type: none"> » 71 partial property acquisitions (1.5 acres): most are relatively minor strips from tax lot frontages. » 2 full property acquisitions from commercial properties (2.5 acres). » 128 off-street parking spaces would be eliminated at 15 properties. Partial access closures at 1 residential property with alternative access. 2 businesses would be displaced as a result of the closure of 2 drive-throughs resulting in full property acquisitions, including 1 fast food restaurant and 1 bank.
Potential Mitigation Measures	None	<ul style="list-style-type: none"> During final design, consider design refinements that avoid or further minimize site-specific property impacts. If practical, during final design, consider design refinements to avoid or further minimize off-street parking loss such as parking lot redesign/restriping or other design refinements. Pay property owners at fair market value for the property acquired, consistent with state and federal law. Any owners or tenants displaced would be eligible for relocation assistance as specified in the Uniform Relocation Act. 	<ul style="list-style-type: none"> During final design, consider design refinements that avoid or further minimize site-specific property impacts. If possible, avoid full acquisition of 2 commercial properties through design refinement. If practical, during final design, consider design refinements to avoid or further minimize off-street parking loss such as parking lot redesign/restriping or other design refinements. Pay property owners at fair market value for the property acquired, consistent with state and federal law. Any owners or tenants displaced would be eligible for relocation assistance as specified in the Uniform Relocation Act.
AIR QUALITY			
Impacts / Benefits	<ul style="list-style-type: none"> No predicted exceedances of relevant air quality standards in 2035. 	<ul style="list-style-type: none"> No predicted exceedances of relevant air quality standards in 2035. Modeling did not show significant differences between this alternative and the No-Build Alternative. During construction, temporary increases in emissions and fugitive dust are expected. 	<ul style="list-style-type: none"> No predicted exceedances of relevant air quality standards in 2035. Modeling did not show significant differences between this alternative and the No-Build Alternative. During construction, temporary increases in emissions and fugitive dust are expected.
Potential Mitigation Measures	None	<p>Require construction contractors to:</p> <ul style="list-style-type: none"> Take reasonable precautions to avoid fugitive dust emissions during construction. Comply with local and state air pollution control regulations during construction. Use air quality BMPs during construction. 	<p>Require construction contractors to:</p> <ul style="list-style-type: none"> Take reasonable precautions to avoid fugitive dust emissions during construction. Comply with local and state air pollution control regulations during construction. Use air quality BMPs during construction.

Table C-4: Summary of Coburg Road Corridor Potential Benefits and Impacts by Alternative

	No-Build Alternative	Enhanced Corridor Alternative	EmX Alternative
COMMUNITY, NEIGHBORHOODS, AND ENVIRONMENTAL JUSTICE			
Impacts / Benefits	<ul style="list-style-type: none"> • Would not result in any impacts on neighborhoods, community facilities, or public services. • Would not result in any economic benefits associated with development in the areas around stations. 	<ul style="list-style-type: none"> • Improved pedestrian, bicycle, and transit options would improve connectivity to neighborhoods and access to community facilities. • Loss of up to 67 off-street parking spaces at 5 properties. • Would restrict 4 business driveways to right-in / right-out turning movements. • Property acquisition impacts would affect 47 properties for total of 1.0 acre. • Removal of up to 3 medium and large street trees and 6 medium and large landscape trees. • No potential noise impacts. • No property acquisition effects to community facilities. • Could affect 2 high-risk hazardous material sites. • No disproportionate high and adverse impacts on minority and low-income populations anticipated. • Temporary noise, dust, vibration, and disruption in access to properties would occur if any roadway or lane closures were required or as result of construction equipment blocking access. • Temporary increases in noise and vibration could temporarily affect existing neighborhood noise levels where construction is adjacent or in close proximity to community facilities and public service locations (see Noise and Vibration section). • Purchase of goods and services to construct planned projects, and construction jobs created would result in short-term economic benefits. • Beneficial indirect impacts for neighborhoods with any new development include creating new meeting places for area residents, and new opportunities to live and work near transit. These indirect benefits would be likely to affect a zone of approximately 0.25 mile around the Enhanced Corridor Alternative stops only if zoning permits, development interest is present, and land area is available. 	<ul style="list-style-type: none"> • Same connectivity benefits as Enhanced Corridor Alternative, but to a greater degree because of increased reliability. • Loss of up to 128 off-street parking spaces at 15 properties. • Would restrict 7 business driveways to right-in / right-out turning movements. • Would affect circulation or drive-through at 2 commercial properties. • Property acquisition impacts would affect 73 properties for total of 4.0 acres. • Would potentially displace 2 businesses. • Removal of up to 138 medium and large street trees and 11 medium and large landscape trees. • Potential noise impacts on up to 46 properties, but mitigation can likely eliminate impacts. • Minor property acquisitions would affect 7 community facilities. • Could affect 3 high-risk hazardous material sites. • No disproportionate high and adverse impacts on minority and low-income populations anticipated. • Temporary noise, dust, vibration, and disruption in access to properties would occur if any roadway or lane closures were required or as result of construction equipment blocking access. • Temporary increases in noise and vibration could temporarily affect existing neighborhood noise levels where construction is adjacent or in close proximity to community facilities and public service locations (see Noise and Vibration section). • Purchase of goods and services to construct planned projects, and construction jobs created would result in short-term economic benefits. • Beneficial indirect impacts for neighborhoods with any new development include creating new meeting places for area residents, and new opportunities to live and work near transit. These indirect benefits would be likely to affect a zone of approximately 0.50 mile around the EmX Alternative stations only if zoning permits, development interest is present, and land area is available.

Table C-4: Summary of Coburg Road Corridor Potential Benefits and Impacts by Alternative

	No-Build Alternative	Enhanced Corridor Alternative	EmX Alternative
Potential Mitigation Measures	None	<ul style="list-style-type: none"> Mitigate anticipated construction-related disruption through implementation of the following methods where possible: flagging and signage, proper staging of equipment, maintaining access to adjacent businesses during normal operating hours, preparing and implementing a traffic detour plan, and a communication and construction update plan. Ensure emergency response vehicles have adequate passage throughout corridor during construction period. During final design, seek to further avoid or minimize property acquisitions and off-street parking impacts. Compensate affected property owners with fair market value according to federal regulations and guidance. Street tree removals replanted at a ratio of at least 1:1 in coordination with City Urban Forestry staff. 	<ul style="list-style-type: none"> Mitigate anticipated construction-related disruption through implementation of the following methods where possible: flagging and signage, proper staging of equipment, maintaining access to adjacent businesses during normal operating hours, preparing and implementing a traffic detour plan, and a communication and construction update plan. Ensure emergency response vehicles have adequate passage throughout corridor during construction period. During final design, seek to further avoid or minimize property acquisitions and off-street parking impacts. Compensate affected property owners with fair market value according to federal regulations and guidance. Street tree removals replanted at a ratio of at least 1:1 in coordination with City Urban Forestry staff.
CULTURAL RESOURCES			
Impacts / Benefits	None	<ul style="list-style-type: none"> Potential direct impacts to 7 resources. Potential indirect impacts to 5 resources. Adverse impacts are unlikely because potential effects are anticipated to be avoided through project design. 	<ul style="list-style-type: none"> Potential direct impacts to 7 resources and 1 grouping. Potential indirect impacts to 3 resources and 1 grouping. Adverse impacts are unlikely because potential effects are anticipated to be avoided through project design.
Potential Mitigation Measures	None	<ul style="list-style-type: none"> During final design, consider measures to avoid or further minimize ROW acquisitions. Where practical, move stop locations away from historic resources. As appropriate and in coordination with regulating agencies, prepare mitigation plan under MOA to offset impacts (interpretation, documentation, etc.). 	<ul style="list-style-type: none"> During final design, consider measures to avoid or further minimize ROW acquisitions. Where practical, move stop locations away from historic resources. As appropriate and in coordination with regulating agencies, prepare mitigation plan under MOA to offset impacts (interpretation, documentation, etc.).
ECOSYSTEMS			
Impacts / Benefits	None	<ul style="list-style-type: none"> Increased runoff from 358,600 ft² of new, reconstructed, and adjoining impervious surface. Tree removal resulting in a temporary loss of urban avian habitat. Construction activities would temporarily increase potential to increase sediment transport to waterways. More efficient transit system than No-Build, potentially resulting in less pollutant loading. 	<ul style="list-style-type: none"> Increased runoff from 812,900 ft² of new, reconstructed, and adjoining impervious surface. Tree removal resulting in a temporary loss of urban avian habitat. Construction activities would temporarily increase potential to increase sediment transport to waterways. More efficient transit system than No-Build, potentially resulting in less pollutant loading.

Table C-4: Summary of Coburg Road Corridor Potential Benefits and Impacts by Alternative

	No-Build Alternative	Enhanced Corridor Alternative	EmX Alternative
Potential Mitigation Measures	None	<ul style="list-style-type: none"> Comply with applicable local and state water quality treatment standards. Design the project to minimize new pollution-generating impervious surface as much as practicable. Replace removed street trees at least one for one with species approved by City of Eugene arborists. Replace disturbed landscape trees and landscaping where feasible. Comply with Migratory Bird Treaty Act by avoiding tree removal during nesting season. Utilize BMPs to avoid or minimize impacts to waterways and aquatic species. Avoid wetland impacts by conducting additional wetland determination/ delineation and design refinement. 	<ul style="list-style-type: none"> Comply with applicable local and state water quality treatment standards. Design the project to minimize new pollution-generating impervious surface as much as practicable. Replace removed street trees at least one for one with species approved by City of Eugene arborists. Replace disturbed landscape trees and landscaping where feasible. Comply with Migratory Bird Treaty Act by avoiding tree removal during nesting season. Utilize BMPs to avoid or minimize impacts to waterways and aquatic species. Avoid wetland impacts by conducting additional wetland determination/ delineation and design refinement.
ENERGY, SUSTAINABILITY AND GHG			
Impacts / Benefits	<ul style="list-style-type: none"> Limited potential for sufficient mode shifts away from motor vehicle travel to transit to improve energy use and sustainability. Limited potential for future reduction in indirect energy consumption. 	<ul style="list-style-type: none"> Systemwide reduction in VMT of 0.016% as compared to No-Build Alternative. Systemwide reduction in energy consumption of 0.022% as compared to No-Build. Systemwide reduction in GHG emissions of 0.023% compared to No-Build. Systemwide increase in maintenance and repair energy of 0.015% compared to No-Build. Temporary increase in construction-related energy use and emissions. The cement used for bus stops will require less maintenance than asphalt over time. The project will create jobs and related economic benefits. 	<ul style="list-style-type: none"> Systemwide reduction in VMT of 0.017% as compared to No-Build Alternative. Systemwide reduction in energy consumption of 0.001% as compared to No-Build. Systemwide increase in GHG emissions of 0.002% as compared to No-Build. Systemwide increase in maintenance and repair energy of 0.018% compared to No-Build. Temporary increase in construction-related energy use and emissions. The cement used for bus/BRT vehicle lanes and stations will require less maintenance than asphalt over time. The project will create jobs and related economic benefits.
Potential Mitigation Measures	None	None	None
GEOLOGY AND SEISMIC			
Impacts / Benefits	<ul style="list-style-type: none"> Impacts would be associated with planned improvements in Eugene TSP that are expected to be developed in Corridor, even without building proposed project. 	<ul style="list-style-type: none"> Long-term impacts related to geologic and seismic hazards already exist and are the same as for the No-Build Alternative. Proposed project would be within seismically active area but project would meet seismic design standards to minimize long-term risks to system. 	<ul style="list-style-type: none"> Long-term impacts related to geologic and seismic hazards already exist and are the same as for the No-Build Alternative. Proposed project would be within seismically active area but project would meet seismic design standards to minimize long-term risks to system.

Table C-4: Summary of Coburg Road Corridor Potential Benefits and Impacts by Alternative

	No-Build Alternative	Enhanced Corridor Alternative	EmX Alternative
	<ul style="list-style-type: none"> Transportation infrastructure, including transit, within corridor would be affected by slope instability and seismic hazards identified for build alternatives. 	<ul style="list-style-type: none"> Overall risk of impacts because of constructing in landslide hazard areas would be limited for the intersection of Chad Drive and Shadow View Drive, sections of Coburg Road between Crescent Avenue and Old Coburg Road, the intersection of Coburg Road and I-105 interchange, and sections of Coburg Road from E. 4th Avenue to the Martin Luther King, Jr. Boulevard ramp that have been mapped as moderate (landsliding possible) to high (landsliding likely). Major source of construction vibration and noises would be from vibratory rollers and jack hammers. 	<ul style="list-style-type: none"> Overall risk of impacts because of constructing in landslide hazard areas would be limited for the intersection of Chad Drive and Shadow View Drive, sections of Coburg Road between Crescent Avenue and Old Coburg Road, the intersection of Coburg Road and I-105 interchange, and sections of Coburg Road from E. 4th Avenue to the Martin Luther King, Jr. Boulevard ramp that have been mapped as moderate (landsliding possible) to high (landsliding likely). Major source of construction vibration and noises would be from vibratory rollers and jack hammers.
Potential Mitigation Measures	None	<ul style="list-style-type: none"> Detailed study during final design would confirm degree of geologic risk and at sites where geologic conditions were not suitable, appropriate design and construction measures would be implemented to avoid potential effects and geologic risks during operations. Engineering design standards and best management practices would be used to avoid and minimize potential construction impacts. 	<ul style="list-style-type: none"> Detailed study during final design would confirm degree of geologic risk and at sites where geologic conditions were not suitable, appropriate design and construction measures would be implemented to avoid potential effects and geologic risks during operations. Engineering design standards and best management practices would be used to avoid and minimize potential construction impacts.
HAZARDOUS MATERIALS			
Impacts / Benefits	<ul style="list-style-type: none"> Projects proposed under other programs would generate comparable mix and quantity of hazardous materials proportional to magnitude of improvements. Contaminated sites could affect these improvement projects. In areas where no construction is proposed under other programs, would not remediate existing contaminants. 	<ul style="list-style-type: none"> Extent of long-term operation impacts associated with acquisition of properties that are source of contamination would be defined more specifically during subsequent design refinement. Not expected to change number of hazardous materials sites along corridor, although it is likely to result in removal of some contaminated soils and groundwater which, if disposed of outside of the API, would have positive effect on overall environmental conditions within general vicinity. Could potentially affect 2 high-risk sites. None of the 66 medium-risk sites located within the API are within potentially affected tax lots. Construction could inadvertently disturb sites with previously undocumented contamination or could affect known sites with contaminated media. 	<ul style="list-style-type: none"> Extent of long-term operation impacts associated with acquisition of properties that are source of contamination would be defined more specifically during subsequent design refinement. Not expected to change number of hazardous materials sites along corridor, although it is likely to result in removal of some contaminated soils and groundwater which, if disposed of outside of the API, would have positive effect on overall environmental conditions within general vicinity. Could potentially affect 3 high-risk sites. None of the 65 medium-risk sites located within the API are within potentially affected tax lots. Construction could inadvertently disturb sites with previously undocumented contamination or could affect known sites with contaminated media.
Potential Mitigation Measures	None	<ul style="list-style-type: none"> During final design and permitting phase, perform Phase I Environmental Site Assessment and Phase II Environmental Site Assessment, if appropriate, as part of due diligence to confirm presence or absence of contaminated environmental media at properties proposed for partial or full acquisition. 	<ul style="list-style-type: none"> During final design and permitting phase, perform Phase I Environmental Site Assessment and Phase II Environmental Site Assessment, if appropriate, as part of due diligence to confirm presence or absence of contaminated environmental media at properties proposed for partial or full acquisition.

Table C-4: Summary of Coburg Road Corridor Potential Benefits and Impacts by Alternative

	No-Build Alternative	Enhanced Corridor Alternative	EmX Alternative
		<ul style="list-style-type: none"> Use construction BMPs that minimize disturbance or release of contaminated media. Prepare and use comprehensive contaminated media management, safety, and environmental response contingency plans, as appropriate, to mitigate direct and indirect impacts from potential release of hazardous substances. Manage and dispose of hazardous or contaminated materials in accordance with applicable local, state and federal regulations. 	<ul style="list-style-type: none"> Use construction BMPs that minimize disturbance or release of contaminated media. Prepare and use comprehensive contaminated media management, safety, and environmental response contingency plans, as appropriate, to mitigate direct and indirect impacts from potential release of hazardous substances. Manage and dispose of hazardous or contaminated materials in accordance with applicable local, state and federal regulations.
LAND USE, PRIME FARMLANDS			
Impacts / Benefits	<ul style="list-style-type: none"> Inconsistent with adopted goals and policies. Transit would not serve all Key Transit Corridors in a manner consistent with local and regional planning policy. 	<ul style="list-style-type: none"> No significant adverse impacts. Generally consistent with most area plans and local land use regulations. Beneficial effects include transit serving Key Transit Corridors in a manner consistent with local and regional planning policy. Conversion of up to approximately 1.0 acre to a transportation-related use. Remove up to 67 off-street parking spaces. No prime farmlands impacts. TOD could occur under this alternative, but potentially not to the same degree or intensity as with the EmX Alternative. 	<ul style="list-style-type: none"> No significant adverse impacts. Consistent with area plans and local land use regulations. Beneficial effects include transit serving Key Transit Corridors in a manner consistent with local and regional planning policy. Conversion of up to approximately 4.0 acres to a transportation-related use. Remove up to 128 off-street parking spaces. No prime farmlands impacts. EmX Alternative would better support and foster accelerated rates of TOD implementation in places that local and regional land use planning documents have designated for Mixed-Use and Multi-Family Residential development than No-Build or Enhanced Corridor Alternatives.
Potential Mitigation Measures	None	<ul style="list-style-type: none"> During final design, consider design modifications which could minimize property acquisition and conversion of land uses to a transportation-related use. During final design, consider refinements to avoid or further minimize off-street parking loss through parking lot redesign/restriping or other design refinements. 	<ul style="list-style-type: none"> During final design, consider design modifications which could minimize property acquisition and conversion of land uses to a transportation-related use. During final design, consider refinements to avoid or further minimize off-street parking loss through parking lot redesign/restriping or other design refinements.
NOISE AND VIBRATION			
Impacts / Benefits	None	<ul style="list-style-type: none"> No noise impacts anticipated based on current guidance in the FTA Manual. No vibration impacts anticipated. 	<ul style="list-style-type: none"> No significant adverse impacts, however, potential noise impacts at up to 46 properties (including single- and multi-family residences, a hotel, churches and a school) based on current guidance in the FTA Manual. No vibration impacts anticipated.

Table C-4: Summary of Coburg Road Corridor Potential Benefits and Impacts by Alternative

	No-Build Alternative	Enhanced Corridor Alternative	EmX Alternative
Potential Mitigation Measures	None	<ul style="list-style-type: none"> None required, however, during final design, should noise and vibration impacts be discovered, where applicable, detailed mitigation planning will be developed in the NEPA documentation phase of the project in accordance with the FTA criteria. 	<ul style="list-style-type: none"> Where applicable, detailed mitigation planning will be developed in the NEPA documentation phase of the project in accordance with the FTA criteria.
PARKLANDS AND RECREATION AREAS			
Long-Term Direct Impacts / Benefits	None	<ul style="list-style-type: none"> No significant adverse impacts. Improved transit access to park resources within the corridor with construction of 7 enhanced and 2 upgraded bicycle and pedestrian crossings, improvements to existing bus stops, and construction of new stops. Transit service to the Park Blocks, Skinner Butte Park, and Alton Baker Park would be more frequent. Park users at Skinner Butte Park would have a greater distance to walk from transit. No Section 6(f) resources would be affected. 	<ul style="list-style-type: none"> No significant adverse impacts. Improved transit access to park resources within the corridor with construction of 9 enhanced and 3 upgraded bicycle and pedestrian crossings and new EmX stations. Transit service to the Park Blocks, Skinner Butte Park, and Alton Baker Park would be more frequent. Park users at Skinner Butte Park would have a greater distance to walk from transit. Construction of an EmX station could require acquisition of less than 0.01 acre of the Park Blocks, though there would not be a loss of park amenities. No Section 6(f) resources would be affected.
Potential Mitigation Measures	None	<ul style="list-style-type: none"> Where possible, mitigate short-term, minor impacts from construction through coordination of construction timing with Eugene Parks and Open Space Division to avoid or reduce disruptive activities for users of parks and recreation resources. 	<ul style="list-style-type: none"> Where possible, mitigate short-term, minor impacts from construction through coordination of construction timing with Eugene Parks and Open Space Division to avoid or reduce disruptive activities for users of parks and recreation resources. Permanent loss of Park Blocks property would be mitigated, first by further exploring avoidance during subsequent design development phases and, if avoidance is not practical, then in coordination with City consider compensation or enhancing remaining park property consistent with City's park plans.
SECTION 4(F) RESOURCES			
Impacts / Benefits	None	<ul style="list-style-type: none"> Historic resources affected: <ul style="list-style-type: none"> » 5 directly affected » 3 indirectly affected » 2 both directly and indirectly affected Potential <i>de minimis</i> use anticipated: <ul style="list-style-type: none"> » 10 Historic Resources 	<ul style="list-style-type: none"> » Permanent incorporation of less than 0.01 acre of parkland from the Park Blocks to construct an EmX station and sidewalk. » Temporary occupancy of the Park Blocks to install an EmX station and sidewalk. » No activities, features, or attributes would be permanently impacted by project actions nor would temporary construction actions at the park permanently or temporarily interfere with visitors using the park.

Table C-4: Summary of Coburg Road Corridor Potential Benefits and Impacts by Alternative

	No-Build Alternative	Enhanced Corridor Alternative	EmX Alternative
			<ul style="list-style-type: none"> Historic resources affected: <ul style="list-style-type: none"> » 6 directly affected » 2 indirectly affected » 2 both directly and indirectly affected Potential <i>de minimis</i> use anticipated: <ul style="list-style-type: none"> » Park blocks » 10 Historic Resources
Potential Mitigation Measures	None	<ul style="list-style-type: none"> In accordance with 23 CFR 774, prepare detailed impacts analyses, determine detailed minimization, compensatory and mitigation measures with concurrence from the agency of jurisdiction over the resources, allow for public review and make a final determination. LTD would seek a <i>de minimis</i> impact determination for resources affected by project actions. 	<ul style="list-style-type: none"> If mitigation of park property cannot be further minimized, mitigation would include enhancement of park property through coordination with Eugene Parks and Open Space division and the City's Full 30 Year Vision for Parks and Recreation Capital Projects List with Draft Priorities (City of Eugene, 2017, March 8). In accordance with 23 CFR 774, prepare detailed impacts analyses, determine detailed minimization, compensatory and mitigation measures with concurrence from the agency of jurisdiction over the resources, allow for public review and make a final determination. LTD would seek a <i>de minimis</i> impact determination for resources affected by project actions.
<p>STREET AND LANDSCAPE TREES (NOTE: STREET TREES ARE LOCATED IN PUBLIC RIGHT-OF-WAY AND LANDSCAPE TREES ARE LOCATED ON PRIVATE PROPERTY.)</p>			
Impacts / Benefits	None	<ul style="list-style-type: none"> No Charter or Heritage trees to be removed. Up to 3 medium and large street trees and up to 6 landscape trees may be removed. Short-term construction-related impacts may occur to trees at: <ul style="list-style-type: none"> » Coburg Road and Harlow Road due to intersection widening. 	<ul style="list-style-type: none"> No Charter or Heritage trees to be removed. Up to 138 medium and large street trees and up to 11 landscape trees may be removed. Short-term construction-related impacts may occur to trees at: <ul style="list-style-type: none"> » Coburg Road and Harlow Road due to intersection widening. » In the median of Coburg Road between Country Club Road and I-105 Interchange due to construction of BAT lanes.
Potential Mitigation Measures	None	<ul style="list-style-type: none"> Replant removed street trees in new sidewalk landscaping strips at a ratio of at least 1:1 in coordination with City Urban Forestry staff. Replant removed landscape trees where appropriate through coordination with individual property owners. Develop a Tree Protection Plan before construction and use BMPs for tree protection during construction. 	<ul style="list-style-type: none"> Replant removed street trees in new sidewalk landscaping strips at a ratio of at least 1:1 in coordination with City Urban Forestry staff. Replant removed landscape trees where appropriate through coordination with individual property owners. Develop a Tree Protection Plan before construction and use BMPs for tree protection during construction.

Table C-4: Summary of Coburg Road Corridor Potential Benefits and Impacts by Alternative

	No-Build Alternative	Enhanced Corridor Alternative	EmX Alternative
TRANSPORTATION AND TRANSIT			
Impacts / Benefits	<ul style="list-style-type: none"> No benefit or impact to: <ul style="list-style-type: none"> » roadway capacity » safety » circulation Limited potential: <ul style="list-style-type: none"> » for mode shifts away from motor vehicle travel to transit to reduce single occupancy vehicle trips. » to support locally adopted transportation policies. » to improve connectivity to bicycle or pedestrian facilities. Intersection mobility standards would not be met at 1 intersection under proposed standards. 	<ul style="list-style-type: none"> Improved in-vehicle transit travel time by 5 minutes during the a.m. peak hour inbound compared to No-Build. Some potential for increased transit reliability due to 3.7% increase in transit exclusive/priority lanes compared to No-Build. Increased average weekday systemwide transit ridership by 340 (0.5%) compared to No-Build. Increased average weekday corridor boardings by 340 compared to No Build. Local traffic operations would improve at 2 intersections. Mobility standards would be met at all intersections under proposed standards. Installation of 7,050 feet (1.43 miles) of new or improved sidewalks on the 10.3-mile corridor, 7 new enhanced pedestrian/bike crossings, and 2 new upgraded pedestrian/bike crossings. Moderate safety improvements due to BAT lanes and increased crossing opportunities for bikes and pedestrians. Up to 67 potential off-street parking stalls impacted, 1 driveway closure, and access restrictions at 4 businesses. Some potential for mode shifts away from motor vehicle travel to transit to reduce single occupancy vehicle trips. Temporary construction-related vehicle delay and bicycle and pedestrian detours. 	<ul style="list-style-type: none"> Improved in-vehicle transit travel time by 5 minutes during the a.m. peak hour over the full length of the corridor compared to No-Build. Greatest potential for increased transit reliability due to 16.7% increase in transit exclusive/ priority lanes compared to No Build. Increased average weekday systemwide transit ridership by 860 (1.9%) compared to No-Build. Increased average weekday corridor boardings by 1,420 compared to No Build. Local traffic operations would degrade slightly at 2 intersections. Mobility standards would not be met at 3 intersections under proposed standards. Installation of 14,800 feet (2.80 miles) of new or improved sidewalks on the 10.3 mile corridor, 1,900 feet (0.36 mile) of improved bike lanes, 9 new enhanced pedestrian/bike crossings, and 3 new upgraded pedestrian/bike crossings. Greatest safety improvements due to BAT lanes, buffered bike lanes, and increased crossing opportunities for bikes and pedestrians. Up to 128 potential off-street parking stalls impacted, 7 on-street parking stalls impacted, 1 driveway closure, 2 drive-through closures, and access restrictions at 7 businesses. Temporary construction-related vehicle delay and bicycle and pedestrian detours.
Potential Mitigation Measures	None	<ul style="list-style-type: none"> During final design, where possible, use design refinements to avoid or further minimize impacts to off-street parking, circulation, and drive-throughs. Plan construction to minimize potential impacts where possible to businesses, roadway users, and surrounding communities using a variety of techniques that may include: <ul style="list-style-type: none"> » Limit length of single lane closures. » Work on one side of road at a time. » Construct in shorter segments in locations with high driveway density. » Consider night-time construction hours in areas with greatest number of businesses to further reduce business and traffic disruptions. » Maintain business access points during construction and provide appropriate signage. 	<ul style="list-style-type: none"> During final design, where possible, use design refinements to avoid or further minimize impacts to off-street parking, circulation, and drive-throughs. Plan construction to minimize potential impacts where possible to businesses, roadway users, and surrounding communities using a variety of techniques that may include: <ul style="list-style-type: none"> » Limit length of single lane closures. » Work on one side of road at a time. » Construct in shorter segments in locations with high driveway density. » Consider night-time construction hours in areas with greatest number of businesses to further reduce business and traffic disruptions. » Maintain business access points during construction and provide appropriate signage.

Table C-4: Summary of Coburg Road Corridor Potential Benefits and Impacts by Alternative

	No-Build Alternative	Enhanced Corridor Alternative	EmX Alternative
		<ul style="list-style-type: none"> As appropriate, use variable message signs to provide road users with advance notice of current or pending construction activities and alternate routes. 	<ul style="list-style-type: none"> As appropriate, use variable message signs to provide road users with advance notice of current or pending construction activities and alternate routes.
UTILITIES			
Long-Term Direct Impacts / Benefits	None	<ul style="list-style-type: none"> Replacement and/or relocation of aging utility infrastructure would provide a potential indirect benefit. Short-term service disruptions during construction. 	<ul style="list-style-type: none"> Beneficial effect of constructing new fiber connections along the length of the corridor is improved quality of service, customer safety and operational efficiency. Network bandwidth provided over fiber enables the District to operate HD cameras for monitoring of platforms/stations, deliver real-time information to platform-based display panels and management of platform/stations amenities from a central location for example lighting, irrigation, ticket vending machines, and audio systems. Replacement and/or relocation of aging utility infrastructure would provide a potential indirect benefit. Short-term service disruptions during construction.
Potential Mitigation Measures	None	<ul style="list-style-type: none"> Modify project design, where feasible, to avoid and minimize impacts to utilities. Coordinate with utility providers early and throughout design and construction process. Use environmental BMPs during construction and relocation to mitigate potential hazards. Notify businesses and residences, as appropriate, for extended service disruptions. 	<ul style="list-style-type: none"> Modify project design, where feasible, to avoid and minimize impacts to utilities. Design refinement would be necessary to avoid impacts to a NW Natural gas transmission line near a proposed multi-use path. Coordinate with utility providers early and throughout design and construction process. Use environmental BMPs during construction and relocation to mitigate potential hazards. Notify businesses and residences, as appropriate, for extended service disruptions.
VISUAL AND AESTHETIC RESOURCES			
Impacts / Benefits	None	<ul style="list-style-type: none"> Up to 9 trees removed. 1.1 miles of high to moderate potential to change visual character of scattered areas along corridor. Replanted trees could be selected to develop a more visually unified corridor. 7 new enhanced and 2 new upgraded bicycle and pedestrian crossings would assist in visually unifying the corridor. Construction activities and equipment would temporarily alter the appearance of the corridor, particularly in areas where existing trees would need to be removed. 	<ul style="list-style-type: none"> Up to 149 trees removed. 3.1 miles of high to moderate potential change to visual character of scattered areas along corridor. Replanted trees could be selected to develop a more visually unified corridor. 9 new enhanced and 3 new upgraded bicycle and pedestrian crossings would assist in visually unifying the corridor. 28 new EmX stations would be constructed, which would assist in visually unifying the corridor. Construction activities and equipment would temporarily alter the appearance of the corridor, particularly in areas where existing trees would need to be removed.

Table C-4: Summary of Coburg Road Corridor Potential Benefits and Impacts by Alternative

	No-Build Alternative	Enhanced Corridor Alternative	EmX Alternative
Potential Mitigation Measures	None	<ul style="list-style-type: none"> Replace all removed street trees at a ratio of at least one tree planted for one tree removed or as otherwise required by Eugene Code and coordinated with City Urban Forestry staff on tree species, planting locations, and soil conditions per City standards. Replace removed landscape trees where possible through coordination with individual property owners. Develop a Tree Protection Plan before construction and use BMPs for tree protection during construction. 	<ul style="list-style-type: none"> Replace all removed street trees at a ratio of at least one tree planted for one tree removed or as otherwise required by Eugene Code and coordinated with City Urban Forestry staff on tree species, planting locations, and soil conditions per City standards. Replace removed landscape trees where possible through coordination with individual property owners. Develop a Tree Protection Plan before construction and use BMPs for tree protection during construction.
WATER QUALITY			
Long-Term Direct Impacts / Benefits	<ul style="list-style-type: none"> New and reconstructed impervious area per the Draft Eugene 2035 TSP. 	<ul style="list-style-type: none"> 358,600 ft² of new and reconstructed impervious area in the Debrick Slough, Dodson Slough, and Willamette River Basins, of which 126,500 ft² would be new roadway and sidewalk. No direct impacts to Willamette River, Debrick Slough or Dodson Slough floodplains. Potential for temporary construction-related impacts to Willamette River floodplain at intersection of Coburg Road and Cedarwood Drive. Potential for temporary construction-related sediment release. With mitigation measures, such as water quality and flow control facilities, there would be net water quality improvement associated with reconstructed impervious areas and impacts of new impervious area would be reduced. 	<ul style="list-style-type: none"> 812,900 ft² of new and reconstructed impervious area in the Debrick Slough, Dodson Slough, and Willamette River Basins, of which 49,400 ft² would be new roadway and sidewalk. No direct impacts to Willamette River, Debrick Slough or Dodson Slough floodplains. Potential for temporary construction-related impacts to Willamette River floodplain at intersection of Coburg Road and Cedarwood Drive. Potential for temporary construction-related sediment release. With mitigation measures, such as water quality and flow control facilities, there would be net water quality improvement associated with reconstructed impervious areas and impacts of new impervious area would be reduced.
Potential Mitigation Measures	<ul style="list-style-type: none"> Water quality and flow control facilities located near major areas of construction. Erosion control and sediment prevention activities. 	<ul style="list-style-type: none"> Comply with applicable local, state and federal water quality treatment standards and regulations. Implement vegetated and mechanical stormwater runoff treatment BMPs, as appropriate and approved by regulating agencies. To decrease overall impacts, construct water quality and flow control facilities at the following possible intersections, as appropriate and approved by regulating agencies: <ul style="list-style-type: none"> » Coburg Road and Cedarwood Drive » Coburg Road and Frontier Drive » Coburg Road and Crescent Avenue Implement temporary erosion and sediment control activities to lessen impacts to project surroundings during construction. 	<ul style="list-style-type: none"> Comply with applicable local, state and federal water quality treatment standards and regulations. Implement vegetated and mechanical stormwater runoff treatment BMPs, as appropriate and approved by regulating agencies. To decrease overall impacts, construct water quality and flow control facilities at the following possible intersections, as appropriate and approved by regulating agencies: <ul style="list-style-type: none"> » Coburg Road and Cedarwood Drive » Coburg Road and Frontier Drive » Coburg Road and Crescent Avenue Implement temporary erosion and sediment control activities to lessen impacts to project surroundings during construction.

Table C-5: Summary of MLK, Jr. Boulevard Corridor Potential Benefits and Impacts by Alternative

	No-Build Alternative	Enhanced Corridor Alternative
ACQUISITIONS AND DISPLACEMENTS		
Impacts / Benefits	<ul style="list-style-type: none"> No planned property acquisitions. 	<ul style="list-style-type: none"> No significant adverse impacts; however, property acquisitions will occur, including up to: <ul style="list-style-type: none"> » 6 partial property acquisitions (<0.1 acre): all are relatively minor strips from tax lot frontages.
Potential Mitigation Measures	None	<ul style="list-style-type: none"> During final design, consider design refinements that avoid or further minimize site-specific property impacts. Pay property owners at fair market value for the property acquired, consistent with state and federal law. Any owners or tenants displaced would be eligible for relocation assistance as specified in the Uniform Relocation Act.
AIR QUALITY		
Impacts / Benefits	<ul style="list-style-type: none"> No predicted exceedances of relevant air quality standards in 2035. 	<ul style="list-style-type: none"> No predicted exceedances of relevant air quality standards in 2035. Modeling did not show significant differences between this alternative and the No-Build Alternative. During construction, temporary increases in emissions and fugitive dust are expected.
Potential Mitigation Measures	None	<p>Require construction contractors to:</p> <ul style="list-style-type: none"> Take reasonable precautions to avoid fugitive dust emissions during construction. Comply with local and state air pollution control regulations during construction. Use air quality BMPs during construction.
COMMUNITY, NEIGHBORHOODS, AND ENVIRONMENTAL JUSTICE		
Impacts / Benefits	<ul style="list-style-type: none"> Would not result in any impacts on neighborhoods, community facilities, or public services. Would not result in any economic benefits associated with development in the areas around stations. 	<ul style="list-style-type: none"> Improved pedestrian, bicycle, and transit options would improve connectivity to neighborhoods and access to community facilities. Property acquisition impacts would affect 6 properties for total of <0.1 acre. Removal of up to 9 medium and large trees along the corridor. Minor property acquisition would affect 1 community facility. No disproportionate high and adverse impacts on minority and low-income populations anticipated. Temporary noise, dust, vibration, and disruption in access to properties would occur if any roadway or lane closures were required or as result of construction equipment blocking access. Temporary increases in noise and vibration could temporarily affect existing neighborhood noise levels where construction is adjacent or in close proximity to community facilities and public service locations (see Noise and Vibration section). Purchase of goods and services to construct planned projects, and construction jobs created would result in short-term economic benefits. Beneficial indirect impacts for neighborhoods with any new development include creating new meeting places for area residents, and new opportunities to live and work near transit. These indirect benefits would be likely to affect a zone of approximately 0.25 mile around the Enhanced Corridor Alternative stops only if zoning permits, development interest is present, and land area is available.

Table C-5: Summary of MLK, Jr. Boulevard Corridor Potential Benefits and Impacts by Alternative

	No-Build Alternative	Enhanced Corridor Alternative
Potential Mitigation Measures	None	<ul style="list-style-type: none"> Mitigate anticipated construction-related disruption through implementation of the following methods where possible: flagging and signage, proper staging of equipment, maintaining access to adjacent businesses during normal operating hours, preparing and implementing a traffic detour plan, and a communication and construction update plan. Ensure emergency response vehicles have adequate passage throughout corridor during construction period. During final design, seek to further avoid or minimize property acquisitions. Compensate affected property owners with fair market value according to federal regulations and guidance.
CULTURAL RESOURCES		
Impacts / Benefits	None	<ul style="list-style-type: none"> No impacts anticipated for any historical resources.
Potential Mitigation Measures	None	<ul style="list-style-type: none"> During final design, if potential impacts to historical resources are discovered, consider measures to avoid or further minimize ROW acquisitions. Where practical, move stop locations away from historic resources. During final design, if potential impacts to historical resources are discovered and cannot be avoided, as appropriate and in coordination with regulating agencies, prepare mitigation plan under MOA to offset impacts (interpretation, documentation, etc.).
ECOSYSTEMS		
Impacts / Benefits	None	<ul style="list-style-type: none"> Increased runoff from 325,300 ft² of new, reconstructed, and adjoining impervious surface. Tree removal resulting in a temporary loss of urban avian habitat. Construction between Centennial Loop and Leo Harris Parkway may encroach on the 50-ft Water Resources Conservation setback on the Q Street Canal, however, design refinements could avoid impacts to the setback area. Construction activities would temporarily increase potential to increase sediment transport to waterways. More efficient transit system than No-Build, potentially resulting in less pollutant loading.
Potential Mitigation Measures	None	<ul style="list-style-type: none"> Comply with applicable local and state water quality treatment standards. Design the project to minimize new pollution-generating impervious surface as much as practicable. Replace removed street trees at least one for one with species approved by City of Eugene arborists. Replace disturbed landscape trees and landscaping where feasible. Comply with Migratory Bird Treaty Act by avoiding tree removal during nesting season. Utilize BMPs to avoid or minimize impacts to waterways and aquatic species. Avoid wetland impacts by conducting additional wetland determination/ delineation and design refinement.
ENERGY, SUSTAINABILITY AND GHG		
Impacts / Benefits	<ul style="list-style-type: none"> Limited potential for sufficient mode shifts away from motor vehicle travel to transit to improve energy use and sustainability. Limited potential for future reduction in indirect energy consumption. 	<ul style="list-style-type: none"> Systemwide reduction in VMT of 0.012% as compared to No-Build Alternative. Systemwide increase in energy consumption of 0.003% as compared to No-Build. Systemwide increase in GHG emissions of 0.008% compared to No-Build.

Table C-5: Summary of MLK, Jr. Boulevard Corridor Potential Benefits and Impacts by Alternative

	No-Build Alternative	Enhanced Corridor Alternative
		<ul style="list-style-type: none"> • Systemwide reduction in maintenance and repair energy of 0.012% compared to No-Build. • Temporary increase in construction-related energy use and emissions. • Cement used for bus stops would require less maintenance than asphalt over time. • Project would create jobs and related economic benefits.
Potential Mitigation Measures	None	None
GEOLOGY AND SEISMIC		
Impacts / Benefits	<ul style="list-style-type: none"> • Impacts would be associated with planned improvements in Eugene TSP that are expected to be developed in Corridor, even without building proposed project. • Transportation infrastructure, including transit, within corridor would be affected by slope instability and seismic hazards identified for build alternative. 	<ul style="list-style-type: none"> • Long-term impacts related to geologic and seismic hazards already exist and are the same as for the No-Build Alternative. • Proposed project would be within seismically active area but project would meet seismic design standards to minimize the long-term risks to system.
Potential Mitigation Measures	None	<ul style="list-style-type: none"> • Detailed study during final design would confirm degree of geologic risk and at sites where geologic conditions were not suitable, appropriate design and construction measures would be implemented to avoid potential effects and geologic risks during operations. • Engineering design standards and best management practices would be used to avoid and minimize potential construction impacts.
HAZARDOUS MATERIALS		
Impacts / Benefits	<ul style="list-style-type: none"> • Projects proposed under other programs would generate comparable mix and quantity of hazardous materials proportional to magnitude of improvements. • Contaminated sites could affect these improvement projects. • In areas where no construction is proposed under other programs, would not remediate existing contaminants. 	<ul style="list-style-type: none"> • Extent of long-term operation impacts associated with acquisition of properties that are source of contamination would be defined more specifically during subsequent design refinement. • Not expected to change number of hazardous materials sites along corridor, although it is likely to result in removal of some contaminated soils and groundwater which, if disposed of outside of the API, would have positive effect on overall environmental conditions within general vicinity. • Could potentially affect 1 high-risk site and 1 medium-risk site. • Construction could inadvertently disturb sites with previously undocumented contamination or could affect known sites with contaminated media.
Potential Mitigation Measures	None	<ul style="list-style-type: none"> • During final design and permitting phase, perform Phase I Environmental Site Assessment and Phase II Environmental Site Assessment, if appropriate, as part of due diligence to confirm presence or absence of contaminated environmental media at properties proposed for partial or full acquisition. • Use construction BMPs that minimize disturbance or release of contaminated media. • Prepare and use comprehensive contaminated media management, safety, and environmental response contingency plans, as appropriate, to mitigate direct and indirect impacts from potential release of hazardous substances. • Managing and disposing of hazardous or contaminated materials in accordance with applicable local, state and federal regulations.

Table C-5: Summary of MLK, Jr. Boulevard Corridor Potential Benefits and Impacts by Alternative

	No-Build Alternative	Enhanced Corridor Alternative
LAND USE, PRIME FARMLANDS		
Impacts / Benefits	<ul style="list-style-type: none"> Inconsistent with adopted goals and policies. Transit would not serve all Key Transit Corridors in a manner consistent with local and regional planning policy. 	<ul style="list-style-type: none"> No significant adverse impacts. Generally consistent with most area plans and local land use regulations. Conversion of less than 0.1 acre to a transportation-related use. No prime farmlands impacts. TOD could occur under this alternative.
Potential Mitigation Measures	None	<ul style="list-style-type: none"> During final design, consider design modifications which could minimize property acquisition and conversion of land uses to a transportation-related use.
NOISE AND VIBRATION		
Impacts / Benefits	None	<ul style="list-style-type: none"> No significant adverse impacts, however, potential noise impacts on up to 1 hotel based on current guidance in the FTA Manual. No vibration impacts anticipated.
Potential Mitigation Measures	None	<ul style="list-style-type: none"> Where applicable, detailed mitigation planning will be developed in the NEPA documentation phase of the project in accordance with the FTA criteria.
PARKLANDS AND RECREATION AREAS		
Impacts / Benefits	None	<ul style="list-style-type: none"> No significant adverse impacts. Improved transit access to all park resources within the corridor with 4 new enhanced bicycle and pedestrian crossings and increased service frequencies. No Section 6(f) resources would be affected.
Potential Mitigation Measures	None	<ul style="list-style-type: none"> Where possible, mitigate short-term, minor impacts from construction through coordination of construction timing with Eugene Parks and Open Space Division to avoid or reduce disruptive activities for users of parks and recreation resources.
SECTION 4(F) RESOURCES		
Impacts / Benefits	None	<ul style="list-style-type: none"> No impacts anticipated to any Section 4(f) resources.
Potential Mitigation Measures	None	<ul style="list-style-type: none"> None required.
STREET AND LANDSCAPE TREES (NOTE: STREET TREES ARE LOCATED IN PUBLIC RIGHT-OF-WAY AND LANDSCAPE TREES ARE LOCATED ON PRIVATE PROPERTY.)		
Impacts / Benefits	None	<ul style="list-style-type: none"> No Charter or Heritage trees to be removed. Up to 9 medium and large street trees removed. No landscape trees removed.
Potential Mitigation Measures	None	<ul style="list-style-type: none"> Replant removed street trees in new sidewalk landscaping strips at a ratio of at least 1:1 in coordination with City Urban Forestry staff. Develop a Tree Protection Plan before construction and use BMPs for tree protection during construction.
TRANSPORTATION AND TRANSIT		
Impacts / Benefits	<ul style="list-style-type: none"> No benefit or impact to: <ul style="list-style-type: none"> » roadway capacity » safety » circulation. 	<ul style="list-style-type: none"> Improved in-vehicle transit travel time by 2 minutes during the a.m. peak hour inbound compared to No-Build. Some potential for increased transit reliability due to 25.1% increase in transit exclusivity/priority lanes compared to No-Build.

Table C-5: Summary of MLK, Jr. Boulevard Corridor Potential Benefits and Impacts by Alternative

	No-Build Alternative	Enhanced Corridor Alternative
	<ul style="list-style-type: none"> Limited potential: <ul style="list-style-type: none"> » for mode shifts away from motor vehicle travel to transit to reduce single occupancy vehicle trips. » to support locally adopted transportation policies. » to improve connectivity to bicycle or pedestrian facilities. Intersection mobility standards would be met at all intersections under proposed standards. 	<ul style="list-style-type: none"> Increased average weekday systemwide transit ridership by 620 (1.3%) compared to No-Build. Increased average weekday corridor boardings by 1,400 compared to No Build. Local traffic operations would improve at 1 intersection. Mobility standards would be met at all intersections under proposed standards. Installation of 2,380 feet (0.45 mile) of new or improved sidewalks on the 6.0 mile corridor and 4 new enhanced pedestrian / bike crossings would enhance multi-modal access along the corridor. Moderate safety improvements due to BAT lanes and increased crossing opportunities for bikes and pedestrians. Temporary construction-related vehicle delay and bicycle and pedestrian detours.
Potential Mitigation Measures	None	<ul style="list-style-type: none"> Plan construction to minimize potential impacts where possible to businesses, roadway users, and surrounding communities using a variety of techniques that may include: <ul style="list-style-type: none"> » Limit length of single lane closures. » Work on one side of road at a time. » Construct in shorter segments in locations with high driveway density. » Consider night-time construction hours in areas with greatest number of businesses to further reduce business and traffic disruptions. » Maintain business access points during construction and provide appropriate signage. » As appropriate, use variable message signs to provide road users with advance notice of current or pending construction activities and alternate routes.
UTILITIES		
Impacts / Benefits	None	<ul style="list-style-type: none"> Replacement and/or relocation of aging utility infrastructure would provide potential indirect benefit. Short-term service disruptions during construction.
Potential Mitigation Measures	None	<ul style="list-style-type: none"> Modify project design, where feasible, to avoid and minimize impacts to utilities. Coordinate with utility providers early and throughout design and construction process. Use environmental BMPs during construction and relocation to mitigate potential hazards. Notify businesses and residences, as appropriate, for extended service disruptions.
VISUAL AND AESTHETIC RESOURCES		
Impacts / Benefits	None	<ul style="list-style-type: none"> Up to 9 trees removed. 0.6 mile of high to moderate potential to change visual character of scattered areas along corridor. Replanted trees could be selected to develop a more visually unified corridor. 4 new enhanced bicycle and pedestrian crossings would assist in visually unifying the corridor. Construction activities and equipment would temporarily alter the appearance of the corridor, particularly in areas where existing trees would need to be removed.

Table C-5: Summary of MLK, Jr. Boulevard Corridor Potential Benefits and Impacts by Alternative

	No-Build Alternative	Enhanced Corridor Alternative
Potential Mitigation Measures	None	<ul style="list-style-type: none"> Replace all removed street trees at a ratio of at least one tree planted for one tree removed or as otherwise required by Eugene Code and coordinated with City Urban Forestry staff on tree species, planting locations, and soil conditions per City standards. Develop a Tree Protection Plan before construction and use BMPs for tree protection during construction.
WATER QUALITY		
Impacts / Benefits	<ul style="list-style-type: none"> New and reconstructed impervious area for constructed projects identified in Draft Eugene 2035 TSP. Potential for temporary construction-related sediment release related to TSP projects. 	<ul style="list-style-type: none"> 325,300 ft² of new and reconstructed impervious area in Amazon Creek Basin, of which 11,200 ft² would be new roadway and sidewalk. No direct impacts to either Q Street Canal or Willamette River floodplains. Potential for temporary construction-related sediment release. With mitigation measures, such as water quality and flow control facilities, there would be net water quality improvement associated with reconstructed impervious areas and impacts of new impervious area would be reduced.
Potential Mitigation Measures	<ul style="list-style-type: none"> Water quality and flow control facilities located near major areas of construction. Erosion control and sediment prevention activities. 	<ul style="list-style-type: none"> Comply with applicable local, state and federal water quality treatment standards and regulations. Implement vegetated and mechanical stormwater runoff treatment BMPs, as appropriate and approved by regulating agencies. To decrease overall impacts, construct water quality and flow control facilities at the following possible intersections, as appropriate and approved by regulating agencies: <ul style="list-style-type: none"> » MLK, Jr. Blvd. and Centennial Loop » MLK, Jr. Blvd. and Kinsrow Avenue Implement temporary erosion and sediment control activities to lessen impacts to project surroundings during construction.

Appendix D: References and Supporting Documents

The following supporting documents may be obtained by contacting Lane Transit District or the City of Eugene Planning and Development Department or Public Works. Some documents are also available on the project website at MovingAhead.org.

Please note that tables and figures compiled from multiple technical reports and data sources are cited as “MovingAhead Project Team” in the Alternatives Analysis report.

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During the creation of the AA report, the project team determined that some of the data and analysis in the Draft Technical Reports was inaccurate or inconsistent between reports. Additional analysis was performed to ensure data accuracy and consistency in the AA report. These additional analyses are document in several technical memos referenced in Appendix C. Therefore, some of the data in the Draft Technical Reports will not be consistent with the corrected data documented in the AA report. After the Preferred Investment Package is selected, as each of the alternatives in the package enters project development, LTD and the City of Eugene would conduct any additional analysis required to correct and clarify data and analysis from the Draft Technical Reports.



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