



DRAFT FINAL Air Quality Technical Report

Lane Transit District
City of Eugene

In cooperation with
Lane Council of Governments
Lane County
Oregon Department of Transportation

July 7, 2017

DRAFT FINAL Air Quality Technical Report

MovingAhead Project

Prepared in accordance with the
National Environmental Policy Act of 1969, as amended 42 U.S.C. 4322
and the
Federal Transit Act of 1964, as amended 49 U.S.C. 1601 et seq.

July 7, 2017

Prepared for
Federal Transit Administration
Lane Transit District
City of Eugene

Prepared by

Michael Minor and Associates, Inc.
CH2M HILL, Inc.

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Acronyms, Abbreviations, and Terms

Acronyms and Abbreviations	Definitions
$\mu\text{g}/\text{m}^3$	microgram(s) per cubic meter
AA	Alternatives Analysis
ADA	Americans with Disabilities Act
API	Area of Potential Impact
BAT	Business Access and Transit
BRT	Bus Rapid Transit
CAA	Clean Air Act
CFR	Code of Federal Regulations
CH2M	CH2M HILL, Inc.
CIP	Capital Improvements Program
CO	carbon monoxide
DEQ	Oregon Department of Environmental Quality
DKS	DKS Associates
DOT	Department of Transportation
Draft Eugene 2035 TSP	<i>DRAFT Eugene 2035 Transportation System Plan (City of Eugene, 2016)</i>
EmX	Emerald Express, Lane Transit District's Bus Rapid Transit System
EPA	U.S. Environmental Protection Agency
FTA	Federal Transit Administration
FTN	Frequent Transit Network
LCC	Lane Community College
LCOG	Lane Council of Governments
LOS	level of service
LRAPA	Lane Regional Air Protection Agency
LTD	Lane Transit District
MPO	Metropolitan Planning Organization
NAAQS	National Ambient Air Quality Standards
NEPA	National Environmental Policy Act of 1969, as amended, 42 U.S.C. 4321-4347
NO_2	nitrogen dioxide
NO_x	nitrous oxides; nitrogen oxides
NS	No standard established
O_3	Ozone
OAR	Oregon Administrative Rules
ODOT	Oregon Department of Transportation
Pb	Lead

Acronyms and Abbreviations	Definitions
PM	particulate matter
PM ₁₀	Particulate matter – 10 microns in diameter
PM _{2.5}	Particulate matter – 2.5 microns in diameter
ppb	parts per billion
ppm	parts per million
RTP	Regional Transportation Plan; Central Lane Metropolitan Planning Organization Regional Transportation Plan (adopted November 2007). (The RTP includes the Financially Constrained Roadway Projects List)
SIP	State Implementation Plan
SO ₂	sulfur dioxide
TIP	Transportation Improvement Program
TSP	total suspended particulate or Transportation System Plan
VMT	Vehicle Miles Traveled
VOC	volatile organic compound
WEEE	West Eugene EmX Extension

Terms	Definitions
Accessibility	The extent to which facilities are barrier free and useable for all persons with or without disabilities.
Alternatives Analysis (AA)	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 Impact (API)	Alternative specific corridor plus a 1/8-mile buffer area on either side of the corridor alternative centerline.
Base Period	The period between the morning and evening peak periods when transit service is generally scheduled on a constant interval. Also known as "off-peak period."
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.
Business Access and Transit Lane (BAT)	In general, a BAT lane is a concrete lane, separated from general-purpose lanes by a paint stripe and signage. A BAT lane provides Bus Rapid Transit (BRT) priority operations, but general-purpose traffic is allowed to travel within the lane to make a turn into or out of a driveway or at an intersecting street. However, only the BRT vehicle is allowed to use the lane to cross an intersecting street.

Terms	Definitions
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 (high-occupancy vehicle) lanes, expressways, or ordinary streets. The vehicles are designed to allow rapid passenger loading and unloading, with more doors than ordinary buses.
Capital Improvements Program (CIP)	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.
Categorical Exclusion	A Categorical Exclusion (CE) means a category of actions which do not individually or cumulatively have a significant effect on the human environment and for which, therefore, neither an environmental assessment nor an environmental impact statement is required.
Clean Air Act Amendments of 1990 (CAAA)	The comprehensive federal legislation which establishes criteria for attaining and maintaining the federal standards for allowable concentrations and exposure limits for various air pollutants; the act also provides emission standards for specific vehicles and fuels.
Collector Streets	Collector streets provide a balance of both access and circulation within and between residential and commercial/industrial areas. Collectors differ from arterials in that they provide more of a citywide circulation function, do not require as extensive control of access and are located in residential neighborhoods, distributing trips from the neighborhood and local street system.
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.
Documented Categorical Exclusion (DCE)	<p>A Documented Categorical Exclusion (DCE) means a group of actions that may also qualify as Categorical Exclusions (CEs) if it can be demonstrated that the context in which the action is taken warrants a CE exclusion; i.e., that no significant environmental impact will occur. Thus, these actions are referred to as DCEs. Such actions require some National Environmental Policy Act NEPA documentation, but not an Environmental Assessment or a full-scale Environmental Impact Statement.</p> <p>DCEs documentation must demonstrate that in the context(s) in which these actions are to be performed, they will have no significant environmental impact or that such impacts will be mitigated.</p>
Draft Environmental Impact Statement (DEIS)	The DEIS is the document that details the results of the detailed analysis of all of the projects alternatives. The DEIS contains all information learned about the impacts of a project and alternatives.
Effects	Effects include ecological, aesthetic, historic, cultural, economic, social, or health, whether direct, indirect, or cumulative. 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, and (2) indirect effects that are caused by the action and are later in time or farther removed in distance but are still reasonably foreseeable. Indirect effects 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 (40 CFR 1508.8).

Terms	Definitions
EmX	Lane Transit District’s Bus Rapid Transit System, pronounced “MX,” short for Emerald Express.
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.
Environmental Impact Statement (EIS)	A comprehensive study of likely environmental impacts resulting from major federally-assisted projects; statements are required by the National Environmental Policy Act (NEPA).
Environmental Justice	<p>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:</p> <p>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.</p> <p>To ensure the full and fair participation by all potentially affected communities in the transportation decision-making process.</p> <p>To prevent the denial of, reduction in, or significant delay in the receipt of benefits by minority and low-income populations.</p>
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.
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 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 and taxicabs.
Goals and Objectives	<p>Goals and objectives define the project’s desired outcome and reflect community values. Goals and objectives build from the project’s Purpose and Need Statement.</p> <p>Goals are overarching principles that guide decision making. Goals are broad statements.</p> <p>Objectives define strategies or implementation steps to attain the goals. Unlike goals, objectives are specific and measurable.</p>
Guideway	A transit right of way separated from general purpose vehicles.
Headway	Time interval between vehicles passing the same point while moving in the same direction on a particular route.

Terms	Definitions
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).
Key Transit Corridors	Key Transit Corridors are mapped in Envision Eugene and are anticipated to be significant transit corridors for the City and the region
Lane Regional Air Protection Agency (LRAPA)	Lane Regional Air Protection Agency is responsible for achieving and maintain clean air in Lane County using a combination of regulatory and non-regulatory methods
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.
Local Streets	Local streets have the sole function of providing direct access to adjacent land. Local streets are deliberately designed to discourage through traffic movements.
Locally Preferred Alternative (LPA)	The Locally Preferred Alternative is the alternative selected through the Alternatives Analysis process completed prior to or concurrent with National Environmental Policy Act (NEPA) analysis. This term is also used to describe the proposed action that is being considered for New Starts or Small Starts funds.
Maintenance facility	A facility along a corridor used to clean, inspect, repair and maintain rail vehicles, as well as to store them when they are not in use.
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.
Mitigation	A means to avoid, minimize, rectify, or reduce an impact, and in some cases, to compensate for an impact.
Mode	A particular form or method of travel distinguished by vehicle type, operation technology and right of way separation from other traffic.
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. In freight transportation, modal split may be measured in mass.
MovingAhead Project	<p>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 transportation corridors for people using transit, and facilities for people walking and biking. MovingAhead will prioritize transit, walking and biking projects along these corridors so that they can be funded and built in the near-term.</p> <p>The project will focus on creating active, vibrant places that serve the community and accommodate future growth. During Phase 1, currently underway, the community will weigh in on preferred transportation solutions for each corridor and help prioritize corridors for implementation. When thinking about these important streets, LTD and the City of Eugene refer to them as corridors because several streets may work as a system to serve transportation needs.</p>

Terms	Definitions
Multimodal	Multimodal refers to various 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 approval of grants; also requiring preparation of an Environmental Impact Statement (EIS) for every major federal action significantly affecting the quality of the human environment.
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 cost-effectiveness, alternatives analysis results 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).
Off-Peak Period	Non-rush periods of the day when travel activity is generally lower and less transit service is scheduled. Also called "base period."
Park and Ride	Designated parking areas for automobile drivers who then board transit vehicles from these locations.
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	Morning and afternoon time periods when transit riding is heaviest.
Preferred Alternative	An alternative that includes a major capital improvement project to address the problem under investigation. As part of the decision-making process, the Preferred Alternative is compared against the No Action or No-Build Alternative from the standpoints of transportation performance, environmental consequences, cost-effectiveness, and funding considerations.
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.
Ridership	The number of rides taken by people using a public transportation system in a given time period.
Right of Way	Publicly owned land that can be acquired and used for transportation purposes.
Scoping	A formal coordination process used to determine the scope of the project and the major issues likely to be related to the proposed action (i.e., project).
Screening Criteria	Criteria used to compare alternatives.
State Implementation Plan (SIP)	A state plan mandated by the Clean Air Act Amendments of 1990 (CAAA) that contains procedures to monitor, control, maintain and enforce compliance with national standards for air quality.
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.

Terms	Definitions
Title VI	This title declares it to be the policy of the United States that discrimination on the ground of race, color, or national origin shall not occur in connection with programs and activities receiving Federal financial assistance and authorizes and directs the appropriate Federal departments and agencies to take action to carry out this policy.
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.
Transportation Improvement Program (TIP)	A program of intermodal transportation projects, to be implemented over several years, growing out of the planning process and designed to improve transportation in a community. This program is required as a condition of a locality receiving federal transit and highway grants.
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.

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Air Quality Summary

This Air Quality Technical Report presents results for the air quality analyses conducted for the Lane Transit District (LTD) and City of Eugene’s MovingAhead Project in Eugene, Oregon. The purpose of the MovingAhead Project is to determine which high-capacity transit corridors identified in the adopted Emerald Express (EmX) System Plan, *Lane Transit District Long-Range Transit Plan* (LTD, 2014) and the Frequent Transit Network are ready to advance to capital improvements programming in the near term. LTD and the City of Eugene initiated the MovingAhead Project in 2014 to identify and examine alternatives for improving multimodal safety, mobility, and accessibility in key transit corridors in the City. A main theme of the City’s vision is to concentrate new growth along and near the City’s key transit corridors and core commercial areas while protecting neighborhoods and increasing access to services for everyone. LTD and the City are jointly conducting the project to facilitate a more streamlined and cost-efficient process through concurrent planning, environmental review, and design and construction of multiple corridors.

LTD and the City of Eugene examined multimodal transit alternatives in five key transit corridors identified in the *Draft Envision Eugene Comprehensive Plan* (Envision Eugene, 2016) and the *DRAFT Eugene 2035 Transportation System Plan* (City of Eugene, 2016; Draft Eugene 2035 TSP), the region’s highest growth centers, and downtown Eugene:

- Highway 99 Corridor
- River Road Corridor
- 30th Avenue to Lane Community College (LCC) Corridor
- Coburg Road Corridor
- Martin Luther King, Jr. Boulevard Corridor

No-Build, Enhanced Corridor, and EmX Alternatives were developed for each corridor, except the Martin Luther King, Jr. Boulevard Corridor, for which only No-Build and Enhanced Corridor Alternatives were developed. Each proposed corridor location is shown on Figures S.1-1 and S.1-2 for the Enhanced Corridor Alternatives and the EmX Alternatives, respectively. The *MovingAhead Level 2 Definition of Alternatives* (CH2M HILL, Inc. [CH2M] et al., 2016) contains a detailed description of the project alternatives. The following is a summary of the project alternatives evaluated.

- The **No-Build Alternatives** serve as a reference point to gauge the benefits, costs, and effects of the Enhanced Corridor and EmX Alternatives in each corridor. Each No-Build Alternative is based on the projected conditions in 2035. Capital projects are derived from the financially constrained project lists in the Draft Eugene 2035 TSP, the *Lane County Transportation System Plan* (Lane County Public Works, Engineering Division Transportation Planning, 2004, update in progress), the *Lane Transit District Capital Improvement Plan* (LTD, 2015), and the *Lane Transit District Long-Range Transit Plan* (LTD, 2014).
- **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 improvements, operational improvements, and transit service refinements, including 15-minute-service frequency. Features can 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, and enhanced shelters. These features can improve reliability, reduce transit travel time, and increase passenger comfort, making transit service along the corridor more attractive.

Figure S.1-1. Enhanced Corridor Alternatives Overview

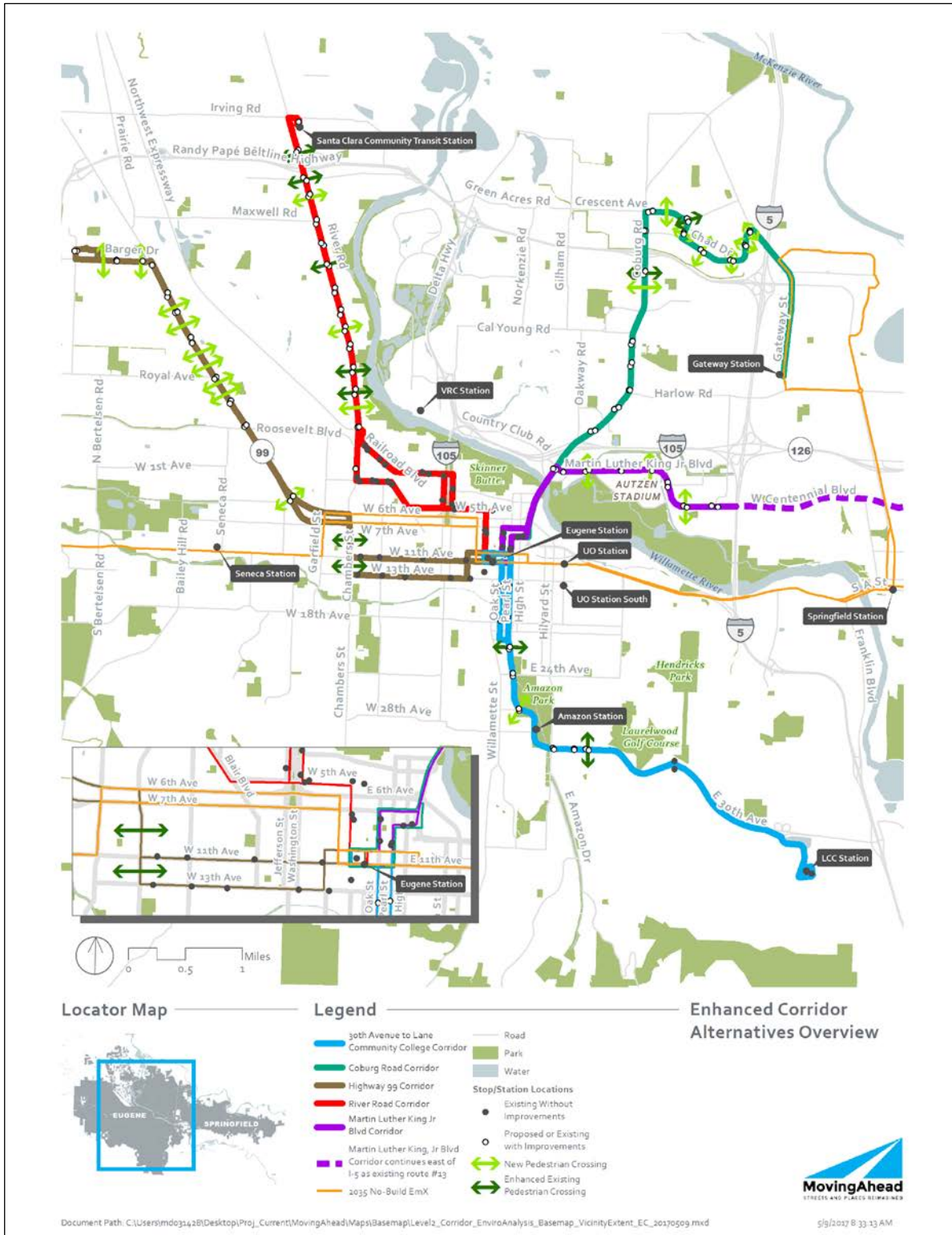
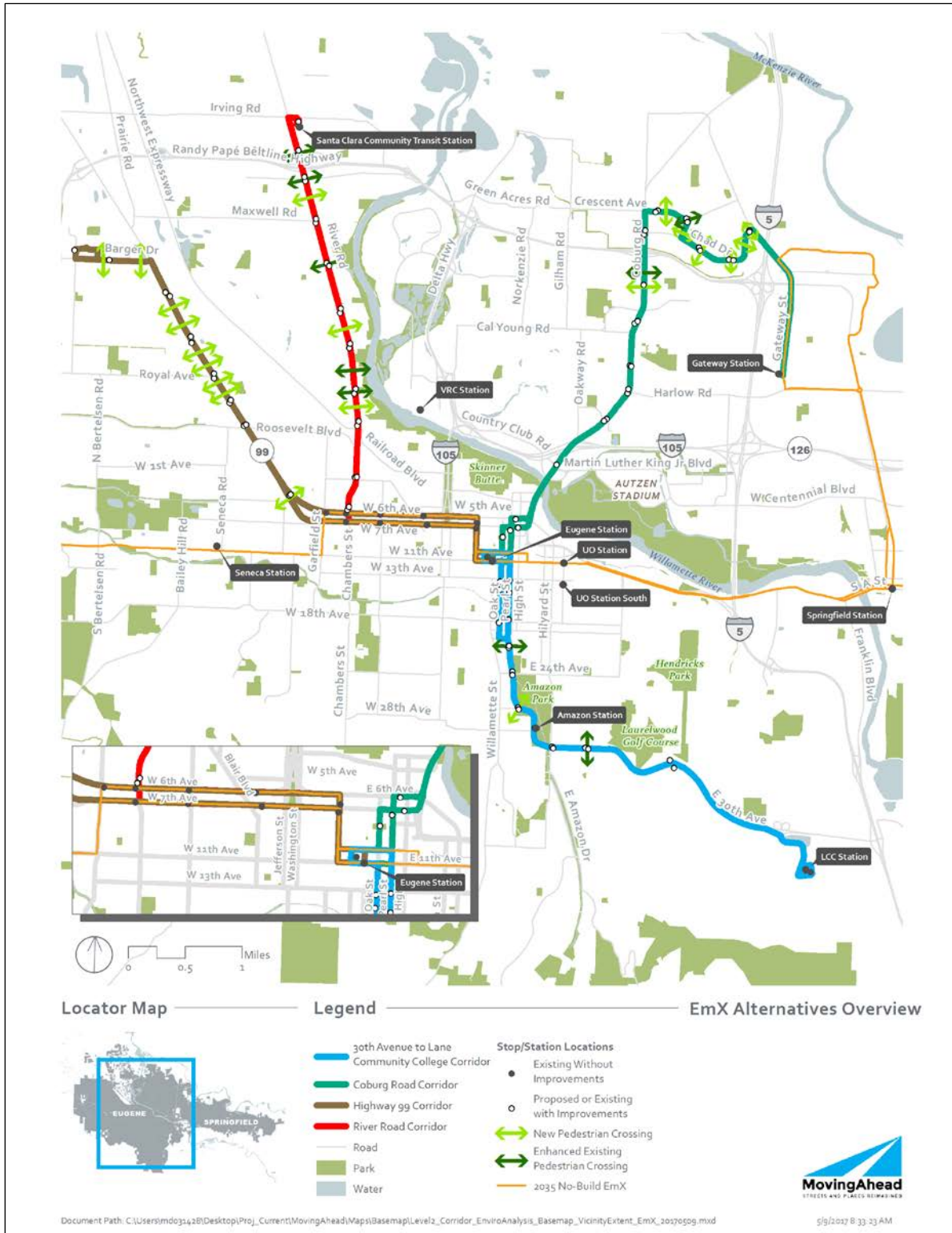


Figure S.1-2. EmX Alternatives Overview



- **EmX Alternatives** are characterized by sections of exclusive guideway, branded multi-door 60-foot-long bus rapid transit vehicles, and 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. In general, EmX is a transit mode positioned between fixed-route bus service operating in mixed traffic and urban-rail service operating in a separate right of way. EmX service is intended to improve transit speed, reliability, and ridership.

Figure S.1-1 shows the proposed corridors for the Enhanced Corridor Alternatives and Figure S.1-2 shows the proposed corridors for the EmX Alternatives.

This technical report, prepared to support the MovingAhead Project Alternatives Analysis, provides information on the methods used for the analysis and compares air pollutant emissions of the alternatives using the *New and Small Starts Evaluation and Rating Process Final Policy Guidance* (Federal Transit Administration [FTA], 2013).

This report was prepared in compliance with the National Environmental Policy Act (NEPA) and applicable state environmental policy legislation, as well as local and state planning and land use policies and design standards.

S.1. Affected Environment

The MovingAhead Project's five corridors are primarily located within the City of Eugene, with a portion of the River Road and 30th Avenue to LCC Corridors located within unincorporated Lane County, and a portion of the Coburg Road Corridor located in the City of Springfield.

The MovingAhead Project encompasses five corridors in the City of Eugene. Typically, the effects of air quality are local in nature and for some pollutants, such as carbon monoxide (CO), are worst near congested intersections. Therefore, the affected environment can be described as the areas near the proposed corridors and the greater Eugene-Springfield area. The alternatives corridors, which also define the Areas of Potential Impact for the build alternatives, are presented in Figure S.2-1.

S.2. Environmental Consequences

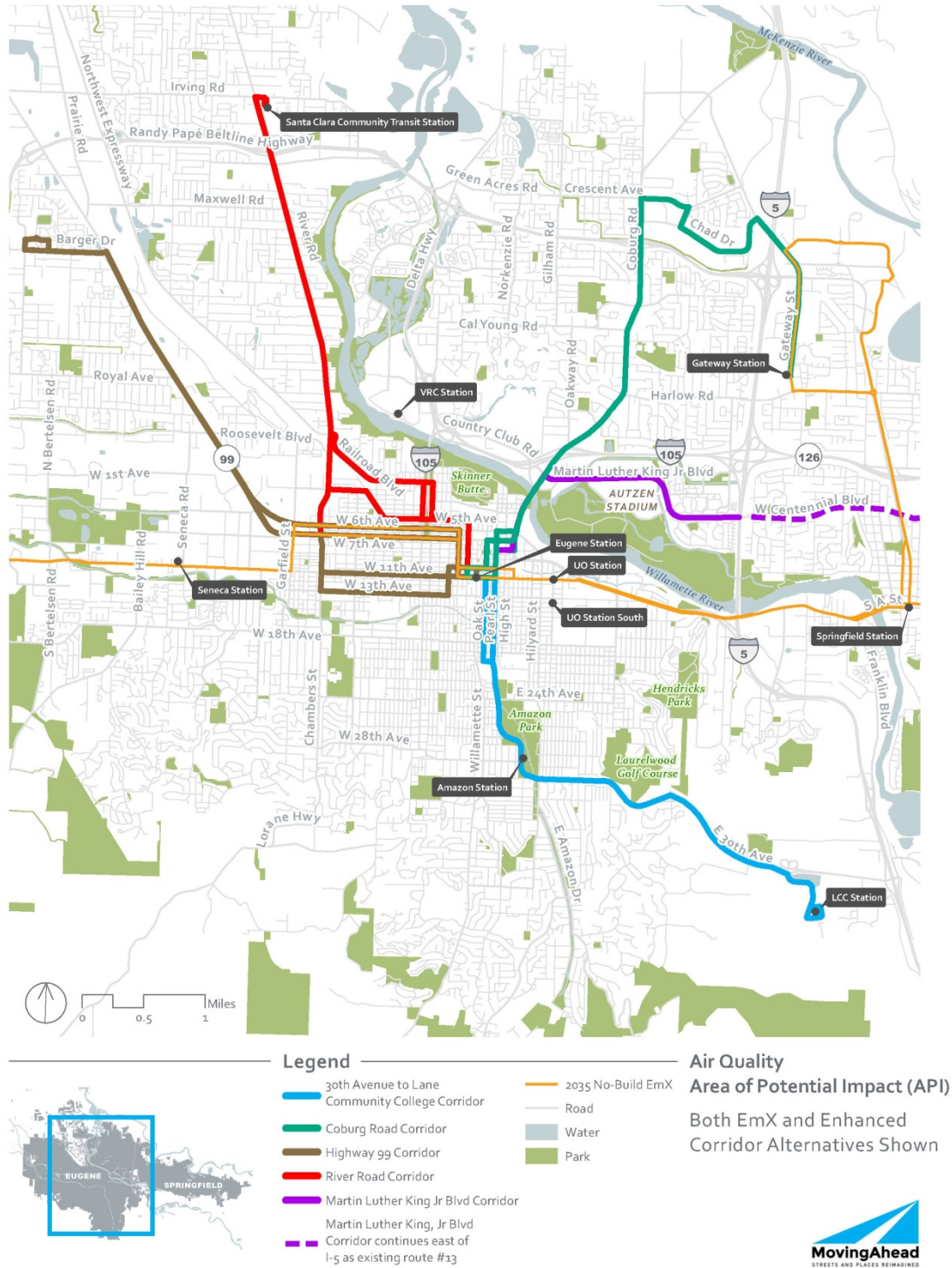
The Eugene-Springfield region completed the 20-year maintenance period in 2014 for CO with no exceedances. As a result, no regional CO hot spot air modeling or local air quality impacts analysis is required for transportation projects in the region. However, for informational purposes, a regional burden analysis was conducted. No build alternatives were found to have an adverse effect on air quality under the regional analysis.

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. However, construction impacts only need be considered for projects with a construction duration of 5 years or longer.

S.3. Mitigation Options

No air quality impacts are predicted for any build alternatives; thus, no operational air quality mitigation is expected for this project. Reasonable precautions to avoid dust emissions during construction of any build alternatives, as listed in Oregon Administrative Rules (OAR) 340-208-0210, should be taken. In addition, contractors are required to comply with Oregon Department of Transportation (ODOT) standard specifications relating to air pollution control measures.

Figure S.2-1. Air Quality Area of Potential Impact



S.4. Conclusions

All build alternatives would be constructed in the Eugene-Springfield region. The region has completed its air quality maintenance period; thus, no impact analysis is required for any build alternative. A regional burden analysis was conducted for informational purposes, and that analysis demonstrated that no operational air quality impacts are expected under any build alternative.

Table S.4-1 provides a summary of air quality environmental consequences by corridor and alternative.

Table S.4-1. Summary of Air Quality Environmental Consequences by Corridor and Alternative

Alternatives	Temporary / Short-Term Construction Related Impacts / Benefits	Long-Term Direct Impacts / Benefits	Indirect / Cumulative Effects	Mitigation Measures	Unavoidable Adverse Effects
Highway 99 Corridor					
No-Build Alternative	<ul style="list-style-type: none"> • None 	<ul style="list-style-type: none"> • None 	<ul style="list-style-type: none"> • None 	<ul style="list-style-type: none"> • None 	<ul style="list-style-type: none"> • None
Enhanced Corridor Alternative	<ul style="list-style-type: none"> • Short-term dust and local air impacts 	<ul style="list-style-type: none"> • None 	<ul style="list-style-type: none"> • None 	<ul style="list-style-type: none"> • Reasonable precautions to avoid dust emissions during construction • Compliance with OAR-340-208-0210 during construction • Compliance with ODOT standard specifications relating to air pollution control measures during construction 	<ul style="list-style-type: none"> • None
EmX Alternative	<ul style="list-style-type: none"> • Short-term dust and local air impacts 	<ul style="list-style-type: none"> • None 	<ul style="list-style-type: none"> • None 	<ul style="list-style-type: none"> • Reasonable precautions to avoid dust emissions during construction • Compliance with OAR-340-208-0210 during construction • Compliance with ODOT standard specifications relating to air pollution control measures during construction 	<ul style="list-style-type: none"> • None
River Road Corridor					
No-Build Alternative	<ul style="list-style-type: none"> • None 	<ul style="list-style-type: none"> • None 	<ul style="list-style-type: none"> • None 	<ul style="list-style-type: none"> • None 	<ul style="list-style-type: none"> • None
Enhanced Corridor Alternative	<ul style="list-style-type: none"> • Short-term dust and local air impacts 	<ul style="list-style-type: none"> • None 	<ul style="list-style-type: none"> • None 	<ul style="list-style-type: none"> • Reasonable precautions to avoid dust emissions during construction • Compliance with OAR-340-208-0210 during construction • Compliance with ODOT standard specifications relating to air pollution control measures during construction 	<ul style="list-style-type: none"> • None

Table S.4-1. Summary of Air Quality Environmental Consequences by Corridor and Alternative

Alternatives	Temporary / Short-Term Construction Related Impacts / Benefits	Long-Term Direct Impacts / Benefits	Indirect / Cumulative Effects	Mitigation Measures	Unavoidable Adverse Effects
EmX Alternative	<ul style="list-style-type: none"> Short-term dust and local air impacts 	<ul style="list-style-type: none"> None 	<ul style="list-style-type: none"> None 	<ul style="list-style-type: none"> Reasonable precautions to avoid dust emissions during construction Compliance with OAR-340-208-0210 during construction Compliance with ODOT standard specifications relating to air pollution control measures during construction 	<ul style="list-style-type: none"> None
30th Avenue to LCC Corridor					
No-Build Alternative	<ul style="list-style-type: none"> None 	<ul style="list-style-type: none"> None 	<ul style="list-style-type: none"> None 	<ul style="list-style-type: none"> None 	<ul style="list-style-type: none"> None
Enhanced Corridor Alternative	<ul style="list-style-type: none"> Short-term dust and local air impacts 	<ul style="list-style-type: none"> None 	<ul style="list-style-type: none"> None 	<ul style="list-style-type: none"> Reasonable precautions to avoid dust emissions during construction Compliance with OAR-340-208-0210 during construction Compliance with ODOT standard specifications relating to air pollution control measures during construction 	<ul style="list-style-type: none"> None
EmX Alternative	<ul style="list-style-type: none"> Short-term dust and local air impacts 	<ul style="list-style-type: none"> None 	<ul style="list-style-type: none"> None 	<ul style="list-style-type: none"> Reasonable precautions to avoid dust emissions during construction Compliance with OAR-340-208-0210 during construction Compliance with ODOT standard specifications relating to air pollution control measures during construction 	<ul style="list-style-type: none"> None
Coburg Road Corridor					
No-Build Alternative	<ul style="list-style-type: none"> None 	<ul style="list-style-type: none"> None 	<ul style="list-style-type: none"> None 	<ul style="list-style-type: none"> None 	<ul style="list-style-type: none"> None

Table S.4-1. Summary of Air Quality Environmental Consequences by Corridor and Alternative

Alternatives	Temporary / Short-Term Construction Related Impacts / Benefits	Long-Term Direct Impacts / Benefits	Indirect / Cumulative Effects	Mitigation Measures	Unavoidable Adverse Effects
Enhanced Corridor Alternative	<ul style="list-style-type: none"> Short-term dust and local air impacts 	<ul style="list-style-type: none"> None 	<ul style="list-style-type: none"> None 	<ul style="list-style-type: none"> Reasonable precautions to avoid dust emissions during construction Compliance with OAR-340-208-0210 during construction Compliance with ODOT standard specifications relating to air pollution control measures during construction 	<ul style="list-style-type: none"> None
EmX Alternative	<ul style="list-style-type: none"> Short-term dust and local air impacts 	<ul style="list-style-type: none"> None 	<ul style="list-style-type: none"> None 	<ul style="list-style-type: none"> Reasonable precautions to avoid dust emissions during construction Compliance with OAR-340-208-0210 during construction Compliance with ODOT standard specifications relating to air pollution control measures during construction 	<ul style="list-style-type: none"> None
Martin Luther King, Jr. Boulevard Corridor					
No-Build Alternative	<ul style="list-style-type: none"> None 	<ul style="list-style-type: none"> None 	<ul style="list-style-type: none"> None 	<ul style="list-style-type: none"> None 	<ul style="list-style-type: none"> None
Enhanced Corridor Alternative	<ul style="list-style-type: none"> Short-term dust and local air impacts 	<ul style="list-style-type: none"> None 	<ul style="list-style-type: none"> None 	<ul style="list-style-type: none"> Reasonable precautions to avoid dust emissions during construction Compliance with OAR-340-208-0210 during construction Compliance with ODOT standard specifications relating to air pollution control measures during construction 	<ul style="list-style-type: none"> None

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1. Introduction

1.1. MovingAhead Technical Reports

A total of 20 technical reports have been prepared for the MovingAhead Project. The technical reports have been prepared to support the selection of preferred alternatives for the MovingAhead Project and subsequent environmental documentation. The technical reports assume that any corridors advanced for environmental review will require a documented categorical exclusion under the National Environmental Policy Act (NEPA). Any corridors requiring a higher level of environmental review would be supported by the technical evaluation but might not be fully covered by the technical evaluation.

Technical reports have been prepared for the following disciplines:

- Acquisitions and Displacements
- Air Quality
- Capital Cost Estimating
- Community Involvement, Agency and Tribal Coordination
- Community, Neighborhood, and Environmental Justice
- Cultural Resources
- Ecosystems (Biological, Fish Ecology, Threatened and Endangered Species, Wetlands and Waters of the U.S. and State)
- Energy and Sustainability
- Geology and Seismic
- Hazardous Materials
- Land Use and Prime Farmlands
- Noise and Vibration
- Operating and Maintenance Costs
- Parklands, Recreation Areas, and Section 6(f)
- Section 4(f)
- Street and Landscape Trees
- Transportation
- Utilities
- Visual and Aesthetic Resources
- Water Quality, Floodplain, and Hydrology

In general, each technical report includes the following information for identifying effects:

- Relevant laws and regulations
- Contacts and coordination
- Summary of data sources and analysis methods described in the *MovingAhead Environmental Disciplines Methods and Data Report* (CH2M HILL, Inc. [CH2M] et al., 2015)
- Affected environment
- Adverse and beneficial effects including short-term, direct, indirect and cumulative
- Mitigation measures
- Permits and approvals
- References

1.2. Air Quality Technical Report and Purpose

This technical report presents the results of the air quality assessment for the MovingAhead corridor alternatives. The purpose of this air quality technical analysis is to compare air pollutant emissions of the alternatives using the *New and Small Starts Evaluation and Rating Process Final Policy Guidance* (Federal Transit Administration [FTA], 2013, August). This report considers potential effects to air quality and possible mitigation measures to inform selection of the preferred alternative in each MovingAhead corridor.

1.3. Discipline Experts

Table 1.3-1 identifies those discipline experts who contributed to the preparation of this report, including their area of expertise, affiliated organization, title, and years of experience.

Table 1.3-1. Discipline Experts

Discipline	Technical Expert	Affiliated Organization	Title / Years of Experience
Air Quality	Michael Minor	Michael Minor and Associates, Inc.	President / 25 years
Editors	Lynda Wannamaker	Wannamaker Consulting	President / 33 years
	Scott Richman	CH2M	Senior Project Manager / 20 years
	Kelly Hoell	LTD	Transit Development Planner / 11 years

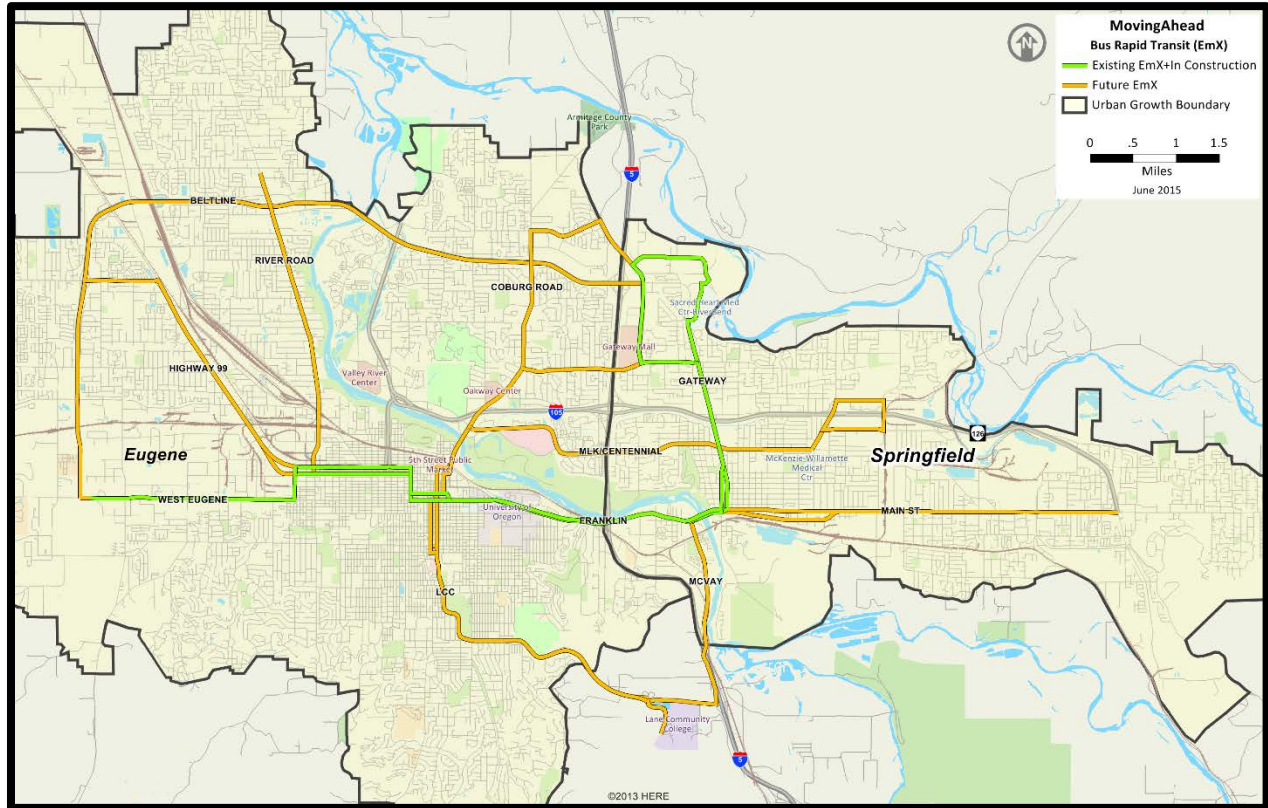
Source: MovingAhead Project Team. (2017).

1.4. Study Background

The purpose of the MovingAhead Project is to determine which high-capacity transit corridors identified in the adopted *Central Lane Metropolitan Planning Organization Regional Transportation Plan* (Lane Council of Governments [LCOG], 2011, December; RTP) and the *Lane Transit District Long Range Transit Plan* (Lane Transit District [LTD], 2014) as part of the Frequent Transit Network (FTN) are ready to advance to capital improvements programming in the near term. The study is being conducted jointly with the City of Eugene and LTD to facilitate a streamlined and cost-efficient process through concurrent planning, environmental review, and design and construction of multiple corridors. The study area includes Eugene and portions of unincorporated Lane County.

The *Lane Transit District Long-Range Transit Plan* (LTD, 2014) identifies the full Martin Luther King, Jr. Boulevard / Centennial Boulevard Corridor as a future part of the FTN. Initially, MovingAhead considered options on Centennial Boulevard to serve Springfield as part of this corridor. Because Springfield does not have the resources available to consider transit enhancements on Centennial Boulevard at this time, MovingAhead will only develop Emerald Express (EmX) and Enhanced Corridor Alternatives within Eugene. Figure 1.4-1 presents LTD's existing and future bus rapid transit (BRT) system.

Figure 1.4-1. Lane Transit District's Bus Rapid Transit (BRT) System



Source: LTD. (2015, Amended 2015, June).

1.5. Screening and Evaluation of Multimodal Options

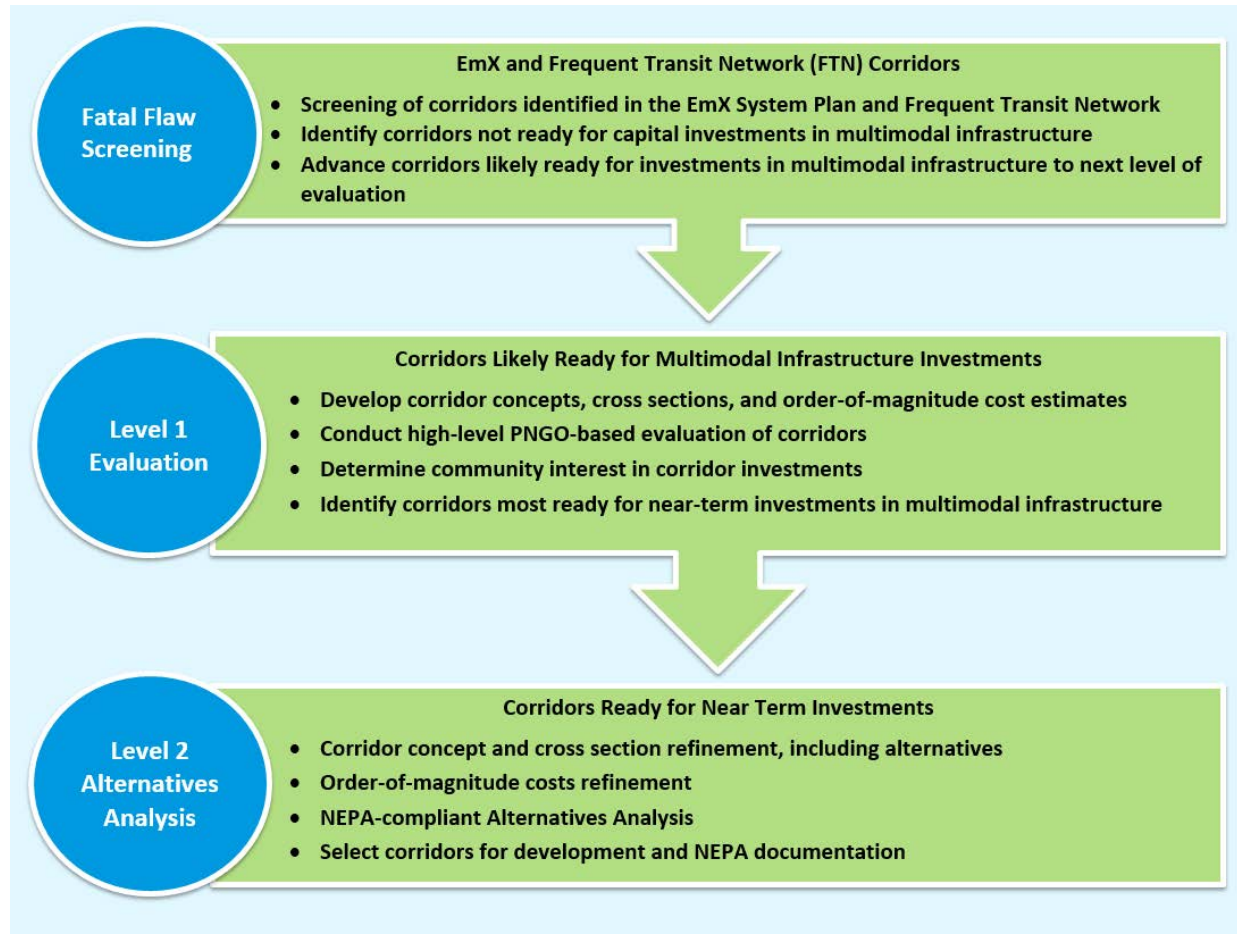
The MovingAhead Project process includes two phases. This first phase has three discrete but closely related tasks: identifying transit improvements; identifying improvements for bicyclists, pedestrians, and users of mobility devices; and preparing a NEPA-compliant evaluation of alternatives focused on the region's transportation system. Corridor options identified as part of the first phase were developed using multimodal cross sections that include variations on automobile, truck, and bus travel lanes; bicycle lanes; landscaping strips; and sidewalks. At the end of the first phase, the City of Eugene and LTD will select the corridors that are most ready for near-term capital improvements and prioritize improvements for funding. The selected corridors will be advanced to the second phase, which will focus on preparing NEPA environmental reviews (Documented Categorical Exclusions), and initiating the Federal Transit Administration (FTA) project development process.

1.5.1. 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 (Figure 1.5-1). This high-level evaluation used criteria based on MovingAhead's Purpose, Need, Goals, and Objectives (LTD, 2015, Amended 2015, June) 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 three 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 1.5-1 shows the results of the fatal flaw screening.

Figure 1.5-1. MovingAhead Phase 1 Steps



Source: Wannamaker Consulting. (2015).

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 (on May 20, 2015) determined that the corridor is ready to advance to a study to select a locally preferred transit solution. At the time (May 2015), the Main Street-McVay Highway Corridor was on a schedule ahead of the MovingAhead Project schedule. If the Main Street-McVay Highway Corridor study schedule is delayed and its progress coincides with this project, the corridor could be reincorporated back into MovingAhead.

Table 1.5-1. Results of the Fatal Flaw Screening

Corridor	Advanced to Level 1	Consider Later
Highway 99	✓	
River Road	✓	
Randy Papé Beltline		✓
18th Avenue		✓
Coburg Road	✓	
Martin Luther King Jr. Boulevard / Centennial Boulevard	✓	
30th Avenue to Lane Community College	✓	
Main Street-McVay Highway	✓	
Valley River Center	✓	
Bob Straub Parkway		✓

Source: LTD and City of Eugene. (2015).

The six remaining multimodal corridors were advanced to the Level 1 Screening Evaluation to determine how they compared with each other in meeting the Purpose, Need, Goals, and Objectives.

1.5.2. 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 (AA) (Table 1.5-2):

- No-Build Alternatives: all corridors
- Enhanced Corridor and EmX Alternatives:
 - Highway 99 Corridor
 - River Road Corridor
 - 30th Avenue to Lane Community College (LCC) Corridor
 - Coburg Road Corridor
- Enhanced Corridor Alternative:
 - Martin Luther King Jr. Boulevard Corridor

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

Table 1.5-2. Corridors and Transit Alternatives Advanced to the Level 2 Alternatives Analysis

Corridor	No-Build	Enhanced Corridor	EmX
Highway 99	✓	✓	✓
River Road	✓	✓	✓
30th Avenue to Lane Community College	✓	✓	✓
Coburg Road	✓	✓	✓
Martin Luther King, Jr. Boulevard	✓	✓	

Source: CH2M. (2016).

For a detailed discussion of alternatives and design options considered for each corridor, but not carried forward to the Level 2 AA, please refer to the *Alternatives and Design Options Considered but Eliminated Technical Memorandum* (CH2M, 2016).

1.5.3. Level 2 Alternatives Analysis

To guide the Level 2 AA, LTD prepared new ridership forecasts and related evaluation measures using the 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 Level 2 AA is 2035. The built and natural environments, transit operations, traffic, finance, historical resources, and other areas were also evaluated as part of the Level 2 AA. The findings from the Level 2 AA will aid LTD and the City of Eugene in determining how corridors should be prioritized for capital investments over the next 5 years. Selected corridors will be advanced to Phase 2.

1.6. Purpose and Need

The prioritization of capital investments in multimodal transit corridors is 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 of, and prioritizing the funding for, strategic multimodal capital investments, the MovingAhead Project (a multimodal transit corridor study) helps ensure that future development is consistent with our region's plans and vision.

The Purpose and Need Statement was refined based on public and agency input.

1.6.1. Purpose

The purpose of the MovingAhead Project is to:

- Develop a Capital Improvements Program that forecasts and matches projected revenues and capital needs over a 10-year period
 - Balance desired multimodal transit corridor improvements 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 improvements
- Establish partnerships between LTD, City of Eugene, 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

1.6.2. Need

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 RTP that provides the best level of transit service in a cost-effective and sustainable manner.
- Need for streamlined environmental reviews to leverage systemwide analysis.
- Need to build public support for implementation of the systemwide vision.
- Selection of the next EmX / FTN corridors is based on long-range operational and financial planning for LTD's service.

1.6.3. 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 and bicycling, and to transit
- Objective 1.5: Improve the safety of pedestrians 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 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: Support community vision for high capacity transit in each 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

1.6.4. Evaluation Criteria

Evaluation criteria will be used during the Trade-off Analysis, which is part of the Level 2 AA, to aid in determining how well each of the corridor alternatives would meet the project’s Purpose, Need, Goals, and Objectives. The evaluation criteria require a mix of quantitative data and qualitative assessment. The resulting data will be used to measure the effectiveness of each proposed corridor alternative and to assist in comparing and contrasting the alternatives and options. In Table 1.6-1, evaluation criteria are listed for each of the project’s objectives. Some objectives have only one criterion for measuring effectiveness, while others require several criteria.

Table 1.6-1. Evaluation Criteria

Goals and Objectives		Evaluation Criteria
Goal 1: Improve multimodal transit corridor service		
Objective 1.1:	Improve transit travel time and reliability	<ul style="list-style-type: none"> • Round-trip p.m. peak transit travel time between select origins and destinations • On-time performance (no more than 4 minutes late) of transit service
Objective 1.2:	Provide convenient transit connections that minimizes the need to transfer	<ul style="list-style-type: none"> • Number of transfers required between heavily used origin-destination pairs
Objective 1.3:	Increase transit ridership and mode share in the corridor	<ul style="list-style-type: none"> • Average weekday boardings on corridor routes • Transit mode share along the corridor • Population within 0.5 mile of transit stop • Employment within 0.5 mile of transit stop
Objective 1.4:	Improve access for people walking and bicycling, and to transit	<ul style="list-style-type: none"> • Connectivity to existing pedestrian facilities • Connectivity to existing bicycle facilities
Objective 1.5:	Improve the safety of pedestrians and bicyclists accessing transit, traveling in and along the corridor, and crossing the corridor	<ul style="list-style-type: none"> • Opportunity to provide a safe and comfortable environment for pedestrians and bicyclists in 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	<ul style="list-style-type: none"> • Cost per trip • Impact on LTD operating cost • Cost to local taxpayers
Objective 2.2:	Increase transit capacity to meet current and projected ridership demand	<ul style="list-style-type: none"> • Capacity of transit service relative to the current and projected ridership
Objective 2.3:	Implement corridor improvements that provide an acceptable return on investment	<ul style="list-style-type: none"> • Benefit / cost assessment of planned improvements
Objective 2.4:	Implement corridor improvements that minimize impacts to the environment and, where possible, enhance the environment	<ul style="list-style-type: none"> • Results of screening-level assessment of environmental impacts of transit solutions

Table 1.6-1. Evaluation Criteria

Goals and Objectives		Evaluation Criteria
Objective 2.5:	Leverage funding opportunities to extend the amount of infrastructure to be constructed for the least amount of dollars	<ul style="list-style-type: none"> • Number and dollar amount of funding opportunities that could be leveraged • Meet the FTA’s Small Starts funding requirements
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	<ul style="list-style-type: none"> • Consistent with the BRT System Plan and FTN concept • Consistent with the <i>Regional Transportation System Plan</i> (Central Lane Metropolitan Planning Organization [MPO], 2007) • Consistent with local comprehensive land use plans
Objective 3.2:	Coordinate transit improvements with other planned and programmed pedestrian and bicycle projects	<ul style="list-style-type: none"> • Capability of transit improvement to coordinate with other planned and programmed pedestrian and bicycle projects identified in adopted plans and Capital Improvements Programs
Objective 3.3:	Coordinate transit improvements with other planned and programmed roadway projects	<ul style="list-style-type: none"> • Capability of transit improvement to coordinate with other planned and programmed roadway projects identified in adopted plans and Capital Improvements Programs
Objective 3.4:	Minimize adverse impacts to existing businesses and industry	<ul style="list-style-type: none"> • Impacts to businesses along the Corridor measured in number and total acres of properties acquired, parking displacements, and access impacts. • Impact on freight and delivery operations for Corridor businesses
Objective 3.5:	Support community vision for high capacity transit in corridor	<ul style="list-style-type: none"> • Community vision includes high capacity transit in 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	<ul style="list-style-type: none"> • Impact on current and future year intersection level of service (LOS) on state facilities • Impact on current and future year p.m. peak hour auto / truck travel times on state facilities
Objective 3.7:	Improve transit operations in a manner that is mutually beneficial to vehicular traffic flow for emergency service vehicles	<ul style="list-style-type: none"> • Qualitative assessment of potential impacts to emergency service vehicle traffic flow and access

Source: LTD and City of Eugene. (2015).

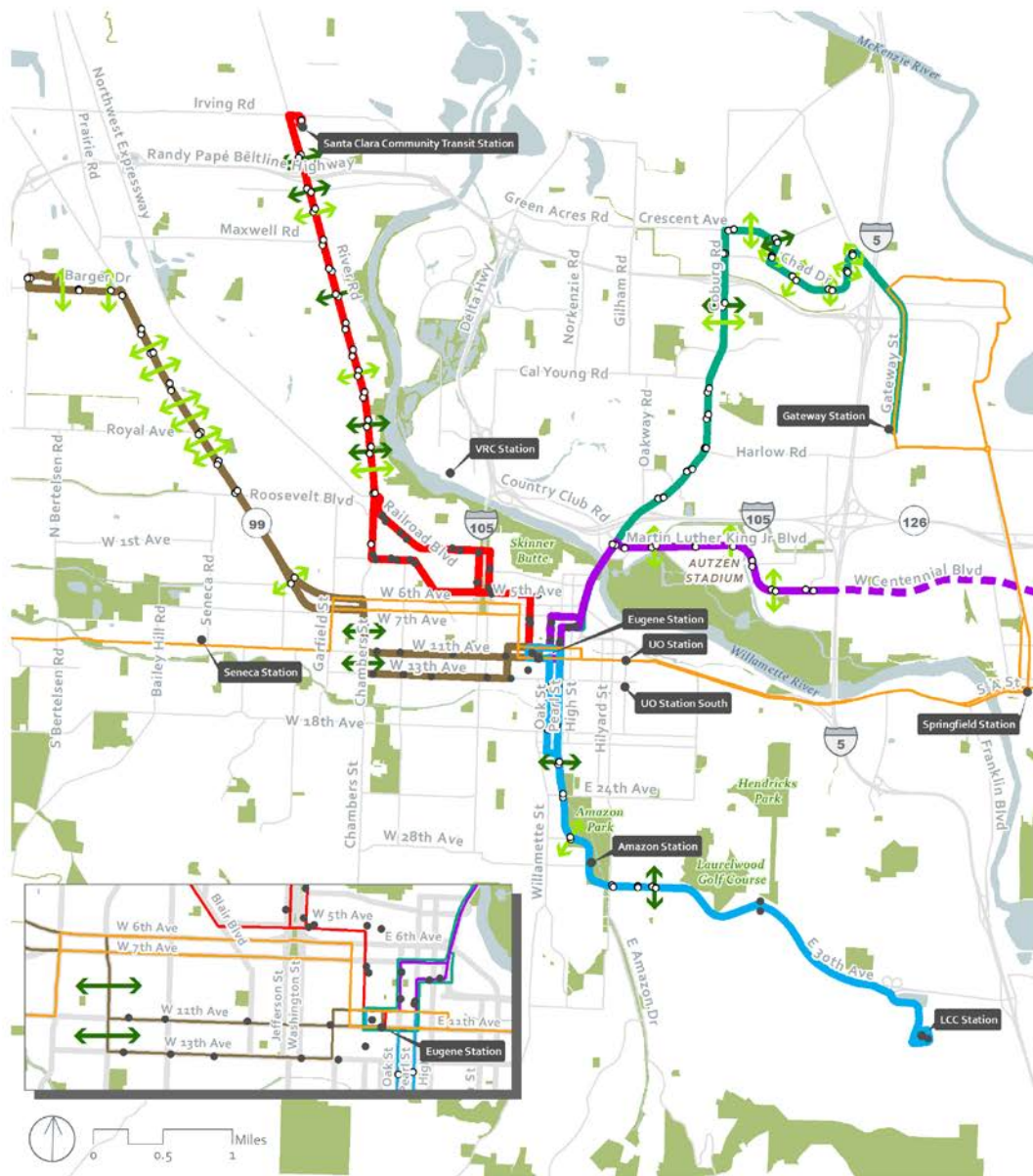
LOS = level of service

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2. Alternatives Considered

This section briefly reviews the major features of the alternatives considered in the Level 2 AA. For full details on each alternative and the five corridors described in this technical report – Highway 99, River Road, 30th Avenue to LCC, Coburg Road, and Martin Luther King, Jr. Boulevard – refer to the *MovingAhead Level 2 Definition of Alternatives* (CH2M et al., 2016). Each corridor location is shown on Figures 2.1-1 and 2.1-2 for the Enhanced Corridor Alternatives and the EmX Alternatives, respectively.

Figure 2.1-1. Enhanced Corridor Alternatives Overview



Locator Map



Legend

- 30th Avenue to Lane Community College Corridor
- Coburg Road Corridor
- Highway 99 Corridor
- River Road Corridor
- Martin Luther King Jr Blvd Corridor
- Martin Luther King, Jr Blvd Corridor continues east of I-5 as existing route #13
- 2035 No-Build EmX
- Road
- Park
- Water
- Stop/Station Locations
 - Existing Without Improvements
 - Proposed or Existing with Improvements
- New Pedestrian Crossing
- Enhanced Existing Pedestrian Crossing

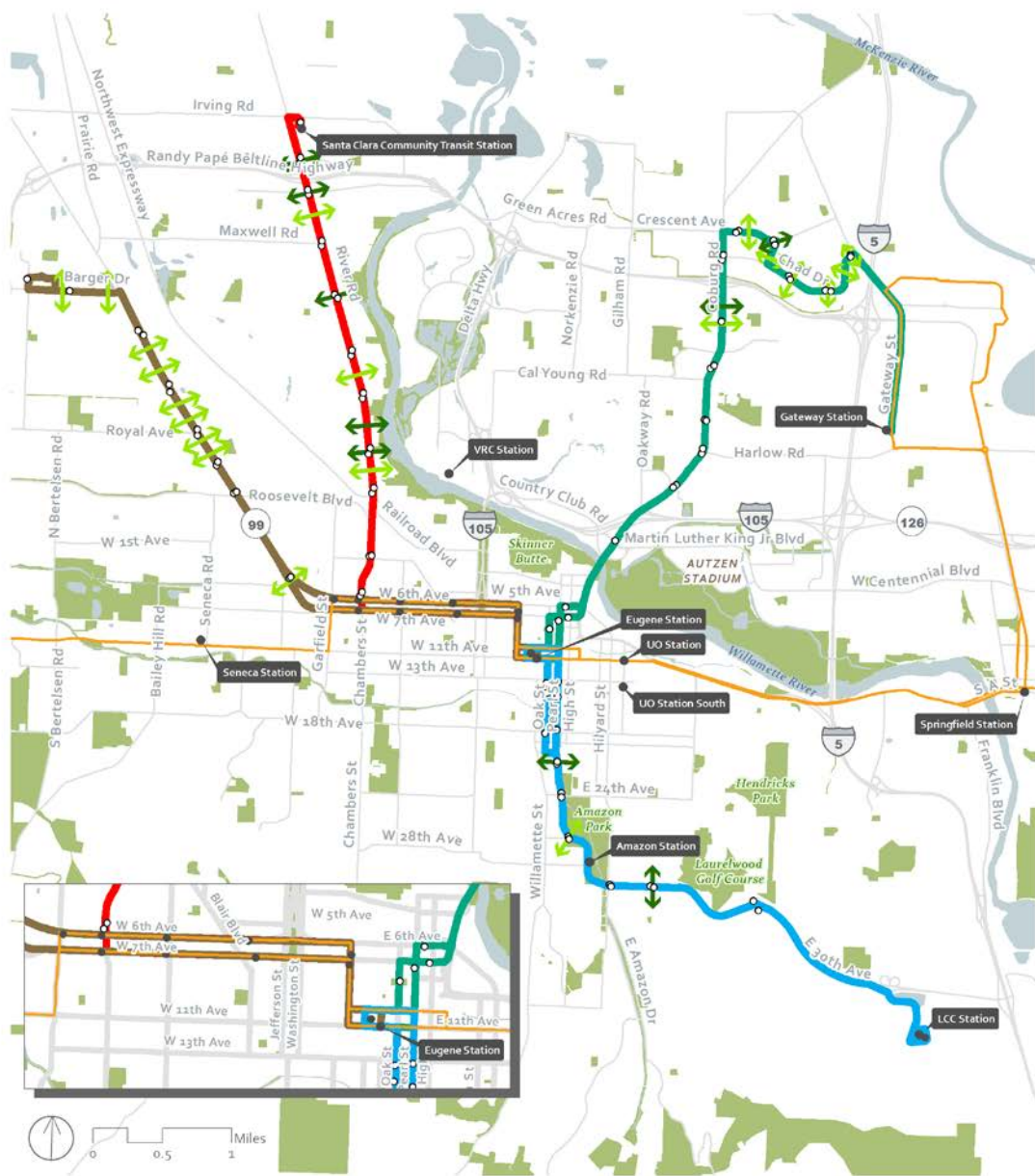
Enhanced Corridor Alternatives Overview



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Figure 2.1-2. EmX Alternatives Overview



Locator Map



Legend

- 30th Avenue to Lane Community College Corridor
 - Coburg Road Corridor
 - Highway 99 Corridor
 - River Road Corridor
 - Road
 - Park
 - Water
- Existing Without Improvements
 - Proposed or Existing with Improvements
 - ↔ New Pedestrian Crossing
 - ↔ Enhanced Existing Pedestrian Crossing
 - 2035 No-Build EmX

EmX Alternatives Overview



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2.1. No-Build Alternative Transit Network

This section describes the No-Build Alternative transit network, which 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.

2.1.1. Capital Improvements

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

- **West Eugene EmX Extension.** Currently under construction, the West Eugene EmX Extension (WEEE) project and its associated capital improvements will be completed in 2017.
- **Santa Clara Community Transit Center.** The existing River Road Station is located at the southeast corner of the River Road / Randy Papé Beltline Highway interchange between the eastbound on-ramp and River Avenue. To meet growing demand and avoid the impacts of increasing congestion, LTD plans to relocate the River Road Station to a site north of the Randy Papé Beltline Highway at the southeast corner of River Road and Hunsaker Lane. Once relocated to the new site, the River Road Station would be renamed the Santa Clara Community Transit Center. This new transit center is planned to include a mix of uses including a park and ride lot, residential housing, community space, and commercial uses. The River Road Station relocation to the new site is anticipated to be completed by the end of 2018.
- **Main Street EmX Extension.** Included in the RTP and currently under study, the extension of the existing Franklin EmX line on Main Street from Springfield Station to Thurston Station and associated capital improvements (e.g., stations, bicycle and pedestrian facilities, and signal modifications) is anticipated to be completed within the 20-year planning horizon (2035). The No-Build Alternative transit network assumes EmX service on Main Street. However, the outcome of this study, and the ultimate improvements chosen, are uncertain at this time.
- **McVay Highway Enhanced Corridor.** Included in the RTP and currently under study, Enhanced Corridor service from Springfield Station on McVay Highway to LCC and associated capital improvements (e.g., improved stops, transit queue jumps, and improved bicycle and pedestrian crossings) is anticipated to be completed within the 20-year planning horizon (2035).

2.1.2. Transit Operations

The No-Build Alternatives for each corridor include changes to transit service anticipated as a result of the WEEE project, Main Street EmX Extension project, development of the Santa Clara Community Transit Center, and other changes to fixed route service. The following changes to the existing 2016 fixed route services are anticipated by 2035:

- Eliminated routes:
 - Route 11 (replaced by Main Street EmX service)
 - Route 32 (replaced by WEEE service)
 - Route 76 (replaced by WEEE service)
 - Route 85 (replaced by Enhanced Corridor service on the McVay Highway)
 - Route 43 (replaced by WEEE service)

- Other route modifications:
 - Add WEEE service (replaces Route 43 service on W. 11th Avenue) as extension of existing EmX service
 - Add Main Street EmX service from Springfield Station to Thurston Station
 - Add Route 2 with service from Barger Drive / Echo Hollow Road to Eugene Airport
 - Add Route 16 to connect north and south of Main Street with EmX service
 - Add Enhanced Corridor service on McVay Highway from Springfield Station to LCC (replaces Route 85)
 - Reroute Route 33 and extend to Amazon Parkway
 - Reroute Route 36 to extend north of W. 11th Avenue to Barger Drive (replaces Route 43)
 - Reroute Route 41 via Highway 99 / Royal Avenue / W. 11th Avenue
 - Reroute Route 40 via Royal Avenue / Elmira Road / Roosevelt Boulevard / Chambers Street / W. 2nd Avenue / Oak and Pearl Streets
 - Add Route 44 paralleling Route 40 above to serve West Eugene
 - Reroute Route 55 to extend to Santa Clara Community Transit Center
 - Reroute Route 93 with service continuing to Eugene Station via Seneca Station and service terminating at the WEEE terminus
- Change in service frequencies:
 - Increase service on Route 24 from 30-minute peak frequencies to 15-minute peak frequencies
 - Increase service on Route 28 from approximately 30-minute peak frequencies (varying 20- to 30-minute intervals) to 15-minute peak frequencies
 - Increase service on Route 41 from 30- and 15-minute peak frequencies to 15-minute peak frequencies
 - Increase service on Route 51 from 60-minute off-peak frequencies to 30-minute off-peak frequencies
 - Increase service on Route 52 from 60-minute off-peak frequencies to 30-minute off-peak frequencies
 - Increase service on Route 66 from 30- and 15-minute weekday a.m. peak, off-peak, and p.m. peak frequencies to 15-minute weekday a.m. peak, off-peak, and p.m. peak frequencies
 - Increase service on Route 67 from approximately 30-minute weekday a.m. peak, off-peak, and p.m. peak frequencies to 15-minute weekday a.m. peak, off-peak, and p.m. peak frequencies
 - Increase service on Route 78 from approximately 60-minute frequencies from 8 a.m. to 6 p.m. to 30-minute weekday a.m. peak, off-peak, and p.m. peak frequencies
 - Increase service on Route 79x from 30-minute peak frequencies to 10-minute peak frequencies, and modify off peak frequencies to 15 minutes from between 10 and 30 minutes currently
 - Decrease a.m. peak service on Route 93 from 60-minute frequencies to 120-minute frequencies during a.m. peak hours, and increase from no service between Veneta and the WEEE terminus

to 120-minute frequencies during p.m. peak hours (off-peak service is 120-minute frequencies between Veneta and the WEEE terminus)

- Decrease a.m. peak service on Route 96 from 30-minute frequencies to 60-minute frequencies, and increase off-peak service from no service between 8:20 a.m. and 3:40 p.m. to 60-minute off-peak frequencies

Key transportation improvements specific to each corridor are described under each corridor's No-Build Alternative.

2.2. Enhanced Corridor Alternatives

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 improvements, 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.

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.

2.3. EmX Alternatives

EmX (BRT) Alternatives are characterized by exclusive guideways (business access and transit lanes [BAT] or bus-only lanes); branded, multi-door 60-foot-long BRT vehicles; enhanced stations with level boarding platforms instead of stops; off-board fare collection; signal priority; wider stop spacing; and frequent and redesigned service to improve cross-town connectivity.

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.

2.4. 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 on Cubit Street north of the intersection of Barger Drive and Cubit Street east of the Randy Papé Beltline Highway. This corridor is approximately 10.5 round-trip miles.

2.4.1. No-Build Alternative

The Highway 99 Corridor No-Build Alternative includes existing roadway, bicycle, pedestrian, and transit facilities in the corridor, as well as planned improvements in the DRAFT *Eugene 2035 Transportation System Plan* (City of Eugene, 2016; Draft Eugene 2035 TSP). The No-Build Alternative would not include capital improvements on Highway 99. As part of the Draft Eugene 2035 TSP, the following transportation improvements are planned along or adjacent to the corridor:

- Upgrade Bethel Drive, from Highway 99 to Roosevelt Boulevard, to a two-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 and Garfield Street (the section of this project from Roosevelt 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 the 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 a bicycle lane on Roosevelt Boulevard from Highway 99 east to railroad tracks

Under the No-Build Alternative, Highway 99 Corridor service would remain at 15-minute headways during peak periods and 30-minute headways during off-peak periods and evenings. Under the No-Build Alternative, a slight change is also made to Route 93, which would stop at the Pearl Buck Center in the absence of Route 44.

2.4.2. Enhanced Corridor Alternative

Capital improvements under the Highway 99 Corridor Enhanced Corridor Alternative would include enhanced bicycle and pedestrian crossings; improvements 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; and roadway widening at some locations in the corridor.

Existing conventional fixed-service routes would remain the same as with the No-Build Alternative, with the exception of the elimination of Route 41. Service west of WinCo would also remain the same or be improved.

2.4.3. EmX Alternative

The Highway 99 Corridor EmX Alternative would include creating BAT lanes on segments of W. 7th Avenue and Highway 99; reconstructing the Highway 99 / Roosevelt Boulevard intersection (traffic signal, turn lanes, and queue jump); completing other intersection modifications in the corridor; roadway widening at some locations; and constructing nine new enhanced pedestrian and bicycle crossings, new sidewalks, and a pedestrian bridge across the railroad line from Highway 99 to the Trainsong neighborhood. Four existing bus stop locations would be improved to EmX stations, in addition to constructing new stations. Some existing EmX stations would be used for the Highway 99 Corridor EmX service.

Route 44 is a conventional service line added to this alternative only, providing coverage on 11th and 13th Avenues as well as service to the Pearl Buck Center on W. 1st Avenue, with 30-minute headways during all periods. This would be a decrease in service for the 11th and 13th Avenue corridors that currently have 15-minute peak service. Route 44 is primarily intended to replace conventional service lost with the removal of the existing Route 41. Route 41 would be replaced with the Highway 99 Corridor EmX service described in this alternative.

2.5. River Road Corridor

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

2.5.1. No-Build Alternative

The River Road Corridor No-Build Alternative would include existing roadway, bicycle, pedestrian, and transit facilities in the corridor, as well as planned improvements in the Draft Eugene 2035 TSP. There would be no additional major bus capital improvements under the No-Build Alternative.

As part of the Draft Eugene 2035 TSP, the following transportation improvements are planned adjacent to and along the River Road Corridor:

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

Under the No-Build Alternative, River Road Corridor service would remain at 30-minute headways for both Routes 51 and 52 (which together effectively provide 15-minute service during peak periods) and off-peak periods. After 6:15 p.m., there is no longer a combined 15-minute frequency, and headways return to 30 minutes.

2.5.2. Enhanced Corridor Alternative

Capital improvements constructed as part of the River Road Corridor Enhanced Corridor Alternative would include BAT lanes on River Road approaching the Randy Papé Beltline Highway and other roadway improvements, like traffic signal reconstruction at certain locations along the corridor. Improvements to existing bus stops and the construction of new stops would also occur.

Routes 51 and 52 would be eliminated, and Enhanced Corridor service for River Road includes a split alignment in order to serve portions covered by those routes at 30-minute headways. In this arrangement, the area from Railroad Boulevard to W. 1st Avenue is served by one Enhanced Corridor service as a replacement for the Route 51 service, while the area along Blair Boulevard and W. 2nd Avenue is served by the other alignment to replace service lost with removal of Route 52. Those alignments meet at Railroad Boulevard and River Road to serve the River Road Corridor with consistent 15-minute headways.

2.5.3. EmX Alternative

New construction under the River Road Corridor EmX Alternative would include lane repurposing on River Road for BAT lanes, constructing short sections of exclusive bus lanes near the Randy Papé Beltline Highway, reconstructing traffic signals and intersections at several locations, constructing new bicycle and pedestrian crossings, improving existing stops to EmX stations, and constructing new stations. Some existing EmX stations would be used with the River Road EmX service.

Transit service changes would also include modifying headways on Route 40 during the a.m. and p.m. peak hours to 15 minutes, developing a new Route 50 “River Road Connector” with 30-minute headways all day, and eliminating Routes 51, 52, and 55. These replacements ensure no loss in existing coverage or service.

2.6. 30th Avenue to Lane Community College 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 10.2 round-trip miles.

2.6.1. No-Build Alternative

The 30th Avenue to LCC Corridor No-Build Alternative would include existing roadway, bicycle, pedestrian, and transit facilities in the corridor, as well as planned improvements in the Draft Eugene 2035 TSP. There would be no additional major bus capital improvements to the 30th Avenue to LCC Corridor under the No-Build Alternative.

The Draft Eugene 2035 TSP identifies the following transportation improvements along or adjacent to the corridor:

- Bicycle boulevard on Alder Drive

For the portion of E. 30th Avenue in unincorporated Lane County, Lane County does not plan to improve bicycle facilities along the road.

Under the No-Build Alternative, 30th Avenue to LCC Corridor service would remain at 30-minute headways on Route 81. The Route 82 service would remain at 10-minute headways during the a.m. peak, 15-minute headways during off-peak periods, and 20-minute headways during the p.m. peak, with no weekend service.

2.6.2. Enhanced Corridor Alternative

Capital improvements as part of the 30th Avenue to LCC Corridor Enhanced Corridor Alternative would include the construction of new bus stops, capital improvements to some existing bus stops, a new traffic signal on Amazon Parkway at E. 20th Avenue, and new bike facilities on Oak and Pearl Streets.

Under the 30th Avenue to LCC Corridor Enhanced Corridor Alternative, service to LCC provided by Routes 81 and 82 would be eliminated and replaced by Enhanced Corridor service. The direct connection between LCC and the University of Oregon Station along Route 81 would be eliminated. It would be replaced by connecting the 30th Avenue to LCC Corridor Enhanced Corridor Alternative to the Franklin EmX line with a transfer at Eugene Station.

2.6.3. EmX Alternative

The 30th Avenue to LCC Corridor EmX Alternative would include repurposing parking and general-purpose lanes to BAT lanes on Oak and Pearl Streets, constructing queue jumps, extending E. 20th Avenue, adding a new traffic signal on Amazon Parkway, and adding a new cycle track on High Street. In addition to constructing new EmX stations, existing bus stops would be improved to EmX stations in certain locations.

Service to LCC provided by Routes 81 and 82 would be replaced with EmX service. The direct connection between LCC and the University of Oregon Station along Route 81 would be eliminated. It would be replaced by connecting the 30th Avenue to LCC Corridor EmX Alternative to the Franklin EmX line with a transfer at Eugene Station.

2.7. 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 improvements for the corridor terminate at Interstate 5 (I-5). This corridor is approximately 11.2 round-trip miles.

2.7.1. No-Build Alternative

The Coburg Road Corridor No-Build Alternative includes existing roadway, bicycle, pedestrian, and transit facilities in the corridor, as well as planned improvements in the Draft Eugene 2035 TSP. There would be no additional major transportation improvements to the Coburg Road Corridor under the No-Build Alternative.

Under the No-Build Alternative, the Coburg Road Corridor service would remain at 15-minute headways on Routes 66 and 67 at all weekday times, 30-minute headways on Saturdays, and 60-minute headways on Sundays.

2.7.2. Enhanced Corridor Alternative

The Coburg Road Corridor Enhanced Corridor Alternative would include new traffic signal construction, intersection reconstruction at several locations on Coburg Road, the addition of queue jumps, and the addition of BAT lanes south of the Interstate 105 (I-105) interchange. New crossings for bicyclists and pedestrians would be constructed. Existing bus stops would be improved and new stops would also be constructed.

Route 12 would be altered to serve Valley River Center and Marcola Road. A new route (Route 60) would be added to serve Valley River Center, and Routes 66 and 67 would be eliminated. This change would provide new service and coverage to the Cal Young neighborhood and along Hayden Bridge Way in Springfield. It would require current passengers along Harlow Road to transfer in order to get downtown.

2.7.3. EmX Alternative

Improvements to the corridor under the Coburg Road Corridor EmX Alternative would include construction of exclusive transit lanes at several locations on Coburg Road and intersection reconstruction at multiple locations. New bicycle and pedestrian crossings and EmX stations would be constructed, and some existing bus stops would be improved to EmX stations.

As in the Coburg Road Corridor Enhanced Corridor Alternative, Route 12 would be altered to serve Valley River Center and Marcola Road, and Route 60 would be added to serve Valley River Center, while Routes 66 and 67 would be eliminated. This change would provide new service and coverage to the Cal

Young neighborhood and along Hayden Bridge Way in Springfield. It would require current passengers along Harlow Road to transfer in order to get downtown.

2.8. Martin Luther King, Jr. Boulevard Corridor

The Martin Luther King, 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 Martin Luther King, Jr. Boulevard and continues east on Martin Luther King, Jr. Boulevard past Autzen Stadium to Centennial Boulevard. Although transit service continues along Centennial Boulevard, capital improvements for the corridor terminate at I-5. The corridor is approximately 6.0 round-trip miles.

2.8.1. No-Build Alternative

The Martin Luther King, Jr. Boulevard Corridor No-Build Alternative includes existing roadway, bicycle, pedestrian, and transit facilities in the corridor, as well as planned improvements in the Draft Eugene 2035 TSP. The Draft Eugene 2035 TSP identifies the following transportation improvements along or adjacent to the Martin Luther King, Jr. Corridor:

- Add a center turn lane along sections of Martin Luther King, Jr. Boulevard from Club Road to Leo Harris Parkway

Under the No-Build Alternative, the Martin Luther King, Jr. Boulevard Corridor service would remain at 30-minute headways.

2.8.2. Enhanced Corridor Alternative

Capital improvements associated with the Martin Luther King, Jr. Boulevard Corridor Enhanced Corridor Alternative would include reconstructing traffic signals at the intersections of Coburg Road and Martin Luther King, Jr. Boulevard and of Martin Luther King, Jr. Boulevard and Centennial Loop; repurposing existing outside general-purpose lanes to BAT lanes on Martin Luther King, Jr. Boulevard; adding a new traffic signal at the intersection of Martin Luther King, Jr. Boulevard and Leo Harris Parkway; enhancing pedestrian crossings; constructing new bus stops; and improving existing bus stops. Existing Route 13 would be eliminated.

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3. Methods and Data

This report describes the air quality-related methods and data used for the MovingAhead Project's screening and AA. The air quality-related methods, data and analysis are closely tied to the transportation methods and data and analysis prepared for the project, found in the *MovingAhead Transportation Technical Report* (DKS Associates [DKS] and CH2M, 2017).

The purpose of this air quality technical analysis is to compare air pollutant emissions of the alternatives using the *New and Small Starts Evaluation and Rating Process Final Policy Guidance* (FTA, 2013, August). The report includes a discussion of the following elements:

- Existing air quality conditions in areas potentially affected by the alternatives
- Regulations and policy governing evaluation of impacts and mitigation
- Methodology used in the analysis
- Impacts of the alternatives (short-term, long-term, cumulative, and indirect)
- Potential mitigation measures

3.1. Relevant Laws and Regulations

This subsection summarizes the federal, state, and local environmental laws and regulations related to air quality.

3.1.1. Federal

Clean Air Act (CAA). This comprehensive public law forms the basis for a broad range of regulations that control allowable emissions and concentrations of air pollutants in the environment.

40 CFR 50. U.S. Environmental Protection Agency (EPA). National Primary and Secondary Air Quality Standards. U.S. Code of Federal Regulations (CFR). EPA established National Ambient Air Quality Standards (NAAQS) to protect the public from air pollution. These federal standards for air quality analysis are used by the FTA. The NAAQS are shown in Table 3.1-1.

Geographic areas where concentrations of a pollutant exceed the ambient air quality standards are classified as nonattainment areas (i.e., do not attain standards). Previously designated nonattainment areas now in compliance with air quality standards are classified as maintenance areas. Areas that meet the standards are classified as attainment areas (attain standards). Federal regulations require states to prepare State Implementation Plans (SIPs) that identify emission reduction strategies for nonattainment and maintenance areas.

40 CFR 86. EPA. Control of Emissions from New and In-Use Highway Vehicles and Engines. CFR.

Starting in the early 1970s, EPA promulgated numerous regulations to control air pollutant emissions from motor vehicles. The most recent regulations were promulgated in the early 2000s and adopted controls on heavy-duty diesel vehicles, sulfur in fuels, and air toxic emissions from mobile sources. While these standards will not apply directly to the project alternatives, they apply to all vehicles on the highway system and are the regulatory controls responsible for substantial reductions in vehicle emissions since the 1970s and additional projected vehicle emissions reductions over the next 25 to 30 years.

Table 3.1-1. Ambient Air Quality Standards

Pollutant	Federal Standard	State Standard
Inhalable Particulate Matter (PM₁₀) (µg/m³)		
24-hour Average (µg/m ³)	150	150
Particulate Matter (PM_{2.5}) (µg/m³)		
Annual Arithmetic Mean (µg/m ³)	12	12
24-hour Average (µg/m ³)	35	35
Carbon Monoxide (CO)		
8-hour Average (ppm)	9	9
1-hour Average (ppm)	35	35
Ozone (O₃)		
8-hour average (ppb)	70	70
Nitrogen Dioxide (NO₂)		
Annual Average (ppb)	53	53
1-hour Average (ppb)	100	NS
Lead (Pb)		
Quarterly Average (µg/m ³)	0.15	0.15
Sulfur Dioxide (SO₂)		
Annual Average (ppb)	NS	20
24-hour Average	NS	100
3-hour Average	50	50
1-hour Average (ppb)	75	75

Source: EPA. (2016); DEQ. (2016, July).

µg/m³ = microgram(s) per cubic meter

NS = no standard established

PM_{2.5} = particulate matter – 2.5 microns in diameter

PM₁₀ = particulate matter – 10 microns in diameter

ppb= parts per billion

ppm= parts per million

3.1.2. State

OAR 340 Division 202. Oregon Department of Environmental Quality (DEQ). Ambient Air Quality Standards and PSD Increments. In addition to the NAAQS, DEQ established State Ambient Air Quality Standards that are at least as stringent as the NAAQS. These state standards are listed in Table 3.1-1.

OAR 340 Division 252. DEQ. Transportation Conformity. The transportation conformity regulations establish criteria and procedures for determining conformity with SIPs. This rule covers transportation plans, programs, and projects in Oregon that are developed, funded, or approved by the United States Department of Transportation (DOT) and by MPOs or other recipients of funds under Title 23 of the U.S.C. or the Federal Transit Laws.

OAR 340 Division 254. DEQ. Rules for Indirect Sources. The indirect source rules regulate parking facilities and other indirect sources with associated parking. In the project area, parking lots with a capacity of 1,000 or more parking spaces would be regulated.

3.1.3. Local

DEQ and EPA delegated air quality program implementation to the Lane Regional Air Protection Agency (LRAPA). LRAPA also has stationary source regulations that could apply to hot asphalt plants and concrete mix plants, as well as general particulate matter (PM) regulations that could apply to construction activities in or within 5 miles of the municipal boundaries of the City of Eugene or the City of Springfield for specific sources, including parking facilities with a capacity of 250 or more parking spaces, highway sections with an anticipated annual Average Daily Traffic volume of 20,000 or more motor vehicles per day within 10 years after completion, or modified highway sections that increase the annual Average Daily Traffic volume on that highway section by 10,000 or more motor vehicles per day within 10 years after completion. The indirect source permit regulations are not anticipated to apply to this project.

3.2. Analysis Area

LRAPA monitors three criteria pollutants in the Eugene-Springfield area: PM, carbon monoxide (CO), and ozone. The pollutants are monitored at one location in Springfield and four locations in Eugene.

3.2.1. Existing Air Quality and Compliance Status with National Ambient Air Quality Standards

The Eugene-Springfield area was first designated a nonattainment area on January 10, 1980, for exceeding the 24-hour secondary total suspended particulate (TSP) standard. The TSP standard was changed to the particulate matter – 10 microns in diameter (PM₁₀) standard in 1987, which resulted in a PM₁₀ nonattainment designation on August 7, 1987. PM, including PM₁₀, is generated by wood stoves, open burning, industrial activities, fugitive dust, and motor vehicles. PM emissions are not significantly affected by transportation sources in the Eugene-Springfield area.

Ozone has been monitored in the Eugene-Springfield area since May 1974. The area has remained in attainment with the federal standards. Volatile organic compounds (VOCs) and nitrogen oxides (NO_x) react with sunlight to produce ozone. Vehicle emissions are the primary source of NO_x and one of the leading sources of VOCs.

CO is a pollutant of local concern with highest concentrations usually measured near heavily congested intersections. Maximum CO concentrations usually occur during winter weather conditions when still, cold conditions create an inversion and trap pollutants near the ground. LRAPA began monitoring CO in 1971 and has continued to monitor CO in the downtown Eugene area. The Eugene-Springfield area was

designated as a maintenance area on February 4, 1994. The CO standard was last exceeded in 1986. The standard allows for one 8-hour exceedance per calendar year. LRAPA developed a control strategy to forestall or prevent the occurrence of future problems as population growth occurs.

In 2014, the Eugene-Springfield region completed the 20-year maintenance period, having met the air quality standards for CO for at least 20 years. As a result of this successful reduction in CO concentrations, no further assessment of CO levels is required under the CAA for transportation projects in the region.

3.3. Contacts and Coordination

Project staff used previous planning efforts as guiding documents for regulatory agencies to help scale the level of analysis. Information sources included the following:

3.3.1. Federal

- FTA

3.3.2. State

- Oregon Department of Transportation (ODOT)
- DEQ

3.3.3. Local

- LRAPA
- LCOG to verify the exact status of the project in the most recent conforming RTP and Transportation Improvement Program (TIP). A discussion of the project status and results of the regional analysis will be included in the report and the Draft environmental impact statement section

3.3.4. Other

- Project alignment files from the project design team
- Traffic data from the *MovingAhead Transportation Technical Report* (DKS and CH2M, 2017)
- *New and Small Starts Evaluation and Rating Process Final Policy Guidance* (FTA, 2013, August)

3.4. Level 2 Alternatives Analysis

3.4.1. Air Quality Conformity Determination

Section 176(c)(1) of the CAA requires federal agencies to ensure that their actions conform to applicable implementation plans for achieving and maintaining the NAAQS for criteria pollutants. Specifically, a federal action must not contribute to new violations of ambient air quality standards, increase the frequency or severity of existing violations, or delay timely attainment of standards in the area of concern. Transportation plans, programs, and projects in air quality nonattainment or maintenance areas must demonstrate conformity.

The Eugene-Springfield region completed the 20-year maintenance period for CO with no exceedances, and therefore, no CO hot spot air modeling is required for transportation projects.

It has been established that emissions from motor vehicles are an insignificant contributing factor to overall PM₁₀ emissions; therefore, a conformity determination is not required for regional emissions of PM₁₀. Instead LRAPA must demonstrate PM₁₀ conformity for non-transportation sources in the nonattainment area. Projects within the PM₁₀ nonattainment area must comply with project level conformity requirements. PM₁₀ emissions from transportation sources in the Eugene-Springfield area are a very low percentage of total PM₁₀ emissions, and project emissions are not expected to contribute to violations of the standard or to delay attainment of the standard.

3.4.2. Regional Impacts (Burden) Analysis

The primary pollutants of concern for transportation projects in the Eugene-Springfield area are CO, NO_x, and VOC. A comparison of the project's regional air quality effects was assessed through a regional burden analysis. The burden analysis compared the estimated annual regional emissions associated with the No-Build and Build Alternatives for the future year (2035). A burden analysis is not required for the conformity demonstration, but it has been included for informational purposes. The methods for the burden analysis followed the *New and Small Starts Evaluation and Rating Process Final Policy Guidance* (FTA, 2013, August) and used estimated annual regional emissions based on vehicle miles traveled (VMT) for the No-Build and Build Alternatives.

3.4.2.1. Local Impacts Analysis

Because the Eugene-Springfield region completed the 20-year maintenance period for CO with no exceedances, no CO hot spot air modeling is required for transportation projects in the region. Therefore, no local air quality impacts analysis, or CO hot spot analysis, is required for any of the proposed corridors.

3.4.2.2. Data Collection

The following data and information was obtained and used in the analysis.

- Average annual regional traffic volumes taken from the *MovingAhead Transportation Technical Report* (DKS and CH2M, 2017)

3.4.2.3. Significance Thresholds

Table 3.1-2 contains the environmental rating range break points used under the regional burden analysis to compare air quality effects of the different alternatives when compared to the No-Build Alternative. Each build alternative is compared to the No-Build Alternative using the rating scale in Table 3.1-2. The higher the change in percentage points, the greater the environmental effect of the project. Projects with ratings of Low-Medium and Low are predicted to have slight improvements in air quality, while Medium-High and Medium could result in slight increases in pollutants. Medium rated projects are predicted to have a negligible effect on air quality.

Table 3.1-2. Environmental Rating Break Points for New and Small Starts Projects

Rating	Range
High	> 10%
Medium – High	5% to 10%
Medium	0% to 5%
Low – Medium	0% to -10%
Low	< 10%

Source: FTA. (2013, August).

3.4.2.4. Impact Analysis

Methods for determining potential air quality impacts are described in this subsection.

Long-Term Impacts Analysis Approach

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

The project’s regional air quality impacts were assessed through a regional burden analysis. That analysis calculated the incremental environmental burden (or benefit) of the project on regional air quality by comparing projected 20-year horizon data with the project to the No-Build Alternative transit system, which includes the existing transportation system as well as any projects identified in the LCOG RTP or TIP.

The analysis involved several steps, and was done separately for each pollutant. First, changes in VMT for each build alternative were obtained from the project traffic engineers and were used to calculate the incremental change in quantity for each pollutant based on FTA air quality emission factors (expressed in grams / VMT). Second, FTA monetization factors (expressed in dollars per kilogram) were applied to those incremental changes to determine the dollar cost of each incremental change. In other words, for each build alternative and each air pollutant, the potential effect of that alternative on the level of a pollutant generated by the project was quantified in dollars. This includes increases and decreases in the pollutant levels, or in some rare cases, no change in a pollutant level. The dollar per kilogram amount is based on the pollutant type and EPA air quality models. Finally, the incremental cost change for each project option was expressed as a percent change from the overall No-Build Alternative cost for the pollutant in question.

The No-Build Alternative costs were also calculated using VMTs and the same FTA air quality emission factors and monetization factors. This methodology was applied to each pollutant, and the calculations were done separately by vehicle class before the aggregate comparison between the No-Build Alternative and build alternatives was made for each pollutant.

Short-Term Impacts Approach

During construction, CO and PM are expected to increase. These increased emissions are due to heavy construction vehicles, lowered traffic speeds and earth excavation. They create temporary impacts on the ambient air quality. If construction duration will be 5 years or longer, construction impacts must be considered in the conformity analysis.

Construction impacts would result from the generation of dust from site clearing, excavation, grading, direct emissions from construction vehicles, and impacts to traffic flow in the project area. Traffic congestion increases idling times and reduces travel speeds, which results in increased vehicle emission levels. Construction of concrete structures may have associated dust-emitting sources, such as concrete mixing operations. Asphalt mix plants could also be associated with construction and could have particulate, hazardous air pollutant, and combustion source emissions. Stationary sources such as concrete and asphalt mix plants are generally required to obtain air permits from DEQ or LRAPA, and to comply with regulations to control dust and other pollutant emissions.

Cumulative and Indirect Impact Analysis Approach

Regional traffic data was generated that accounts for expected regional land use and growth and was used in this analysis. As a result, this air quality assessment has incorporated any expected cumulative and indirect traffic increases.

3.4.2.5. Mitigation Measures Approach

Because the Eugene-Springfield region completed the 20-year maintenance period for CO with no exceedances, no CO hot spot air modeling was performed. Air quality as related to project construction was reviewed, and various mitigation measures were reviewed and identified. More detailed mitigation planning will be developed in the NEPA documentation phase of the project.

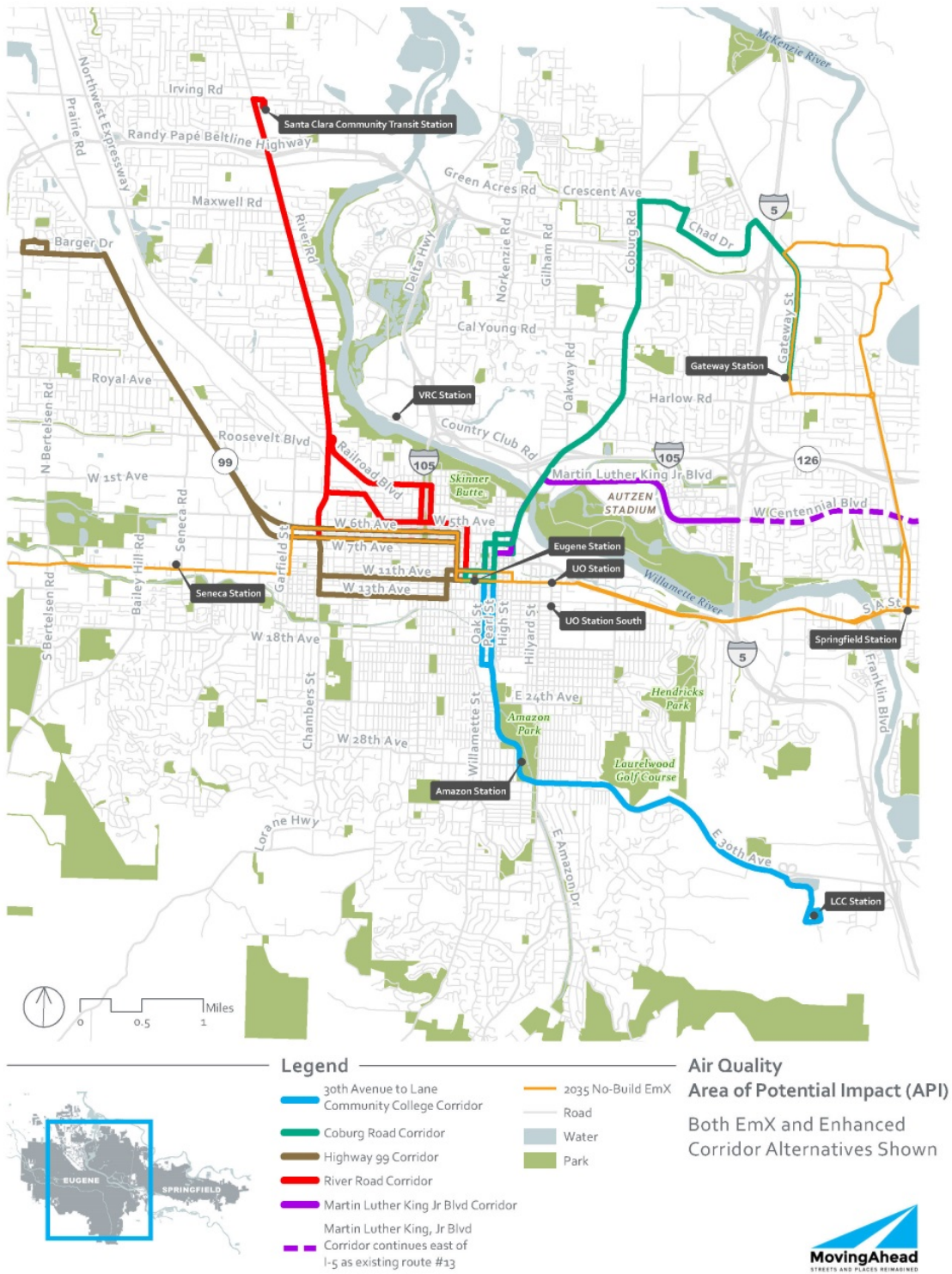
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4. Systemwide Environmental Consequences

4.1. Affected Environment

The affected environment for this evaluation is the Eugene-Springfield region. The area of effect will depend on the alignment selected, as air quality is typically localized in nature. For the majority of pollutants, any effect on air quality would only occur near congested intersections. This is typically within 100 to 150 feet of signalized intersections. The APIs for the build alternatives are presented in Figure 4.1-1.

Figure 4.1-1. Air Quality Area of Potential Impact



4.2. Long-Term Impacts for All Alternatives

The results of the FTA-compliant air quality burden analysis for each alternative are listed in Table 4.2-1. The data in Table 4.2-1 present the incremental environmental burden (or benefit) of the project on regional air quality, which was done by comparing projected 20-year horizon data with the project to the No-Build Alternative transit system. The No-Build Alternative would include the existing transportation system as well as any projects identified in the LCOG RTP or TIP.

Table 4.2-1. Comparison of Change in Air Quality for MovingAhead Alternatives

Alternative	Primary Pollutants ^a				Rating ^b
	CO	NO _x	VOC	PM _{2.5}	
No-Build Alternative	\$44,148.35	\$382,251.10	\$48,586.21	\$770,826.90	Baseline
Highway 99 Corridor Enhanced Corridor					
Change from NB	-\$9.99	\$11.86	-\$8.79	-\$37.88	Medium / Low-Medium
Percentage Change	-0.02%	0.00%	-0.02%	0.00%	
Highway 99 Corridor EmX Alternative					
Change from NB	-\$27.59	-\$70.41	-\$26.60	-\$247.89	Low-Medium
Percentage Change	-0.1%	0.0%	-0.1%	0.0%	
River Road Corridor Enhanced Corridor Alternative					
Change from NB	-\$4.65	-\$30.93	-\$4.91	-\$68.25	Low-Medium
Percentage Change	-0.01%	-0.01%	-0.01%	-0.01%	
River Road Corridor EmX Alternative					
Change from NB	-\$8.63	\$68.56	-\$6.29	\$48.23	Medium / Low-Medium
Percentage Change	-0.02%	0.02%	-0.01%	0.01%	
30th Avenue to LCC Corridor Enhanced Corridor Alternative					
Change from NB	\$5.42	\$11.11	\$5.16	\$44.91	Medium
Percentage Change	0.01%	0.00%	0.01%	0.01%	
30th Avenue to LCC Corridor EmX Alternative					
Change from NB	-\$6.96	-\$18.13	-\$6.72	-\$63.04	Low-Medium
Percentage Change	-0.02%	0.00%	-0.01%	-0.01%	
Coburg Road Corridor Enhanced Corridor Alternative					
Change from NB	-\$6.49	-\$79.62	-\$7.67	-\$145.83	Low-Medium
Percentage Change	-0.01%	-0.02%	-0.02%	-0.02%	
Coburg Road Corridor EmX Alternative					
Change from NB	-\$9.99	-\$1.11	-\$9.09	-\$55.92	Low-Medium
Percentage Change	-0.02%	0.00%	-0.02%	-0.01%	
Martin Luther King, Jr. Boulevard Corridor Emissions Balancing					
Change from NB	\$0.00	\$0.00	\$0.00	\$0.00	Medium / Low-Medium
Percentage Change	0.00%	0.00%	0.00%	0.00%	
Martin Luther King, Jr. Boulevard Corridor Enhanced Corridor					
Change from NB	-\$6.92	-\$3.05	-\$6.34	-\$41.87	Low-Medium
Percentage Change	-0.02%	0.00%	-0.01%	-0.01%	

Source: FTA. (2013, August).

NB = northbound

^a Pollutants taken from the *New and Small Starts Evaluation and Rating Process Final Policy Guidance* (FTA, 2013, August).

^b Ratings for change in air quality taken from Table 4.1-1.

As is shown in Table 4.2-1, each build alternative received a Medium to Low-Medium rating. This rating means that for each analyzed air pollutant, the quantity of pollutant expected under the build alternative is not predicted to vary on an incremental basis from the quantity under the No-Build Alternative by more than -10.0 percent to +4.99 percent. In fact, a review of the percentage changes shows that when compared to the No-Build Alternative, no build alternative increase is expected to be greater than 0.02 percent. The reason for the insignificant changes is directly related to overall volume of traffic in the greater Eugene-Springfield area when compared to the level of service for each high capacity transit alternative. Therefore, no alternatives are predicted to have an adverse effect on the overall air quality in the project areas and none would be predicted to cause any air related impacts.

4.3. Indirect and Cumulative Effects

Regional traffic data was generated that accounts for expected regional land use and growth and was used in this analysis. As a result, this air quality assessment has incorporated any expected cumulative and indirect traffic increases.

4.4. Short-Term Construction-Related Impacts

During construction, CO and PM are expected to increase. These increased emissions are due to heavy construction vehicles, lowered traffic speeds and earth excavation. They create temporary impacts on the ambient air quality. If construction duration will be 5 years or longer, construction impacts must be considered in the conformity analysis.

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. Traffic congestion increases idling times and reduces travel speeds, which results in increased vehicle emission levels. Construction of concrete structures may have associated dust-emitting sources, such as concrete mixing operations. Asphalt mix plants could also be associated with construction and could have particulate, hazardous air pollutant, and combustion source emissions. Stationary sources such as concrete and asphalt mix plants are generally required to obtain air permits from DEQ or LRAPA, and to comply with regulations to control dust and other pollutant emissions.

4.5. Potential Mitigation Measures

Because the Eugene-Springfield region completed the 20-year maintenance period for CO with no exceedances, no CO hot spot air modeling will be performed, and no air quality impacts are expected from the proposed transit operations in any corridors. Therefore, no operational air quality mitigation is expected for this project. However, air quality as related to project construction was reviewed, and various mitigation measures were reviewed. Air quality from construction is predicted to be approximately the same regardless of the alternative selected, and all build alternatives would need to comply with the construction air quality specifications.

Construction contractors are required to comply with OAR 340 Division 208, which addresses visible emissions and nuisance requirements. OAR 340 Division 208-0210 places limits on fugitive dust that causes a nuisance or violates other regulations. Violations of the regulations can result in enforcement actions and fines. The regulation provides a list of reasonable precautions be taken to avoid dust emissions:

- Use of water or chemicals where possible for the control of dust in the demolition of existing buildings or structures, construction operations, the grading of roads, or the clearing of land

- Application of asphalt, oil, water, or other suitable chemicals on unpaved roads, materials stockpiles, and other surfaces which can create airborne dusts
- Full or partial enclosure of materials stockpiles in cases where applications of oil, water, or chemicals are not sufficient to prevent PM from becoming airborne
- Installation and use of hoods, fans, and fabric filters to enclose and vent the handling of dusty materials
- Adequate containment during sandblasting or other similar operations
- When in motion, always covering open-bodied trucks transporting materials likely to become airborne

In addition, contractors are required to comply with ODOT standard specifications. Section 290 of the specifications has requirements for environmental protection, which include air pollution control measures. These control measures, designed to minimize vehicle track-out and fugitive dust, would be documented in the pollution control plan that the contractor is required to submit prior to the pre-construction conference.

4.6. Permits and Approvals

Permits and approvals listed in Table 4.6-1 may be required to construct the project alternatives.

Table 4.6-1. Air Quality Related Permits and Approvals

Permits and Approvals	No-Build Alternative	Enhanced Corridor Alternative	EmX Alternative
DEQ – Fugitive dust and other pollutant control	N/A	Contract Specifications	Contract Specifications
LRAPA – Indirect Source Construction Permit	N/A	None	None

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5. References

- 40 CFR § 50. (2007). Environmental Protection Agency. National Primary and Secondary Air Quality Standards. *U.S. Code of Federal Regulations*. <https://www.gpo.gov/fdsys/pkg/CFR-2007-title40-vol2/xml/CFR-2007-title40-vol2-part50.xml>.
- 40 CFR § 86. (1977). Environmental Protection Agency. Control of Emissions from New and In-Use Highway Vehicles and Engines. *U.S. Code of Federal Regulations*. <https://www.gpo.gov/fdsys/pkg/CFR-2007-title40-vol18/pdf/CFR-2007-title40-vol18-part86.pdf>.
- Central Lane Metropolitan Planning Organization (MPO). (2007). *Regional Transportation Plan*.
- CH2M HILL, Inc. (CH2M). (2016). *MovingAhead Alternatives and Design Options Considered but Eliminated Technical Memorandum*.
- CH2M HILL, Inc. (CH2M), Environmental Science & Assessment, Heritage Research Associates, Michael Minor & Associates, and Wannamaker Consulting. (2015). *MovingAhead Environmental Disciplines Methods and Data Report*.
- CH2M HILL, Inc. (CH2M), Wannamaker Consulting, DKS Associates (DKS), and John Parker Consulting. (2016). *Moving Ahead Level 2 Definition of Alternatives*.
- City of Eugene. (2016). *DRAFT Eugene 2035 Transportation System Plan*. (Draft Eugene 2035 TSP).
- DKS Associates (DKS) and CH2M HILL, Inc. (CH2M). (2017). *MovingAhead Transportation Technical Report*.
- Envision Eugene. (2016, July). *Draft Envision Eugene Comprehensive Plan*. <https://www.eugene-or.gov/3009/The-Envision-Eugene-Comprehensive-Plan> and <https://www.eugene-or.gov/760/Envision-Eugene>. (Draft Envision Eugene).
- Federal Transit Administration (FTA). (2013, August). *New and Small Starts Evaluation and Rating Process Final Policy Guidance*. http://www.apta.com/gap/fedreg/Documents/NS-SS_Final_PolicyGuidance_August_2013.pdf.
- Lane County Public Works, Engineering Division Transportation Planning. (2004, June 4; update in progress). *Lane County Transportation System Plan*.
- Lane Regional Air Pollution Authority (LRAPA). (1990). Indirect Sources Required to Have Indirect Source Construction Permits. LRAPA Title 20, Eugene, OR. <http://or-lanerapa.civicplus.com/DocumentCenter/Home/View/254>.
- Lane Regional Air Pollution Authority (LRAPA). (2008). Rules for Fugitive Emissions. LRAPA Title 48, Eugene, OR. <http://or-lanerapa.civicplus.com/DocumentCenter/Home/View/276>.
- Lane Transit District (LTD). (2014). *Lane Transit District Long-Range Transit Plan*.
- Lane Transit District (LTD). (2015, Amended 2015, June). *Lane Transit District Capital Improvement Plan. MovingAhead*.
- Lane Transit District (LTD) and City of Eugene. (2015). *MovingAhead Fatal Flaw Screening Technical Memorandum*.
- MovingAhead Project Team. (2016). Discipline Experts.
- National Environmental Policy Act of 1969, as amended. 42 U.S.C. 4321-4347. (NEPA). <https://energy.gov/nepa/downloads/national-environmental-policy-act-1969>.

Oregon Administrative Rule (OAR) 340 Division 202. Oregon Department of Environmental Quality. Ambient Air Quality Standards and PSD Increments. *Oregon Administrative Rules*. http://arcweb.sos.state.or.us/pages/rules/oars_300/oar_340/340_202.html.

Oregon Administrative Rule (OAR) 340 Division 252. Oregon Department of Environmental Quality. Transportation Conformity. *Oregon Administrative Rules*. http://arcweb.sos.state.or.us/pages/rules/oars_300/oar_340/340_252.html.

Oregon Administrative Rule (OAR) 340 Division 254. Oregon Department of Environmental Quality. Rules for Indirect Sources. *Oregon Administrative Rules*. http://arcweb.sos.state.or.us/pages/rules/oars_300/oar_340/340_254.html.

Oregon Department of Environmental Quality. (2016, July). 2015 Oregon Air Quality Data Summaries. <http://www.deq.state.or.us/aq/forms/2015AQDataSummaryReport.pdf>.

U.S. Environmental Protection Agency (EPA). (2016). NAAQS Table. <https://www.epa.gov/criteria-air-pollutants/naaqs-table>.

Wannamaker Consulting. (2015). MovingAhead Phase 1 Steps.

Appendix A: Glossary and Naming Conventions

This appendix includes a detailed list of acronyms, abbreviations, and technical terms used throughout this report. It also includes naming conventions used in the MovingAhead Project.

Acronyms and Abbreviations

Table A-1. Acronyms and Abbreviations

Acronyms and Abbreviations	Definitions
/H-RCP	Historic Structures or Sites Combine Zone
/WP	Waterside Protection
/WQ	Water Quality
°C	degree(s) Celsius
µg/L	microgram(s) per liter
µg/m ³	microgram(s) per cubic meter
AA	Alternatives Analysis
AAC	all aluminum conductor
AASHTO	American Association of State Highway and Transportation Officials
AAI	All Appropriate Inquiry
ACS	American Community Survey
ADA	Americans with Disabilities Act
AEO	Annual Energy Outlook
APE	Area of Potential Effect
API	Area of Potential Impact
approx.	approximately
ARTS	All Roads Transportation Safety Program
ATR	Automated Traffic Recording
BAT	business access and transit
BEST	Better Eugene Springfield Transit
BFE	Base Flood Elevation
BMP	best management practice
BPA	Bonneville Power Administration
BRT	bus rapid transit
Btu	British thermal unit
c	circa
CAA	Clean Air Act
CAFE	Corporate Average Fuel Economy
CEQ	Council on Environmental Quality

Table A-1. Acronyms and Abbreviations

Acronyms and Abbreviations	Definitions
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act of 1980
CERCLIS	Comprehensive Environmental Response Compensation and Liability Information System
CFR	Code of Federal Regulations
CFU	Colony-Forming Unit
CH2M	CH2M HILL, Inc.
CIG	Capital Investment Grant
CIP	Capital Improvements Program
City	City of Eugene
CO	carbon monoxide
CO ₂	carbon dioxide
CO ₂ e	carbon dioxide equivalent
COGP	County Opportunity Grant Program
Corps	U.S. Army Corps of Engineers
CRL	Confirmed Release List
CSZ	Cascadia Subduction Zone
CTR	commute trip reduction
CWA	Clean Water Act
CY	cubic yard
dB	decibel
dba	A-weighted decibel
DBE	Disadvantaged Business Enterprise
DEIS	Draft Environmental Impact Statement. Also referred to as Draft EIS.
DEQ	Oregon Department of Environmental Quality
DKS	DKS Associates
DLS	Donation Land Claim
DOE	Determination of Eligibility
DOGAMI	Oregon Department of Geology and Mineral Industries
DOT	Department of Transportation
Draft EIS	Draft Environmental Impact Statement. Also referred to as DEIS.
Draft Envision Eugene	<i>Draft Envision Eugene Community Vision</i> (Envision Eugene, 2016, July)
Draft Eugene 2035 TSP	<i>DRAFT Eugene 2035 Transportation System Plan</i> (City of Eugene, 2016)
DSL	Oregon Department of State Lands
DU	dwelling unit
EA	Environmental Assessment or each
EC	City of Eugene Code

Table A-1. Acronyms and Abbreviations

Acronyms and Abbreviations	Definitions
EC	eligible contributing
EC	Enhanced Corridor Alternative (in some tables)
ECLA	<i>Eugene Comprehensive Lands Assessment</i> (ECONorthwest, 2010, June)
ECSI	Environmental Cleanup Site Information database (Oregon DEQ, 2016)
EFH	essential fish habitat
EIS	Environmental Impact Statement
EJ	Environmental Justice
EmX	Emerald Express, Lane Transit District's Bus Rapid Transit System
EmX	EmX Alternative (in some tables)
EOA	Equity and Opportunity Assessment
EPA	U. S. Environmental Protection Agency
ES	eligible significant
ES NR	eligible significant NRHP
ESA	Endangered Species Act or Environmental Site Assessment
ESH	essential indigenous anadromous salmonid habitat
ESU	Evolutionarily Significant Unit
EWEB	Eugene Water & Electric Board
FAST Act	Fixing America's Surface Transportation Act
FEIS	Final Environmental Impact Statement. Also referred to as Final EIS.
FEMA	Federal Emergency Management Agency
FHWA	Federal Highway Administration
FIFRA	Federal Insecticide, Fungicide, and Rodenticide Act of 1974
Final EIS	Final Environmental Impact Statement. Also referred to as FEIS.
FOE	Finding of Effect
FPPA	Farmland Protection Policy Act, 7 U.S.C. 4201-4209 and 7 CFR 658
FRA	Federal Railroad Administration
ft	foot (feet)
ft ²	square foot (feet)
FTA	Federal Transit Administration
FTN	Frequent Transit Network
FY	fiscal year
GAN	Grant Anticipation Note
GARVEE	Grant Anticipation Revenue Vehicle
GHG	greenhouse gas
GIS	geographic information system
GLO	General Land Office

Table A-1. Acronyms and Abbreviations

Acronyms and Abbreviations	Definitions
Heritage	Heritage Research Associates, Inc.
HGM	Hydro-geomorphic
HMTA	Hazardous Materials Transport Act of 1975, with amendments in 1990 and 1994
HOV	high-occupancy vehicle
HPNW	Historic Preservation Northwest
I-5	Interstate 5
I-105	Interstate 105
IOF	Immediate Opportunity Fund
ISA	International Society of Arboriculture
ISTEA	Intermodal Surface Transportation Efficiency Act
kV	kilovolt(s)
LaneACT	Lane Area Commission on Transportation
LCC	Lane Community College
LCDC	Land Conservation and Development Commission
LCOG	Lane Council of Governments
Ldn	day-night sound level
LE	Listed Endangered
LEP	limited English proficiency
L_{eq}	equivalent sound level
LF	lineal foot (feet)
LGAC	Local Government Affairs Council
LGGP	Local Government Grant Program
LID	Local Improvement District
L_{max}	maximum sound level
L_{min}	minimum sound level
LNG	liquefied natural gas
LOS	level of service
LPA	Locally Preferred Alternative
LRAPA	Lane Regional Air Protection Agency
LRFP	LTD's Long-Range Financial Plan
LRT	Light Rail Transit
LRTP	LTD's Long-Range Transit Plan
LT	Listed Threatened
LTD	Lane Transit District
LUST	leaking underground storage tank
LWCF	Land and Water Conservation Fund

Table A-1. Acronyms and Abbreviations

Acronyms and Abbreviations	Definitions
m	meter(s)
MAP-21	Moving Ahead for Progress in the 21st Century
MBTA	Migratory Bird Treaty Act
Metro Plan	<i>Metro Plan, Eugene-Springfield Metropolitan Area General Plan</i> (LCOG et al., 1987, as updated on 2015, December 31)
mg/kg	milligram(s) per kilogram
MI	mile(s)
mL	milliliter(s)
MMA	Michael Minor and Associates, Inc.
MOA	Memorandum of Agreement
MOE	Measure of Effectiveness
MPC	Metropolitan Policy Committee
mpg	miles per gallon
mph	miles per hour
MPO	Metropolitan Planning Organization
MTIP	<i>Metropolitan Transportation Improvement Program Federal FY 2015 to Federal FY 2018</i> (Central Lane MPO, adopted 2014, October, as amended)
Mw	Earthquake moment magnitude
N/A	not applicable
NA	not applicable; no data available
NAAQS	National Ambient Air Quality Standards
NAC	Noise Abatement Criteria
NAVD88	North American Vertical Datum of 1988
ND	nodal development
NEPA	National Environmental Policy Act of 1969, as amended, 42 U.S.C. 4321-4347
NFA	no further action
NHPA	National Historic Preservation Act
NMFS	National Marine Fisheries Service
NO ₂	nitrous dioxide
NO _x	nitrous oxides
NPDES	National Pollutant Discharge Elimination System
NPMS	National Pipeline Mapping System
NPS	Department of Interior's National Park Service
NR	Natural Resource
NRCS	Natural Resources Conservation Service
NRHP	National Register of Historic Places

Table A-1. Acronyms and Abbreviations

Acronyms and Abbreviations	Definitions
NS	no standard established
NW Natural	Northwest Natural
O ₃	ozone
O&M	operations and maintenance
OAR	Oregon Administrative Rule
OARRA	Oregon Archaeological Records Remote Access
ODA	Oregon Department of Agriculture
ODEQ	Oregon Department of Environmental Quality
ODFW	Oregon Department of Fish and Wildlife
ODOE	Oregon Department of Energy
ODOT	Oregon Department of Transportation
OHP	Oregon Highway Plan
OPA	Oil Pollution Act of 1990
OPRD	Oregon Parks and Recreation Department
OR	Oregon
ORBIC	Oregon Biodiversity Information Center
ORS	Oregon Revised Statutes
OTIB	Oregon Transportation Infrastructure Bank
Pb	lead
PCB	polychlorinated biphenyl
PEM	Palustrine Emergent Wetland
PM	particulate matter
PM ₁₀	particulate matter – 10 microns in diameter
PM _{2.5}	particulate matter – 2.5 microns in diameter
PMT	Project Management Team
ppb	parts per billion
PPE	personal protective equipment
ppm	parts per million
PROS	Parks, Recreation, and Open Space
PUC	Public Utilities Commission
Qls	landslide and debris avalanche deposits
Qtg	terrace and fan deposits
Qty	quantity
RCRA	Resource Conservation and Recovery Act of 1976
RFFA	reasonably foreseeable future action
ROW	right of way

Table A-1. Acronyms and Abbreviations

Acronyms and Abbreviations	Definitions
RRFB	Rectangular Rapid Flash Beacon
RTP	<i>Central Lane Metropolitan Planning Organization Regional Transportation Plan</i> (LCOG, adopted 2007, November; 2011, December). (The RTP includes the Financially Constrained Roadway Projects List)
SARA	Superfund Amendments and Reauthorization Act of 1986
SARA III	Emergency Planning and Community Right to Know Act of 1986; part of the SARA amendments
SC	sensitive critical
SCC	Standard Cost Categories
SCORP	Statewide Comprehensive Outdoor Recreation Plan
SDC	Systems Development Charge
SDWA	Safe Drinking Water Act
sec	second(s)
Section 4(f)	Section 4(f) of the Department of Transportation Act of 1966
Section 6(f)	Section 6(f) of the LWCF Act of 1965
Section 106	Section 106 of the National Historic Preservation Act of 1966 (36 CFR 800.5)
SF	square foot (feet)
SHPO	Oregon State Historic Preservation Office
SIP	State Implementation Plan
SMU	Species Management Unit
SO ₂	sulfur dioxide
SOC	species of concern
SSGA	Small Starts Construction Grant Agreement
STA	Special Transportation Area
STIP	Statewide Transportation Improvement Program
SV	Sensitive Vulnerable
SY	square yard(s)
TAP	Transportation Alternatives Program
TAZ	traffic analysis zone
TCE	Temporary Construction Easement
TD	transit-oriented development
TDM	Transportation Demand Management
TEA-21	Transportation Equity Act for the 21st Century
Teoe	siliciclastic marine sedimentary rocks
TESCP	Temporary Erosion and Sediment Control Plan
TIF	Tax Increment Financing
TIP	Transportation Improvement Program

Table A-1. Acronyms and Abbreviations

Acronyms and Abbreviations	Definitions
TMDL	total maximum daily load
TOD	transit-oriented development
TPAU	Department of Transportation – Transportation Planning Analysis Unit
TPR	Transportation Planning Rule
TransPlan	<i>Eugene-Springfield Transportation System Plan</i> (City of Eugene et al., adopted 2002, July)
TRB	Transportation Research Board
TSI	Transportation System Improvement
TSM	Transportation System Management
TSP	Transportation System Plan
UGB	Urban Growth Boundary
UMTA	Urban Mass Transit Administration
Uniform Act	Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970, as amended, 42 U.S.C. 4601 et. seq., 49 CFR Part 24
URA	Urban Renewal Area
U.S.C.	United States Code
USDOT	U.S. Department of Transportation
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey
UST	underground storage tank
v/c	volume-to-capacity
VHT	vehicle hours traveled
VMT	vehicle miles traveled
VOC	volatile organic compound
WEEE	West Eugene EmX Extension
WEG	wind erodibility group
YOE	year of expenditure

Terms

Table A-2. Terms

Terms	Definitions
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.”
Agricultural / Forest / Natural Resource	AG, EFU-25, EFU-30, EFU-40, F-1, F-2, and NR
Alignment	Alignment is the street or corridor that the transit project would be located within.
Alternative Fuels	Low-polluting fuels which are used to propel a vehicle instead of high-sulfur diesel or gasoline. Examples include methanol, ethanol, propane or compressed natural gas, liquid natural gas, low-sulfur or "clean" diesel and electricity.
Alternatives Analysis (AA)	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	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	An assessment’s Area of Potential Impact for the project is defined separately for each discipline.
Auxiliary Lanes	Lanes designed to improve safety and reduce congestion by accommodating cars and trucks entering or exiting the highway or roadway, and reducing conflicting weaving and merging movements.
Base Fare	The price charged to one adult for one transit ride; excludes transfer charges, and reduced fares.
Base Period	The period between the morning and evening peak periods when transit service is generally scheduled on a constant interval. Also known as "off-peak period."
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 Phase	An exclusive traffic signal phase for buses and/or BRT vehicles.
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, high-occupancy vehicle (HOV) lanes, expressways, or ordinary streets. The vehicles are designed to allow rapid passenger loading and unloading, with more doors than ordinary buses.

Table A-2. Terms

Terms	Definitions
Business Access and Transit (BAT) Lane	In general, a BAT lane is a concrete lane, separated from general-purpose lanes by a paint stripe and signage. A BAT lane provides Bus Rapid Transit (BRT) priority operations, but general-purpose traffic is allowed to travel within the lane to make a turn into or out of a driveway or at an intersecting street. However, only the BRT vehicle is allowed to use the lane to cross an intersecting street.
Busway	Exclusive freeway lane for buses and carpools.
Capital Improvements Program (CIP)	A CIP is a short-range plan, usually 4 to 10 years, which identifies capital projects and equipment purchases, provides a planning schedule, and identifies options for funding projects in the program.
Categorical Exclusion (CE)	A CE means a category of actions that do not individually or cumulatively have a significant effect on the human environment and for which, therefore, neither an environmental assessment nor an environmental impact statement is required.
Chambers Special Area Zone	S-C
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	Industrial (I-2 and I-3), Commercial (C-3), Mixed-Use (C-1, C-2, GO, S-C, S-CN, S-DR, S-DW, S-E, S-F, S-HB, S-JW, S-RN, S-W, and S-WS), Single-Family Residential (R-1), Multi-Family Residential (R-2 and R-3), Institution (PL and PRO), Agricultural / Forest / Natural Resource (AG, EFU-25, EFU-30, EFU-40, F-1, F-2, and NR), Office (E-1 and E-2), Special Area Zone (Non-Mixed Use) (S-H and S-RP), Downtown Westside Special Area Zone (S-DW), Chambers Special Area Zone (S-C)
Clean Air Act Amendments of 1990	The comprehensive federal legislation that establishes criteria for attaining and maintaining the federal standards for allowable concentrations and exposure limits for various air pollutants; the act also provides emission standards for specific vehicles and fuels.
Collector Streets	Collector streets provide a balance of both access and circulation within and between residential and commercial/industrial areas. Collectors differ from arterials in that they provide more of a citywide circulation function, do not require as extensive control of access, and are located in residential neighborhoods, distributing trips from the neighborhood and local street system.
Commercial	C-3

Table A-2. Terms

Terms	Definitions
Commuter Rail	Commuter rail is a transit mode that is a multiple car electric or diesel propelled train. It is typically used for local, longer-distance travel between a central city and adjacent suburbs, and can operate alongside existing freight or passenger rail lines or in exclusive rights of way.
Compressed Natural Gas (CNG)	An alternative fuel; compressed natural gas stored under high pressure. CNG vapor is lighter than air.
Conformity	The ongoing process that ensures the planning for highway and transit systems, as a whole and over the long term, is consistent with the state air quality plans for attaining and maintaining health-based air quality standards; conformity is determined by metropolitan planning organizations (MPOs) and the U.S. Department of Transportation (U.S. DOT), and is based on whether transportation plans and programs meet the provisions of a State Implementation Plan.
Congestion Mitigation and Air Quality (CMAQ)	Federal funds available for either transit or highway projects that contribute significantly to reducing automobile emissions, which cause air pollution.
Cooperating Agency	Regulations that implement the National Environmental Policy Act define a cooperating agency as any federal agency, other than a lead agency, which has jurisdiction by law or special expertise with respect to any environmental impact involved in a proposal (or a reasonable alternative) for legislation or other major federal action significantly affecting the quality of the human environment.
Coordination Plan	Required under Moving Ahead for Progress in the 21st Century (MAP-21), the coordination plan contains procedures aimed at achieving consensus among all parties in the initial phase of environmental review and to pre-empt disagreements that can create delays later on in a project.
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.
Corridor Transit Service Characteristics	The amount of transit service provided in each corridor, measured by daily vehicle hours traveled, daily vehicle miles traveled, and daily place-miles of service.
Demand Responsive	Non-fixed-route service utilizing vans or buses with passengers boarding and alighting at pre-arranged times at any location within the system's service area. Also called "Dial-a-Ride."
Diesel Multiple Unit (DMU)	Each unit carries passengers and can be self-powered by a diesel motor; no engine unit is required.
Documented Categorical Exclusion (DCE)	A DCE means a group of actions that may also qualify as Categorical Exclusions (CEs) if it can be demonstrated that the context in which the action is taken warrants a CE exclusion; i.e., that no significant environmental impact will occur. Thus, these actions are referred to as DCEs. Such actions require some National Environmental Policy Act documentation, but not an Environmental Assessment or a full-scale Environmental Impact Statement. DCEs documentation must demonstrate that, in the context(s) in which these actions are to be performed, they will have no significant environmental impact or that such impacts will be mitigated.

Table A-2. Terms

Terms	Definitions
Downtown Westside Special Area Zone	S-DW
Draft Environmental Impact Statement (DEIS)	The DEIS is the document that details the results of the detailed analysis of all of the projects alternatives. The DEIS contains all information learned about the impacts of a project and alternatives.
Earmark	A federal budgetary term that refers to the specific designation by Congress that part of a more general lump-sum appropriation be used for a particular project; the earmark can be designated as a minimum and/or maximum dollar amount.
Effects	Effects include ecological, aesthetic, historic, cultural, economic, social, or health, whether direct, indirect, or cumulative. 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, and (2) indirect effects that are caused by the action and are later in time or farther removed in distance but are still reasonably foreseeable. Indirect effects 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 (40 CFR 1508.8).
Electrical Multiple Unit (EMU)	The EMU is heavier than a light rail vehicle, but it is powered in the same way by an overhead electrical system.
EmX	Lane Transit District’s Bus Rapid Transit System, pronounced “MX,” short for Emerald Express.
Environmental Assessment (EA)	A report subject to the requirements of the National Environmental Policy Act (NEPA) demonstrating that an Environmental Impact Statement (EIS) is not needed for a specific set of actions. The EA can lead to a Finding of No Significant Impact (FONSI).
Environmental Impact Statement (EIS)	A comprehensive study of likely environmental impacts resulting from major federally-assisted projects; EISs are required by the National Environmental Policy Act.
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 three fundamental environmental justice principles: <ul style="list-style-type: none"> • 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.

Table A-2. Terms

Terms	Definitions
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.
Exclusive Right of Way	A roadway or other facility that can only be used by buses or other transit vehicles.
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).
Finding of No Significant Impact (FONSI)	A document prepared by a federal agency showing why a proposed action would not have a significant impact on the environment and thus would not require preparation of an Environmental Impact Statement (EIS). A FONSI is based on the results of an Environmental Assessment (EA).
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 and taxicabs.
Geographic Information System (GIS)	A 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 build from the project’s Purpose and Need Statement. <ul style="list-style-type: none"> • Goals are overarching principles that guide decision making. Goals are broad statements. • Objectives define strategies or implementation steps to attain the goals. Unlike goals, objectives are specific and measurable.
Guideway	A transit right of way separated from general purpose vehicles.
Headway	Time interval between vehicles passing the same point while moving in the same direction on a particular route.

Table A-2. Terms

Terms	Definitions
Heritage Tree	The <i>City of Eugene Urban Forest Management Plan</i> (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).
In-vehicle Travel Time	The amount of time it takes for a transit vehicle to travel between an origin and a destination.
In-vehicle Walk and Wait Travel Time	The amount of in-vehicle travel time plus time spent walking to transit, initial wait time, transfer wait time (if any), and time walking from transit to the destination.
Independent Utility	A project or section of a larger project that would be a usable and reasonable expenditure even if no other projects or sections of a larger project were built and/or improved.
Industrial	I-2 and I-3
Institution	PL and PRO
Intergovernmental Agreement	A legal pact authorized by state law between two or more units of government, in which the parties contract for, or agree on, the performance of a specific activity through either mutual or delegated provision.
Intermodal	Those issues or activities that involve or affect more than one mode of transportation, including transportation connections, choices, cooperation, and coordination of various modes. Also known as "multimodal."
Jefferson Westside Special Area Zone	S-JW
Joint Development	Ventures undertaken by the public and private sectors for development of land around transit stations or stops.
Key Transit Corridors	Key Transit Corridors are mapped in <i>Envision Eugene</i> and are anticipated to be significant transit corridors for the City and the region
Kiss & Ride	A place where commuters are driven and dropped off at a station to board a public transportation vehicle.
Land and Water Conservation Fund (LWCF) Act of 1965	16 U.S.C. 4601-4 et seq. The Land and Water Conservation Fund (LWCF) State Assistance Program was established by the LWCF Act of 1965 to stimulate a nationwide action program to assist in preserving, developing, and providing assurance to all citizens of the United States (of present and future generations) such quality and quantity of outdoor recreation resources as may be available, necessary, and desirable for individual active participation. The program provides matching grants to states and through states to local units of government, for the acquisition and development of public outdoor recreation sites and facilities.
Landscape Tree	A living, standing, woody plant having a trunk that exists on private property.

Table A-2. Terms

Terms	Definitions
Lane Regional Air Protection Agency (LRAPA)	LRAPA is responsible for achieving and maintain clean air in Lane County using a combination of regulatory and non-regulatory methods
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.
Lead Agency	The organization that contracts and administers a study. For transit projects, FTA would typically fill this role. The lead agency has the final say about the project's purpose and need, range of alternatives to be considered, and other procedural matters.
Level of Detail	The amount of data collected, and the scale, scope, extent, and degree to which item-by-item particulars and refinements of specific points are necessary or desirable in carrying out a study.
Level of Service (LOS)	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.
Light Rail Transit (LRT)	Steel wheel/steel rail transit constructed on city streets, semi-private right of way, or exclusive private right of way. Formerly known as "streetcar" or "trolley car" service, LRT's major advantage is operation in mixed street traffic at grade. LRT vehicles can be coupled into trains, which require only one operator and often are used to provide express service.
Limited (or Controlled) Access	Restricted entry to a transportation facility based upon facility congestion levels or operational condition. For example, a limited access roadway normally would not allow direct entry or exit to private driveways or fields from said roadway.
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.
Liquefied Natural Gas (LNG)	An alternative fuel; a natural gas cooled to below its boiling point of 260 degrees Fahrenheit so that it becomes a liquid; stored in a vacuum bottle-type container at very low temperatures and under moderate pressure. LNG vapor is lighter than air.
Local Streets	Local streets have the sole function of providing direct access to adjacent land. Local streets are deliberately designed to discourage through-traffic movements.
Locally Preferred Alternative (LPA)	The LPA is the alternative selected through the Alternatives Analysis process completed prior to or concurrent with National Environmental Policy Act analysis. This term is also used to describe the proposed action that is being considered for New Starts or Small Starts funds.
Low-Income Persons	Those whose median household income is at or below the Department of Health and Human Services poverty guidelines. For a four-person household with two related children, the poverty threshold is \$24,300 (year 2016 dollars).

Table A-2. Terms

Terms	Definitions
Maintenance area	An air quality designation for a geographic area in which levels of a criteria air pollutant meet the health-based primary standard (national ambient air quality standard, or NAAQS) for the pollutant. An area may have an acceptable level for one criteria air pollutant, but may have unacceptable levels for others. Maintenance/attainment areas are defined using federal pollutant limits set by EPA.
Maintenance facility	A facility along a corridor used to clean, inspect, repair and maintain bus vehicles, as well as to store them when they are not in use.
Major Arterial	Major arterial streets should serve to interconnect the roadway system of a city. These streets link major commercial, residential, industrial, and institutional areas. Major arterial streets are typically spaced about one mile apart to assure accessibility and reduce the incidence of traffic using collectors or local streets for through traffic in lieu of a well-placed arterial street. Access control, such as raised center medians, is a key feature of an arterial route. Arterials are typically multiple miles in length.
Major Investment Study (MIS)	An alternatives analysis study process for proposed transportation investments in which a wide range of alternatives is examined to produce a smaller set of alternatives that best meet project transportation needs. The purpose of the study is to provide a framework for developing a package of potential solutions that can then be further analyzed during an Environmental Impact Statement process.
Metro Plan Designations	Commercial, Commercial / Mixed Use, Government and Education, Heavy Industrial, High Density Residential / Mixed-Use, High Density Residential, Light-Medium Industrial, Low Density Residential, Medium Density Residential, Medium Density Residential / Mixed-Use, Mixed-Use, Parks and Open Space, Major Retail Center, Campus Industrial, University Research
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.
Minimum Operable Segment	A stand-alone portion of the alternative alignment that has independent utility, allowed by FTA to be considered as interim termini for a project. A minimum operable segment (MOS) provides flexibility to initiate a project with available funding while pursuing additional funding to complete the remainder of the project.
Minor Arterial	A 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.

Table A-2. Terms

Terms	Definitions
Minority	<p>A person who is one or more of the following:</p> <ul style="list-style-type: none"> • 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: a person 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-Use	C-1, C-2, GO, S-C, S-CN, S-DR, S-DW, S-E, S-F, S-HB, S-JW, S-RN, S-W, and S-WS
Modal Split	A term that 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. In freight transportation, modal split may be measured in mass.
Mode	A particular form or method of travel distinguished by vehicle type, operation technology, and right-of-way separation from other traffic.
Moving Ahead for Progress in the 21st Century (MAP-21)	Moving Ahead for Progress in the 21st Century (MAP-21) was signed by President Obama on July 6, 2012, reauthorizing surface transportation programs through FY 2014. It includes new and revised program guidance and regulations with planning requirements related to public participation, publication, and environmental considerations.
MovingAhead Project	<p>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 transportation corridors for people using transit, and facilities for people walking and biking. MovingAhead will prioritize transit, walking, and biking projects along these corridors so that they can be funded and built in the near-term.</p> <p>The project will focus on creating active, vibrant places that serve the community and accommodate future growth. During Phase 1, currently underway, the community will weigh in on preferred transportation solutions for each corridor and help prioritize corridors for implementation. When thinking about these important streets, LTD and the City of Eugene refer to them as corridors because several streets may work as a system to serve transportation needs.</p>
Multi-Family Residential	R-2 and R-3
Multimodal	Multimodal refers to various modes. For the MovingAhead project, multimodal refers to Corridors that support various transportation modes including vehicles, buses, walking and cycling.

Table A-2. Terms

Terms	Definitions
National Environmental Policy Act of 1969 (NEPA)	A comprehensive federal law requiring analysis of the environmental impacts of federal actions such as the approval of grants; also requiring preparation of an Environmental Impact Statement for every major federal action significantly affecting the quality of the human environment.
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 cost-effectiveness, alternatives analysis results, 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 action. The No-Build Alternative consists of the existing conditions, plus any improvements that have been identified in the Statewide Transportation Improvement Program.
Nonattainment Area	Any geographic region of the United States that the U.S. Environmental Protection Agency (EPA) has designated as not attaining the federal air quality standards for one or more air pollutants, such as ozone and carbon monoxide.
Notice of Intent	A federal announcement, printed in the <i>Federal Register</i> , advising interested parties that an Environmental Impact Statement will be prepared and circulated for a given project
Off-Peak Period	Non-rush periods of the day when travel activity is generally lower and less transit service is scheduled. Also called "base period."
Office	E-1 and E-2
Oregon Statewide Comprehensive Outdoor Recreation Plan (SCORP)	The 2013-2017 Oregon Statewide Comprehensive Outdoor Recreation Plan (SCORP), entitled <i>Ensuring Oregon's Outdoor Legacy</i> (OPRD, No Date), constitutes Oregon's basic 5-year plan for outdoor recreation. The plan guides the use of LWCF funds that come into the state; provides guidance for other OPRD-administered grant programs; and provides recommendations to guide federal, state, and local units of government, as well as the private sector, in making policy and planning decisions.
Park and Ride	Designated parking areas for automobile drivers who then board transit vehicles from these locations.
Participating Agency	A federal or non-federal agency that may have an interest in the project. These agencies are identified and contacted early-on in the project with an invitation to participate in the process. This is a broader category than "cooperating agency" (see Cooperating Agency).
Passenger Miles	The total number of miles traveled by passengers on transit vehicles; determined by multiplying the number of unlinked passenger trips times the average length of their trips.
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	Morning and afternoon time periods when transit riding is heaviest.

Table A-2. Terms

Terms	Definitions
Peak/Base Ratio	The number of vehicles operated in passenger service during the peak period divided by the number operated during the base period.
Place-miles	Place-miles refers to the total carrying capacity (seated and standing) of each bus and is calculated by multiplying vehicle capacity of each bus by the number of service miles traveled each day. Place-miles highlight differences among alternatives caused by a different mix of vehicles and levels of service.
Preferred Alternative	An alternative that includes a major capital improvement project to address the problem under investigation. As part of the decision making process, the Preferred Alternative is compared against the No Action or No-Build Alternative from the standpoints of transportation performance, environmental consequences, cost-effectiveness, and funding considerations.
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	Occurs when traffic lanes cannot fit all the vehicles trying to use them, or if the line at an intersection extends into an upstream intersection.
Record of Decision (ROD)	A decision made by FTA as to whether the project sponsor receives federal funding for a project. The Record of Decision follows the Draft EIS and Final EIS.
Regulatory Agency	An agency empowered to issue or deny permits.
Resource Agency	A federal or state agency or commission that has jurisdictional responsibilities for the management of a resource such as plants, animals, water, or historic sites.
Revenue Hours	Hours of transit service available for carrying paying riders.
Ridership	The number of rides taken by people using a public transportation system in a given time period.
Ridesharing	A form of transportation, other than public transit, in which more than one person shares the use of the vehicle, such as a van or car, to make a trip. Also known as "carpooling" or "vanpooling."
Right of Way	Publicly owned land that can be acquired and used for transportation purposes.
Safe, Accountable, Flexible, Efficient Transportation Equity Act (SAFETEA-LU)	SAFETEA-LU was passed by Congress July 29, 2005, and signed by the President August 10, 2005. Includes new and revised program guidance and regulations (approximately 15 rulemakings) with planning requirements related to public participation, publication, and environmental considerations. SAFETEA-LU covers FY 2005 through FY 2009 with a total authorization of \$45.3 billion.
Scoping	A formal coordination process used to determine the scope of the project and the major issues likely to be related to the proposed action (i.e., project).
Screening Criteria	Criteria used to compare alternatives.
Section 4(f) of the Department of Transportation Act of 1966	23 U.S.C. 138 and 49 U.S.C. 303. Parks are subject to evaluation in the context of Section 4(f) of the Department of Transportation Act of 1966, which governs the use of publicly-owned/open to the public park and recreation lands, government-owned wildlife lands, and historic resources.

Table A-2. Terms

Terms	Definitions
Section 4(f) resources	(i) any publicly owned land in a public park, recreation area, or wildlife and waterfowl refuge of national, state, or local significance, or (ii) any land from a historic site of national, state, or local significance
Section 6(f) of the LWCF Act of 1965	The LWCF’s most important tool for ensuring long-term stewardship is its “conversion protection” requirement. Section 6(f)(3) strongly discourages conversions of state and local park, and recreational facilities to other uses. Conversion of property acquired or developed with assistance under the program requires approval of the Department of Interior’s National Park Service (NPS) and substitution of other recreational properties of at least equal fair market value, and of reasonably equivalent usefulness and location.
Section 106	Section 106 of the National Historic Preservation Act of 1966 requires that federal agencies take into account the effect of government-funded construction projects on property that is included in, or eligible for inclusion in, the NRHP.
Shuttle	A public or private vehicle that travels back and forth over a particular route, especially a short route or one that provides connections between transportation systems, employment centers, etc.
Single-Family Residential	R-1
Special Area Zone (Non-Mixed Use)	S-H and S-RP
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.
Springfield Transportation System Plan (TSP)	The City of Springfield’s Transportation System Plan looks at how the transportation system is currently used and how it should change to meet the long-term (20-year) needs of the City of Springfield’s residents, businesses, and visitors. The Plan, which identifies improvements for all modes of transportation, will serve as the City of Springfield’s portion of the Regional Transportation System Plan prepared by Lane Council of Governments (LCOG). It was prepared in coordination with Oregon Department of Transportation, LCOG, and the Oregon Department of Land Conservation and Development. The TSP was adopted March 11, 2014.
State Implementation Plan (SIP)	A state plan mandated by the Clean Air Act Amendments of 1990 that contains procedures to monitor, control, maintain, and enforce compliance with national standards for air quality.
Strategy	An intended action or series of actions which when implemented achieves the stated goal.
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.
Throughput	The number of users being served at any time by the transportation system.

Table A-2. Terms

Terms	Definitions
Title VI	This Title declares it to be the policy of the United States that discrimination on the ground of race, color, or national origin shall not occur in connection with programs and activities receiving federal financial assistance and authorizes and directs the appropriate federal departments and agencies to take action to carry out this policy.
Transit Oriented Development (TOD) or Nodal Development	A strategy to build transit ridership, while discouraging sprawl, improving air quality and helping to coordinate a new type of community for residents. TODs are compact, mixed-use developments situated at or around transit stops. Sometimes referred to as Transit Oriented Communities, or Transit Villages.
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.
Transitway	A Bus Rapid Transit (BRT) priority lane generally with a concrete lane, with or without concrete tracks with grass-strip divider, and a curb separation, traversable by general-purpose vehicles at signalized intersections.
Transportation Demand Management (TDM)	Strategies to attempt to reduce peak period automobile trips by encouraging the use of high occupancy modes through commuter assistance, parking incentives, and work policies that alter the demand for travel in a defined area in terms of the total volume of traffic, the use of alternative modes of travel, and the distribution of travel over different times of the day.
Transportation Improvement Program (TIP)	A program of intermodal transportation projects, to be implemented over several years, growing out of the planning process and designed to improve transportation in a community. This program is required as a condition of a locality receiving federal transit and highway grants.
Travel Shed	Synonymous with “corridor” (see Corridor). A subarea in which multiple transportation facilities are experiencing congestion, safety, or other problems.
urban plaza	An urban plaza is a place that can be used for socializing, relaxation, and/or events.
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 level of service (LOS). If the volume exceeds the capacity of the roadway (volume divided by capacity exceeds 1.00), congestion exists.
Vehicle Hours of Delay	Cumulative delay experiences by transit vehicles during high traffic periods.
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.
Whiteaker Special Area Zone	S-W

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Appendix B: Construction Activities

General Construction Methods

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

Utility work will generally be completed before the transportation infrastructure is constructed. Utility work, often conducted by local utility companies, occurs separately from project-related construction. After completing required utility relocation and other preparatory site work, the contractor will begin with construction of new transit lanes, bike lanes, sidewalks, and any other "flatwork." The contractor will modify existing signals or construct new traffic signals as part of this work. In some cases, the contractor may construct the signal footings but install signal arms after initial work is complete. Flatwork for stations, including curbs, ramps, and station footings, will be completed as the work progresses along the alignment. Streets and street segments will be restored to normal operations after this work is complete. The contractor is expected to progress approximately two blocks every 2 weeks, with additional time required – up to 2 weeks – for each enhanced stop or EmX station. Additional time will be required at intersections that require new or substantially modified traffic signals. The construction sequencing will be determined through coordination between the contractor and local residents, businesses, and property owners regarding construction scheduling preferences. It is expected that, for each major segment, the work would start at one end of the segment and progress to the other end of the segment. All flatwork is expected to be completed in two construction seasons.

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

The contractor and LTD will coordinate closely with the Oregon Department of Transportation (ODOT) and with the City of Eugene (as appropriate to the jurisdiction) on traffic control. Depending on the segment, ODOT or the City will review and approve traffic plans for construction.

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

Coordination with Businesses and Residents

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

concerns and to provide information to affected businesses, residents, and other interested persons. LTD will provide a 24-hour hotline to quickly address construction concerns from businesses and residences.

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