Environmental Disciplines Methods and Data Report

Lane Transit District
City of Eugene

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

June 2015

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Environmental Disciplines Methods and Data 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 eq. seq.

June 2015

Prepared for
Federal Transit Administration
Lane Transit District
City of Eugene

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1. Introduction

1.1 Report and Purpose

This report describes the analysis methodologies and data to be used for the various environmental disciplines for the MovingAhead project's alternatives Level 1 screening, Level 2 alternatives analysis, and subsequent environmental documentation. This report assumes 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 this documentation but may not be fully covered by this documentation. Environmental disciplines covered in this report are:

- Acquisitions and Displacements
- Air Quality
- Ecosystems (Biological, Fish Ecology, and Threatened and Endangered Species, Wetlands and Waters of the U.S. and State)
- Cultural Resources
- Energy and Sustainability
- Geology and Seismic
- Hazardous Materials
- Land Use and Prime Farmlands
- Noise and Vibration
- Parklands, Recreation Areas, and Section 6(f)
- Section 4(f)
- Street and Landscape Trees
- Socioeconomics, Environmental Justice, Neighborhoods, Community Facilities, and Public Services
- Utilities
- Visual and Aesthetic Resources
- Water Quality and Hydrology

Other discipline methodologies included in this report are for:

- Capital cost estimating
- Operating and maintenance cost estimating
- Financial analysis

Transportation and travel demand forecasting methodologies are described in a separate report.

In general, each environmental section of the report includes the following information for identifying impacts (short-term, direct, indirect and cumulative) for each discipline:

- Relevant laws and regulations
- Contacts and coordination
- Analysis areas
- Level 1 Screening
    - Data sources and analysis methods
    - Significance Thresholds
- Level 2 Alternatives Analysis
    - Data sources and analysis methods
    - Significance Thresholds
    - Mitigation measures approach
- NEPA Documentation
    - Any additional data or analysis required
- References

The purpose of this report is to provide agency reviewers an opportunity to consider and comment on the tools and techniques discipline experts will use in determining potential impacts and mitigation measures before the analyses are conducted. Once approved, this report becomes a guiding document for LTD and the City of Eugene's NEPA compliant impact analysis process.

1.2 Discipline Experts

A number of discipline experts have contributed to the preparation of this report. Those experts are identified in Table 1.2-1 below including their area of expertise, affiliated organization, title and years of experience.

Table 1.2-1. Discipline Experts

Discipline	Technical Expert	Affiliated Organization	Title / Years of Experience
Acquisitions and Displacements	Alisa Swank	CH2M HILL	Senior Planner / 10 yrs
Air Quality	Carl Bloom	Michael Minor and Associates	Air Analyst / 20 yrs
Capital Cost Estimating	Adrianna Stanley	CH2M Hill	Engineer / 8 yrs
Cultural Resources	Kathryn Toepel, PhD, RPA	Heritage	Cultural Resource Principal / 36 yrs
Ecosystems	Patrick Hendrix	Environmental Science & Assessment	Senior Scientist / 21 yrs
Editors	John Evans	Lane Transit District	Senior Project Manager / 25 yrs
	Ryan Farncomb	CH2M HILL	Senior Transportation Planner / 7 yrs
	Terri Harding	City of Eugene	Senior Planner / 18 yrs
	Chris Henry	City of Eugene	Transportation Planning Engineer / 26 yrs
	Kristin Hull	CH2M HILL	Senior Project Manager / 15 yrs
	Sasha Luftig	Lane Transit District	Transit Development Planner / 2 yrs
	Lynda Wannamaker	Wannamaker Consulting	President / 33 yrs
Energy & Sustainability	Deena Platman	DKS	Senior Project Manager / 20 yrs
Financial analysis	David Knowles	CH2M Hill	Senior Program Manager / 40 yrs
Geology and Seismic	Todd Cotten	CH2M Hill	Geotechnical Engineer / 20 yrs
Hazardous Materials	Rachel Chang	CH2M Hill	Project Manager / 20 yrs
Land Use and Prime Farmlands	Michael Hoffmann	CH2M Hill	Senior Planner / 14 yrs
Noise and Vibration	Michael Minor	Michael Minor and Associates	President / 25 yrs
Operating and maintenance costs	Nathan Banks	LTD	Transit Planner / 14 yrs
Parklands, Recreation Areas, and Section 6(f)	Michael Hoffmann	CH2M Hill	Senior Planner / 14 yrs
Section 4(f)	Michael Hoffmann	CH2M Hill	Senior Planner / 14 yrs
Street and Landscape Trees	Reza Farhoodi	CH2M Hill	Transportation Planner / 5 yrs
Socioeconomics, Environmental Justice, Neighborhoods, Community Facilities, and Public Services	Rob Rodland	CH2M Hill	Senior Planner / 10 yrs
Utilities	Ryan Farncomb	CH2M Hill	Senior Transportation Planner / 7 yrs
Visual and Aesthetic Resources	Rick Attanasio	CH2M Hill	Senior Engineer / 25 yrs
Water Quality and Hydrology	Michael Hoffmann	CH2M Hill	Senior Planner / 14 yrs

Source: MovingAhead Project Team. 2015.

1.3 Study Description

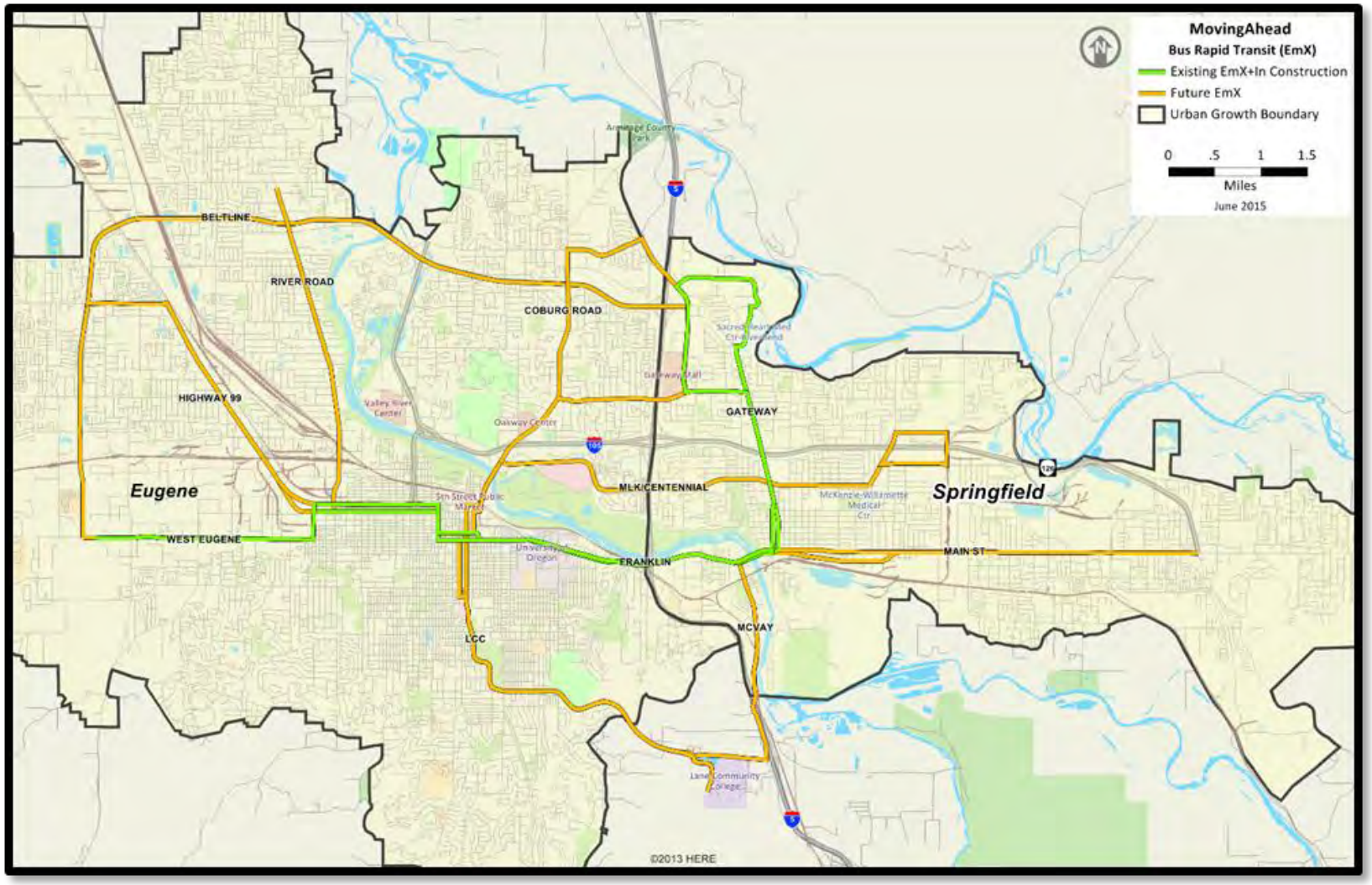
The MovingAhead project is a study to determine which of the high capacity transit corridors identified in the adopted EmX System Plan (Figure 1.3-1) and the Frequent Transit Network (FTN) (Figure 1.3-2) are ready to advance to capital improvements programming in the near term. The study is being conducted jointly with local agencies to facilitate a more streamlined and cost-efficient process through concurrent planning, environmental review, design and construction of multiple corridors.

The 10 corridors under consideration in this study are:

- Highway 99 Corridor
- River Road Corridor
- Randy Papé Beltline Corridor
- 18th Avenue Corridor
- Coburg Road Corridor
- Martin Luther King, Jr. Boulevard / Centennial Boulevard Corridor
- 30th Avenue – Lane Community College Corridor
- Main Street – McVay Highway Corridor
- Valley River Center Corridor
- Bob Straub Parkway Corridor

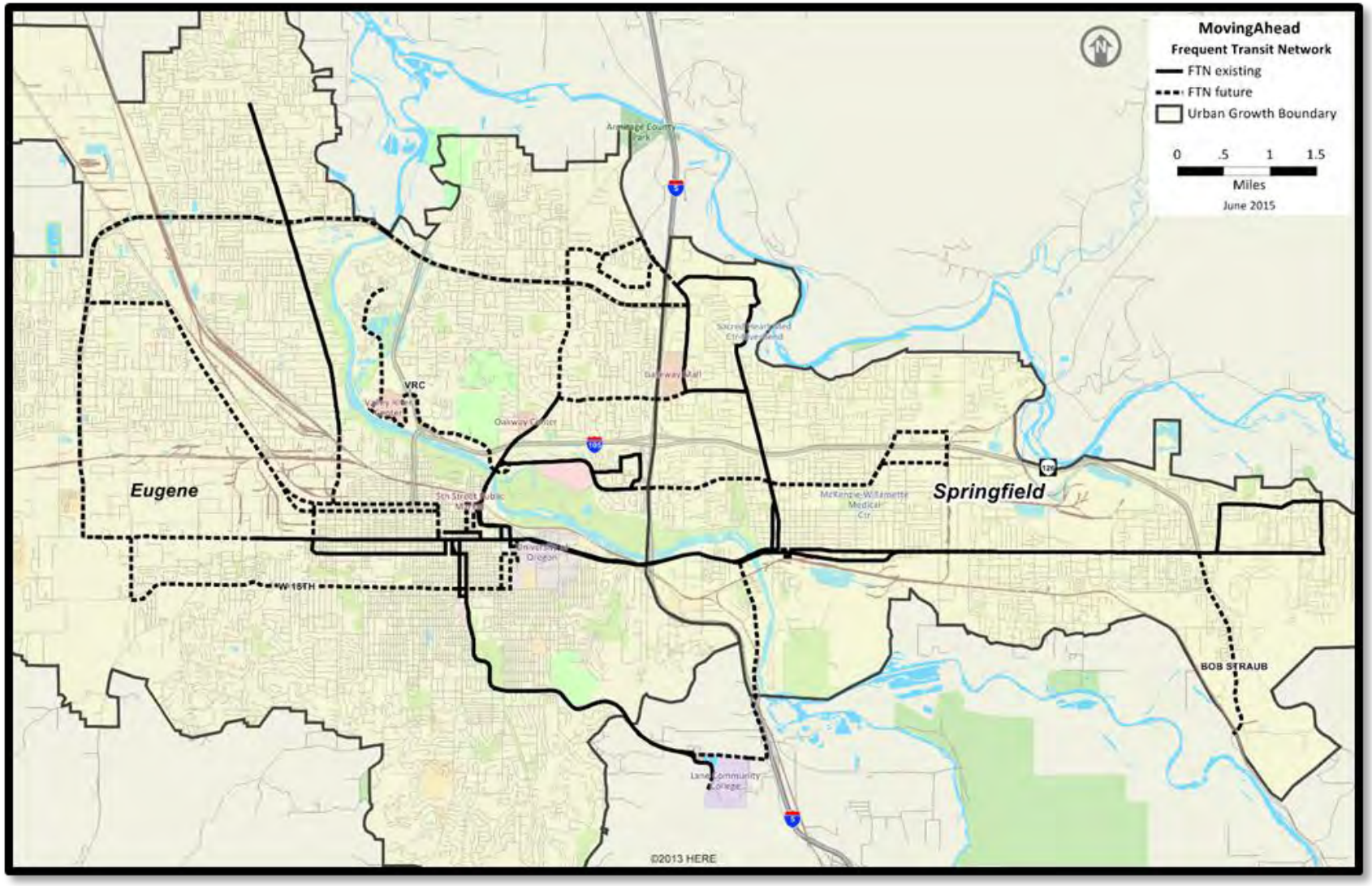
These corridors are illustrated in Figure 1.3-3.

Figure 1.3-1. Lane Transit District's EmX System



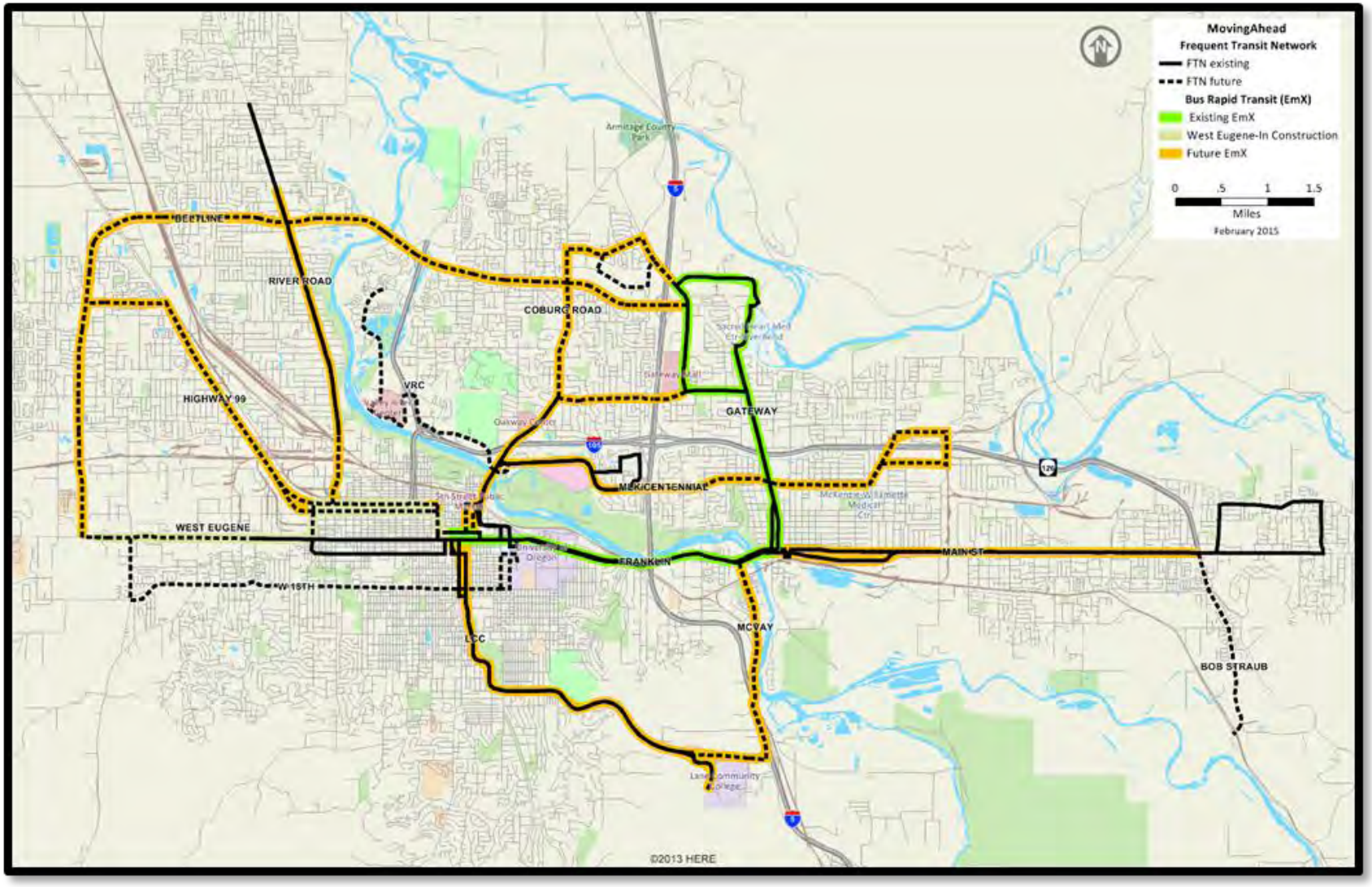
Source: Lane Transit District. 2015.

Figure 1.3-2. Lane County Regional Frequent Transit Network



Source: Lane Transit District. 2015.

Figure 1.3-3. 10 Corridors Considered in MovingAhead Project



Source: Lane Transit District. 2015.

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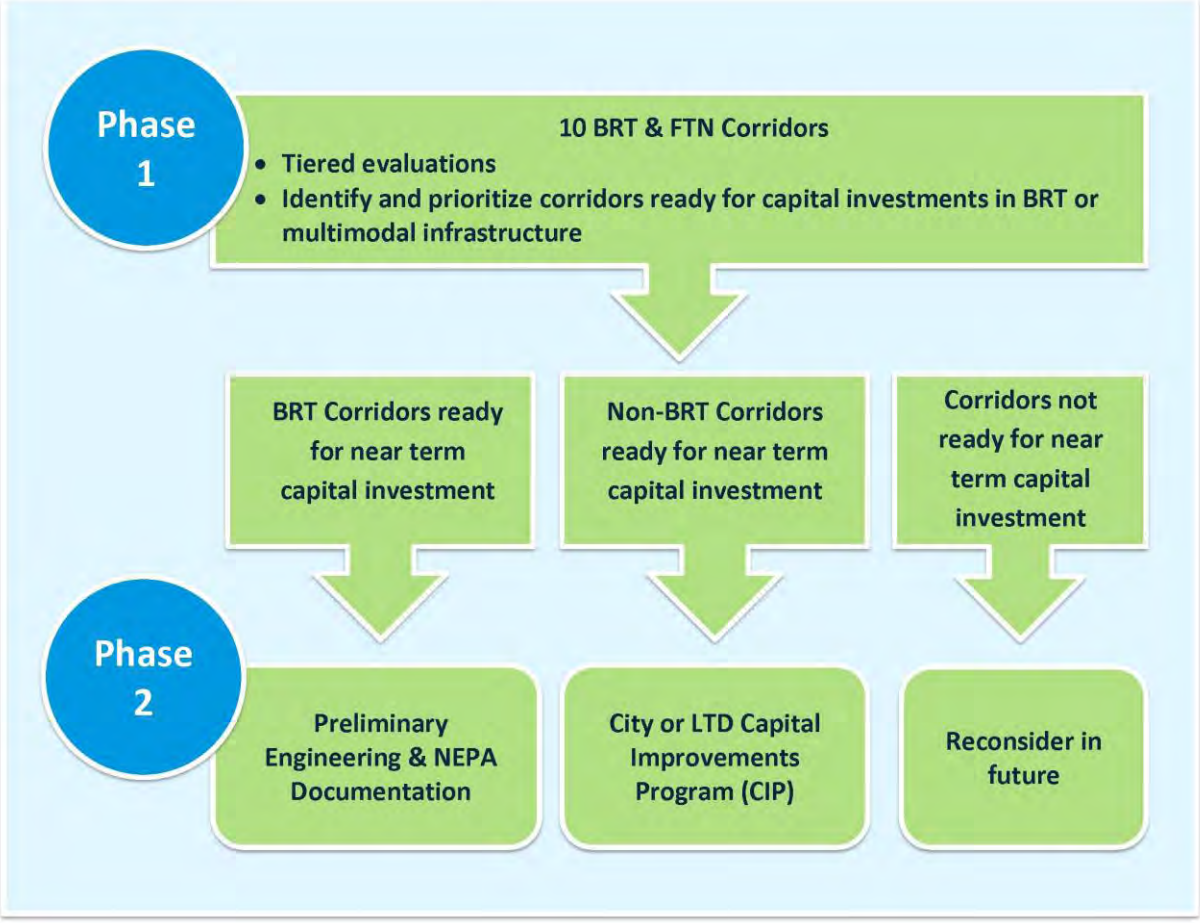
The MovingAhead project will be completed in two phases (Figure 1.3-4). Phase 1 will initially be focused on the region's transportation system. Corridor alternatives identified as part of this phase will be developed using multimodal cross sections that include variations on auto, truck and bus travel lanes, bicycle lanes and sidewalks (see examples in Figure 1.3-5). These multimodal cross section corridor alternatives will undergo a high-level screening (Level 1 Screening Evaluation) to determine the most promising alternatives to advance to a Level 2 Alternatives Analysis (Level 2 AA). Conceptual designs for corridor alternatives advanced to the Level 2 AA will be refined.

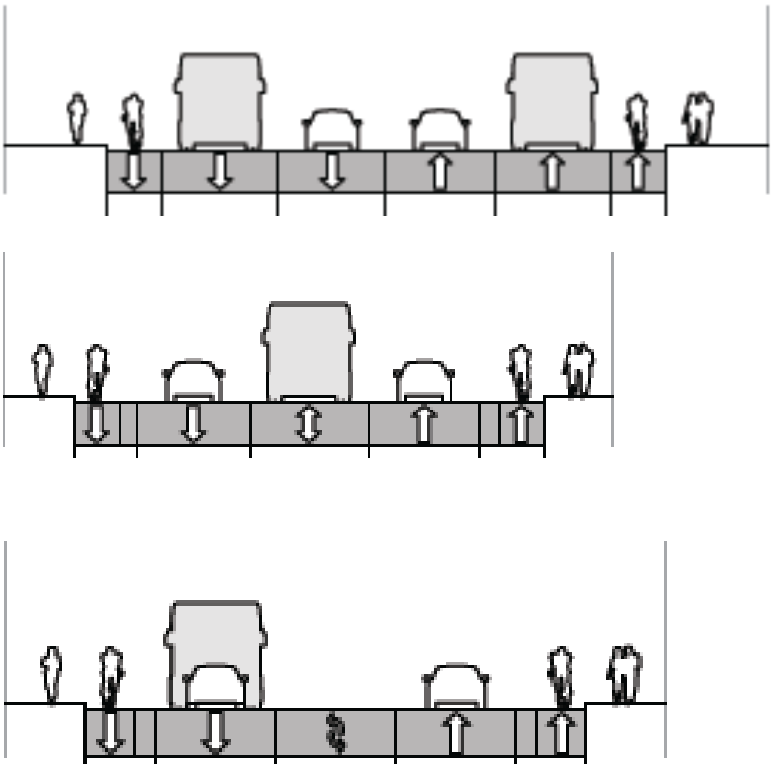
Phase 2 will complete preliminary engineering for one or more corridors and required environmental documentation. Only those corridors selected for bus rapid transit capital investments will advance to Phase 2.

Figure 1.3-4. MovingAhead Phases



Source: Wannamaker Consulting. 2015

Figure 1.3-5. Cross Section Examples



Source: CH2M. 2015

1.4 Phase 1 Organization

The purpose of Phase 1 of the MovingAhead project is to:

- Define the role of transit in each of the multimodal corridors. The role of transit is defined in the context of the community's vision for the corridors (as informed by Envision Eugene, Springfield 2030, and LTD's Long-Range Transit Plan).
- Define the pedestrian and bike needs in the multimodal corridors, generate multimodal cross sections for transit corridors, and develop strategies to improve multimodal access to transit stations including bike and pedestrian crossings of arterials.
- Prioritize transit, pedestrian and bike improvements in the City of Eugene (including corridors that connect to and are located in the City of Springfield) with the aim of identifying the corridors that are most ready for transit investment and the accompanying multimodal improvements to support development of complete streets (see sidebar for definition of Complete Streets).

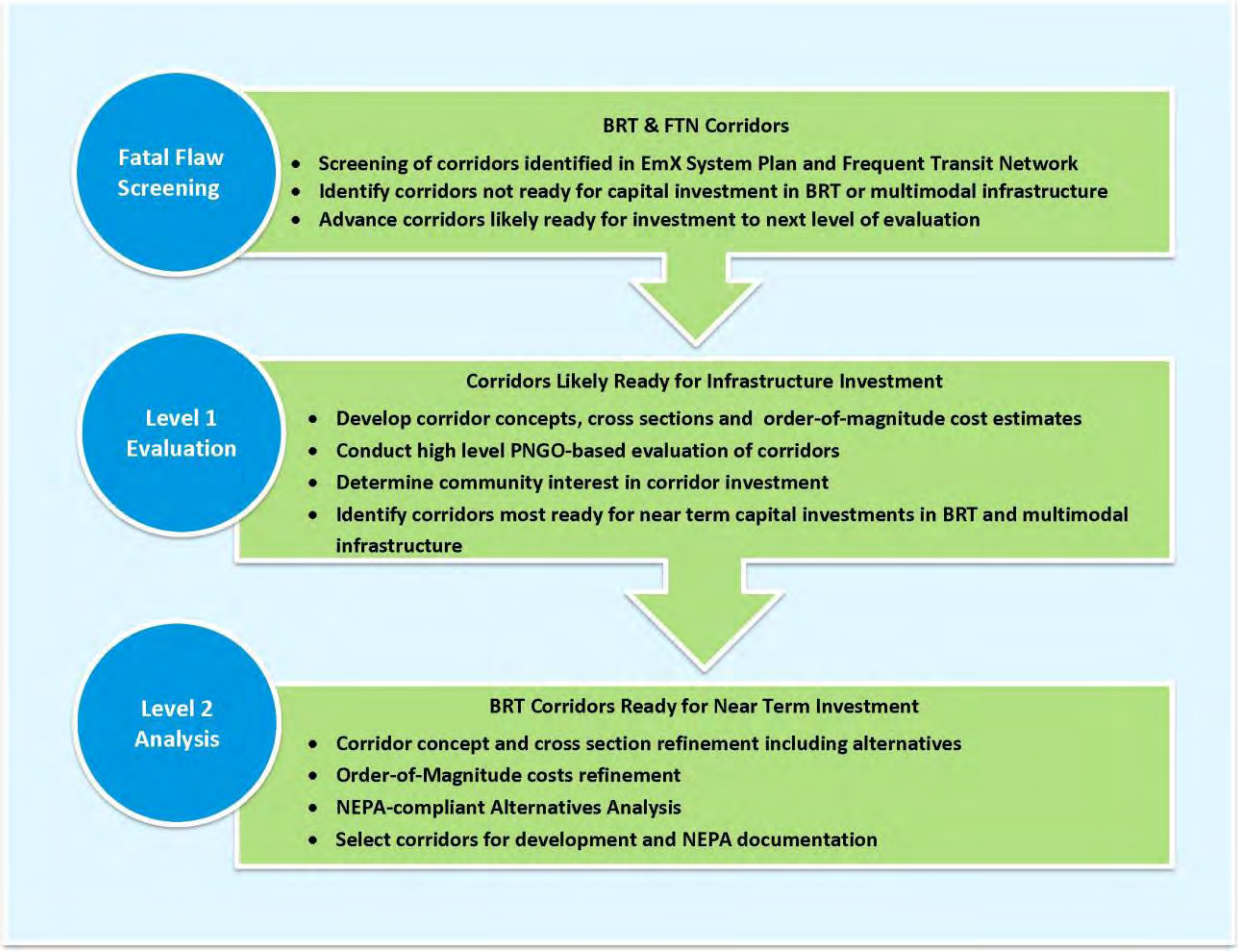
Complete Streets

"Complete Streets" is a transportation policy and design approach that requires streets to be planned, designed, operated, and maintained to enable safe, convenient and comfortable travel and access for users of all ages and abilities regardless of their mode of transportation.

- Complete environmental analysis for the corridors to support future NEPA documentation with particular focus on those elements of the environmental study that can be addressed at the system level (e.g. air quality).

The Phase 1 study will be broken into three discrete but closely related tasks: identification of transit improvements, identification of bike and pedestrian improvements, and preparation of a NEPA-compliant evaluation of alternatives (Figure 1.4-1). The outcome of Phase 1 will be a prioritized set of corridors and system-level and corridor-level NEPA documentation. The City of Springfield transit corridors will be included in the system-level NEPA documentation.

Figure 1.4-1. MovingAhead Phase 1 Steps



Source: Wannamaker Consulting. 2015.

Fatal Flaw Screening. The Fatal Flaw Screening was conducted in February 2015 and identified which of the 10 corridors should not move forward to the Level 1 Screening Evaluation (see Fatal Flaw Technical Memorandum in Appendix B). This high level evaluation used criteria based on the project's Purpose and Need, Goals and Objectives (PNGO) and existing data to determine which corridors will not be ready for any level of capital investment in bus rapid transit or multimodal infrastructure in the next 10 years. The screening was conducted with local, regional, and state agency staff (see sidebar for list of agencies). Each of the 10 corridors was evaluated and ranked.

Agencies Participating in Fatal Flaw Screening

- City of Coburg
- City of Eugene
- City of Springfield
- Lane County
- Lane Metropolitan Planning Organization
- Lane Transit District
- Oregon Department of Transportation

Three corridors were not advanced from the Fatal Flaw Screening to the Level 1 Screening:

- 18th Avenue
- Bob Straub Parkway
- Randy Papé Beltline Highway

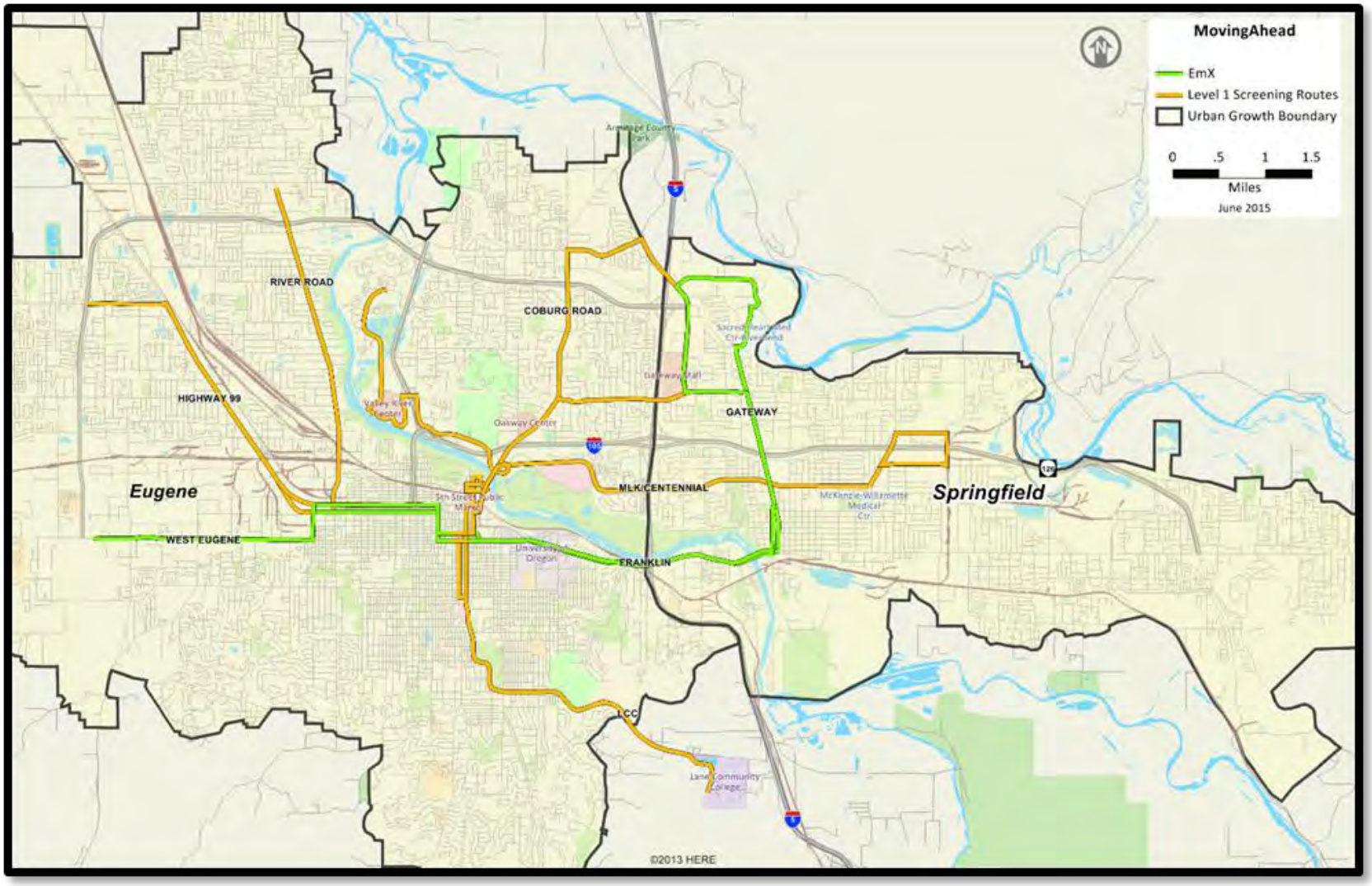
The 18th Avenue and Bob Straub Parkway Corridors were determined to not be ready for any level of capital investment in bus rapid transit or multimodal infrastructure in the next 10 years. The Randy Papé Beltline Highway was not advanced as an independent corridor but will be considered as a frequent bus line that will serve as an east-west system connector.

Although originally advanced from the Fatal Flaw Screening, the Main Street-McVay Highway Corridor was not advanced to the Level 1 Screening because the Springfield City Council (on May 18, 2015) and LTD Board (on May 20, 2015) determined that this corridor is ready to advance into a study to select a locally preferred transit solution. At this time, the Main-Street-McVay Highway Corridor will continue to be studied on a schedule that is ahead of the MovingAhead project schedule. If in the near future, the Main Street-McVay Highway Corridor study schedule is delayed and its progress coincides with this project, then the Corridor could be reincorporated back into the MovingAhead project.

The six corridors advanced to Level 1 Screening Evaluation are illustrated in Figure 1.4-2 and listed below.

- Highway 99 Corridor
- River Road Corridor
- Coburg Road Corridor
- Martin Luther King, Jr. Boulevard / Centennial Boulevard Corridor
- 30th Avenue – Lane Community College Corridor
- Valley River Center Corridor

Figure 1.4-2. Corridors Advanced to Level 1 Screening



Source: Lane Transit District. 2015.

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Level 1 Screening. Prior to the Level 1 Screening, general cross section concepts will be developed for the various right of way widths of the corridors. Concept graphics will show a route, any relevant design options and color-coding to indicate transit treatments (e.g., Business Access and Transit (BAT) lanes, mixed traffic, separated running way). Data collection will be based on existing studies and readily available Geographic Information System (GIS) data. Screening criteria will be based on the PNGO. The Level 1 Screening Evaluation will be qualitative and will include order-of-magnitude cost estimates based on lane miles of each type of transit treatment, ridership potential and community input. The community will have the opportunity to provide input and comment through corridor workshops, online workshops, the project website, and direct input to partner agencies. Corridors that most effectively meet the criteria and are supported by the corridor community will be advanced to the Level 2 Alternatives Analysis (AA). Corridors without BRT improvement concepts will not be advanced to the Level 2 AA. Improvements needed in these corridors (bike or pedestrian projects or transit enhancements) would be advanced to capital improvements programming by either the City or LTD.

Transportation projects not advanced from the Level 1 Screening can be incorporated into the City of Eugene's capital improvements programming in several different ways. Larger projects such as shared use paths, significant sidewalk infill and protected bike lanes can be incorporated into the City of Eugene Transportation System Plan (TSP) through an amendment to the TSP. These types of larger projects are typically implemented through federal and state funded grants that the City will apply for in the future. Smaller projects, such as pedestrian crossing improvements, can be identified for implementation through existing funding programs (e.g., the pedestrian and bicycle component of the Street Bond) that are already in the City's Capital Improvements Program (CIP). These smaller projects will be put on a list to be considered for such funding in subsequent years.

Transit improvement projects not advanced from the Level 1 Screening can be incorporated into LTD's CIP, which is reviewed and adopted annually (see sidebar for a description of LTD's CIP). Staff will be responsible for determining which transit enhancement projects identified in MovingAhead will be advanced to the CIP. Staff will create the draft CIP and submit it to the public for a 30-day comment period. The public can submit in writing any comments or questions about the program and testify at a public hearing that is scheduled within the comment period. Once the public comment period is concluded, all comments or questions along with staff responses are submitted to the LTD Board of Directors. A revised draft program will then be submitted to the Board for adoption.

LTD's Capital Improvements Program

Lane Transit District's CIP is a 10-year framework that provides direction and guidance for LTD's capital investments. Annual revisions of the CIP consider new projects and reflect updates to the LTD Road Map and Long-Range Transit Plan. The CIP has two fundamental objectives: 1) to facilitate the efficient use of LTD's limited financial resources, and 2) to implement regional priorities that anticipate the need for public transportation in the future.

Level 2 Alternatives Analysis. Prior to conducting the Level 2 Alternatives Analysis (Level 2 AA), conceptual designs for corridor alternatives advanced from the Level 1 Screening will be developed for each corridor. These conceptual designs for corridor alternatives will define a mode, route, and transit treatment and will define a "footprint" for the multimodal improvement to allow for environmental impact assessments. Data collection will build on data from the Level 1 Screening and will include some field verification and data modeling. Evaluation will be a mix of qualitative and quantitative analysis including planning-level cost estimates, ridership using LCOG's regional model, environmental impact

analysis, and traffic analysis. The Level 2 AA will provide environmental analysis sufficient to support FTA's Documented Categorical Exclusion (DCE) NEPA classification. The findings from the Level 2 AA will aid LTD and its partner agencies in determining which high capacity transit corridors should be prioritized for capital investments over the next 10 years.

1.5 Phase 2

Selected corridors will be advanced to Phase 2 for NEPA-compliant evaluation and documentation. Preliminary engineering will be prepared to support the NEPA documentation. Additional technical analysis will be conducted, where needed to supplement analyses from the Level 2 AA, for the DCEs. Findings from the NEPA DCEs will be used to prioritize corridors advanced to capital improvements programming.

1.6 Preliminary Purpose and Need

The prioritization of capital investments in multimodal transit corridors will be a powerful tool for implementing local and regional comprehensive land use and transportation plans, agency strategic plans, and other community planning documents. Capital investments in multimodal transit corridors can have a substantial impact on patterns of growth and development. By coordinating the timing of and prioritizing the funding for strategic multimodal capital investments, the MovingAhead project, a multimodal transit corridor study, helps ensure that development occurs consistent with our region's plans and vision.

At this stage of the study, the Purpose and Need Statement is preliminary and, during the early stages of the study, will be refined with 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 Lane Transit District (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 bus rapid transit in the next 20 years consistent with the RTP that provide 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/Frequent Transit Network (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 3.4: Coordinate transit improvements with other planned and programmed roadway projects

Objective 3.5: Minimize adverse impacts to existing businesses and industry

Objective 3.6: Supports community vision for high capacity transit in each corridor

Objective 3.7: 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 3.8: 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 are used during the screening process to aid in determining how well each of the corridor alternatives would meet the project's Purpose and Need and 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 1.4-1 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 to measure effectiveness.

The following Evaluation Criteria were prepared by LTD and the City of Eugene and will be reviewed by the community.

Goals and Objectives		Evaluation Criteria
Goal 1: Improve multimodal transit corridor service		
Objective 1.1:	Improve transit travel time and reliability	• Round trip pm 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	• Number of transfers required between heavily used origin-destination pairs
Objective 1.3:	Increase transit ridership and mode share in the corridor	• Average weekday boardings on corridor routes • Transit mode share along the corridor • Population within 1/2 mile of transit stop • Employment within 1/2 mile of transit stop
Objective 1.4:	Improve access for people walking and bicycling, and to transit	• 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	• 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	• 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	• Capacity of transit service relative to the current and projected ridership
Objective 2.3:	Implement corridor improvements that provide an acceptable return on investment	• Benefit/cost assessment of planned improvements
Objective 2.4:	Implement corridor improvements that minimize impacts to the environment and, where possible, enhance the environment	• Results of screening-level assessment of environmental impacts of transit solutions

Goals and Objectives		Evaluation Criteria
Objective 2.4:	Leverage funding opportunities to extend the amount of infrastructure to be constructed for the least amount of dollars	• Number and dollar amount of funding opportunities that could be leveraged • Meet 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	• Consistent with the BRT System Plan and Frequent Transit Network (FTN) concept • Consistent with the regional Transportation System Plan • Consistent with local comprehensive land use plans
Objective 3.2:	Coordinate transit improvements with other planned and programmed pedestrian and bicycle projects	• Capability of transit improvement to coordinate with other planned and programmed pedestrian and bicycle projects identified in adopted plans and CIPs
Objective 3.3:	Coordinate transit improvements with other planned and programmed roadway projects	• Capability of transit improvement to coordinate with other planned and programmed roadway projects identified in adopted plans and CIPs
Objective 3.4:	Minimize adverse impacts to existing businesses and industry	• 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 3.6:	Supports community vision for high capacity transit in corridor	• Community vision includes high capacity transit in corridor
Objective 3.7:	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	• Impact on current and future year intersection Level of Service (LOS) on state facilities • Impact on current and future year PM peak hour auto / truck travel times on state facilities
Objective 3.8:	Improve transit operations in a manner that is mutually beneficial to vehicular traffic flow for emergency service vehicles	• Qualitative assessment of potential impacts to emergency service vehicle traffic flow and access

2. Acquisitions and Displacements

This section of the report addresses the methods and data that will be used to assess potential direct and indirect long-term property acquisition impacts of the alternatives under study in the MovingAhead project's Level 1 Screening, Level 2 AA, and NEPA documentation.

All published data on potential property acquisitions and displacements will be aggregated and no parcel-level data will be published. All acquisitions will be characterized as potential, because a primary objective of design refinement in subsequent phases of project development is to avoid or minimize the acquisition of private property and displacements.

2.1 Relevant Laws and Regulations

This section summarizes the federal, state, and local environmental laws and regulations that will affect the acquisitions and displacements analysis for the Level 2 AA.

2.1.1 Federal

The Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970, 42 U.S.C. 4601 et seq. (http://www.access.gpo.gov/uscode/title42/chapter61_subchapteri_.html). The Uniform Act establishes minimum standards for federally funded programs and projects that require the acquisition of real property (real estate) or displace persons from their homes, businesses, or farms. The Act's protections and assistance apply to the displacement of residents, and the acquisition, rehabilitation, or demolition of real property for federal or federally-funded projects.

2.2 Analysis Area

No analysis will be complete as part of Level 1. The area of analysis for the property acquisition analysis will be within the footprint of the alignment alternatives selected for further analysis in the Level 2 AA and the NEPA documentation.

2.3 Contacts and Coordination

LCOG, Lane County, the City of Eugene, and the City of Springfield will be contact sources for preparing the property acquisition analysis. Data on property value on ownership is expected to be available from the Lane County Assessor's Office. If this information has not already been obtained in a GIS format from the county prior to analysis, it will be obtained as part of the analysis.

2.4 Level 1 Screening

No data will be collected for the Level 1 Screening.

2.5 Level 2 Alternatives Analysis

2.5.1 Data Collection

Property acquisition needs, by alternative, will be based on the MovingAhead Project Conceptual Designs. LTD and its consultant team will prepare the long-term footprints of the alternatives. Parcel-

level data (location, ownership, tax records, assessed value) will be obtained from Lane County in GIS format. Recent aerial maps will be obtained from the Cities, County and/or LCOG. Windshield surveys may be conducted to verify information on the potential displacement of structures and/or multi-occupant buildings or parcels.

2.5.2 Significance Thresholds

None – the environmental significance of potential property acquisitions by the project will be addressed in the Socioeconomic section of the Level 2 AA.

2.5.3 Impact Analysis

The number of potential displacements will be documented for each corridor by type of property (residential, business or public institutional) and include tabulation of critical information.

2.5.3.1 Long-Term Impacts Analysis Approach

All impacts are expected to be long-term impacts. The long-term footprint of the alternatives will be overlaid on parcel maps to determine impacts using GIS. Parcel specific impacts will be tracked using an Excel database, and for each parcel the following information will be collected and tracked:

- Partial or full acquisition
- Approximate area of acquisition (in square feet or acres)
- Percentage of parcel taken for partial acquisitions
- Number of buildings on parcel
- Type of buildings on parcel
- Number of residential/business units in each building
- Number of potential displacements for each parcel characterized as residential, business, and public institutional
- Ownership
- Value

2.5.3.2 Short-Term Impacts Approach

No short-term impacts related to property acquisitions are expected. If temporary easements are identified, any impacts from these will be evaluated as described under 2.5.3.1.

2.5.3.3 Indirect Impact Analysis Approach

The potential for property acquisitions and/or displacements to indirectly cause additional acquisitions or displacements in the future will be assessed. Indirect impacts from property acquisition do not typically occur with property acquisitions.

2.5.3.4 Cumulative Impact Analysis Approach

If other recent past, current, or reasonably foreseeable future projects with acquisitions or displacements are occurring nearby, or if the MovingAhead project is displacing a use that has been

relocated or altered due to previous projects, cumulative impacts may be present. The analysis will review available information about past or current projects and the location of other proposals in the vicinity to determine the potential for cumulative impacts.

2.5.3.5 Mitigation Measures Approach

An approach to mitigating potential property acquisition and displacement impacts will be defined. Compliance with the Federal Uniform Real Property Acquisition and Relocation Act, as amended, is accepted as part of the project definition and is not considered an additional mitigation measure. Any removal of designated low-income or affordable housing would comply with the applicable local policies and regulations for such housing, if they exist.

2.6 NEPA Documentation

For corridors advanced into NEPA evaluation, additional data or analysis may be required for a DCE. Some analyses may need to be updated from the Level 2 AA depending on how much time passes between planning analyses and corridor development, and factors like the amount of major new development that has occurred. Additional data collection and/or analyses will be determined in consultation with FTA and will likely include:

- Acquisitions – amount and type updated based on refined conceptual designs
- Displacements – number and type updated based on refined conceptual designs
- Environmental Justice impacts

2.7 References

Federal Transit Administration. United States Department of Transportation. 1970. The Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970. (http://uscode.house.gov/view.xhtml?path=/prelim@title42/chapter61&edition=prelim)

Lane County Assessor's Office, personal email.

3. Air Quality

This section of the report describes the air quality-related methods and data the project team will use for the MovingAhead project's Level 1 Screening, Level 2 AA and NEPA documentation. The air quality-related methods and data are closely tied to the transportation methods and data that will also be prepared for the project, which are documented in a separate report, titled Transportation Analysis Methodology Report.

An Air Quality Technical Report will be prepared in support of the project's Level 2 AA. The purpose of the report will be to compare air pollutant emissions of the alternatives, describe the air quality impacts of the alternatives, and address potential mitigation measures for impacts, if needed. The report will include 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 section summarizes the federal, state, and local environmental laws and regulations that will affect the air quality analysis for the Level 2 AA.

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. EPA. "National Primary and Secondary Air Quality Standards." U.S. Code of Federal Regulations.** The federal government has established NAAQS to protect the public from air pollution. The NAAQS are shown in Table 6.2-1.

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.

The most current standards for air quality analysis used by the FTA are shown in Table 3.6-1.

.**40 CFR 86. EPA. "Control of Emissions from New and In-Use Highway Vehicles and Engines." U.S. Code of Federal Regulations.** 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.

3.1.2 State

Oregon Administrative Rule (OAR) 340 Division 202. DEQ. "Ambient Air Quality Standards and PSD Increments." In addition to the NAAQS, DEQ has established State Ambient Air Quality Standards (SAAQS) that are at least as stringent as the NAAQS. These standards are listed in Table 6.2-1.

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 metropolitan planning organizations (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

The Lane Regional Air Protection Agency (LRAPA) has delegation of air quality program implementation from DEQ and the U.S. Environmental Protection Agency (EPA). LRAPA also has stationary source regulation 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 five 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 (ADT) of 20,000 or more motor vehicles per day within ten years after completion, or modified highway sections that increase the annual ADT on that highway section by 10,000 or more motor vehicles per day within ten 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 the City of Springfield and four locations in City of Eugene.

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 PM_{10} standard in 1987, which resulted in a PM_{10} nonattainment designation on August 7, 1987. Particulate matter, including PM_{10}, 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 Clean Air Act for transportation projects.

3.3 Contacts and Coordination

Agencies or organizations that may be contacted during the data collection or analysis of corridors are listed below.

3.3.1 Federal

- Federal Transit Administration (FTA)

3.3.2 State

- Oregon Department of Transportation (ODOT)
- Oregon Department of Environmental Quality (ODEQ)

3.3.3 Local

- Lane Regional Air Protection Agency (LRAPA)
- Lane Regional Council of Governments (LCOG) to verify the exact status of the project in the most recent conforming RTP and TIP. A discussion of the project status and results of the regional analysis will be included in the report and the Level 2 AA section.

3.3.4 Other

- Project design files in Microstation or AutoCAD will be obtained from the project design team and used for the analysis.

3.4 Level 1 Screening

No data will be collected for the Level 1 Screening.

3.5 Level 2 Alternatives Analysis

3.5.1 Air Quality Conformity Determination

Section 176(c)(1) of the federal Clean Air Act requires federal agencies to ensure that their actions conform to applicable implementation plans for achieving and maintaining the National Ambient Air Quality Standards 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. As previously stated, 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 PM_{10} emissions; therefore, a conformity determination is not required for regional emissions of PM_{10}. Instead LRAPA must demonstrate PM_{10} conformity for non-transportation sources in the nonattainment area. Projects within the PM_{10} nonattainment area must comply with project level conformity requirements. PM_{10} emissions from transportation sources in the Eugene-Springfield area are a very low percentage of total PM_{10} emissions, and project emissions are not expected to contribute to violations of the standard or to delay attainment of the standard.

3.5.2 Emissions Factors

Emission factors for the regional (burden) analysis will be developed using the new EPA MOVES model in consultation with LRAPA to determine appropriate model input assumptions. Model input assumptions will be consistent with those used by LCOG for the conformity analysis.

3.5.3 Regional Impacts (Burden) Analysis

The primary pollutants of concern for transportation projects in the Eugene-Springfield area are CO, NO_x, and VOC. The project's regional air quality impacts will be assessed through a regional burden analysis. The burden analysis will compare the estimated annual regional emissions associated with the No-Build and Build alternatives for the base year (2007 or earlier) by defining the existing conditions and, for the 2035 horizon year, anticipating future conditions. A burden analysis is not required for the conformity demonstration, but it will be included for informational purposes. A simplified calculation method will be used to estimate annual regional emissions based on vehicle miles traveled (VMT) for the No-Build and Build alternatives and regional average emission factors.

3.5.4 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. Therefore, no local air quality impacts analysis, or CO hot spot analysis, is required for any of the proposed corridors.

3.6 Data Collection

The following data and information will be obtained and used in the analysis.

- LRAPA operates air quality monitoring stations to obtain data on actual ambient air quality concentrations. A review of nearby air quality monitoring sites will be performed and included in the

Air Quality technical report. Nearby monitoring sites are in downtown Eugene and West Eugene at Highway 99 and Roosevelt Boulevard.

3.6.1 Significance Thresholds

Table 3.6-1 contains thresholds for air quality. Regulations require detailed analysis in areas and for projects where air quality impacts may occur.

Table 3.6-1. Federal and State Ambient Air Quality Standards

Pollutant	Federal (NAAQS)	Oregon (SAAQS)
Inhalable Particulate Matter (PM10) (μg/m3)		
Annual Arithmetic Mean (μg/m3)	50	NS
24-hour Average (μg/m3)	150	150
Particulate Matter (PM2.5) (μg/m3)		
Annual Arithmetic Mean (μg/m3)	15	15
24-hour Average (μg/m3)	35	35
Carbon Monoxide (CO)		
8-hour Average (ppm)	9	9
1-hour Average (ppm)	35	35
Ozone (O3)		
8-hour average (ppm)	0.08	0.08
Nitrogen Dioxide (NO2)		
Annual Average (ppm)	0.053	0.05
Lead (Pb)		
Quarterly Average (μg/m3)	1.5	1.5
Sulfur Dioxide (NO2)		
Annual Average (ppm)	0.03	0.02
24-hour Average (ppm)	0.14	0.10
1-hour Average (ppm)	NS	0.50

Source: ODEQ 2005 Air Quality Data Summary

NS=No standard established; (μg/m3) = micrograms per cubic meter; ppm= parts per million

3.6.2 Impact Analysis

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

3.6.2.1 Long-Term Impacts Analysis Approach

The operational impacts analysis will provide general information on pollutant emissions for the alternatives. The focus of the air quality analysis for the Level 2 AA will be to evaluate the regional and subarea pollutant emissions differences between the alternatives and No-Build options. This comparison will show the broad effects of the proposed alternatives.

3.6.2.2 Short-Term Impacts Approach

Construction impacts to air quality will be addressed qualitatively. A general comparison of the relative potential impact of the alternatives will be based on factors such as expected construction duration, general types of construction activity and extent of construction area, and potential for traffic rerouting. Diesel emissions from construction equipment will be discussed qualitatively.

3.6.2.3 Cumulative and Indirect Impact Analysis Approach

Regional traffic data are generated with models that take expected regional land use and growth into account. As a result, air quality assessments based on the data incorporate expected cumulative and indirect traffic generation. Data on air quality trends will be discussed.

3.6.2.4 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 will be performed, and no air quality impacts are expected from the proposed transit operations in any of the corridors. Therefore, no operational air quality mitigation is expected for this project. However, air quality as related to project construction will be reviewed, and various mitigation measures that are available to reduce emissions from construction activities will be discussed qualitatively.

3.7 NEPA Documentation

For corridors advanced into the NEPA evaluation, no additional data collection and analysis is anticipated for a DCE. However, FTA will be consulted to determine if any additional data or analysis required for the DCE for any corridor.

3.8 References

40 CFR 50. Environmental Protection Agency. "National Primary and Secondary Air Quality Standards." U.S. Code of Federal Regulations. (http://www.access.gpo.gov/nara/cfr/waisidx_07/40cfr50_07.html)

40 CFR 86. Environmental Protection Agency. "Control of Emissions from New and In-Use Highway Vehicles and Engines." U.S. Code of Federal Regulations. (http://www.access.gpo.gov/nara/cfr/waisidx_07/40cfr86_07.html)

Lane Regional Air Pollution Authority. 1999. "Indirect Sources Required to Have Indirect Source Construction Permits." LRAPA Title 20, Eugene, OR. (http://www.lrapa.org/rules/title20-Indirect_Sources.php)

Lane Regional Air Pollution Authority. 2001. "Rules for Fugitive Emissions." LRAPA Title 48, Eugene, OR. (http://www.lrapa.org/rules/title48-Rules_for_Fugitive_Emissions.php)

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/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/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/rules/OARs_300/OAR_340/340_254.html)

Oregon Department of Environmental Quality. 2006. "Oregon Air Quality Data Summaries." http://www.deq.state.or.us/aq/forms/2006ar/2006ar.pdf)

U.S. Environmental Protection Agency. 2003. "User's Guide to MOBILE6.1 and 6.2." EPA 420- R-03-D10. 2003. (http://www.epa.gov/otaq/models/mobile6/420r03010.pdf)

U.S. Environmental Protection Agency. 1995. "User's Guide to CAL3QHC Version 2.0." Office of Air Quality Planning and Standards (OAQPS). Research Triangle Park, NC. (EPA454/R-92-006R).

U.S. Environmental Protection Agency. 2001. Mobile Source Air Toxics. (http://www.epa.gov/otaq/toxics.htm#March292001)

U.S. Environmental Protection Agency. 1996. "Approval and Promulgation of Implementation Plans and Designations." (http://www.epa.gov/fedrgstr/EPA-AIR/1996/July/Day29/pr-23557.html)

4. Ecosystems

4.1 Biological, Fish Ecology, and Threatened and Endangered Species

The biological resources and listed species evaluation will identify potential significant adverse impacts and beneficial effects of the various project alternatives and design options on wildlife habitat, wildlife corridors and riparian buffers, and listed (state and federal endangered, threatened, and proposed) wildlife and plant species. The data collection and evaluation will support the optimization of design concepts and the analysis and evaluation of alternatives for the project. The biological resources and listed species analysis will also be prepared in compliance with the National Environmental Policy Act (NEPA), applicable state environmental policy legislation, and local and state planning and land use policies and design standards.

There are a number of federal, state, and local requirements for protecting wildlife, habitat, and listed plant species. The analysis will identify these requirements as well as document the presence of known biological resources and listed species. Coordination with resource agencies, review of existing databases, and field surveys will be used to document the presence of relevant biological resources. Potential adverse impacts and beneficial effects to biological resources, such as degradation of habitat, will be identified in the analysis of alternatives.

Current fish distribution data will be obtained from resource agencies. Fish habitat within the project area will be characterized. Applicable federal, state, and local regulatory requirements will be reviewed concerning fish habitat, passage, and listed species. Potential impacts to fish resources will be documented. Significant impacts include, but are not limited to, alternatives that result in a “take” of federally listed or state listed fish species, adverse modification of federally designated critical habitat, loss or degradation of essential fish habitat, and creation of obstructions to fish passage.

4.1.1 Relevant Laws and Regulations

4.1.1.1 Federal

Endangered Species Act (ESA), 16 USC 1531-1544
(https://www.law.cornell.edu/uscode/text/16/chapter-35) The federal ESA prohibits the take of any federally listed species. The law defines "take" as “harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, collect, or attempt to engage in any such conduct” (Section 3(18)). "Harm" includes any act that actually kills or injures members of the species, including acts that may modify or degrade habitat in a way that significantly impairs essential behavioral patterns of the species. Under Section 7 of the ESA, any federal agency that authorizes, funds, or carries out an action must ensure that the action is not likely to jeopardize the continued existence of listed species or result in the destruction or adverse modification of designated critical habitat.

"Critical habitat" refers to specific geographic areas that are essential to the conservation of a threatened or endangered species. The purpose of designating critical habitat is to require federal agencies (or their representatives) to consider the effects of actions they carry out, fund, or authorize on habitat that is essential to the conservation of a listed species. Critical habitat areas typically have special management considerations for actions taken within such areas or for any actions that could impact those areas.

If federally listed species or designated critical habitat are found within the project area, informal or formal consultation with the National Marine Fisheries Service (NMFS) and the U.S. Fish and Wildlife Service (USFWS) under Section 7 of the ESA may be required. Informal consultations occur for projects that likely would not adversely affect listed species, whereas formal consultation is required for projects that likely would adversely affect listed species.

Magnuson-Stevens Fishery and Conservation Management Act of 1976, Public Law 94-265, as amended (http://www.nmfs.noaa.gov/sfa/magact/) The Fishery Conservation and Management Act of 1976 (Magnuson Act) authorized NMFS to regulate the fisheries of the United States. The act also established eight regional fishery management councils. These councils prepared fishery management plans (FMPs) to govern their management activities, and submitted these plans to NMFS for approval. The Sustainable Fisheries Act of 1996 amended the Magnuson Act (and also renamed it to the Magnuson-Stevens Fishery and Conservation Management Act) to emphasize the sustainability of the nation's fisheries. The act requires cooperation between NMFS, the regional fishery management councils, and federal agencies to protect, conserve, and enhance "essential fish habitat (EFH)," defined as "those waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity."

The act requires EFH descriptions to be included in federal fishery management plans, and requires federal agencies to consult with NMFS on activities that may adversely affect EFH. NMFS regulations implementing the EFH provisions require all fishery management councils to amend their fishery management plans to describe and identify EFH for each managed fishery. The Pacific Fishery Management Council amended the Pacific Coast Salmon Plan in 1999 (Amendment 14). This amendment covers EFH for all fisheries under NMFS jurisdiction that would potentially be affected by the proposed action. EFH includes all streams, lakes, ponds, wetlands, and other currently viable water bodies, and most of the habitat historically accessible to salmon. Under Section 305(b)(4) of the act, NMFS must provide EFH conservation and enhancement recommendations to federal and state agencies for actions that adversely affect EFH.

In 1999 and 2000, the Pacific Fishery Management Council added provisions for the protection of EFH to three FMPs (Coastal Pelagics, Groundfish, and Pacific Coast Salmonids) in the Pacific Northwest. Each federal agency must consult with NMFS on all activities or proposed activities authorized, funded, or undertaken by the agency that may adversely affect EFH. Compliance with this Act is typically handled by incorporating an impact analysis of the EFH within the Biological Assessment prepared in compliance with Section 7 of the ESA.

Migratory Bird Treaty Act (MBTA), 16 USC 703-712
(https://www.law.cornell.edu/uscode/text/16/chapter-7/subchapter-II) The MBTA protects migratory bird species and prohibits unauthorized destruction of active nests and disturbances that lead to the abandonment of active nests. Under the MBTA, nests of migratory birds should not be destroyed during the breeding season (approximately March - August). The MBTA is administered by the USFWS.

Bald and Golden Eagle Protection Act, 16 USC 668a-d
(https://www.law.cornell.edu/uscode/text/16/668) This law protects the bald eagle (*Haliaeetus leucocephalus*) and the golden eagle (*Aquila chrysaetos*) by prohibiting, except under certain specified conditions, the taking and possession of and placing into commerce such birds. "Take" includes pursue, shoot, shoot at, poison, wound, kill, capture, trap, collect, molest, or disturb.

Fish and Wildlife Coordination Act, 16 USC 661-667e
(https://www.law.cornell.edu/uscode/text/16/chapter-5A/subchapter-I) The federal Fish and Wildlife Coordination Act requires consultation with the USFWS and the appropriate state wildlife agency when

a project will impound, divert, channelize, or otherwise control or modify the waters of any stream or other body of water. Such actions would also require compliance with Section 404 of the Clean Water Act (see below). Consideration must be given to preventing damage or loss to wildlife and to mitigating any effects caused by a federal project. The environmental assessment must include an evaluation of how the actions may affect fish and wildlife resources, and must identify measures to reduce impacts to fish and wildlife.

Clean Water Act (CWA), 33 USC 1251-1376 (https://www.law.cornell.edu/uscode/text/33/chapter-26) The federal CWA requires states to set water quality standards for all contaminants in surface waters, based on the "beneficial" or "designated" uses for the water body, and makes it unlawful for any person to discharge any pollutant from a point source into navigable waters unless a permit was obtained under its provisions. It also recognizes the need to address the problems posed by nonpoint source pollution. Some of the permitting processes that fall within the purview of the CWA include Section 402: National Pollutant Discharge Elimination System (NPDES) permits, Section 404: permits for the discharge of dredged or fill material into waters of the United States, and Section 401: Water Quality Certification.

The discharge of dredged and fill material into jurisdictional waters of the United States, including wetlands, requires a Section 404 permit from the U.S. Army Corps of Engineers (USACE). Section 401 of the CWA is triggered when an applicant for a federal license or permit plans to conduct an activity that may result in a discharge to waters of the state or U.S. The applicant must obtain a water quality certification attesting that the activity complies with state water quality requirements and standards. Applicants in Oregon submit a Joint Permit Application form to USACE and the Oregon Department of State Lands (DSL), and the USACE forwards the application to the Oregon Department of Environmental Quality (DEQ) for water quality certification. DEQ then determines whether to certify that the project meets state water quality standards and does not endanger waters of the State/U.S. or wetlands.

4.1.1.2 State

Oregon Revised Statutes (ORS) 496.171-192, ORS 564-100-135, OAR 635-100, and OAR 603-073-0090, Oregon's Endangered Species Act (https://www.oregonlegislature.gov/bills_laws/Pages/ORS.aspx) The Oregon ESA applies to actions of non-federal public agencies and actions on non-federal public lands. In general, the Oregon ESA is much more limited in scope than the federal law. Once a species is placed on the state list as threatened or endangered, Oregon statutes regulate the "take" (collect, cut, damage, destroy, dig, pick, remove, or otherwise disturb, kill, obtain possession, or control) of the listed species. Under the Oregon ESA, the Oregon Department of Fish and Wildlife (ODFW) is responsible for fish and wildlife, and the Oregon Department of Agriculture (ODA) is responsible for plants. ODFW or ODA may issue a permit to any person for the incidental take of a state-listed threatened or endangered species if it determines that such take will not adversely impact the long-term conservation of the species or its habitat. The ODFW or ODA may issue the permit under such terms, conditions, and time periods as are necessary to minimize the impact on the species or its habitat. An incidental take permit may be issued for individuals of more than one state-listed species. ODFW may not issue incidental take permits for species listed under the federal ESA.

Essential Indigenous Anadromous Salmonid Habitat, ORS 196.810, ORS 196.910 (https://www.oregonlegislature.gov/bills_laws/Pages/ORS.aspx) Essential indigenous anadromous salmonid habitat (ESH) is defined as the habitat necessary to prevent the depletion of indigenous (native) anadromous salmonid species (chum, sockeye, Chinook and coho salmon; and steelhead, bull, and cutthroat trout) during their spawning and rearing life history stages. The designation applies only to those species that have been listed as sensitive, threatened, or endangered by a state or federal authority. In areas designated as ESH, Oregon's Removal-Fill Law (see below) requires a permit from the

Department of State Lands (DSL) for most removal and fill activities (OAR 141-085-0002 (http://arcweb.sos.state.or.us/pages/rules/access/numerically.html); ORS 196.810(1)(b)). DSL, in consultation with ODFW, designates ESH based on field surveys and/or the professional judgment of ODFW's district biologist.

Oregon's Removal-Fill Law, ORS 196.795-196.990
(https://www.oregonlegislature.gov/bills_laws/Pages/ORS.aspx) Impacts to jurisdictional wetlands or other waters of the state (including some ditches) require a Removal-Fill permit from DSL. In most cases, the preparation of a Joint Permit Application will require completing a wetland delineation and particular resource plans, including a compensatory mitigation plan, an erosion and sediment control plan, and a stormwater management plan.

Fish Passage; Fishways; Screen Devices; Hatcheries Near Dams, ORS 509.580-509.910
https://www.oregonlegislature.gov/bills_laws/Pages/ORS.aspx) Oregon's fish passage law requires the owner or operator of an artificial obstruction located in waters in which native migratory fish are currently or were historically present to address fish passage requirements before certain trigger events. All new culverts, bridges, and dams must meet ODFW's current fish passage criteria. Fish passage criteria and designs are normally based on the migration timing and swimming ability of the weakest individual of the weakest species and life history stage of native migratory fish that are present and require upstream access. Thus, it is important to identify this information for the location in question.

The law allows for waivers and exemptions in limited circumstances. All requests for waivers and exemptions must be approved by either the ODFW fish passage coordinator or the Oregon Fish and Wildlife Commission, depending on the amount of habitat that will be removed from fish usage. Waivers allow for mitigation if the applicant can show that the mitigation will provide a net benefit to native migratory fish over providing passage at the artificial obstruction in question. Exemptions may be allowed if (1) a lack of fish passage has already been mitigated, (2) a legal waiver has already been granted, or (3) there is no appreciable benefit to native migratory fish by providing passage. Exemptions are reviewed at least every 7 years and are revocable. If an exemption is revoked, then passage must be provided immediately, independent of a trigger event. If required, the fish passage structure must be constructed within one in-water work period of the determination that fish passage is required.

Statewide Planning Goals and Guidelines, Goal 5: Natural Resources, Scenic and Historic Areas, and Open Spaces, OAR 660-015-0000(5)
(http://arcweb.sos.state.or.us/pages/rules/access/numerically.html) Goal 5 protects natural resources and conserves scenic and historic areas and open spaces throughout the state. Goal 5 and its related administrative rules (Oregon Administrative Rules Chapter 660, Divisions 16 and 23) describe how cities and counties must plan and zone land to conserve resources listed in the goal. Local governments throughout Oregon have adopted programs to protect natural resources and conserve scenic, historic, and open space resources under Goal 5. Goal 5 planning related to biological resources within the project area includes the following:

- Fish and wildlife areas and habitats should be protected and managed in accordance with the Oregon Wildlife Commission's fish and wildlife management plans.
- Stream flow and water levels should be protected and managed at a level adequate for fish, wildlife, pollution abatement, recreation, aesthetics and agriculture.
- Significant natural areas that are historically, ecologically, or scientifically unique, outstanding or important, including those identified by the State Natural Area Preserves Advisory Committee, should be inventoried and evaluated.

- Plans should provide for the preservation of natural areas consistent with an inventory of scientific, educational, ecological, and recreational needs for significant natural areas.

4.1.1.3 Local

City of Eugene Land Use Code. Natural Resource Zone (NR) (EC 9.2500 to 9.2540) The NR natural resource zone is designed to implement the Eugene-Springfield Metropolitan General Plan (Metro Plan) by providing areas that will be preserved for long term protection of native vegetation, wetlands, waterways, wildlife habitat, rare plants, and surface and ground water quality. In general this zone is intended to protect outstanding natural resource areas identified in adopted plans. The NR zone is also intended to address state and federal laws and policies that regulate development within jurisdictional wetlands, and to protect water quality including applicable provisions of the federal Clean Water Act and the State of Oregon's wetland laws. The natural functions and values intended to be protected by this zone include all of the following: habitat for federally listed rare, threatened or endangered plant and animal species; floodwater storage and conveyance; sediment and erosion control; natural pollution control; fish and wildlife habitat; aquifer recharge and water supply; and native plant communities.

City of Eugene Land Use Code. Park, Recreation and Open Space Zone (PRO) (EC 9.2600 to 9.2650) The Park, Recreation and Open Space Zone (PRO) is intended to implement the Metro Plan, Eugene Parks and Recreation Plan and other applicable plans by providing areas that will (1) conserve and preserve a variety of parks, recreation areas and open spaces to maintain livability of the metropolitan area; (2) provide a balance of active and passive recreation opportunities to meet neighborhood, community and metropolitan needs; (3) efficiently implement plans and improvements to parks and open areas with appropriate reviews where compatibility issues may arise; and (4) facilitate preservation of scenic and natural values and ecosystem management.

City of Eugene Land Use Code. Tree Preservation and Removal Standards (EC 9.6880 to 9.6885) The Tree Preservation and Removal Standards are designed to: (1) Implement the Metro Plan and refinement plan policies related to vegetation preservation; (2) Maintain a minimum level of tree canopy cover throughout the city while addressing the city's goals for a healthy economy, affordable housing, and reduced sprawl; (3) Mitigate the impacts of development on the essential functions of the urban forest through requirements for preservation and replacement of tree canopy cover; (4) Ensure a healthy future urban forest by encouraging protection of mixed age stands of trees and promoting a diversity of tree species; and (5) Maintain a safe and attractive environment for residents and workers by requiring the integration of urban forestry principles into the design of new development.

City of Eugene Land Use Code. Willamette Greenway Permits (EC 9.8800 to 9.8825) Willamette Greenway Permits implement the Oregon Statewide Planning Goal 15, Willamette River Greenway, which is designed to protect, conserve, enhance, and maintain the natural, scenic, historical, agricultural, economic and recreational qualities of lands along the Willamette River. Changes in land use, intensification of uses, or developments require special consideration before being permitted within the Willamette River Greenway boundaries.

City of Springfield, Oregon. (2012). *Exhibit D Springfield Development Code Amendments*. Retrieved from: http://www.ci.springfield.or.us/dsd/Planning/documents/FinalDevCode_000.pdf

City of Springfield, Oregon. (2011). *Springfield 2030 Refinement Plan, Residential Land Use and Housing Element*. Retrieved from http://www.springfield-or.gov/DPW/CommunityPlanningDevelopment/SupportFiles/2030Plan/ResidentialLandUseHousingElementOrd6268.pdf

City of Springfield, Oregon. (2010a). *Chapter 3 Land Use Districts*. Retrieved from http://www.ci.springfield.or.us/dsd/Planning/Springfield%20Develoment%20Code/Home%20Page%20for%20SDC.htm

City of Springfield, Oregon. (2010b). *Technical Services Directory; GIS Section*. Retrieved from http://www.springfield-or.gov/pubworks/technicalservices.htm

Lane Community College. (2014). About Lane. Retrieved from http://www.lanecc.edu/about

4.1.2 Analysis Area

The analysis area for the MovingAhead project will be based on the alternatives selected for further analysis in the Level 2 AA. The analysis area is located along the eight corridors identified in Figure 1.3-3 and the associated APE, which will be defined in the Level 2 AA.

4.1.3 Contacts and Coordination

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

4.1.3.1 Federal

- U.S. Fish and Wildlife Service
- National Marine Fisheries Service
- U.S. Army Corps of Engineers
- Bureau of Land Management

4.1.3.2 State

- Oregon Department of Fish and Wildlife
- Oregon Department of Agriculture
- Oregon Biodiversity Information Center
- Oregon Department of State Lands

4.1.3.3 Local

- Lane County
- City of Eugene
- City of Springfield
- Lane Council of Governments
- The Nature Conservancy

4.1.4 Level 1 Screening

No data will be collected for the Level 1 Screening.

4.1.5 Level 2 Alternatives Analysis

4.1.5.1 Data Collection

Specific tasks include:

- Define the biological resources APE for the project alternatives.
- Obtain and analyze data from the Oregon Biodiversity Information Center (ORBIC) pertaining to records of species listed under the federal or State ESA. Review the USFWS county species list.
- Contact federal, state, and local agencies and non-governmental sources to obtain data on the presence of listed wildlife and botanical species in the project area as appropriate/applicable. Compile a list of State and federally listed species known to occur in the vicinity and their habitats. Determine if critical habitat has been designated for listed species in the project area. Examine primary constituent elements (PCEs) for species with designated critical habitat.
- Obtain current fish distribution information from NMFS, USFWS, ORBIC, and ODFW and determine if listed species (State and federal endangered, threatened and proposed) occur within the project area. Determine if critical habitat, essential fish habitat, or essential salmonid habitat has been designated within the project area. Examine primary constituent elements (PCE) for species with designated critical habitat. Determine listed species habitat requirements within the project area.
- Review United States Geological Survey (USGS) topographic maps, Oregon Department of Forestry (ODF) fish presence maps, ODFW StreamNet species distribution maps, and digital aerial photos. Other data sources may include available GIS layers from watershed assessments and Environmental Protection Agency (EPA) Research Lab fish sampling data.
- Conduct a habitat overview to characterize habitats and determine potential impacts to wildlife species. The approach will involve: 1) using aerial photos to map major habitat types, 2) evaluating habitats based on existing studies and literature to characterize existing conditions, 3) conducting reconnaissance-level surveys of the alignment alternatives, and 4) analyzing impacts to habitats. Important habitat characteristics of interest include habitat distribution, structure, composition, fragmentation, and connectivity.
- Conduct reconnaissance-level field surveys of stream crossings within the proposed project area. Surveys of existing and proposed crossings will encompass the entire width of the existing or proposed corridor plus a 100-foot buffer upstream and downstream and to the width of the riparian vegetation. Stream surveys will characterize instream and riparian habitat conditions.
- Compile and present sensitive areas locations and general locations of federal and State listed species within the APE of the alignment alternatives including stream crossings, and known locations of listed fish species within the APE.

Additional analysis will include a review of the following information for relevance and applicability:

- National Environmental Policy Act of 1969.
- National Marine Fisheries Service. Endangered Species Act Status Reviews and Listing Information. Accessed at: http://www.nmfs.noaa.gov/pr/species/esa_species.htm.
- National Marine Fisheries Service. ESA Critical Habitat Designations for West Coast Salmon and Steelhead. Accessed at: http://www.nwr.noaa.gov/Salmon-Habitat/Critical-Habitat/Index.cfm.

- National Marine Fisheries Service, Essential Fish Habitat. Accessed at: http://www.psmfc.org/efh/efh.html.
- Oregon Department of Fish and Wildlife. Oregon List of Threatened and Endangered Fish and Wildlife Species. Accessed at: http://www.dfw.state.or.us/threatened_endangered/t_e.html.
- Oregon Department of Fish and Wildlife. Fish passage requirements.
- Oregon Department of State Lands. Removal-Fill permit requirements.
- Csuti, B., A.J. Kimberling, T.A. O'Neil, M.M. Shaughnessy, E.P. Gaines, and M.M.P. Huso. 1997. Atlas of Oregon Wildlife. Oregon State University Press.
- Eastman, Donald. 1990. Rare and Endangered Plants of Oregon. Beautiful America Publishing Company. Wilsonville, OR.
- Goal 5. Natural Resources, Scenic and Historic Areas, and Open Spaces. Oregon's Statewide Planning Goals & Guidelines. OAR 660-015-0000(5). Amendments Effective 08/30/96.
- Isaacs, F.B. and R.G. Anthony. 2006. Bald eagle nest locations and history of use in Oregon and the Washington portion of the Columbia River Recovery Zone, 1971 through 2006. Oregon Cooperative Fish and Wildlife Research Unit, Oregon State University. Corvallis, Oregon.
- Hitchcock, C. L and A. Cronquist. 1973. Flora of the Pacific Northwest. University of Washington Press, Seattle, Washington.
- Johnson, D. and T.A. O'Neil. 2001. Wildlife-Habitat Relationships in Oregon and Washington. Oregon State University Press.
- Oregon Flora Project. Oregon Plant Atlas. Accessed at: http://www.oregonflora.org/.
- Oregon Department of Fish and Wildlife. Oregon List of Threatened and Endangered Fish and Wildlife Species. Accessed at: http://www.dfw.state.or.us/threatened_endangered/t_e.html
- Oregon Biodiversity Information Center. 2013. Rare, Threatened and Endangered Species of Oregon. Institute for Natural Resources, Portland State University, Portland, Oregon. 111 pp.
- U.S. Department of the Interior, Fish and Wildlife Service. List of Threatened, Endangered, and Proposed Species information for Oregon and Washington. Accessed at: http://ecos.fws.gov/tess_public/servlet/gov.doi.tess_public.servlets.UsaLists?state=all

4.1.5.2 Significance Thresholds

For the impact analysis, staff will draw on existing guidance to determine significance thresholds, including FHWA Technical Advisory T 6640.8A (1987). Staff will also coordinate with federal, state and local resource agencies to determine the level of impact, using the criteria listed below as a guide to determine significance thresholds.

Impacts to fish, wildlife or botanical resources will be considered significant if:

- An alternative may result in a "take" of a federally or state-listed species.
- An alternative may result in an adverse modification of federally designated critical habitat.
- An alternative may result in the direct loss of habitat and the loss would result in the habitat's inability to provide vital functions for species to the extent that populations may decline.
- An alternative may result in the direct loss of a listed species, as defined under the MBTA.

- An alternative may adversely affect EFH under the Magnuson-Stevens Act,
- An alternative results in the loss or degradation of ESH to the point where the species' ability to use the habitat is impaired.
- An alternative creates an obstruction in fish passage and is non-compliant with the Oregon Fish Passage law.

In addition to adverse impacts, beneficial effects may be determined to be significant. Examples include removal of obstructions to fish passage or substantial habitat enhancement.

4.1.5.3 Impact Analysis

Methods for determining potential impacts to biological resources and protected species are described in this section.

Long-Term Impacts Analysis Approach

The data gathered for this study will be used to evaluate potential long-term impacts of the project alternatives, such as loss of habitat connectivity or degraded habitat. Staff will apply the following process to determine long-term impacts on fish and wildlife and botanical resources:

1. Analyze the potential for destruction or adverse modification of critical habitat, suitable habitat, and/or "take" of listed species.
2. Evaluate impacts to species and resources not listed under the ESA, based on levels of habitat modification or destruction or increased levels of disturbance from project operations.
3. Contact local, state, and federal agencies, local biologists, and others with knowledge of the region to discuss potential impacts.
4. Evaluate impacts based on the significance thresholds.
5. Identify and evaluate opportunities to mitigate for long-term operation impacts, as described below.
6. In addition to adverse impacts, beneficial effects will be identified and evaluated based on the potential to enhance, restore, or create habitat.

Short-Term Impacts Approach

Similar to the long-term impact approach, staff will use the following process to determine short-term impacts on fish and wildlife and botanical resources:

1. Analyze the potential for destruction of or adverse modification to critical habitat, suitable habitat, and/or "take" of listed wildlife and plants.
2. Evaluate impacts to species and resources not listed under the ESA, based on levels of habitat modification or destruction or increased levels of disturbance from project construction.
3. Contact local, state, and federal agencies, local biologists, and others with knowledge of the region to discuss potential impacts.
4. Evaluate impacts based on significance thresholds.
5. Identify and evaluate opportunities to mitigate for short-term construction impacts.
6. In addition to adverse impacts, beneficial effects will be identified and evaluated based on the potential to enhance, restore, or create habitat.

Indirect Impact Analysis Approach

The indirect impacts analysis will focus on those impacts that are later in time or farther removed in distance but that are still reasonably foreseeable. Impacts to fish and wildlife and botanical resources from indirect effects include those that relate to destruction or adverse modification of habitats or the individual loss of special-status species. Indirect impacts will be analyzed by their short and long-term impacts on fish and wildlife and botanical resources.

Cumulative Impact Analysis Approach

The cumulative impact analysis will focus on those impacts resulting from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions, regardless of which agency (federal or non-federal) or person undertakes such other actions. Cumulative impacts can result from individually minor but collectively significant actions that take place over time. Impacts to fish and wildlife and botanical resources from cumulative effects include those that relate to destruction or adverse modification of habitats and habitats of federally and state-listed species and other special-status species, or the individual loss of these species.

Cumulative impacts will be analyzed by looking at long-term trajectories of ecosystem function and determining how the project will change the current trajectory. To conduct this analysis, staff will collect data, as described above, on species and habitat types present within the project area and compare these to historical species and habitat types. Staff will examine species and habitat protections put into place by local, state, and federal agencies to determine how species and habitat presence are likely to change in the future, with and without the project. Growth and planned urbanization of the region will be analyzed for their potential future impacts to fish and wildlife and botanical resources in the project area.

Mitigation Measures Approach

Mitigation for impacts to biological resources may be necessary to comply with local, state, and federal laws. For significant impacts that require mitigation, staff will identify project-specific mitigation directly related to impacted resources. Staff also will analyze long-term operational and short-term construction impacts to biological resources to identify impacts that will require mitigation. Staff will identify mitigation measures according to the effectiveness and benefit of the measure on the affected resource and the ability to monitor and evaluate the measure. In addition to identifying resources that may be impacted and require mitigation, data collected on species and habitats will help identify appropriate mitigation opportunities. Mitigation measures will be based on the level of impact to the resource and on local, state, and federal regulations that guide when mitigation is necessary and the appropriate measures required. Measures could include providing on-site or off-site mitigation, as well as payment to mitigation banks. Mitigation measures may also include best management practices.

Mitigation strategies and options will be identified within the Level 2 AA of the project. More detailed mitigation planning will be developed in the NEPA documentation phase of the project.

4.1.6 NEPA Documentation

4.1.6.1 Data Collection

Some analyses may need to be updated from the Level 2 AA depending on how much time passes between planning analyses and corridor development, and depending on factors like the amount of major new development.

Specific tasks may include:

- Obtain and analyze updated data from ORBIC pertaining to records of species listed under the federal or State ESA. Review the USFWS county species list for updates.
- Contact federal, state, and local agencies and non-governmental sources to obtain updated data on the presence of listed wildlife and botanical species in the project area as appropriate/applicable. Update the list of State and federally listed species known to occur in the vicinity and their habitats. Determine if critical habitat has been designated for listed species in the project area. Examine primary constituent elements (PCEs) for species with designated critical habitat.
- Obtain updated fish distribution information from NMFS, USFWS, ORBIC, and ODFW, and determine if listed species occur within the project area. Determine if critical habitat, essential fish habitat, or essential salmonid habitat has been designated within the project area. Examine primary constituent elements (PCE) for species with designated critical habitat.
- Review United States Geological Survey (USGS) topographic maps, Oregon Department of Forestry (ODF) fish presence maps, ODFW StreamNet species distribution maps, and digital aerial photos. Other data sources may include available GIS layers from watershed assessments and Environmental Protection Agency (EPA) Research Lab fish sampling data.
- Conduct rare plant surveys during the appropriate season to document populations of State and federally listed plants identified by ORBIC database and the USFWS county species list. Map located populations and describe population size, health, and habitat.
- Use a wildlife habitat assessment technique, utilizing principles outlined by Johnson and O'Neil (2001), to characterize habitats and determine potential impacts to wildlife species. The approach will involve: 1) using updated aerial photos to map major habitat types, 2) evaluating habitats based on existing studies and literature to characterize existing conditions, 3) conducting detailed habitat surveys along the corridor, and 4) analyzing impacts to habitats. Important habitat characteristics of interest include habitat distribution, structure, composition, fragmentation, and connectivity.
- Conduct field surveys of the corridor stream crossings within the proposed project area. Surveys of existing and proposed crossings will encompass the entire width of the existing or proposed corridor plus a 100-foot buffer upstream and downstream and to the width of the riparian vegetation. Stream surveys will characterize instream and riparian habitat conditions.
- Conduct field surveys at proposed mitigation sites to determine a baseline condition for the sites.
- Compile and present sensitive areas locations and general locations of federal and State listed species within the APE of the alignment alternatives including stream crossings, and known locations of listed fish species within the APE. Determine and present ESA findings.
- Conduct a detailed stormwater analysis to assess potential impacts to fishery resources.
- Initiate Section 7 consultation under ESA for listed species.
- Determine and present Magnuson-Stevens Act findings.

4.1.6.2 Significance Thresholds

The same significance thresholds identified for the Level 2 AA will be used for NEPA documentation.

4.1.6.3 Impact Analysis

The same Impact Analysis approach identified for the Level 2 Alternatives Analysis will be applied to the NEPA documentation for long term, short term, indirect and cumulative impacts.

Mitigation Measures Approach

Staff will confer with local, state, and federal agencies to gather information on areas where mitigation is necessary and develop appropriate mitigation measures. If the project requires Section 7 consultation under the ESA, mitigation measures will be based on conservation measures identified during the Section 7 consultation. The consultation process may identify mitigation measures that will minimize the project's adverse effects on listed species.

Mitigation for project-related impacts will be commensurate with the area and severity of the impact and will be measured by the ecological value lost. Mitigation actions should be implemented in advance of or in the same year as the project-related construction activities. Mitigation activities may include habitat enhancements, establishment of a mitigation site within the project area, and removal of existing fish passage barriers.

In accordance with previous comments and recommendations made by ODFW, fish ecology mitigation opportunities may be explored that include:

- Retaining large conifer trees taken from the project clear zones and using them for habitat improvement within the project area.
- Providing fish passage consistent with ODFW Fish Passage Criteria at all stream crossings where ODFW determines native migratory fish were historically or are currently present.
- Implementing native vegetation plans that reduce the need for future mowing or herbicide applications, especially adjacent to streams.

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

The wetlands evaluation will identify potential significant adverse impacts and beneficial effects of the various project alternatives and design options on wetlands and jurisdictional waters. Wetlands and waterways are regulated at the local, state, and federal levels, and the presence of jurisdictional resources could affect the permitting process. Alternatives that require placing obstructions, stream diversion, or flow reductions require an extensive permitting process. The wetland and waterways evaluation will focus on avoiding or minimizing impacts to reduce permitting efforts and mitigation requirements. This analysis will also be prepared in compliance with the National Environmental Policy Act (NEPA), applicable state environmental policy legislation, and local and state planning and land use policies and design standards.

4.2.1 Relevant Laws and Regulations

4.2.1.1 Federal

Clean Water Act (CWA), 33 USC 1251-1376 (https://www.law.cornell.edu/uscode/text/33/chapter-26) The federal CWA requires states to set water quality standards for all contaminants in surface waters, based on the "beneficial" or "designated" uses for the water body, and makes it unlawful for any person to discharge any pollutant from a point source into navigable waters unless a permit was obtained under its provisions. It also recognizes the need to address the problems posed by nonpoint source

pollution. Some of the permitting processes that fall within the purview of the CWA include Section 402: National Pollutant Discharge Elimination System (NPDES) permits, Section 404: permits for the discharge of dredged or fill material into waters of the United States, and Section 401: Water Quality Certification.

The discharge of dredged and fill material into jurisdictional waters of the United States, including wetlands, requires a Section 404 permit from the U.S. Army Corps of Engineers (USACE). Section 401 of the CWA is triggered when an applicant for a federal license or permit plans to conduct an activity that may result in a discharge to waters of the state or U.S. The applicant must obtain a water quality certification attesting that the activity complies with state water quality requirements and standards. Applicants in Oregon submit a Joint Permit Application form to USACE and the Oregon Department of State Lands (DSL), and the USACE forwards the application to the Oregon Department of Environmental Quality (DEQ) for water quality certification. DEQ then determines whether to certify that the project meets state water quality standards and does not endanger waters of the State/U.S. or wetlands.

4.2.1.2 State

Oregon's Removal-Fill Law, ORS 196.795-196.990
(https://www.oregonlegislature.gov/bills_laws/Pages/ORS.aspx) Impacts to jurisdictional wetlands or other waters of the state (including some ditches) require a Removal-Fill permit from DSL. In most cases, the preparation of a Joint Permit Application will require completing a wetland delineation and particular resource plans, including a compensatory mitigation plan, an erosion and sediment control plan, and a stormwater management plan.

Compensatory Mitigation and Wetland Mitigation, OAR 141-085-0115 to 141-085-0176
(http://arcweb.sos.state.or.us/pages/rules/access/numerically.html) These administrative rules govern the issuance and enforcement of removal-fill authorizations within waters of Oregon, including wetlands. DSL may require mitigation as a condition of an authorization to compensate for reasonably expected adverse impacts to water and wetland resources. Compensatory mitigation may include off-site or onsite restoration, enhancement or improvements, wetland creation, and/or monetary compensation for the purpose of watershed health, as approved by DSL. DSL may approve compensatory mitigation for impacts to waters of the state other than freshwater wetlands or estuarine areas, when the applicant demonstrates in writing that the compensatory mitigation plan will replace or provide a comparable substitute for water resources of the state and/or navigation, fishing, and public recreation uses lost by project development.

Section 401 Water Quality Certification, OAR 340-048-0005 to 304-048-0055
(http://arcweb.sos.state.or.us/pages/rules/access/numerically.html) As described in the section addressing the federal Clean Water Act, Section 401 of the CWA is triggered when an applicant for a federal license or permit plans to conduct an activity that may result in a discharge to waters of the state or U.S. The applicant must obtain a water quality certification attesting that the activity complies with state water quality requirements and standards. The Oregon DEQ determines whether to certify that a project meets state water quality standards and does not endanger waters of the State/U.S. or wetlands.

NPDES, OAR 340-045-0005 to 340-045-0080
(http://arcweb.sos.state.or.us/pages/rules/access/numerically.html) A National Pollution Discharge Elimination System (NPDES) permit is required for construction activities such as clearing, grading, or excavating that disturb one or more acres of land. An NPDES General Construction 1200-C Stormwater Permit from DEQ, including a Temporary Erosion and Sediment Control Plan (TESCP) may be required.

Statewide Planning Goals and Guidelines, Goal 5: Natural Resources, Scenic and Historic Areas, and Open Spaces, OAR 660-015-0000(5)
(http://arcweb.sos.state.or.us/pages/rules/access/numerically.html) Goal 5 protects natural resources and conserves scenic and historic areas and open spaces throughout the state. Goal 5 and its related administrative rules (Oregon Administrative Rules Chapter 660, Divisions 16 and 23) describe how cities and counties must plan and zone land to conserve resources listed in the goal. Local governments throughout Oregon have adopted programs to protect natural resources and conserve scenic, historic, and open space resources under Goal 5. Goal 5 planning related to biological resources within the project area includes the following:

- Fish and wildlife areas and habitats should be protected and managed in accordance with the Oregon Wildlife Commission's fish and wildlife management plans.
- Stream flow and water levels should be protected and managed at a level adequate for fish, wildlife, pollution abatement, recreation, aesthetics and agriculture.
- Significant natural areas that are historically, ecologically, or scientifically unique, outstanding or important, including those identified by the State Natural Area Preserves Advisory Committee, should be inventoried and evaluated.
- Plans should provide for the preservation of natural areas consistent with an inventory of scientific, educational, ecological, and recreational needs for significant natural areas.

4.2.1.3 Local

City of Eugene Land Use Code. Natural Resource Zone (NR) (EC 9.2500 to 9.2540) The NR natural resource zone is designed to implement the Metro Plan by providing areas that will be preserved for long term protection of native vegetation, wetlands, waterways, wildlife habitat, rare plants, and surface and ground water quality. In general this zone is intended to protect outstanding natural resource areas identified in adopted plans. The NR zone is also intended to address state and federal laws and policies that regulate development within jurisdictional wetlands, and to protect water quality including applicable provisions of the Federal Clean Water Act and the State of Oregon's wetland laws. The natural functions and values intended to be protected by this zone include all of the following: habitat for federally listed rare, threatened or endangered plant and animal species; floodwater storage and conveyance; sediment and erosion control; natural pollution control; fish and wildlife habitat; aquifer recharge and water supply; and native plant communities.

City of Eugene Land Use Code. Waterside Protection Overlay Zone (/WP) (EC 9.4700 to 9.4760) The purpose of the /WP overlay zone is to protect water quality in designated waterways, riparian areas, and adjacent wetlands. This is accomplished by maintaining an undeveloped setback area between these features and adjacent development. The setback is also intended to protect wildlife habitat and prevent property damage from flooding. The /WP overlay zone is designed to implement policies in the Metro Plan and refinement plans calling for protection of riparian vegetation, wetlands, waterways, wildlife habitat, and surface and groundwater quality.

City of Eugene Land Use Code. Water Quality Overlay Zone (/WQ) (EC 9.4770 to 9.4790) The /WQ overlay zone is designed to protect and improve the physical integrity and water quality function within and adjacent to otherwise unprotected waterways. In particular it applies to waterways identified pursuant to section 303(d) of the Clean Water Act, as well as tributaries to those waterways and headwater streams. The City of Eugene Land Use Code establishes allowed uses, uses subject to standards review, and prohibited uses within the /WQ Management Area. Examples of standards that

could apply to this section include standards that address stream and channel crossings, maintaining existing hydrology, and repair and reconstruction of stream banks and channels.

City of Eugene Land Use Code. Wetland Buffer Overlay Zone (/WB) (EC 9.4800 to 9.4860) The purpose of the /WB overlay zone is to maintain or improve water quality within protected wetland sites identified in the West Eugene Wetlands Plan by maintaining an undeveloped setback area between the wetland and developed areas. Secondary benefits of buffers and setbacks include creating open space between the resource and adjacent uses, helping to maintain or improve wildlife habitat values and wetland hydrology, protecting the aesthetic value of the site and minimizing property damage from floods. The provisions of this overlay zone are also intended to address state and federal laws and policies that regulate development within jurisdictional wetlands to protect water quality, including applicable provisions of the Federal Clean Water Act and the State of Oregon's wetland laws.

City of Eugene Land Use Code. Water Resources Conservation Overlay Zone(/WR) (EC 9.4900 to 9.4980) The purpose of the /WR Water Resources Conservation overlay zone is to provide conservation of significant riparian areas, wetlands and other water-related wildlife habitat areas included on the city's adopted Goal 5 inventory. In order to conserve these resources and the biological systems they contain and support, the overlay zone not only conserves the physical resources but also protects the water quality within the resource areas as a fundamental and essential requirement for continued survival of these biological systems.

West Eugene Wetlands Plan. 2004 This document addresses wetlands and economic development as critical parts of a healthy, livable community, providing detailed goals, policies, and recommended actions. The document addresses resource protection; development and mitigation; operating, maintaining, and monitoring the West Eugene Wetlands; financing; and future studies.

4.2.2 Analysis Area

The analysis area for the MovingAhead project will be based on the alternatives selected for further analysis in the Level 2 AA. The analysis area is located along the eight corridors identified in Figure 1.3-3 and the associated APE, which will be defined in the Level 2 AA.

4.2.3 Contacts and Coordination

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

4.2.3.1 Federal

- U.S. Fish and Wildlife Service
- U.S. Army Corps of Engineers

4.2.3.2 State

- Oregon Department of Fish and Wildlife
- Oregon Department of State Lands
- Oregon Department of Environmental Quality

4.2.3.3 Local

- Lane County
- City of Eugene
- Lane Regional Council of Governments

4.2.4 Level 1 Screening

No data will be collected for the Level 1 Screening.

4.2.5 Level 2 Alternatives Analysis

4.2.5.1 Data Collection

Specific tasks include:

- Define the wetlands and other jurisdictional water resources APE for the project alternatives.
- Examine relevant data including topographic maps, aerial photographs, USFWS National Wetland Inventory (NWI) maps, Local Wetland Inventory (LWI) maps, the West Eugene Wetlands Plan, and the Natural Resources Conservation Service (NRCS) Soil Survey data and other available mapping and data sources to identify documented wetland locations in the project area.
- Conduct reconnaissance-level field surveys of the project corridors to identify and field verify potential wetland areas.
- Map potential wetland areas identified through the existing data review and reconnaissance-level field surveys. No formal wetland delineations will be conducted as part of the Level 2 Alternatives Analysis.

Additional analysis will include a review of the following information for relevance and applicability:

- National Environmental Policy Act of 1969.
- GIS layers of the project area.
- Oregon Department of State Lands. Removal-Fill permit requirements.
- Goal 5. Natural Resources, Scenic and Historic Areas, and Open Spaces. Oregon's Statewide Planning Goals & Guidelines. OAR 660-015-0000(5). Amendments Effective 08/30/96.

4.2.5.2 Significance Thresholds

For the impact analysis, staff will draw on existing guidance to determine significance thresholds, including FHWA Technical Advisory T 6640.8A (1987). Staff will also coordinate with federal, state and local resource agencies to determine the level of impact, using the criteria listed below as a guide to determine significance thresholds.

Impacts to wetland resources will be considered significant if they result in modification of wetland hydrologic regimes, destruction of wetland vegetation, and/or destruction or fill of the wetland that would result in:

- An adverse change in wetland function.
- Degradation in wetland quality.

- Disturbance to wetlands providing listed species habitat.

Impacts to waterways will be considered significant if an alternative requires placement of fill or any part of a structure within a jurisdictional waterway as defined by the USACE. Restriction of flows or revisions to the stream path would also be considered significant impacts.

4.2.5.3 Impact Analysis

Methods for determining potential impacts to wetlands and jurisdictional waters are described in this section.

Long-Term Impacts Analysis Approach

Using the data collected, project staff will evaluate the potential long-term impacts of the project, such as permanently altered hydrology, wetland loss or disturbance, or degraded habitat. The following process will be applied to determine long-term impacts to wetland and other jurisdictional water resources:

1. Evaluate impacts to wetlands and other waters based on the significance thresholds described above.
2. Identify and evaluate opportunities for mitigating long-term impacts.
3. In addition to adverse impacts, beneficial effects from the project will be identified and evaluated based on the potential to enhance, restore, or create wetlands or waterways.

The impact analyses will place emphasis on impacts to wetlands and other waters associated with floodplains and their respective riparian zones and wildlife habitat functions. Emphasis will also be placed on wetlands and other waters that provide high level functions and values, provide habitat for listed species, or wetland types that are rare or declining in abundance and acreage.

Short-Term Impacts Approach

Similar to the long-term impact approach, staff will use the following process to determine short-term impacts on wetland and other jurisdictional water resources:

1. Evaluate impacts to wetlands and other waters based on the significance thresholds described above.
2. Identify and evaluate opportunities for mitigating long-term impacts.
3. In addition to adverse impacts, beneficial effects from the project will be identified and evaluated based on the potential to enhance, restore, or create wetlands or waterways.

Indirect Impact Analysis Approach

The indirect impacts analysis will focus on those impacts that are later in time or farther removed in distance but that are still reasonably foreseeable. Impacts to wetlands and other jurisdictional water resources from indirect effects include those that relate to increases in pollution loads, sedimentation, and erosion, or alteration of hydrologic regimes. Indirect impacts will be analyzed by their short and long-term impacts on wetlands and other jurisdictional water resources.

Cumulative Impact Analysis Approach

The cumulative impact analysis will focus on those impacts resulting from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions, regardless of which agency (federal or non-federal) or person undertakes such other actions. Cumulative impacts can result from individually minor but collectively significant actions that take place over time. Impacts to wetlands and other jurisdictional water resources from cumulative effects include those that relate to losses of wetlands at a larger geographic scale, destruction of wetland vegetation, increases in pollution loads, sedimentation, and erosion, or altered hydrologic regimes.

Cumulative impacts will be analyzed by looking at long-term trajectories of ecosystem function and determining how the project will change the current trajectory. To conduct this analysis, staff will collect data, as described above, on wetlands and other jurisdictional waters present within the project area and compare these to historical conditions. Staff will examine wetland and other jurisdictional waters protections put into place by local, state, and federal agencies to determine how conditions are likely to change in the future, with and without the project. Growth and planned urbanization of the region will be analyzed for their potential future impacts to wetlands and other jurisdictional water resources in the project area.

Mitigation Measures Approach

Mitigation for impacts to wetlands and other jurisdictional water resources may be necessary to comply with local, state, and federal laws. For significant impacts that require mitigation, staff will identify conceptual mitigation options. Staff will identify mitigation measures according to the effectiveness and benefit of the measure on the affected resource and the ability to monitor and evaluate the measure. In addition to identifying resources that may be impacted and require mitigation, data collected on wetlands and other jurisdictional water resources will help identify appropriate mitigation opportunities. Mitigation measures will be based on the level of impact to the resource and on local, state, and federal regulations that guide when mitigation is necessary and the appropriate measures required. Measures could include providing on-site or off-site mitigation, as well as payment to mitigation banks. Mitigation measures may also include best management practices.

Mitigation strategies and options will be identified within the Level 2 AA phase of the project. More detailed mitigation planning will be developed in the NEPA phase of the project.

4.2.6 NEPA Documentation

4.2.6.1 Data Collection

Some analyses may need to be updated from the Level 2 AA depending on how much time passes between planning analyses and corridor development, and depending on factors like the amount of new development.

Specific tasks may include:

- Examine relevant data that may have been updated such as aerial photographs, approved jurisdictional determination, and other available mapping and data sources to identify documented wetland locations in the project area.
- Conduct reconnaissance-level field surveys of the project corridors to identify and field verify potential wetland areas.

- Map potential wetland areas identified through the existing data review and reconnaissance-level field surveys. Formal wetland delineations may need to occur as part of the NEPA documentation.
- Conduct field surveys at proposed mitigation sites to determine a baseline condition for the site.

4.2.6.2 Significance Thresholds

The same significance thresholds identified for the Level 2 AA will be used for NEPA documentation.

4.2.6.3 Impact Analysis

The same Impact Analysis approach identified for the Level 2 AA will be applied to the NEPA documentation for long term, short term, indirect and cumulative impacts.

Mitigation Measures Approach

Staff will confer with local, state, and federal agencies to gather information on areas where wetland and other jurisdictional water resources mitigation is necessary and to develop appropriate mitigation measures. Staff will also discuss mitigation measures with the formal interagency coordination team.

Mitigation measures for any permanent wetland or other jurisdictional water resource impacts will need to comply with USACE and DSL regulations. Mitigation banking may also be an option. Mitigation for temporary impacts will be described in a site restoration plan in accordance with DSL guidelines. Mitigation for project-related impacts will be commensurate with the area and severity of the impact and will be measured by the ecological value lost. Mitigation actions should be implemented in advance of or in the same year as the project-related construction activities.

4.3 References

City of Eugene. Land Use Code. City of Eugene Department of Planning and Development. (http://www.eugene-or.gov/DocumentCenter/Home/Index/262)

Cornel University Law School, Legal Information Institute website. 16 U.S. Code Chapter 5A, Subchapter I – Game, Fur-Bearing Animals, and Fish. (https://www.law.cornell.edu/uscode/text/16/chapter-35)

Cornel University Law School, Legal Information Institute website. 16 U.S. Code Chapter 7, Subchapter II – Migratory Bird Treaty. (https://www.law.cornell.edu/uscode/text/16/chapter-35)

Cornel University Law School, Legal Information Institute website. 16 U.S. Code Chapter 35 – Endangered Species. (https://www.law.cornell.edu/uscode/text/16/chapter-35)

Cornel University Law School, Legal Information Institute website. 16 U.S. Code 668 – Bald and Golden Eagles. (https://www.law.cornell.edu/uscode/text/16/668)

Cornel University Law School, Legal Information Institute website. 33 U.S. Code Chapter 26 – Water Pollution Prevention and Control. (https://www.law.cornell.edu/uscode/text/33/chapter-26)

David Evans Associates (DEA). 1998. City of Springfield Urban Growth Boundary Comprehensive Wetlands Inventory. December 30, 1998.

FHWA. 1987. NEPA Implementation, Guidance for Preparing and Processing Environmental and Section 4(f) Documents. FHWA Technical Advisory T 6640.8A. October 30, 1987. (http://www.environment.fhwa.dot.gov/projdev/impTA6640.asp)

Johnson, D. and T.A. O'Neil. 2001. Wildlife-Habitat Relationships in Oregon and Washington. Oregon State University Press. 736 pp. (http://wdfw.wa.gov/hab/habspp.htm)

National Marine Fisheries Service, Magnuson-Stevens Fishery Conservation and Management Act website. (http://www.nmfs.noaa.gov/sfa/magact/)

Oregon Secretary of State, Oregon Administrative Rules (OAR). http://arcweb.sos.state.or.us/pages/rules/access/numerically.html

Oregon State Legislature, Oregon Revised Statutes (ORS). https://www.oregonlegislature.gov/bills_laws/Pages/ORS.aspx

5. Capital Cost Estimating

This section describes the analysis methodologies and data to be used for the Capital Cost Estimating evaluation for the MovingAhead project.

5.1 Approach

The method of estimating capital costs needs to be tailored to reflect the level of concept development for all corridors under consideration. As the corridors advance through the development process from broad concepts to specific analysis of the footprint of alternatives, the project's capital cost estimates will also become better defined due to the increasing level of detail and available data upon which to base the estimates.

5.2 Capital Cost Estimate Development

The development of the capital cost estimate for each alternative under study is outlined by phase under each subheading below. Generally estimates will be compiled in a format that meets FTA Small Starts reporting criteria as detailed in Section 5.3, Cost Categories.

5.2.1 Level 1 Screening

The scope of design involved in the Level 1 Screening process will be enough to provide a review of generalized order-of-magnitude cost estimate between corridors and to the No-Build alternatives. General cross sections will be developed for proposed treatments that may apply to multiple corridors and concepts. These cross sections will be attributed an assumed capital cost based on experience and bid data from prior projects as provided by LTD. While not comprehensive in scope, the items quantified will be intended to define the major construction elements needed to complete the work.

Corridors under consideration during Level 1 screening will be reviewed at a high level to determine the estimated number of lane miles of the developed cross-section treatments. The general cost of each cross section concept as estimated will be multiplied by the number of assumed lane-miles to establish a baseline cost of each corridor under consideration. Other major items with cost implications such as BRT stations, park and ride facilities, new BRT vehicles, and operations and maintenance facilities will be factored into the cost at this level of development to produce generalized order-of-magnitude cost estimates for each corridor considered. Cost estimates for bicycle and pedestrian facilities will not be produced for the Level 1 Screening.

5.2.2 Level 2 Alternatives Analysis

Order-of-magnitude cost estimates for corridor alternatives advanced to the Level 2 AA phase will be updated based on the refined design footprint established in this phase. Right of way, parking, utility, and other impacts associated with the footprint will be factored into the cost of each alternative. Transit operations and maintenance costs are not included in these capital cost estimates and are addressed in Chapter 13. Order-of-magnitude cost estimates for bicycle and pedestrian improvements will be developed separately from transit capital costs.

The cost estimates for the this phase of work will be based on research into historic construction bid data from other similar projects including existing EmX corridors in Lane County, for the various design and costing components of the MovingAhead project. Using the construction bid data, available design

and footprint information for each alternative and appropriate contingencies based on the level of design refinement, a reasonable planning-level estimate of the expected project capital costs can be determined appropriate to the level of project definition in the Level 2 AA phase.

5.2.3 NEPA Documentation

Refined order-of-magnitude costs will be included in the NEPA documentation based on the criteria detailed above. Alternatives selected to move into the NEPA documentation phase will again be examined for cost implications associated with their footprint, overall traffic and transit operation, impacts to right of way, access, parking, and other facilities along the corridor.

5.3 Cost Categories

FTA has developed a spreadsheet to standardize the approach for estimating capital costs on transit projects – called *Standardized Cost Categories* (SCC). The SCC spreadsheets are traditionally updated by FTA in approximately May or June of each year. The SCC spreadsheets are accompanied by a methodology description. The cost estimates for the MovingAhead project's Level 2 AA will use and conform to the June 2014 Small Starts spreadsheets and methods. The spreadsheets and methodology are attached as Appendix D for reference.

Based on the June 2014 FTA SCC spreadsheets and methodologies (see Appendix D), the cost estimates for the Level 2 AA phase of work will break down the capital cost estimates into nine specific line items:

10 Guideway and Track Elements

20 Stations / Transit Stops

30 Support Facilities

40 Sitework

50 Systems

60 Right of way

70 Vehicles

80 Professional Services

90 Unallocated Contingencies

Following is a general description of each of these nine elements:

10 – Guideway and Track Elements. For a BRT project, track is not a significant component. For purposes of these estimates, however, BRT work elements within the envelope of the exclusive bus lane or busway will be included in this item as guideway. A unit cost per foot will be developed for each general type of bus lane/busway and applied to the calculated quantity of each type within each plan sheet and capital cost segment.

20 – Stations/Transit Stops. For purposes of determining stations and transit stops, a unit price will be developed for each of the general types of stations based on the design cross sections developed in the Phase 1 Screening portion of the project and further refined in subsequent phases. Cost estimates for each station type will be dependent upon the amenities that would be included by station type, which will be specified by LTD. Each park-and-ride lot (if any) will be costed as a separate specific unit, based

on the approximate size, configuration, location, amenities, etc, that would be included in the park-and-ride lot.

30 – Support Facilities. Support facilities generally consist of operation and maintenance facilities needed to support transit revenue vehicles, such as buses or bus rapid transit vehicles. Support facilities include the number of maintenance bays, storage area and dispatch facilities. Sizing of new support facilities or expansion of existing support facilities will be based upon peak load vehicle requirements for each alternative configured as a system with other alternatives as well as ratios between vehicle size and support facility size. Cost estimates for support facilities will include real estate costs and improvement costs (e.g., buildings, sitework, etc.). Costs for existing support facilities will be provided by LTD. LTD will estimate the number of vehicles that would be supported by a maintenance bay and the capital cost per bay.

40 – Sitework. Sitework encompasses all work outside of the bus lane/busway envelope needed to complete the project. This work can be categorized as three major elements of work: roadway widening, signal reconstruction and sidewalk reconstruction. Quantities for major elements of construction need to accomplish these three general types of work. The quantities will be calculated based on the alternative concept plans and multiplied by appropriate unit costs. In some instances, other major work such as bridge construction will also be estimated when identified in the Level 2 AA.

50 – Systems. This item includes the installation of conduit, vaults and conductor/fiber-optic necessary to provide the communications backbone for such items as closed-circuit television cameras, next bus reader boards and intercoms on the station platforms. The cost will be estimated using a unit price per route mile based on unit bid analysis completed on other projects and provided by LTD.

60 – Right of Way. Right of way costs will be estimated by calculating the approximate area of acquisition needed to accomplish the construction required for each segment of each alternative. The cost of this acquisition of property will be based on a prorated cost per square foot from the values used by the County for tax assessment. Locations where an acquisition may require displacement of a business or residence will also be identified and an additional cost to relocate the impacted occupant (e.g., resident, business) will be added to the estimate and the total area of the parcel was included as an acquisition. Parking and access impacts will be assessed and quantified under this cost category.

70 – Vehicles. Revenue vehicle needs will be calculated based upon a peak load analysis by vehicle type for system configurations of the alternatives, as discussed under 30 – Support Facilities. Revenue vehicles will include buses (possible of varying lengths/capacities) and a standard BRT vehicle with a configuration similar to LTD's current BRT fleet. Unit costs for the vehicles will be based on recent purchases by LTD and other similar transit properties, the estimated size of the fleet purchase(s) and other factors that may significantly affect pricing.

80 – Professional Services. Professional services will be estimated on the basis of percentages of construction costs with allocated contingencies. Professional services will not include an additional contingency as that would potentially compound the contingency already allocated to the construction cost categories. The total work under this line item will be approximately 25 percent of the construction subtotal – a final percentage to be used will be based upon a review of the Pioneer Parkway and Franklin projects and an assessment of any special conditions that may apply to the MovingAhead Project.

90 – Contingencies. Project contingencies are divided into two types, allocated and unallocated. Allocated contingencies will be applied to each major construction category listed above based on the level of design detail. These contingencies will account for the general level of detail available upon which to complete the estimate, cover items not quantified or for which a cost cannot currently be determined. As the design progresses these contingencies will decrease at each step of project

development until it is completely eliminated upon completion of the construction contract documents. The level of allocated contingency is applied at the following rates (these rates may be adjusted based on LTD's documented experience with similar projects and/or other factors):

Table 5.3-1. Contingency Percentages

Item	Percentage
Guideway	20%
Stations	25%
Systems	30%
Sitework	35%
Right of way	20%
Vehicles	10%
Professional Services	15%

Unallocated contingencies will be included to cover unexpected changes in project scope, higher than predicted inflation, and any such items that cannot be identified at this level of development. At this point for this project, an unallocated contingency of 5 percent is expected to be used, contingent on further review of the West Eugene project and anticipated special circumstances for the MovingAhead project.

Bicycle and pedestrian cost estimates will be developed separately from these cost categories, based on research into historic construction bid data from other similar projects including existing EmX corridors and recent bicycle and pedestrian projects.

5.4 References

Federal Transit Administration. United States Department of Transportation. 2014. Standardized Cost Categories. (http://www.fta.dot.gov/12305_15612.html)

6. Cultural Resources

This section describes the analysis methodologies and data to be used for the Cultural Resources evaluation for the MovingAhead project. The purpose of the historic resource evaluation is to ensure that the proposed project complies with laws, regulations, and policies set forth at the federal, state, and local levels. The extent to which these historic resource laws and regulations might apply to this project will depend upon the resources encountered within the project area. The analysis will comply with the National Environmental Policy Act (NEPA), Section 106 of the National Historic Preservation Act (NHPA), applicable state environmental policy legislation, and local and state planning policies.

6.1 Relevant Laws and Regulations

Several federal, state and local environmental laws and regulations addressing historic resources may apply to the project. Legislative mandates and regulatory requirements that may apply include the following:

6.1.1 Federal

National Environmental Policy Act of 1969, 42 U.S.C. 4321-4347. The National Environmental Policy Act (NEPA) requires that federal agencies consider environmental impacts before taking actions that could significantly affect the human environment. As interpreted by the Council on Environmental Quality (CEQ), NEPA requires that "reasonably foreseeable" direct, indirect, and cumulative effects of a proposed action be considered in the decision making process. The term "effects" includes "aesthetic, historic, cultural, economic, social, or health" effects.

National Historic Preservation Act of 1966, 16 U.S.C. 470. (http://www.law.cornell.edu/uscode/html/uscode16/usc_sec_16_00000470----000-.html). This act is the primary authority used in complying with the nation's cultural resources protection objectives.

Antiquities Act of 1906, 16 U.S.C. 431-433, (http://www.cr.nps.gov/local-law/anti1906.htm). This act protects historic, prehistoric ruins, monuments, or objects of antiquity located on lands owned or controlled by the U.S. Government.

Historic Sites Act of 1935, 16 U.S.C. 461-467 (http://www.cr.nps.gov/local-law/FHPL_HistSites.pdf). This act is a basic authority for the Secretary of the Interior to adopt rules and regulations concerning historic properties.

Section 4(f), Department of Transportation Act of 1966, 49 U.S.C. 303, 23 U.S.C. 138 (http://www.environment.fhwa.dot.gov/projdev/pd5sec4f.asp). This act requires that there be no constructive use for a highway project of historic sites, in addition to publicly owned parks, recreation areas, and wildlife and waterfowl refuges, unless there is no prudent and feasible alternative to the use of such land.

Archaeological and Historic Preservation Act of 1974, 16 U.S.C. 469 (http://www.cr.nps.gov/local-law/FHPL_ArchHistPres.pdf). This statute requires that federal agencies preserve historical and archaeological data (including relics and specimens) that might otherwise be irreparably lost or destroyed as the result of any alteration of the terrain resulting from any federal construction project or federally licensed activity or program. The Act greatly expanded the number and range of federal agencies that must take archeological resources into account when executing, funding, or licensing projects.

36 CFR Part 800, Protection of Historic Properties (http://www.achp.gov/regs-rev04.pdf). This regulation sets forth the process by which federal agencies account for the effects of their undertakings on historic properties eligible for the National Register of Historic Places. It outlines the procedures for how federal agencies meet these statutory responsibilities.

36 CFR Part 63 (http://archnet.asu.edu/Topical/CRM/usdocs/36cfr63.html). These regulations explain how federal agencies can identify and evaluate the eligibility of properties for inclusion in the National Register of Historic Places.

40 CFR 1508.27 (http://www.ecfr.gov/cgi-bin/retrieveECFR?gp=1&SID=e5af297e1a9d16e1d637e3e3f2c32e25&ty=HTML&h=L&mc=true&r=PART&n=pt40.33.1508#se40.33.1508_127). This regulation provides guidance on defining significance thresholds for various environmental disciplines, specifically pertaining to project impacts.

Executive Order 11593 (http://www.gsa.gov/portal/content/101025). This order directs federal agencies to protect and enhance cultural sites, including those non-federally owned, through inventory and evaluation.

6.1.2 State

Oregon Revised Statutes (ORS) 97.740-97.760 (Indian Graves and Protected Objects) (http://www.oregonlaws.org/ors/97.740), 358.905-358.955 (Archaeological Objects and Sites) (https://www.oregonlegislature.gov/bills_laws/lawsstatutes/2013ors358.html), and 390.235 (Permit and Conditions for Excavation or Removal of Archaeological or Historical Materials) (http://www.oregonlaws.org/ors/390.235). These statutes protect Native American artifacts and human remains, including prohibiting the destruction or alteration of archaeological sites and objects on private or public lands in Oregon without a state permit.

ORS 358.653 (https://www.oregonlegislature.gov/bills_laws/lawsstatutes/2013ors358.html). This statute requires that any state agency or political subdivision responsible for real property of historic significance must, in consultation with the State Historic Preservation Officer, institute a program to conserve the property and assure that such property will not be inadvertently transferred, sold, demolished, substantially altered or allowed to deteriorate.

Oregon Statewide Planning Goal 5 (OAR 660-015-0000) Natural Resources, Scenic and Historic Areas, and Open Spaces (http://www.oregon.gov/LCD/docs/goals/goal5.pdf). Under Goal 5, local governments throughout Oregon have adopted programs that will protect natural resources and conserve scenic, historic, and open spaces resources. Cultural areas, including historic and archaeological resources, are among the resources recommended for inventory by local governments and state agencies.

6.1.3 Local

Historic Structures of Sites Combine Zone (/H-RCP). The Lane County Code 16.233, Historic Structures of Sites Combine Zone (/H-RCP), is an ordinance providing for review of building permits or demolition permits for historic structures or sites to ensure preservation. Permits are required for the alteration or demolition of a historic structure or site. Only minimum alteration of historic structures or sites or their environment shall be allowed in order to achieve the intended use, and the distinguishing original qualities or character of a historic building, structure, or site and its environment should not be destroyed.

Article 30 (Historical Overlay District), Springfield Development Code. The purpose of Article 30 is to encourage the restoration, preservation and adaptive use of Historic Landmark Structures and Sites within the City of Springfield. The Historic Overlay District implements the various historic policies of the Metro Plan, the Washburne Historic Landmark District, Chapter 1 of the Springfield Code (1965), and OAR Chapter 660.

Springfield Historic Design Guidelines. These design guidelines, based on the Secretary of the Interior's Standards for Rehabilitation, are intended to provide guidance for ways in which to appropriately maintain, rehabilitate, and utilize historic resources in the City of Springfield and their settings. Guidelines for public works projects are relevant to the MovingAhead project.

Historic Zoning District (S-H). The City of Eugene's S-H Historic Zoning designation (EC 9.3020 and EC 9.3450) is used selectively to help ensure the conservation of historic properties in the City of Eugene. Properties with the S-H Historic zoning overlay are subject to the land use regulations appropriate to their underlying zoning district (i.e. medium density residential, light industrial). However, the S-H Historic overlay designation allows greater flexibility with allowable uses for the property, with a goal of finding a use that is compatible with the historic character of the property and will help ensure its continued productive use. An example of this is allowing a professional office in a historic house in a residential district where such an office would not normally be permitted. Before a property can receive the S-H Historic zoning designation it must first be designated as a City Landmark or be listed in the National Register of Historic Places.

6.2 Analysis Area

The MovingAhead project encompasses a number of corridors throughout the cities of Eugene and Springfield, Oregon and unincorporated Lane County. Establishing an Area of Potential Effect (APE) for Section 106 resources requires a tiered process focusing on two sequential steps: overall study area and APE.

First, for the purposes of establishing a historical context for the project, an overall study area has been identified. This overall study area is defined as one-quarter mile from the proposed project's physical improvements. This one-quarter mile study area will provide a framework for determining potential direct, indirect and cumulative impacts to historic resources, notably those indirect or cumulative impacts that could affect the overall context of the historic landscape. Within the one-quarter mile study area, documentary research using both primary and secondary data will be gathered noting both potential traffic impacts as well as the range of historic resources known to be present, with special note taken of previously inventoried resources, National Register listed historic districts, properties designated as National Register listed or eligible, and Statewide Planning Goal 5-protected historic resources.

Second, the project will establish an APE for addressing the potential for all direct, indirect and cumulative impacts to resources (e.g. property acquisition, demolition). This APE for potential impacts to historic resources will be established at approximately 350 feet from either side of each proposed alignment alternative. This APE is based on the FTA *Transit Noise and Vibration Impact Assessment Manual*, May 2006 and the Oregon Department of Transportation (ODOT) *Traffic Noise Manual,* January 2007 and is established in particular to ensure that potential noise and visual impacts to historic resources are captured. All other impacts are expected to generally occur to parcels directly adjacent to the proposed improvements, in an area less than the 350-foot boundary; however, using a 350-foot boundary would capture any potential impacts to resources.

Based on this two-step process, LTD and FTA will develop a proposed APE for Section 106 analysis. The proposed APE will need to be approved by the Oregon State Historic Preservation Office (SHPO) once the extent of direct landscape alterations and the indirect impacts to traffic patterns of the project are known.

The area of potential effect for archaeological resources will be confined to locations that will be directly impacted by the project, including locations where historical structures would be removed by the proposed project.

6.3 Contacts and Coordination

6.3.1 Federal

Federal Transit Administration, Region X

6.3.2 State

Oregon State Historic Preservation Office (SHPO), Salem, Oregon

6.3.3 Local

- City of Springfield, OR
- City of Eugene, OR
- Lane County, OR

6.3.4 Other

Project engineering and environmental team

6.4 Level 1 Screening

No data will be collected for the Level 1 Screening

6.5 Level 2 Alternatives Analysis

Historic resources tasks, to be accomplished by cultural resource professionals meeting the qualification standards set forth by the Secretary of the Interior, will include:

- Coordination with the FTA and SHPO on defining the APE
- Documentary research using primary and secondary source materials on file at Oregon SHPO (to identify properties designated as National Register listed or eligible, or Statewide Planning Goal 5-protected historic resources), Lane County, City of Springfield, City of Eugene, and other appropriate archives
- Field survey to identify potential archaeological resources and preparation of archaeological report
- Field reconnaissance, windshield, and intensive-level survey of historic resources within the APE (building, structures, objects, and sites)

- Assessments and determinations of significance according to the National Register of Historic Places criteria; and preliminary findings of potential project effect in accordance with Section 106 (36 CFR 800.5)

Properties identified in the APE that are of sufficient age to be eligible for the NRHP either currently or within the anticipated construction period (that is, properties that are currently more than 45 years of age will be 50 years of age by the anticipated construction period) will be identified in a historic resources existing conditions report. The existing conditions study will present resource information in a baseline format to include photographs, a brief description of each resource, and a map that identifies the location of each potential historic resource. The report will indicate recommendations on the potential eligibility of all identified properties.

FTA and SHPO will review the historic resources existing conditions report and, on the basis of the APE and the potential significance of the identified resources, will determine which resources will be recorded in the Oregon SHPO electronic historic resources database. Formally recorded resources will be reviewed by SHPO staff for concurrence on properties that are considered eligible for the National Register of Historic Places. Staff will include location maps and photographs with the SHPO database submittals.

Once SHPO has concurred on the eligible historic properties, project staff will assess and evaluate the project's effects on these resources. Determination of Eligibility (DOE) forms will only be prepared for all potentially eligible historic resources if requested by SHPO and FTA. For each resource within the APE that is formally determined eligible for the NRHP, a Finding of Effect (FOE) will be prepared using criteria set out in 36 CFR 800.9 for Effect and Adverse Effects to determine if there is "no effect," "no adverse effect," or an "adverse effect." If there are any "adverse effects," mitigation will be developed in a Memorandum of Agreement, and Section 4(f) documentation will be prepared as appropriate.

Throughout the Section 106 process, coordination and consultation is required with the Oregon SHPO and with consulting parties that may include Certified Local Government Historic Preservation Commissions, local planners, historical societies, Native American tribes, and private interest groups. The project's communications and coordination with Native American tribes will be conducted based upon FTA's letter to the tribes, dated September 18, 2008. In summary, FTA will coordinate all substantive communications directly with Native American tribes where their coordination and consultation is required. Communications not requiring concurrence or concerning a finding or determination will be conducted by LTD.

6.5.1 Data Collection

The following data sources will be consulted for historic, archaeological and cultural resources impact analysis:

- Oregon SHPO National Register and State Inventory files
- Lane County Inventory and Goal 5 Historic Resources
- City of Springfield Inventory and Goal 5 Historic Resources
- City of Eugene Inventory and Goal 5 Historic Resources
- Tax records from Lane County
- Field investigations (reconnaissance to confirm and/or modify existing data, and locate and identify any previously uninventoried historic resources)

- Sanborn Fire Insurance maps and other historical maps
- City of Eugene
- City of Springfield
- Conceptual Designs Set
- Visual Resources Baseline Conditions
- Visual Resources Impact Analysis Technical Report
- Noise Baseline Conditions
- Noise Impact Analysis Technical Report

6.5.2 Significance Thresholds

Historic resources, including archaeological resources, are determined to be significant based on the criteria set forth in 36 CFR 63. The goal of the project is to avoid impacts to significant historic resources to the maximum extent possible to minimize harm. A significant impact with respect to NHPA Section 106 would result if the project resulted in the direct loss, destruction, or alteration of the historic character or integrity of a significant cultural or historical resource. Indirect impacts (such as changes in visual setting including removal of visually prominent trees or alterations to the streetscape, aesthetics, noise, traffic, accessibility, or use) affecting the integrity of the property's location, setting, feeling, or association may also result in a significant adverse effect, as specified in 36 CFR 800.5.

Historic properties determined to be National Register-eligible shall also be subject to Section 4(f) provisions, and the historic resources analysis will be closely coordinated with the Section 4(f) analysis. Properties that are protected by state or local regulations (such as Oregon Statewide Planning Goal 5), but are determined by SHPO to be National Register-ineligible, shall nonetheless be determined to be subject to Section 4(f) evaluation requirements.

6.5.3 Impact Analysis

A high level determination of impacts and effects to historic resources will be conducted for screening purposes for both above ground and below ground resources. This preliminary analysis will be based upon the findings of the data collection and significance assessment of historic resources. A final impact analysis for the final project design will be conducted during the NEPA documentation (6.6 below).

6.6 NEPA Documentation

The NEPA documentation will build upon the report findings from the Level 2 AA (6.5) and assumes a DCE. This phase will focus on corridor-specific surveys and assessments as needed for engineering designs. The preliminary findings of project effect will be refined in response to final design.

The following historic resources tasks will be accomplished by cultural resource professionals meeting the qualification standards set forth by the Secretary of the Interior:

- Continued coordination with the FTA and SHPO in finalizing the Area of Potential Effect (APE)
- Update documentary research conducted for the Level 2 AA report as appropriate
- Field survey to ensure complete coverage of final APE to identify archaeological resources and preparation of final archaeological report for SHPO concurrence

- Intensive-level survey of historic resources within the APE (building, structures, objects, and sites)
- Supplementary assessments and determinations of significance according to the National Register of Historic Places criteria
- Findings of project effect in accordance with Section 106 (36 CFR 800.5)
- SHPO concurrence for archaeological technical report and for historic resources inventory and assessment
- Preparation of Memorandum of Agreement(s) (MOA) if there is any adverse effect to listed or eligible historic resources, and
- Preparation of Section 4(f) Evaluation(s) if there are any property "uses" that alter the characteristics that qualify a historic property for the NRHP.

Throughout the Section 106 process, coordination and consultation will continue with the Oregon SHPO and with consulting parties that may include Certified Local Government Historic Preservation Commissions, local planners, historical societies, Native American tribes, and private interest groups (see 6.5).

6.6.1 Impact Analysis

6.6.1.1 Long-Term Impacts Analysis Approach

Determination of impacts and effects to historic resources will be dependent upon the findings of ancillary studies, including but not restricted to traffic, noise, air and aesthetics. The effects of traffic levels on historic properties will be determined by the findings pertaining to indirect impacts of traffic on noise levels and air quality. The effects of the project to the visual environment associated with historic resources will be based on the visual resources impact analysis. Beneficial effects may include improved access to historic community resources. The thresholds used for determining significant impacts in these other disciplines will be the same ones used for the Section 106 assessments.

6.6.1.2 Short-Term Impacts Approach

Construction impacts within the APE may result in the loss, destruction, or alteration of the historic character or integrity of significant cultural or historical resources and would be evaluated in the Section 106 process in Findings of Effect (FOE) and be mitigated for in a Memorandum of Agreement (MOA). Aside from these direct impacts, it is assumed that there will be no additional short-term impacts (noise, air, access, etc.) to historic resources associated with construction.

6.6.1.3 Indirect and Indirect Impact Analysis Approach

Other past, current and future transportation projects in the vicinity of the APE, as defined for the project, will be reviewed for additive impacts to historic and cultural resources. For indirect effects, the APE will be re-assessed if historic structures are removed or if structures are removed and expose historic structures not previously visible. Notable trends in degradation of housing, neighborhoods, commercial or industrial areas containing historic resources, as identified by local planning officials, will be noted.

6.6.1.4 Mitigation Measures Approach

For historic resources, mitigation plans will be designed and drafted in cooperation with LTD, SHPO, local jurisdictions, and FTA. Mitigation measures may include interpretive panels, photo documentation,

Historic American Building Survey/Historic American Engineering Record reporting, historic context statements, and/or other measures as agreed upon. Cultural resource mitigation measures must be agreed upon in a Memorandum of Agreement (MOA) as part of the NEPA documentaiton.

6.7 References

The following references were relied on in making this report:

- The statutes and rules referred to in the Relevant Laws and Regulations Section
- Heritage Research Associates files for previous projects in the analysis area
- Conversations with project team
- *Guidelines for Conducting Historic Resource Surveys in Oregon*, Revised 2011, State Historic Preservation Office, Oregon Parks And Recreation Department

7. Energy and Sustainability

This section of the Report addresses the methods and data that will be used to assess potential affects to energy and sustainability use as a result of the project's various alternatives and design options under study in the LTD MovingAhead project.

The purpose of the energy and sustainability evaluation is to identify potential adverse impacts and beneficial effects of the various alternatives and design options on energy use for LTD's MovingAhead project and LTD's adopted policies regarding sustainability. At a basic level, energy use is a process where raw materials are converted into energy to power transit, personal vehicles, and construction equipment, as well as to produce materials for transportation facilities. As a byproduct of energy use and the conversion process, outputs are created such as carbon dioxide. As the effects of carbon dioxide (greenhouse gas emissions) are better understood in terms of climate change, more efforts are focused on energy conservation and reduction of emissions output. Reducing the amount of energy and carbon dioxide production in transportation can be accomplished by reducing miles traveled, increasing the number of people in a vehicle, increasing public transportation use, utilizing alternative fuel types, increasing the fuel efficiency of vehicles, or by reducing delay created by congestion. The Energy and Sustainability analysis will use energy as a framework for evaluating sustainability of the various alternatives and design options under study. Additionally, the Sustainability analysis will qualitatively address LTD's Sustainability Policy, adopted September 18, 2013, and the City of Eugene's Sustainability Policy, adopted November 13, 2006. These policies demonstrate LTD's commitment to advancing the social, economic and environmental sustainability of the Eugene-Springfield metropolitan area. LTD has committed to pursue action in four areas:

- Providing quality transit service
- Using environmentally-friendly vehicles
- Constructing earth-friendly projects
- Implementing sustainable operating practices

7.1 Methods

Energy use and supply in the project area will be generally characterized for fossil fuels and electricity, including supply sources, rates of energy use, and demand forecasts. For example, existing energy consumption and supply data will be provided by documents such as the State of Oregon's Energy Plan.

Energy use for operation and construction will be determined for each of the project alternatives and the baseline (present day) condition. Operational energy use includes the amount of fuel energy used to operate BRT vehicles for each alternative and design options including the anticipated background traffic for each scenario. This estimate will be calculated based on estimated VMT and average fuel efficiency (miles per gallon) of motor vehicles and the BRT fleet.

To determine construction energy, an analysis method developed by the California Department of Transportation (Caltrans) will be used which calculates energy use based on energy factors for manufacturing, processing and placement of construction materials. Construction energy will be calculated based on the construction and permanent footprint provided in the *Conceptual Designs Set*.

A carbon footprint analysis will estimate greenhouse gas (GHG) emissions for the alternatives based on operational fuel energy and construction energy outputs, with consideration of:

a. forecasts of added / reduced vehicle-miles resulting from the proposed alternative

b. increased / reduced emissions associated with congestion or its alleviation

As such, the energy use analysis and factors such as VMT and traffic delay/congestion (derived from the traffic modeling exercise) will be utilized to determine potential carbon output for the project alternatives. The short term construction energy use and carbon output and longer term operational energy use and carbon output will be totaled for each alternative. Project staff will identify potential impacts to sustainability for those alternatives that exhibit relatively higher levels of energy consumption and carbon output.

7.2 Relevant Laws and Regulations

No local, state or federal laws constrain energy use or regulate carbon output or sustainability practices; however, some policies do address energy use and sustainability, mainly in terms of conserving energy or providing means to improve the efficiency of energy use. These policies may be applicable to this Energy and Sustainability analysis and are discussed in the section below.

7.2.1 Federal

National Environmental Policy Act of 1969 (NEPA). 42 USC 4332. NEPA requires that federal agencies consider environmental impacts before taking actions that could affect the human environment. As interpreted by the Council on Environmental Quality (CEQ), NEPA requires that "reasonably foreseeable" direct, indirect, and cumulative effects of a proposed action be considered in the decision making process. As defined by NEPA, the term "effects" includes "aesthetic, historic, cultural, economic, social, or health" effects. Energy use is one of the environmental elements typically assessed in NEPA documentation.

Title 42 of the United States Code (USC). 42 USC 6201, 13401, and 13431. Title 42 of the USC focuses on energy conservation, reduced reliance on foreign energy sources (mainly petroleum), use of alternative fuels, and increased efficiency in energy use. Policies related to energy include:

- Providing for improved energy efficiency in motor vehicles (42 USC 6201).
- Increasing economic efficiency by meeting future needs for energy services at the lowest cost considering technologies that improve the efficiency of energy end use, while conserving energy supplies such as oil (42 USC 13401).
- Reducing air, water, and other environmental impacts (including emissions of greenhouse gases) related to energy production, distribution, transportation, and use by development of an environmentally sustainable energy system (42 USC 13401).
- Reducing demand for oil in the transportation sector for all motor vehicles (42 USC 13431).

Energy Independence and Security Act of 2007. Public Law (PL) 110-140. December 18, 2007. The Energy Independence and Security Act of 2007 amended and now supersedes several previous energy policy acts, including the Energy Policy Act of 2005, National Energy Act of 1978 (PL 95-619), the Energy Policy and Conservation Act Amendments of 1985 (PL 99-58), and the Energy Policy Act of 1992 (PL 102-486). The Energy Independence and Security Act of 2007 includes transportation-related provisions which:

- Increase production of biofuels.

- Increase efficiency in motor vehicles.

Moving Ahead for Progress in the 21st Century (MAP-21) as amended. PL 112-141. MAP-21 was established to maintain and expand the national transportation system. The purpose of the act is to *"create a streamlined, performance-based, and multimodal program to address the many challenges facing the U.S. transportation system. These challenges include improving safety, maintaining infrastructure condition, reducing traffic congestion, improving efficiency of the system and freight movement, protecting the environment, and reducing delays in project delivery."*

MAP-21 strengthens the metropolitan planning process by continuing to give more emphasis to intermodal planning, coordination with land use planning and development, and consideration of economic, energy, environmental, and social effects. This process is enhanced by incorporating performance goals, measures, and targets into the process of identifying needed transportation improvements and project selection.

MAP-21 has been extended by PL 113-159 through May 31, 2015, and is currently in effect.

EPA Light-Duty Truck Greenhouse Gas Standards. The EPA and the National Highway Traffic Safety Administration (NHTSA) jointly developed GHG emissions and fuel economy standards in September 2009 under the Clean Air Act for 2012-2015. These standards apply to light duty cars and truck in model years 2012-2016 (first phase) and model years 2017-2025 (second phase). This program is projected to cut 6 billion metric tons of GHG over the lifetimes of vehicles sold in model years 2012-2025 and reduce America's dependence on oil by more than 2 million barrels per day in 2025.

7.2.2 Regional

Western Climate Initiative. 2012. The Western Climate Initiative (WCI) is a regional GHG reduction program. It includes seven U.S. States (Arizona, California, Montana, New Mexico, Oregon, Utah) and four Canadian provinces (British Columbia, Manitoba, Ontario, and Quebec), as well as additional observer states and provinces in the United States, Canada, and Mexico.

The initiative seeks to reduce GHG to levels 15 percent below 2005 levels by 2020. This will be met through a regional market-based multi-sector mechanism and other policies. The cap-and-trade program has a broad scope that includes six greenhouse gases and will cover 90 percent of GHG emissions from the region when fully implemented.

7.2.3 State

State of Oregon Energy Plan 2013-2015. The Oregon Energy Plan includes an energy action plan with goals and recommendations to help ensure that Oregon has an adequate supply of affordable and reliable energy. Goals related to transportation energy include the following:

- Implement Oregon's Energy Incentive Program (EIP), which includes allocation of credits for transit and creation of alternative fuel vehicle infrastructure.
- Implement strategy for reducing greenhouse gases (this includes emissions from transportation sources).

Oregon State Transportation Plan. 2006. The proposed 2006-2030 State Transportation Plan continues an emphasis on efficient energy use for transportation. The plan has seven main goals, two of which relate to energy. Goal 3, Economic Vitality, promotes the expansion and diversification of Oregon's economy through the energy efficient movement of people, goods, services and information. Goal 4,

Sustainability, focuses on "providing a transportation system that meets present needs without compromising the ability of future generations to meet their needs..." Goal 4 addresses energy: "It is the policy of the State of Oregon to support efforts to move to a more diversified and cleaner energy supply, promote fuel efficiencies, and prepare for possible fuel shortages."

Oregon Highway Plan (OHP). 2006. The OHP defines policies and investment strategies for Oregon's state highway system for the next 20 years and further refines the goals and policies of the Oregon Transportation Plan. Several of these relate to energy use and are similar to those found in the Oregon Transportation Plan. For example, Goal 4 is "to optimize the overall efficiency and utility of the state highway system through the use of alternative modes and travel demand management strategies." Travel demand management (TDM) techniques are discussed under Policy 4.D. These TDM measures have the goals of decreasing energy consumption, congestion, and vehicle miles traveled (VMT).

Oregon Statewide Planning Goals. Oregon Administrative Rules (OAR) 660-14. Oregon has developed and maintained a strong statewide program of land use planning since the early 1970s. The core of this program consists of 19 statewide planning goals. Two of these goals, 12 and 13, relate to energy.

Goal 12, Transportation, is to provide and encourage a safe, convenient and economic transportation system. It states that transportation plans must encourage the conservation of energy. In addition, transportation systems shall, to the fullest extent possible, be planned to utilize existing facilities and rights-of-way within the state, provided that such use is not inconsistent with the environmental, energy, land use, economic or social policies of the state.

Section 35 of OAR 660-12 relates to evaluation and selection of transportation system alternatives. It states "the transportation system shall minimize adverse economic, social, environmental and energy consequences."

Goal 13, Energy Conservation, states that land and uses developed on the land shall be managed and controlled so as to maximize the conservation of all forms of energy, based on sound economic principles (OAR 660-015).

Oregon Revised Statutes (ORS) 2013 Edition. Oregon Revised Statute 469.010 states that "energy-efficient modes of transportation for people and goods shall be encouraged, while energy-inefficient modes of transportation shall be discouraged."

Oregon Sustainable Transportation Initiative (OSTI), 2010. OSTI is a "statewide effort to reduce GHG emissions from transportation while creating healthier, more livable communities and greater economic opportunity." It is designed to help the state meets its goal of reducing GHG emissions by 75 percent below 1990 levels by 2050.

Oregon Senate Bill 838C – Renewable Portfolio Standard. 2007. Senate Bill 838 establishes a Renewable Portfolio Standard (RPS) for electricity. The bill requires that 25 percent of Oregon's electric load come from new renewable energy by 2025. The RPS sets interim targets of 5 percent by 2011, 15 percent by 2015 and 20 percent by 2020. The RPS requirement of 25 percent by 2025 applies to electric utilities and any electricity service suppliers that serve at least 3 percent of Oregon's electric load. This covers Oregon's three largest electric utilities with over 75 percent of Oregon's electric load.

Oregon House Bill 3543. 2007. Oregon House Bill 3543 establishes GHG reduction goals for the State:

- 2010: Stabilize emissions and begin reduction
- 2020: Achieve 10 percent reduction below 1990 levels
- 2050: Achieve 75 percent reduction below 1990 levels

House Bill 2001, the Jobs and Transportation Act. 2009. The following GHG reduction strategies are included in this bill:

- New Funding. HB 2001 directs ODOT to participate in and finance the development of transportation plans needed to reduce GHG emission by light vehicles by working with multiple agencies, local governments, and other partners
- New Criteria for Funding. HB 2001 calls for updating the criteria used to select projects programmed in the Statewide Transportation Improvement Program to ensure that project selection is consistent with GHG reduction goals
- Scenario Planning. HB 2001 directs Portland Metro and the Central Lane MPO to each develop two or more land use/transportation scenarios reducing GHG from cars while planning for population growth.
- Other. HB 2001 also directs ODOT to create a provision for medium speed electric vehicles so that when they are manufactured to meet federal passenger car safety standards ODOT can be ready. In addition, HB 2001 directs ODOT to work with the Travel Information Council and the private sector to develop a plan for installing electric motor vehicle charging stations at rest areas.

House Bill 2186. 2009. The following GHG strategies are included in this bill:

- Low carbon fuel standards for fuel that is used for transportation. The aim of Oregon's low carbon fuel standard will be to reduce the average carbon intensity of the mix of transportation fuels used in Oregon by 10 percent by 2020.
- Establishment of a Metropolitan Planning Organization (MPO) Greenhouse Gas Emissions Task Force. The charge to the Task Force was to recommend legislation to interim Legislative assembly committees to establish a process for adopting and implementing GHG emissions reductions plans, including a schedule for the planning process and an estimate of necessary funding. The focus is on reducing GHG emissions from light motor vehicles of 10,000 pounds or less and must consider contributions of improved vehicle technologies and fuels.
- Requirements to maintain or retrofit medium-duty and heavy-duty trucks in order to reduce aerodynamic drag and otherwise reduce GHG emissions from those trucks.
- Restrictions and prohibitions on the sale and distribution of after-market motor vehicle parts, including but not limited to tires, if alternatives are available that decrease GHG emissions from motor vehicles.
- Requirements for motor vehicle service providers to check and inflate tire pressure according to manufacturer recommended specifications.
- Restrictions on engine use by parked commercial vehicles, including but not limited to medium-duty trucks and heavy-duty trucks, and by commercial ships while at port, and requirements that truck stops and ports provide alternatives to engine use such as electric power.

Senate Bill 1059. 2010. On March 18, 2010, Governor Ted Kulongoski signed House Bill 1059. This legislation directs Oregon Transportation Commission (OTC) to adopt statewide transportation strategies on GHG emissions to aid in achieving emission reduction goals in ORS 468A.205. In addition, the legislation requires:

- ODOT and DLCD to coordinate and consult with metropolitan planning organizations (MPOs) and other state agencies to develop a state-level strategy to reduce greenhouse gases from transportation.
- Development of a toolkit to assist local governments and MPOs in reducing greenhouse gases from transportation.
- Development of guidelines for scenario planning.
- Information to be provided to DLCD to set transportation-related GHG reduction targets for major metropolitan areas
- Outreach and education to the public and work with local governments within urban areas served by an MPO in order to consider how they may reduce greenhouse gases short-term in the transportation sector.

7.2.4 Local

Eugene-Springfield Metropolitan Area General Plan. 2010 Update. The Metro Plan includes an energy element in section III.J. This section discusses conservation and strategies to increase energy efficiency in areas such as transportation.

Lane Transit District Long-Range Transit Plan: Draft Goals, Policies, and Actions. 2013. Lane Transit District has developed policies to advance the social, economic and environmental sustainability of the Eugene-Springfield metropolitan area. In the policy, LTD commits to pursue action in the following six areas:

- Improve connectivity throughout LTD service area
- Ensure equitable and accessible transit service
- Maintain and enhance safety and security
- Use resources sustainably in adapting to future conditions
- Engage the regional community in short-term and long-term planning
- Sustain and enhance prosperity through investment in transit service and infrastructure.

Eugene Community Climate and Energy Action Plan. 2013 Progress Report. In September 2010, Eugene City Council adopted the Community Climate and Energy Action Plan. The plan contains three separate but overlapping goals:

- Reduce community-wide GHG emissions 10 percent below 1990 levels by 2020
- Reduce community-wide fossil fuel use 50 percent by 2030
- Identify strategies that will help the community adapt to a changing climate and increasing fossil fuel prices.

City Council of Eugene Resolution No 4618. On February 28, 2000 the City Council adopted Resolution No 4618 adopting a definition and statement of intent regarding the application of sustainability principles to the City of Eugene and affirmed the commitment of City elected officials and staff to uphold these principles

City Council of Eugene Resolution No 4893. On November 13, 2006 the City Council adopted Resolution No 4893 adopting a definition a resolution publicly committing the City of Eugene to sustainable

practices and to businesses that produce sustainable products and services. This resolution further states that the City Council will cooperate with other public agencies to promote sustainable practices and the use of sustainable products and services to achieve the long term outcomes in the report prepared by the Sustainable Business Initiative Task Force Report as accepted by the City Council on October 23, 2006. The intent of the declaration by the City is to spur the adoption of sustainable practices and the growth of sustainable industries within the private and non-profit sectors of the community and make it clear to City employees and other public agencies that incorporating sustainability into planning policy permitting and all forms of decision making is a City priority.

City of Eugene Ordinance 20540. In July 2014, the City of Eugene adopted Ordinance No 20540 adopting goals for climate action, climate assessment, climate benchmarks, and climate reporting. The goals related to climate action were:

- By the year 2020, all city-owned facilities and city operations shall be carbon neutral
- By the year 2030, the city shall reduce its use of fossil fuels by 50 percent compared to 2010 usage
- By the year 2030, all businesses, individuals, and others living or working in the city shall reduce the total (not per capita) use of fossil fuels by 50 percent compared to 2010 usage.

7.3 Contacts and Coordination

Project staff may coordinate with the following agencies for guidance and data collection:

7.3.1 Federal

- U.S. Department of Transportation
- U.S. Department of Energy
- U.S. Environmental Protection Agency
- Bonneville Power Administration

7.3.2 State

- Oregon Department of Environmental Quality
- Oregon Department of Transportation
- Oregon Department of Energy

7.3.3 Local

- City of Eugene Office of Sustainability
- City of Eugene Planning and Development Department
- City of Eugene Public Works
- City of Springfield Development Services
- City of Springfield Public Works
- Lane Council of Governments

- Eugene Water and Electric Board (EWEB)

7.3.4 Other

- Northwest Power Planning Council
- Pacific Northwest Utilities Conference Committee
- Local energy suppliers such as EWEB

7.4 Analysis Areas

In general, the analysis area for the energy and sustainability assessment will be within the footprint of the alignments selected for further analysis in the Level 2 AA Data Sources and Collection Methods

Generally, the Energy and Sustainability analysis will evaluate the differences in energy consumption and GHG emissions between the project's various alternatives and design options including the No-Build alternatives, based on the following:

- The forecast year is the "horizon" year of the 20-year planning period, in this case, 2035.
- VMT data are estimated in the LCOG regional travel demand model
- The project area consists of the corridor transportation network modeled for air quality and travel demand purposes.
- Energy consumption in British thermal units (Btus) is based on estimated changes in VMT as reported in Evaluation and Rating Process Final Policy Guidance for New and Small Starts (FTA 2013).
- The GHG emissions are calculated from the Btu estimates developed for the energy consumption estimate multiplied by standard tons of CO2/million Btu conversion template, provided in the Evaluation and Rating Process Final Policy Guidance for New and Small Starts (FTA 2013).

Project staff will collect regional and project specific data related to energy use and sustainability practices including the availability and existing use of energy in the Eugene-Springfield metropolitan area, and forecasts of future energy demand for various transportation-related fuels types particularly petroleum and electricity. Characterize the supply and demand for existing energy resources (natural gas, electricity and petroleum).

Project staff will obtain from other team members project related capital costs, operation and maintenance costs, BRT vehicle assumptions, and baseline and operational conditions (ADT, VMT) and energy used for associated maintenance and park-and-ride facilities. This will be used to determine operational fuel energy use and carbon output in the corridor—for the specific BRT alignments as well as anticipated background traffic.

7.4.1 Energy

The corridor VMT will be separated into passenger miles, heavy truck miles, and bus miles to account for differences in energy consumption levels. The Btu(s) per VMT for each mode will be taken from the FTA New Starts program standardized evaluation criteria as follows:

Table 7.5-1. Change in Energy Use Factors (Btu/VMT)

	Current Year	10-year Horizon	20-year Horizon
Automobile	7,559	6,167	5,633
Bus – Diesel	41,436	35,635	33,978
Bus – Hybrid	33,149	28,508	27,182
Commuter Rail – Diesel (new) and DMU	96,138	96,138	96,138
Commuter Rail – Diesel (Used)	96,138	96,138	96,138
Heavy Truck*	21,542*	21,542*	17,544*

Source: Federal Transit Administration New and Small Starts Evaluation and Rating Process Final Policy Guidance, August 2013
*Source: Calculation from data in U.S. Energy Information Administration Annual Energy Outlook 2015 With Projections to 2040, April 2015

The energy use factors for heavy trucks were calculated by dividing energy consumption by vehicle miles traveled. Both of these values are reported in the Annual Energy Outlook 2015 document for 2010 and 2035. The 2010 values were used to calculate both current year and 10-year horizon factors (since heavy truck energy standards have not been established yet for the near future); the 2035 values were used to calculate the 20-year horizon factor.

The operational fuel energy used by vehicles including buses will be determined based on several factors. These include the ADT, length of roadway segment and the energy consumption levels estimated by vehicle type. Vehicle fuel energy use will be calculated for the opening year and design year for all alternatives and design options. The general formula for calculating vehicle fuel energy use is:

$E = V \times L \times F$

where: E = Energy in Btu

V = Number of Vehicles (ADT)

L = Length of Roadway Segment (miles)

F = Btu estimates from FTA New Starts program standardized evaluation criteria

7.4.1.1 Greenhouse Gas

The calculation of the proposed unit rates for GHG emissions uses CO_2 equivalents (CO_2e). This is a factor that converts all GHG emissions (including, but not limited to, CO_2), which have different rates of affecting global warming, into CO_2 terms. The change in GHG emissions factors is listed in Table 7.5-2.

Once all of the energy consumption and GHG emission data is calculated, the various alternatives and design options will be compared to each other, including comparison to the No-Build alternatives.

Construction energy will be calculated based on the analysis method developed by the California Department of Transportation (Caltrans) in their 1983 report *Energy and Transportation Systems*. This will be used to calculate energy use based on energy factors for manufacturing, processing and placement of construction materials.

Using results from other analyses, project staff will qualitatively assess the various project alternatives and design options for consistency with LTD's adopted sustainability policies and programs in place at the time of the analysis.

Table 7.5-2. Change in Greenhouse Gas (CO_2e) Emissions Factors

	Current Year	10- Year Horizon	20-year Horizon
Automobile	532	434	397
Bus – Diesel	3,319	2,854	2,721
Bus – Hybrid	2,655	2,283	2,177
Bus – CNG	2,935	2,524	2,406
Bus – Electric	2,934	2,441	2,303
Heavy Rail	3,211	3,106	3,073
Light Rail and Streetcar	4,779	4,623	4,574
Commuter Rail – Diesel (new) and DMU	7,970	7,970	7,970
Commuter Rail – Diesel (used)	7,970	7,970	7,970
Commuter Rail – Electric and EMU	5,821	5,632	5,572
Heavy Truck	TBD	TBD	TBD

Source: Federal Transit Administration New and Small Starts Evaluation and Rating Process Final Policy Guidance, August 2013

Operational fuel energy use for an alternative will be translated into carbon output using carbon dioxide emissions standards published by the Transportation Energy Data Book, Table 11-11.

CO_2 emissions from a gallon of gasoline = 8,887 grams = 19.6 pounds/gallon

CO_2 emissions from a gallon of diesel = 10,180 grams = 22.4 pounds/gallon

(Note that many factors may effect these calculations, such as temperature and specific fuel blend, but for the purposes of this project the calculations will be used as the general standard)

7.5 Significance Thresholds

Project staff will compare energy use and carbon output among the alternatives. There is no regulatory threshold related to energy use and carbon output, per se. However, for the purposes of this project, impacts may be considered significant if:

- Based on the methodology described above, a project alternative exceeds the current baseline carbon output by more than 25 percent in the design year (2035).
- The project is determined to be inconsistent with LTD's adopted sustainability policies.

7.6 Impact Analysis

7.6.1 Long-Term Impacts Analysis Approach

Direct impacts for energy use are measured by the estimated amount of fuel consumed under the various project alternatives and design options. Estimated fuel consumption of project alternatives will be compared to the No-Build alternatives. These impacts will be quantified by Btus and represented in data tables within the energy and sustainability technical impact assessment memorandum.

Sustainability impacts of the various project alternatives will be qualitatively evaluated in terms of general consistency of the alternatives with LTD's adopted sustainability policies and programs in place at the time of the analysis. If project alternatives are not consistent with LTD's adopted policies, this analysis will identify any necessary changes to LTD's policies or programs to accommodate the

alternative. Additionally, interviews with LTD staff will be conducted to determine if the necessary changes would be opposed or favored.

7.6.2 Short-Term Impacts Approach

Construction of the proposed LTD MovingAhead project may cause short-term impacts such as increases in energy consumption. Design drawings for alternatives and construction management plans will be used to identify direct construction related impacts to energy and determine if construction management plans are consistent with LTD's adopted sustainability policies. Where direct impacts are identified, the significance thresholds will be applied.

7.6.3 Indirect Impact Analysis Approach

In addition to analyzing potential direct impacts to energy use, the analysis will include potential indirect impacts to energy consumption and sustainability policies resulting from each of the alternatives. This evaluation will include qualitatively determining if 2035 traffic volume forecasts and anticipated land use changes may potentially impact energy consumption and sustainability policies.

7.6.4 Cumulative Impact Analysis Approach

Cumulative impacts result from the combined impacts of the proposed project with those occurring in the past, present, and reasonably foreseeable future. A cumulative impact is the impact on the environment resulting from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (federal or nonfederal) or person undertakes such other actions.

Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time. Cumulative impacts may include the effects of natural processes and events, depending on the specific resource in question. Cumulative impacts include the total of all impacts to a particular resource that have occurred, are occurring, and will likely occur as a result of any action or influence. The cumulative impact analysis for energy and sustainability will be a comparison of the past, present, and reasonably foreseeable energy consumption impacts within a larger area of potential impact.

The Council on Environmental Quality provides an 11 step process for cumulative impact analysis in their report, Considering Cumulative Effects Under the National Environmental Policy Act, which is documented on the AASHTO Center for Environmental Excellence's site for Indirect Effects/Cumulative Impacts:

1. Identify the significant cumulative effects issues associated with the proposed action and define the assessment goals.
2. Establish the geographic scope for the analysis
3. Establish the time frame for the analysis
4. Identify other actions affecting the resources, ecosystems, and human communities of concern.
5. Characterize the resources, ecosystems, and human communities identified during scoping in terms of their response to change and capacity to withstand stresses.
6. Characterize the stresses affecting these resources, ecosystems, and human communities and their relation to regulatory thresholds.
7. Define a baseline condition for the resources, ecosystems, and human communities.

8. Identify the important cause and effect relationships between human activities and resources, ecosystems, and human communities.
9. Determine the magnitude and significance of cumulative effects.
10. Modify or add alternatives to avoid, minimize, or mitigate significant cumulative effects.
11. Monitor the cumulative effects of the selected alternative and adapt management.

Cumulative impacts will be qualitatively analyzed and will be based on comprehensive land use and transportation elements that are components of all build alternatives. This contextual analysis will include past, present and reasonably foreseeable future projects or actions occurring in the project area or the broader community which when combined with the project build alternatives, may lead to significant increases in energy consumption or conflicts with LTD's and the City of Eugene's adopted sustainability policies.

7.7 Mitigation Measures Approach

A qualitative analysis of likely impacts will be used to determine appropriate mitigation measures and to evaluate cost of measures and their potential effectiveness. Mitigation measures will also be prioritized to respond to the greatest land use impacts and coordinated with affected jurisdictions.

7.7.1 References

The following references were used in preparing this MDR:

AASHTO. Center for Environmental Excellence. 2015. (http://environment.transportation.org/environmental_issues/indirect_effects/)

Eugene-Springfield Metropolitan Area General Plan. 2010 Update. (http:/www.lcog.org/DocumentCenter/View/137)

Federal Transit Administration. United States Department of Transportation. 2013. New and Small Starts Evaluation and Rating Process Final Policy Guidance. (http://www.fta.dot.gov/documents/NS-SS_Final_PolicyGuidance_August_2013.pdf)

Oregon Department of Energy. 2013. State of Oregon Energy Plan 2013-2015. (http://www.oregon.gov/energy/docs/reports/legislature/2013/ODOE%202013%202015%20EnergyPlan.pdf).

State of California. Department of Transportation. Division of Engineering Services. Office of Transportation Laboratory. July 1983. Energy and Transportation Systems. (http://www.dot.ca.gov/research/researchreports/1981-1988/energytranssystems_1983.pdf)

Transportation Energy Data Book. Oak Ridge National Laboratory. July 2014. (http://cta.ornl.gov/data/index.shtml)

U.S. Environmental Protection Agency. Office of Transportation and Air Quality. February 2005. Emission Facts: Average Carbon Dioxide Emissions Resulting from Gasoline and Diesel Fuel. (http://www.chargepoint.com/files/420f05001.pdf).

8. Financial Analysis

This section describes the analysis methodologies and data to be used for the Financial Analysis for the MovingAhead project.

8.1 Approach

The analysis will vary between the different evaluation phases and will be based on the capital and operating costs and system configurations defined at that stage of the project. The financial analysis will focus on two elements: the project's capital plan and the project's operating plan. Other chapters of this report outline the contents and methodologies the project team will use to prepare the capital cost estimating and analysis (see Chapter 5) and operating and maintenance financial analysis (see Chapter 13), which will inform the financial analysis for the project.

8.1.1 Level 1 Screening

During the Level 1 Screening, current and projected order-of-magnitude cost estimates for capital costs and operations and maintenance costs will be developed for the project alternatives including the No-Build Alternative. Projected costs will be based on LTD's most recent Long Range Financial Plan (LRFP). Costs will be compared to current and projected BRT operations to determine if the order-of-magnitude costs are greatly in excess of LTD's existing system. No further analysis will be conducted for the Level 1 Screening.

8.1.2 Level 2 Alternatives Analysis

Refined order-of-magnitude cost estimates will be developed based on refined conceptual designs. The Level 2 AA financial analysis will consider:

- Currently available revenue
- Operations and Maintenance (O&M) costs
- Project capital costs, revenue, and shortfall
- Proposed additional project revenue sources
- Cash flow analysis
- Risks and uncertainties
- Implementation

A key part of the financial analysis that will inform the shortfall and risk and uncertainties discussions will be other funding opportunities. The project team will assess funding opportunities and produce a discussion of the financial implications each alternative is likely to have on local finances. Potential funding and financing opportunities will include those mechanisms that the City and LTD already employ and those that there may be an opportunity to utilize. Opportunities considered may include:

- Property taxes
- Payroll taxes
- Vehicle registration fees and other transportation fees

- Fare revenue
- Bonds
- Tax increment financing
- State grants
- Federal grants

Financial analysis will consider the impact each alternative would have on the LTD's finances in terms of the estimated capital costs and long-run operations and maintenance costs. Financial analysis will be consistent with the documentation requirements of Section 5309 Small Starts Grants, generally described below in Section 8.2

8.1.3 NEPA Documentation

Order-of-magnitude cost estimates for build alternatives will be refined based on conceptual or preliminary engineering designs. Financial analysis and discussion of funding opportunities will be refined accordingly based on the new estimates.

8.2 Small Starts

The working assumption for the project is that if one or more corridors are selected for near term capital programming, LTD will pursue Section 5309 Small Starts funds from the federal government to cover a yet-to-be-determined share of the project's capital costs. It is presumed that LTD would fund operations through local revenues. Analysis and reporting requirements for the FTA's Section 5309 Small Starts funding program is described in the *Updated Interim Guidance and Instructions – Small Starts Provisions of the Section 5309 Capital Investment Program* (July 20, 2007) and Reporting Instructions for Section 5309 Small Starts Grants (July 2014).The Small Starts guidance related to the project's financial analysis is termed Local Financial Commitment (page 12 of the *Interim Guidance*). The financial analysis methodology will comply with the Small Starts guidance in effect when the Level 2 AA and environmental documentation are prepared.

Two key provisions of the Small Starts Local Financial Commitment will affect the financial analysis for the project:

First, if the proposed O&M costs are less than 5 percent of current systemwide O&M costs, then the project sponsor is not required to prepare a detailed financial plan for the project. Consistent with experience on the Pioneer Parkway and WEEE projects, this methodology assumes that the O&M costs for the advanced corridors will be less than 5 percent of systemwide O&M costs and, therefore, no detailed finance plan will be developed.

Second, the financial analysis for a Small Starts project is to focus on opening year conditions. The MovingAhead project's opening year will be determined during the Level 2 AA phase, and that opening year will be used for the project's financial analysis (the opening year may vary by corridor alternative).

8.3 Capital Plan

The project's capital finance plan prepared during the Level 2 AA phase will have four elements for each alternative under consideration: 1) year-of-expenditure costs; 2) proposed capital funding sources and

amounts; 3) anticipated shortfalls (if applicable); and 4) identification and management of risks and uncertainties.

Year-of-Expenditure Costs. Determination of the year-of-expenditure costs for each alternative will be calculated using the base year costs (2014 dollars), a construction cost inflation rate, and a project schedule. FTA's Standard Cost Categories (SCC) spreadsheets (current at the time the report is prepared) will be used to perform these calculations (see the *MovingAhead Project Capital Cost Estimating Methodology* section for more detail). The construction cost inflation rate will be based on recent experience on the West Eugene EmX project and other similar local public works projects, in consultation with FTA. The construction schedule will be based on experience from the West Eugene, Pioneer Parkway and Franklin Boulevard projects and on the level of construction required for each alternative.

Proposed Capital Funding Sources and Amounts. LTD will assemble two or more proposed funding sources for each alternative, which will address local and Federal shares. Statutory requirements, current level of commitment, and past experience in obtaining funds for each funding source will be assessed, including a range of possible funding from each source. Due to the nature of the MovingAhead project, multiple agencies are likely to contribute

Anticipated Shortfalls. If the total proposed amount that may be reasonably available from the proposed funding sources is less than the projected year-of-expenditure costs for a given alternative, then the financial analysis will document the anticipated shortfall of capital funds for that alternative. Further, the financial analysis will explore options for addressing that anticipated capital funding shortfall.

Identification and Management of Risks and Uncertainties. The project's financial analysis for the Level 2 AA phase will conclude with an identification of the risks and uncertainties included within the alternatives' financial plans, including recommendations on how to manage those risks and uncertainties as an alternative might advance through the project development process. The risk assessment will conform with FTA guidance (last updated in 2008) on fiscal risk assessment current at the time the report is prepared

8.4 Operating Finance Plan

As noted in Section 8.2, the level of detail in the project's operating financial analysis will be determined by whether the project's O&M costs constitute less than 5 percent of systemwide O&M costs – this methodology is predicated on that being the case. Therefore, this methodology anticipates the preparation of an operating financial analysis focusing on the project's expected opening year. If that turns out not being the case, then LTD will prepare a more detailed financial plan for the project, in compliance with FTA's Small Starts guidance in place at the time.

An assessment will be made of the systemwide O&M revenues and costs for the opening year and the change in those costs that would result from each alternative. The O&M cost estimates for the opening year will be calculated by inflating costs and revenues from the base year (FY 2014-2015) to the yet-to-be-determined opening year using an inflation rate that reflects recent experience for O&M costs. An assessment will also be made as to whether or not the systemwide O&M costs will exceed revenues for any of the alternatives under consideration. If any shortfalls are identified, then the finance plan will address potential ways of addressing the O&M shortfall(s).

8.5 References

Federal Transit Administration. United States Department of Transportation. 2014. Reporting Instructions for Section 5309 Small Starts Criteria. (http://www.fta.dot.gov/documents/FY_16_SS_Reporting_Instructions_Final.doc)

Federal Transit Administration. United States Department of Transportation. 2014. Standardized Cost Categories. (http://www.fta.dot.gov/12305_15612.html)

Federal Transit Administration. United States Department of Transportation. 2007. Updated Interim Guidance and Instructions: Small Starts Provisions of the Section 5309 Capital Investment Program. (http://www.fta.dot.gov/documents/SS_Interim_Guidance_Web_Version%281%29.doc)

9. Geology and Seismic

This section describes the analysis methodologies and data to be used for the Geology and Seismic evaluation for the MovingAhead project.

9.1 Relevant Laws and Regulations

Local and state design codes for public streets and related facilities will apply to the design and construction of facilities within the city and state rights-of-way, respectively, including addressing geologic hazards that could result from or affect the project facilities. A full inventory of those standards will be prepared during the project's final design phase, and all applicable standards will be met in order to receive construction permits from the applicable jurisdiction or agency.

For geotechnical design including earthquake design standards, the applicable guidance in the Oregon Department of Transportation Design Manual (ODOT, 2011) will be applicable. Seismic design of bridges, if any are included in the project, will follow the *American Association of State Highway and Transportation Officials (AASHTO) Guide Specifications for Load and Resistance Factor Design Seismic Bridge Design* (AASHTO, 2009), as supplemented by the *ODOT 2014 Bridge Design and Drafting Manual*, with all applicable updates and revisions through 2014.

If liquefaction assessment is required, the guidance in the following two documents will be followed:

- *Assessment and Mitigation of Liquefaction Hazards to Bridge Approach Embankments in Oregon*, Dickenson, S., et al., Oregon State University, Department of Civil, Construction and Environmental Engineering, SPR Project 361, November, 2002.
- *Recommended Guidelines For Liquefaction Evaluations Using Ground Motions From Probabilistic Seismic Hazard Analysis*, Dickenson, S., Oregon State University, Department of Civil, Construction and Environmental Engineering, Report to ODOT, June, 2005.

9.2 Analysis Area

In general, the analysis area for the geologic assessment will be within the footprint of the alignments selected for further analysis in the Level 2 AA.

9.3 Contacts and Coordination

The City of Eugene and City of Springfield Public Works departments will be contacted to request information on geologic hazards within the study corridor such as soft ground, seeps, or slope instability areas that the department and especially operation and maintenance staff may be aware of.

It is not anticipated that contacts external to the project team will be made to complete the geologic assessment.

9.4 Level 1 Screening

No data will be collected for the Level 1 Screening.

9.5 Level 2 Alternatives Analysis

The first step in assessing potential impact of geology and geologic hazards to the project will be to determine whether project construction for any of the alternatives under consideration would occur in areas identified as significant geologic hazard zones or pass within close proximity of potentially active crustal faults and folds. A final consideration will be whether project construction will require significant cup or fill slopes be developed or result in permanent slopes in excess of 10 percent.

The assessment as to whether the project alternative passes through a significant geologic hazard zone will be based on geology/geologic hazard maps and experience of City of Eugene and City of Springfield staff. The assessment of whether a project alternative crosses or is located within close proximity will be made using the United States Geological Survey (USGS) fault and fold database (USGS, 2012). The alternative will considered to be in close proximity if it is located within approximately 6 miles (10 kilometers) of a "Class A" fault where geologic evidence demonstrates the existence of a Quaternary fault of tectonic origin, whether the fault is exposed by mapping or inferred from liquefaction or other deformational features.

If the alternatives do not occupy areas identified as significant geologic hazard zones, is not located within approximately 6 miles of a Class A fault and there would be no permanent grades greater than 10 percent, the finding will be documented and no further analysis will be performed.

If construction would occur within significant geologic hazard zones, within close proximity to a Class A fault, or create permanent grades greater than 10 percent, then a further assessment of the geologic conditions present in the area will be conducted. The assessment will include a review of published geology and geologic hazard maps, National Resources Conservation Service soil surveys, water well logs, past geotechnical reports for the area, and historical observations from the City of Eugene and City of Springfield Public Works staff. This available data will be used to assess whether the project facilities would impacted by the geologic hazards or potentially increase the risk of slope instability or seismically induced lateral spread.

9.5.1 Data Collection

Data sources for the utility relocation assessment will include:

- MovingAhead Project Conceptual Designs
- City of Eugene, Public Works Department
- City of Springfield, Public Works Department
- Natural Resources Conservation Service web soil survey for Lane County, Oregon
- Oregon Department of Geology and Mineral Industries (DOGAMI) maps for the City of Eugene and Lane County including:
    - geologic mapping
    - geologic hazard maps
    - relative earthquake hazard maps
    - landslide inventory maps
- 2008 United States Geological Survey (USGS) Seismic Hazard Maps
- 2012 USGS Quaternary Fault and Fold Database

- Geologic soils analyses for bridges and other transportation projects in the project vicinity (e.g., West Eugene Parkway Hydrology Analysis Findings Report; ODOT: May 2006).

9.5.2 Significance Thresholds

If one or more of the project alternatives would be constructed within an area identified as a significant geologic hazard zone, cross or be located within 6 miles of a Class A fault as identified on the USGS fault and fold database, or would result in grades of greater than 10 percent, then additional analysis will be prepared to assess whether the project would be at risk from and/or create a geologic hazard. A geologic hazard would be deemed significant if that hazard would put improvements and/or persons at risk and if the hazard could not be avoided through design modifications and/or mitigated.

9.5.3 Impact Analysis

The potential for geology and geologic hazards to impact the short and long term performance of the project alternatives will be made using historic observations and geologic mapping reviewed for the project.

9.5.3.1 Long-Term Impacts Analysis Approach

The potential for long term impacts will be evaluated for the alternatives that will pass through geologic hazard zones or result in permanent grades greater than 10 percent.

Long term impacts to geologic and seismic hazards could result if significant cut or fill slopes are required, especially if they were located in areas that could result in an increased risk of slope instability. Long term settlement resulting in poor performance and increased maintenance could result if construction occurs in areas identified as having highly organic or compressible soils.

Crossing a potentially active fault increased the potential for fault rupture and associated ground displacement that could have a significant impact on the project. There is also a risk of increased ground shaking associated with construction in the vicinity of existing “Class A” faults where there is some evidence of recent (Quaternary) activity. In the event that an alternative crosses or is located within close proximity to a Class A fault, an assessment of the slip rate, fault length, and fault type will be made to evaluate the relative risk to the project associates with the potential for future rupture of the fault.

The risk of liquefaction and corresponding lateral spread is greater in areas where subsurface conditions consist of loose, saturated sol condition.

9.5.3.2 Short-Term Impacts Approach

Short term impacts could be associated with project elements that require construction practices that could increase the potential for slope instability. Such practices could include large temporary excavations or fills. Depending on the alternatives evaluated, a general assessment will be made to the potential that the project elements could require construction practices that might result in short term impacts to slope stability.

9.5.3.3 Indirect Impact Analysis Approach

Indirect impacts are not applicable.

9.5.3.4 Cumulative Impact Analysis Approach

If any alternatives include new or altered bridges, retaining walls, or other similar structures, indirect and cumulative impact analysis will be required. These methods will be updated appropriately should an alternative include these features.

9.5.3.5 Mitigation Measures Approach

The primary mitigation measure will be avoidance of geologic hazard zones. In the event that geologic hazard zones cannot be avoided, the following mitigation measures may be evaluated for effectiveness:

- Slope stabilization
- Ground improvement
- Development of post construction monitoring and maintenance procedures

9.6 NEPA Documentation

- Class A faults and folds from USGS mapping relative to project alternatives
- Location of significant geologic hazard zones relative to project alternatives
- Summary of historic geologic hazard areas based on City of Eugene Public Works Department observations (if any)
- Structures or slopes related impacts
- For earthquake design standards, the first step will be to review the project's *Conceptual Designs* to determine whether any of the alternatives would include a major structure (e.g., alignment bridge or overpass or retaining walls – minor structures, such as open air shelters or BRT stations would not apply). If a major structure would be constructed, then the project staff will document the applicable earthquake design standard that would be used to design that structure, based upon current seismic hazard maps available from the Oregon Department of Geology and Mineral Industries (DOGAMI) and the current applicable U.S. Geologic Survey (USGS) seismic hazard data.
- Discussion of possible mitigation measures where project alternatives cross significant geologic hazard areas or are located within close proximity to "Class A" faults.

9.7 References

American Association of State Highway and Transportation Officials (AASHTO). 2009. Guide Specifications for LRFD Seismic Bridge Design. 1st Edition.

Natural Resources Conservation Service. Web Soil Survey. Accessed at: http://websoilsurvey.nrcs.usda.gov/app/WebSoilSurvey.aspx

Oregon Department of Transportation (ODOT). 2011. Geotechnical Design Manual. April.

U.S. Geological Survey (USGS). 2008. *National Seismic Hazard Maps*. http://earthquake.usgs.gov/hazards/products/conterminous/2008.

U.S. Geological Survey (USGS). 2012. *Quaternary Fault and Fold Database for the United States*. http://geohazards.usgs.gov/cfusion/qfault/index.cfm.

10. Hazardous Materials

This section describes the analysis methodologies and data to be used for the Hazardous Materials evaluation for the MovingAhead project.

10.1 Relevant Laws and Regulations

10.1.1 Federal

Federal environmental regulatory programs that may impact highway development originate from statutory laws and regulations. Two environmental acts that directly impact highway projects are the Resource Conservation and Recovery Act of 1976 (RCRA), and the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA). RCRA was designed to regulate materials that can be defined as both a solid and a hazardous waste, and is related to activities that are currently taking place. CERCLA was designed to identify sites that are contaminated as a result of past releases of a hazardous substance into the environment.

If contaminated soil or hazardous substances are discovered during construction, the handling and cleanup of the materials and the site must be conducted according to existing regulations. These include not only RCRA and CERCLA, but the Safe Drinking Water Act, Clean Air Act, Toxic Substances Control Act, etc.

The legal definition of hazardous waste is contained in 40 CFR 261.3. It is important to note that the process of identifying a chemical/waste material as a hazardous waste is complex. "Regulations for Identifying Hazardous Waste" are contained in 40 CFR 261.

FTA Circular 5010.1c, Chapter II.2 – October 1, 1998 regulates due diligence efforts by grantees during property acquisition activities.

Environmental Acts

RCRA. The Resource Conservation and Recovery Act of 1976. Established for the regulation of hazardous waste and related activities that include hazardous waste generators, transporters, and storage and disposal facilities.

CERCLA. The Comprehensive Environmental Response, Compensation, and Liability Act of 1980. Established to identify and provide for the cleanup of sites contaminated with hazardous substances from past uncontrolled releases into the environment. Also provides for emergency response actions and gives the federal government the authority to assign responsibilities for contamination and subsequent cleanup via a superfund liability.

CWA. The Clean Water Act of 1972 (33 United States Code [U.S.C.] 26), with amendments in 1977. Established for the regulation of discharges of pollutants into the waters of the United States. Also provide standards for surface water quality.

SDWA. The Safe Drinking Water Act of 1974, with amendments in 1986 and 1996. Established drinking water standards to ensure the quality of drinking water.

SARA. The Superfund Amendments and Reauthorization Act of 1986. Amended CERCLA and introduced more stringent and detailed guidelines for cleanups. Also created more complex and costly liability issues as well as defenses against liability for potentially responsible parties.

SARA III. The Emergency Planning and Community Right to Know Act of 1986. Part of the SARA amendments. Required that communities and the public be supplied with information on chemical inventories, release reporting, accidents/spills, and provided for full public participation in planning and preparing for chemical emergencies with local industries.

TSCA. The Toxic Substances Control Act of 1976. Established for the regulation of toxic substances such as PCBs and related activities.

FIFRA. The Federal Insecticide, Fungicide, and Rodenticide Act of 1974. Established for the regulation of chemicals that are used as pesticides.

HMTA. The Hazardous Materials Transport Act of 1975, with amendments in 1990 and 1994. Provided for the regulation of the transportation of hazardous materials by the U.S. Department of Transportation.

OPA. The Oil Pollution Act of 1990. Established requirements for contingency planning to prevent and respond to oil spills.

10.1.2 State

Oregon Hazardous Waste Management Act. ORS 466.005 – 466.225. Hazardous Waste Management Rules; OAR 340-100 et. Seq. Establish a regulatory structure for the generation, transportation, treatment, storage, and disposal of hazardous wastes.

Hazardous Substance Remedial Action Rules. ORS 465.200-465.900 and OAR 340-122 et seq. Establishes Oregon State Department of Environmental Quality (DEQ) guidelines for assessing human health and ecology risk assessments on potential adverse effects from contamination according to DEQ risk guidelines and levels. Sets standards for degree of cleanup required.

Solid Waste Management. ORS 459.005-418; OAR 340-093-097 Establishes a regulatory structure for the collection, transportation, treatment, storage and disposal of solid wastes.

Asbestos Removal. OAR 340-32-5620 through 5650 establish DEQ requirements for licensing and certification for asbestos workers. All workers who handle asbestos-containing materials must meet certain training, licensing and certification requirements. OAR 340-33-010 through 100 Establish DEQ requirements for handling asbestos containing materials.

10.1.3 Local

Not applicable

10.2 Analysis Area

The environmental search and site analysis will be conducted for parcels within 1/8 mile (660 feet) of a proposed alignment under consideration in the Level 2 AA. Identified parcels that fully or partially fall within the project's long-term footprint or construction footprint will be identified as potentially displaced.

10.3 Contacts and Coordination

Government agencies will not be directly contacted for the conduct of the Level 1 Screening Analysis, as no data will be collected for the Level 1 Screening Analysis. State agencies may be contacted for the

conduct of the environmental search and Level 2 AA in the event site information is not accessible online or available in the environmental database search.

10.3.1 Federal

Not applicable.

10.3.2 State

If needed, public records may be requested from the State of Oregon Department of Environmental Quality (DEQ).

10.3.3 Local

Not applicable.

10.4 Level 1 Screening

No data will be collected for the Level 1 Screening.

10.5 Level 2 Alternatives Analysis

To support the Level 2 AA, the project will employ an environmental records search for hazardous materials in the vicinity of the MovingAhead project. This search will consist of a review of applicable regulatory databases of known or potential hazardous wastes sites and properties or facilities currently under investigation for potential environmental violations. The search will be conducted to identify known properties or facilities that may have the potential to adversely affect environmental conditions along the BRT alignment. An environmental database query report will be ordered from Environmental Data Resources (EDR). The EDR report will define the databases reviewed and identify sites within the search radii specified by ASTM Standard E1527. It should be noted that the EDR provides information as it receives it from various government databases. It is not possible for either project staff or EDR to verify the accuracy or completeness of information contained in these databases. As needed, project staff may also obtain and review available information from sources such as the Oregon DEQ.

The major objectives of the Level 2 AA for hazardous materials will be:

- To establish the potential for the presence of hazardous waste and substances on a specific parcel of land.
- To protect LTD from liability that may be incurred by unknowingly acquiring contaminated property.
- To document if wastes were present on the property prior to acquisition.
- To identify any adjacent properties that may be involved with or were involved with activities that resulted in the generation of hazardous waste that could potentially affect the property under consideration by LTD.
- To establish and justify the need for further site assessment including sampling and testing to confirm the existence or nonexistence of hazardous waste.
- Provide information on how the MovingAhead project would avoid and minimize potential effects of hazardous materials.

- Assist in the decision with regard to the selection of specific alternatives.

10.5.1 Data Collection

The data review will involve several databases:

- The Comprehensive Environmental Response Compensation and Liability Information System (CERCLIS) is the official repository for site specific and non-site specific data to support the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA). It contains information on hazardous waste site assessment/remediation from 1983 to the present.
- The Oregon DEQ maintains the Environmental Clean-up Site Information (ECSI) list. It contains sites that are, or may be, contaminated and may require clean-up.
- DEQ also maintains the Leaking underground Storage Tank (LUST) list, a compilation of site names and addresses for sites that contain reported leaking underground storage tanks, and the Underground Storage Tank (UST) list, which does not indicate whether a spill or release has occurred.
- Current and historical aerial maps to document changes in land use that may relate to the presence of hazardous materials.
- Project staff will visit the identified sites and conduct a general reconnaissance survey of readily viewable areas – these will be windshield surveys and project staff will not enter any private property for the surveys.

10.5.2 Significance Thresholds

This section describes the methods to be used for evaluating effects under NEPA and the significance criteria used in establishing thresholds for evaluating impacts under NEPA.

Methods for Evaluating Effects under NEPA

Pursuant to NEPA regulations (40 CFR 1500-1508), project effects are evaluated based on the criteria of context and intensity. Context means the affected environment in which a proposed project occurs. Intensity refers to the severity of the effect, which is examined in terms of the type, quality, and sensitivity of the resource involved, location and extent of the effect, duration of the effect (short- or long-term), and other considerations. Beneficial effects are identified and described. When there is no measurable effect, an impact is found not to occur. The intensity of adverse effects is the degree or magnitude of a potential adverse effect, described as negligible, moderate, or substantial. Context and intensity are considered together when determining whether an impact is significant under NEPA. Thus, it is possible that a significant adverse effect may still exist when the intensity of the impact is determined to be negligible or even if the impact is beneficial.

For hazardous materials:

- An impact with negligible intensity is defined as a risk to health and safety that could largely be mitigated.
- An impact with moderate intensity is defined as creating a known but rare or infrequent health and safety condition. Moderate intensity encompasses adverse effects of the proposals in localized areas but that would not have wide-ranging effects.

- An impact with substantial intensity is defined as creating a permanent and known health and safety condition.

10.5.3 Impact Analysis

10.5.3.1 Impacts Analysis Approach

The operational impacts analysis will provide information on the nature of potential impacts from sites with hazardous materials releases for the alternatives. The Level 2 AA for hazardous material will focus on the affected environment in which the proposed project occurs, and the severity of the effect, as determined by factors such as the type, quality, and sensitivity of the resource involved, location and extent of the effect, and the duration of the effect.

Short-term impacts will focus on releasing and spreading contaminated soil, sediment, or groundwater; accidental hazardous materials spills or releases; types and quantities of construction and operation wastes and their likely treatment/disposal methods, and potential risks and management provisions related to the accidental release of oil or toxic chemicals.

For the Level 2 AA, sites identified on the environmental database search would be categorized into three risk categories: high, medium, and low. The purpose of the risk analysis is to prioritize sites to determine the need for avoidance, remediation, and/or mitigation while considering associated costs and liability. The risk levels are defined as follows:

- **High**. The high risk level is assigned to contaminated sites that might create liability for LTD either due to construction activities or by virtue of acquiring all or a portion of the site. High-risk sites typically include contaminated sites that are located within or adjacent to the project construction limit and have not received a no-further action determination from regulatory agencies such as Oregon DEQ.
- **Medium**. Medium risk level sites are sites located within or adjacent to construction limits where there has been past releases at the site but the sites have undergone remedial cleanup and have received a no further action determination from regulatory agencies such as Oregon DEQ. Medium risk level sites could also include sites that have existing contamination but are not located directly adjacent to the project construction limit.
- **Low**. This risk level applies to sites where there has been no documented release to the environmental and therefore are not expected to have noticeable impacts on the project.

The number of sites by risk category will be evaluated between the alternatives and No-Build options and this comparison will show the effects of the proposed alternatives.

10.5.3.2 Cumulative and Indirect Impact Analysis Approach

Cumulative and indirect impacts will be addressed qualitatively. The study area and temporal boundary of the proposed project will be defined and a general comparison of the relative potential impacts of the alternatives to current and reasonably foreseeable future actions or projects in the study area will be made. The cumulative and indirect impacts analysis will focus on potential health and safety conditions associated with hazardous materials.

10.5.3.3 Mitigation Measures Approach

If the analysis identifies hazardous material-related potential impacts to human health or the environment, mitigation measures will be considered. Typical measures include identifying and

implementing best management practices to control hazardous materials planned for use within the context of constructing, operating and maintaining the EmX system. These measures will be discussed qualitatively.

10.6 NEPA Documentation

An AAI-compliant Phase 1 Environmental Site Assessment may be required if evidence of existing, past, or material threat of release of a hazardous substance is found during the Level 2 AA. If no such threat is found, the NEPA documentation will be the same as the Level 2 AA.

10.7 References

Hazardous Substance Remedial Action Rules. ORS 465.200-465.900. https://www.oregonlegislature.gov/bills_laws/lawsstatutes/2013ors465.html

National Environmental Policy Act. 2005. Regulations For Implementing The Procedural Provisions Of The National Environmental Policy Act 40 CFR Parts 1500-1508. (http://energy.gov/sites/prod/files/NEPA-40CFR1500_1508.pdf)

11. Land Use and Prime Farmlands

This section describes the analysis methodologies and data to be used for the Land Use and Prime Farmlands evaluation for the MovingAhead project.

Key issues to be discussed in the land use report include:

- What are the possible direct impacts to land uses?
- What are the Comprehensive Plan designations of properties being impacted?
- What are the zoning designations of properties being impacted?
- Is the project in accordance with applicable state and local land use plans?
- Does the project impact any protected resource lands (wetlands, greenways, etc.)?
- What are planned and existing land uses in these areas?
- Will any planned major development projects be impacted?
- Will the planned pattern of land uses in the primary project area be disrupted?
- What are the possible indirect impacts on land use?
- What are possible beneficial impacts related to land use?
- Will the additional capacity of the project induce growth that may result in densities and development intensities that are incompatible with existing development and/or adopted plans?
- What cumulative land use impacts may occur because of the project?
- To the extent that information is available, will the alternatives have an additive and significant relationship with any other relevant past, present, and/or reasonably foreseeable actions?
- What changes in location and type of future land use may occur due to the proposed alternatives?
- How could potentially adverse impacts to land uses be mitigated?

11.1 Relevant Laws and Regulations

Relevant laws and regulations include federal requirements, state plans and laws governing land use and transportation planning, and local plans and policies adopted by the City of Eugene, Lane County and the Central Lane MPO. Statewide goals are implemented by local plans, which are implemented by development regulations. These local plans, ordinances, and policies will provide direction for the data needed to analyze the project's impacts. Some laws and regulations provide a context and legislative intent for local plans and codes but will not guide the data gathering for this report. The laws and regulations that may be applicable to the land use impacts analysis include the following:

11.1.1 Federal

National Environmental Policy Act, 42 U.S.C. 4321-4347

Uniform Relocation Assistance and Real Property Acquisition Policies Act, 42 U.S.C. 4601 et. seq., 49 CFR Part 24. The Uniform Act provides protections and assistance for people affected by the acquisition, rehabilitation, or demolition of real property for Federal or federally funded projects. This law helps

ensure that people whose real property is acquired, or who move as a direct result of projects receiving federal funds, are treated fairly and equitably and receive assistance in moving from the property they occupy. (http://www.fhwa.dot.gov/REALESTATE/ua/index.htm)

Executive Order (EO) 12898, Federal Actions to address Environmental Justice in Minority Populations and Low-Income Populations; 59 CFR 7629, 62 CFR 18377, 60 CFR 33896. This will be reviewed to the extent that this policy broadly applies to land use. The primary analysis will be detailed in the Methods and Data Report for Environmental Justice.

11.1.2 State

Oregon Statewide Planning Goals, OAR 660-15-0000 (1-15). (http://www.lcd.state.or.us/LCD/goals.shtml#Statewide_Planning_Goals). The foundation of Oregon's land use planning program is a set of 19 Statewide Planning Goals. The goals express the state's policies on land use and related topics, such as citizen involvement, housing, and natural resources and are achieved through local comprehensive planning. State law requires each city and county to adopt a comprehensive plan and the zoning and land-division ordinances needed to put the plan into effect. Thus, the Statewide Planning Goals are the foundation of locally adopted plans, which are approved if consistent with Statewide Goals. No data collection or analysis will be conducted specifically for the Statewide Goals because they are implemented through local code and plans, which will direct the data gathering and analysis. Through reviewing the implementing plans and codes, the Project Team will address the following: Goal-1 Citizen Involvement, Goal-2 Land Use Planning, Goal-3 Agricultural Lands, Goal-4 Forest Lands, Goal-5 Open Spaces, Scenic and Historic Areas, and Natural Resources, Goal-8 Recreational Needs, Goal-9 Economic Development, Goal-10 Housing, Goal-11 Public Facilities and Service, Goal-12 Transportation, and Goal-14 Urbanization. No data collection or analysis will be conducted specifically for these statutes, as they are implemented through local code and plans which will direct the data gathering and analysis.

Land Conservation and Development Commission, Transportation Planning Rule, OAR Chapter 660, Division 12 (2007). http://www.oregon.gov/ODOT/TD/TP/TPR.shtml

11.1.3 Local

- Envision Eugene (Eugene's Comprehensive Plan; latest draft or as adopted)
- Central Lane RTP (October/November 2007)
- Metro Plan, Eugene-Springfield Metropolitan General Area Plan (2004 Update)
- Eugene Downtown Plan (April 2004)
- Eugene Commercial Lands Study (1992)
- Eugene Neighborhood and Refinement Plans (for corridors advanced to Level 2 AA)
- TransPlan, The Eugene-Springfield Transportation System Plan (July 2002)
- Chapter 9 of the Eugene Code, 1971 (Land Use Code)
- Eugene Parks, Recreation and Open Space Comprehensive Plan (February 2006)
- West Eugene Wetlands Plan (May 2004)
- City of Eugene Capital Improvement Program, FY 2006-2011 (April 2005)

- Shaping 4J's Future, Superintendent's Report and Recommendations (January 2008 or later amended versions)
- City of Springfield Development Code
- Springfield 2030 Refinement Plan (2013)
- Springfield Downtown Refinement Plan (2005)
- Glenwood Refinement Plan (2014)
- Springfield Vision for Main Street (February 2015)

11.2 Analysis Area

The land use analysis area for the MovingAhead project will be based on the alternatives selected for further analysis in the AA. The final boundaries of the land use analysis area will be adjusted to include all parcels within 200 feet of centerline of the alternatives to be analyzed.

11.3 Contacts and Coordination

11.3.1 Federal

At this time, there are no federal contacts or documents pertaining to the land use impacts of transit systems.

11.3.2 State

- Department of Land Conservation and Development (DLCD)
- Oregon Department of Transportation (ODOT)

11.3.3 Local

- City of Eugene
- City of Springfield
- Lane County
- LCOG
- SD4J
- Neighborhood organizations

11.4 Level 1 Screening

For the Level 1 Screening, an analysis of land use opportunities will be conducted. This analysis will be a qualitative assessment of major existing, emerging, or likely future trip generators within the corridor based on the transit market assessment technical review. Additionally, community input collected during the corridor workshops and other public input opportunities will be considered in determining which corridor alternatives are advanced to the Level 2 AA.

11.5 Level 2 Alternatives Analysis

Data on existing land use conditions within the project study area will be collected. Existing land uses in the project study area will be determined from Lane County, City of Eugene, City of Springfield, and LCOG GIS data files. The report will summarize the state and local public policies regarding land use and transportation facilities in the project study area and all state, regional, and local land use policies and regulations that guide the selection of the alternative alignments to be analyzed during the AA process.

11.5.1 Data Collection

Primary data sources will include existing GIS data and discussions with City of Eugene, City of Springfield, and LCOG planning staff for existing and planned land use data. The land use analysis area will be identified using existing GIS land use mapping; land uses within at least 300 feet of a proposed alignment will be considered as part of the API and subsequently assessed for potential impacts.

Data on proposed major land use developments will be obtained via coordination with City of Eugene, City of Springfield, and LCOG planning and public works staff; a list of reasonably-foreseeable private and public major land use development projects will be compiled. Other information sources will include state, regional, and local land use plans as well as transportation and acquisition/displacement analyses to be conducted for this project.

11.5.2 Significance Thresholds

As preliminary environmental considerations of the MovingAhead project have resulted in an assumption that the project will be eligible for a categorical exclusion, the evaluation of potential land use impacts will verify this assumption with respect to the land use discipline by addressing the following:

- Comprehensive Plan designations of properties being impacted
- Zoning designations of properties being impacted
- Project conformance with the following:
- Transportation Planning Rule
- Statewide Planning Goals
- City of Eugene Comprehensive Plan
- City of Springfield Comprehensive Plan
- Applicable neighborhood and/or specific area plans (nodal, transit-oriented development, urban renewal, etc.)
- Concurrence from City of Eugene, City of Springfield, and LCOG that the project conforms with the plans noted above
- Existence of any protected resources (wetlands, greenways, etc.) in the land use analysis area

Because the land use analysis area for the MovingAhead project lies entirely within the urban growth boundaries (UGBs) of the cities of Eugene and Springfield; the project assumes no Forest or EFU-zoned lands will be impacted by the MovingAhead project and subsequently no potential conversion of any farmland.

The evaluation of potential land use effects will rely on the *Guidelines for Preparing Environmental Assessments, and the Guidance for Preparing and Processing Environmental and Section 4(f) Documents*, developed by the Federal Transit Administration and the Federal Highway Administration (FHWA), respectively. This approach will use analytical tools and findings specific to the Eugene-Springfield area, including its laws, plans, and regulations. It will look for evidence of a variety of potential effects, including the following:

- The project substantially increases or diminishes access to high capacity transit (HCT).
- Increased access to HCT is found to increase development intensities in areas with existing and planned low-density development.
- Planned development intensities are reduced by the proposed project.
- A recognized special district, overlay, or plan area is impacted or determined to have significant impacts by other discipline technical reports.
- The proposed project alternative conflicts with local plans, and appropriate agencies do not favor amendment of the plans.
- The proposed project alternative requires a change in zoning, and the local land use planning agency does not support the change.

11.5.3 Impact Analysis

As noted earlier, the analysis area consists of Eugene-Springfield metropolitan area; the project assumes no Forest or EFU-zoned lands will be impacted by the MovingAhead project and subsequently no potential conversion of any farmland.

Land use impacts of each of the proposed project alternatives will be evaluated for general consistency with adopted land use plans and policies. Potential direct impacts for land use include displacement or relocation of residences or businesses and acquisition of land for right of way. Residential and business access impacts will also be identified and reported.

11.5.3.1 Long-Term Impacts Analysis Approach

Land use impacts within the study area will be evaluated in terms of general consistency of the alternatives with adopted land use plans and policies. This analysis will include impacts to development patterns as approved within the plans and policies of the City of Eugene and the region.

11.5.3.2 Short-Term Impacts Approach

Construction of the proposed MovingAhead project may cause short-term impacts, including noise pollution, visual disturbance, and access impedances. As available, design drawings for alternatives and staging areas, construction management plans, and the findings from other reports, including traffic and displacements, will be used to identify direct impacts.

11.5.3.3 Indirect Impact Analysis Approach

In addition to analyzing potential direct displacement of residences and businesses, the analysis will include potential indirect impacts to land use resulting from each of the alternatives. This evaluation will include a general assessment of whether traffic demands and potential traffic congestion on existing local access streets may potentially impact access, and subsequently, development of nearby parcels. The analysis will identify impacts to designated special districts, plans, and urban centers.

11.5.3.4 Cumulative Impact Analysis Approach

Cumulative impacts result from the combined impacts of the proposed project with those occurring in the past, present, and reasonably foreseeable future. A cumulative impact is the impact on the environment resulting from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (federal or nonfederal) or person undertakes such other actions. As part of the land use analysis effort a list of reasonably-foreseeable private and public major land use development projects will be compiled.

Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time. Cumulative impacts may include the effects of natural processes and events, depending on the specific resource in question. Cumulative impacts include the total of all impacts to a particular resource that have occurred, are occurring, and will likely occur as a result of any action or influence. The cumulative impact analysis for land use will be a comparison of the past, present, and reasonably foreseeable land use impacts within a larger area of potential impact. The analysis will establish a temporal frame of reference, and geographic frame of reference.

Cumulative impacts will be qualitatively analyzed using comprehensive land use and transportation elements that are components of all build alternatives. This contextual analysis will include past, present and reasonably foreseeable future projects or actions occurring in the project area or the broader community which when combined with the project build alternatives, may conflict with adopted land use plans.

11.5.3.5 Mitigation Measures Approach

A qualitative analysis of likely impacts will be used to determine appropriate mitigation measures and to evaluate cost of measures and their potential effectiveness. Mitigation measures will also be prioritized to respond to the greatest land use impacts and coordinated with affected jurisdictions, business owners, and property owners.

11.6 NEPA Documentation

As noted earlier, the analysis area consists of Eugene-Springfield metropolitan area; the project assumes no Forest or EFU-zoned lands will be impacted by the MovingAhead project and subsequently no potential conversion of any farmland. The land use analysis will identify any impacts to federal or state-protected land uses or resources.

11.7 References

U.S. Department of Transportation, Federal Transit Administration. 1979. Guidelines for Preparing Environmental Assessments. Washington, D.C.

U.S. Department of Transportation, Federal Highway Administration. 1987. Guidance for Preparing and Processing Environmental and Section 4(f) Documents. Washington, D.C.

Chapter 9 of the Eugene Code, 1971. (http://www.eugene-or.gov/portal/server.pt/gateway/PTARGS_0_0_5848_319_0_43/http%3B/cesrv501/lf7citycode/Home.aspx)

Envision Eugene (Eugene's Comprehensive Plan; latest draft or as adopted). (http://www.eugene-or.gov/index.aspx?nid=760)

Springfield 2030 (draft comprehensive plan). (http://www.ci.springfield.or.us/DPW/2030Plan.htm)

Consideration of Cumulative Impacts In EPA Review of NEPA Documents, U.S. Environmental Protection Agency, Office of Federal Activities (2252A), EPA 315-R-99-002/May 1999. (http://www.epa.gov/compliance/resources/policies/nepa/cumulative.pdf)

Eugene Downtown Plan, April 2004. (http://www.eugene-or.gov/portal/server.pt/gateway/PTARGS_0_2_229169_0_0_18/DowntownPLanAll.pdf)

Eugene Parks, Recreation and Open Space Comprehensive Plan, February 2006. (http://www.eugene-or.gov/portal/server.pt?open=514&objID=1360&parentname=CommunityPage&parentid=5&mode=2&in_hi_userid=2&cached=true)

Executive Order 12898, Federal Actions to address Environmental Justice in Minority Populations and Low-Income Populations EO 12898; 59 CFR 7629, 62 CFR 18377, 60 CFR 33896.

Land Conservation and Development Commission. Transportation Planning Rule, OAR Chapter 660, Division 12 (2007) (http://arcweb.sos.state.or.us/rules/OARS_600/OAR_660/660_012.html)

Lane Council of Governments GIS Data 2007

Metro Plan, Eugene-Springfield Metropolitan General Area Plan, 2004 Update. (http://www.lcog.org/metro/2004MetroPlan_91306_web.pdf)

National Environmental Policy Act (NEPA), 42 U.S.C. 4321-4347 (http://www.nepa.gov/nepa/regs/nepa/nepaeqia.htm)

Shaping 4J's Future, Superintendent's Report and Recommendations, January 2008 (http://www.4j.lane.edu/files/shaping4j/4J_SH4J_Supt_Rec_p1.pdf)

TransPlan, The Eugene-Springfield Transportation System Plan, July 2002. (http://www.lcog.org/transplan/default.htm)

Uniform Relocation Assistance and Real Property Acquisition Policies Act (http://www.fhwa.dot.gov/realestate/act.htm)

West Eugene Wetlands Plan, May 2004 (http://www.eugene-or.gov/portal/server.pt?space=CommunityPage&control=SetCommunity&CommunityID=667&PageID=1504)

12. Noise and Vibration

This section describes the analysis methodologies and data to be used for the Noise and Vibration evaluation for the MovingAhead project. Because project operation is expected to use only rubber-tired vehicles, vibration is unlikely to be an issue for this project; however, a screening for potential vibration sensitive locations will be performed. Vibration as related to project construction will be included in the analysis and construction related vibration mitigation measures will be provided.

12.1 Relevant Laws and Regulations

The primary regulations used for FTA projects are taken from the FTA *Transit Noise and Vibration Impact Assessment* (FTA Manual, 2006). The FTA criteria state that if sufficient evidence shows that highway noise dominates, the methods of FHWA, including the latest authorized version of the Traffic Noise Model (TNM), should be used for the analysis. Otherwise both FHWA and FTA prediction and impact assessment procedures should be used to determine whether neither, one or each mode causes impact and where mitigation is best applied. Based on this requirement, the selected method for assessing impacts will be based on the type of project, with dedicated Bus Rapid Transit (BRT) type projects relying primarily on the FTA criteria, while bus priority systems and bus systems that use existing roadways will rely on the FHWA method for determining noise levels. Regardless, the FTA criteria will be used to evaluated all noise impacts, while the FHWA criteria are only applicable to projects on existing or improved roadways

In addition to the above regulatory concerns, under the FTA criteria, project construction, park and rides, maintenance bases and other project related ancillary facilities must comply with the appropriate state, county or city noise control ordinance.

12.1.1 Federal

The US DOT's regulations related to noise impact analysis for transit projects includes the FTA Manual (2006, FTA) and the FHWA *Procedures for Abatement of Highway Traffic Noise and Construction Noise – Final Rule* (U.S. DOT 2011).

12.1.1.1 FTA Regulations

Noise impacts for the proposed project under the FTA criteria are determined based on the criteria defined in the FTA Manual (FTA, 2006). The FTA noise impact criteria are based on well-documented research on community reaction to noise and on change in noise exposure rated using a sliding scale. Although more transit noise is allowed in neighborhoods with high levels of existing noise, as existing noise levels increase, smaller increases in total noise exposure are allowed than in areas with lower existing noise levels. The FTA noise impact criteria group noise-sensitive land uses into the following three categories:

- **Category 1:** Tracts of land where quiet is an essential element in their intended purpose. This category includes lands set aside for serenity and quiet, land uses such as outdoor amphitheaters and concert pavilions, as well as National Historic Landmarks with significant outdoor use. Also included in this category are recording studios and concert halls.
- **Category 2:** Residences and buildings where people normally sleep. This category includes homes, hospitals, and hotels where a nighttime sensitivity to noise is assumed to be of utmost importance.

- **Category 3:** Institutional land uses with primarily daytime and evening use. This category includes schools, libraries, theaters, and churches where it is important to avoid interference with activities such as speech, meditation, and concentration on reading material. Places for meditation or study associated with cemeteries, monuments, museums, campgrounds, and recreational facilities are also considered to be in this category. Certain historical sites and parks are also included, but their sensitivity to noise must be related to their defining characteristics; generally, parks with active recreational facilities are not considered noise sensitive.

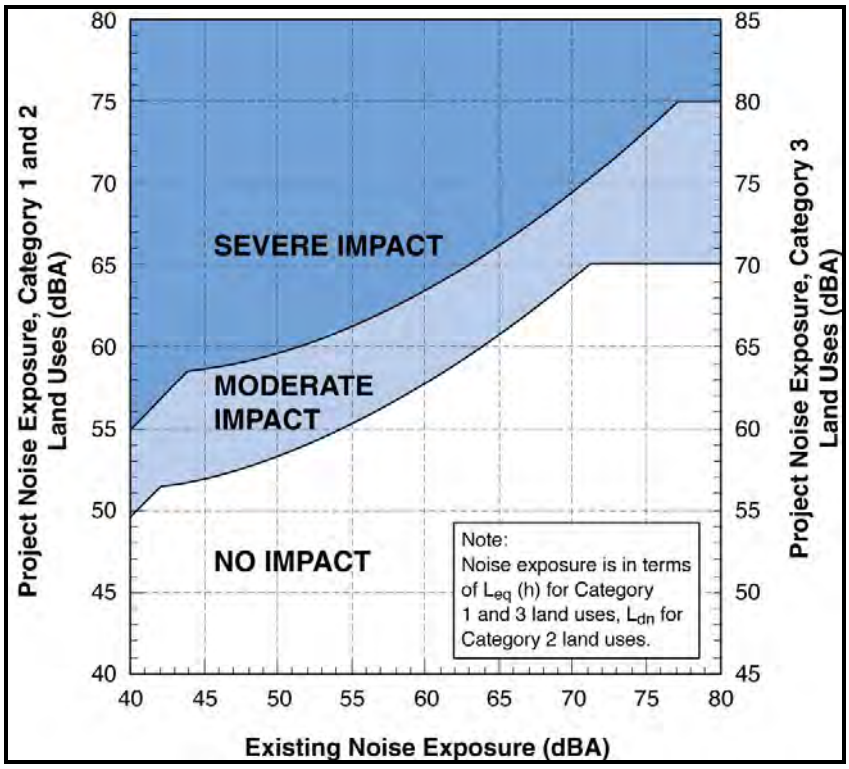
Ldn is used to characterize noise exposure for residential areas (Category 2). For other noise-sensitive land uses, such as outdoor amphitheaters and school buildings (Categories 1 and 3), the maximum 1-hour Leq during the facility's operating period is used.

The two levels of impact included in the FTA criteria (severe and moderate) are as follows:

- **Severe Impact:** Project-generated noise in the severe impact range can be expected to cause a large percentage of people to be highly annoyed by the new noise and represents the most compelling need for mitigation. Noise mitigation will normally be specified for severe impact areas unless there are truly extenuating circumstances that prevent mitigation.
- **Moderate Impact:** In this range of noise impact, the change in the cumulative noise level is noticeable to most people but may not be sufficient to cause strong, adverse reactions from the community. In this transitional area, other project-specific factors must be considered to determine the magnitude of the impact and the need for mitigation. These factors include the existing level, the projected level of increase over existing noise levels, the types and numbers of noise-sensitive land uses affected, the noise-sensitivity of the properties, the effectiveness of the mitigation measures, community views, and the cost of mitigating noise to more acceptable levels.

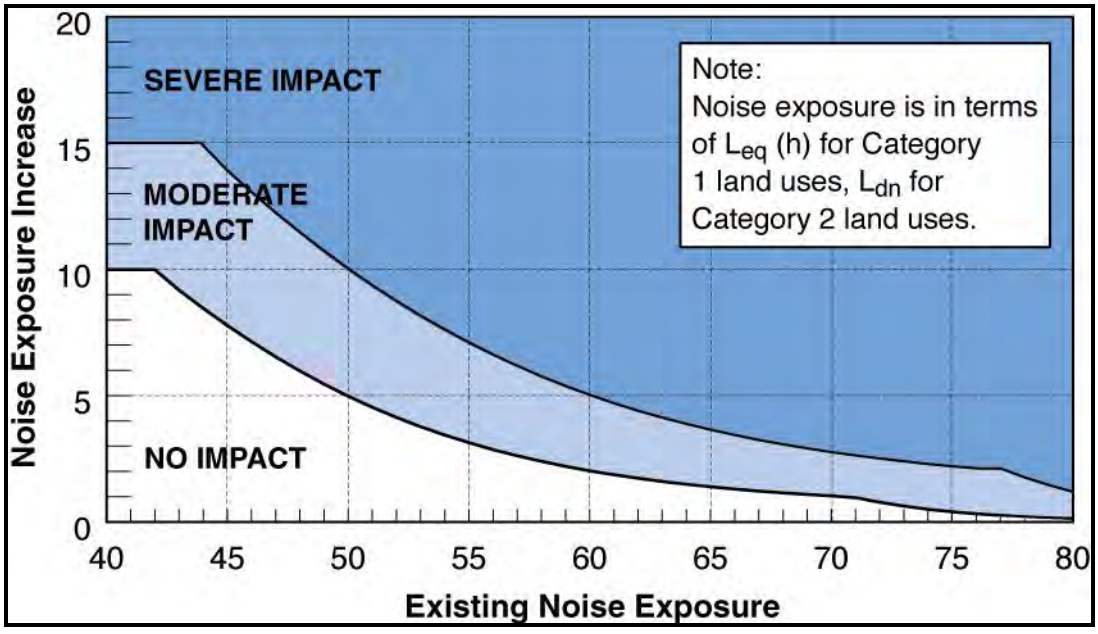
The FTA noise impact criteria are summarized in graphical form in Figure 12.1-1, which shows the existing noise exposure and the allowable noise exposure from the transit project that would cause either moderate or severe impact. The future noise exposure would be the combination of the existing noise exposure and the additional noise exposure caused by the light rail project. Figure 12.1-2 expresses the same criteria in terms of the increase in total or cumulative noise that can occur in the overall noise environment before an impact occurs.

Figure 12.1-1. FTA Project Noise Impact Criteria



Source: FTA *Transit Noise and Vibration Impact Assessment*. (2006).

Figure 12-1-2. Increase in Cumulative Noise Exposure Allowed by FTA Criteria



Source: FTA Transit Noise and Vibration Impact Assessment. (2006).

The FTA Manual provides details on how parks are analyzed for noise in Chapter 3, Section 2, Application of Noise Impact Criteria, of the manual. FTA assumes that parks are a special case, and how they are used and where they are located should be considered when considering whether or not a particular park, or an area in a park, is considered noise-sensitive. Parks that are used for outdoor recreation are typically not considered noise-sensitive. This includes parks with baseball diamonds, soccer fields, basketball courts, football fields, and other active recreation areas.

Noise-sensitive parks are defined as those where quiet is an essential element in their intended purpose, or places where it is important to avoid interference with activities such as speech, meditation, and reading. The existing noise levels at a park can indicate the sensitivity of its use. All parks along the project corridors will be evaluated for consideration under the FTA criteria, and based on the park locations and existing noise levels, will determine if any parks meet the requirements for noise-sensitivity under the FTA Category 3 criteria.

12.1.1.2 FHWA and ODOT Traffic Noise Criteria

Under the FTA criteria, projects where the majority of noise throughout the day and night are produced by traffic noise should consider using the FHWA Traffic Noise Model (TNM) to predict traffic noise levels. In addition, projects that include any of the following improvements should also be analyzed using the FHWA TNM:

1. The construction of a highway on a new location; or,
2. The physical alteration of an existing highway where there is either:
    a) Substantial Horizontal Alteration. A project that halves the distance between the traffic noise source and the closest receptor between the existing condition to the future build condition; or,
    b) Substantial Vertical Alteration. A project that removes shielding, therefore, exposing the line-of-sight between the receptor and the traffic noise source. This is done by either altering the vertical alignment of the highway or by altering the topography between the highway traffic noise source and the receptor; or,
3. The addition of a through-traffic lane(s). This includes the addition of a through-traffic lane that functions as a HOV lane, High-Occupancy Toll (HOT) lane, bus lane, or truck climbing lane; or,
4. The addition of an auxiliary lane, except when the auxiliary lane is a turn lane; or,
5. The addition or relocation of interchange lanes or ramps added to a quadrant to complete an existing partial interchange; or,
6. Restriping existing pavement for the purpose of adding a through-traffic lane or an auxiliary lane; or,
7. The addition of a new or substantial alteration of a weigh station, rest stop, rideshare lot or toll plaza.

Because it is possible that some of these improvements may be used for the different corridors, the following regulatory information is prudent to this analysis.

The criteria for traffic noise impacts are taken from the FHWA Procedures for Abatement of Highway Traffic Noise and Construction Noise, Code of Federal Regulations (CFR) Title 23, Subchapter H, Section 772 (1982). A traffic noise impact occurs if predicted traffic noise levels approach the criteria levels for specific land use categories or substantially exceed existing noise levels (e.g., a 10-dbA increase). These

levels are defined as noise abatement criteria (NAC), and are based on hourly Leq levels for the peak hour of traffic noise. The FHWA criterion applicable for residences is an exterior hourly equivalent sound level (Leq) that approaches or exceeds 67 dBA. The exterior criterion for places of worship, schools, recreational uses, and similar areas is also 67 dBA Leq. The criterion applicable for hotels, motels, offices, restaurants/bars, and other developed lands is an exterior Leq that approaches or exceeds 72 dBA. There are FHWA traffic noise impact criteria for retail facilities, industrial and warehousing uses, undeveloped lands that are not permitted, or construction noise. No analysis of traffic noise impacts is required for those uses for which no criteria exist.

The noise assessment for traffic noise evaluation on public roadways will address and comply with the ODOT *Noise Manual* (Updated July 2011). Under ODOT regulations, a traffic noise impact occurs if predicted noise levels are within 2 dB of the NAC level identified in Table 1. As a result, in Oregon, residential impacts (category B property) begin to occur at 65 dBA. Impacts at places of worship, schools and recreational areas (category C properties) also begin to occur at 65 dBA in Oregon. Hotel/motel, office building, and restaurant/bar impacts (category E property) begin to occur at 70 dBA. In addition, ODOT considers a 10 dB increase over the existing noise levels a substantial increase, and therefore an impact. Table 12.1-1 summarizes the FHWA NAC and the ODOT traffic noise approach abatement criteria (NAAC).

The noise assessment for traffic noise evaluation on public roadways will address and comply with the ODOT *Noise Manual* (Updated July 2011).

Table 12.1-1. Roadway Noise Abatement Criteria and Land Use Categories

Activity Category	Activity Criteria in hourly Leq (dBA)		Evaluation Location	Activity Description
	FHWA NAC	ODOT NAAC		
A	57	55	Exterior	Lands on which serenity and quiet are of extraordinary significance and serve an important public need and where the preservation of those qualities is essential if the area is to continue to serve its intended purpose.
B1	67	65	Exterior	Residential
C1	67	65	Exterior	Active sport areas, amphitheaters, auditoriums, campgrounds, cemeteries, day care centers, hospitals, libraries, medical facilities, parks, picnic areas, places of worship, playgrounds, public meeting rooms, public or nonprofit institutional structures, radio studios, recording studios, recreation areas, Section 4(f) sites, schools , television studios, trails, and trail crossings
D	52	50	Interior	Auditoriums, day care centers, hospitals, libraries, medical facilities, places of worship, public meeting rooms, public or nonprofit institutional structures, radio studios, recording studios, schools, and television studios
E1	72	70	Exterior	Hotels, motels, offices, restaurants/bars, and other developed lands, properties or activities not included in A-D or F.
F	--	--	--	Agriculture, airports, bus yards, emergency services, industrial, logging, maintenance facilities, manufacturing, mining, rail yards, retail facilities, shipyards, utilities (water resources, water treatment, electrical), and warehousing
G	--	--	--	Undeveloped lands that are not permitted

Source: FHWA Procedures for Abatement of Highway Traffic Noise and Construction Noise, Code of Federal Regulations (CFR) Title 23, Subchapter H, Section 772. (1982).
ODOT *Noise Manual.* (Updated July 2011).

Notes:

1. Includes undeveloped lands permitted for this activity category

12.1.2 State

The State of Oregon Department of Environmental Quality (DEQ) has noise regulations that are primarily applicable to noise produced by residential, commercial and industrial uses by limiting the amount of noise that is allowable at other nearby uses. However, for areas with a local noise control ordinance, like Lane County and the cities of Eugene and Springfield, the local noise ordinance would be the applicable ordinance for any noise impact analysis. Therefore, the DEQ noise regulations would not be used for this analysis.

12.1.3 Local

There are three local noise control ordinances, the county ordinance from Lane County, and two city ordinances, one from the City of Eugene and the second from the City of Springfield.

12.1.3.1 Lane County Noise Control Ordinance

The Lane County Noise Control Ordinance is found in Chapter 5, Section 5.600 of the Lane County Code. The Lane County Code provides specific property boundary maximum allowable noise levels and would be applicable to noise related to maintenance bases, park and rides, and other fixed project-related ancillary facilities. Under the Lane Code, noise levels are restricted to 60 dBA between the hours of 7:00 am and 10:00 pm, and 50 dBA between the hours of 10:00 pm and 7:00 am.

12.1.3.2 City of Eugene Noise Ordinance

The City of Eugene Municipal Code has a Noise Disturbance section that is found in the City Code Sections 6.750. The City of Eugene's Noise Code restricts commercial and industrial noise to 60 dBA at the property line of any nearby residential land use (city zone R-1, R-2, R-3 or R-4). Further, the code restricts general construction noise to the hours of 7:00 am to 7:00 pm; therefore, a noise variance would be required for construction between the hours of 7:00 pm and 7:00 am the following day.

12.1.3.3 City of Springfield Noise Ordinance

The City of Springfield noise ordinance is also mainly for disturbances. However, the City of Springfield Noise Control Ordinance, found in the Springfield Municipal Code, Section 5.220, also limits construction noise and activities between the hours of 6:00 pm and 7:00 am without a variance from the Springfield City Council.

12.2 Analysis Area

The analysis areas for noise studies typically includes all nearby lands that could meet, or exceed the noise criteria. For bus transit systems, this is typically between 50 and 500 feet from the project noise source, depending on the type of noise source and topographical conditions and shielding between the source and receiver. For highway projects, impacts at residences can occur as far as 500 feet, or more from the roadway, depending on the volume, speed and vehicle mixture of the traffic and topographical conditions and shielding between the source and receiver. For all noise studies, all project related noise impacts must be identified, and therefore the analysis area for the Level 2 AA will be based on assuring that all noise impacts are identified.

12.3 Contacts and Coordination

Coordination and contacts for the noise study would include several local and state agencies along with the project engineers, design team and traffic engineers for data that would be used for this analysis.

12.3.1 Federal

No direct contact or coordination with specific personnel at the FTA of FHWA is anticipated for this project. However, the results of this analysis will be reviewed by appropriate personnel at the FTA

12.3.2 State

Contact with the Oregon Department of Transportation may be required if the project consists of elements that meet those described under 12.1.1.2.

12.3.3 Local

No local contact outside that necessary for completing this analysis, e.g., data and information from Lane Transit, is anticipated.

12.4 Level 1 Screening

No data will be collected for the Level 1 Screening.

12.5 Level 2 Alternatives Analysis

The project's assessment of potential noise impacts from the alternatives under study will be based on the FTA's current *Transit Noise and Vibration Impact Assessment* (May 2006).

Based on FTA's guidance and a review of the design specifics of the proposed alternatives, the study team will first follow the Screening Assessment as defined in Chapter 4 of the FTA manual for the Level 2 AA noise and vibration analysis. In addition, a review of the proposed corridors will be performed to determine if any projects elements meet the FHWA analysis requirements provided in Chapter 12.1.1.2.

The noise impact analysis area for the Level 2 AA will consist of an area between 50 and 500 feet from either side of the proposed alignment alternatives and facilities. The analysis area is based on the requirements from the FTA and is summarized in Table 12.1-2. The distance from the noise source to the receiver are provided for areas with direct line of sight to the noise source, (unobstructed), and for areas with intervening buildings or other physical shielding that would reduce the transmission of noise.

There is no typical distance for traffic noise impacts from the FHWA. However, because the corridors are current, and well established, transportation corridors, with speeds limits of 45 mph or lower, the potential for traffic noise impacts is likely limited to residences within 500 feet of the centerline of the roadway. This is based on several noise measurements and noise modeling in the greater Springfield and Eugen areas in addition to noise monitoring and modeling in other similar areas.

Table 12.1-2. Screening Distances for Bus Related Transit Projects

System and Subsystem		Screening Distance in Feet[1]	
		Unobstructed	Intervening Building
General Roadway Traffic[2]		500[2]	350[2]
Busway		500	250
BRT on exclusive roadway		200	100
	Access Roads	100	50
	Transit Mall	225	150
Bus Facilities	Transit Center	225	150
	Storage & Maintenance	350	225
	Park & Ride Lots w/Buses	225	150

Source: FTA 2006 and modeling and measured data from previous project in the greater Eugene-Springfield area

1. Distance measured from the centerline of roadway or from the center of noise generating activity for stationary sources
2. Distance for traffic noise impacts is based on noise measurements and noise modeling in the greater Springfield and Eugene areas and other similar areas

In addition, as discussed in Chapter 12.1.1.2, several project elements could result in the need for a traffic noise study. Once the corridor plans are available, the team will review the corridors for locations where roadway widening is required as part of the project. Those areas will be reviewed to determine if the widening constitutes a traffic noise analysis under the FHWA criteria. For areas that meet the requirements in Chapter 12.1.1.2, or are identified with a potential noise impact under the FTA methods, a more detailed noise analysis may be required to determine if project related noise impacts occur. For areas with noise impacts identified, noise mitigation will be examined.

12.5.1 Data Collection

Data sources will include:

- MovingAhead Project Conceptual Designs;
- Transit and traffic speeds by segment from the MovingAhead project's travel demand forecasts and local traffic analysis;
- Reference noise levels for the proposed buses; and
- Ambient noise monitoring results (sampling methods will comply with the FTA and FHWA noise assessment guidance's).

12.5.2 Significance Thresholds

Significance thresholds for the noise impact analysis will be determined by the applicable noise criteria (either FTA and/or FHWA) (see Section 3 of the *Transit Noise and Vibration Impact Assessment*) for transit and traffic related noise. For ancillary facilities, such as park and rides, the significance thresholds will include the FTA criteria and any applicable local noise control ordinance.

12.5.3 Impact Analysis

As defined in in 12.5, Level 2 AA, areas with design elements that require a detailed noise analysis will be analyzed using the appropriated methods. For areas that only meet the FTA requirements, a noise analysis using the FTA criteria will be performed. For areas with design elements that meet the FHWA requirements, a detailed traffic noise analysis may be required.

12.5.3.1 Long-Term Impacts Analysis Approach

If a detailed noise impact analysis is required, then the following methods may be used to determine impacts.

FTA Noise Analysis

Noise impacts for FTA analysis would be determined through the following approach:

1. A land use survey of potential noise-sensitive receptors near the proposed alignments would be performed. This process involved site visits and use of area land-use maps and information from other project team members.
2. Long-term (multi-day) and short-term (15- to 30-minute) noise monitoring sessions would be performed, as needed, to establish existing noise levels for the potentially affected area. The criteria for monitoring location selection included land use, existing ambient noise, number of sensitive receivers in the area, and level of expected impact. Traffic counts will also be taken at sites that could be used for traffic noise modeling, if applicable.
3. Field noise measurements would be used to develop a set of existing ambient sound levels for the noise-sensitive receptors.
4. Existing ambient sound levels would be used to determine the noise impact criteria. The FTA criteria for noise impact are based on the existing noise level and land use (see Chapter 12.1.1.1).
5. Projections of project related noise levels will be predicted using the methods for a Detailed Noise Analysis from the FTA Manual (FTA, 2006).
6. Using the projected noise levels and the FTA criteria for impact, potential noise impacts would be identified.
7. Where noise impacts are identified, mitigation will be considered. Mitigation recommendations will follow the requirements in the FTA Manual (FTA, 2006), and must be considered reasonable and feasible.
8. A Technical Noise Impact and Mitigation Report would be produced to summarize the results of the above analysis.

FHWA / ODOT Traffic Noise Study

For traffic noise, the FHWA and ODOT methods would be used as guidelines for the noise impact analysis and would be determined through the following approach:

1. A land use survey of potential noise-sensitive receptors near the proposed alignments would be performed. This process involved site visits and use of area land-use maps and information from other project team members.

2. Short-term noise monitoring will be performed during a typical weekday. Traffic counts of all major roadways will be performed during the noise monitoring. The short-term measured noise levels will be used to validate the FHWA Traffic Noise Model and establish the existing noise environment.
3. Operational noise levels from the project roadway will be predicted for the existing condition, the no-build condition, and the build alternatives. The noise model used for the analysis shall be the FHWA Traffic Noise Model (TNM) version 2.5, or newer.
4. Based on the modeled noise levels, the locations of noise impacts will be identified.
5. If noise impacts are identified, noise mitigation must be considered. Where noise mitigation is considered, the contractor shall perform a cost effectiveness analysis as required by ODOT. Mitigation measures are found to be reasonable and feasible would be recommended for inclusion with the project.
6. A noise technical report summarizing the finding of the noise study will be produced. The contents will include land use, existing noise, methodology, impacts, and recommended mitigation.

12.5.3.2 Short-Term Impacts Approach

Construction noise analysis will also be discussed. The methods for analyzing construction noise will follow the methods given in the FTA Manual (FTA, 2006). The analysis will review the types of construction equipment and techniques required for project construction and determine potential noise levels at 50 feet from the activity. Because construction noise is exempt during daytime hours of 7:00 am to 7:00 pm in the City of Eugene and 7:00 am to 6:00 pm in the City of Springfield, no construction noise impacts are predicted if construction is performed during the allowable hours.

12.5.3.3 Indirect Impact Analysis Approach

There are no indirect impacts predicted as part of this project.

12.5.3.4 Cumulative Impact Analysis Approach

Cumulative noise levels include the project noise and any other noise sources or projects in the immediate area. For most corridors under consideration, the primary noise source would be local area traffic, with additional noise from local commercial, industrial and residential activities. The noise analysis will include the existing and future noise levels through measurements and modeling.

12.5.3.5 Mitigation Measures Approach

Mitigation will be considered for areas with noise impacts. Mitigation for the FTA impacts will follow the requirements in the FTA Manual (FTA, 2006), and must be considered reasonable and feasible. Mitigation for FHWA impacts

12.6 NEPA Documentation

The NEPA documentation will include the Technical Noise Reports, produced as part of the study.

12.7 References

23 CFR Part 772: Procedures for Abatement of Highway Traffic Noise and Construction Noise – Final Rule (FHWA: 2011)

Highway Traffic Noise Analysis and Abatement Policy and Guidance (FHWA Office of Environment and Planning, Noise and Air Quality Branch: June 1995).

13. Operating and Maintenance Costs Estimating

This section describes the analysis methodologies and data to be used for the Operating and Maintenance Costs Estimating for the MovingAhead project.

13.1 Approach

Annual corridor Operating and Maintenance (O&M) costs will be estimated for the transit service portion of the alternatives under study in the project's Level 1 screening, Level 2 alternatives analysis, and subsequent environmental documentation. O&M costs will be based on service levels for the project's forecast year (2035). Those service levels will be calibrated to meet forecast demand based on projected land use, employment, and population levels for the forecast year. All costs will be stated in current dollars (2015), but again, costs are based on service levels needed to meet transit demand in the forecast year (2035).

O&M cost differences will be assessed only for MovingAhead Corridor routes. That is, operating costs will be calculated only for those routes that would operate differently under the project's alternatives. The O&M costs for all other routes will be considered to remain constant across all of the alternatives.

13.2 Operating and Maintenance Costs Estimate Development

LTD will estimate O&M costs using a spreadsheet model in which costs are assessed within three categories: service, fixed infrastructure, and other related costs. The O&M unit costs will be based on LTD's actual costs for the most current full fiscal year available when the cost estimates are prepared.

13.2.1 Cost Categories

13.2.1.1 Service

- Annual platform hours for corridor routes
- Annual vehicle miles for corridor routes

13.2.1.2 Fixed Infrastructure

- Annual cost per mile to maintain LTD right of way
- Annual cost to maintain/operate a transit-vehicle-actuated signal (as per intergovernmental agreements)
- Annual cost to maintain a station

13.2.1.3 Other Costs

- Fare collection and ticket machine maintenance
- Station security and fare enforcement
- Differential in collected fares compared to the No-Build Alternative

13.2.2 Level 1 Screening

Order-of-magnitude cost estimates will be developed.

13.2.3 Level 2 Alternatives Analysis

Refined order-of-magnitude cost estimates will be developed for the corridors and alternatives advanced from the Level 1 Screening.

13.2.4 NEPA Documentation

Refined order-of-magnitude cost estimates will be developed for the corridor preferred alternatives advanced from the Level 2 AA.

14. Parklands, Recreation Areas, and Section 6(f)

This section describes the analysis methodologies and data to be used for the Parklands, Recreation Areas, and Section 6(f) evaluation for the MovingAhead project.

14.1 Relevant Laws and Regulations

14.1.1 Federal

National Environmental Policy Act, 42 U.S.C. 4321-4347

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. Section 4(f) is specifically addressed in Section 15 of this report.

Section 6(f) of the Land and Water Conservation Fund 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 assuring to all citizens of the United States of present and future generations such quality and quantity of outdoor recreation resources as may be available and are 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.

The purpose of the LWCF Act is to assist in preserving, developing, and ensuring accessibility to outdoor recreation resources and to strengthen the health and vitality of the citizens of the United States by providing funds, planning, acquisition, and development of facilities. Recreation facilities awarded such funds are subject to the provisions of this Act. 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 recreation facilities to other uses. Conversion of property acquired or developed with assistance under the program requires approval of NPS and substitution of other recreation properties of at least equal fair market value and of reasonably equivalent usefulness and location.

Section 6(f)(3) of the LWCF Act requires that no property acquired or developed with LWCF assistance be converted to other than public outdoor recreation uses without the approval of the Secretary of the Interior, only if the Secretary finds it to be in accord with the then existing Statewide Comprehensive Outdoor Recreation Plan, and only upon such conditions as the Secretary deems necessary to ensure the substitution of other recreation properties of at least equal fair market value and of reasonably equivalent usefulness and location (pursuant to 36 CFR 59). Section 6(f) conversion would require additional coordination with the agency of jurisdiction and the Oregon Parks and Recreation Department (OPRD), which oversees the LWCF program for the NPS, and the NPS regarding the project effects and conversion area and replacement property.

14.1.2 State

Oregon Statewide Planning Goals, OAR 660-15-0000 (1-15)
(http://www.lcd.state.or.us/LCD/goals.shtml#Statewide_Planning_Goals). The foundation of Oregon's land use planning program is a set of 19 Statewide Planning Goals. The goals express the state's policies on land use and related topics, such as citizen involvement, housing, and natural resources and are achieved through local comprehensive planning. State law requires each city and county to adopt a comprehensive plan and the zoning and land-division ordinances needed to put the plan into effect. Thus, the Statewide Planning Goals are the foundation of locally adopted plans, which are approved if consistent with Statewide Goals. No data collection or analysis will be conducted specifically for the Statewide Goals because they are implemented through local code and plans, which will direct the data gathering and analysis. Statewide Goals specifically relevant to the assessment of Parks and Recreation area impacts are: Goal-5 Open Spaces, Scenic and Historic Areas, and Natural Resources, Goal-8 Recreational Needs, and Goal-15 Willamette River Greenway. No data collection or analysis will be conducted specifically for these statutes, as they are implemented through local code and plans which will direct the data gathering and analysis.

Oregon Statewide Outdoor Recreation Plan (SCORP)
The 2013-2017 Oregon Statewide Outdoor Recreation Plan (SCORP), entitled *Ensuring Oregon's Outdoor Legacy*, constitutes Oregon's basic five-year plan for outdoor recreation. The plan guides the use of Land and Water Conservation Fund (LWCF) funds that come into the state, provides guidance for other Oregon Parks and Recreation Department (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. No data collection or analysis will be conducted specifically for these statutes, as they are implemented through local code and plans which will direct the data gathering and analysis.

14.1.3 Local

- Metro Plan, Eugene-Springfield Metropolitan General Area Plan (2004 Update)
- Envision Eugene (Eugene's Comprehensive Plan; latest draft or as adopted)
- Springfield 2030 (draft comprehensive plan)
- Eugene Parks, Recreation and Open Space Comprehensive Plan (February 2006) and applicable local park master plans
- Willamalane Parks and Recreation District 20-year Parks and Recreation Comprehensive Plan

14.2 Analysis Area

The parks and recreation / Section 6(f) analysis area for the MovingAhead project will be based on the corridor alternatives selected for further analysis in the Level 2 AA. The final boundaries of the Land Use Analysis Area will be adjusted to include all parcels within 350 feet of the alternatives to be analyzed. The 350-foot distance was used because 350 feet is the unobstructed screening distance for FTA noise impact assessments and will allow identification of potential noise impacts to parkland resources.

14.3 Contacts and Coordination

14.3.1 Federal

- U.S. Department of Interior National Park Service

14.3.2 State

- Oregon Parks and Recreation Department

14.3.3 Local

- City of Eugene Parks Department
- Willamalane Parks and Recreation District
- Lane County Parks Department
- Willamalane Park and Recreation District
- LCOG

14.4 Level 1 Screening

No data will be collected nor analysis conducted for the Level 1 Screening.

14.5 Level 2 Alternatives Analysis – Parks and Recreation Areas

14.5.1 Data Collection

GIS will be utilized to identify and describe all park and recreation properties located within 350 feet of potential BRT alignments. For identifying parks / recreational resources, GIS data sets to be utilized will include City of Eugene, City of Springfield, Lane County, and state parks and trails GIS data layers. Subsequent to this initial GIS operation, a follow-up visual scan of the study area will be conducted using Google Earth ™ and applicable state and local parks maps to verify that all parks/recreational resources have been identified. Park / recreational trail maps will be obtained from applicable state and jurisdictional web sites, comprehensive plans and / or parks master plans.

The following existing condition elements will be addressed in the description of each park/recreation property in the study area:

- Physical description (location/address; size of resource; setting)
- Ownership
- Activities/features/attributes of the resource
- Access to the resource
- Visitor use
- Planned Uses

14.5.2 Significance Thresholds

Direct impacts are those that involve acquisition of land for permanent use or for temporary construction easements.

14.5.3 Impact Analysis

14.5.3.1 Long-Term Impacts Analysis Approach

GIS spatial analysis will be used to facilitate the assessment of impacts to park / recreation resources. GIS will be used to assess whether there will be any direct impacts to park / recreation properties, and, if so, the size of the area that would be permanently or temporarily incorporated from the property. This assessment will be based on the proposed footprint of the project. In the case of any direct impacts, the analysis will specify the features, attributes and amenities of the impacted area of the park / recreation property.

14.5.3.2 Short-Term Impacts Approach

GIS will be used to assess whether there will be any construction-related impacts to park / recreation properties, and, if so, the size of the area that would be temporarily incorporated from the property. This assessment will be based on the proposed footprint of the project. In the case of any short-term construction impacts, the analysis will specify the features, attributes and amenities of the impacted area of the park/recreation property.

14.5.3.3 Indirect Impact Analysis Approach

The assessment of indirect impacts will consider whether the proximity effects of the project results in substantial impairment to a park / recreational property's activities, features, or attributes. An impact will be found to have a substantial impairment if the recreational value of the property will be meaningfully reduced or lost. Such an impact could be the result of a variety of project related-effects such as impacts to park access (from delays or closures), visual impacts, or increases in noise.

14.5.3.4 Cumulative Impact Analysis Approach

Cumulative impacts result from the combined impacts of the proposed project with those occurring in the past, present, and reasonably foreseeable future. A cumulative impact is the impact on the environment resulting from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (federal or nonfederal) or person undertakes such other actions. As part of the park and recreation area analysis effort a list of reasonably-foreseeable planned park and recreation projects will be compiled.

Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time. Cumulative impacts may include the effects of natural processes and events, depending on the specific resource in question. Cumulative impacts include the total of all impacts to a particular resource that have occurred, are occurring, and will likely occur as a result of any action or influence. The cumulative impact analysis for parks and recreation will be a comparison of the past, present, and reasonably foreseeable energy consumption impacts within a larger area of potential impact. The analysis will establish a temporal frame of reference, and geographic frame of reference.

Cumulative impacts will be qualitatively analyzed and will be based on comprehensive land use and transportation elements that are components of all build alternatives. This contextual analysis will include past, present and reasonably foreseeable future projects or actions occurring in the project area

or the broader community which when combined with the project build alternatives, may lead to significant increases or changes in park use or conflicts with adopted parks-related policies.

The analysis will review other transportation and land development projects in the area. The analysis will consider whether these projects may have similar impacts on parks and recreation resources.

14.5.3.5 Mitigation Measures Approach

Measures to avoid or minimize potential impacts to park / recreation properties will be developed in coordination with the applicable jurisdictional park department.

14.6 Level 2 Alternatives Analysis – Section 6(f)

14.6.1 Data Collection

The LWCF *Detailed Listing of Grants with County Totals* datasets website (http://waso-lwcf.ncrc.nps.gov/public/index.cfm) will be investigated for Lane County to identify if any parks in the analysis area have received LWCF grants in the past. Subsequent to this, both the study area parks list and the applicable Lane County LWCF list will be sent to OPRD for review to ensure the LWCF list did not miss any of the study area parks.

14.6.2 Significance Thresholds

For the Section 6(f) assessment, a significant impact would be defined as one in which property from a Section 6(f) property would need to be acquired by the project and converted to transportation use.

14.6.3 Impact Analysis

GIS spatial analysis will be used to determine whether any proposed alignments would necessitate the permanent incorporation of property from a Section 6(f) property. This assessment will be based on the proposed footprint of the project. In the case of any permanent incorporation of property, the analysis will specify the features, attributes and amenities of the area of the park/recreation property that would be converted to transportation use.

14.6.3.1 Mitigation Measures Approach

If a proposed alternative would result in the need to convert parkland from a Section 6(f) resource and that alternative was subsequently selected as a preferred alternative, the project would need to coordinate with the jurisdictional owner and OPRD to develop a Section 6(f) Conversion Proposal in accordance with 36 CFR 59.3.The Conversion Proposal would need to demonstrate that the proposed strategy for replacing existing protected Section 6(f) land with new land was in full accordance with both the prerequisites for conversion approval and the criteria for determining “equivalent usefulness and location” of a replacement property, as described in 36 CFR 59.3.

14.7 References

Land and Water Conservation Fund. Detailed Listing of Grants with County Totals. (http://waso-lwcf.ncrc.nps.gov/public/index.cfm)

National Environmental Policy Act. 36 CFR 59.3. (http://www.nps.gov/ncrc/programs/lwcf/post_completion_compliance_docs/36cfr59.3.pdf)

15. Section 4(f)

This section describes the analysis methodologies and data to be used for the Section 4(f) evaluation for the MovingAhead project.

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

15.1 Relevant Laws and Regulations

15.1.1 Federal

Department of Transportation Act of 1966, Section 4(f), 49 U.S.C. 303
(http://www.law.cornell.edu/uscode/uscode49/usc_sec_49_00000303----000-.html); implementing regulations at 23 CFR 771.101-771.137 (http://ecfr.gpoaccess.gov/cgi/t/text/text-idx?c=ecfr&tpl=/ecfrbrowse/Title23/23cfr771_main_02.tpl) ; and guidelines in the FHWA, DOT Section 4(f) Policy Paper (http://www.environment.fhwa.dot.gov/projdev/4fpolicy.asp)

This act prohibits the Secretary of Transportation from approving any program or project that requires the "use" of (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, (collectively, "Section 4(f) resources") unless there is no feasible and prudent alternative to the use of such land, and unless such program or project includes all possible planning to minimize harm to the park, recreation area, wildlife refuge, or historic resource.

Historic resources are addressed separately under the Historic, Cultural, and Archaeological Report, with coordination in this section for shared Section 4(f) resources.

National Historic Preservation Act of 1966, 16 U.S.C. 470
(http://www.law.cornell.edu/uscode/html/uscode16/usc_sec_16_00000470----000-.html) and implementing regulations, 36 CFR Part 63--- Determinations of Eligibility for Inclusion in the National Register of Historic Places (http://ecfr.gpoaccess.gov/cgi/t/text/text-idx?c=ecfr&tpl=/ecfrbrowse/Title36/36cfr63_main_02.tpl), 36 CFR Part 800--- PROTECTION OF HISTORIC PROPERTIES (http://ecfr.gpoaccess.gov/cgi/t/text/text-idx?c=ecfr&tpl=/ecfrbrowse/Title36/36cfr800_main_02.tpl).

This act establishes a program for preserving historic properties throughout the nation and declares as a national policy to protect, rehabilitate, restore, and reuse districts, sites, buildings, structures, and objects significant in American architecture, history, archaeology, and culture. Section 106 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 National Register of Historic Places.

15.1.2 State

None applicable.

15.1.3 Local

None applicable.

15.2 Analysis Area

The Section 4(f) analysis area for the MovingAhead project will be based on the corridor alternatives selected for further analysis in the Level 2 AA. The final boundaries of the Section 4(f) analysis area will be adjusted to include all parcels within 350 feet of the center line of the alternatives to be analyzed. The 350-foot distance is proposed because 350 feet is the unobstructed screening distance for FTA noise impact assessments and will allow identification of potential noise impacts to park resources.

15.3 Contacts and Coordination

The project team will coordinate with owners of potentially impacted Section 4(f) resources, appropriate regulatory agency staff, and consult applicable planning documents to identify park and recreation resources, determine Section 4(f) applicability, and evaluation of the project alternatives for potential uses. Information sources may include the following:

15.3.1 Federal

- U.S. Department of Interior National Park Service
- Federal Transit Administration
- U.S. Bureau of Land Management

15.3.2 State

- Oregon Department of Transportation
- Oregon Parks and Recreation Department
- State Historic Preservation Office

15.3.3 Local

- Lane County, Oregon
- Lane Council of Governments
- City of Eugene Planning and Development Department
- City of Eugene Parks and Recreation Department
- City of Springfield Community Planning and Development
- Willamalane Park and Recreation District

15.4 Level 1 Screening

No data will be collected nor analysis conducted for the Level 1 Screening.

15.5 Level 2 Alternatives Analysis

15.5.1 Data Collection

15.5.1.1 Parks and Recreation Resources

GIS and other mapping will be used to identify publicly owned parks / recreational resources within the Section 4(f) analysis area's 350 foot buffer of proposed alignments. A follow-up visual scan of the study area will also be conducted using Google Earth™ and applicable state and local parks maps to verify that all parks / recreational resources have been identified. Each park and recreational resource will be reviewed to determine that it is publicly owned, open to the general public, and used for recreation. If the resource is mapped or included in an adopted planning document it will be considered "significant" per the Section 4(f) statute.

The following existing condition elements will be addressed in the description of each Section 4(f) property in the study area:

- Physical description (location / address; size of resource; setting)
- Ownership
- Activities / features / attributes of the resource
- Access to the resource
- Visitor use
- Planned Uses

15.5.1.2 Historic Resources

GIS data collected as part of the cultural resources assessment will be used to identify cultural resources that are listed or are eligible for listing on the National Register of Historic Places (NRHP) within the affected environment's 350-foot buffer.

15.5.2 Significance Thresholds

For the Section 4(f) assessment, a significant impact would be defined as one in which there is a potential "use" of a Section 4(f) resource. A significant park or recreational property is one that plays a comparatively important role in meeting the park and recreational objectives of the community or jurisdiction. Publicly owned parks and recreational lands that are accessible to the public and that are significant are subject to Section 4(f).

15.5.3 Determination of Use (Impact Analysis)

After identifying the Section 4(f) properties in the Section 4(f) analysis area, it will be determined whether and to what extent the project would "use" each property. The type of Section 4(f) use would be determined according to the following Section 4(f) use definitions:

- ***Permanent Use*.** Pursuant to 23 CFR 774.17, a permanent use occurs when land from a Section 4(f) property is permanently incorporated into a transportation project. This may occur as a result of partial or full acquisition of the Section 4(f) property, permanent easements, or temporary easements that exceed regulatory limits.

- ***Temporary Use***. As defined in 23 CFR 774.13(d), a temporary use occurs when there is a temporary use of land that is "adverse in terms of the statute's preservation purpose as determined by the criteria in 23 CFR 774.13(d)." If the criteria in 23 CFR 774.13(d) are met, the "temporary use exception" applies in which there is no "use" of the Section 4(f) property. If the criteria in 23 CFR 774.13(d) are not met, the use is evaluated as permanent (see Section 3.5.1.5 for a listing of the temporary occupancy criteria).
- ***Constructive Use***. As defined in 23 CFR 774.15(a), a constructive use occurs when a transportation project does not incorporate land from a Section 4(f) property, but the project's proximity impacts are so severe that the protected activities, features or attributes that qualify a property for protection under Section 4(f) are substantially impaired.

15.5.3.1 Permanent Use Analysis

If analysis reveals that land from a Section 4(f) property would be permanently incorporated into the project, an assessment would be made as to whether the impacts of this permanent use would be *de minimis* in nature.

A determination of *de minimis* use can be made only if the project will not adversely affect the features, attributes or activities that make the Section 4(f) property significant. The specific requirements for a *de minimis* use determination are different for historic sites and for public parklands, recreational areas, and wildlife and waterfowl refuges. Per Section 4(f) regulations, evaluations of avoidance alternatives and selection of an alternative having the least overall harm are not required if a *de minimis* use determination is made.

If the official with jurisdiction does not agree with a *de minimis* use determination, an Individual Section 4(f) Evaluation would need to be undertaken that would include an analysis of avoidance alternatives. If the Individual Section 4(f) Evaluation concludes that there is no feasible and prudent alternative to use of the Section 4(f) property, FTA may only approve the alternative or alternatives that cause the least overall harm. A least overall harm analysis is conducted to determine which alternative/s may proceed. A *de minimis* use determination is inappropriate where a project results in a constructive use (23 CFR 774.3(b) and 23 CFR 774.17).

- ***Parks, Recreation, and Refuges.*** A *de minimis* use on a public parkland, recreational area, or wildlife and waterfowl refuge is defined as that which does not "adversely affect the features, attributes or activities qualifying the property for protection under Section 4(f)." This determination can be made only with the concurrence of the official with jurisdiction, and can be made only after an opportunity for public review and comment on the proposed determination.
- ***Historic Properties.*** As defined in 23 CFR 774.5 and 774.17, a *de minimis* use determination is made for an historic site if FTA makes a determination for a property of "No Adverse Effect" or "No Historic Properties Affected" through consultation under Section 106 of the National Historic Preservation Act (NHPA), and the State Historic Preservation Officer (SHPO) concurs with that determination.

15.5.3.2 Temporary Use Analysis

If analysis reveals that land from a Section 4(f) property would be temporarily occupied by the project during construction activities, an assessment would be made as to whether the this temporary occupancy constitutes a use.

Temporary occupancies do not constitute a use and are, therefore, not subject to the provisions of Section 4(f) if they meet each of the following five criteria for temporary occupancy exception in 23 CFR 774.13(d):

i. Duration of occupancy must be temporary; i.e. less than the time needed for construction of the project, and there can be no change in ownership of the land.

ii. The scope of work must be minor; i.e., both the nature and magnitude of the changes to the Section 4(f) property are minimal.

iii. There can be no anticipated permanent adverse physical impacts, nor can there be interference with the activities, features or attributes of the property, on either a temporary or permanent basis.

iv. The land being used must be fully restored; i.e. the property must be returned to a condition that is at least as good as that which existed prior to the project.

v. Written concurrence must be obtained from the officials with jurisdiction, documenting agreement with the above conditions. If the official with jurisdiction does not agree with a temporary occupancy exception determination, an analysis of use must be conducted. If concurrence is obtained from the officials with jurisdiction over the properties, a final determination will be made by FTA in the Final Section 4(f) Evaluation, which will be included in the Record of Decision.

If the official with jurisdiction does not agree that the temporary occupancy criteria have been met then the temporary occupancy of Section 4(f) property would be considered a use, and an Individual Section 4(f) Evaluation would need to be undertaken that would include an analysis of avoidance alternatives.

15.5.3.3 Constructive Use Analysis

A constructive use involves no actual physical use of the Section 4(f) property via permanent incorporation of land or a temporary occupancy of land into a transportation facility. A constructive use occurs when the proximity impacts of a proposed project adjacent to, or nearby, a Section 4(f) property result in substantial impairment to the property's activities, features, or attributes that qualify the property for protection under Section 4(f). As a general matter this means that the value of the resource, in terms of its Section 4(f) purpose and significance, will be meaningfully reduced or lost. The types of impacts that may qualify as constructive use are addressed in 23 CFR 774.15. A project's proximity to a Section 4(f) property is not in itself an impact that results in constructive use. The assessment for constructive use will be based upon the impact that is directly attributable to the project under review, not the overall combined impacts to a Section 4(f) property from multiple sources over time.

15.5.3.4 Individual Section 4(f) Evaluation

The term "individual Section 4(f) evaluation" is used in this section to refer to the process of assessing avoidance alternatives, determining the alternative with the least overall harm, and considering all possible planning to minimize harm for each property that would be used by the project and where that use would not be *de minimis*. This analysis is required for all uses of a Section 4(f) property, except in the case of a *de minimis* use determination (*de minimis* use was described earlier).

The primary steps in a Section 4(f) evaluation are described below:

- ***Analyze Avoidance Alternatives:*** In this step, FTA considers alternatives that completely avoid the use of a Section 4(f) property. The avoidance analysis applies the Section 4(f) feasible and prudent

criteria (23 CFR 774.17(2) and (3)). An alternative is not feasible if it cannot be built as a matter of sound engineering judgment (2). An avoidance alternative is not considered prudent (3) if:

i. It compromises the project to a degree that it is unreasonable to proceed with the project in light of its stated purpose and need;

ii. It results in unacceptable safety or operational problems;

iii. After reasonable mitigation, it still causes:

(a) severe social, economic, or environmental impacts;

(b) severe disruption to established communities;

(c) severe disproportionate impacts to minority or low income populations, or

(d) severe impacts to environmental resources protected under other Federal statutes;

iv. It results in additional construction, maintenance, or operational costs of an extraordinary magnitude;

v. It causes other unique problems or unusual factors; or

vi. It involves multiple factors in paragraphs (3)(i) through (3)(v) of this definition, that while individually minor, cumulatively cause unique problems or impacts of extraordinary magnitude.

- ***Consider All Possible Planning to Minimize Harm:*** After determining that there are no feasible and prudent alternatives to avoid the use of Section 4(f) property, the project approval process for an individual Section 4(f) evaluation requires the consideration and documentation of all possible planning to minimize harm to Section 4(f) property (see 23 CFR 774.3(a)(2)). *All possible planning*, defined in 23 CFR 774.17, means that all reasonable measures identified in the Section 4(f) evaluation to minimize harm or to mitigate for adverse impacts and effects must be included in the project. All possible planning to minimize harm does not require analysis of feasible and prudent avoidance alternatives, as such analysis will have already occurred in the context of searching for feasible and prudent alternatives that would avoid Section 4(f) properties altogether under 23 CFR 774.3(a)(a). Minimization and mitigation measures should be determined through consultation with the official(s) with jurisdiction. Mitigation measures involving public parks, recreation areas, or wildlife or waterfowl refuges may involve replacement of land and/or facilities of comparable value and function, or monetary compensation to enhance remaining land. Mitigation of historic sites usually consists of those measures necessary to preserve the integrity of the site and agreed to in the project's Section 106 Agreement in accordance with 36 CFR 800 by FTA, SHPO, and other consulting parties.
- ***Determine Alternative/s with Least Overall Harm:*** If no feasible and prudent alternatives are identified that would avoid using a Section 4(f) property, FTA also determines the alternative that would cause the least overall harm to Section 4(f) properties using the following factors (23 CFR 774.3(c)1) and the results of considering all possible planning to minimize harm:

  i. The ability to mitigate adverse impacts to each Section 4(f) property

  ii. The relative severity of the remaining harm after mitigation

  iii. The relative significance of each Section 4(f) property

  iv. The views of the officials with jurisdiction over each property

  v. The degree to which each alternative meets the project purpose and need;

vi. The magnitude of adverse effects to resources not protected by Section 4(f)

vii. Substantial cost differences among the alternatives

- ***Coordinate with Officials with Jurisdiction:*** FTA and the Council are coordinating with the officials with jurisdiction over each of the protected properties for which a determination is made in the project's Draft Section 4(f) Evaluation.

15.5.3.5 Mitigation Measures Approach

Based on the location, degree and nature of significant adverse effects, the project team will identify possible mitigation measures during the evaluation process and in coordination with other disciplines. The project team will consult with the jurisdictional owners of the Section 4(f) properties to determine the most appropriate measures to mitigate for potential impacts.

15.6 References

In addition to the laws and regulations discussed earlier in this report, the following sources were used in preparing this report:

City of Eugene Land Use Code.(http://www.eugene-or.gov/portal/server.pt/gateway/PTARGS_0_0_5848_319_0_43/http%3B/cesrv501/lf7citycode/Home.aspx)

Department of Transportation Act of 1966, Section 4(f), 49 U.S.C. 303 (http://www.law.cornell.edu/uscode/uscode49/usc_sec_49_00000303----000-.html)

Federal Highway Administration. 2012. FHWA Section 4(f) Policy Paper. (http://www.environment.fhwa.dot.gov/4f/4fpolicy.asp)

Land and Water Conservation Fund Act of 1965, Section 6(f), 16 USC 460l-8(f)(3) (http://www.law.cornell.edu/uscode/html/uscode16/usc_sec_16_00000460---l008-.html)

Maryland State Highway Administration. 2003. Section 4(f) Interactive Training website. (http://www.section4f.com/home.htm)

Oregon Parks and Recreation Department. 2014. Oregon Grants Manual and Application Forms Federal Land and Water Conservation Fund. (http://www.oregon.gov/oprd/grants/pages/lwcf_other.aspx)

Oregon Parks and Recreation Department. 2012. Local Government Grant Program Grants Manual. (http://library.state.or.us/repository/2010/201002231110042/OPRD_GRANTS_docs_LGGP_2012_LGGP_Manual_Final_2.pdf)

Oregon Parks and Recreation Department. 2015. County Opportunity Grants Program Grants Manual. (http://www.oregon.gov/oprd/GRANTS/docs/CountyOp/2014-15_COGP_MANUAL_9.22.14.pdf)

Oregon Parks and Recreation Department. 2008. Statewide Comprehensive Outdoor Recreation Plan (SCORP). (http://www.oregon.gov/oprd/PLANS/docs/scorp/2008-2012_SCORP/2008_Scorp_Final_Web.pdf)

Sound Transit/WSDOT. 2003. Issue Paper No. 41. (http://www.fta.dot.gov/documents/tro10_issue41.pdf)

16. Street and Landscape Trees

This section describes the analysis methodologies and data to be used for the Street and Landscape Trees evaluation for the MovingAhead project.

16.1 Relevant Laws and Regulations

The following federal, state, and local laws, regulations, and agency jurisdiction and management guidance describe the applicable requirements for tree removal, evaluate the degree of impact, and identify the requirements and need for mitigation. These regulations are listed below.

16.1.1 Federal

National Environmental Policy Act (NEPA), 42 U.S.C. 4321-4347. The NEPA process consists of an evaluation of the environmental effects of a federal undertaking including its alternatives. There are three levels of analysis depending on whether or not an undertaking could significantly affect the environment. These three levels are: categorical exclusion determination; preparation of an environmental assessment/finding of no significant impact (EA/FONSI); and preparation of an environmental impact statement (EIS).

16.1.2 State

Oregon Statewide Planning Goal 5 Natural Resources, Scenic and Historic Areas, and Open Spaces. This goal calls for the conservation of open space and protection of natural and scenic resources that promote healthy and visually attractive environments. Street trees located along state-owned road facilities will be subject to state regulations. There are no instances of landscape trees located on state-owned non-roadway facilities.

16.1.3 Local

At the local level, the City of Eugene and the City of Springfield are the regulating agencies on the removal of street and landscape trees and may require LTD to obtain a permit to remove trees as part of a future high-capacity transit project. The City of Eugene Code chapters 6 and 9 document tree preservation removal standards. Administrative Rule R-6.305 clarifies Eugene tree preservation code, EC 6.300 – 6.330. Administrative Rule R-7.280 clarifies Eugene Street Tree Program code, EC 7.280, and establishes standards for tree protection, planting and pruning.

City of Eugene Urban Forest Management Plan (December 1992). This document contains goals and policies that guide the City in its actions and decisions affecting trees within the city limits. It also provides policies on protecting "Heritage Trees," defined 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." Oaks must be at least 34 inches in diameter and other trees listed must be 44 inches in diameter to be further evaluated to determine if they qualify as Heritage Trees (see Appendix C of the UF Management Plan).

City of Eugene Historic Tree Charter. Adopted during a special City election held on November 6, 1984, this law requires, with exceptions, voter approval for the removal of any historic tree(s) for any road-widening project, unless the City Manager approves an exception. A "Charter Tree" is defined as "Trees (a living, standing, woody plant having a trunk 25 inches in circumference at a point 4.5 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." (Eugene Charter 2002, Chapter XIII, Section 52, Amendment II)

16.2 Analysis Area

The MovingAhead project encompasses a number of corridors throughout the cities of Eugene and Springfield, Oregon. The analysis area for the project will be based on the alternatives selected for further analysis in the AA. The area of potential impact (API) encompasses street and landscape trees within the footprint of the potential alignments and associated improvements, on both sides of the corridor(s). Street trees are defined as those within the existing public road right of way. Landscape trees are defined as those located on adjacent private property outside the existing public right of way.

The trees that are considered of greater significance are those eligible for Charter Tree status or those that could be designated as Heritage Trees within the City of Eugene. Such trees are provided protections through City of Eugene code and policy. Heritage trees are trees of exceptional community value as defined in the Eugene Urban Forest Management Plan and are prohibited from removal under EC 6.305(4) and R-6.305-C(4) unless the City Manager determines their removal is necessary to protect the public health, safety, or welfare. Charter Trees are protected through the Historic Tree Charter. See the Regional and Local regulations section above for discussion of these regulations and policies.

16.3 Contacts and Coordination

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

16.3.1 Federal

None

16.3.2 State

- Oregon Department of Transportation

16.3.3 Local

- Lane County
- City of Eugene
- City of Springfield
- Lane Regional Council of Governments

16.4 Level 1 Screening

No data will be collected for the Level 1 Screening

16.5 Level 2 Alternatives Analysis

16.5.1 Charter Trees

For the Level 2 AA, to determine whether street and landscape trees meet the definition of a Charter Tree, the project will obtain historic aerial imagery of the City of Eugene project area. These photos will be compared with contemporary imagery to estimate whether potentially impacted trees existed 50 years ago, which would indicate possible charter eligibility. The project team will additionally obtain available Geographic Information Systems (GIS) data on existing Charter Trees from the City of Eugene. This information will be used to determine where Charter Trees may be impacted along the proposed corridors. This determination of potential impacts will be made based on the location of the resources relative to dimensions from proposed transitway cross sections. The project team will prepare maps of potentially impacted Charter Trees adjacent to project alternative alignments.

16.5.2 Heritage Trees

To determine whether street and landscape trees meet the definition of a Heritage Tree, the project will obtain the City's existing tree inventory database and contemporary aerial imagery of the City of Eugene project area. Trees that may meet the criteria for Heritage Tree status (based on species and size) will be overlaid on the aerial imagery in GIS mapping. Windshield surveys will be conducted to determine if (1) trees identified in the database may meet the Heritage Tree criteria; and, (2) other trees, not previously identified, may meet the Heritage Tree criteria. During the windshield surveys, trees that may meet the size criterion (in diameter breast height (DBH)) will be roughly measured. This information will be used to determine where Heritage Trees may be impacted along the proposed corridors. This determination of potential impacts will be made based on the location of the resources relative to dimensions from proposed transitway cross sections. The project team will prepare maps of potentially impacted Heritage Trees adjacent to project alternative alignments.

16.5.3 Other Street and Landscape Trees

Street and landscape trees not identified as Charter or Heritage Trees but located within the footprint of the potential alignments and associated improvements will be tabulated. Clusters of 15 or more trees providing large canopy coverage will be identified and indicated on GIS mapping. Other trees providing large canopy coverage for biological resources will be identified and indicated on GIS mapping.

16.5.4 Significance Thresholds

For the impact analysis, staff will draw on existing guidance to determine significance thresholds, namely the City of Eugene Code Landscape Standards 9.6200 to 9.625, Tree Preservation and Removal Code 9.6880 to 9.6885 and 6.300 to 6.330, and R-6.305.

Impacts to street and landscape trees will be considered significant if:

- An alternative may result in a "take" of known Charter Trees or healthy Heritage Trees, including whole removal of the tree or damage to 30 percent of the CRZ.
- An alternative may result in a "take" of a cluster of 15 or more trees with large canopy coverage that densely line a street corridor and the removal would have significant adverse visual effects (as determined by the visual and aesthetic resources discipline expert).

- An alternative may result in a "take" of trees providing large canopy coverage for avian or other animal habitat and the removal would have significant adverse effects on biological resources (as determined by the biological resources discipline expert).

The estimated total number of potential street tree impacts for each proposed corridor is based on the forecast figures for a future construction year to be determined farther along in the planning process.

Potentially impacted street trees will be grouped according to estimated Charter or Heritage Tree eligibility status and other resource value:

- "Potential Charter Tree in present day"
- "Potential Charter Tree in a future construction year"
- "Potential Heritage Tree in present day"
- "Potential Heritage Tree in a future construction year"
- "Potential significant visual and aesthetic resource" or
- "Potential significant biological habitat resource"

16.5.5 Impact Analysis

16.5.5.1 Long-Term Impacts Analysis Approach

The data gathered for this study will be used to evaluate potential long-term impacts of the project, such as permanently altered corridor environments that do not allow for the trees to be either replanted in the vicinity or replaced on-site with new trees as outlined in the *City of Eugene Tree Preservation Code* Long-term impacts would also include an analysis of affected street and landscape trees that are at locations where the existing curb would be moved to accommodate roadway widening and sidewalk improvements or at locations of new BRT station platforms, and documentation of whether they are Charter Trees or Heritage Trees and whether they might require removal. Based on project precedent, trees removed by project construction other than right of way widening, such as station construction and intersection improvements, do not fall under the provisions of the Historic Tree Charter Amendment provision.

16.5.5.2 Short-Term Impacts Approach

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

16.5.5.3 Indirect Impact Analysis Approach

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

16.5.5.4 Cumulative Impact Analysis Approach

The cumulative impacts analysis will focus on those impacts resulting from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions, regardless of which agency or person undertakes such other actions. Cumulative impacts can result from individually minor but collectively significant actions that take place over time. Impacts to street and landscape trees include the determination of net loss or gain of trees and tree canopy in conjunction with other projects throughout the region.

16.5.5.5 Mitigation Measures Approach

The proposed project alternatives will be designed to minimize and avoid street and landscape tree impacts within the constraints of providing an acceptable rapid transit operating environment and serving travel destinations along the corridor. Where possible, the project will make modifications to the design to avoid impacts to tree crowns and root systems.

For significant impacts that cannot be avoided, LTD will identify project-specific mitigation that is directly related to impacted street and landscape trees. In addition, LTD will also analyze the long-term operational and short-term construction impacts to street and landscape trees, to identify impacts that will need mitigation.

Where street tree removals are required, long-term impacts would be mitigated through planting new trees, replacing all removed trees at a ratio of at least one tree planted for one tree removed or as otherwise required by City Code section 6.300 – 6.330, and coordinating with the City of Eugene's urban forestry staff on the selection of tree species to be planted and their specific locations.

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

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

16.6 NEPA Documentation

For the purposes of a DCE, where needed, LTD would conduct additional street and landscape tree assessment using windshield surveys, aerial maps, and other resources. This assessment would not include a detailed inventory of all trees, but would look to identify areas of potentially impacted street and landscape trees along potential corridor alignments that appear to merit further research, including potential Charter Trees and Heritage Trees, as defined in the Eugene Urban Forest Management Plan.

The project team will develop conceptual design plans for the potential corridor alignments to identify all environmental impacts to street and landscape trees and make adequate provision for their mitigation in accordance with NEPA. The design would include all major or critical project elements, including plans for the guideway, systems, station, and related capital improvements (including new or relocated utilities), to the level that no significant unknown impacts relative to their costs or schedule would result.

Existing and potential Charter Trees and Heritage Trees previously identified in tree removal areas will be confirmed, as needed, through evaluation of the City of Eugene's street tree inventory GIS database, windshield surveys and/or field observations. Project staff will work with Eugene urban forestry staff to identify existing and potential Heritage Trees based on the methodology specified in Eugene administrative rules.

In GIS software, the conceptual design will be overlaid on an aerial image along with the street tree inventory to determine potential impacts. Potential impacts include those corridor areas that include street widening, sidewalk improvements or placement of station platforms. Potential tree removals are to be counted and spot-checked through field visits and use of aerial maps. Landscape tree impacts will be assessed by viewing areas where new right of way would be needed on adjacent properties and counting potential tree removals.

The project team will consult with City of Eugene urban forestry staff on the interpretation and implementation of the City of Eugene Code Tree Preservation and Removal Standards. In evaluating Charter Trees in the field, and whether they meet the minimum 25" diameter at breast height (DBH) threshold set in the Eugene Charter, the project team will determine tree DBH per the methodology described in the *Guide for Plant Appraisal*, 9th Edition, Council of Tree and Landscape Appraisers. DBH shall be measured at 4.5 feet above mean ground level per City of Eugene Administrative Rule 6-3.05. DBH is used to and to calculate the Critical Root Zone (CRZ), defined as the area in which the loss, disturbance, or damage to any roots will adversely affect the tree's long-term health and structural stability. DBH, or an alternative method proposed by City of Eugene urban forestry staff, will be used to estimate tree age for the purposes of determining future Charter or heritage trees.

Potentially impacted trees within the project area will be characterized as potential existing Charter Tree, potential future Charter Tree, potential existing Heritage Trees, or potential future Heritage Trees, potential significant visual and aesthetic resources, potential significant biological habitat, or none of these classifications. Applicable federal, state, and local regulatory requirements will be reviewed concerning street and landscape trees and potential impacts and the degree of impact to street and landscape trees will be documented. Tree growth for the purposes of determining potential future Charter Trees and potential future Heritage Trees will be estimated for the anticipated construction date based on an average annual diameter growth rate (determined by City of Eugene urban forestry staff) from the baseline diameter provided in the Eugene street tree inventory.

16.7 References

The following references were used in preparing this MDR:

- City of Eugene Tree Charter Amendment
- City of Eugene Code Chapter 6: Environment and Health; Tree Preservation
- Administrative Rule R-6.305 (Street Tree Removal Permit Program), R-7.280 (tree protection, planting and pruning standards) and City of Eugene Standard Details and Amendments (e.g., LS120, Tree Protection Standard Detail)
- City of Eugene Code Chapter 9: Land Use; Tree Preservation and Removal Standards
- Map of City Limits 1915
- City of Eugene Urban Forestry staff, personal conversation (June 23, 2015)

17. Socioeconomics, Environmental Justice, Neighborhoods, Community Facilities, and Public Services

This section describes the analysis methodologies and data to be used for the Socioeconomics, Environmental Justice, Neighborhoods, Community Facilities, and Public Services evaluation for the MovingAhead project.

17.1 Relevant Laws and Regulations

17.1.1 Federal

- **National Environmental Policy Act (NEPA), 42 U.S.C. 4321-4347.**
- **Title VI of the Civil Right Act of 1964 and Civil Rights Restoration Act of 1987** (http://www.fhwa.dot.gov/legsregs/directives/notices/n4720-6.htm).
  - 42 U.S.C. 2000d-200d-7. (http://www.justice.gov/crt/about/cor/coord/titlevistat.php)
  - 23 U.S.C. 324. (http://www.justice.gov/crt/about/cor/byagency/dot324.php)
  - 49 CFR Part 21. (http://www.access.gpo.gov/nara/cfr/waisidx_02/49cfr21_02.html)
  - 49 CFR, Volume 1, Parts 1 to 99. (Revised October 1, 1999). (http://www.fta.dot.gov/documents/49_CFR_21.doc).
- **Title VI of the Civil Rights Act of 1964 (Title VI), 42 U.S.C 2000d, 49 CFR Part 21, 23 CFR Part 200.** Title VI (http://ecfr.gpoaccess.gov/cgi/t/text/text-idx?c=ecfr&tpl=/ecfrbrowse/Title23/23cfr200_main_02.tpl).
- **Civil Rights Restoration Act of 1987, 465 U.S. 555 (1987).** (http://www.fhwa.dot.gov/legsregs/directives/notices/n4720-6.htm).
- **Title VIII of the Civil Rights Act of 1968 (Fair Housing Act), 42 U.S.C. 601 et seq.** (http://www.justice.gov/crt/about/hce/title8.php).
- **Federal-Aid Highway Act of 1970 (FAHA 1970) , 23 U.S.C. 109(h)** (http://www.fhwa.dot.gov/environment/cia/resources/23usc109h.cfm)
- **The Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970, 42 U.S.C. 4601 et seq.** (http://www.fhwa.dot.gov/legsregs/directives/fapg/cfr4924a.htm).
- **The Age Discrimination Act of 1975, 42 U.S.C. 6101-6107.** (http://www.dol.gov/oasam/regs/statutes/age_act.htm).
- **The Americans with Disabilities Act of 1990, As Amended (ADA), 42 U.S.C. 12101 et seq.** (http://www.ada.gov/pubs/adastatute08.htm).
- **Executive Order 12898 – Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations, 59 Federal Register 7629, Feb. 11, 1994. Amended by EO 12948 (Jan 30, 1995).** (http://www.archives.gov/federal-register/executive-orders/pdf/12898.pdf).
- **Executive Order 13166 – Improving Access to Services for Persons with Limited English Proficiency, 65 Federal Register 50121 (Aug. 16, 2000).** (http://www.dol.gov/oasam/regs/statutes/Eo13166.pdf

- **Executive Order 13045 – Protection of Children from Environmental Health Risks and Safety Risks, 62 Federal Register 19883 (April 23, 1997).** (http://www.gpo.gov/fdsys/pkg/FR-1997-04-23/pdf/97-10695.pdf). This order requires federal agencies to identify and assess environmental health risks and safety risks that may disproportionately affect children. This has the effect of making children a protected population with regard to Environmental Justice issues.
- **U.S. DOT Environmental Justice Order 6510.2, 62 Federal Register 18377 (April 15, 1997).** (http://www.fhwa.dot.gov/environment/environmental_justice/facts/dot_ord.cfm).
- **FTA Circular 4702.1B (October 1, 2012).** (http://www.fta.dot.gov/documents/FTA_Title_VI_FINAL.pdf). This circular provides recipients of FTA financial assistance with guidance and instructions necessary to carry out USDOT Title VI regulations (49 CFR part 21) and to integrate into their programs and activities considerations expressed in the Department's Policy Guidance Concerning Recipients' Responsibilities to Limited English Proficient Persons (70 FR 74087, December 14, 2005).
- **FTA Circular 4703.1 (August 15, 2012)**. (http://www.fta.dot.gov/documents/FTA_EJ_Circular_7.14-12_FINAL.pdf). This circular provides recipients of FTA financial assistance with guidance in order to incorporate environmental justice principles into plans, projects, and activities that receive funding from FTA.

17.1.2 State

- **Oregon Revised Statutes (ORS) §182.542, Duties of Task Force, 2007.** (http://www.oregonlaws.org/ors/182.542).
- **Oregon Revised Statutes (ORS) §182.538, Environmental Justice of Task Force, 2007.** (http://www.oregonlaws.org/ors/182.538).
- **Executive Order No. EO 97 – 16, August 1, 1997.** (http://archivedwebsites.sos.state.or.us/Governor_Kitzhaber_2003/governor/legal/execords/eo97-16.pdf).

17.1.3 Local

At this time, there are no local regulations pertaining to Environmental Justice.

17.2 Analysis Area

To characterize the analysis area and to assess potential impacts, the project team will use US Census block group data. The area of potential impact (API) will include all block groups within ½ mile of all corridors under consideration.

17.3 Contacts and Coordination

The agencies that may be contacted and information sources that may be consulted are listed below. Census data, field verification and communications with community resources knowledgeable about identified environmental justice populations will be utilized for the analysis.

17.3.1 Federal

- Federal Transit Administration (FTA)

- Environmental Protection Agency (EPA)
- U.S. Department of Labor (DOL)
- U.S. Census Bureau

17.3.2 State

- State of Oregon Economic and Community Development Department
- State of Oregon Employment Department
- State of Oregon Civil Rights Division
- State of Oregon Department of Environmental Quality
- Oregon Department of Transportation (ODOT)

17.3.3 Local

- Lane Regional Council of Governments
- Lane County Assessor
- City of Eugene Department of Planning and Development
- City of Eugene Parks and Recreation Department
- City of Springfield Development and Public Works Department
- Housing Authority
- 4J School District
- Neighborhood organizations
- Owners / managers of community facilities
- Public Safety Services and Facilities purveyors: Fire District, police department, County sheriff's office, state highway patrol, ambulance service providers

17.4 Level 1 Screening

No data will be collected for the Level 1 Screening.

17.5 Level 2 Alternatives Analysis

The following is a brief summary of the methods and criteria that will be used for the socioeconomics technical report and Level 2 AA.

17.5.1 Existing Conditions

Existing conditions will be developed to create a basis for understanding the general social (population and social groups), neighborhoods, community facilities, and economic character of the area. Existing social conditions will be assessed at the level of census block group. Data from the US Census Bureau and LCOG will be used to identify neighborhoods, community facilities, and public services. Existing

economic conditions will be assessed based on regional economic trends as reported by LCOG and state employment division data.

17.5.2 Alternatives Analysis

Adverse and beneficial impacts to existing roadways / connectivity, community cohesion, community facilities, and public services will be identified using GIS road coverage, alignment footprints, and discussions with consultant and agency staff, if warranted. GIS will also be used to identify potential displaced residences and businesses for the specific parcels expected to be acquired.

Any identified adverse impacts will be weighed against potential beneficial impacts generated from the increase in traffic capacity, accessibility and visibility. This analysis will evaluate how build alternatives may support the plans for residential, commercial, and industrial development, and discuss the implications of these development trends on the local and regional economy.

Several other potential impacts will be analyzed in the technical report and Level 2 AA, including:

- A generalized assessment of short-term construction impacts based on expected changes in access, parking and other traffic patterns and the effect they will have on local businesses and residents as well as the number of jobs the construction is expected to create, based on ODOT multipliers;
- An assessment of indirect impacts, which includes an analysis of the potential effect of induced land use changes on the existing economic conditions in the area and the region; and,
- An assessment of cumulative impacts, which will include a discussion of how the proposed project, combined with other recently completed and expected infrastructure improvements, will cumulatively impact socioeconomic conditions in the area.

For the purposes of this Environmental Justice analysis, the 2010 U.S. Census of Population and Housing, Summary File 3 and local TAZ data (also developed from Census data), will provide the majority of quantitative data for the affected environment section. Because Environmental Justice issues may exist in areas that lack discernable minority or low-income population clusters, information from public outreach activities will supplement this effort.

This analysis will use the following guidelines and assumptions to define minority status and low-income status:

- **Minority Populations:** Minority status is defined as individuals listed in the 2010 census as:
    - Black or African-American (a person having origins in any of the black racial groups of Africa);
    - Hispanic (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, the Indian subcontinent, or the Pacific Islands);
    - American Indian/Alaskan Native (a person having origins in any of the original people of North America and who maintains cultural identification through tribal affiliation or community recognition);
    - Native Hawaiian or Other Pacific Islander (a person having origins in any of the original peoples of Hawaii, Guam, Samoa, or other Pacific Islands);

- **Low-income** is defined by USDOT as a person whose household income is at or below the U.S. Department of Health and Human Services poverty guidelines. Because the report will analyze population within aggregated geographic units (TAZ, block groups, etc.), data on poverty status will be used to identify low-income populations. Low-income persons are defined as those identified in the 2010 U.S. Census as living at or below the poverty level.

This data will be used to identify communities with a relatively high concentration of minority or low-income populations. Census data and public outreach will also inform discussions of youth (<18) and elderly (>65) populations, disability, households without access to vehicles, and households with limited English proficiency information. Information collected from public meetings and community outreach activities will help to supplement and verify the analyses described above.

The project team will accommodate those with limited English proficiency (LEP) through the public outreach process by making translators available and/or materials available in other languages if significant LEP populations (more than 5percent of a census block) are present in the API.

17.5.3 Data Collection

The socioeconomics impact analysis will use the following data sources to describe existing conditions:

- API
- Total Population by block group
- Employment by block group
- Neighborhoods
- Environmental Justice / Title VI populations by block group
- Community facilities, including but not limited to:
    - Churches
    - Social service organizations
    - Community centers
    - Theaters, museums, other cultural institutions
    - Public services

GIS data:

- Lane County Assessment and Taxation, Tax lot data.
- US Census TIGER data
- City of Eugene GIS Data

Other data references will include:

- Metro Plan, Eugene-Springfield Metropolitan General Area Plan (2007 Update)
- Eugene Downtown Plan (April 2004)
- Envision Eugene (Eugene's Comprehensive Plan; latest draft or as adopted)
- TransPlan, The Eugene-Springfield Transportation System Plan (July 2002-07)

- Chapter 9 of the Eugene Land Use Code, 1971 (2014 Amendments)
- Eugene Parks, Recreation and Open Space Comprehensive Plan (February 2006)
- Eugene Parks, Recreation and Open Space Project and Priority Plan (2006)
- West Eugene Wetlands Plan (May 2004)
- City of Eugene Capital Improvement Program, FY 2014-2019 (March 2013)
- Shaping 4J's Future, Superintendent's Report and Recommendations (March 2008)
- Social, Economic and Demographic data from LCOG (most current versions) if applicable and acceptable to FTA for EJ analysis
- Livability Lane: Equity and Opportunity Assessment (2014)
- Oregon Employment Department. Oregon Labor Market Information System – Region 5 Lane County.
- Springfield 2030 (Comprehensive Plan), draft as of April 2015

17.5.4 Significance Thresholds

To determine significance thresholds for the socioeconomic impact analysis, project staff will draw from the FHWA "NEPA Implementation, Guidance for Preparing and Processing Environmental and Section 4(f) Documents, FHWA Technical Advisory T 6640.8A, October 30, 1987." Socioeconomic effects may be considered potentially significant if:

- The proposed project would disrupt or improve accessibility within the region.
- The proposed project will or will not support the levels of employment and residential density planned for the project area.
- The proposed project would result in job creation, both directly and through the multiplier effect.
- The proposed project would result in the acquisition and/or displacement of existing businesses.
- Community facilities and public safety services would be disrupted or enhanced through a change in access to facilities and/or a significant alteration of service areas.
- Vehicular, pedestrian or bicycle travel patterns would be disrupted or improved.
- The proposed project would substantially alter the neighborhood or the social and economic character of the area by:
    - Displacing/relocating a significant number of people and/or families;
    - Creating or removing barriers between segments of the neighborhood;
    - Altering the physical boundaries of the neighborhood;
    - Changing access to neighborhoods or businesses;
    - Reducing or increasing cut-through traffic; or
    - Disrupting or improving neighborhood pedestrian and bicycle travel options and pedestrian and bicycle connections to public services or shopping.

The Environmental Justice analysis occurs in two parts. The first part is the initial screening of community characteristics to determine possible clusters of low income or minority populations. The screening approach described below is largely derived from EPA guidance for environmental justice research and methods. The second part of this analysis, the evaluation of proposed project alternatives, provides more conclusive findings on potential significant adverse and beneficial effects. Levels of significance can be determined for both components. An impact would be considered disproportionately high and adverse for minority and / or low-income populations if it is either:

A. Predominately borne by a minority and /or low-income population, or

B. Suffered by the minority and/or low-income population and is appreciably more severe or greater in magnitude than the adverse effect that will be suffered by the non-minority or higher income population.

To screen for populations of notable Environmental Justice (EJ) concern, the project team will identify those TAZs within the study area that contain a significant share of minority and low-income residents, as compared to TAZs in the greater community.

With EJ populations identified, the second part of the analysis will focus on identifying adverse and beneficial impacts of the proposed project alternatives and their level of impact to identified minority and low-income communities. If members of a minority or low-income population are receiving more of the adverse effects from a project than the remaining population, or a lower proportion of the total benefits, the planning decision could have a disproportionate adverse effect on the minority or low-income population. Other technical reports, including air quality, hazardous materials, noise, visual quality, land acquisition and displacements, and safety will be used for this analysis. Criteria to consider will include:

- Whether impacts resulting from other activities are generally above the accepted norms identified for those technical disciplines.
- Whether populations of environmental justice concern stand to have risks of exposure that may exceed the risk normally present in the general population.

17.5.5 Impact Analysis

This section describes the approach to evaluating project alternatives, including the No-Build alternative, for potential effects to socioeconomic conditions and environmental justice populations.

17.5.5.1 Long-Term Impacts Analysis Approach

Economic Effects

The project team will evaluate the potential for beneficial and adverse effects on:

- *Regional and Local Economy*. The analysis will evaluate how alternatives may support the plans for residential, commercial, and industrial development, and discuss the implications of these development trends on the local and regional economy.
- *Employment Displacement.* The Acquisitions and Displacements report will identify parcels with businesses requiring acquisition under each of the alternatives to determine effects on employment displacement.

- *Housing and Employment Capacity.* GIS data will be used to identify the aggregate amount of property acquisition required under each alternative, in addition to land use and zoning information, to determine effects on housing and employment capacity.
- *Business Access.* The design of each of the build alternatives may include changes in access to local commercial establishments. The socioeconomics impact analysis will assess how altered access could affect area businesses.

Social Effects

Evaluate the potential for beneficial and adverse social effects of the No-Build and build alternatives through a combination of quantitative and qualitative methods by assessing:

- *Household and Community Facility Displacement/Relocation*. Using GIS data and the project alternative footprints, the number of households and community facilities potentially displaced will be estimated.
- *Public Safety Services and Facilities.* The impact analysis will identify the location of public safety facilities to facilitate a qualitative assessment of potential impacts to response time.
- *Mobility, access, and safety.* The project team will assess how project alternatives may impact mobility, access, and safety within and between neighborhoods; community facilities, and public services. This report element will be coordinated with the Transportation analysis.
- *Neighborhood and Community Cohesion*. Assess whether the proposed project will serve as a neighborhood barrier, eliminate crossings, increase overall access, or tie neighborhoods together.

Environmental Justice Populations Effects

The location, intensity, and duration of potential environmental impacts, mitigation, and benefits to environmental justice populations will be determined through examination of the findings from the project technical reports for each discipline in the environmental review (including operational, construction, indirect, and cumulative impacts).

Adverse impacts will be determined as described above in Section 17.5.2 Significance Thresholds.

17.5.5.2 Short-Term Impacts Approach

Short-term construction impacts will be assessed by:

- Using the estimated construction timeline to determine potential construction impacts to access, safety, and mobility during the construction period, as well as any short-term effects on access to community facilities or essential public services;
- Using ODOT multipliers to estimate the amount of employment stimulated by project construction.

17.5.5.3 Indirect Impact Analysis Approach

Potential indirect economic and social impacts will be evaluated by looking at land use changes that may result from the proposed project alternatives, particularly commercial and residential uses that will benefit from increased traffic capacity, street access and visibility, and how these changes could disproportionately affect Environmental Justice populations.

17.5.5.4 Cumulative Impact Analysis Approach

Cumulative impacts analysis identifies how past, present and reasonably foreseeable future development and infrastructure improvements have affected and will potentially impact Environmental Justice communities in the analysis area. The 2010 base year will be used to assess cumulative impacts, and the Environmental Justice report will evaluate how previous infrastructure projects and development patterns from the base year forward have affected Environmental Justice populations in the analysis area. To understand reasonably foreseeable future projects with potential for cumulative impacts, the project team will review area plans and interview planning, public works, and building department staff from the City of Eugene, LCOG and other agencies to identify any relevant information on planned and funded transportation, land use, and/or development projects in the analysis area to the planning horizon year.

17.5.5.5 Mitigation Measures Approach

If mitigation is required, specific mitigation approaches will be suggested for each impact. Specific businesses or property owners may be consulted to determine the best mitigation for potential impacts. These measures will be developed collaboratively with LTD and other appropriate agencies or organizations, which may include FTA, the City of Eugene, Lane County, affected neighborhoods (identified primarily through public meetings), owners / managers of community facilities, and purveyors of public safety services.

Short-term mitigation measures will be formulated as a response to construction activities. They will address noise abatement, dust, vibration, safety, and access to residences, services and resources.

Long-term mitigation measures will be identified to mitigate potential project impacts such as property acquisition, noise impacts, and any other disproportionate impacts borne by environmental justice populations. Long-term mitigation measures will be identified through the technical assessment and through public involvement and outreach activities.

As appropriate, coordination with resource and service agencies will occur to determine appropriate mitigation measures for adverse impacts to access to services and resources.

17.6 NEPA Documentation

For the NEPA documentation, adverse and / or beneficial impacts of the selected project alternatives will be described and documented, as appropriate. Adverse and beneficial effects considered include long term effects for the duration of the project after construction, short term effects or those associated with construction, indirect effects, and cumulative effects. Additional analysis and documentation will be conducted if refined conceptual designs reveal areas of concern not identified in the Level 2 AA. Corridor specific NEPA analysis and documentation will include:

- Environmental Justice / Title VI population impacts and benefits, including acquisitions and / or displacements
- Community facilities impacts
- Public services impacts
- Possible mitigation measures

17.7 References

EPA 1998. Guidance for Incorporating Environmental Justice Concerns in EPA's NEPA Compliance Analyses. Available at: (http://www.epa.gov/compliance/resources/policies/ej/ej_guidance_nepa_epa0498.pdf)

EPA – Office of Environmental Justice. April 1998. Final Guidance for Incorporating Environmental Justice Concerns in EPA's NEPA Compliance Analyses. (http://www.epa.gov/compliance/resources/policies/ej/ej_guidance_nepa_epa0498.pdf)

FHWA 2003. Environmental Justice: What You Should Know. FHWA. Washington Division Office. (http://www.fhwa.dot.gov/wadiv/CRP/ejwadiv.htm)

Guidance for Preparing and Processing Environmental and Section 4(f) Documents, Technical Advisory T 6640.8A. U.S. Department of Transportation, Federal Highway Administration. (http://www.fhwa.dot.gov/legsregs/directives/techadvs/t664008a.htm)

Keys to Efficient Development of Useful Environmental Documents. Report No. FTA-MA-26-1023-2007.1. (September 2007) (http://www.fta.dot.gov/documents/enviroDocs.pdf)

NCHRP Report 532. Effective Methods for Environmental Justice Assessment. Transportation Research Board (2004). (http://onlinepubs.trb.org/onlinepubs/nchrp/nchrp_rpt_532.pdf).

Transportation Research Board Annual Meeting 2007 Paper #07-0186. Methodological Challenges of Environmental Justice Assessments for Transportation Projects. Transportation Research Board (2007).

18. Utilities

This section describes the analysis methodologies and data to be used for the Utilities evaluation for the MovingAhead project.

The assessment of impacts to utilities will focus on determining which, if any, utilities would likely need to be relocated as a result of the alternatives under consideration. In addition, the analysis will consider any major planned utility projects or relocations within alternative corridors. Because the level of design work will be conceptual engineering during the Level 2 AA, precise determination of the number, extent and location of utility relocations will generally not be feasible. Instead, the assessment will provide a determination of the general level of risk that any given utility may need to be relocated under a given alternative. As the Locally Preferred Alternative (LPA) is selected for each corridor and as its design progresses, the level of certainty concerning resulting utility relocations will increase. Ultimately, utility relocation will become a part of the project's construction documents, performed either by utilities or their contractors or by the project and LTD's contractors.

In general, the design of the alternatives, including the LPA, will seek to avoid or minimize utility relocations to avoid disruptions to the community and the utilities and to help reduce costs.

18.1 Relevant Laws and Regulations

The City of Eugene and ODOT have standards for utility design, location and installation within their area of jurisdiction. Those regulations will be obtained for utilities that may be relocated, based on whether the City and / or ODOT would have jurisdiction at a given location. The project would seek to relocate utilities within existing public right of way. State laws may apply to regional utility facilities and design regulations for public utilities will also apply (e.g., Eugene Water and Electric Board (EWEB)).

18.2 Analysis Area

In general, the analysis area for the utility assessment will be within the footprint of the alignments selected for further analysis in the Level 2 AA.

18.3 Contacts and Coordination

The following agencies and jurisdictions will be contacted and potentially coordinated with as the utility assessment is prepared:

- MovingAhead project's design team;
- City of Eugene Public Works;
- City of Springfield Public Works;
- ODOT right of way staff;
- Eugene Water and Electric Board (EWEB);
- Northwest Natural Gas;
- Telecom providers (e.g., Comcast).

18.4 Level 1 Screening

No data will be collected for the Level 1 Screening.

18.5 Level 2 Alternatives Analysis and Approach

The first step in assessing potential utility relocation will be the acquisition of the conceptual designs, which will provide the construction and permanent footprint of the alternatives.

Second, project staff will review available public and private utility records within the project footprints, including natural gas, electrical, sewer, stormwater and oil. The general presence and general location (vertically and horizontally), and ownership of the utility will be determined. Based upon the construction activities likely to occur within a given segment of the alternative, project staff will assess and document the likelihood that any utilities within the project footprint would need to be relocated. Due to the confidentiality and sensitivity of some utility data (e.g., U.S. Homeland Security's restrictions on pipeline locations), some utilities and their risk of relocation may not be available during the Level 2 AA.

The determination of whether or not a particular utility would need to be relocated under a particular alternative will also be affected by LTD's policy toward utilities within a BRT right of way. Past practice, guidance and/or policy from the Franklin Boulevard, Pioneer Parkway, and West Eugene EmX projects will be used to prepare guidelines of utility relocation for the MovingAhead project, and to help determine the circumstances that would lead to utility relocations.

The results of the utility relocation assessment will be considered in the development of the project costs, accounting for the level of risk that any given utility may need to be relocated under a particular alternative.

18.5.1 Data Collection

Data sources for the utility relocation assessment will include:

- MovingAhead Project Conceptual Designs Set;
- Description of Project Construction Activities;
- Utility records at the City of Eugene, ODOT and potentially affected utilities;
- Consultation with relevant staff at utility agencies.

18.5.2 Significance Thresholds

Utility relocation by its nature is not a significant impact and utility relocations would generally be addressed with the project's operating cost estimate. It is highly unlikely that any utility would be removed and not replaced as a result of an alternative – if that removal would affect a relatively large number of residents and/or businesses, then the removal would be designated as significant.

18.5.3 Mitigation Measures

Flexibility in station locations and other project facilities can offer opportunities to avoid utility conflicts altogether. Typically, this design work is part of preliminary and final engineering, as it is typically these phases of the design process where enough information is known to inform the design team. The

information needed to adequately locate and design around existing utilities typically consists of the following:

- Topographic design survey of the alignment
- Existing utility lines marked (blue-staked) and included in field survey
- Existing utility features (valves, manholes, etc.) included in field survey, with elevation/invert data
- Utility access and relocation criteria defined
- Environmental clearance complete or in final stages

Once these elements are known, LTD and the design team can work to identify where small adjustments to project facilities would allow existing utilities to be unaffected. Small adjustments are defined as those that would not trigger additional environmental analysis beyond the clearance already received.

Following a detailed utility investigation and refinement of the LPA, there may be opportunities to leave utility lines in place where stations or other project facilities would be located. These opportunities are specific to individual utilities and the conditions of the site. For example, a sewer line may be buried so deep that it will not affect, or be affected by, BRT operations. These opportunities should be studied by the design team and brought to LTD for a case-by-case analysis and strategy.

The typical reason to do this are because the impacts from the utility and from the project are so minimal that the cost is not worth the benefit to either party; and existing access points to the utility line are not affected by project construction or operations. It is a mutually agreed decision after the analysis is brought forward by the design team. Sometimes a mitigation strategy can be recommended to lessen the physical effect on the utility – new manhole locations are one such practice that protects utilities in place.

18.6 NEPA Documentation

No additional analysis or documentation is anticipated, unless major utility relocations (i.e., large pipes or lines) are identified in the Level 2 AA.

19. Visual and Aesthetic Resources

This section describes the analysis methodologies and data to be used for the Visual and Aesthetic Resources evaluation for the MovingAhead project. The purpose of the visual resources evaluation is to ensure that the proposed project will be consistent with project and community goals and will comply with the federal, state, and local laws, regulations, and applicable guidelines addressing the visual environment. The extent to which these requirements might apply to this project will depend upon the resources encountered within the project area and the extent of the project's potential effects on the visual quality of the resources. Visual quality and aesthetics assessment is a process for describing the natural and built environments as they appear before and as they are likely to appear after the project.

The visual resource analysis will also be prepared in compliance with NEPA, applicable state environmental policy legislation, and local and state planning and land use policies and design standards.

19.1 Relevant Laws and Regulations

19.1.1 Federal

23 Code of Federal Regulation (CFR) Parts 750-752, Federal Highway Administration (FHWA), "Highway Beautification" (http://ecfr.gpoaccess.gov/cgi/t/text/text-idx?c=ecfr&tpl=/ecfrbrowse/Title23/23cfr750_main_02.tpl); (http://ecfr.gpoaccess.gov/cgi/t/text/text-idx?c=ecfr&tpl=/ecfrbrowse/Title23/23cfr751_main_02.tpl); (http://ecfr.gpoaccess.gov/cgi/t/text/text-idx?c=ecfr&tpl=/ecfrbrowse/Title23/23cfr752_main_02.tpl) These are the implementing regulations for the Highway Beautification Act of 1965, which was enacted to provide effective control of outdoor advertising and junkyards, protect public investment, promote the safety and recreational value of public travel, preserve natural beauty, and provide landscapes and roadside development reasonably necessary to accommodate the traveling public.

23 CFR 771,FHWA,"Environmental Impact and Related Procedures" (http://ecfr.gpoaccess.gov/cgi/t/text/text-idx?c=ecfr&tpl=/ecfrbrowse/Title23/23cfr771_main_02.tpl). These are the implementing regulations for environmental impacts and related policies and procedures for NEPA to ensure that environmental considerations, such as impacts related to aesthetics and visual quality, are given due weight in project decision-making.

40 CFR 1500-1508, Council on Environmental Quality (CEQ), "Regulations for Implementing NEPA" (http://www.nepa.gov/nepa/regs/ceq/toc_ceq.htm). Under CEQ's implementing regulations, environmental analysis must consider impacts on urban quality, historic and cultural resources, and the built environment.

"Visual Impact Assessment for Highway Projects," FHWA Pub. No. FHWA-HI-88-054 (http://www.dot.ca.gov/ser/downloads/visual/FHWAVisualImpactAssmt.pdf). This document provides guidelines and worksheets for assessing visual impacts for highway projects.

National Historic Preservation Act, Section 106, 16 U.S.C. 470f (http://frwebgate.access.gpo.gov/cgi-bin/getdoc.cgi?dbname=browse_usc&docid=Cite:+16USC470f). This Act addresses the impacts of growth and development on the historic and cultural character of communities. Implementing regulations require that federal agencies consider the effects of all of their undertakings on historic properties and define criteria of adverse effect to include the "introduction of visual, audible, or atmospheric elements that are out of character with the property or alter its setting." 36 CFR 800.8

(http://ecfr.gpoaccess.gov/cgi/t/text/text-idx?c=ecfr&sid=bb5a965cbeab04337c5bd951846d65ac&rgn=div8&view=text&node=36:3.0.6.1.1.2.1.6&idno=36)

19.1.2 State

Oregon Statewide Planning Goal 5---"Natural Resources, Scenic and Historic Areas, and Open Spaces" (http://www.lcd.state.or.us/LCD/docs/goals/goal5.pdf). Oregon's statewide planning goals provide the framework for planning within the state. Goal 5 establishes specific procedures and criteria for protecting natural resources and conserving scenic and historic areas and open spaces.

OAR 660 Division 23, Procedures and Requirements for Complying with Goal 5 (http://arcweb.sos.state.or.us/rules/OARS_600/OAR_660/660_023.html). This division establishes procedures and criteria for inventorying and evaluating Goal 5 resources and for developing land use programs to conserve and protect significant scenic resources. It explains how local governments apply Goal 5 inventory, assessment (Environmental, Social, Economic, and Energy Consequences Analysis), and protection measures (such as scenic protection overlay zones) when conducting periodic review and when amending acknowledged comprehensive plans and land use regulations.

Oregon Department of Transportation (ODOT). "Roadside Development Design Manual." 2006. This document provides guidance for assessing visual resource impacts and recommendations for landscaping and architectural treatments.

19.1.3 Local

City of Eugene Land Use Code (Chapter 9).

City of Springfield Land Use Code (Chapter 3).

Envision Eugene. Envision Eugene is the City of Eugene's Comprehensive Plan (latest draft or as adopted).

Springfield 2030. The draft Comprehensive Plan for the City of Springfield.

Eugene-Springfield Metropolitan Area General Plan. The Eugene-Springfield Metropolitan Area General Plan (Metro Plan) is this metropolitan area's comprehensive plan. Metro Plan policies and the Metro Plan Diagram provide guidance on how land use, natural resources, public facilities, and the local economy should be developed, designed, and / or conserved over time, based on a broad range of citizen input. In essence, the Metro Plan contains the vision for the future of the Eugene-Springfield community.

City of Eugene Parks, Recreation, and Open Space (PROS) Comprehensive Plan. The PROS Comprehensive Plan identifies future needs for parks, open space, and recreation programs and services. This plan provides guidance for the city's approximately 2,900 acres of land in 130 parks, natural areas, and special use facilities and wide variety of recreational programs, special events, and services. Based on the identified needs, the PROS Comprehensive Plan proposes dozens of strategies for achieving the community's vision to improve parks, provide recreation opportunities, and protect natural resource values.

Rivers to Ridges, Metropolitan Regional Parks and Open Space Study, Vision and Strategies (2003). This document provides a comprehensive vision and broader regional perspective for the metropolitan region's parks and open space planning.

19.2 Analysis Area

The analysis area for visual quality assessment is called a "viewshed." A viewshed is the aggregate landscape that can be seen from the project corridors and that has views of the project corridors. Views to and from the project tend to be reciprocal. The viewshed analysis area is delimited by topography, vegetation, and the built environment.

The viewshed analysis area for each corridor selected for further analysis in the Level 2 AA will be determined primarily by the proposed addition or removal of large features within the landscape, i.e. large trees, signs, and structures that will have an impact on views to and from the project area. This will be determined from the conceptual design plans. The furthest vantage points within the surrounding landscape from which project-related changes are visible will delineate the limits of the viewshed analysis area. Subjective evaluation of visual impacts will play a role in defining the area's limits, because changes may be visually detectable, though insignificant by any reasonable measure, from great distances. The viewshed analysis area will be determined based on the preliminary range of conceptual alternatives, objective assessment, and subjective professional judgment.

19.3 Contacts and Coordination

19.3.1 Federal

At this time, there are no federal contacts requiring coordination that pertain to the visual impacts of roadway facilities.

19.3.2 State

At this time, there are no state contacts requiring coordination that pertain to the visual impacts of roadway facilities.

19.3.3 Local

- City of Eugene Planning and Development Department
- City of Eugene Parks and Recreation Department
- Willamalane Parks and Recreation District
- City of Springfield Development and Public Works Department

19.4 Level 1 Screening

No data will be collected for the Level 1 Screening.

19.5 Level 2 Alternatives Analysis

19.5.1 General Methods

Data collection and assessment methods for the visual quality and aesthetics evaluation will follow the Federal Highway Administration (FHWA) visual quality and aesthetics assessment methodology. Technical Advisory TA-6640 (October 1987) provides the guidance for preparing and processing

environmental documents for lands subject to section 4(f) of the Department of Transportation Act of 1966, including visual impacts. The FHWA methodology is an accepted framework for describing and analyzing a transportation project's subjective visual experience, for developing the social and physical contexts for visual impact analyses, and for conducting due-diligence practices in support of the project's objectives to comply with policies, laws, and regulations related to protecting the aesthetic environment.

Oregon's Statewide Planning Goal 5 establishes specific procedures and criteria for protecting natural resources and conserving scenic and historic areas and open spaces. Goal 5 will be referenced in conjunction with FHWA's methodology. The Comprehensive Plan for City of Eugene includes statements that refer to qualitative goals for preserving and/or enhancing views and scenic resources and will be additionally referenced. These documents do not describe a specific assessment methodology.

The following describes the approach for identifying and illustrating specific viewpoints and scenic resources, as well as significance thresholds used for assessing visual impact levels, impact analysis, and potential mitigation measures.

19.5.2 Approach

The process of identifying specific viewpoints and scenic resources associated with the proposed alternatives will follow the general approach described below.

- Determine key scenic resources and specific viewpoints through consultation with City staff and by visiting the project area and identifying any views or view corridors described in Envision Eugene (the City of Eugene's Comprehensive Plan; latest draft or as adopted) and other local planning documents. Areas containing sensitive viewers (such as residential areas or parks) will be identified for each corridor in consultation with City and LTD staff and using GIS maps.
    - Consultation with design and engineering staff is required to identify key features of corridor alternatives as they relate to the visual environment. GIS mapping and consultation with LTD and the City of Eugene will aid in identifying character-defining visual resources and elements in corridors. These may include:
- Landforms: types, gradients, and scale
- Vegetation: types, size and maturity, and continuity
- Land uses: size, scale, and character of associated buildings and ancillary site uses
- Transportation facilities: types, sizes, scale, and directional orientation
- Overhead utility structures and lighting: types, sizes, and scale
- Open space: type (e.g., parks, reserves, greenbelts, and undeveloped land), extent, and continuity
- Viewpoints and views to visual resources
- Water bodies, historic structures, and downtown skylines
- Scenic resources and areas containing sensitive viewers will be used to determine key observation points (KOP) in each corridor. Views will be assessed based on FHWA methodology from selected KOPs as they exist before and as they are likely to be after the project.
- Photographs will be taken from KOPs as needed to aid in describing potential scenic or aesthetic impacts. Table 19.5-1 describes significance thresholds for visual impacts.

19.5.3 Data Collection

Data sources for this analysis will include:

- Existing digital and paper mapping to aid in characterizing existing development, including topography, vegetation, and water patterns, land use patterns, street structures, neighborhood boundaries, and edges.
- Color orthophotographs: density, scale, and texture of vegetation cover, development, and open space patterns.
- Local land-use plans, policies, and regulations: references to significant visual resources, plans for visual quality and aesthetics.
- Photographic documentation of existing project area conditions.
- Conceptual alternative design information.

19.5.4 Significance Thresholds

There are no regulatory or policy-based significance thresholds for visual quality. This analysis uses the methodology and significant thresholds established in FHWA-HI-88-054 "Visual Impact Assessment for Highway Projects." The three impact levels (low, moderate, or high) are generally defined according to the following criteria in Table 19.5-1.

Table 19.5-1. Visual Impact Assessment Impact Levels

Low: **Generally Not Significant**	**Moderate:** **Possibly Significant**	**High:** **Generally Significant**
• No physical changes are expected to result from the proposed project. • Any remodeling of existing structures necessitated by project includes blending of the remodeled buildings into the surrounding area. • Proposed structures would be located in areas that do not exhibit a defined visual character (areas made up of different uses, different scales of structures, and with no landmarks or historic structures). • Proposed project is compatible with visual character of surrounding area.	• Proposed construction includes new structures that have a different scale, color, location, and/or orientation from surrounding structures. • Proposed project is located within historic district, adjacent to historic structures, or adjacent to major public buildings designed as focal points (e.g. city halls and courthouses).	• Proposed project is of a scale that contrasts with its surroundings (e.g. contains structures of greater bulk than those in surrounding areas or introduce voids such as parking lots into the midst of a developed area of well-defined street spaces). The magnitude of impacts will be greater in areas with a recognized visual character that reinforces their use and its perception by the community as an asset. • Proposed project would disrupt important views (e.g. views of mountains, oceans, rivers, or significant manmade structures).

Source: FHWA-HI-88-054 "Visual Impact Assessment for Highway Projects." (1987).

Visual impact levels that fall within the moderate category are necessarily based on subjective value judgments. Part of the process will include reaching consensus on these items with review agencies. Items that are identified as having a moderate impact will be discussed with the review agencies in order to make a firm determination.

Beneficial Effects

The previous visual impact categories are concerned with visual resource changes that range from non-significant to detrimental, relative to existing conditions. Consideration must also be given to impacts or effects that improve the quality of visual resources and the ways in which these improvements function as a mitigating factor on the impacts to visual resources as a whole. Beneficial effects are defined as elements that meet the goals of scenic quality and view enhancement outlined in the City of Eugene Comprehensive Plan. These elements can include unifying architectural detailing, street furnishings, lighting, and landscaping. These effects will likewise be categorized as having low, medium, or high beneficial effect.

While there are no regulatory or policy-based significance thresholds for visual quality, visual impacts and beneficial effects will be compared and evaluated through discussions with review agencies.

19.5.4.1 Mitigation Measures

Staff will identify possible mitigation measures for potentially significant adverse impacts during the evaluation process and in coordination with other disciplines. The project team will note locations where impacts occur and the degree and nature of the impact. In addition, staff will identify possible mitigation options for these locations. Mitigation measures will be closely coordinated with review agencies. Measures likely to be considered include:

- Avoiding and minimizing impacts to mature and significant trees, where practicable
- Using interdisciplinary design teams to incorporate aesthetic considerations in designing project elements
- Identifying mitigation strategies with review agencies by reviewing photo simulations depicting impacts to existing structures, large trees, environmentally sensitive areas, and others
- Integrating facilities with area redevelopment plans
- Minimizing clearing for construction and operation
- Planting appropriate vegetation in and adjoining the project right of way
- Replanting remainder parcels
- Using source shielding in exterior lighting
- Determination of final mitigation measures to be included in the project will be made after impacts have been identified.

19.6 NEPA Documentation

No additional analysis is anticipated.

19.7 References

City of Eugene Land Use Code. (http://www.eugene-or.gov/portal/server.pt/gateway/PTARGS_0_0_5848_319_0_43/http%3B/cesrv501/lf7citycode/Home.aspx)

City of Eugene Parks, Recreation and Open Space (PROS) Comprehensive Plan (http://www.eugene-or.gov/portal/server.pt?open=514&objID=1360&parentname=CommunityPage&parentid=0&mode=2&in_hi_userid=2&cached=true)

Eugene-Springfield Metropolitan Area General Plan (http://www.lcog.org/metro/2004MetroPlan_91306_web.pdf)

Oregon Statewide Planning Goal 5. 1975. "Natural Resources, Scenic and Historic Areas, and Open Spaces." (http://www.oregon.gov/LCD/docs/goals/goal5.pdf)

Rivers to Ridges, Metropolitan Regional Parks and Open Space Study, Vision and Strategies (2003) (http://www.lcog.org/PDF/RiversRidgesVisionDocWeb.pdf)

"Visual Impact Assessment for Highway Projects." FHWA-HI-88-054.

20. Water Quality, Floodplain, and Hydrology

This memorandum describes the analysis methodologies and data that will be used to document the existing surface water and stormwater conditions and analyze the potential water quality impacts of Project alternatives for the MovingAhead project. Additionally, it will document existing floodplain conditions and analyze the potential floodplain impacts of Project alternatives for the MovingAhead project.

The Lane Transit District (LTD) will prepare study documents including the methodologies and data report to be used for the environmental disciplines for the MovingAhead project's Level 1 screen, Level 2 AA, and subsequent environmental documentation.

The water resources related evaluation will identify potential significant adverse impacts and beneficial effects of the various project alternatives and design options on project area floodplains, hydrology and hydraulics, and water quality. The data collection and evaluation will assist in developing design concepts and the alternatives analysis and evaluation. This section introduces each of the water resources related subject areas that will be evaluated in the MovingAhead project study.

Floodplain regulations affect potential Project stormwater discharges and permit requirements. Many jurisdictions require a no-rise certification to maintain downstream conveyance capacities and prevent significant property damage during flood events. Discharges in floodplain areas may be restricted to meet this certification requirement. Structures allowed within a floodplain must be anchored and resistant to water damage. Adding or removing fill to or from a floodplain usually requires additional permits and mitigation to prevent changes to the existing high water level. Floodplain analysis will identify potential impacts or beneficial effects from Project alternatives on area floodplains and any associated permits and mitigation required for the proposed improvements.

The intention of the **hydrology and hydraulics** evaluation is to quantify the effect of the project concerning stormwater runoff and to address anticipated impacts. Runoff impacts, particularly peak flow rates and total volume, will be sensitive to any new additional impervious area associated with the Project. The hydrology study will assess changes to the quantity of runoff anticipated, and the hydraulics study will assess existing and potential stormwater management infrastructure anticipated by the Project. This includes an investigation of pipe sizes, inlets, stormwater facilities, discharges, and a determination of scour potential. Hydraulics also identifies potential flow obstructions. The evaluation of hydrology and hydraulics will provide design parameters for each alternative.

The **water quality** assessment will address potential impacts to receiving waterbodies from stormwater management system discharges. Water quality becomes critical when the waterbody accepting runoff contains threatened or endangered fish species. Fish are sensitive to small quantities of common pollutants. Water quality restrictions generally dictate methods for managing the treatment and flow control of stormwater runoff, which will affect the Project areas and vary in severity by alternative.

The Water Quality, Floodplain and Hydrology analysis will be prepared in compliance with the National Environmental Policy Act (NEPA), applicable state environmental policy legislation, and local and state planning and land use policies and design standards.

20.1 Relevant Laws and Regulations

Described below are the relevant federal, state, and local laws that will be consulted to conduct impact assessments for floodplains, hydrology and hydraulics, and water quality. The laws may apply only to one of the alternatives considered or may apply broadly to several alternatives.

20.1.1 Federal

National Environmental Policy Act (NEPA), 42 USC 4321-4347. NEPA requires Federal agencies to consider the potential environmental consequences of their proposals, document the analysis, and make this information available to the public for comment prior to implementation. NEPA mandates, to the fullest extent possible, that the policies, regulations, and laws of the federal government be interpreted and administered in accordance with its environmental protection goals. NEPA also requires federal agencies to use an interdisciplinary approach in planning and decision-making for any action that adversely affects the environment.

23 CFR Part 771 Environmental Impact and Related Procedures, Federal Highway Administration (FHWA), Department of Transportation (DOT). This regulation contains FHWA's and DOT's NEPA requirements for highway projects. It governs the preparation of Environmental Impact Statements (EISs) and related documents under grant programs administered by FHWA.

Following are federal laws and regulations specific to each discipline addressed in this report:

20.1.1.1 Floodplains

Federal Emergency Management Act (FEMA) Regulations (CFR Title 44 Ch. 1). The FEMA Floodway standards include the policies and procedures associated with the initial establishment of the regulatory floodway based on a maximum allowable 1' foot rise in the Base Flood Elevation (BFE) and the procedures for permitting development within the regulatory floodway after it has been established. The flood fringe are lands outside the floodway that are at or below the BFE that store, but do not effectively convey, floodwaters. Lands that compose the flood fringe will be inundated during a 1percent chance flood event but, due to physical characteristics of the floodplain, convey shallow, slower moving waters. The floodway and the Base Flood Elevation (BFE) of the 1percent chance flood are determined using hydraulic modeling techniques. FEMA's regulations allow for State and local government regulations that are more stringent (allow something less than a one foot rise) to take precedence.

FEMA's Procedures for "No-Rise" Certificates: Section 60.3 (d) (3) of the National Flood Insurance Program (NFIP) requires that Communities shall prohibit encroachments, fill, new development, substantial improvements, and other development within the adopted regulatory floodway unless it has been demonstrated through hydrologic and hydraulic analyses that the proposed encroachment would not result in any increase in flood levels within the community of the base flood (100-year) discharge.

20.1.1.2 Hydrology and Hydraulics

Clean Water Act (CWA) (in Federal Water Pollution Control Act), 33 USC 1251-1387. The CWA requires states to set water quality standards for all contaminants in surface waters, based on the "beneficial" or "designated" uses for the water body, and makes it unlawful for any person to discharge any pollutant from a point source into navigable waters unless a permit was obtained under its provisions. It also recognizes the need to address the problems posed by nonpoint source pollution.

NPDES Permits. Section 402 prescribes the process for obtaining a National Pollutant Discharge Elimination System (NPDES) permit. The United States Environmental Protection Agency (EPA) requires NPDES permits for construction activities as well as for municipalities of certain size that discharge stormwater into waterways. In Oregon, the Oregon Department of Environmental Quality (DEQ) administers these permits, as discussed in more detail below in the section on state regulations.

Safe Drinking Water Act (SDWA), 42 USC 300f to 300j-26. The SDWA requires many actions to protect drinking water and its sources, including rivers, lakes, reservoirs, springs, and groundwater wells. SDWA authorizes the Environmental Protection Agency (EPA) to set national health-based standards for drinking water to protect against both naturally-occurring and human-made contaminants. Oregon's drinking water program provides direct oversight of drinking water systems. This law would apply only if infiltration basins or Underground Injection Control (UIC) measures were incorporated into the preferred project design. Local codes encourage infiltration of treated stormwater where feasible.

20.1.1.3 Water Quality

Clean Water Act (CWA), 33 USC 1251-1387. The CWA requires states to set water quality standards for all contaminants in surface waters, based on the "beneficial" or "designated" uses for the water body and makes it unlawful for any person to discharge any pollutant from a point source into navigable waters unless a permit was obtained under its provisions. It also recognizes the need to address the problems posed by nonpoint source pollution. Some of the relevant provisions include Section 303(d), Section 401, and Section 404.

Section 303(d). This section requires states to develop a list of water quality limited segments. These are waters that do not meet water quality standards, even after point sources of pollution have installed the minimum required levels of pollution control technology. The law requires states to establish priority rankings for water on the lists and develop action plans, referred to as Total Maximum Daily Loads (TMDL), to improve water quality. TMDLs identify the pollutant load reductions that are necessary from point and nonpoint sources and guide implementation work by federal, state, tribal, territorial, and local water quality protection programs. In Oregon, DEQ develops Section 303(d) lists for approval by EPA.

Section 401 Water Quality Certification. This section requires an applicant for a federal license or permit to conduct an activity that may result in a discharge to waters of the state or U.S. to also obtain a certification that the activity complies with state water quality requirements and standards. Applicants in Oregon submit a Joint Permit Application to the U.S. Army Corps of Engineers (USACE), which then forwards the application to the certifying state agency, DEQ. DEQ then determines whether or not to certify that the project meets state water quality standards and does not endanger waters of the state, U.S., or wetlands.

Section 404 Permits. This section establishes a program to regulate the discharge of dredged and fill material into waters of the United States, including wetlands. Given the linear nature of transportation projects, impacts to waters of the U.S., including wetlands, are often unavoidable. Under the Section 404(b)(1) Guidelines, every effort needs to be made to minimize impacts to jurisdictional waters and wetlands to the maximum extent practical. A Section 404 permit would be required for any build alternative that involves work within a jurisdictional wetland or below the ordinary high water mark of any of the water bodies in the project area. A Section 404 permit triggers the need for a Section 401 Water Quality Certification.

20.1.2 State

20.1.2.1 Floodplains

Oregon Revised Statutes (ORS), 196.795 to 196.990, Oregon's Removal-Fill Law. Removal or fill within jurisdictional wetlands, waters of the state, or fish habitat requires a Removal-Fill permit from the Oregon Department of State Lands (DSL). DSL requires a wetland delineation, conceptual mitigation plan, and stormwater control plan as part of the permit application.

20.1.2.2 Hydrology and Hydraulics

Oregon Administrative Rules (OAR) 340-045-0005 to 340-045-0080, Department of Environmental Quality, NPDES and WPCF Permits. In Oregon, DEQ enforces NPDES permits and authorizes Section 401 Water Quality Certifications. An NPDES General Construction 1200-C Stormwater Permit is mandatory for construction activities on sites covering more than 1 acre. This permit requires a Temporary Erosion and Sediment Control Plan (TESCP). DEQ's web site provides guidance on selecting methods of erosion and sediment control.

20.1.2.3 Water Quality

OAR 340-045-0005 to 340-045-0080, NPDES and WPCF Permits. In Oregon, DEQ enforces NPDES permits and authorizes Section 401 Water Quality Certifications. An NPDES General Construction 1200-C Stormwater Permit is mandatory for construction activities on sites covering more than 1 acre. This permit requires a Temporary Erosion and Sediment Control Plan (TESCP). DEQ's web site provides guidance on selecting methods of erosion and sediment control.

As part of the Section 401 Water Quality Certification process, applicants may be required to incorporate protective measures into their construction and operational plans. These measures may include bank stabilization, treatment of stormwater runoff, spill protection, and fish and wildlife protection.

ORS 196.795 to 196.990, Oregon's Removal-Fill Law. Removal or fill within jurisdictional wetlands, waters of the state or fish habitat requires a Removal-Fill permit from the Oregon Department of State Lands (DSL). DSL requires a wetland delineation, conceptual mitigation plan, and stormwater control plan as part of the permit application.

ORS Chapter 468B, Water Quality (http://www.leg.state.or.us/ors/468b.html). This statute authorizes the Environmental Quality Commission to set water quality standards for waters of the state. The Department of Environmental Quality (DEQ) and Department of Agriculture (USDA) have enforcement authority, including permitting responsibilities. The issuing authority also is responsible for reviewing proposed construction documents.

20.1.3 Local

20.1.3.1 Floodplains

City of Eugene Land Use Code. Site Development Standards (EC 9.6700).

This code section describes the standards for site development in Eugene, including standards for development in environmentally sensitive areas, standards for circulation, height limits, etc.

City of Springfield, Land Use Code. Floodplain Development (SC 3.3-420).

Flood plain development is regulated by this chapter of Springfield Code. It contains standards for development of homes and other non-residential structures in floodways.

20.1.3.2 Hydrology and Hydraulics

City of Eugene Land Use Code. Stormwater Development Standards (EC 9.6790 to 9.6976). Stormwater Development Standards are regulations for locating, designing, constructing, and maintaining stormwater facilities, applicable to development of new and replaced impervious surfaces.

City of Springfield Land Use Code. Stormwater Management (4.3-110)

This codes section contains regulations regarding on-site stormwater management, as well as standards for protection of riparian zones.

20.1.3.3 Water Quality

City of Eugene Stormwater Management Manual. The purpose of this manual is to provide stormwater management principles and techniques that help preserve or mimic the natural hydrologic cycle and achieve water quality goals. This manual provides developers and design professionals with specific requirements for reducing the impacts of stormwater runoff quantity and pollution resulting from new development.

City of Eugene Land Use Code Waterside Protection Overlay Zone (WP) (EC 9.4700). This zone protects water quality in designated waterways, riparian zones and adjacent wetlands by maintaining an undeveloped setback area between these features and adjacent developed areas. The intention of this zone is to maintain or enhance open spaces adjacent to water features.

City of Eugene Land Use Code. Stormwater Development Standards (EC 9.6790 to 9.6976). Stormwater Development Standards are regulations for locating, designing, constructing, and maintaining stormwater facilities, applicable to development of new and replaced impervious surfaces.

City of Eugene Comprehensive Stormwater Management Plan, 1993. This plan provides the policy framework for the City of Eugene's stormwater program. The Stormwater Plan focuses on management practices and techniques to reduce pollution through education, on-site pretreatment, operational practices, land use regulations, and other means to eliminate and reduce the discharge of pollutants to the municipal storm system

City of Eugene Stormwater Management Manual. The purpose of this manual is to provide stormwater management principles and techniques that help preserve or mimic the natural hydrologic cycle and achieve water quality goals. This manual provides developers and design professionals with specific requirements for reducing the impacts of stormwater runoff quantity and pollution resulting from new development.

20.1.3.4 Watershed Master Plans

The following documents have been identified to potentially be applicable to the site. The information within these documents may provide site specific requirements for water quality or flow control.

- City of Eugene Stormwater Master Plan, Volumes 1 through 8, 2002.
- City of Springfield Stormwater Master Plan, 2010.

20.2 Analysis Area

The analysis area will be similar for all aspects of the water resources, but are significantly dependent on the selected alternatives. The analysis area for the MovingAhead project is the contributing drainages, waterways, and floodplains adjacent to each corridor, all of which are located in the Eugene-Springfield metropolitan area; corridor-specific analysis areas will be defined based on the alternatives selected further analysis in the Level 2 AA.

20.3 Contacts and Coordination

20.3.1 Federal

- US Army Corps of Engineers (USACE)
- US Environmental Protection Agency (USEPA)
- Federal Highway Administration (FHWA)
- US Department of Transportation (DOT)
- Federal Emergency Management Agency (FEMA)

20.3.2 State

- Oregon Department of Environmental Quality (DEQ)
- Oregon Division of State Lands (DSL)
- Oregon Department of Transportation (ODOT)

20.3.3 Local

- City of Eugene
- City of Springfield
- Lane County
- Lane Regional Council of Governments

20.4 Level 1 Screening

No data will be collected for the Level 1 Screening.

20.5 Level 2 Alternatives Analysis

Existing maps and data will be reviewed to identify floodplains, the stormwater management system, and the current 303(d) list of impaired waters within the project area. Relevant regulatory requirements will also be reviewed. This information will be overlaid on the project alternatives to identify potential conflicts with any of these resources. Impacts will be documented where an alternative encroaches on a floodplain and where an alternative has the potential to release runoff to the floodplain. In addition, impacts to water quality will be analyzed in terms of runoff-related pollutants to waterbodies with established Total Maximum Daily Loads (TMDLs).

20.5.1 Data Collection

Several types of information will be collected for this analysis. Specific tasks include the following, in order of specialization.

20.5.1.1 Floodplains

- Project staff will review updated Federal Emergency Management Agency (FEMA) National Flood Insurance Program (NFIP) Flood Insurance Rate Maps (FIRM), along with associated online geodatabases and mapping applications containing the same information.
- Staff will identify the approximate location of 100-year floodplains and elevations, confirming boundaries shown on local maps.
- Relevant floodplain regulations of local agencies will be reviewed.
- Staff will collect information on permitting requirements related to storm drainage for alternatives that involve crossing a floodplain.

20.5.1.2 Hydrology and Hydraulics

- Maps of the existing stormwater management system will be reviewed if any of the alternatives will permit continued use of the existing stormwater drainage system. The maps will be used to determine the location of current outfalls, water quality treatment and flow control facilities.
- Relevant stormwater regulations will be reviewed.
- Staff will obtain and review current Capital Improvement Program (CIP) lists from the local agencies to evaluate opportunities to improve local facilities during construction of each alternative. Local agencies will be contacted to obtain detailed information on each applicable CIP.

20.5.1.3 Water Quality

- An updated 303(d) list of streams within the Project area will be reviewed as well as any established TMDLs pertinent to the affected Project area.
- Relevant local water quality regulations will be reviewed.
- Staff will identify and describe the water quality status of waterbodies affected by the project.

20.5.2 Significance Thresholds

20.5.2.1 Floodplains

In accordance with local regulations, any impact to the existing floodplain will be considered significant. This would include building a structure within any part of the floodplain, release of runoff directly to the floodplain, whether detained or not, and temporary or permanent use of land below the flood elevation during construction and for maintenance activities of new stormwater management facilities following construction.

Maintenance activities for existing structures within the floodplain, however, will not be considered significant.

20.5.2.2 Hydrology and Hydraulics

A significant impact will be defined as the necessitation of new flow control structures that release treated stormwater to the floodplain or area waterbodies. Only alternatives that would require the addition of new flow control structure(s) in close proximity to the floodplain or area waterbodies would be defined as resulting in a significant impact.

20.5.2.3 Water Quality

Impacts to water quality will be considered significant only if the Total Maximum Daily Loads (TMDLs) for typical project transit related stormwater runoff pollutants apply to a receiving waterbody for additional stormwater discharges. If the waterbodies do not have TMDLs, water quality treatment requirements for runoff will be presumed sufficient to prevent significant impacts.

20.5.3 Impact Analysis

20.5.3.1 Long-Term Impacts Analysis Approach

For each of the disciplines, a long-term impact analysis will be conducted independently. The event horizon for long-term impacts will extend until 2035

Floodplains

Alternatives that involve crossing the floodplain will be analyzed for long-term impacts by reviewing the standard section detail for the proposed roadway and GIS based topography, in addition to local maps of the existing drainage system. An adverse impact would be defined as an overlap of the relevant road section on the existing floodplain. Discharge of stormwater runoff directly to the floodplain may result in a rise in flood elevation. Beneficial effects will be defined as the avoidance of impacts to the floodplain. Beneficial effects apply only to an alternative that remains a minimum of twenty feet away from the defined flood plain.

Hydrology and Hydraulics

Hydrology and hydraulic impacts will be assessed by obtaining maps and records of the existing stormwater management system and by comparing them against topographical maps. Existing stormwater management system records will be used to determine the location of existing outfalls, while topographic maps will indicate the changes in elevation throughout an alternative. If an alternative involves the expansion of the existing road, it is likely that elevations for the new section of the road will be similar to the existing road. Estimated runoff from expanded road surface will increase.

Water Quality

Long-term impacts to water quality may occur with release of additional treated stormwater runoff to receiving waters. However, impacts will only be significant if the receiving water body has applicable TMDL requirements. Identification of waterbodies in the study area and their TMDL requirements will be a first step toward assessment of long-term impacts. If any of the waterbodies within the study area have TMDLs, the potential impacts of each alternative will be assessed. This will involve estimating the probable location of additional flow control and water quality treatment facilities based on topography. The effects of releasing treated stormwater runoff into a receiving waterbody will be qualitatively described. Probable effects on the waterbodies will be estimated only for the pollutant load allocations defined in the TMDLs.

20.5.3.2 Short-Term Impacts Approach

Floodplains

Each alternative will be assessed for the potential requirements of construction easements within the floodplain boundary. This approach will involve outlining the floodplain and overlapping it with the

anticipated road section. Section outlines that lie within 20 feet of the floodplain delineation will be assumed to have a short-term impact. The assumption is that a twenty foot wide temporary construction easement will be required to construct the road. Within this easement, the Contractor may store equipment, materials, or fill which could affect flood elevations during a storm event.

Hydrology and Hydraulics

Short-term impacts to hydrology and hydraulics would involve removal of existing stormwater management system components with the intention to replace or enlarge it. Another potential short-term impact would involve directing stormwater runoff temporarily into the existing stormwater management system. To assess the potential for these impacts, the width of a typical cross section for each alternative will be overlaid upon a map of the existing system. The use of appropriate Best Management Practices (BMPs) is expected to prevent adverse effects from changing the existing stormwater drainage system.

Water Quality

Short-term impacts will be determined by assessing the probable construction impacts from modifications, additions, or removal of the existing stormwater management system. Clearing, grading, and removal or fill operations for the roadway will also have a temporary impact on water quality, although appropriate erosion and sediment control measures would be expected to minimize those impacts. Assessment will involve overlaying the roadway section and the existing storm system on a topographic map and reviewing the anticipated construction process.

20.5.3.3 Indirect Impact Analysis Approach

For purposes of this analysis, indirect impacts will be defined as those reasonably foreseeable adverse and beneficial impacts separated by time and space from the direct impacts of proposed alternatives. The approach for indirect impact analysis will consist of using information obtained on existing environmental conditions as part of the existing conditions analysis, applying and evaluating conceptual alternatives, predicting indirect impacts using literature reviews, case studies, and qualitative professional judgment and assessing their significance using standards or criteria as described in the significance thresholds section. A few examples of factors that will be considered in the analysis include location and size of improvements as well as features and function. Resultant findings will be documented as they relate to floodplains, hydrology and hydraulics, and water quality.

20.5.3.4 Cumulative Impact Analysis Approach

For purposes of this analysis, cumulative impacts will be defined as those resulting from the incremental impact of the alternative when added to other past, present and reasonably foreseeable future actions. Similar to the indirect impact analysis approach, the approach for adverse and beneficial cumulative impact analysis will consist of using information obtained on existing environmental conditions as part of the existing conditions analysis. In this approach, information obtained about future conditions as described in master plans and other sources will also be considered. Conceptual alternatives will be applied and evaluated, and together with the existing and future condition information, cumulative impacts will be predicted using literature reviews, case studies, and qualitative professional judgment. Significance will be assessed using criteria as described in the significance thresholds section. A few examples of factors that will be considered in the analysis include location and size of improvements as well as features and function. Resultant findings will be documented as they relate to floodplains, hydrology and hydraulics, and water quality.

20.5.3.5 Mitigation Measures Approach

Following the impacts identification and assessment, impact mitigation measures will be identified and evaluated. Specific mitigation measures will be dependent on a variety of factors including size of improvements and location, and might consist of decreasing the magnitude of the impacts or including features that will compensate for the impacts. Applicable regulations will be reviewed for mitigation thresholds and any directives on specific mitigation measures to be applied. Where regulations do not speak to thresholds or required mitigation measures, case studies and qualitative professional judgment will be used to develop appropriate mitigation measures.

20.6 NEPA Documentation

This process will elaborate on the analysis done in the Level 2 AA for the Endangered Species Act (ESA) consultation. The analysis will provide an updated impact analysis (long-term, short-term, indirect, and cumulative impacts, as well as mitigation measures) for each of the water resources areas for the specific corridor(s). If necessary, the analysis will provide a quantitative analysis of new impervious surface generated by the selected alternative, using previously provided data and GIS mapping applications. No additional data will be required from that which was obtained in the Level 2 AA.

For the purposes of this study, a DCE is assumed for the NEPA documentation.

The following conditions, in relation to water resources, must be satisfied to ensure that a DCE is granted:

- The action does not have any significant environmental impacts as described in 23 CFR 771.
- The action does not involve the following:
    - Any work encroaching on a regulatory floodway or any work affecting the base floodplain elevations of a waterbody.
    - Construction in, across or adjacent to a river designated as a component or proposed for inclusion in the National System of Wild and Scenic Rivers published by the US Department of the Interior/US Department of Agriculture.

Provided that the data, methodologies and approaches of the Level 1 Screening and Level 2 AA are completed and documented, no additional data is anticipated to be required for the DCE.

20.7 References

Army Corps of Engineers, Portland District or (https://www.nwp.usace.army.mil/op/g/jur_det.asp?cms_g=1138228229570/) (Provides links including a definition of navigable waterways and list of defined navigable waterways in Oregon State)

California Department of Transportation (Caltrans) or (http://www.dot.ca.gov/ser/vol1/sec1/ch1fedlaw/chap1.htm#LAWS) (Provides reference links for environmental documents, including applicable Federal laws and NEPA guideline documents)

City of Springfield. Stormwater Management Plan. (http://www.ci.springfield.or.us/pubworks/EnvironmentalServices/Stormwater/StormwaterManagementPlan.pdf)

City of Springfield. Development Code, Stormwater Management. (http://qcode.us/codes/springfield-development/)

City of Eugene. Chapter 9, Land Use Code. City of Eugene Department of Planning and Development. (http://www.eugene-or.gov/portal/server.pt/gateway/PTARGS_0_0_5848_319_0_43/http%3B/cesrv501/lf7citycode/Home.aspx)

City of Eugene Comprehensive Stormwater Management Plan, 1993. (http://www.eugene-or.gov/portal/server.pt/gateway/PTARGS_0_2_13790_0_0_18/CSWMP.pdf)

City of Eugene Stormwater Management Manual, July 2006. (http://www.eugene-or.gov/portal/server.pt?open=512&objID=689&PageID=1795&cached=true&mode=2&userID=2)

City of Eugene, Stormwater Basin Master Plan , Bethel-Danebo Basin, 2002. (http://www.eugene-or.gov/portal/server.pt/gateway/PTARGS_0_2_173764_0_0_18/vol3.pdf)

City of Eugene, Stormwater Basin Master Plan, Amazon Basin, 2002.(http://www.eugene-or.gov/portal/server.pt/gateway/PTARGS_0_2_244064_0_0_18/Volume2.pdf)

Commission on Environmental Quality or (http://ceq.eh.doe.gov/nepa/regs/nepa/nepaeqia.htm) (presents NEPA in its amended form)

Federal Emergency Management Agency (FEMA) or (https://msc.fema.gov/portal) (federal resource for flood insurance rate maps)

Federal Highway Administration or (http://www.environment.fhwa.dot.gov/projdev/index.asp) (provides an overview of NEPA purpose, requirements and implementation for projects, along with references to applicable regulations)

Oregon Administrative Rules (OAR) or (http://arcweb.sos.state.or.us/rules/number_index.html) (index to OAR rules by numerical chapter)

Oregon Administrative Rules (OAR) for Department of Environmental Quality (DEQ) or (http://arcweb.sos.state.or.us/rules/OARs_300/OAR_340/340_tofc.html) (Chapter 340 of OARs)

Oregon Administrative Rules (OAR) for Department of Environmental Quality (DEQ) or (http://arcweb.sos.state.or.us/rules/OARs_300/OAR_340/340_tofc.html) (Chapter 340 of OARs)

Oregon Department of Environmental Quality (ODEQ) or (http://www.oregondeq.com/wq/wqpermit/stminfo.htm) (Information on NDPES permit applications)

Oregon Department of Environmental Quality (ODEQ) or (http://www.deq.state.or.us/wq/assessment/assessment.htm) (state resource inventory for impaired waterbodies)

Oregon Department of Transportation (ODOT) or (http://www.oregon.gov/ODOT/HWY/GEOENVIRONMENTAL/pages/hyd_manual_info.aspx) (state guidance document for roadway hydraulics)

Oregon Division of State Lands (DSL) or (http://www.oregon.gov/DSL/PERMITS/working_ww.shtml) (Information on requirement for removal / fill permits within wetlands and waterways)

United States Environmental Protection Agency (EPA) or (http://www.epa.gov/region5/water/cwa.htm) (overview of Clean Water Act, with links to individual titles)

United States Environmental Protection Agency (EPA) or
(http://www.epa.gov/region5/defs/html/sdwa.htm) (overview of Safe Drinking Water Act, with a link to the complete document)

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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

Acronyms and Abbreviations	Definitions
AA	Alternatives Analysis
AAI	All Appropriate Inquiry
ADA	Americans with Disabilities Act
AEO	Annual Energy Outlook
APE	Area of Potential Effect
API	Area of Potential Impact
BAT	Business Access and Transit
BMP	Best Management Practices
BRT	Bus Rapid Transit
CIP	Capital Improvements Program
CO	Carbon Monoxide
COGP	County Government Grant Program
Corps	U.S. Army Corps of Engineers
dB	Decibel
dBA	A-weighted decibel
DBE	Disadvantaged Business Enterprise
DEQ	Oregon Department of Environmental Quality
DOT	Department of Transportation
Draft EIS	Draft Environmental Impact Statement. Also referred to as DEIS.
DSL	Oregon Department of State Lands
EA	Environmental Assessment
EE	Envision Eugene, City of Eugene's Comprehensive Plan; latest draft or as adopted
EIS	Environmental Impact Statement
EJ	Environmental Justice
EmX	Emerald Express, Lane Transit District's Bus Rapid Transit System
EPA	U. S. Environmental Protection Agency
ESA	Endangered Species Act or Environmental Site Assessment
Eugene TSP	Eugene Transportation System Plan
EWEB	Eugene Water & Electric Board
FEMA	Federal Emergency Management Agency
FHWA	Federal Highway Administration
Final EIS	Final Environmental Impact Statement. Also referred to as FEIS.
FTA	Federal Transit Administration
FY	Fiscal Year

Acronyms and Abbreviations	Definitions
HGM	Hydro-geomorphic
ISTEA	Intermodal Surface Transportation Efficiency Act
LCOG	Lane Council of Governments
Ldn	Day-night Sound Level
L_{eq}	Equivalent Sound Level
LGGP	Local Government Grant Program
L_{max}	Maximum Sound Level
L_{min}	Minimum Sound Level
LOS	Level of Service
LPA	Locally Preferred Alternative
LRAPA	Lane Regional Air Protection Agency
LRFP	LTD's Long-Range Financial Plan
LRTP	LTD's Long-Range Transit Plan
LTD	Lane Transit District
LUST	Leaking Underground Storage Tank
LWCF	Land and Water Conservation Fund
MAP-21	Moving Ahead for Progress in the 21st Century
MetroPlan	Eugene-Springfield Metropolitan Area General Plan
MOE	Measures of Effectiveness
MPC	Metropolitan Policy Committee
MPH	Miles per hour
MPO	Metropolitan Planning Organization
NAAQS	National Ambient Air Quality Standards
NAC	Noise Abatement Criteria
NEPA	National Environmental Policy Act
NHPA	National Historic Preservation Act
NHRP	National Register of Historic Places
NO_2	Nitrous Dioxide
NO_x	Nitrous Oxides
NPS	Department of Interior's National Park Service
NRHP	National Register of Historic Places
O_3	Ozone
O&M	Operations and maintenance
OAR	Oregon Administrative Rule
ODFW	Oregon Department of Fish and Wildlife
ODOE	Oregon Department of Energy
ODOT	Oregon Department of Transportation
OHP	Oregon Highway Plan
PEM	Palustrine Emergent Wetland
PM	Particulate matter
PM_{10}	Particulate matter – 10 microns in diameter

Acronyms and Abbreviations	Definitions
$PM_{2.5}$	Particulate matter – 2.5 microns in diameter
PPE	Personal Protective Equipment
Ppm	Parts Per Million
ROW	Right of way
RTP	Central Lane Metropolitan Planning Organization Regional Transportation Plan (adopted November 2007). (The RTP includes the Financially Constrained Roadway Projects List)
SCC	Standard Cost Categories
SHPO	Oregon State Historic Preservation Office
SO_2	Sulfur Dioxide
STA	Special Transportation Area
TDM	Transportation Demand Management
TESCP	Temporary Erosion and Sediment Control Plan
TMDL	Total Maximum Daily Load
TransPlan	Eugene-Springfield Transportation System Plan (adopted 2001)
TPAU	Department of Transportation – Transportation Planning Analysis Unit
TRP	Transportation Planning Rule
TSM	Transportation System Management
UGB	Urban Growth Boundary
USFWS	U.S. Fish and Wildlife Service
VMT	Vehicle Miles Traveled
VOCs	volatile organic compounds
WEEE	West Eugene EmX Extension
YOE	Year of Expenditure

Source: MovingAhead Project Team. March 2015.

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.”
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	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

Terms	Definitions
	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.
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 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."
Base Fare	The price charged to one adult for one transit ride; excludes transfer charges, and reduced fares.
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 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.
Boarding	Boarding is a term used in transit to account for passengers of public transit systems. One person getting on a transit vehicle equals one boarding. In many cases individuals will have to transfer to an additional transit vehicle to reach their destination and may well use transit for the return trip. Therefore a single rider may account for several transit boardings in one day.
Bus Rapid Transit (BRT)	A transit mode that combines the quality of rail transit and the flexibility of buses. It can operate on bus lanes, HOV lanes, expressways, or ordinary streets. The vehicles are designed to allow rapid passenger loading and unloading, with more doors than ordinary buses.
Busway	Exclusive freeway lane for buses and carpools.
Capital Improvements Program	A Capital Improvement Plan or Program (CIP) is a short-range plan, usually four to 10 years, which identifies capital projects and equipment purchases, provides a planning schedule and identifies options for funding projects in the program.
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.
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

Terms	Definitions
	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.
Cooperating Agency	Regulations that implement NEPA 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 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.
Congestion Mitigation and Air Quality (CMAQ)	Federal funds available for either transit or highway projects which contribute significantly to reducing automobile emissions which cause air pollution.
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.
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 Documented Categorical Exclusion (DCE) means a group of actions that may also qualify as 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 Documented Categorical Exclusions. Such actions require some NEPA 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.
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.
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.
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).
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).

Terms	Definitions
	Envision Eugene includes a determination of the best way to accommodate the community's projected needs over the next 20 years.
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; statements are required by the National Environmental Policy Act (NEPA).
Environmental Justice	A formal federal policy on environmental justice was established in February 1994, with Executive Order 12898 (EO 12898), "Federal Actions to Address Environmental Justice in Minority Populations and Low-income Populations." There are three fundamental environmental justice principles: To avoid, minimize, or mitigate disproportionately high and adverse human health and environmental effects, including social and economic effects, on minority populations and low-income populations. To ensure the full and fair participation by all potentially affected communities in the transportation decision-making process. To prevent the denial of, reduction in, or significant delay in the receipt of benefits by minority and low-income populations.
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 probably 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)	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. Goals are overarching principles that guide decision making. Goals are broad statements. Objectives define strategies or implementation steps to attain the goals.

Terms	Definitions
	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.
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).
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.
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 which involve or affect more than one mode of transportation, including transportation connections, choices, cooperation and coordination of various modes. Also known as "multimodal."
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 Envision Eugene 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.
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)	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.
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.
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.
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.

Terms	Definitions
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 NEPA analysis. This term is also used to describe the proposed action that is being considered for New Starts or Small Starts funds.
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 on 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 rail 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 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 (EIS) process.
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	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.
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.
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

Terms	Definitions
	programs through FY 2014. Includes new and revised program guidance and regulations with planning requirements related to public participation, publication, and environmental considerations.
MovingAhead Project	The City of Eugene and LTD are working with regional partners and the community to determine which improvements are needed on some of our most important 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. 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.
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).
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 Federal Register, 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."
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.
Peak/Base Ratio	The number of vehicles operated in passenger service during the peak period

Terms	Definitions
	divided by the number operated during the base period.
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.
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."
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.
Safe, Accountable, Flexible, Efficient Transportation Equity Act	Safe, Accountable, Flexible, Efficient Transportation Equity Act - A Legacy for Users (SAFETEA-LU) Passed by Congress July 29, 2005, 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.
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.
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 identified improvements for all modes of transportation, will serve as the City of Springfield's portion of the Regional Transportation System Plan prepared by LCOG and was prepared in coordination with ODOT, 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 (CAAA) that contains procedures to monitor, control, maintain and enforce compliance with national standards for air quality.

Terms	Definitions
Strategy	An intended action or series of actions which when implemented achieves the stated goal.
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.
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.
Throughput	The number of users being served at any time by the transportation system.
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 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 which 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). Sub area in which multiple transportation facilities are experiencing congestion, safety or other problems.
Vehicle Hours of Delay	Cumulative delay experience by transit vehicles during high traffic periods.
v/c ratio	Used as a principal measure of congestion. The “V” represents the volume or the number of vehicles that are using the roadway at any particular period. The “C” represents the capacity of a roadway at its adopted LOS. If the volume exceeds the capacity of the roadway (volume divided by capacity exceeds 1.00), congestion exists.
Water Quality	Refers to the characteristics of the water, such as its temperature and oxygen levels, how clear it is, and whether it contains pollutants.
WEEE	West Eugene EmX Extension

Source: MovingAhead Project Team. March 2015.

Naming Conventions for the MovingAhead Project

All technical memoranda should use the same terminology for names of alternatives, roads, segments, stations, places, etc. This list is not the complete list of naming conventions and will be updated as needed throughout the project.

Project Elements	Naming Convention
Project Name	MovingAhead Project In technical documents only, MAP may be used as the acronym for the project name.
Corridors (in text)	Highway 99 Corridor River Road Corridor Randy Papé Beltline Corridor 18th Avenue Corridor Coburg Road Corridor Martin Luther King, Jr. Boulevard / Centennial Boulevard Corridor 30th Avenue – Lane Community College Corridor Main Street – McVay Highway Corridor Valley River Center Corridor Bob Straub Parkway Corridor
Corridors (on graphics)	Hwy 99 Corridor River Rd Corridor Beltline Corridor 18th Ave Corridor Coburg Rd Corridor MLK Jr Blvd / Centennial Blvd Corridor 30th Ave – LCC Corridor Main St – McVay Hwy Corridor Valley River Center Corridor Bob Straub Pkwy Corridor
Modes	No-Build Enhanced Bus EmX
Roads	When citing the names of specific roads, streets, avenues, etc., in text, spell out "Road," "Street," "Avenue," etc., as part of the facility's name, and always provide the location designation (abbreviated). For example: W. 11th Avenue. In tables, the names may include abbreviations for streets, avenues, roads, etc. For example: "Ave". But be consistent within a given table – either abbreviate all roads, streets, avenues, etc., or do not abbreviate any of them. Note that the "th", "nd," in numbered street names is superscript formatted text. When the area of the road of concern spans into two of the City's location areas (e.g., W and E), the location designation for the road should be omitted; for example, "The alignment would be located on the left shoulder of 11th Avenue, from Alder Street to Terry Street."
Places	Following is a list of some of the common place names that will be used throughout the technical memoranda. Please use their format as presented here as they are used in the memoranda. Other place names will likely be added to this

Project Elements	Naming Convention
	list.
	Downtown Eugene
	Eugene Station
EmX Station Names	Following is a list of the names of some of the Project station names. Consistently use the full standard names when referring to these stations. Existing stations should generally be referred to as an existing station. For example: “There would be approximately 275 boardings on an average weekday in 2030 at the existing Seneca Street Station.”
	Eugene Station
	Springfield Station
	Seneca Station
	River Road Station

Source: MovingAhead Project Team. March 2015.

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Appendix B: Fatal Flaw Screening

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MovingAhead

STREETS AND PLACES REIMAGINED

Fatal Flaw Screening Technical Memorandum

Lane Transit District
City of Eugene

In cooperation with
City of Springfield
Lane Council of Governments

June 2015

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Fatal Flaw Screening Technical Memorandum

MovingAhead Project

June 2015

Prepared for
Federal Transit Administration
Lane Transit District
City of Eugene

Prepared by
Sasha Luftig, Lane Transit District
Chris Henry, City of Eugene

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Introduction

This technical memorandum describes the Fatal Flaw Screening conducted by the Lane Transit District (LTD) and the City of Eugene for the MovingAhead project. The MovingAhead project will determine which of the high capacity transit corridors identified in the adopted EmX System Plan and the Frequent Transit Network (FTN) are ready to advance to capital improvements programming in the near term. The study is being conducted jointly with local agencies to facilitate a more streamlined and cost-efficient process through concurrent planning, environmental review, and design and construction of multiple corridors.

Overview

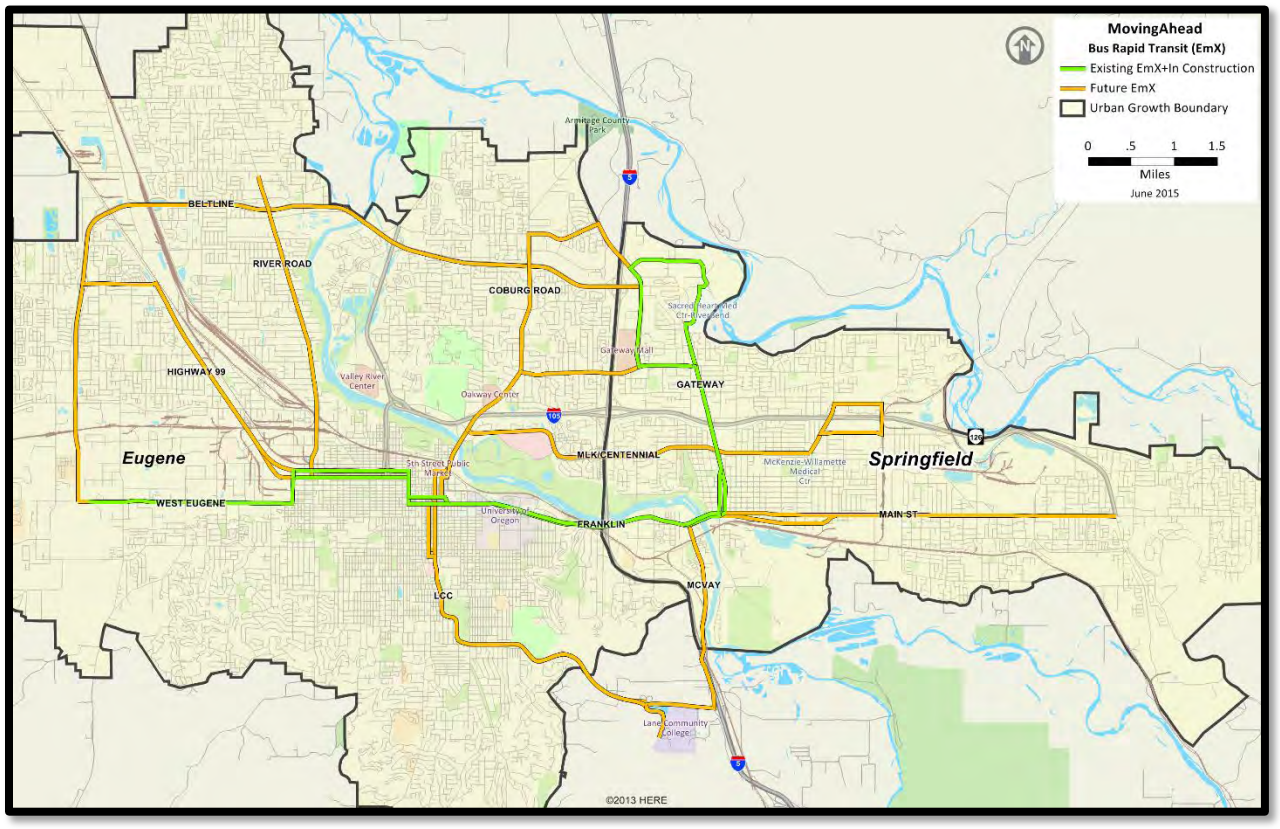
The prioritization of capital investments in multi-modal transit corridors is a powerful tool for implementing local and regional comprehensive land use and transportation plans, agency strategic plans, and other community planning documents. Capital investments in multi-modal transit corridors can have a substantial impact on patterns of growth and development. By coordinating the timing and prioritizing the funding for strategic multi-modal capital investments, the multi-modal transit corridor capital improvements program helps ensure that development occurs consistent with the region's plans and vision.

In February 2015, LTD and the City of Eugene began the first step in determining which multi-modal transit corridors should be advanced to near-term capital improvements programming. They conducted a screening level evaluation of the 10 future corridors identified in the region's adopted EmX System Plan (Figure 1) and the Frequent Transit Network (FTN) (Figure 2). The goal of the Fatal Flaw Screening was to identify which of the 10 future corridors ***should not*** move forward to the next level of evaluation by determining which corridors will not be ready for any level of capital investment in bus rapid transit or multimodal infrastructure in the next 10 years.

This quick and high level screening was based on the project's preliminary Purpose and Need and Goals and Objectives (PNGO) and data that already existed. The initial set of 10 corridors are listed below and are shown in Figure 3.

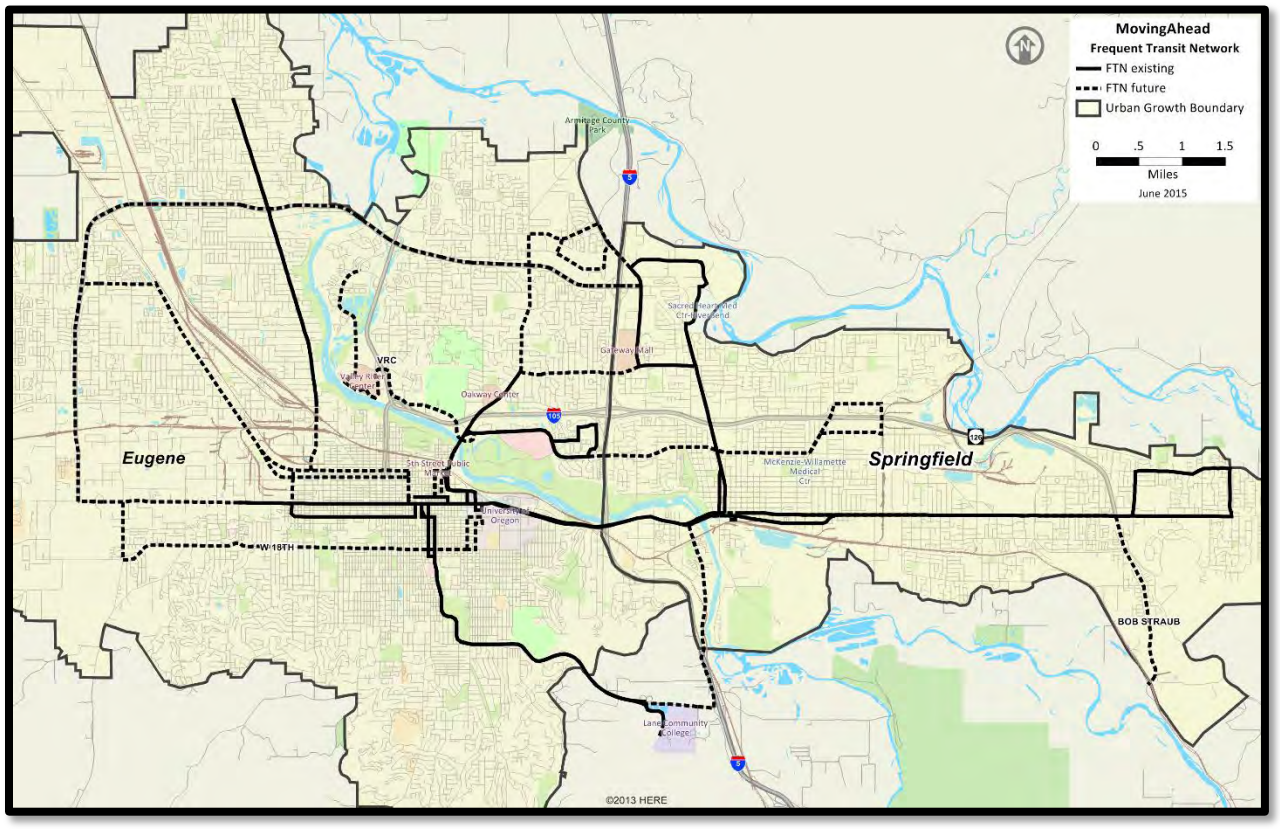
- Highway 99
- River Road
- Randy Papé Beltline
- 18th Avenue
- Coburg Road
- Martin Luther King Jr. Boulevard/Centennial Boulevard
- 30th Avenue/Lane Community College
- Main Street - McVay Highway
- Valley River Center
- Bob Straub Parkway

Figure 1. EmX System Plan



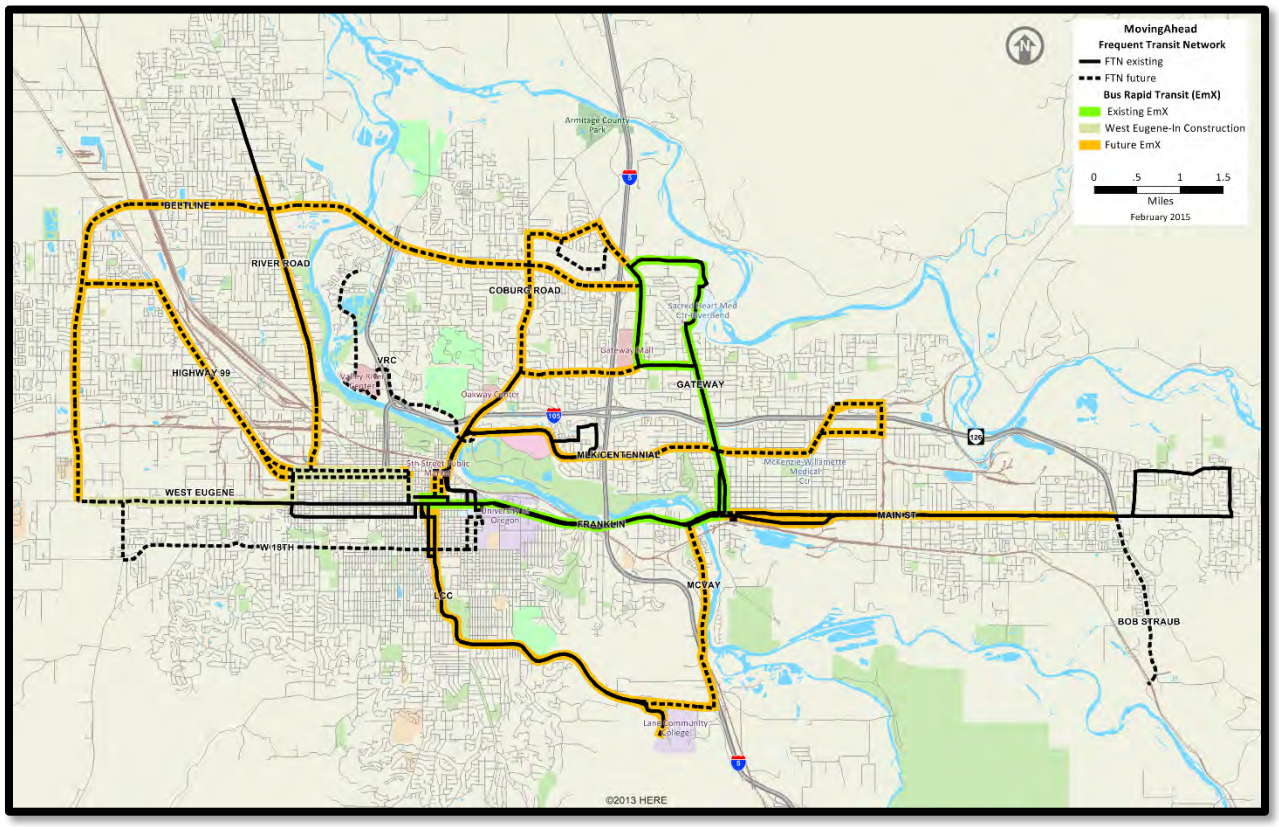
Source: Lane Transit District. 2015.

Figure 2. Frequent Transit Network



Source: Lane Transit District. 2015.

Figure 3. 10 Corridors Considered in Fatal Flaw Screening



Source: Lane Transit District. 2015.

Findings

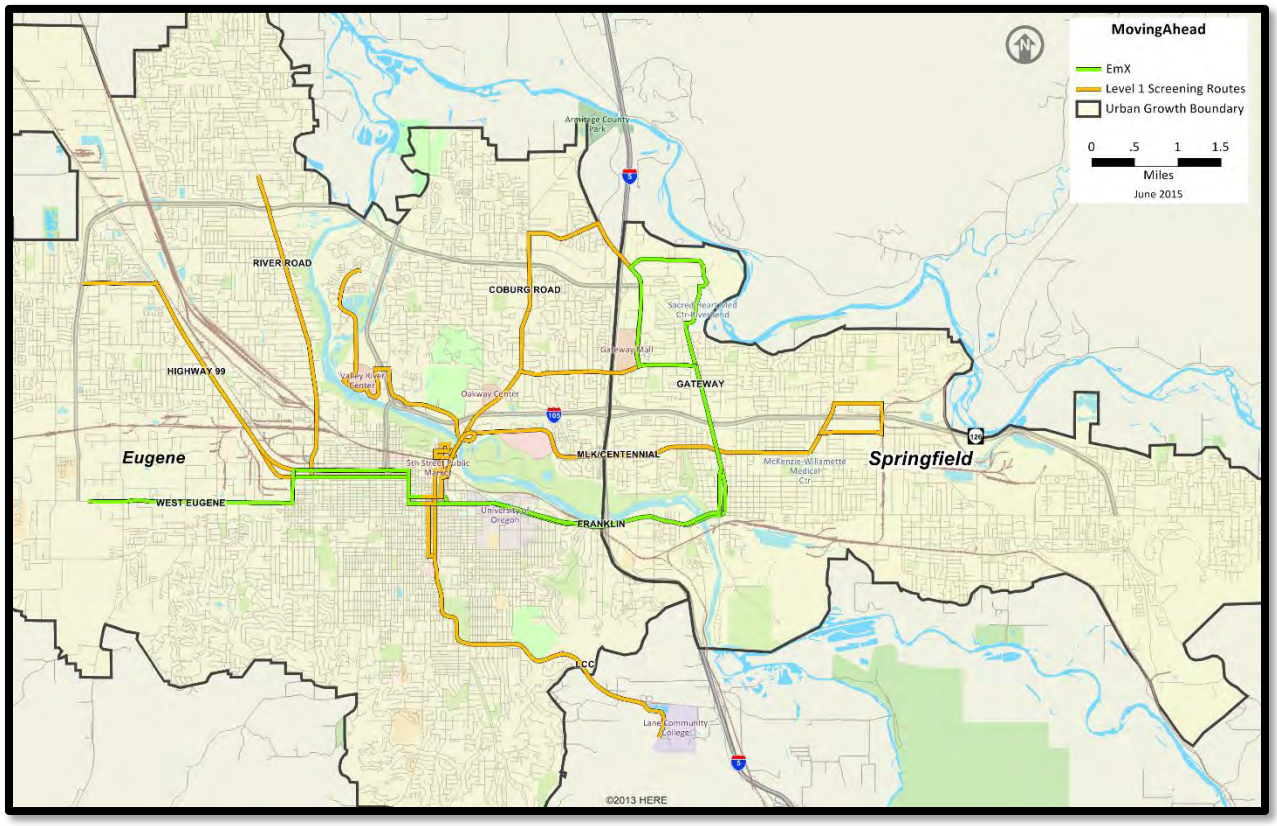
At the conclusion of the Fatal Flaw Screening, the team of agency participants identified three (3) corridors that should not be advanced to the Level 1 Screening Evaluation and seven (7) corridors that were ready to advance to the Level 1 Screening, listed below in Table 1 and shown in Figure 4.

Table 1. Summary of Fatal Flaw Screening Findings

Corridor	Fatal Flaw Screening Determination
Highway 99 Corridor	Advance to Level 1 Screening
River Road Corridor	Advance to Level 1 Screening
Randy Papé Beltline Corridor	Not advanced to Level 1 Screening – will be considered for frequent service as an east-west system connector
18th Avenue Corridor	Not ready for capital investment in bus rapid

	transit or multimodal infrastructure in the next 10 years
Coburg Road Corridor	Advance to Level 1 Screening
Martin Luther King, Jr. Boulevard / Centennial Boulevard Corridor	Advance to Level 1 Screening
30th Avenue – Lane Community College Corridor	Advance to Level 1 Screening
Main Street – McVay Highway Corridor	Advance the Main Street segment of this corridor to Level 1 Screening. The McVay Highway segment of this corridor is not ready for capital investment in bus rapid transit or multimodal infrastructure in the next 10 years. *Note: Although originally advanced to the Level 1 Screening in this study, this corridor was removed from consideration after the Fatal Flaw Screening was conducted because it was advanced by Springfield City Council (on May 18, 2015) and the LTD Board (on May 20, 2015) into a study to select a locally preferred transit solution. This corridor is on a schedule that is ahead of the MovingAhead project schedule.*
Valley River Center Corridor	Advance to Level 1 Screening
Bob Straub Parkway	Not ready for capital investment in bus rapid transit or multimodal infrastructure in the next 10 years

Figure 4. Corridors Advanced for Further Consideration



Source: Lane Transit District. 2015.

The corridors advanced to the Level 1 Screening will have cross section concepts developed and will be studied in more detail to determine which corridors are most ready to advance to capital improvements programming. For those corridors advanced into the Level 2 Alternatives Analysis, concepts will be refined, alternatives and design options will be developed, and the corridors will be studied in much more detail to determine which concepts best meet the community's vision and are ready to advance into project development.

Screening Process

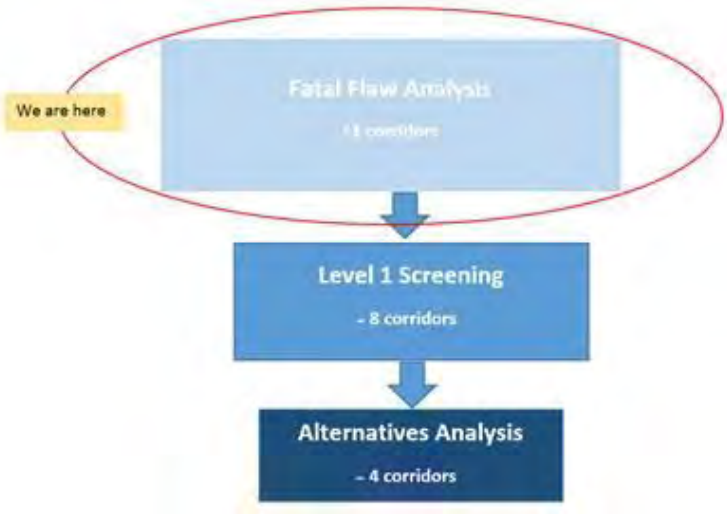
During two workshops, the screening was conducted by staff from Lane County, the cities of Eugene, Springfield, and Coburg, ODOT, the Central Lane MPO, and LTD (Table 2). The group reached their final recommendation at a meeting on February 19, 2015. Figure 5 shows how the Fatal Flaw Screening relates to the steps in the MovingAhead evaluation process.

Table 2. Agency Staff Conducting Fatal Flaw Screening

City of Coburg Petra Schuetz	**Lane Council of Governments** Susan Payne Mary McGowan, Paul Thompson
City of Eugene Will Dowdy, Planning Terri Harding, Planning Chris Henry, Public Works Rob Inerfeld, Public Works	**Lane County** Lydia McKinney
City of Springfield Tom Boyatt	**Lane Transit District** Dan Tutt Tom Schwetz Sasha Luftig
Oregon Department of Transportation Frannie Brindle Dave Reesor	

Source: Lane Transit District. 2015.

Figure 5. MovingAhead Evaluation Steps



Source: Lane Transit District. 2015.

Evaluation Criteria

Evaluation criteria were developed from the project's preliminary PNGO (Appendix). Evaluation criteria were used during the screening process to aid in determining how well each of the corridor alternatives would meet the project's PNGO. The evaluation on criteria used in the Fatal Flaw Screening required a mix of quantitative data and qualitative assessment. The resulting data was used to compare and contrast the corridors and measure the readiness of each corridor for advancing to capital investment.

The Fatal Flaw Screening used the following seven criteria:

- Employment within 1/2 mile of the corridor
- Population within 1/2 mile of the corridor
- Average weekday transit boardings on corridor routes
- Communities of concern
- Consistency with the BRT System Plan and the FTN concept
- Consistency with the Regional Transportation Plan (RTP)
- Consistency with local comprehensive land use plans

The agency team reviewed the data and rated each corridor as high, moderate, or low in terms of how effectively it could meet each criterion. The corridors were then ranked based on their overall effectiveness in meeting the criteria. The highest ranked corridors were advanced to the Level 1 Screening.

Each of the criteria is described in more detail below.

Employment within 1/2 Mile of Corridor

Employment data was derived from the 2012 employment point shape file from Lane Council of Governments. This annual file is created using Oregon's Quarterly Census of Employment and Wages data for 2012. "Number of Employees" data is from the Average Annual Employment field in the shape file. Employers inside the 1/2 mile buffer corridor were identified and the total number of employees was tabulated. "Average # of Employees per Mile" was calculated by dividing total employees by corridor length. The rankings for high, moderate, and low were determined by averaging the number of employees along all corridors, rounding, and selecting that rounded average as the middle point for the moderate rating.

Criteria Evaluation	**Average # of Employees per Mile**
High	>4000
Moderate	2000-4000
Low	<2000

Population within 1/2 Mile of Corridor

Population was determined using the 2010 US Census block point shape file. Block points inside the 1/2-mile corridor buffer were identified and population was totaled. "Average population per mile" was

calculated by dividing the total corridor population within 1/2 mile by corridor length. The rankings for high, moderate, and low were the same as the ratings for employment due to the similarity in range between the two data sets.

Criteria Evaluation	**Average Population per Mile**
High	>4000
Moderate	2000-4000
Low	<2000

Average Weekday Transit Boardings on Corridor Routes

Passenger boarding data was collected by Lane Transit District's Automatic Passenger Counting (APC) system. Individual stops are GPS based and passengers are counted as they pass an infrared beam located at the bus doors. Bus stop data is from October 2014 weekdays (10/06-10/10, 10/13-10/17, 10/20-10/24, and 10/27-10/31). Bus stops on routes within the 1/2 mile corridor were selected and average weekday boardings were totaled. "Average Weekday Boardings per Mile" were calculated by dividing corridor length by average weekday boardings within the ½ mile corridor. The rankings for high, moderate, and low were determined by taking the average of the highest and lowest boardings, rounding, and selecting that number as the middle point for the moderate rating.

Criteria Evaluation	**Average Weekday Boardings per Mile**
High	>2000
Moderate	1000-2000
Low	<1000

Communities of Concern

The Lane Council of Governments (LCOG) has tabulated data and prepared a 2008-2012Communities of Concern in Central Lane Metropolitan Planning Organization (MPO) map, which displays, by census block group, concentrated areas of minority, elderly and disabled populations and low income households. The data source is the 2008-2012 American Community Survey and Lane Council of Governments (LCOG).

For the Central Lane MPO area, concentrations are defined as areas above the regional averages in which: minorities are greater than 17.5 percent of total population, and elderly persons are greater than 13.1 percent of total population.

The Lane Council of Governments (LCOG) has tabulated data and prepared a 2008-2012 Households with No Cars in Central Lane Metropolitan Planning Organization (MPO) map, which displays, by census block group, the percentage of households with no vehicles. The data source is the 2008-2012 American Community Survey and Lane Council of Governments.

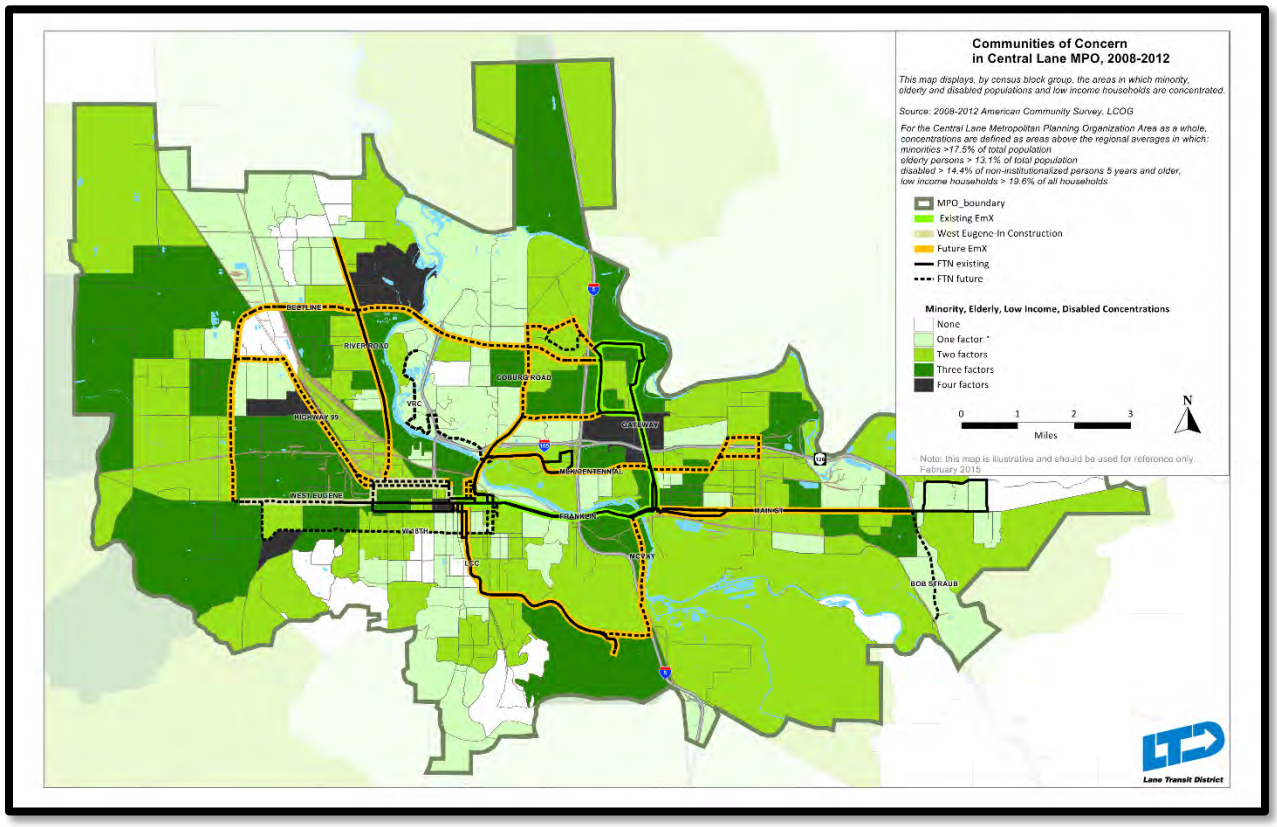
For the Central MPO area as a whole, this percentage was 9.9 percent for the surveyed period. There are an estimated 10,270 households with no vehicles.

In Figure 6, each color represents approximately 12,260 of the MPO households. The number in each block group area shows the approximate number of no vehicle households in each area. No Car concentrations of 15.3 percent or greater is a factor in Communities of Concern.

All corridors were overlaid on the Communities of Concern map to determine which corridors could serve communities of concern. Evaluation criteria are shown in the table below. The ratings for high, moderate, and low were based on visual analysis of the maps for Communities of Concern (Figure 5) and Households with No Car (Figure 6).

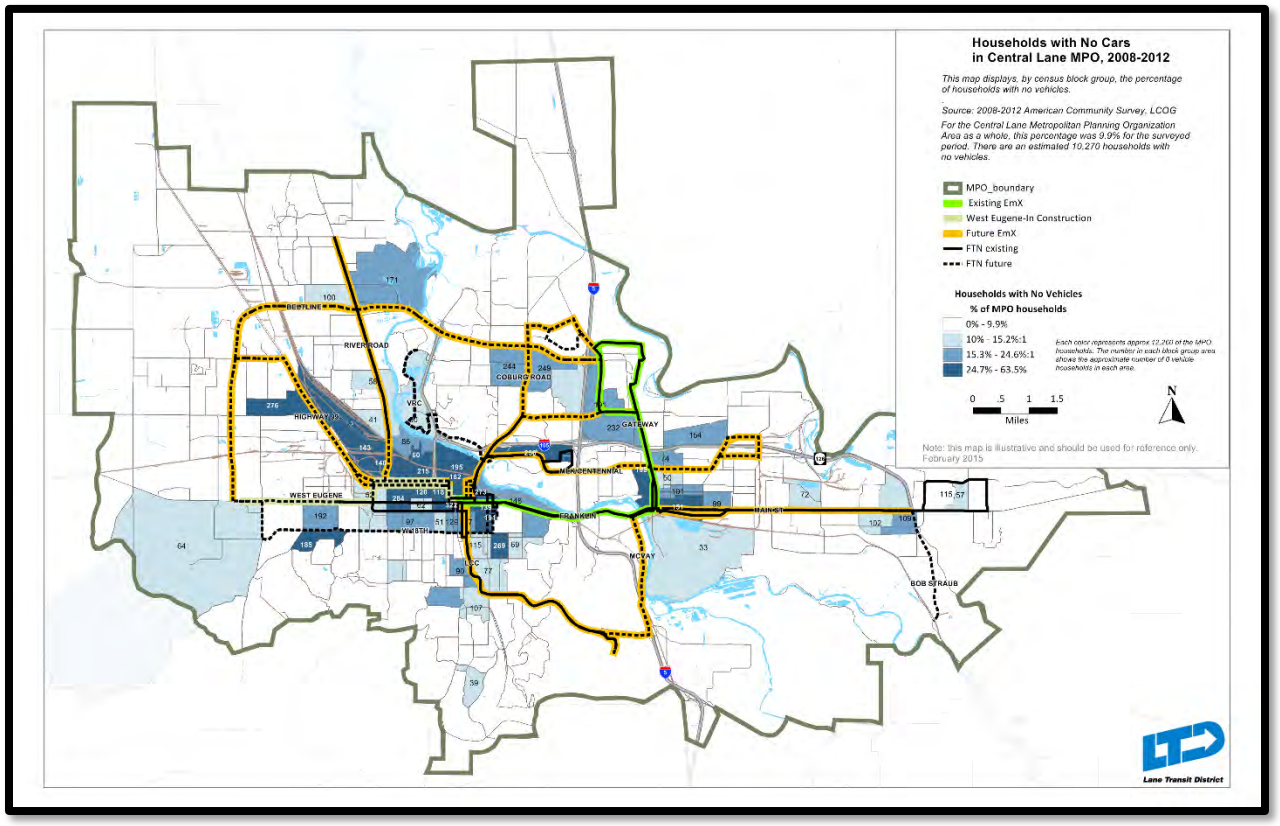
Criteria Evaluation	**Minority, Elderly, Low Income, Disabled, No Car Concentrations**
High	3 or more factors for 50% or more of corridor
Moderate	2 factors for 50% or more of corridor
Low	1 or fewer factors for 50% or more of corridor

Figure 5. 2008-2012 Communities of Concern



Source: Lane Transit District, Lane Council of Governments. 2015.

Figure 6. 2008-2012 Households with No Cars



Source: Lane Transit District, Lane Council of Governments. 2015.

Consistency with BRT System Plan and FTN Concept

Lane Transit District's (March 2014) Long-Range Transit Plan (LRTP) was examined to determine which corridors are consistent with the Bus Rapid Transit (BRT) System Plan and the Frequent Transit Network (FTN) concept. If the corridor was highlighted as a current or future FTN it received a high ranking for consistency. If the corridor was not highlighted as a current or future FTN it received a low ranking.

Consistency with Regional Transportation Plan (RTP)

The Regional Transportation Plan 2007-2031 (adopted November 2007) for the Central Lane Metropolitan Planning Organization was examined to determine which BRT transit corridors are identified in the RTP. If the corridor was highlighted in the RTP, it received a high ranking for consistency. If the corridor was not highlighted in the RTP it received a low ranking.

Consistency with Local Comprehensive Land Use Plans

The growth plans for the City of Eugene (Envision Eugene) and the City of Springfield (Springfield 2030 Preliminary Draft (2010)) were reviewed. Additionally, staff from both agencies familiar with the growth plans, were consulted during the Fatal Flaw Screening workshop. If an area adjacent to the corridor was identified as a development/redevelopment opportunity area for employment and/or residential, it received a high ranking. If it was not identified as a development/redevelopment

opportunity area for employment and/or residential, it received a low ranking. In some cases a corridor received a moderate ranking where a portion of the corridor was identified as a development/redevelopment opportunity area, but the majority of the corridor was not adjacent to the opportunity area.

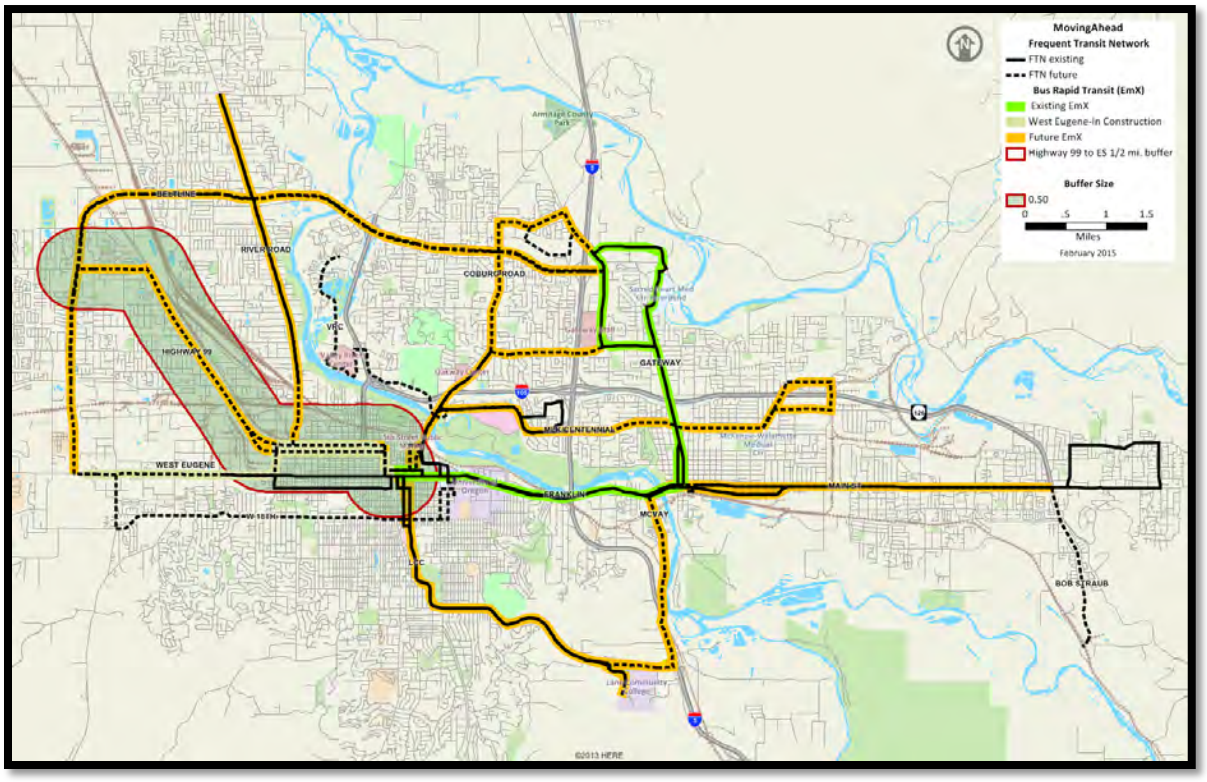
Corridors Evaluated

This section includes a brief description of the 11 corridors evaluated in the Fatal Flaw Screening.

Highway 99 Corridor

This corridor begins at the Eugene Station, uses West 6th Avenue (outbound) and West 7th Avenue (inbound) to Garfield Street, then Highway 99 to Barger Drive, and Barger Drive to a terminus in the area of the Randy Papé Beltline (Figure 7). This corridor is approximately 5.45 miles one way and is currently served by Routes #40, #41, #43, and #95. The average number of boardings per weekday is 15,012 boardings

Figure 7. Highway 99 Corridor



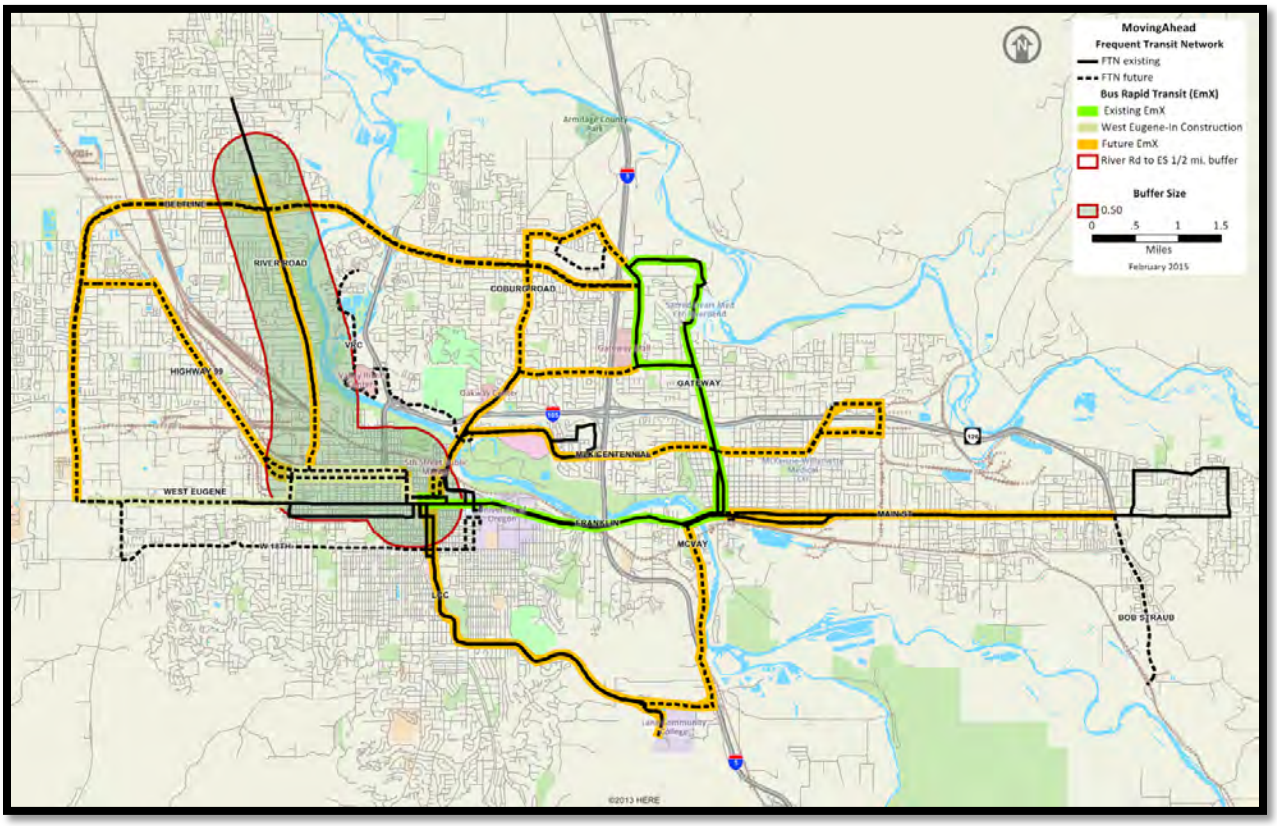
Source: Lane Transit District. 2015.

Within 1/2 mile of Highway 99, there are approximately 2,269 employers with 26,278 employees and 13,429 housing units with a population of 27,312 people. The area along the corridor is characterized primarily by industrial and commercial development with some residential uses.

River Road Corridor

This corridor begins at the Eugene Station, uses West 6th Avenue (outbound) and West 7th Avenue (inbound) to Chambers Street, then River Road to approximately Irving Road (Figure 8). This corridor is approximately 5.16 miles one way and is currently served by Routes #51, #52, and #55. The average number of boardings per weekday is 14,874 boardings.

Figure 8. River Road Corridor



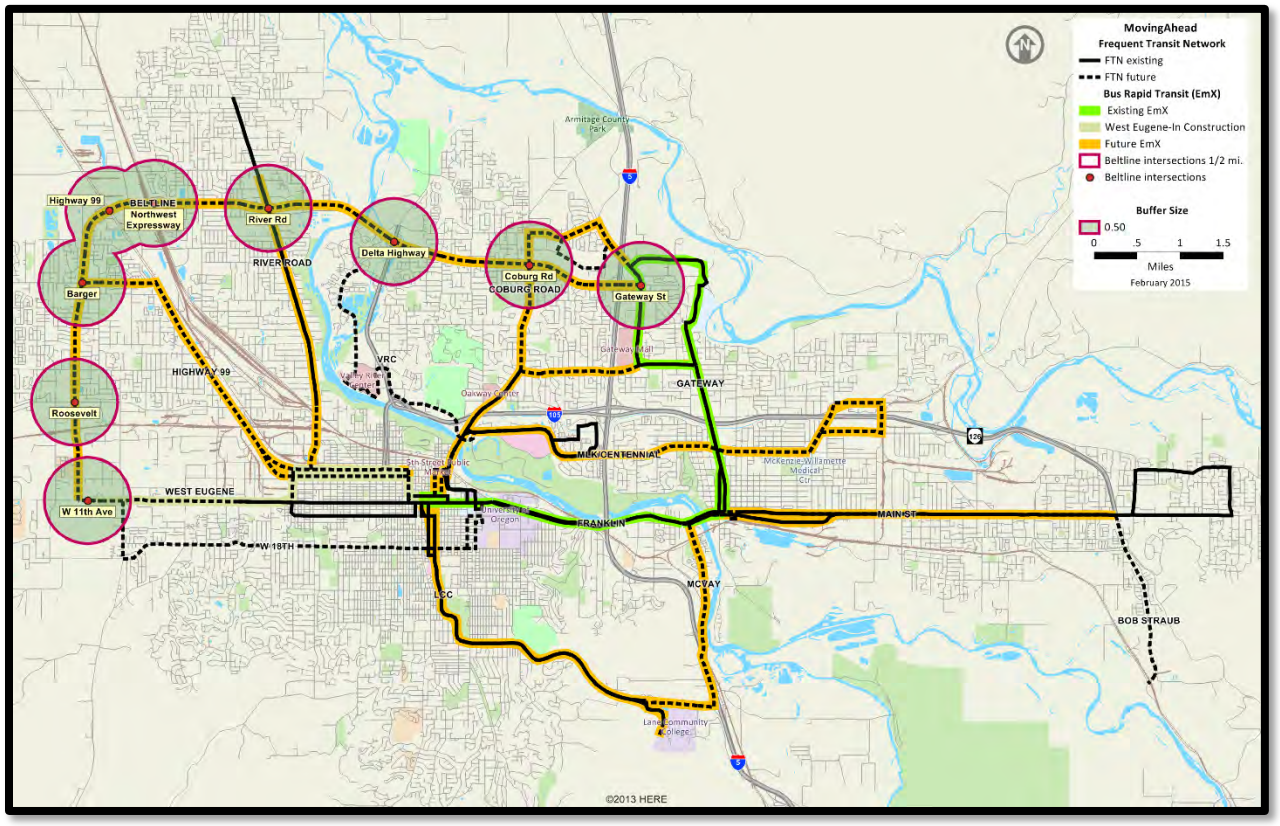
Source: Lane Transit District. 2015.

Within 1/2 mile of River Road, there are approximately 2,230 employers with 25,047 employees and 13,465 housing units with a population of 26,840 people. The area along the corridor is characterized primarily by industrial and commercial development and residential uses.

Randy Papé Beltline Corridor

This corridor follows Randy Papé Beltline beginning at West 11th Avenue in West Eugene (Figure 9). The route goes north, then east to Gateway Street in Springfield. Randy Papé Beltline is a limited access expressway. The corridor buffer was established by selecting the accessible intersections and creating a 1/2 mile buffer around them. The intersections include West 11th Avenue, Roosevelt Boulevard, Barger Drive, Highway 99, Northwest Expressway, River Road, Delta Highway, Coburg Road, and Gateway Street. The corridor is approximately 10.1 miles one way and is not currently served by LTD routes. The average boarding per day on routes within 1/2 mile of the selected intersections is 2,445 boardings.

Figure 9. Randy Papé Beltline Corridor



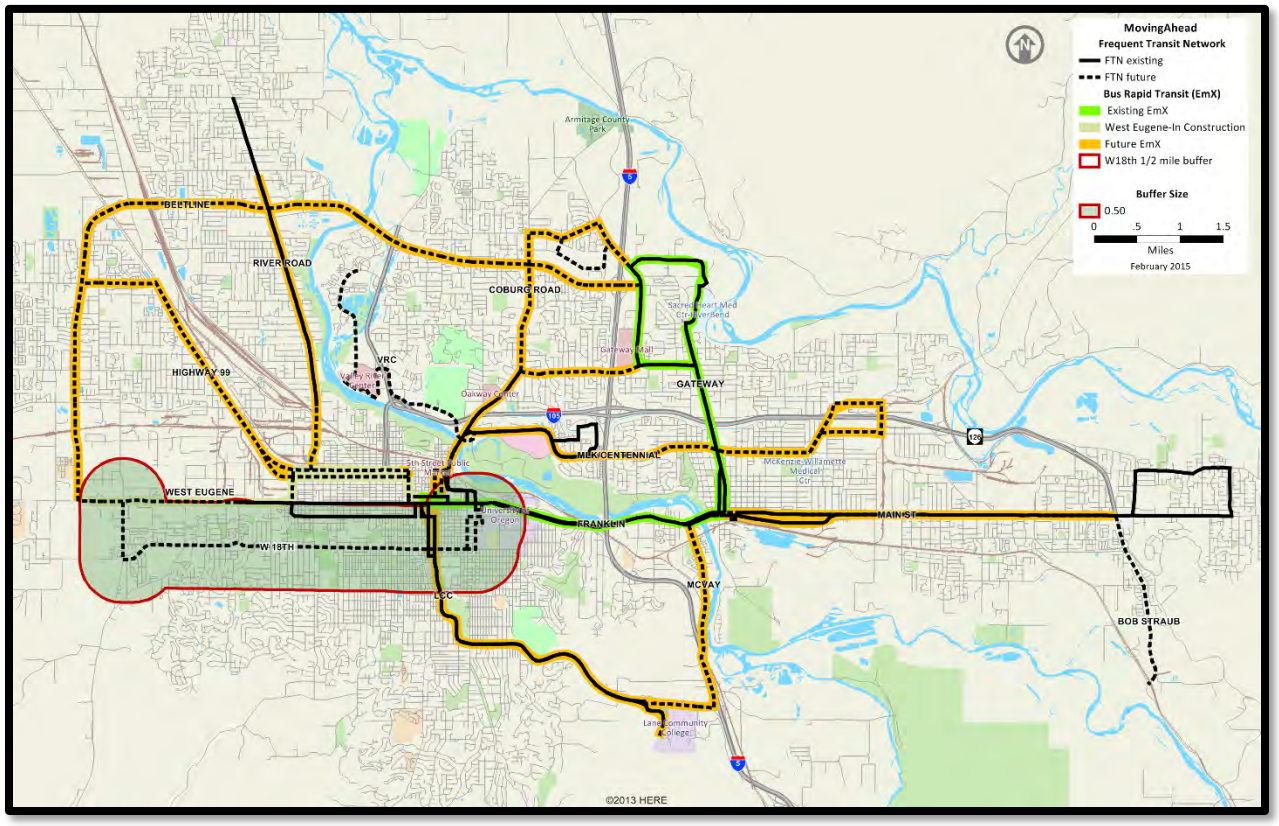
Source: Lane Transit District. 2015.

Within 1/2 mile of the Randy Papé intersections there are approximately 970 employers with 15,626 employees and 9,257 housing units with a population of 20,742 people. The area along the corridor is characterized primarily by residential and commercial development with some industrial use.

18th Avenue Corridor

This corridor begins at LTD's University Station on the west side of the University of Oregon (Figure 10). The route uses Alder Street (outbound) and Hilyard Street (inbound) to East 18th Avenue, East 18th Avenue to Bertelsen Road, then Bertelsen Road to West 11th Avenue. The corridor is approximately 5.3 miles one way and is currently served by Routes #36 and #78. The average number of weekday boardings is 8,515 boardings.

Figure 10. 18th Avenue Corridor



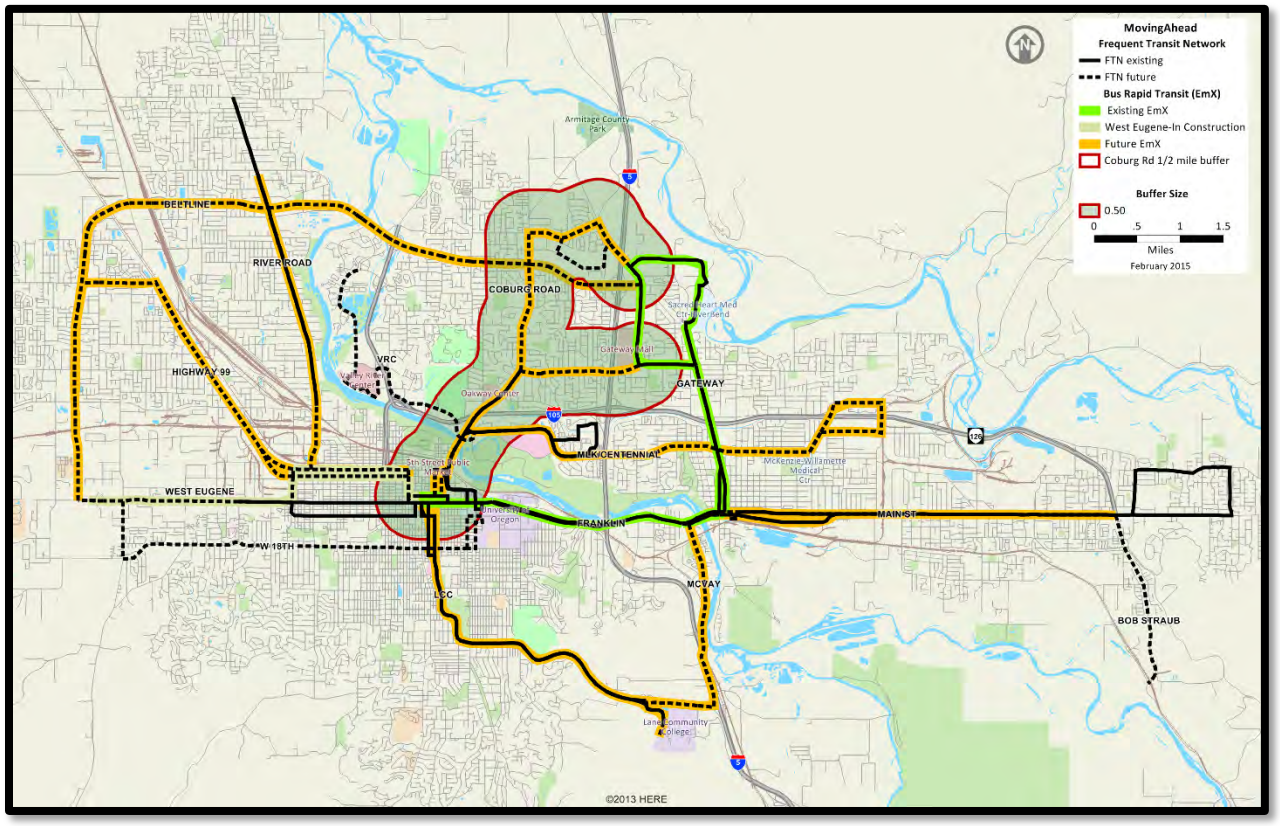
Source: Lane Transit District. 2015.

Within 1/2 mile of the 18th Avenue corridor there are approximately 1,458 employers with 19,685 employees and 15,172 housing units with a population of 32,590 people. The area along the corridor is characterized primarily by residential and commercial development.

Coburg Road Corridor

The corridor begins at the Eugene Station and uses the Ferry Street Bridge to Coburg Road (Figure 11). The corridor splits at the intersection of Coburg Road and Harlow Road. One segment follows Harlow Road east to Gateway Street, the other segment continues north on Coburg Road to Crescent Avenue, then east on Crescent Avenue to North Game Farm Road, then south on North Game Farm Road to Gateway Street. The corridor is approximately 6.6 miles one way, 5.21 miles for Coburg road and 1.40 mile for Harlow Road. The corridor is served by the #66 and #67. Route #12 runs on Coburg Road to Harlow Road and #96 partially serves the corridor. The average number of weekday boardings is 16,842 boardings.

Figure 11. Coburg Road Corridor



Source: Lane Transit District. 2015.

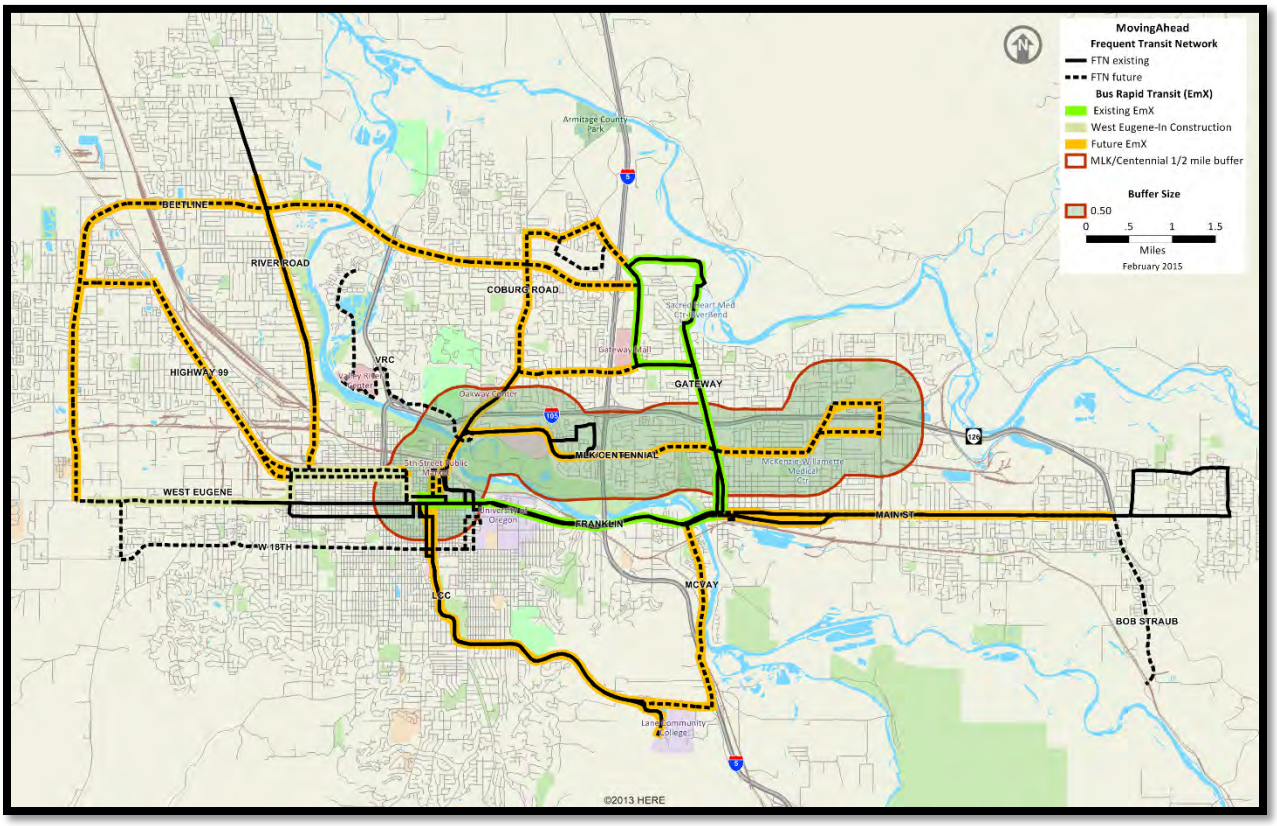
Within 1/2 mile of the Coburg Road corridor there are approximately 2,360 employers with 34,088 employees and 13,977 housing units with a population of 29,040 people. The area along the corridor is characterized primarily by residential and commercial development.

Martin Luther King, Jr. Boulevard/Centennial Boulevard Corridor

The corridor begins at the Eugene Station and uses the Ferry Street Bridge to reach Martin Luther King, Jr. Boulevard (Figure 12). It continues east on Martin Luther King, Jr. Boulevard to Interstate 5, where the street name changes to Centennial Boulevard. It continues east on Centennial Boulevard to Mohawk Boulevard. From Mohawk Boulevard, the corridor follows a one-way loop on Marcola Road, 28th Street and Olympic Street, returning to Mohawk Boulevard.

The corridor is approximately 7.6 miles one way and is served by route #13. Other routes operate within the corridor. West of Interstate 5 within Eugene, the #79x is a direct route from student housing to the University of Oregon. East of Interstate 5 within Springfield, EmX, #17 and #18 serve parts of the corridor. The average number of weekday boardings is 18,049 boardings.

Figure 12. Martin Luther King, Jr. Boulevard/Centennial Boulevard Corridor



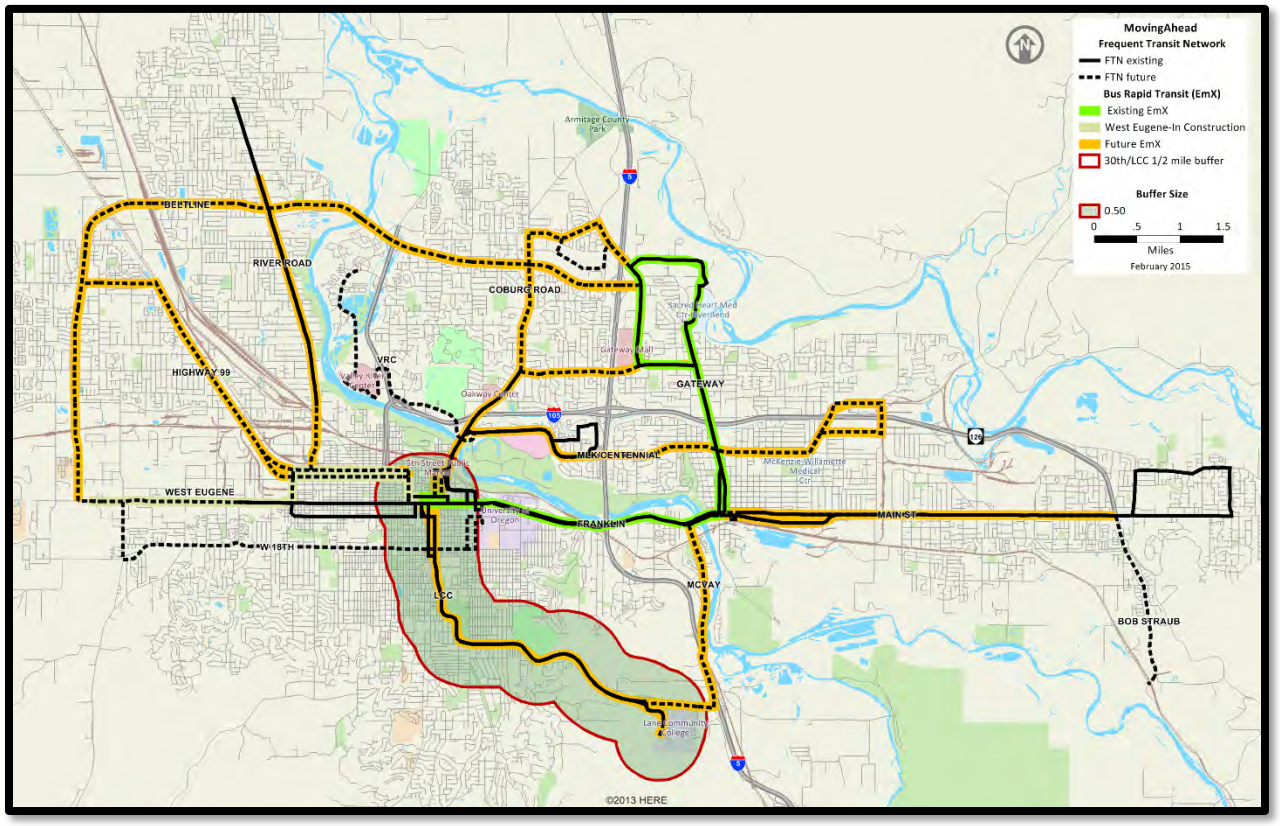
Source: Lane Transit District. 2015.

Within 1/2 mile of the corridor there are 2,217 employers with 29,999 employees and 15,713 housing units with a population of 33,632 people. The area along the corridor is characterized primarily by residential and commercial development.

30th Avenue – Lane Community College Corridor

The corridor begins at the Eugene Station and travels south to East 30th Avenue, then on East 30th Avenue to Lane Community College (Figure 13). The corridor is approximately 5.0 miles one way and is served by routes #81, #82, and #92. Other routes operating within the corridor include #24, #28, and #73. The average number of weekday boardings is 16,797 boardings.

Figure 13. 30th Avenue/Lane Community College Corridor



Source: Lane Transit District. 2015.

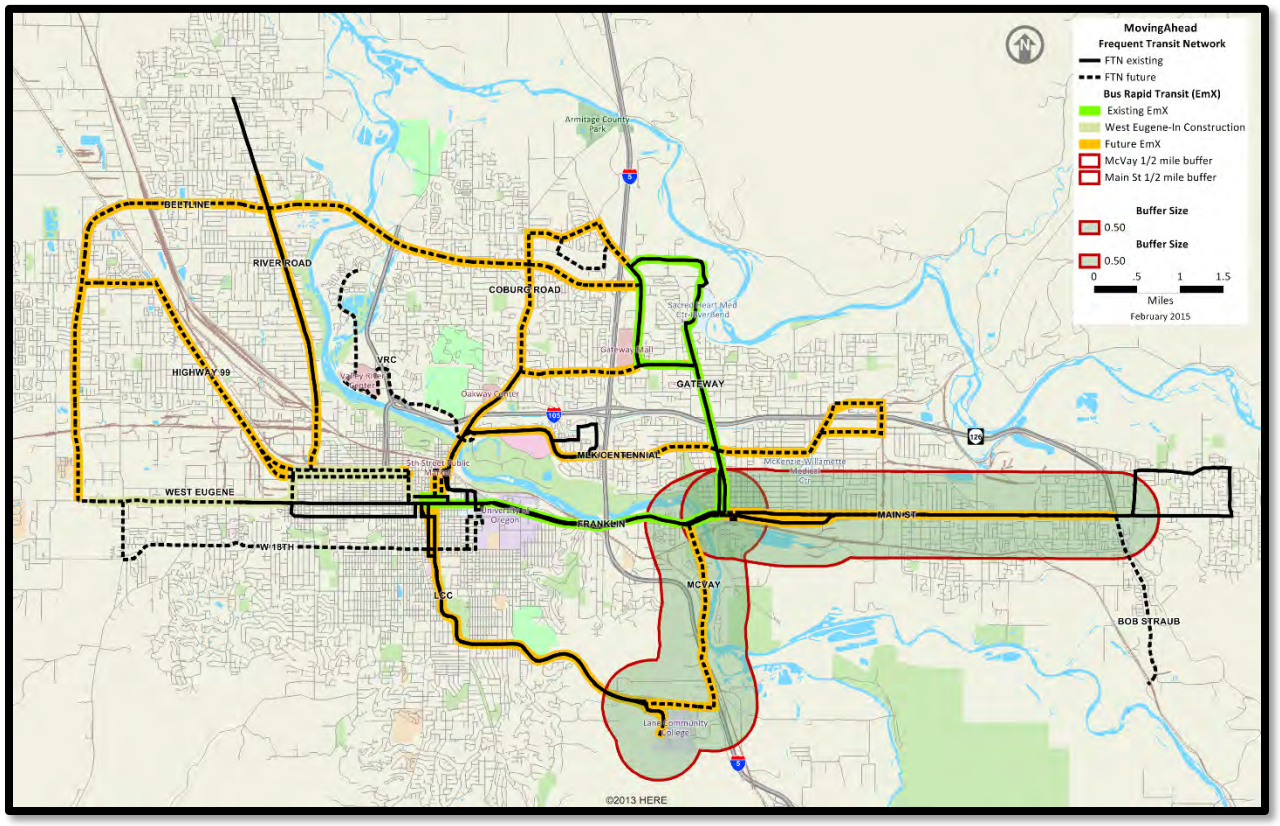
Within 1/2 mile of the corridor there are 1,707 employers with 23,611 employees and 11,241 housing units with 22,458 people. The area along the corridor is characterized primarily by residential and commercial development. Part of the corridor is adjacent to parkland.

Main Street –McVay Highway Corridor

The corridor starts at the Springfield Station and would provide east-west service along Main Street and north-south service along McVay Highway (Figure 14). The Main Street segment of this corridor runs east from Springfield Station and terminates at Bob Straub Parkway (Thurston Station). The Main Street segment is approximately 4.59 miles one way and is served by route #11. The average number of weekday boardings is 6,247 boardings.

From Springfield Station, the McVay Highway segment of this corridor runs west and then south on Franklin Boulevard and McVay Highway to Lane Community College. The McVay Highway segment is approximately 3.97 mile one way and is served by route #85. The average number of weekday boardings is 6,268 boardings.

Figure 14. Main Street-McVay Highway Corridor



Source: Lane Transit District. 2015.

Within 1/2 mile of the Main Street corridor segment are 666 employers with 7,199 employees and 9,586 housing units with a population 22,708 people. Within ½ mile of McVay Highway corridor segment are 255 employers with 5,866 employees and 2,348 housing units with 4,641 people. The area along Main Street corridor segment is a mix of residential, commercial and industrial development. The area along the McVay Highway corridor segment is a mix of commercial, industrial, undeveloped land, and mobile home parks.

A transit study of Main Street/McVay has been completed as part of a larger Springfield study named "Our Main Street Springfield."

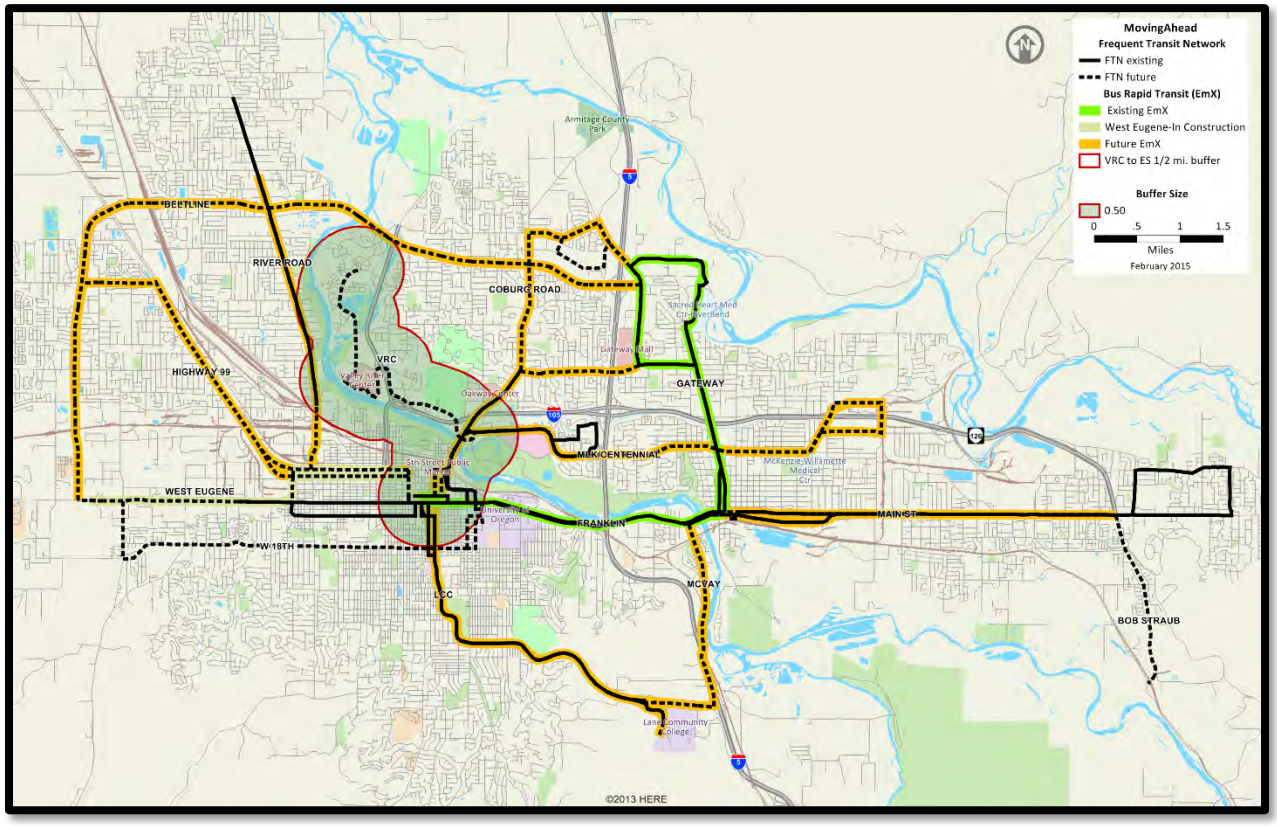
Our Main Street Springfield project overview is available online: http://ourmainstreetspringfield.org/

The Main-McVay transit study report is also available online: http://ourmainstreetspringfield.org/main-mcvay-final-report/

Valley River Center Corridor

The corridor begins at the Eugene Station and runs northeast over the Ferry Street Bridge to Martin Luther King, Jr. Boulevard, then northwest on Country Club Road, west on Valley River Drive, and north on Goodpasture Island Road to Goodpasture Loop (Figure 15). The corridor is approximately 5.44 miles one way and is served by routes #66 and #67. The average number of weekday boardings is 15,696 boardings.

Figure 15. Valley River Center Corridor



Source: Lane Transit District. 2015.

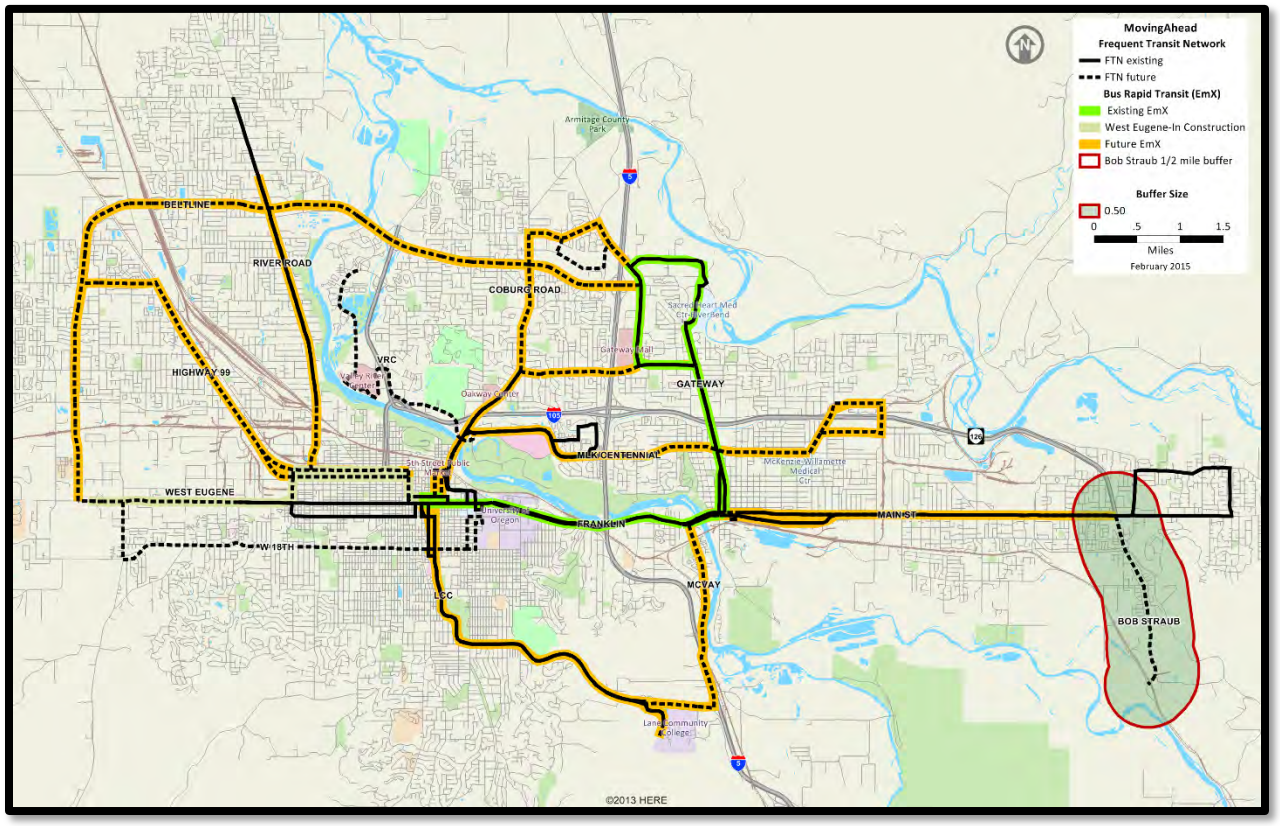
Within 1/2 mile of the Valley River Center corridor are 2,242 employers with 30,440 employees and 10,269 housing units with a population of 19,022 people.

The area along the corridor is characterized primarily by commercial and residential development.

Bob Straub Parkway Corridor

The corridor runs south from Main Street and Highway 126 to Jasper Road (Figure 16). The corridor is approximately 2.1 miles one way and is not currently served by LTD routes. The average number of weekday boardings is 563 boardings at bus stops at the north end of the corridor.

Figure 16. Bob Straub Parkway Corridor



Source: Lane Transit District. 2015.

Within 1/2 mile of the Bob Straub Parkway Corridor are 104 employers with 1,153 employees and 2,108 housing units with a population of 4,879 people. The corridor is characterized with commercial development on Main Street, residential development and vacant land to the south.

Fatal Flaw Screening Findings

Based on the Fatal Flaw Screening, regional staff agreed that three corridors were not ready to advance to capital improvements programming at this time, one corridor should be removed from consideration as an independent corridor, and seven corridors should advance to the next level of evaluation. The results of the Fatal Flaw Screening and the rationale for setting aside three corridors are described below.

Corridor Screening

Table 3 shows the ratings for all corridors.

Table 3. MovingAhead Fatal Flaw Screening Ratings Summary

BRT/FTN Corridor	Employment within 1/2 mile of corridor	Population within 1/2 mile of corridor	Average weekday boardings on corridor routes	Communities of Concern	Consistent with BRT System Plan and FTN concept	Consistent with regional TSP	Consistent with local comprehensive land use plans	Ranking (High/ Moderate/ Low)	Advance to Level 1 Screening (Yes/No)
Highway 99	High	High	Moderate	High	High	High	High	High	Yes
River Road	High	High	Moderate	High	High	High	High	High	Yes
Randy Papé Beltline Highway	Low	Moderate	Low	Moderate	High	High	Moderate	Moderate	Yes
18th Street	Moderate	High	Moderate	Moderate	High	High	Low	Moderate	No
Coburg Road	High	High	High	Moderate	High	High	High	High	Yes
MLK/ Centennial Boulevard	Moderate	Moderate	High	Moderate	High	High	Moderate	Moderate	Yes
30th Avenue -- LCC	High	Moderate	High	Moderate	High	High	Moderate	Moderate	Yes
McVay Highway	Low	Low	Moderate	Moderate	High	High	Moderate	Moderate	No
Main Street	Low	Moderate	High	High	High	High	High	High	Yes
Valley River Center	Moderate	Low	Low	Low	Low	Low	High	Moderate	Yes
Bob Straub Parkway	Low	Low	Low	Low	High	High	Moderate	Low	No

Corridors Delayed for Near Term Investment

The agency team determined that three corridors were not ready for capital improvements programming in the near term. These corridors will be considered again at a future date. The key reasons for not advancing each of these corridors are described below.

18th Avenue Corridor
The 18th Avenue Corridor was not advanced to the Level 1 Screening for several reasons. The existing residential and commercial developments along the corridor leave few opportunities for new development or redevelopment. The exception to this is the west end of the corridor where the existing population density does not warrant frequent transit service. Additionally, the existing right of way is constrained primarily by residential properties, leaving little opportunity for capital transit investments without facing multiple impacts to residential properties. Lastly, due to the lack of development opportunities, it is not likely that this corridor will experience as much densification as other corridors in the region, allowing transit service to continue to operate in a cost-effective and sustainable manner without major capital transit investments over the next ten-year period.

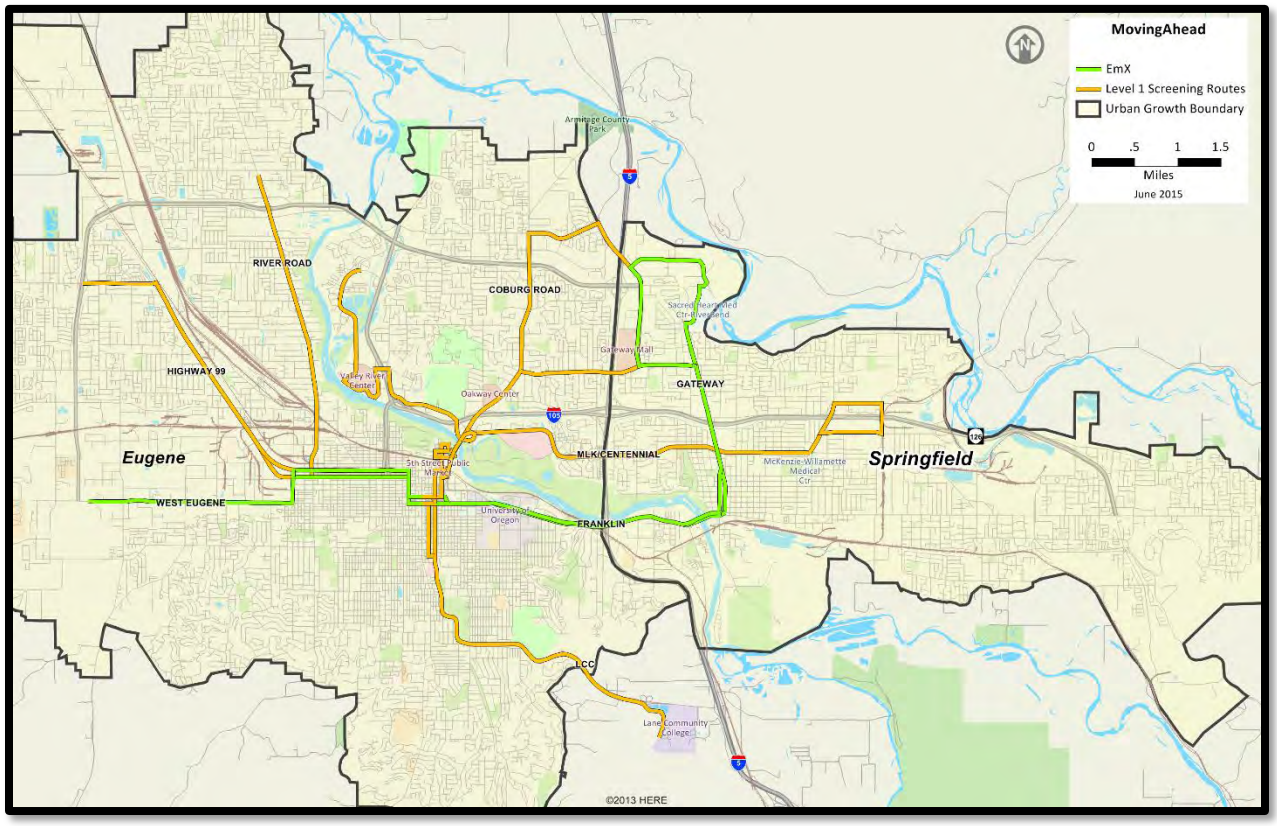
McVay Highway Segment of the Main Street–McVay Highway Corridor
The McVay Highway segment of the Corridor was not advanced to the Level 1 Screening for two reasons. First, ridership demand to Lane Community College is seasonal, peak demand is limited to specific times of day, and there is almost no demand for weekend service. Second, low population and employment densities along the corridor, excluding Lane Community College, make bus rapid transit investments unlikely at this time. If there are significant changes in land use along the corridor that lead to increased employment or population levels, investigation into more significant transit investments would be warranted.

Bob Straub Parkway Corridor
The Bob Straub Parkway Corridor was not advanced to the Level 1 Screening because there is neither a population nor employment density that would support transit service along the corridor at this time or in the near term. Currently the corridor is not served by transit. Significant development would need to occur to warrant transit capital investments along the corridor.

Corridors Advanced for Further Consideration

The agency team determined that seven (7) corridors were potentially ready for near term capital improvements programming and should be advanced to the Level 1 Screening (Figure 17). The key reasons for advancing each of these corridors is described below.

Figure 17. Corridors Advanced for Further Consideration



Source: Lane Transit District. 2015.

Highway 99 Corridor

The Highway 99 Corridor was advanced to the Level 1 Screening for several reasons. In particular, the high concentration of minority, elderly, low income, disabled, or no car populations warrant further evaluation of the corridor. Additionally, the employment and population densities along the corridor are high. The Highway 99 Corridor is also identified as a key transit corridor in Envision Eugene, and is consistent with the Bus Rapid Transit System Plan and the Regional Transportation Plan.

River Road Corridor

The River Road Corridor was advanced to the Level 1 Screening for several reasons. The high concentration of minority, elderly, low income, disabled, or no car populations warrant further evaluation of the corridor. Additionally, the employment and population densities along the corridor are high. The River Road Corridor is also identified as a key transit corridor in Envision Eugene, and is consistent with the Bus Rapid Transit System Plan and the Regional Transportation Plan.

Coburg Road Corridor

The Coburg Road Corridor was advanced to the Level 1 Screening for several reasons. The employment and population densities along the corridor are high. Additionally, average weekday boardings on transit routes that travel the corridor are high. The Coburg Road Corridor is also identified as a key

transit corridor in Envision Eugene, and is consistent with the Bus Rapid Transit System Plan and the Regional Transportation Plan.

Martin Luther King, Jr. Boulevard/Centennial Boulevard Corridor
The Martin Luther King Jr. Boulevard/Centennial Boulevard corridor was advanced to the Level 1 Screening for several reasons. While the employment and population levels within a half mile of the corridor are moderate, the average weekday boardings on transit routes that serve the corridor are high. The Martin Luther King, Jr. Boulevard/Centennial Boulevard Corridor is also consistent with the Bus Rapid Transit System Plan and the Regional Transportation Plan.

30th Avenue – Lane Community College Corridor
The 30th Avenue – Lane Community College Corridor was advanced to the Level 1 Screening for several reasons. Employment within a half mile of the corridor is high and the population within a half mile of the corridor is moderate. The average weekday boardings on transit routes that travel the corridor are high. The 30th Avenue – Lane Community College Corridor is also consistent with the Bus Rapid Transit System Plan and the Regional Transportation Plan.

Main Street Segment of Main Street – McVay Highway Corridor
The Main Street segment of the Main Street – McVay Highway Corridor was advanced to the Level 1 Screening. The average weekday boardings on transit routes that travel the corridor are high. The Main Street segment is also consistent with the Bus Rapid Transit System Plan and the Regional Transportation Plan.

The corridor will continue to be studied through the Main-McVay Transit Study process, which is separate from the MovingAhead project. The other corridors advanced for further consideration will be studied in the MovingAhead project.

Valley River Center Corridor
The Valley River Center Corridor was advanced to the Level 1 Screening for several reasons. Employment within a half mile of the corridor is high. The average weekday boardings on transit routes that serve the corridor are high. Additionally, City of Eugene staff noted that there are significant multi-family developments being constructed adjacent to the corridor. While this corridor is not currently consistent with the FTN concept, the City of Eugene's draft Transportation System Plan (anticipated adopting of fall 2015) lists this corridor as a FTN corridor. It is anticipated, that the Valley River Center Corridor will also be added to the Regional Transportation Plan and LTD's Long-Range Transit Plan in order to maintain consistency within the multiple regional plans.

Corridors Advanced as Connector

The agency team determined that one corridor should not be advanced as an independent corridor but instead should be considered as an east-west connector for other routes. The reasoning is described below.

Randy Papé Beltline Corridor
The Randy Papé Beltline Corridor was not advanced to the Level 1 Screening as an independent BRT corridor but instead determined to better serve the transit system as an east-west connector. The reasoning behind this decision was primarily because BRT would not operate on the Beltline highway in the near term but it could provide significant regional connectivity to the transit network. As the

MovingAhead study advances, the Randy Papé Beltline facility will be considered as an east-west connector between any advanced BRT corridors.

Appendix A. Preliminary Purpose and Need and Goals and Objectives

The following preliminary Purpose and Need, Goals and Objectives (PNGO) were the basis for the Fatal Flaw Screening. Subsequent to the Fatal Flaw Screening but prior to the completion of this technical memo, the preliminary Purpose and Need, Goas and Objectives were modified by the MovingAhead Oversight Committee. Please see the study's website (www.movingahead.org) for the most current version of the PNGO.

Multi-Modal Transit Corridor System Programmatic Study
Preliminary Purpose and Need, Goals and Objectives (November 2014)

The prioritization of capital investments in multi-modal transit corridors will be a powerful tool for implementing local and regional comprehensive land use and transportation plans, agency strategic plans, and other community planning documents. Capital investments in multi-modal transit corridors can have a substantial impact on patterns of growth and development. By coordinating the timing and prioritizing the funding for strategic multi-modal capital investments, the multi-modal transit corridor capital improvements program helps ensure that development occurs consistent with our region's plans and vision.

Purpose

The purpose of the Multi-Modal Transit Corridor System Programmatic Study is to:

- Develop a Capital Investment Program that forecasts and matches projected revenues and capital needs over a 10-year period.
    - Balance desired multi-modal transit corridor improvements with the community's financial resources.
    - Ensure the timely and coordinated construction of multi-modal transit corridor infrastructure.
    - Eliminate unanticipated, poorly planned, or unnecessary capital expenditures.
- Identify the most economical means of financing multi-modal transit corridor capital improvements.
- Establish partnerships between LTD and local agencies that prioritize multi-modal transit infrastructure needs and promote interagency cooperation.
- Ensure that multi-modal transit corridor investments are consistent with patterns of growth and development anticipated by local comprehensive land use and transportation plans.

Need

The need for the Multi-Modal Corridor System Programmatic Study is based on the following factors:

- LTD's and the region's commitment to implementing five BRT lines in the next 20 years consistent with the RTP that provide the best level of transit service in a cost effective and sustainable.
- Need for streamlined environmental reviews so that they leverage system-wide analysis.
- Need to build public support for implementation of the system-wide vision.
- Selection of the next EmX/FTN corridors is based on long-range operational and financial planning for LTD's service.

Goals and Objectives

Goal 1: Improve multi-modal 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 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 3.4: Coordinate transit improvements with other planned and programmed roadway projects

Objective 3.5: Minimize adverse impacts to existing businesses and industry

Objective 3.6: Supports community vision for high capacity transit in corridor

Evaluation Criteria

Goals and Objectives		Evaluation Criteria
Goal 1: Improve multi-modal transit corridor service		
Objective 1.1:	Improve transit travel time and reliability	• Round trip pm 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	• Number of transfers required between heavily used origin-destination pairs
Objective 1.3:	Increase transit ridership and mode share in the corridor	• Average weekday boardings on corridor routes • Transit mode share along the corridor

Goals and Objectives		Evaluation Criteria
		• Population within ½ mile of transit stop • Employment within ½ mile of transit stop
Objective 1.4:	Improve access for walking and bicycling, and to transit	• Connectivity to existing pedestrian facilities • Connectivity to existing bicycle facilities
Objective 1.5:	Improve the safety of pedestrians and bicyclists accessing transit and crossing, and traveling along the corridor	• 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	• Cost per trip • Impact on LTD operating • Cost to local taxpayers
Objective 2.2:	Increase transit capacity to meet current and projected ridership demand	• Capacity of transit service relative to the current and projected ridership
Objective 2.3:	Implement corridor improvements that provide an acceptable return on investment	• Benefit/cost assessment of planned improvements
Objective 2.4:	Implement corridor improvements that minimize impacts to the environment and, where possible, enhance the environment	• Results of screening-level assessment of environmental impacts of transit solutions
Objective 2.4:	Leverage funding opportunities to extend the amount of infrastructure to be constructed for the least amount of dollars	• Number and dollar amount of funding opportunities that could be leveraged • Meet 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	• Consistent with the BRT System Plan and Frequent Transit Network (FTN) concept • Consistent with the regional Transportation System Plan • Consistent with local comprehensive land use plans
Objective 3.2:	Coordinate transit improvements with other planned and programmed pedestrian and bicycle projects	• Capability of transit improvement to coordinate with other planned and programmed pedestrian and bicycle projects identified in adopted plans and CIPs
Objective 3.3:	Coordinate transit improvements with other planned and programmed roadway projects	• Capability of transit improvement to coordinate with other planned and programmed roadway projects identified in adopted plans and CIPs
Objective 3.4:	Minimize adverse impacts to existing businesses and industry	• Impacts to businesses along the Corridor measured in number and total acres of properties acquired, parking displacements,

Goals and Objectives		Evaluation Criteria
		and access impacts. • Impact on freight and delivery operations for Corridor businesses
Objective 3.6:	Supports community vision for high capacity transit in corridor	• Community vision includes high capacity transit in corridor

Appendix C: Construction Activities

This section of the Environmental Disciplines MDR addresses the methods and data that will be used to assess potential direct and indirect short-term construction-related impacts of the alternatives for the MovingAhead project's AA. This section first outlines how construction-related activities for the alternatives will be determined and documented and second which disciplines will address potential construction-related impacts and any specific methodologies and/or data that will be used.

Description of Construction-Related Activities

The MovingAhead project engineer will use the project's *Conceptual Engineering Plan Set* and capital cost estimating documents to develop a general description of construction activities that would occur under each alternative or under groups of alternatives. The description will address the following: general types and locations of construction activities; duration of types of construction activities (i.e., days of week, time of day, weeks/months/years); general geographic scope of construction activities; known staging area requirements; significant fill/excavation requirements.

Specific construction-related issues that will be addressed include:

- In-water construction
- Activities under, across or over freight rail lines
- Street, highway, bicycle facility and/or pedestrian facility detours/closures
- Transit line and facility detours
- Property access closures
- Noise-generating activities
- Runoff-generating activities
- Dust-generating
- Known best management practices that will or may be implemented during construction

The draft description of construction-related activities for the MovingAhead project will be reviewed and commented on by construction project management staff for the MovingAhead project. Specific areas of concern (e.g., the potential for a significant short-term construction related impact) may require additional detail to be included within the description of construction-related activities for one or more of the discipline areas.

Specific Methodologies

Specific methodologies used to address potential impacts due to project construction activities are addressed under the discipline sections of this Environmental Disciplines MDR.

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Appendix D: Standardized Cost Categories Methodologies and Spreadsheets

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U.S. Department
of Transportation
Federal Transit
Administration

Reporting Instructions for the Section 5309 Small Starts Criteria

July 2014

Prepared by:
Federal Transit Administration
Office of Planning and Environment

NOTICE

This document is disseminated under the sponsorship of the U.S. Department of Transportation in the interest of information exchange. The United States Government assumes no liability for its contents or its use.

For additional guidance on the Section 5309 Capital Investment Grant program criteria, and for specific questions related to this document, contact Beth Day, Director, Office of Capital Project Development, Federal Transit Administration, Washington, DC, at (202) 366-5159 or elizabeth.day@dot.gov.

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I. Introduction

The Federal Transit Administration (FTA) has produced these *Reporting Instructions for the Section 5309 Small Starts Criteria* ("*Reporting Instructions*") to inform sponsors of proposed Small Starts projects of the information they must provide to FTA so that it may undertake the legislatively required evaluation and rating of project merit.

FTA reviews and evaluates the information developed according to these instructions to:

- Assign ratings to proposed Small Starts projects that are in the Project Development phase and wish to be considered for a funding recommendation to Congress in the *Annual Report on Funding Recommendations* ("*Annual Report*"); and,
- Determine final ratings for Small Starts projects prior to a Small Starts Grant Agreement (SSGA).

As in past years, project sponsors may request advancement into Project Development at any time throughout the year, and need not tie advancement to the *Annual Report* schedule. In addition, project sponsors may not need to provide all of the information requested in these *Reporting Instructions*. Project sponsors should talk to their assigned FTA staff member in the Office of Planning and Environment to determine what needs to be submitted. The requirements outlined in these *Reporting Instructions* are applicable until updated *Reporting Instructions* are released.

Reporting Format

Information should be submitted electronically via email and/or on CDs to the FTA Office of Planning and Environment, Office of Capital Project Development, 1200 New Jersey Avenue SE, East Building, Washington, DC, 20590. **FTA requests electronic files in their original format (Excel/Microsoft Word/etc.) and not PDF files. When submitting a financial cash flow electronically in Excel format, sponsors must submit a version with the formulas included and not just a version with hardcoded numbers.**

As a reminder, Small Starts project sponsors must use the most recent Small Starts Standard Cost Categories (SCC) worksheets issued by FTA for reporting the capital costs and schedules of their proposed projects. Small Starts project sponsors should report costs in 2014 constant dollars. Small Starts project sponsors must also use the most recent Small Starts templates issued by FTA.

In past years FTA required that project sponsors submit a "Certification of Technical Methods, Planning Assumptions, and Project Development Procedures." This is no longer required. Instead, project sponsors should include with their submittal a cover letter from the Chief Executive Officer (CEO) of the sponsoring agency attesting that the technical approaches and assumptions used are consistent with FTA's Reporting Instructions and Policy Guidance. In the event that it is necessary to deviate from FTA's guidance, the letter should identify any differences and explain why. Any such differences should be discussed with FTA's Office of Planning and Environment in advance so that appropriate guidance can be provided. The cover letter should also summarize what changes were made to the project and to the information in the submittal since the last evaluation and rating and explain the reasons those changes were made. This information should provide specific details on any changes. For example, if changes were

made to the inflation assumptions in the SCC workbook, those changes and the associated reasons should be summarized.

Contacting FTA

For additional guidance on the Section 5309 Capital Investment Grant program criteria, and for specific questions related to this document, contact Beth Day, Director, Office of Capital Project Development, Federal Transit Administration, Washington, DC, at (202) 366-5159 or elizabeth.day@dot.gov.

II. Principles to Ensure a Level Playing Field for Comparison of Projects

FTA strives to create a "level playing field" upon which a wide variety of candidate projects compete for funding. This section summarizes FTA's key policy and planning principles intended to ensure such competition. Please visit FTA's Small Starts website for additional guidance on the planning and development of Capital Investment Grant projects.

Time Horizons

FTA requires sponsors of proposed Small Starts projects to calculate the measures for the evaluation criteria using current year inputs. The current year is defined as the most recent year for which demographic and transit usage data are available. At their option, sponsors may also calculate the evaluation criteria using a horizon year, either 10 or 20 years in the future. Horizon years are based on available socioeconomic forecasts from metropolitan planning organizations, which are generally prepared in five year increments such as for the years 2020, 2025, 2030, and 2035.

Points of Comparison

Most evaluation measures are based on absolute rather than incremental values. Where a basis for comparison is required to calculate the evaluation measure, the no-build will be the point of comparison. The no-build scenario is defined in the table below.

Analysis year	**Point of comparison**
Current	Existing transportation system (excluding the proposed Small Starts project)
10-year horizon	Existing transportation system plus transportation investments committed in the Transportation Improvement Plan (TIP) pursuant to 23 CFR 450 (excluding the proposed Small Starts project). Project sponsor should use the TIP that is in place at the time that the sponsor seeks to be considered for a funding recommendation. If forecasts are updated later, as required when there is a significant change in the project or prior to an SSGA, the point of comparison would include the projects in the TIP at that time.
20-year horizon	Existing transportation system plus all projects identified in the metropolitan planning organization's fiscally constrained long range transportation plan (excluding the proposed Small Starts project)

In cases where a Small Starts project is part of a multimodal package that includes infrastructure for other modes, such as highway expansion, the components of the package that are not proposed for Small Starts funding are not evaluated as part of the Small Starts project. If a

proposed Small Starts project is proposed to be built in phases, FTA generally evaluates and funds each phase separately. Thus, only the phase currently seeking Small Starts funds would be evaluated according to the Small Starts criteria.

Cost Estimating Assumptions

A project's capital cost estimate includes costs for planning, design and construction. It includes labor and material for construction of the improvement – such as guideways, stations, support facilities, sitework, special conditions and systems – as well as costs for vehicle design and procurement, right-of-way acquisition, relocation of existing households and businesses, planning, facility design, construction management, project administration, finance charges, and contingencies. Small Starts project sponsors must use the most recent Small Starts SCC worksheets issued by FTA for reporting the capital costs and schedules of their proposed projects. Small Starts project sponsors should report costs in 2014 constant dollars.

FTA expects that cost estimates for the project be up-to-date, be based on unit costs that apply to expected conditions during construction, and specifically identify remaining uncertainties in those unit costs. Similarly, estimates of operations and maintenance costs should be based on current local experience, adjusted for differences in vehicle and service characteristics, and, for any transit modes new to the system, consistent with experience in similar settings elsewhere.

III. General Reporting Information

This section describes information that must be submitted to FTA for project evaluation and rating.

III.1. Project Background Information

The following subsections describe information necessary for FTA to understand the project, its planning context, and how (and why) it addresses the identified transportation problems in the corridor. Project background information comprises the three items described in this section:

- Project Description Template
- Project Narrative
- Project Maps

Project Description Template

Project sponsors must provide descriptive information on the proposed Small Starts project and the regional public transportation system. FTA uses the information in the Project Description Template to understand the project and to establish a database of project characteristics and local contact information. All Small Starts project sponsors must submit this template to FTA.

Project Narrative

A project sponsor may submit to FTA a short (no more than five-page) narrative that succinctly describes the benefits of the proposed investment. The optional document helps to familiarize FTA with the proposed Small Starts project and its rationale; it does not affect a project's rating. The short narrative should describe key project outcomes drawn from planning studies performed by the project sponsor that were used as the basis for selecting the proposed project.

Below is an outline of what the narrative could contain.

- **Project Identification**. In two or three short sentences, provide the essential characteristics of the proposed project: its location, length, termini, number of stations, hours of service, and frequency by time period.
- **Setting**. Along with a good map of the corridor, in a few paragraphs describe the key elements of the setting; include the major activity centers within the corridor, significant highway facilities, existing transit facilities like fixed-guideways and transfer centers, and, to illustrate how these features relate to the project, the alignment of the proposed project.
- **Current Conditions**. Important conditions are: the population and employment of the corridor and any major activity centers within the corridor; congestion levels on important highway facilities and transit shares, ridership volumes, and any key attributes (capacity issues, rider characteristics, etc.) that are important for the project. Highlight the principal functions of transit services in the corridor, focusing on whatever limitations

exist on the performance of the transit system. Focus on the corridor itself, rather than the metropolitan area.

- **Conditions in the Horizon Year (if applicable)**. If a project sponsor is submitting horizon year data to FTA, the narrative might describe the anticipated changes in key corridor characteristics between today and the horizon year – absent significant transit improvements in the corridor. Particularly in rapidly growing corridors, this would highlight major changes in demographics, travel patterns, volumes and speeds on major highway facilities, the service quality and capacity of transit services, and anticipated transit ridership. The discussion should make clear the key functions of the transit system in the corridor and highlight whatever limitations are anticipated on its performance. As with the discussion of current conditions, this section must focus on the key characteristics of the corridor itself rather than aggregate information on broader geographical areas.
- **Purpose of the Project**. Succinctly describe the specific ways that the proposed major transit investment will address the problems identified in the corridor.
- **Merits of the Project**. Describe how the project addresses the Purpose of the Project more effectively compared to other alternatives.
- **Summary**. In one paragraph draw together the key points made in the document. Highlight the conditions that motivate consideration of a major transit improvement, the specific purpose of the project, and the ways that the project succeeds in addressing the purpose.

Project Maps

All Small Starts sponsors must submit electronic maps of their proposed projects for inclusion in the *Annual Report on Funding Recommendations* and/or posting on FTA's website. To ensure compatibility, maps should be created in a geographic information system (GIS) program such as Map Info, Arc Info, Maptitude, or TransCAD. In lieu of a GIS-based map, a clearly legiblemap of the project may be submitted in Adobe Acrobat or other electronic format.

To ensure consistency between projects, maps submitted to FTA must include the following features:

- A title indicating the project's name and primary city and state.
- The alignment of the project, not including future proposed extensions of the proposed project or extensions to the existing transit system. For example, if the Small Starts project is an initial operating segment, then only the initial operating segment should be shown on the map. The map should be scaled to the project; also, the line style used to depict the project's alignment should be easily distinguishable from styles used for other transportation infrastructure.
- Stations included in the project, marked in a distinguishable manner from existing transit stations and labeled. Stations with park & ride facilities should be further distinguished from others, either via markings or labels.

- Any transit vehicle maintenance or storage facilities to be constructed as part of the project.
- Street, highway and railroad networks in the area surrounding the project, with major streets' names and highways' designations labeled as appropriate.
- Key connecting mass transit lines including existing stations, particularly if the project represents an extension of an existing line.
- Major water bodies with names labeled as appropriate.
- Names of cities and/or counties to be served by the project, with jurisdictional boundaries demarcated as appropriate.
- A legend, scale and compass.

Elements of the maps should be distinguishable when reproduced in grayscale. Maps should fit on 8.5 by 11 inch paper, with one-inch margins. Maps may be provided in landscape or portrait orientation depending on the alignment of the project; typically, north-south alignments are provided in portrait orientation and east-west alignments are provided in landscape orientation.

III.2. Travel Forecasts

Project sponsors may choose to predict trips using one of three basic approaches: their own locally adopted travel forecasting procedures, FTA's forecasting tool entitled Simplified-Trips-on-Projects Software (STOPS), or, in some cases, an incremental data-driven method.

The chosen forecasting method should be discussed with FTA well before the submittal of information by the project sponsor for project evaluation and rating. Such discussions will involve a review of the forecast methodology validation and input assumptions specific to the project. If STOPS is chosen as the method used, documentation of the methodology and validation and a detailed review by FTA is not necessary. However, project sponsors must provide to FTA an electronic copy of their STOPS application, including both the inputs used and the resulting output reports.

The following three items must be submitted to FTA in support of the travel forecasts:

- Travel Forecasts Template;
- Forecast Results Report; and
- Supporting tabulations.

Travel Forecasts Template

The Travel Forecasts Template is the data entry mechanism for all travel forecast information used in the calculation of the mobility improvements and cost effectiveness criteria plus the change in Vehicle Miles Travelled (VMT) forecasts used in the calculation of environmental benefits. This information is transferred automatically through spreadsheet links between the templates to simplify the calculation of the measures and avoid the need for project sponsors to enter the same information more than once.

The Travel Forecasts Template includes a section for inputting trip information from travel forecasts, and another section for inputting VMT information from travel forecasts and transit operating plans. Most lines have current and horizon year fields; the latter need only be used if the project sponsor is opting to calculate the evaluation criteria using both current year and horizon year input data.[1]

- Trips On the Project Section:
    - Daily linked trips on the project, non-transit dependent users (Lines 1a and 2a): the number of daily linked trips using any part of the proposed Small Starts project, excluding trips made by transit-dependent persons or the "special market" trips identified in Lines 3-6. Please contact FTA's Office of Planning and Environment with any questions regarding project trips.
    - Daily linked trips on the project, transit dependent users only (Lines 1b and 2b): the number of daily linked trips using any part of the proposed Small Starts project made by transit dependent persons. Transit-dependent trips are represented in STOPS and most local models as trips made by individuals from households that do not own a car, but some local models may instead represent them as trips made by individuals in the lowest household income category.
    - Special market project trips per-event and per-day by market (Lines 3-6): the number of trips per-event or per-day for each special travel market not considered by the travel model and for which ridership estimates were prepared "off model." Per-event markets include sports venues, concerts, and other intermittent activities. Per-day markets include air passengers, circulation travel, and other markets that are present every day.
    - Annualization factors: the factors needed to compute annual totals from the daily estimates provided by the travel models and special event project trips. Because trips generated by the special markets are annualized separately, the annualization factor reported for lines 1 and 2 must exclude the effects of special markets.

      For daily linked trips on the project (lines 1 and 2), the annualization factor should be consistent with local experience in the existing transit system and also appropriate to the proposed operating plan. For special market project trips (lines 3-6), market-specific annualization factors should be used and explained. For example, a venue for major league baseball should have an annualization factor of approximately 81 because every year each major league team plays 162 games, 81 as the home team and 81 as the visitor.

      In addition to filling out the annualization factors in the Travel Forecasts Template, a written justification for the annualization factors should be provided to FTA.

[1] The horizon year must be selected in the Project Description Template. A selection of "none" signifies that the project sponsor is foregoing the optional horizon-year analysis. When "none" is selected, the cells for horizon-year entries in the Travel Forecasts Template will be grayed out and nothing should be entered in them.

- Vehicle-Miles of Travel (VMT) section:
    - Daily VMT, automobile (Line 9): the total weekday VMT by automobile (any occupancy) for the no-build and build scenarios. Estimates of changes in VMT come from either the local travel model or STOPS. The annualization factor for automobile VMT should be the same as the transit annualization factor entered for trips on the project in lines 1 and 2.
    - Annual VMT, transit modes (Lines 10 through 18): the annual VMT for the no-build and build scenarios for each mode of public transit that has different service levels in the two scenarios. If a mode exists in a project sponsor's region but will not be affected by the proposed project, nothing needs to be entered for that mode because there would be no change in VMT between the no-build and build alternatives. Annual VMT totals for each mode that will be affected by the project should be calculated based on service plans. For rail transit modes, car mileage should be reported rather than train mileage.

Travel Forecast Results Report

The travel forecast results report focuses on the forecasts themselves rather than on the methods used to prepare the forecasts. Documentation on the methods used to prepare the forecasts should have been previously submitted to FTA. The report provides a narrative describing the key characteristics of the forecasts. It is a concise, plain-English narrative of the primary mobility benefits of the project as indicated by the travel forecasts, including:

- the markets that the project serves and the difficulties those markets face (transportation and/or economic);
- the way the project improves transit service to address those difficulties;
- the way overall transit ridership responds to the implementation of the project;
- the resulting trips on the project itself;
- uncertainties inherent in all of these items;
- discussion of the reasons for any large changes in district-to-district trips from no-build to build (or from current year to horizon year, as applicable) that will help FTA reach an overall conclusion of forecast plausibility;
- summary figures as appropriate to support the narrative; and
- an index of the supporting tabulations for easy reference.

Supporting Tabulations

The travel forecasts results report is accompanied by a series of summary tabulations of forecast results. Such tabulations should be provided as spreadsheets that are sized and formatted to be easily readable on a computer screen. Sponsors are encouraged to package the information into as few electronic files as possible using multiple pages or spreadsheet tabs. FTA can provide a

sample formatted spreadsheet if requested, but the characteristics of each project are different and thus the size and layout of the tables may vary. Hard-copy paper printouts of the tabulations included in the spreadsheet files should not be provided to FTA. Electronic prints, in the form of a single PDF file of all of the tabulations, may be provided in addition to the spreadsheets to assist FTA with its review, but are not required.

The summaries should tabulate the forecasts for the current year and, if used in the project ratings, the horizon year. In cases where the sponsor has used locally developed travel forecasting procedures, the summaries must also tabulate the model-validation forecasts. The summaries are based on a set of summary districts defined by the sponsor to sum zone-to-zone information from the forecasts to a reviewable level of aggregation. The required tabulations are:

1. Demographic and socio-economic characteristics:
    - Information used for trip (or tour) production generation (e.g., households by socio-economic group, population, and workers in households) by Transportation Analysis Zone (TAZ) and summary district;
    - Information used for trip (or tour) attraction generation (e.g., number of jobs by classification type) by TAZ and summary district; and
    - All data fields should be clearly labeled.
2. Highway speeds:
    - For current year forecasts: unweighted average peak and off-peak period speeds computed across all zone-to-zone pairs within each district-to-district cell.
    - For horizon-year forecasts if applicable:
        - unweighted average peak and off-peak period speeds computed across all zone-to-zone pairs within each district-to-district cell; and
        - the horizon-year-to-current-year ratio in each cell of the unweighted average peak and off-peak period speeds tabulations.
3. Linked transit trips (for the no-build and build alternatives, including horizon year if applicable):
    - Trips on the entire transit system for each travel market (trip purpose by time-of-day by transit-access mode by socio-economic stratum), and the grand total across all markets, as represented in the mode choice analysis; and
    - Trips on the project for each of the same travel market breakdowns as discussed in the bullet above.
4. Weekday total and home-based-work person trip tables (district-to-district, with row and column totals). One single set of person trip tables must be used for both the no-build and build forecasts.

5. Weekday transit trip tables (district-to-district, with row and column totals):
    - Total transit trips and home-based work transit trips -- no-build, build, and changes between the two
    - Total transit trips by access mode, no-build and build
    - Trips on the project (by trip purpose and, separately, by access mode)
    - The number of zone-to-zone transit trips, separately for walk and drive access, found in zone-to-zone cells that are:
        - Zero in the no-build and non-zero in the build;
        - Zero in the build and non-zero in the no-build; and
        - Lower (but non-zero) in the build than in the no-build.
6. Change in automobile VMT summarized at the district-to-district level. Change in auto VMT is computed as the difference between the no-build and build scenarios in the zone-to-zone auto travel distance multiplied by the zone-to-zone number of trips made by autos.
7. Transit weekday ridership:
    - For the entire transit system: total system boardings (unlinked trips) by mode, no-build and build.
    - For the project (in trip production-attraction format):
        - Station-to-station transit linked trips. For projects which are extensions to existing services, existing stations may be aggregated for simplicity except for the existing terminus from which the proposed project extends;
        - Station ONs and OFFs and link volumes between stations, by direction; and
        - Modes of access and egress by station.
8. A map (in PDF format) showing the boundaries of TAZs and summary districts, the name and number of each district, and the alignment and station locations of the project, with the park and ride stations clearly marked. Generally, sponsors should include between 15 and 20 districts that are designed specifically to focus on the project, with smaller districts near the project and larger districts elsewhere in the region.
9. A map (in PDF format) and supporting tables of information that show changes in the coded transit route alignments, stop locations, and/or service frequencies between the no build and build scenarios.

10. GIS layers (ArcGIS shape file preferred):
    - the TAZ layer;
    - the summary district layer;
    - a layer containing the alignment and station locations of the project, with the park and ride stations clearly marked; and
    - a layer showing changes in the no-build transit routes to accommodate the coding for the build alternative.

Some of the above information may not be available (or may not be readily available) from some local travel forecasting procedures. In the event that local forecasting procedures are unable to produce one or more of these items, project sponsors should contact FTA to discuss possible remedies or a waiver of the individual reporting requirement. Project sponsors should contact FTA prior to preparation of the tabulations to discuss the proposed summary district structure, plus the demographic/network specifications for the current year and (if part of the submission) horizon year. Sponsors using STOPS are not required to prepare detailed tabulation spreadsheets, as the required submittal of the STOPS application to FTA will suffice. This is because the STOPS reports folder provides FTA with all necessary tabulations. They must, however, provide the supporting maps described in bullets 8, 9, and 10 above.

III.3. Operations and Maintenance Costs

System-wide and project specific operations and maintenance costs are a key component of the project financial plan. Project sponsors are required to submit to FTA documentation summarizing how operating and maintenance costs were developed. Guidelines for estimating operations and maintenance costs are available on FTA's website. Additionally, the following considerations apply:

- System-wide and route level operating cost data (and factors) are typically available as part of ongoing operations planning.
- The latest available cost estimates, accurately reflecting the definition of the project, should be used.

III.4. Capital Costs

This section provides information on the Standard Cost Category (SCC) workbook and general guidelines for when project cost estimates should be updated.

Standard Cost Categories

Project sponsors are required to submit capital cost information electronically in the SCC Excel format, using the most recent Small Starts SCC worksheets issued by FTA. The SCC Workbook establishes a consistent format for the reporting of capital cost and schedule information. The SCC structure accommodates all project elements within 10 major cost categories. Small Capital costs must be reported in 2014 constant dollars.

The following worksheets of the SCC Workbook must be submitted:

- Build Main: Ensure that allocated contingency amounts are entered.
- Project Description
- Inflation: The inflation rates shown in the SCC worksheet are provided only as an example. The project sponsor should input inflation rates representative of conditions in their area.
- Schedule
- Build Annualized
- Funding Sources by Cost Category
- Funding Sources by Year: This is an important worksheet that FTA uses to understand annual Small Starts funding levels the project sponsor anticipates receiving, as well as annual funding assumed to come from other sources. The information contained in this worksheet should match what is provided in the financial plan submitted to FTA.

Sponsors should refer to the following two worksheets in the SCC Workbook for general guidance:

- **SCC Definitions**. This worksheet contains explanations of the individual line items and thus helps to achieve consistency of use by all parties. Contact the FTA Office of Engineering if you have questions or would like to comment on the definitions.
- **TEAM Scopes and Activity Line Items (ALIs)**. When applying for a grant from FTA (*any grant*, e.g. Congestion Mitigation and Air Quality, Section 5307, Section 5309, etc.) for your Small Starts project, use the 14-Series Scopes and ALIs shown on this worksheet to input your grant budget. The 14-Series matches the SCC Categories.

SCC Build Annualized Worksheet Instructions

Capital costs in constant or base year dollars are estimated by the project sponsor for the proposed project. The Build Annualized Worksheet automatically calculates the annualized federal share for the project based on the useful lives of the various cost items, an established discount rate, and the information on project funding sources entered by the project sponsor in the Fund Source by Category Worksheet of the Small Starts SCC workbook. The annualized federal share for the project is an input to the calculation of cost effectiveness and environmental benefits.

Below are specific instructions that must be followed when completing the Build Annualized Worksheet:

- Useful Life Assumptions: The Build Annualized Worksheet provides the project sponsor with the opportunity to claim anywhere from 12 to 18 years for the estimated useful life for buses on SCC Line 70.04. If the project sponsor claims a useful life longer than 12 years, documentation demonstrating experience with maintaining buses beyond 12 years

(e.g. National Transit Database records) must be provided supporting the reasonability of such a claim.

- Unallocated Contingency: Base Year costs are automatically populated in the Build Annualized Worksheet from the Build Main Worksheet. However, Unallocated Contingency must be manually distributed across the line items according to perceived risks.

When to Report Updated Project Cost Estimates

The capital cost estimate should be updated when it no longer accurately reflects the current scope and schedule of the project, triggered by either an expansion or reduction in the scope or schedule. The update should be accompanied by a brief explanation. More specifically, a project capital cost estimate should be updated when any of the following events occurs:

- Requests to Advance Through the Process
    - The project sponsor requests an SSGA.
- Scope changes
    - Design and construction scope of work changes - Horizontal or vertical alignment, number or type of stations, length of guideway, mode, quantity of material, substitution of material, value engineering changes.
    - Planning context changes - Political, institutional, or project management changes impacting project scope or schedule; project procurement conditions change, for example change in bidding climate, price of commodities, or contracting methodology.
- Schedule changes
    - Schedule has slipped or been extended by six months or more, resulting in additional cost for labor, materials, and/or inflation, which could result from extended community input, project review, funding disapproval, labor disputes, etc.
- Cost changes
    - The costing methodology has changed as a natural part of project development, for example, from a parametric estimate to a detailed labor and materials quantity take-off.
    - A change in a funding source or financing method has caused modification of scope, schedule or cost.

IV. Project Justification Criteria

The following summarizes the information necessary to support the project justification criteria. Specific information on each of the criteria and measures can be found in the Final Rule and the Final Policy guidance found on FTA's website. All reporting templates are available there as well. Any questions regarding these criteria, their associated measures, and/or the calculation of the measures should be directed to the FTA Office of Planning and Environment's Office of Capital Project Development.

IV.1. Mobility Improvements

The following data must be entered in the templates to compute the mobility improvements measure:

- Trip information (in lines 1 through 6 of the Travel Forecasts Template), and
- Horizon year (in the Project Description Template).

IV.2. Cost Effectiveness

The following data must be entered in the Small Starts templates to compute the cost effectiveness measure:

- Trip information (in lines 1 through 6 of the Travel Forecast Template)
- Horizon year (in the Project Description Template)
- The project's annualized federal share in constant 2014 dollars as generated by the Build Annualized Worksheet of FTA's SCC Workbook. (Annualized federal share should be entered in Line 3 of the Mobility and Cost Effectiveness Template.)

IV.3. Congestion Relief

No information needs to be reported for this criterion at this time. FTA is determining the measures it will use for this criterion. In the interim, all projects will receive an automatic Medium rating for congestion relief.

IV.4. Land Use

The land use rating is based primarily on quantitative measures of existing corridor conditions.

Elements of the land use submission include:

- A complete quantitative Land Use Template;
- The land use portion of Supplemental Land Use and Economic Development Information and Supporting Documentation Templates; and
- Supporting documentation.

Quantitative Data

The quantitative Land Use Template is the reporting format for quantitative data. The objective of gathering these data is to better understand current year and, if a project sponsor is including it in the evaluation, horizon year information about population, housing units, employment, and affordable housing associated with the project.

Quantitative data on population, employment, total housing, and affordable housing served by a proposed Small Starts project are critical inputs to the assessment of existing land use conditions. Key indicators include population and employment in the metropolitan area, population and employment density in the corridor and in individual station areas, total employment in the Central Business District (CBD), and the proportion of legally binding affordability restricted housing units in the corridor compared to the proportion of legally binding affordability restricted housing in the counties through which the proposed project travels. Appendix A provides a sample methodology for estimating station area population, households, affordable housing, and employment. FTA requests that sponsoring agencies follow this methodology in order to ensure consistent reporting of quantitative data among Small Starts applicants.

Documentation of Information for Existing Land Use

FTA requests that project sponsors submit the items in the following table. The footnotes denote whether the information requested should be submitted as supporting documentation or entered directly into the quantitative Land Use Template. In the land use portion of the Supplemental Land Use and Economic Development Information and Supporting Documentation Templates, the project sponsor should provide a summary of the most germane information and data for each category that is being provided to FTA as supporting documentation.

Existing Land Use	
Information Requested	Documentation
Existing corridor and station area development (population, employment, high trip generators)	• Corridor and station area population, housing units, and employment+ • Listing and description of high trip generators (examples include colleges/universities, stadiums/arenas, hospitals/medical centers, shopping centers, performing arts centers, and other significant trip generators)*
Existing station area development character	• Description of character of existing land use mix and pedestrian environment in corridor and station areas* • Station area maps with uses and building footprints shown* • Ground-level or aerial photographs of station areas*
Existing station area pedestrian facilities, including access for persons with disabilities	• Station area maps identifying pedestrian facilities and access provisions for persons with disabilities* • Documentation of achievement of curb ramp transition plans and milestones required under CFR 35.150(d)(2)*
Existing corridor and station area parking supply	• Existing parking spaces per square footage of commercial development and/or per dwelling unit* • Parking spaces per employee in the CBD and/or other major employment centers* • Land area within ½ mile of station devoted to parking* • Average daily parking cost in the CBD and/or other areas*
Existing affordable housing	• Total number of legally binding affordability restricted housing units within a ½-mile radius of all station areas+ • Total housing units of all types and total housing units that are legally binding affordability restricted for each county in which project stations are located+ • A signed certification by the head(s) of the housing agency(ies) from the relevant jurisdictions attesting to the accuracy of the numbers provided*
* Provide this information as supporting documentation. + Enter this information in the quantitative land use template.	

Additional Guidance

- Provide a table of contents at the beginning of the submittal summarizing all materials that are being provided to FTA.
- Where appropriate, maps and graphics should be used to supplement data; for example, the reporting of development and pedestrian amenities via maps and/or aerial photos is helpful. Examples include:

  - Aerial and ground-level photographs of station areas; and
  - Maps showing existing and forecasted population and employment densities in the corridor.

- Submissions should be brief and precise, but thorough, in providing explanatory statements; important information should not be omitted for the sake of brevity.
- Information submitted should identify the mix of land uses within the corridor.

IV.5. Economic Development

The economic development criterion is based on a qualitative analysis of plans and policies to focus future development in the corridor.

Elements of the economic development submission include:

- The economic development portion of the Supplemental Land Use and Economic Development Information and Supporting Documentation Templates; and
- Supporting documentation.

The Supplemental Land Use and Economic Development Information and Supporting Documentation Templates allow project sponsors to provide written statements to highlight or expand upon information for specific factors. Sponsors may also provide specific references to existing maps, plans, or other attached documentation that address the specific factor and type of information requested by FTA.

The supporting documentation should consist of full or relevant portions of the documentation referenced in the Supplemental Land Use and Economic Development Information and Supporting Documentation Templates. Some examples from which to provide either full documents or relevant excerpts include:

- Local comprehensive plans, small-area or station area plans, zoning ordinances, and design guidelines relevant to station areas;
- Station area planning documents (conceptual plans, land inventories, market studies);
- Local affordable housing plans (or sections of other local plans that concern affordable housing);
- Analysis of land development trends and market potential for transit supportive development within the region and station areas;
- Descriptions of the corridor and station area physical environment;
- Descriptions of other tools and incentives available for influencing development; and
- Site plans or descriptions of station area development proposals.

Visual aids, such as maps, photographs, and illustrations, can also be useful as supporting documentation to help communicate the impact of planned future development. Examples include:

- Maps of station areas showing the street network, planned land uses and zoning; and
- Photographs or illustrations of existing transit-supportive station area development that has taken place around any existing transit stations or corridors in the region.

In addition, project sponsors may provide an optional quantitative economic development submittal that forecasts future economic growth scenarios for the proposed station areas. This analysis should demonstrate how the project would produce changes in population and employment and estimate the effect those changes would have on VMT. FTA does not specify a methodology for the optional economic development scenario. Initially, FTA intends to examine any optional analyses prepared by project sponsors and assign ratings based on FTA's qualitative assessment of the reasonableness of the analysis and the magnitude of the numbers presented.

Although it is not used to develop the economic development rating, project sponsors should report their estimate of the number of U.S. jobs related to design, construction, operation and maintenance of the project on page 3 of the Project Description Template.

Documentation of Information for Economic Development Effects

FTA requests that project sponsors submit the following information:

Information Requested	Documentation
I. Transit Supportive Plans and Policies **a. Transit Supportive Corridor Policies**	
Plans and policies to increase corridor and station area development	• Adopted city, county, and regional plans and policies and private sector plans and initiatives that promote development in the corridor and station areas; plans may include general plans, specific plans, redevelopment project plans, or other district plans • Examples of transit supportive policies include: general policy statements in support of transit; policies that support and promote the use of transit; policies/plans that provide for high density development in the corridor and station areas; and policies that support changes to zoning in the corridor and station areas
Plans and policies to enhance transit-friendly character of station area development	• Elements of adopted city, county, and regional plans and policies that promote transit-friendly character of corridor and station area development • Policies to promote mixed-use projects • Policies to promote housing and transit-oriented retail • Policies that allow/promote vertical zoning • Façade improvement programs • Funds to support transit-oriented plans • Private sector plans and initiatives consistent with the public plans and policies listed above
Plans to develop pedestrian facilities and enhance disabled access	• Requirements and policies for sidewalks, connected street or walkway networks, and other pedestrian facility development plans for station areas • Capital improvement programs to enhance pedestrian-friendly design in station areas • Curb ramp transition plans and milestones required under CFR 35.150(d)(2), and other plans for retrofitting existing pedestrian infrastructure to accommodate persons with disabilities in station areas • Street design guidelines or manuals addressing pedestrian and transit-oriented street design
Parking policies (allowances for reductions in parking and traffic mitigation for development near station areas, plans for park-and-ride lots, parking management)	• Policies to reduce parking requirements or cap parking • Policies establishing maximum allowable parking for new development in areas served by transit • Shared parking allowances • Mandatory minimum cost for parking in transit areas • Parking taxes

Information Requested	Documentation
I. Transit Supportive Plans and Policies **b. Supportive Zoning Regulations Near Transit Stations**	
Zoning ordinances that support increased development density in transit stations areas	• Ordinances and maps describing existing zoning (allowable uses and densities) • Recent changes to zoning ordinances to allow or encourage development with transit supportive densities and uses • Transit overlay zoning • Zoning incentives for increased development in station areas (density bonuses, housing fund subsidies, regulation relaxation, expedited zoning review, etc.)
Zoning ordinances that enhance transit-oriented character of station area development and pedestrian access	• Zoning regulations that allow mixed-use development • Zoning regulations addressing placement of building footprints, pedestrian facilities, façade treatments, etc. • Architectural design guidelines and mechanisms for implementation/enforcement of these guidelines
Zoning allowances for reduced parking	• Residential and commercial parking requirements (minimums and/or maximums) in station areas under existing zoning • Zoning ordinances providing reduced parking requirements for development near transit stations

Information Requested	Documentation
I. Transit Supportive Plans and Policies **c. Tools to Implement Transit-Supportive Policies**	
Outreach to government agencies and the community in support of transit-supportive planning	• Promotion and outreach activities by the transit agency, local jurisdictions, and/or regional agencies in support of station area planning, growth management, and transit-oriented development • Inter-local agreements, resolutions, or letters of endorsement from other government agencies in support of coordinating planning with transit investment • Actions of other groups, including Chambers of Commerce, professional development groups, citizen coalitions, as well as the private/commercial sector, in support of transit-oriented development practices • Public outreach materials and brochures
Regulatory and financial incentives to promote transit-supportive development	• Regulatory incentives (e.g., density bonuses, streamlined processing of development applications) for developments near transit • Zoning requirements for traffic mitigation (e.g., fees and in-kind contributions) and citations of how such requirements can be waived or reduced for locations near transit stations • Programs that promote or provide incentives for transit-oriented development such as tax increment financing zones, tax abatement programs, and transit-oriented loan support programs • Other economic development and revitalization strategies for station areas or within the corridor
Efforts to engage the development community in station-area planning and transit-supportive development	• Outreach, education, and involvement activities targeted at the development community (including developers, property owners, and financial institutions) • Transit-oriented market studies • Joint development programs and proposals • Letters of endorsement or other indicators of support from the local development community
Public involvement in corridor and station area planning	• Description of public involvement process, including corridor and station area transit-supportive planning activities • Description of the level of participation in transit-supportive planning activities and support for these activities by the general public and community groups • Public outreach materials and brochures

Information Requested	Documentation
II. Performance and Impacts of Policies **a. Performance of Transit-Supportive Plans and Policies**	
Demonstrated cases of developments affected by transit supportive policies	• Documentation of projects that have recently been built consistent with transit-oriented design principles (higher density, orientation toward street, provision of pedestrian access from transit, etc.) • Documentation of projects that incorporate a mix of uses or increased amounts of housing
Station area development proposals and status	• Descriptions and plans for new development, including joint development proposals, including size, types of uses, and expected dates of start of construction and completion
II. Performance and Impacts of Policies **b. Potential Impact of Transit Investment on Regional Development**	
Adaptability of station area for transit-supportive development	• Description or inventory of land near transit stations that is vacant or available for redevelopment, and amount of development anticipated for these parcels • Projected timeline for development of station area properties • Amount of development allowed at station area build-out compared to existing amount of development
Corridor economic development	• Regional and corridor economic conditions and growth projections • Development market trends in existing corridors and station areas (for areas with existing transit) • Demonstrated market support for higher-density and transit/pedestrian-oriented development • Locations of major employment centers in the region, and expected growth in these centers • Projected population, employment, and growth rates in corridor or station areas compared to region

Information Requested	Documentation
III. Tools to Maintain or Increase the Share of Affordable Housing in the Project Corridor	
Evaluation of corridor-specific affordable housing needs and supply	• Needs assessment that evaluates the demand of affordable housing and compares it to the supply of housing
Plans and policies to preserve and increase affordable housing in region and/or corridor	• Inclusionary zoning or housing programs that require or provide incentives for developers to set aside a percentage of units for income-qualified buyers/renters • Density bonuses or reduction of parking requirements for the provision of units made available for income-qualified buyers or renters • Employer assisted housing policies, using tax credits, partnerships, matching funds, and/or other mechanisms to encourage employers to help employees to buy or rent homes close to work or transit • Rent controls or condominium conversion controls on existing units to maintain affordability for renters • Zoning to promote housing diversity, such as zoning that permits accessory or "in-law" units, and residential zoning based on floor area ratio rather than dwelling units to reduce the disincentive to build smaller units • Tenant "right of first refusal" laws, which require an owner provide the tenants with an opportunity to purchase the property at the same price as a third-party • Affordability covenants, which limit appreciation of rents and/or sales values for units rented or sold to income-qualified tenants for a given length of time

Information Requested	Documentation
Adopted financing tools and strategies targeted to preserve and increase affordable housing in the region and/or corridor	• Funding for targeted property acquisition, rehabilitation, and development of low-income housing, including direct funding for public and nonprofit development authorities, low-income housing tax credits (including criteria that favor application of credits in transit station areas), and local tax abatements for low-income/senior housing • Land banking programs to support the assembly of land for new affordable housing development by public, private, or nonprofit developers • Financial assistance to housing owners/tenants through mechanisms, including affordable housing operating subsidies, weatherization and utilities support programs, tax abatement or mortgage or other home ownership assistance for lower-income/senior households • Local or regional affordable housing trust funds to provide a source of low-interest loans for affordable housing developers • Targeted tax increment financing, other value-capture strategies, or transfer tax programs to generate revenue that can be directed toward low-income housing programs
Evidence of developer activity to preserve and increase affordable housing in the corridor	• Examples of the provision of affordable housing in new or existing developments, including number of units, specific affordability restrictions, length of time restrictions apply, etc.
Extent to which local plans and policies account for long-term affordability and the needs of very- and extremely-low income households in the corridor	• Documentation of evidence that legal affordability restrictions in the transit corridor will be continued over the long-term following the project's opening. Examples include commitments tied to the receipt of Low-Income Housing Tax Credits, HOME or other HUD funds, payment in lieu of taxes (PILOT) agreements, and other legal instruments tied to the receipt of Federal, state, local and/or private funds/financing

Importance of an Organized, Comprehensive Submittal

Ratings assigned by FTA will be directly related to the ability of FTA to readily identify, locate, review, and assess the provided documentation. Thus, project sponsors should strive to produce well-organized submittals.

Additional Guidance

- Provide a table of contents at the beginning of the submittal summarizing all materials that are being provided to FTA.
- Project sponsors should provide documentation to substantiate qualitative information rather than rely solely upon reference.
- Submissions should be brief and precise, but thorough, in providing explanatory statements; important information should not be omitted for the sake of brevity.
- Brief descriptions of anticipated development and implemented projects, rather than simply a list, are helpful.
- Submissions should include explanations of the impact of transit-supportive policies and how implementation would be achieved, particularly when significant changes are anticipated.
- Submissions should distinguish between existing conditions and those expected from the implementation of policies and development practices.
- Submissions should distinguish between station area, corridor, municipality, and regional transit-supportive policies and plans.
- Submissions should address parking policies and pricing strategies.

IV.6. Environmental Benefits

Environmental benefits are evaluated based on the change in VMT resulting from implementation of the proposed project. The estimated environmental benefits are then monetized automatically in the Environmental Benefits Template and compared to the annualized federal share of the proposed project.

VMT data is entered in the VMT section of the Travel Forecasts Template (described in Section III.2 Travel Forecasts). Annualized federal share is entered in the Mobility and Cost Effectiveness Template. The excel workbook containing the templates automatically transfers this information into the Environmental Benefits Template. The only information that the project sponsor needs to enter into the Environmental Benefits Template is the Environmental Protection Agency's (EPA) air quality designation for four air quality criteria pollutants for the metropolitan area in which the proposed project is located. This information can be found in EPA's Green Book.

V. Local Financial Commitment Criteria

Streamlined Financial Evaluation

A streamlined financial evaluation is possible when a Small Starts project sponsor can demonstrate the following:

- A reasonable plan to secure funding for the local share of capital costs or sufficient available funds for the local share (all non-Small Starts funding must be committed before receiving an SSGA);
- The additional operating and maintenance cost of the proposed Small Starts project is less than five percent of the project sponsor's current system-wide operating budget; and
- The project sponsor is in reasonably good financial condition.

Project sponsors shall submit the following items to demonstrate that they meet these conditions:

- A completed Small Starts Finance Template, described below;
- A detailed plan to secure funding for the local share of project costs that includes the sources, amount, and steps needed to secure funding commitments;
- A detailed operating and maintenance cost estimate;
- The current budget documenting that the project's operating and maintenance costs would constitute no greater than five percent of current system-wide operating and maintenance costs; and
- Three years of audited financial statements documenting the financial health of the project sponsor.

Standard Financial Evaluation

If a Small Starts project sponsor does not meet the criteria for a streamlined financial evaluation, FTA requires submittal of:

- a completed Small Starts Finance Template;
- a comprehensive financial plan, including a 20-year cash flow model submitted electronically in excel format with formulas included rather than just hardcoded numbers;
- supporting documentation; and
- a completed financial submittal checklist.

These items are described in detail in the next sections.

Project sponsors that cannot qualify for the streamlined approach must provide all information requested in the *Guidance for Transit Financial Plans*. Failure to include any of the elements required for the financial review will adversely impact the project's financial rating.

Small Starts Project Finance Template

All Small Starts project sponsors – regardless of whether the project qualifies for a streamlined financial evaluation approach or not – must complete the Finance Template. The Finance Template is designed to provide a uniform reporting method for the basic financial information and transit system characteristics necessary for FTA to assess the local financial commitment for the proposed Small Starts project. It is not intended as a substitute for a financial plan. A written explanation should be provided for not submitting any requested or current data. Failure to adequately justify any non-compliance will adversely impact the project's financial rating.

Project sponsors should ensure that information reported in the Finance Template matches that reported in other documentation. FTA recommends that project sponsors perform the following quality control checks on data entered in the Finance Template:

- The capital costs reported on this template should match what is reported in the Build Main Worksheet of the SCCs and the Project Description Template. The capital cost estimate must include project development activities.
- Finance charges must be included in the capital cost estimate of all Small Starts projects. Specifically, only finance charges that are expected to occur prior to either the revenue operations date or the fulfillment of the Section 5309 Small Starts funding commitment in the SSGA, whichever occurs later in time, should be included.
- If the capital cost of the project has changed significantly from last year, please provide an explanation.
- Total Federal funding for the project (Small Starts plus other Federal sources) should not exceed 80 percent.
- The sum of all proposed sources of operating funds reported on the Small Starts Project Finance Template should equal the total transit system annual operating cost in the opening year.
- The type of funding sources should be identified for each capital and operating revenue source.

Financial Plan

Small Starts projects that do not qualify for the streamlined financial evaluation approach must submit a 20-year financial plan to FTA. In accordance with MAP-21, FTA evaluates the financial plan to ensure that the agency has the financial capacity to construct and operate the proposed Small Starts project while continuing to operate and maintain the existing transit system without requiring a reduction in existing services. FTA has developed guidance on the content and format of financial plans for transit agencies in FTA's *Guidance for Transit Financial Plans*. All project sponsors submitting information for evaluation and rating are required to submit financial plans that adhere to these guidelines. Failure to provide a complete financial plan will adversely impact a project's financial rating.

For Small Starts project sponsors opting to prepare horizon year estimates of benefits, the financial plan should include any additional expenses needed to meet horizon year service plans

that serve as inputs to the horizon year estimates of benefits. For example, if additional vehicles are needed to meet increased service frequency projected for the horizon year, then the financial plan must include the cost associated with additional vehicles and demonstrate that the sponsor has sufficient funding to pay for them.

Supporting Documentation

Documentation demonstrating the level of commitment for each of the funding sources included in the financial plan must be provided. All underlying financial assumptions should be identified in the project finance plan and reflect capital financing strategies, projected rehabilitation and replacement costs for the existing system, operations and maintenance costs for the proposed project and the existing system, revenue stream assumptions, and cash flow projections.

Figure 1 on the following page provides a summary of typical supporting documentation for Small Starts financial plans. The ratings assigned by FTA are directly related to the ability of reviewers to readily identify, locate, review, and assess the provided documentation. Therefore, a concise, well-organized submittal is to the advantage of the project sponsor.

Figure 1: Examples of Financial Plan Supporting Documentation

General Documentation

- Background information and description of the transit agency, including organizational structure and an outline of any other significant capital projects underway (e.g., annual audits and annual reports for past three years, current budget).
- Background information and description of the project, including project status (e.g., project pamphlets, planning and engineering reports used to select and define the project).
- Information describing current and forecast economic conditions in the region (e.g., regional socioeconomic reports, regional planning estimates of socioeconomic growth used in the development of the financial and ridership estimates).

Financial Documentation

- Agency capital and operating cash flow analysis for a 20-year period (in year of expenditure dollars.) The cash flow analysis should include expenses and revenues for the proposed project as a separate line item from expenses and revenues for the rest of the system.
- A description of the types and amounts of funds (in year of expenditure dollars) for the transit system and proposed project (e.g., local, state, Federal, sales tax, bonds, flexible funding, other funding sources).
- Operations and maintenance cost estimates (in year of expenditure dollars) for the entire planned transit system, including the proposed project.
- Capital cost estimates (in year of expenditure dollars) for the proposed project, broken out by major cost categories, including contingencies.
- Capital cost estimates (in year of expenditure dollars) for rehabilitation and replacement needs for the existing system broken out by major categories.
- Description of innovative financing techniques (e.g., innovative funding sources or financing techniques to be used to support the project or to be implemented as part of a larger system-wide program).
- Latest bonding prospectus, capital and operating financing plans, and other reports.
- Commitment letters, contracts, agreements, legislative referendums, joint development agreements, or other documentation evidencing commitment of funds
- Correspondence or other documentation indicating local source's "intent to commit" if no formal commitment or programming of local funding is yet in place.

Additional Documentation

- Regional Long Range Transportation Plan
- Regional Transportation Improvement Program (TIP)
- Major Investment Study (MIS) or Alternatives Analysis (AA), Environmental Impact Statement (EIS), if applicable
- Independent Audit Reports
- Rail vehicle and bus fleet management plans

Financial Submittal Checklist

Table 1 below presents a checklist of information that should be submitted to FTA if the Small Starts project does not qualify for the streamlined financial evaluation. The project sponsor must complete the checklist and include it with the financial submittal. If the checklist is not provided, the submittal will be considered incomplete.

Table 1: Local Financial Commitment Checklist

GRANTEE FINANCIAL SUBMITTAL	Included (check one)		Reason Why Information Has Not Been Provided
	Yes	No	
20-year cash flow statement (in year of expenditure dollars) including capital and operating financial plans (provided both electronically and in hardcopy). The cash flow statement should clearly show revenues and expenses for the project separated from those for the remainder of the transit system.			
Detailed written description/discussion of all assumptions used in the financial plan including: Federal/state/local/debt proceeds funding assumptions Average fare assumption Average weekday ridership assumptions Debt coverage requirements/assumptions Assumptions used in the calculation of operating expenses for each mode (i.e. -- vehicle miles, vehicle hours of service provided, etc.)			
Project Description and Small Starts Project Finance Templates			
Capital cost estimate for the proposed project (in year of expenditure dollars) in the FTA standardized cost category worksheet format			
Sensitivity Analysis (spreadsheet calculations as well as narrative summary)			
Supporting Documentation Including:			
Background information and description of the Small Starts project, including project status			
Historical revenue and expense data (minimum of 5 years required, more than 5 years appreciated)			
Commitment letters, contracts, agreements, legislative referendums or other documents demonstrating local share commitment of non-Federal funding partners			
Enacting legislative documents for tax referenda			
Joint development agreements, or description and supporting documentation of other innovative financing techniques, if applicable			
Annual Operating and Capital Budgets for the past 3 years			
Audited Financial Statements and Compliance Reports for the past 3 years			
Annual Reports/Comprehensive Annual Financial Reports (CAFR) for the past 3 years			

GRANTEE FINANCIAL SUBMITTAL	Included (check one)		Reason Why Information Has Not Been Provided
Background information and description of the transit agency, including organizational structure and enabling legislation			
TIP, STIP and Short Range Transit Plan (SRTP), if available (please provide only relevant pages of these documents)			
Regional Long Range Transportation Plan (please provide only relevant pages)			
Capital Improvement Program Documents			
Bus and Rail Fleet Management Plans including fleet replacement schedules			
Latest bonding prospectus/credit facility documents (credit lines, commercial paper, etc.)			
Local development, demographic and economic studies used in preparing the financial plan, plus documentation supporting efficiency or productivity gain assumptions			
Other materials (if any), please describe:			

Appendix A: Sample Methodology for Estimating Station Area Socio-Economic Statistics

A sample approach follows for computing the station-area population, household and employment statistics requested in the *Quantitative Land Use Information Template*. Figure A and Table A provide examples of the approach applied to a hypothetical project.

Figure A: Sketch of Station Areas for a Hypothetical Project

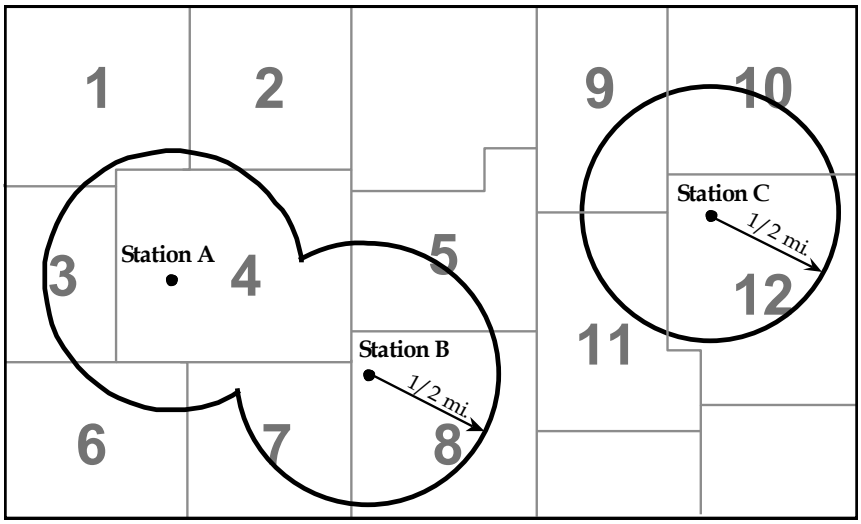


Table A: Calculation of Station-Area Statistics for a Hypothetical Project

	Census Tract Total				Fraction of Tract Land Area within 1/2 Mile of Station	Within 1/2 Mile of Station			
	Land Area (sq. mi.)	Pop-ulation	House-holds	Employ-ment		Land Area (sq. mi.)	Pop-ulation	House-holds	Employ-ment
Stations A and B									
Tract 1	0.452	2,309	987	1,654	0.08	0.036	185	79	132
Tract 2	0.362	133	58	611	0.06	0.022	8	4	37
Tract 3	0.294	398	145	1,254	0.52	0.153	207	76	652
Tract 4	0.655	2,634	1,154	2,719	0.85	0.557	2,239	981	2,311
Tract 5	0.429	1,038	393	858	0.41	0.176	425	161	352
Tract 6	0.416	2,412	887	1,477	0.19	0.079	458	168	281
Tract 7	0.380	2,088	856	2,785	0.54	0.205	1,127	462	1,504
Tract 8	0.434	2,344	991	2,031	0.68	0.295	1.720	720	1,349
Subtotal	3.422	13,542	5,541	13,342		1.523	6,370	2,652	6,618

Station C									
Tract 9	0.355	1,816	722	610	0.24	0.085	436	173	146
Tract 10	0.462	70	31	1,569	0.40	0.185	28	12	628
Tract 11	0.504	2,645	1,156	760	0.33	0.166	873	381	251
Tract 12	0.540	2,573	1,010	1,873	0.65	0.351	1,730	687	67
Subtotal	1.860	7,192	2,966	3,041		0.787	3,066	1,254	1,091
Total	5.282	20,734	8,507	16,384		2.310	9,437	3,906	7,709

1. Plot each station location on a map showing census tracts or, alternatively, TAZs.
2. Draw a circle of ½-mile radius around each station.
3. Obtain data on total land area, population, households, employment, and housing units for the tracts or zones that fall partially or completely within the station areas. Land area, population, and households can be obtained from the census (for census tracts) or from a regional land use database used for travel forecasting modeling (for TAZs). The regional Metropolitan Planning Organization (MPO) should have these data available. Employment data at the tract or TAZ level may be obtained from the MPO. Total residential housing unit data can be obtained from the latest American Community Survey five-year estimates at the county and census tract levels. Data on legally binding affordability restricted housing can be obtained by contacting area housing authorities. In addition, some statistics on affordable housing can be found in the National Housing Preservation Database (http://www.preservationdatabase.org/). This database includes an address-level inventory of federally assisted rental housing. It does not contain information on affordable units supported only by state and local programs.
4. Estimate the total land area, population, households, and employment contained within each ½ mile station radius by summing the data for each tract or zone that falls within the ½ mile station radius. For tracts or TAZs that partially fall within the ½ mile station radius, station-area population, households, and employment should be estimated by multiplying the total for the zone by the proportion of the zone estimated to fall within the ½ mile radius. The proportion of the zone falling within the ½ mile radius can be estimated either visually or using GIS.
5. Avoid double counting of population and employment for stations that are less than 1 mile apart. This can be done in two ways: (a) draw a line dividing the area enclosed by the overlapping circles into two parts; or, (b) group stations that are less than 1 mile apart into clusters and report total data for each cluster (as shown for Stations A and B in the table above). In either case, please report the total land area encompassed by the overlapping circles. (Total land area for individual stations not grouped together should be roughly the area enclosed by a circle of ½-mile radius, i.e., 3.1415*(0.5)^2 = 0.785 sq. mi.)

6. If possible, attach a map showing station locations, ½ mile radii, and census tracts or traffic analysis zones, along with a Table listing the tracts or zones, estimated proportion of each within ½ mile of the station, and population, households, and/or employment for the tract.

Standard Cost Categories for Small Starts Projects

(Rev.16, June, 2014)

10 GUIDEWAY & TRACK ELEMENTS (route miles)

- 10.01 Guideway: At-grade exclusive right-of-way
- 10.02 Guideway: At-grade semi-exclusive (allows cross-traffic)
- 10.03 Guideway: At-grade in mixed traffic
- 10.04 Guideway: Aerial structure
- 10.05 Guideway: Built-up fill
- 10.06 Guideway: Underground cut & cover
- 10.07 Guideway: Underground tunnel
- 10.08 Guideway: Retained cut or fill
- 10.09 Track: Direct fixation
- 10.10 Track: Embedded
- 10.11 Track: Ballasted
- 10.12 Track: Special (switches, turnouts)
- 10.13 Track: Vibration and noise dampening

20 STATIONS, STOPS, TERMINALS, INTERMODAL (number)

- 20.01 At-grade station, stop, shelter, mall, terminal, platform
- 20.02 Aerial station, stop, shelter, mall, terminal, platform
- 20.03 Underground station, stop, shelter, mall, terminal, platform
- 20.04 Other stations, landings, terminals: Intermodal, ferry, trolley, etc.
- 20.05 Joint development
- 20.06 Automobile parking multi-story structure
- 20.07 Elevators, escalators

30 SUPPORT FACILITIES: YARDS, SHOPS, ADMIN. BLDGS

- 30.01 Administration Building: Office, sales, storage, revenue counting
- 30.02 Light Maintenance Facility
- 30.03 Heavy Maintenance Facility
- 30.04 Storage or Maintenance of Way Building
- 30.05 Yard and Yard Track

40 SITEWORK & SPECIAL CONDITIONS

- 40.01 Demolition, Clearing, Earthwork
- 40.02 Site Utilities, Utility Relocation
- 40.03 Haz. mat'l, contam'd soil removal/mitigation, ground water treatments
- 40.04 Environmental mitigation, e.g. wetlands, historic/archeologic, parks
- 40.05 Site structures including retaining walls, sound walls
- 40.06 Pedestrian / bike access and accommodation, landscaping
- 40.07 Automobile, bus, van accessways including roads, parking lots
- 40.08 Temporary Facilities and other indirect costs during construction

50 SYSTEMS

- 50.01 Train control and signals
- 50.02 Traffic signals and crossing protection
- 50.03 Traction power supply: substations
- 50.04 Traction power distribution: catenary and third rail
- 50.05 Communications
- 50.06 Fare collection system and equipment
- 50.07 Central Control

60 ROW, LAND, EXISTING IMPROVEMENTS

- 60.01 Purchase or lease of real estate
- 60.02 Relocation of existing households and businesses

70 VEHICLES (number)

- 70.01 Light Rail
- 70.02 Heavy Rail
- 70.03 Commuter Rail
- 70.04 Bus
- 70.05 Other
- 70.06 Non-revenue vehicles
- 70.07 Spare parts

80 PROFESSIONAL SERVICES (applies to Cats. 10-50)

- 80.01 Project Development
- 80.02 Engineering (not applicable to Small Starts)
- 80.03 Project Management for Design and Construction
- 80.04 Construction Administration & Management
- 80.05 Professional Liability and other Non-Construction Insurance
- 80.06 Legal; Permits; Review Fees by other agencies, cities, etc.
- 80.07 Surveys, Testing, Investigation, Inspection
- 80.08 Start up

90 UNALLOCATED CONTINGENCY

100 FINANCE CHARGES

Standard Cost Categories for Small Starts Projects D E F I N I T I O N S (Rev.16, June, 2014)		**NOTE:** The SCC cost breakdown is based on a traditional Design Bid Build model. If your project is Design Build, to the best of your ability, separate construction costs from design, administration, testing, etc. Put all construction costs in 10 through 50. Put design, administration, testing, etc. in *80 Professional Services*.
10 GUIDEWAY & TRACK ELEMENTS (route miles)		Include guideway and track costs for all transit modes (heavy rail, light rail, commuter rail, BRT, rapid bus, bus, monorail, cable car, etc.) The unit of measure is route miles of guideway, regardless of width. As associated with the guideway, include costs for rough grading, excavation, and concrete base for guideway where applicable. Include all construction materials and labor regardless of whom is performing the work. In your written description of the scope, and in supporting graphic diagrams, indicate whether busway or rail track is single, double, triple, relocated, etc. Put guideway and track elements associated with yards in *30 Support Facilities* below.
10.01	Guideway: At-grade exclusive right-of-way	
10.02	Guideway: At-grade semi-exclusive (allows cross-traffic)	
10.03	Guideway: At-grade in mixed traffic	
10.04	Guideway: Aerial structure	Include foundation excavation; guideway structures including caissons, columns, bridges, viaducts, cross-overs, fly-overs.
10.05	Guideway: Built-up fill	Include construction of earthen berms.
10.06	Guideway: Underground cut & cover	Include excavation, retaining walls, backfill, underground guideway structure and finishes.
10.07	Guideway: Underground tunnel	Include tunneling by means of a tunnel boring machine, drill blasting, mining, and immersed tube tunneling; tunnel structure and finishes.
10.08	Guideway: Retained cut or fill	Include excavation, retaining walls, backfill, underground guideway structure and finishes.
10.09	Track: Direct fixation	Include rails, connectors.
10.10	Track: Embedded	Include rails, ties; ballast where applicable
10.11	Track: Ballasted	Include rails, ties and ballast.
10.12	Track: Special (switches, turnouts)	Include transitional curves.
10.13	Track: Vibration and noise dampening	Include upcharge for vib/noise dampening to any track condition above.
20 STATIONS, STOPS, TERMINALS, INTERMODAL (number)		As associated with stations, include costs for rough grading, excavation, station structures, enclosures, finishes, equipment; mechanical and electrical components including HVAC, ventilation shafts and equipment, station power, lighting, public address/customer information system, safety systems such as fire detection and prevention, security surveillance, access control, life safety systems, etc. Include all construction materials and labor regardless of whom is performing the work. NOTE: Count paired inbound/outbound boarding platforms as one station - do not report the total number of boarding platforms.
		Put guideway and track associated with stations in *10 Guideway & Track Elements* above.
20.01	At-grade station, stop, shelter, mall, terminal, platform	
20.02	Aerial station, stop, shelter, mall, terminal, platform	Include station structures including caissons, columns, platforms, superstructures, etc.
20.03	Underground station, stop, shelter, mall, terminal, platform	Include retaining walls, backfill, structure.
20.04	Other stations, landings, terminals: Intermodal, ferry, trolley, etc.	
20.05	Joint development	Per FTA's Joint Development Guidance, "Joint development is any income-producing activity with a transit nexus related to a real estate asset in which FTA has an interest. ...Joint development projects are commercial, residential, industrial, or mixed-use developments that are induced by or enhance the effectiveness of transit projects. . ."
20.06	Automobile parking multi-story structure	Include retaining walls, backfill, structure.
20.07	Elevators, escalators	
30 SUPPORT FACILITIES: YARDS, SHOPS, ADMIN. BLDGS		As associated with support facilities, include costs for rough grading, excavation, support structures, enclosures, finishes, equipment; mechanical and electrical components including HVAC, ventilation shafts and equipment, facility power, lighting, public address system, safety systems such as fire detection and prevention, security surveillance, access control, life safety systems, etc. Include fueling stations. Include all construction materials and labor regardless of whom is performing the work.
		Where a support facility shares the structure with a station, its cost may be included with station cost. Identify this with a note.
		Except for guideway and track associated with a yard, include all guideway and track costs associated with support facilities in *10 Guideway & Track Elements* above.
30.01	Administration Building: Office, sales, storage, revenue counting	
30.02	Light Maintenance Facility	Include service, inspection, and storage facilities and equipment.
30.03	Heavy Maintenance Facility	Include heavy maintenance and overhaul facilities and equipment.
30.04	Storage or Maintenance of Way Building	
30.05	Yard and Yard Track	Include yard construction, guideway and track associated with yard.

40 SITEWORK & SPECIAL CONDITIONS		Include all construction materials and labor regardless of whom is performing the work.
40.01	Demolition, Clearing, Earthwork	Include project-wide clearing, demolition and fine grading.
40.02	Site Utilities, Utility Relocation	Include all site utilities - storm, sewer, water, gas, electric.
40.03	Haz. mat'l, contam'd soil removal/mitigation, ground water treatments	Include underground storage tanks, fuel tanks, other hazardous materials and treatments, etc.
40.04	Environmental mitigation, e.g. wetlands, historic/archeologic, parks	Include other environmental mitigation not listed.
40.05	Site structures including retaining walls, sound walls	
40.06	Pedestrian / bike access and accommodation, landscaping	Include sidewalks, paths, plazas, landscape, site and station furniture, site lighting, signage, public artwork, bike facilities, permanent fencing.
40.07	Automobile, bus, van accessways including roads, parking lots	Include all on-grade paving.
40.08	Temporary Facilities and other indirect costs during construction	As a general rule and to the extent possible, appropriately allocate indirect costs among the construction costs in Categories 10 through 50. Where that is not possible, include in *40.08 Temporary Facilities* costs for mobilization, demobilization, phasing; time and temporary construction associated with weather (heat, rain, freezing, etc.); temporary power and facilities; temporary construction, easements, and barriers for storm water pollution prevention, temporary access and to mitigate construction impacts; project and construction supervision; general conditions, overhead, profit. **NOTE: Include contractor's general liability and other insurance related to construction such as builder's risk in Cats. 10 - 50, not in 80 Professional Services below.**
50 SYSTEMS		Include all construction materials and labor regardless of whom is performing the work.
50.01	Train control and signals	
50.02	Traffic signals and crossing protection	Include signal prioritization at intersections.
50.03	Traction power supply: substations	
50.04	Traction power distribution: catenary and third rail	
50.05	Communications	Include passenger information systems at stations and on vehicles (real time travel information; static maps and schedules). Include equipment to allow communications among vehicles and with central control.
50.06	Fare collection system and equipment	Include fare sales and swipe machines, fare counting equipment.
50.07	Central Control	
Construction Subtotal (10 - 50)		

60 ROW, LAND, EXISTING IMPROVEMENTS		**Include professional services associated with the real estate component of the project. These costs may include agency staff oversight and administration, real estate and relocation consultants, legal counsel, court expenses, insurance, etc.**
60.01	Purchase or lease of real estate	If the value of right-of-way, land, and existing improvements is to be used as local match to the Federal funding of the project, include the total cost on this line item. In backup documentation, separate cost for land from cost for improvements. Identify whether items are leased, purchased or acquired through payment or for free. Include the costs for permanent surface and subsurface easements, trackage rights, etc.
60.02	Relocation of existing households and businesses	In compliance with Uniform Relocation Act.
70 VEHICLES (number)		**Include professional services associated with the vehicle component of the project. These costs may include agency staff oversight and administration, vehicle consultants, design and manufacturing contractors, legal counsel, warranty and insurance costs, etc.**
70.01	Light Rail	Include light rail and streetcar rail using electric, diesel or other power supply.
70.02	Heavy Rail	
70.03	Commuter Rail	Include locomotives (diesel, electric, or other), trailer cars, self-propelled multiple units (EMU electric or DMU diesel, or other power supply)
70.04	Bus	Includes "rubber-tired" buses and trolleys including new, used, historic replica, articulated, using electric, diesel, dual-power, or other power supply.
70.05	Other	Include Vans, Sedan/Station Wagon, Cable Car, People Mover, Monorail, Car/Inclined Railway, Ferry Boat, Transferred Vehicle
70.06	Non-revenue vehicles	
70.07	Spare parts	
80 PROFESSIONAL SERVICES (applies to Cats. 10-50)		Cat. 80 applies to Cats. 10-50. Cat. 80 includes all professional, technical and management services related to the design and construction of fixed infrastructure (Cats. 10 - 50) during the project development and construction phases of the project. This includes environmental work, design, engineering and architectural services; specialty services such as safety or security analyses; value engineering, risk assessment, cost estimating, scheduling, ridership modeling and analyses, auditing, legal services, administration and management, etc. by agency staff or outside consultants. Include professional liability insurance and other non-construction insurance on 80.05 unless insurance for the agency and its consultants is already included in other lines. Include costs associated with professional services related to real estate and vehicles in Cats. 60 and 70. *(Note that costs for planning activities and NEPA work done before FTA approval to enter project development (PD), regardless of funding source, are not included in an SSGA and therefore, should not be included in the Standard Cost Category worksheets. For example, on one and the same grant, costs incurred prior to FTA approval to enter PD should be omitted from these worksheets whereas costs incurred after FTA approval to enter PD should be included.)*
80.01	Project Development	
80.02	Engineering (not applicable to Small Starts)	
80.03	Project Management for Design and Construction	
80.04	Construction Administration & Management	
80.05	Professional Liability and other Non-Construction Insurance	
80.06	Legal; Permits; Review Fees by other agencies, cities, etc.	
80.07	Surveys, Testing, Investigation, Inspection	
80.08	Start up	Include start up and training. Include in Cats. 10 - 50 above access and protection work by agency staff or outside contractors.
Subtotal (10 - 80)		
90 UNALLOCATED CONTINGENCY		Includes unallocated contingency, project reserves. Document allocated contingencies for individual line items on the BUILD Main worksheet.
Subtotal (10 - 90)		
100 FINANCE CHARGES		Include finance charges expected to be paid by the project sponsor/grantee prior to either the completion of the project or the fulfillment of the Small Starts funding commitment, whichever occurs later in time. Finance charges incurred after this date should not be included in Total Project Cost. (See FFGA Circular FTA C5200.1A Chapter III for additional information.) Derive finance charges from the Small Starts project's financial plan, based on an analysis of the sources and uses of funds. The amount and type of debt financing required and revenues available determine the finance charges. By year, compute finance charges in year-of-expenditure (YOE) dollars. On the Inflation worksheet enter the finance charges for the appropriate years.
Total Project Cost (10 - 100)		

14-Series TEAM Scope / Activity Line Items

Required for <u>all grants</u> that serve a Capital Project

(Rev.16, June, 2014)

1. HOW DO THE SCC AND TEAM RELATE?

TEAM is for grants management. Many grants can serve a capital project -- e.g. CMAQ, 5307, 5309, etc. The Standard Cost Categories (SCC) are for cost management, day to day as well as at important milestones.

To manage capital project costs use the SCC worksheets, back up sheets, detailed cost estimates, etc. At important milestones, "paperclip" the SCC worksheets to the applicable grants in TEAM.

TEAM and the SCC support each other but TEAM doesn't duplicate the level of information in the SCC. Grant budgets will have just the ten lines.

2. WHEN SHOULD I USE THE 14-SERIES?

Use it for capital projects. For a New Starts project, use it from the very first grant that funds Preliminary Engineering, and include all grants issued through the FFGA; these grants may be small or large and may derive funding from diverse sources such as CMAQ, 5307, 5309 Fixed Guideway Mod, 5309 New Starts, Federal Non-Transportation funding from HUD, Defense, etc.

3. HOW IS THE 14-SERIES ORGANIZED AND WHY?

The 14-Series has one Scope and 10 ALIs.
The organization is intentionally simple.
Put guideway costs under the Guideway ALI,
station costs under the Station ALI.
If the costs are organized simply,
the information will be consistent
program-wide and will produce
a reliable database.
For Vehicles, use the 13-Series ALIs.

140-00 PROJECT NAME - (this is the one Scope)

14.01.10	GUIDEWAY & TRACK ELEMENTS		.01 Bus STD 40 FT
			.02 Bus STD 35 FT
			.03 Bus 30 FT
14.02.20	STATIONS, STOPS, TERMINALS, INTERMODAL		.04 Bus < 30 FT
			.05 Bus School
			.06 Bus Articulated
14.03.30	SUPPORT FACILITIES: YARDS, SHOPS, ADMIN BLDGS		.07 Bus Commuter / Suburban
			.08 Bus Intercity
			.09 Bus Trolley STD
14.04.40	SITEWORK & SPECIAL CONDITIONS	Engineering & Design	.10 Bus Trolley Artic.
		13.11.XX	.11 Bus Double Deck
			.12 Bus Used
14.05.50	SYSTEMS	Purchase - Replacement	.13 Bus School Used
		13.12.XX	.14 Bus Dual Mode
			.15 Vans
14.06.60	ROW, LAND, EXISTING IMPROVEMENTS	Purchase - Expansion	.16 Sedan / Station Wagon
		13.13.XX	.20 Light Rail Cars
			.21 Heavy Rail Cars
13____	VEHICLES - use the 13-Series ALIs for vehicles.	Rehabilitation / Rebuild	.22 Commuter Rail Self Propelled Electric
		13.14.XX	.23 Commuter Rail Car Trailer
			.24 Commuter Rail Locomotive Diesel
14.08.80	PROFESSIONAL SERVICES	Mid Life Rebuild (Rail)	.25 Commuter Rail Locomotive Electric
		13.15.XX	.26 Commuter Rail Cars Used
			.27 Commuter Rail Locomotive Used
14.09.90	UNALLOCATED CONTINGENCY	Lease - Replacement	.28 Commuter Rail Self Propelled - Diesel
		13.16.XX	.30 Cable Car
			.31 People Mover
14.10.10	FINANCE CHARGES	Lease - Expansion	.32 Car, Incline Railway
		13.18.XX	.33 Ferry Boats
			.39 Transferred Vehicles
		Vehicle Overhaul	.40 Spare Parts/Assoc.Capital
		13.17.00	/ Maintenance Items

MAIN WORKSHEET - BUILD ALTERNATIVE

(Rev.16, June, 2014)

Insert Project Sponsor's Name here — Today's Date **6/15/14**

Insert Project Name and Location — Yr of Base Year $ 2014

Insert Current Phase (e.g. Applic. for SSGA, Construction, Rev Ops) — Yr of Revenue Ops 2020

	Quantity	Base Year Dollars w/o Contingency (X000)	Base Year Dollars Allocated Contingency (X000)	Base Year Dollars TOTAL (X000)	Base Year Dollars Unit Cost (X000)	Base Year Dollars Percentage of Construction Cost	Base Year Dollars Percentage of Total Project Cost	YOE Dollars Total (X000)
10 GUIDEWAY & TRACK ELEMENTS (route miles)	**5.00**	40,000	10,000	**50,000**	**$10,000**	**45%**	**24%**	**52,300**
10.01 Guideway: At-grade exclusive right-of-way	5.00	40,000	10,000	50,000	$10,000			52,300
10.02 Guideway: At-grade semi-exclusive (allows cross-traffic)				0				0
10.03 Guideway: At-grade in mixed traffic				0				0
10.04 Guideway: Aerial structure				0				0
10.05 Guideway: Built-up fill				0				0
10.06 Guideway: Underground cut & cover				0				0
10.07 Guideway: Underground tunnel				0				0
10.08 Guideway: Retained cut or fill				0				0
10.09 Track: Direct fixation				0				0
10.10 Track: Embedded				0				0
10.11 Track: Ballasted				0				0
10.12 Track: Special (switches, turnouts)				0				0
10.13 Track: Vibration and noise dampening				0				0
20 STATIONS, STOPS, TERMINALS, INTERMODAL (number)	**10**	14,000	1,000	**15,000**	**$1,500**	**13%**	**7%**	**16,075**
20.01 At-grade station, stop, shelter, mall, terminal, platform	10	14,000	1,000	15,000	$1,500			16,075
20.02 Aerial station, stop, shelter, mall, terminal, platform				0				0
20.03 Underground station, stop, shelter, mall, terminal, platform				0				0
20.04 Other stations, landings, terminals: Intermodal, ferry, trolley, etc.				0				0
20.05 Joint development				0				0
20.06 Automobile parking multi-story structure				0				0
20.07 Elevators, escalators				0				0
30 SUPPORT FACILITIES: YARDS, SHOPS, ADMIN. BLDGS	5.00	4,000	1,000	**5,000**	**$1,000**	**4%**	**2%**	**5,266**
30.01 Administration Building: Office, sales, storage, revenue counting				0				0
30.02 Light Maintenance Facility		4,000	1,000	5,000				5,266
30.03 Heavy Maintenance Facility				0				0
30.04 Storage or Maintenance of Way Building				0				0
30.05 Yard and Yard Track				0				0
40 SITEWORK & SPECIAL CONDITIONS	5.00	22,175	4,500	**26,675**	**$5,335**	**24%**	**13%**	**27,084**
40.01 Demolition, Clearing, Earthwork		4,500	900	5,400				5,483
40.02 Site Utilities, Utility Relocation		9,000	1,800	10,800				10,965
40.03 Haz. mat'l, contam'd soil removal/mitigation, ground water treatments				0				0
40.04 Environmental mitigation, e.g. wetlands, historic/archeologic, parks		4,500	900	5,400				5,483
40.05 Site structures including retaining walls, sound walls				0				0
40.06 Pedestrian / bike access and accommodation, landscaping		4,175	900	5,075				5,153
40.07 Automobile, bus, van accessways including roads, parking lots				0				0
40.08 Temporary Facilities and other indirect costs during construction				0				0
50 SYSTEMS	5.00	12,500	2,500	**15,000**	**$3,000**	**13%**	**7%**	**16,075**
50.01 Train control and signals		4,500	500	5,000				5,358
50.02 Traffic signals and crossing protection		1,000	250	1,250				1,340
50.03 Traction power supply: substations		2,000	500	2,500				2,679
50.04 Traction power distribution: catenary and third rail		2,000	500	2,500				2,679
50.05 Communications		2,000	500	2,500				2,679
50.06 Fare collection system and equipment		1,000	250	1,250				1,340
50.07 Central Control				0				0
Construction Subtotal (10 - 50)	5.00	92,675	19,000	**111,675**	**$22,335**	**100%**	**53%**	**116,798**
60 ROW, LAND, EXISTING IMPROVEMENTS	5.00	15,000	2,500	**17,500**	**$3,500**		**8%**	**17,590**
60.01 Purchase or lease of real estate		15,000	2,500	17,500				17,590
60.02 Relocation of existing households and businesses				0				0
70 VEHICLES (number)	**7**	12,600	1,500	**14,100**	**$2,014**		**7%**	**14,851**
70.01 Light Rail	7	12,600	1,500	14,100	$2,014			14,851
70.02 Heavy Rail				0				0
70.03 Commuter Rail				0				0
70.04 Bus				0				0
70.05 Other				0				0
70.06 Non-revenue vehicles				0				0
70.07 Spare parts				0				0
80 PROFESSIONAL SERVICES (applies to Cats. 10-50)	5.00	35,000	3,550	**38,550**	**$7,710**	**35%**	**18%**	**38,684**
80.01 Project Development		12,500	1,300	13,800				13,848
80.02 Engineering (not applicable to Small Starts)								
80.03 Project Management for Design and Construction		2,500	250	2,750				2,760
80.04 Construction Administration & Management		10,000	1,000	11,000				11,038
80.05 Professional Liability and other Non-Construction Insurance		2,500	250	2,750				2,760
80.06 Legal; Permits; Review Fees by other agencies, cities, etc.		2,500	250	2,750				2,760
80.07 Surveys, Testing, Investigation, Inspection		2,500	250	2,750				2,760
80.08 Start up		2,500	250	2,750				2,760
Subtotal (10 - 80)	5.00	155,275	26,550	**181,825**	**$36,365**		**87%**	**187,922**
90 UNALLOCATED CONTINGENCY				**20,000**			**10%**	**21,075**
Subtotal (10 - 90)	5.00			**201,825**	**$40,365**		**96%**	**208,997**
100 FINANCE CHARGES				**7,600**			**4%**	**9,500**
Total Project Cost (10 - 100)	5.00			**209,425**	**$41,885**		**100%**	**218,497**

Allocated Contingency as % of Base Yr Dollars w/o Contingency	17.10%
Unallocated Contingency as % of Base Yr Dollars w/o Contingency	12.88%
Total Contingency as % of Base Yr Dollars w/o Contingency	29.98%
Unallocated Contingency as % of Subtotal (10 - 80)	11.00%
YOE Construction Cost per Mile (X000)	$23,360
YOE Total Project Cost per Mile Not Including Vehicles (X000)	$40,729
YOE Total Project Cost per Mile (X000)	$43,699

INFLATION WORKSHEET

(Rev.16, June, 2014)

Insert Project Sponsor's Name here

Today's Date **6/15/14**

Insert Project Name and Location

Yr of Base Year $ 2014

Insert Current Phase (e.g. Applic. for SSGA, Construction, Rev Ops)

Yr of Revenue Ops 2020

Insert comments, notes, etc.

BASE YEAR DOLLARS (X$000)	Base Yr Dollars	Double-Check Total	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
10 GUIDEWAY & TRACK ELEMENTS (route miles)	50,000	50,000	0	0	0	0	0	0	0	0	0	0	0	0
20 STATIONS, STOPS, TERMINALS, INTERMODAL (number)	15,000	15,000	0	0	0	0	0	0	0	0	0	0	0	0
30 SUPPORT FACILITIES: YARDS, SHOPS, ADMIN. BLDGS	5,000	5,000	0	0	0	0	0	0	0	0	0	0	0	0
40 SITEWORK & SPECIAL CONDITIONS	26,675	26,675	0	0	0	0	0	0	0	0	0	0	0	0
50 SYSTEMS	15,000	15,000	0	0	0	0	0	0	0	0	0	0	0	0
60 ROW, LAND, EXISTING IMPROVEMENTS	17,500	17,500	0	0	0	0	0	0	0	0	0	0	0	0
70 VEHICLES (number)	14,100	14,100	0	0	0	0	0	0	0	0	0	0	0	0
80 PROFESSIONAL SERVICES (applies to Cats. 10-50)	38,550	38,550	0	0	0	0	0	0	0	0	0	263	574	554
90 UNALLOCATED CONTINGENCY	20,000	20,000	0	0	0	0	0	0	0	0	0	0	0	0
100 FINANCE CHARGES	7,600	7,600	0	0	0	0	0	0	0	0	0	0	0	0
Total Project Cost (10 - 100)	209,425	209,425	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**263**	**574**	**554**
Inflation Rate			0.035	0.035	0.035	0.035	0.035	0.035	0.035	0.035	0.035	0.035	0.035	0.035
Compounded Inflation Factor			1.619	1.564	1.511	1.460	1.411	1.363	1.317	1.272	1.229	1.188	1.148	1.109
YEAR OF EXPENDITURE DOLLARS (X$000)	YOE Dollars		2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
10 GUIDEWAY & TRACK ELEMENTS (route miles)	52,300		0	0	0	0	0	0	0	0	0	0	0	0
20 STATIONS, STOPS, TERMINALS, INTERMODAL (number)	16,075		0	0	0	0	0	0	0	0	0	0	0	0
30 SUPPORT FACILITIES: YARDS, SHOPS, ADMIN. BLDGS	5,266		0	0	0	0	0	0	0	0	0	0	0	0
40 SITEWORK & SPECIAL CONDITIONS	27,084		0	0	0	0	0	0	0	0	0	0	0	0
50 SYSTEMS	16,075		0	0	0	0	0	0	0	0	0	0	0	0
60 ROW, LAND, EXISTING IMPROVEMENTS	17,590		0	0	0	0	0	0	0	0	0	0	0	0
70 VEHICLES (number)	14,851		0	0	0	0	0	0	0	0	0	0	0	0
80 PROFESSIONAL SERVICES (applies to Cats. 10-50)	38,684		0	0	0	0	0	0	0	0	0	222	500	500
90 UNALLOCATED CONTINGENCY	21,075		0	0	0	0	0	0	0	0	0	0	0	0
100 FINANCE CHARGES	9,500		0	0	0	0	0	0	0	0	0	0	0	0
Total Project Cost (10 - 100)	218,497		**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**222**	**500**	**500**

2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
0	0	5,000	25,000	20,000	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	5,000	5,000	5,000	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	2,500	2,500	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	5,175	10,000	6,500	5,000	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	5,000	5,000	5,000	0	0	0	0	0	0	0	0	0	0	0	0	0
0	2,500	10,000	5,000	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	7,000	7,100	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1,071	2,588	25,000	5,000	2,500	1,000	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	5,000	5,000	5,000	5,000	0	0	0	0	0	0	0	0	0	0	0	0	0
536	518	500	483	467	451	436	421	407	393	380	367	354	342	331	320	309	298	288
1,607	**10,780**	**55,500**	**66,483**	**52,567**	**16,451**	**436**	**421**	**407**	**393**	**380**	**367**	**354**	**342**	**331**	**320**	**309**	**298**	**288**

0.035	0.035	0.035	0.035	0.035	0.035	0.035	0.035	0.035	0.035	0.035	0.035	0.035	0.035	0.035	0.035	0.035	0.035	0.035
1.071	1.035	1.000	1.035	1.071	1.109	1.148	1.188	1.229	1.272	1.317	1.363	1.411	1.460	1.511	1.564	1.619	1.675	1.734

2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
0	0	5,000	25,875	21,425	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	5,175	5,356	5,544	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	2,588	2,678	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	5,000	10,000	6,728	5,356	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	5,175	5,356	5,544	0	0	0	0	0	0	0	0	0	0	0	0	0
0	2,415	10,000	5,175	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	7,245	7,606	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1,000	2,500	25,000	5,175	2,678	1,109	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	5,000	5,175	5,356	5,544	0	0	0	0	0	0	0	0	0	0	0	0	0
500	500	500	500	500	500	500	500	500	500	500	500	500	500	500	500	500	500	500
1,500	**10,415**	**55,500**	**68,810**	**56,311**	**18,239**	**500**	**500**	**500**	**500**	**500**	**500**	**500**	**500**	**500**	**500**	**500**	**500**	**500**

PROJECT DESCRIPTION - BUILD ALTERNATIVE

(Rev.16, June, 2014)

Insert Project Sponsor's Name here

Today's Date **6/15/14**

Insert Project Name and Location

Insert Current Phase (e.g. Applic. for SSGA, Construction, Rev Ops)

Describe the project elements to explain the unit costs shown on the Main Worksheet. Example: A 20-mile new light rail project has its guideway entirely on grade except for a one-eighth mile bridge over a river. The bridge or aerial structure may have a relatively high unit cost because there is little economy of scale.

Mention precedents and reference points used in the development of costs for this project. Mention other aspects of this project that were important considerations in estimating costs. These could include the physical context, site constraints; design parameters; institutional, contracting and procurement conditions; project schedule, etc.

10 GUIDEWAY & TRACK ELEMENTS (route miles)	
10.01	Guideway: At-grade exclusive right-of-way
10.02	Guideway: At-grade semi-exclusive (allows cross-traffic)
10.03	Guideway: At-grade in mixed traffic
10.04	Guideway: Aerial structure
10.05	Guideway: Built-up fill
10.06	Guideway: Underground cut & cover
10.07	Guideway: Underground tunnel
10.08	Guideway: Retained cut or fill
10.09	Track: Direct fixation
10.10	Track: Embedded
10.11	Track: Ballasted
10.12	Track: Special (switches, turnouts)
10.13	Track: Vibration and noise dampening
20 STATIONS, STOPS, TERMINALS, INTERMODAL (number)	
20.01	At-grade station, stop, shelter, mall, terminal, platform
20.02	Aerial station, stop, shelter, mall, terminal, platform
20.03	Underground station, stop, shelter, mall, terminal, platform
20.04	Other stations, landings, terminals: Intermodal, ferry, trolley, etc.
20.05	Joint development
20.06	Automobile parking multi-story structure
20.07	Elevators, escalators
30 SUPPORT FACILITIES: YARDS, SHOPS, ADMIN. BLDGS	
30.01	Administration Building: Office, sales, storage, revenue counting
30.02	Light Maintenance Facility
30.03	Heavy Maintenance Facility
30.04	Storage or Maintenance of Way Building
30.05	Yard and Yard Track
40 SITEWORK & SPECIAL CONDITIONS	
40.01	Demolition, Clearing, Earthwork
40.02	Site Utilities, Utility Relocation
40.03	Haz. mat'l, contam'd soil removal/mitigation, ground water treatments
40.04	Environmental mitigation, e.g. wetlands, historic/archeologic, parks
40.05	Site structures including retaining walls, sound walls
40.06	Pedestrian / bike access and accommodation, landscaping
40.07	Automobile, bus, van accessways including roads, parking lots
40.08	Temporary Facilities and other indirect costs during construction
50 SYSTEMS	
50.01	Train control and signals
50.02	Traffic signals and crossing protection
50.03	Traction power supply: substations
50.04	Traction power distribution: catenary and third rail
50.05	Communications
50.06	Fare collection system and equipment
50.07	Central Control
Construction Subtotal (10 - 50)	
60 ROW, LAND, EXISTING IMPROVEMENTS	
60.01	Purchase or lease of real estate
60.02	Relocation of existing households and businesses
70 VEHICLES (number)	
70.01	Light Rail
70.02	Heavy Rail
70.03	Commuter Rail
70.04	Bus
70.05	Other
70.06	Non-revenue vehicles
70.07	Spare parts
80 PROFESSIONAL SERVICES (applies to Cats. 10-50)	
80.01	Project Development
80.02	Engineering (not applicable to Small Starts)
80.03	Project Management for Design and Construction
80.04	Construction Administration & Management
80.05	Professional Liability and other Non-Construction Insurance
80.06	Legal; Permits; Review Fees by other agencies, cities, etc.
80.07	Surveys, Testing, Investigation, Inspection
80.08	Start up
Subtotal (10 - 80)	
90 UNALLOCATED CONTINGENCY	
Subtotal (10 - 90)	
100 FINANCE CHARGES	
Total Project Cost (10 - 100)	

S C H E D U L E

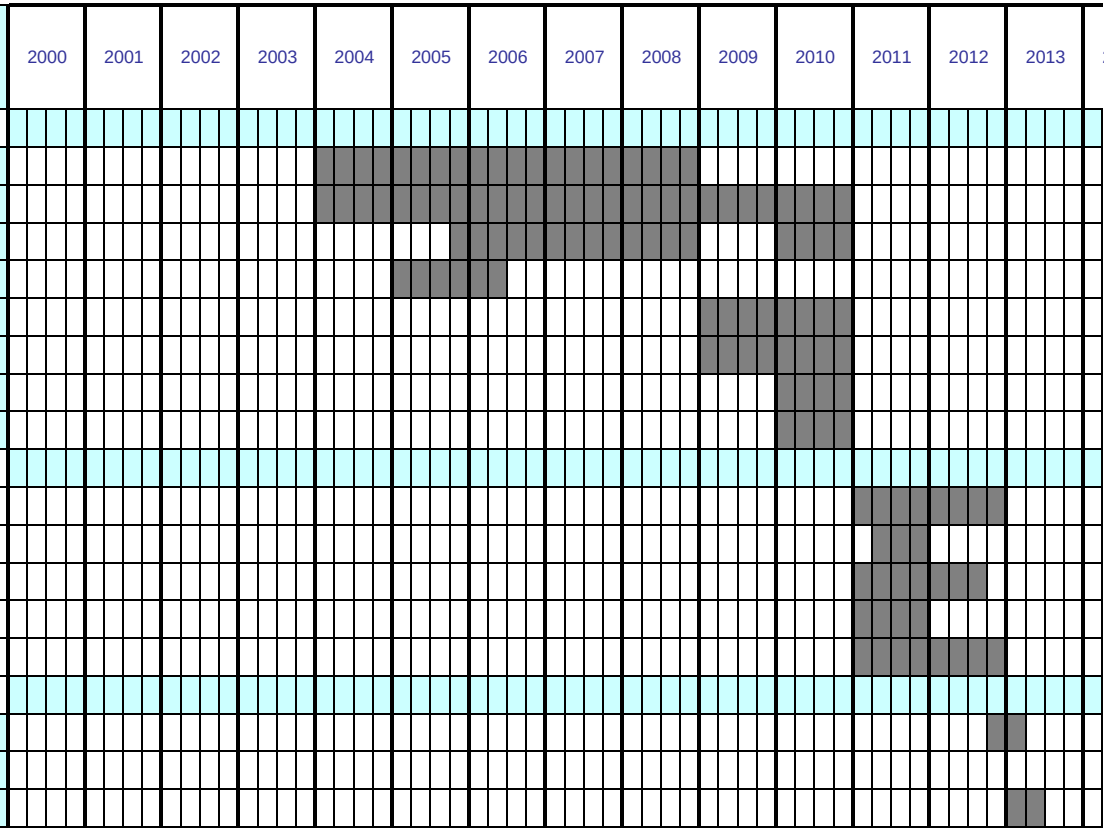
(Rev.16, June, 2014)

Insert Project Sponsor's Name here — Today's Date **6/15/14**

Insert Project Name and Location — Yr of Base Year $ 2014

Insert Current Phase (e.g. Applic. for SSGA, Construc — Yr of Revenue Ops 2020

Insert comments, notes, etc.	Start Date	End Date
Project Development	01/01/04	01/01/11
Design		
Develop cost estimate, schedule, ridership forecast		
Conduct reviews		
Develop NEPA document (DCE/EA/FEIS) and receive determination (CE/FONSI/ROD)		
Develop the contract documents for the Build Alternative		
Acquire real estate; relocate households and businesses		
Submit request / receive FTA approval for SSGA		
Issue requests for bids, make awards of construction contracts		
Construction	01/01/11	01/01/13
Construct fixed infrastructure		
Insert Contract Package Number and Description (i.e. Guideway, Stations, Systems, etc.)		
Insert Contract Package Number and Description (i.e. Guideway, Stations, Systems, etc.)		
Finalize real estate acquisitions and relocations		
Acquire and test vehicles		
Revenue Ops / Closeout of Project	01/01/13	03/01/15
Revenue Operations		
Fulfillment of the Small Starts funding commitment		
Completion of project close-out, resolution of claims		

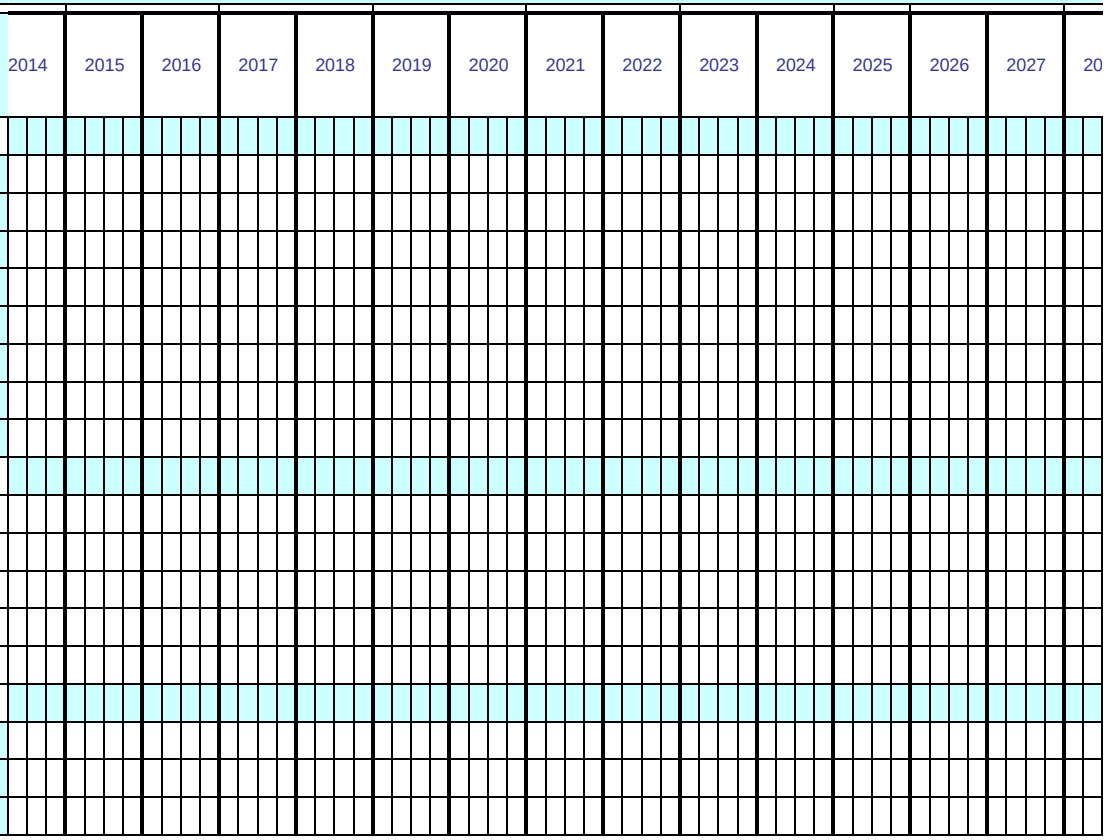


S C H E D U L E

(Rev.16, June, 2014)

Insert Project Sponsor's Name here	Today's Date	**6/15/14**
Insert Project Name and Location	Yr of Base Year $	2014
Insert Current Phase (e.g. Applic. for SSGA, Construc	Yr of Revenue Ops	2020

Insert comments, notes, etc.	Start Date	End Date
Project Development	01/01/04	01/01/11
Design		
Develop cost estimate, schedule, ridership forecast		
Conduct reviews		
Develop NEPA document (DCE/EA/FEIS) and receive determination (CE/FONSI/ROD)		
Develop the contract documents for the Build Alternative		
Acquire real estate; relocate households and businesses		
Submit request / receive FTA approval for SSGA		
Issue requests for bids, make awards of construction contracts		
Construction	01/01/11	01/01/13
Construct fixed infrastructure		
Insert Contract Package Number and Description (i.e. Guideway, Stations, Systems, etc.)		
Insert Contract Package Number and Description (i.e. Guideway, Stations, Systems, etc.)		
Finalize real estate acquisitions and relocations		
Acquire and test vehicles		
Revenue Ops / Closeout of Project	01/01/13	03/01/15
Revenue Operations		
Fulfillment of the Small Starts funding commitment		
Completion of project close-out, resolution of claims		



S C H E D U L E

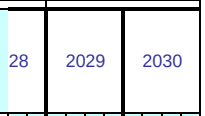
(Rev.16, June, 2014)

Insert Project Sponsor's Name here — Today's Date **6/15/14**

Insert Project Name and Location — Yr of Base Year $ 2014

Insert Current Phase (e.g. Applic. for SSGA, Construc — Yr of Revenue Ops 2020

Insert comments, notes, etc.	Start Date	End Date
Project Development	01/01/04	01/01/11
Design		
Develop cost estimate, schedule, ridership forecast		
Conduct reviews		
Develop NEPA document (DCE/EA/FEIS) and receive determination (CE/FONSI/ROD)		
Develop the contract documents for the Build Alternative		
Acquire real estate; relocate households and businesses		
Submit request / receive FTA approval for SSGA		
Issue requests for bids, make awards of construction contracts		
Construction	01/01/11	01/01/13
Construct fixed infrastructure		
Insert Contract Package Number and Description (i.e. Guideway, Stations, Systems, etc.)		
Insert Contract Package Number and Description (i.e. Guideway, Stations, Systems, etc.)		
Finalize real estate acquisitions and relocations		
Acquire and test vehicles		
Revenue Ops / Closeout of Project	01/01/13	03/01/15
Revenue Operations		
Fulfillment of the Small Starts funding commitment		
Completion of project close-out, resolution of claims		



A N N U A L I Z E D C O S T - B U I L D A L T E R N A T I V E (Current Year)

(Rev.16, June, 2014)

Insert Project Sponsor's Name here — Today's Date **6/15/14**

Insert Project Name and Location — Yr of Base Year $ 2014

Insert Current Phase (e.g. Applic. for SSGA, Construction, Rev Ops) — Yr of Revenue Ops 2020

	Quantity	Total Base Year Dollars (X000)	Cat. 80 Prof. Svc. spread proportionally over Cats. 10 - 50 (X000)	Spread Cat. 90 Unalloc. Cont. according to perceived risks (X000)	Revised Total Base Year Dollars (X000)	Federal Share of Base Year Dollars (based on 60.4 percent Federal funding share)	Years of Useful Life	Annualization Factor (based on 2% rate) [.02/1 - (1.02)^-no. yrs]	**Annualized Federal Share (X000)**
10 GUIDEWAY & TRACK ELEMENTS (route miles)	**5.00**	**50,000**	**17,260**	**7,000**	**74,260**	**44,861**			**980**
10.01 Guideway: At-grade exclusive right-of-way	5.00	50,000	17,260	7,000	74,260	44,861	125	0.0218	980
10.02 Guideway: At-grade semi-exclusive (allows cross-traffic)	0.00	0	0		0	0	30	0.0446	0
10.03 Guideway: At-grade in mixed traffic	0.00	0	0		0	0	20	0.0612	0
10.04 Guideway: Aerial structure	0.00	0	0		0	0	80	0.0252	0
10.05 Guideway: Built-up fill	0.00	0	0		0	0	80	0.0252	0
10.06 Guideway: Underground cut & cover	0.00	0	0		0	0	125	0.0218	0
10.07 Guideway: Underground tunnel	0.00	0	0		0	0	125	0.0218	0
10.08 Guideway: Retained cut or fill	0.00	0	0		0	0	125	0.0218	0
10.09 Track: Direct fixation		0	0		0	0	30	0.0446	0
10.10 Track: Embedded		0	0		0	0	20	0.0612	0
10.11 Track: Ballasted		0	0		0	0	35	0.0400	0
10.12 Track: Special (switches, turnouts)		0	0		0	0	30	0.0446	0
10.13 Track: Vibration and noise dampening		0	0		0	0	30	0.0446	0
20 STATIONS, STOPS, TERMINALS, INTERMODAL (number)	**10**	**15,000**	**5,178**	**10,000**	**30,178**	**18,231**			**486**
20.01 At-grade station, stop, shelter, mall, terminal, platform	10	15,000	5,178	10,000	30,178	18,231	70	0.0267	486
20.02 Aerial station, stop, shelter, mall, terminal, platform	0	0	0		0	0	70	0.0267	0
20.03 Underground station, stop, shelter, mall, terminal, platform	0	0	0		0	0	125	0.0218	0
20.04 Other stations, landings, terminals: Intermodal, ferry, trolley, etc.	0	0	0		0	0	70	0.0267	0
20.05 Joint development		0	0		0	0	70	0.0267	0
20.06 Automobile parking multi-story structure		0	0		0	0	50	0.0318	0
20.07 Elevators, escalators		0	0		0	0	30	0.0446	0
30 SUPPORT FACILITIES: YARDS, SHOPS, ADMIN. BLDGS		**5,000**	**1,726**	**0**	**6,726**	**4,063**			**129**
30.01 Administration Building: Office, sales, storage, revenue counting		0	0		0	0	50	0.0318	0
30.02 Light Maintenance Facility		5,000	1,726		6,726	4,063	50	0.0318	129
30.03 Heavy Maintenance Facility		0	0		0	0	50	0.0318	0
30.04 Storage or Maintenance of Way Building		0	0		0	0	50	0.0318	0
30.05 Yard and Yard Track		0	0		0	0	80	0.0252	0
40 SITEWORK & SPECIAL CONDITIONS		**26,675**	**9,208**	**500**	**36,383**	**21,980**			**654**
40.01 Demolition, Clearing, Earthwork		5,400	1,864		7,264	4,388	125	0.0218	96
40.02 Site Utilities, Utility Relocation		10,800	3,728		14,528	8,777	125	0.0218	192
40.03 Haz. mat'l, contam'd soil removal/mitigation, ground water treatments		0	0		0	0	125	0.0218	0
40.04 Environmental mitigation, e.g. wetlands, historic/archeologic, parks		5,400	1,864		7,264	4,388	125	0.0218	96
40.05 Site structures including retaining walls, sound walls		0	0		0	0	80	0.0252	0
40.06 Pedestrian / bike access and accommodation, landscaping		5,075	1,752	500	7,327	4,426	20	0.0612	271
40.07 Automobile, bus, van accessways including roads, parking lots		0	0		0	0	20	0.0612	0
40.08 Temporary Facilities and other indirect costs during construction		0	0		0	0	100	0.0232	0
50 SYSTEMS		**15,000**	**5,178**	**500**	**20,678**	**12,492**			**572**
50.01 Train control and signals		5,000	1,726	500	7,226	4,365	30	0.0446	195
50.02 Traffic signals and crossing protection		1,250	431		1,681	1,016	30	0.0446	45
50.03 Traction power supply: substations		2,500	863		3,363	2,032	50	0.0318	65
50.04 Traction power distribution: catenary and third rail		2,500	863		3,363	2,032	30	0.0446	91
50.05 Communications		2,500	863		3,363	2,032	20	0.0612	124
50.06 Fare collection system and equipment		1,250	431		1,681	1,016	25	0.0512	52
50.07 Central Control		0	0		0	0	30	0.0446	0
Construction Subtotal (10 - 50)		**111,675**	**38,550**	**18,000**	**168,225**	**101,627**			**2,821**
60 ROW, LAND, EXISTING IMPROVEMENTS		**17,500**		**1,000**	**18,500**	**11,176**			**244**
60.01 Purchase or lease of real estate		17,500		1,000	18,500	11,176	125	0.0218	244
60.02 Relocation of existing households and businesses		0			0	0	125	0.0218	0
70 VEHICLES (number)	**7**	**14,100**		**1,000**	**15,100**	**9,122**			**467**
70.01 Light Rail	7	14,100		1,000	15,100	9,122	25	0.0512	467
70.02 Heavy Rail	0	0			0	0	25	0.0512	0
70.03 Commuter Rail	0	0			0	0	25	0.0512	0
70.04 Bus	0	0			0	0	12	0.0946	0
70.05 Other	0	0			0	0	12	0.0946	0
70.06 Non-revenue vehicles	0	0			0	0	12	0.0946	0
70.07 Spare parts	0	0			0	0	12	0.0946	0
80 PROFESSIONAL SERVICES (applies to Cats. 10-50)		**38,550**							
80.01 Project Development		13,800							
80.02 Engineering (not applicable to Small Starts)		0							
80.03 Project Management for Design and Construction		2,750							
80.04 Construction Administration & Management		11,000							
80.05 Professional Liability and other Non-Construction Insurance		2,750							
80.06 Legal; Permits; Review Fees by other agencies, cities, etc.		2,750							
80.07 Surveys, Testing, Investigation, Inspection		2,750							
80.08 Start up		2,750							
Subtotal (10 - 80)		**181,825**							
90 UNALLOCATED CONTINGENCY		**20,000**							
TOTAL		**201,825**	38,550	20,000	**201,825**	**121,925**			**3,532**

F U N D I N G S O U R C E S B Y C A T E G O R Y

(Rev.16, June, 2014)

Insert Project Sponsor's Name here

Today's Date **6/15/14**

Insert Project Name and Location

Insert Current Phase (e.g. Applic. for SSGA, Construction, Rev Ops)

	Cost		Funding Summary			Federal Sources					Local Sources		
	YOE Cost (X000)	Double-check Total	Federal 5309 Small Starts Funds	Federal Other Funds	Local Funds	Federal 5309 Small Starts	Other (e.g., CMAQ)	Other	Other	Other	Sales Tax	Other	Other
10 GUIDEWAY & TRACK ELEMENTS (route miles)	52,300	52,300	2,000	29,999	20,301	2,000	29,999				20,301		
20 STATIONS, STOPS, TERMINALS, INTERMODAL (number)	16,075	16,075	7,000	6,550	2,525	7,000	6,550				2,525		
30 SUPPORT FACILITIES: YARDS, SHOPS, ADMIN. BLDGS	5,266	5,266	2,500	1,100	1,666	2,500	1,100				1,666		
40 SITEWORK & SPECIAL CONDITIONS	27,084	27,084	10,000	3,000	14,084	10,000	3,000				14,084		
50 SYSTEMS	16,075	16,075	7,500	4,000	4,575	7,500	4,000				4,575		
60 ROW, LAND, EXISTING IMPROVEMENTS	17,590	17,590	7,500	700	9,391	7,500	700				9,391		
70 VEHICLES (number)	14,851	14,851	7,500	1,800	5,551	7,500	1,800				5,551		
80 PROFESSIONAL SERVICES (applies to Cats. 10-50)	38,684	38,684	23,499	4,001	11,184	23,499	4,001				11,184		
90 UNALLOCATED CONTINGENCY	21,075	21,075	5,000	1,500	14,575	5,000	1,500				14,575		
100 FINANCE CHARGES	9,500	9,500	2,500	4,350	2,650	2,500	4,350				2,650		
Total Project Cost (10 - 100)	218,497	218,497	74,999	56,999	86,500	74,999	56,999	0	0	0	86,500	0	0
Percentage of Total Project Cost	100%		34.3%	26.1%	39.6%	34.3%	26.1%	0.0%	0.0%	0.0%	39.6%	0.0%	0.0%
			34.3%	65.7%									
			100.00%										

FUNDING SOURCES BY YEAR

(Rev.16, June, 2014)

Insert Project Sponsor's Name here

Today's Date **6/15/14**

Insert Project Name and Location

Insert Current Phase (e.g. Applic. for SSGA, Construction, Rev Ops)

	Total, All Years		2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
Total Project Cost In YOE Dollars Below insert funding sources and amounts for each year	218,497	double check	0	0	0	0	0	0	0	0	0	222	500	500	1,500
Federal 5309 Small Starts	74,999	74,999													
Local	86,500	86,500	0	0	0	0	0	0	0	0	0	222	500	500	1,500
Federal Other	56,999	56,999													
Total Project Cost (10 - 100)	218,497	218,497	0	0	0	0	0	0	0	0	0	222	500	500	1,500

2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
10,415	55,500	68,810	56,311	18,239	500	500	500	500	500	500	500	500	500	500	500	500	500
416	20,000	29,000	25,583														
2,000	9,000	20,000	28,039	18,239	500	500	500	500	500	500	500	500	500	500	500	500	500
8,000	26,500	19,810	2,689														
10,415	55,500	68,810	56,311	18,239	500	500	500	500	500	500	500	500	500	500	500	500	500

Attachment 3
Baseline Cost Estimate

Project Sponsor Name
Project Name

Table 1 - BCE by Standard Cost Category

Applicable Line Items Only	YOE Dollars Total (X000)
10 GUIDEWAY & TRACK ELEMENTS (route miles)	**52,299,500**
10.01 Guideway: At-grade exclusive right-of-way	52,299,500
10.02 Guideway: At-grade semi-exclusive (allows cross-traffic)	0
10.03 Guideway: At-grade in mixed traffic	0
10.04 Guideway: Aerial structure	0
10.05 Guideway: Built-up fill	0
10.06 Guideway: Underground cut & cover	0
10.07 Guideway: Underground tunnel	0
10.08 Guideway: Retained cut or fill	0
10.09 Track: Direct fixation	0
10.10 Track: Embedded	0
10.11 Track: Ballasted	0
10.12 Track: Special (switches, turnouts)	0
10.13 Track: Vibration and noise dampening	0
20 STATIONS, STOPS, TERMINALS, INTERMODAL (number)	**16,074,714**
20.01 At-grade station, stop, shelter, mall, terminal, platform	16,074,714
20.02 Aerial station, stop, shelter, mall, terminal, platform	0
20.03 Underground station, stop, shelter, mall, terminal, platform	0
20.04 Other stations, landings, terminals: Intermodal, ferry, trolley, etc.	0
20.05 Joint development	0
20.06 Automobile parking multi-story structure	0
20.07 Elevators, escalators	0
30 SUPPORT FACILITIES: YARDS, SHOPS, ADMIN. BLDGS	**5,265,563**
30.01 Administration Building: Office, sales, storage, revenue counting	0
30.02 Light Maintenance Facility	5,265,563
30.03 Heavy Maintenance Facility	0
30.04 Storage or Maintenance of Way Building	0
30.05 Yard and Yard Track	0
40 SITEWORK & SPECIAL CONDITIONS	**27,083,625**
40.01 Demolition, Clearing, Earthwork	5,482,721
40.02 Site Utilities, Utility Relocation	10,965,441
40.03 Haz. mat'l, contam'd soil removal/mitigation, ground water treatmen	0
40.04 Environmental mitigation, e.g. wetlands, historic/archeologic, parks	5,482,721
40.05 Site structures including retaining walls, sound walls	0
40.06 Pedestrian / bike access and accommodation, landscaping	5,152,742
40.07 Automobile, bus, van accessways including roads, parking lots	0
40.08 Temporary Facilities and other indirect costs during construction	0
50 SYSTEMS	**16,074,714**
50.01 Train control and signals	5,358,238
50.02 Traffic signals and crossing protection	1,339,560
50.03 Traction power supply: substations	2,679,119
50.04 Traction power distribution: catenary and third rail	2,679,119
50.05 Communications	2,679,119
50.06 Fare collection system and equipment	1,339,560
50.07 Central Control	0
Construction Subtotal (10 - 50)	**116,798,116**
60 ROW, LAND, EXISTING IMPROVEMENTS	**17,590,000**
60.01 Purchase or lease of real estate	17,590,000
60.02 Relocation of existing households and businesses	0
70 VEHICLES (number)	**14,850,698**
70.01 Light Rail	14,850,698
70.02 Heavy Rail	0
70.03 Commuter Rail	0
70.04 Bus	0
70.05 Other	0
70.06 Non-revenue vehicles	0
70.07 Spare parts	0
80 PROFESSIONAL SERVICES (applies to Cats. 10-50)	**38,683,530**
80.01 Project Development	13,847,801
80.02 Engineering (not applicable to Small Starts)	0
80.03 Project Management for Design and Construction	2,759,526
80.04 Construction Administration & Management	11,038,102
80.05 Professional Liability and other Non-Construction Insurance	2,759,526
80.06 Legal; Permits; Review Fees by other agencies, cities, etc.	2,759,526
80.07 Surveys, Testing, Investigation, Inspection	2,759,526
80.08 Start up	2,759,526
Subtotal (10 - 80)	**187,922,344**
90 UNALLOCATED CONTINGENCY	**21,074,714**
Subtotal (10 - 90)	**208,997,059**
100 FINANCE CHARGES	**9,500,000**
Total Project Cost (10 - 100)	**218,497,059**

Attachment 3
Baseline Cost Estimate

Project Sponsor Name
Project Name

Table 2 - Inflated Cost to Year of Expenditure

	Base Year Dollars w/o Contingency (X000)	Base Year Dollars Allocated Contingency (X000)	Base Year Dollars TOTAL (X000)	Inflation Factor	YOE Dollars TOTAL (X000)
10 GUIDEWAY & TRACK ELEMENTS (route miles)	40,000,000	10,000,000	50,000,000	1.0460	52,299,500
20 STATIONS, STOPS, TERMINALS, INTERMODAL (numbe	14,000,000	1,000,000	15,000,000	1.0716	16,074,714
30 SUPPORT FACILITIES: YARDS, SHOPS, ADMIN. BLDGS	4,000,000	1,000,000	5,000,000	1.0531	5,265,563
40 SITEWORK & SPECIAL CONDITIONS	22,175,000	4,500,000	26,675,000	1.0153	27,083,625
50 SYSTEMS	12,500,000	2,500,000	15,000,000	1.0716	16,074,714
60 ROW, LAND, EXISTING IMPROVEMENTS	15,000,000	2,500,000	17,500,000	1.0051	17,590,000
70 VEHICLES (number)	12,600,000	1,500,000	14,100,000	1.0532	14,850,698
80 PROFESSIONAL SERVICES (applies to Cats. 10-50)	35,000,000	3,550,000	38,550,000	1.0035	38,683,530
90 UNALLOCATED CONTINGENCY			20,000,000	1.0537	21,074,714
100 FINANCE CHARGES			7,600,171	1.2500	9,500,000
Total Project Cost (10 - 100)			**209,425,171**	1.0433	**218,497,059**

Attachment 3
Baseline Cost Estimate

Project Sponsor Name
Project Name

Table 3 - BCE by Source of Funding

	Total Project Cost in YOE Dollars (X000)		Double Check Total (X000)	Federal 5309 Small Starts	Federal Other	Local
10 GUIDEWAY & TRACK ELEMENTS (route miles)	52,299,500		52,299,500	2,000,000	29,998,500	20,301,000
20 STATIONS, STOPS, TERMINALS, INTERMODAL (number)	16,074,714		16,074,714	7,000,000	6,550,000	2,524,714
30 SUPPORT FACILITIES: YARDS, SHOPS, ADMIN. BLDGS	5,265,563		5,265,563	2,500,000	1,100,000	1,665,563
40 SITEWORK & SPECIAL CONDITIONS	27,083,625		27,083,625	10,000,000	3,000,000	14,083,625
50 SYSTEMS	16,074,714		16,074,714	7,500,000	4,000,000	4,574,714
60 ROW, LAND, EXISTING IMPROVEMENTS	17,590,000		17,590,000	7,500,000	699,500	9,390,500
70 VEHICLES (number)	14,850,698		14,850,698	7,500,000	1,800,000	5,550,698
80 PROFESSIONAL SERVICES (applies to Cats. 10-50)	38,683,530		38,683,530	23,499,000	4,000,500	11,184,030
90 UNALLOCATED CONTINGENCY	21,074,714		21,074,714	5,000,000	1,500,000	14,574,714
100 FINANCE CHARGES	9,500,000		10,000,000	2,499,500	4,350,000	3,150,500
Total Project Cost (10 - 100)	**218,497,059**		**218,997,058**	**74,998,500**	**56,998,500**	**87,000,058**

Sources of Federal Funding and Matching Share Ratios

	Costs Attributed to Source of Funds (X000)		Federal/ Local Matching Ratio within Source	All Federal Funds (X000)	Local Funds (X000)
Federal 5309 New Starts	161,998,559		46/54	74,998,500	87,000,059
Federal Other (please specify sources...)	56,998,500			56,998,500	
Total	**218,997,059**			**131,997,000**	**87,000,059**
Overall Federal Share of Project			60.27%		
New Starts Share of Project			34.32%		

Attachment 3A
Project Budget

Project Sponsor Name
Project Name

Scope and Activity Description

Scope Code	ALI Code	Scope and Activity Line Item Descriptions	Qty		Federal 5309 Small Starts			Federal Other			Project Totals			Check Total Project Cost in YOE Dollars (X000)
				Total Federal %	Federal	Local	Total	Federal	Local	Total	Federal	Local	Total	
14010	140110	GUIDEWAY & TRACK ELEMENTS	5.00	61.18%	2,000	20,301	22,301	29,999	0	29,999	31,999	20,301	52,300	52,300
14020	140220	STATIONS, STOPS, TERMINALS, INTERMODAL	10	84.29%	7,000	2,525	9,525	6,550	0	6,550	13,550	2,525	16,075	16,075
14030	140330	SUPPORT FACILITIES, YARDS, SHOPS, ADMIN. BLDGS.		68.37%	2,500	1,666	4,166	1,100	0	1,100	3,600	1,666	5,266	5,266
14040	140440	SITEWORK & SPECIAL CONDITIONS		48.00%	10,000	14,084	24,084	3,000	0	3,000	13,000	14,084	27,084	27,084
14050	140550	SYSTEMS		71.54%	7,500	4,575	12,075	4,000	0	4,000	11,500	4,575	16,075	16,075
14060	140660	ROW, LAND, EXISTING IMPROVEMENTS		46.61%	7,500	9,391	16,891	700	0	700	8,200	9,391	17,590	17,590
14070		VEHICLES	7	62.62%	7,500	5,551	13,051	1,800	0	1,800	9,300	5,551	14,851	14,851
	13.13.20	Light Rail Cars	7											
	13.__.__													
14080	140880	PROFESSIONAL SERVICES		71.09%	23,499	11,184	34,683	4,001	0	4,001	27,500	11,184	38,684	38,684
14090	140990	UNALLOCATED CONTINGENCY		30.84%	5,000	14,575	19,575	1,500	0	1,500	6,500	14,575	21,075	21,075
14100	141010	FINANCE CHARGES		68.50%	2,500	3,151	5,650	4,350	0	4,350	6,850	3,151	10,000	9,500
Total Project Cost (10 - 100)				60.27%	74,999	87,000	161,999	56,999	0	56,999	131,997	87,000	218,997	218,497

Attachment 4
Project Schedule

Project Sponsor Name
Project Name

SCHEDULE	Start Date	End Date	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
10 GUIDEWAY & TRACK ELEMENTS (route miles)																
20 STATIONS, STOPS, TERMINALS, INTERMODAL (number)																
30 SUPPORT FACILITIES: YARDS, SHOPS, ADMIN. BLDGS																
40 SITEWORK & SPECIAL CONDITIONS																
50 SYSTEMS																
60 ROW, LAND, EXISTING IMPROVEMENTS																
70 VEHICLES (number)																
80 PROFESSIONAL SERVICES (applies to Cats. 10-50)																
90 UNALLOCATED CONTINGENCY																
100 FINANCE CHARGES																
Revenue Ops / Closeout of Project																
Fulfillment of the Small Starts funding commitment																
Completion of project close-out, resolution of claims																

Attachment 4
Project Schedule

Project Sponsor Name
Project Name

SCHEDULE	Start Date	End Date	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	20
10 GUIDEWAY & TRACK ELEMENTS (route miles)																
20 STATIONS, STOPS, TERMINALS, INTERMODAL (number)																
30 SUPPORT FACILITIES: YARDS, SHOPS, ADMIN. BLDGS																
40 SITEWORK & SPECIAL CONDITIONS																
50 SYSTEMS																
60 ROW, LAND, EXISTING IMPROVEMENTS																
70 VEHICLES (number)																
80 PROFESSIONAL SERVICES (applies to Cats. 10-50)																
90 UNALLOCATED CONTINGENCY																
100 FINANCE CHARGES																
Revenue Ops / Closeout of Project																
Fulfillment of the Small Starts funding commitment																
Completion of project close-out, resolution of claims																

Attachment 4
Project Schedule

Project Sponsor Name
Project Name

SCHEDULE	Start Date	End Date	27	2028	2029	2030
10 GUIDEWAY & TRACK ELEMENTS (route miles)						
20 STATIONS, STOPS, TERMINALS, INTERMODAL (number)						
30 SUPPORT FACILITIES: YARDS, SHOPS, ADMIN. BLDGS						
40 SITEWORK & SPECIAL CONDITIONS						
50 SYSTEMS						
60 ROW, LAND, EXISTING IMPROVEMENTS						
70 VEHICLES (number)						
80 PROFESSIONAL SERVICES (applies to Cats. 10-50)						
90 UNALLOCATED CONTINGENCY						
100 FINANCE CHARGES						
Revenue Ops / Closeout of Project						
Fulfillment of the Small Starts funding commitment						
Completion of project close-out, resolution of claims						