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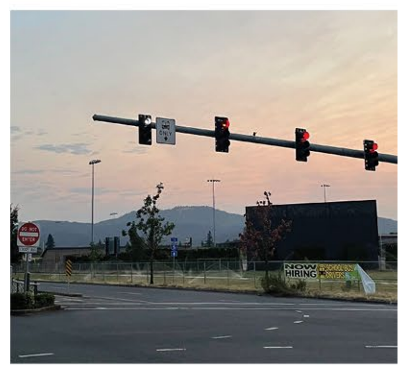
CENTRAL LANE
METROPOLITAN PLANNING ORGANIZATION

2045 Regional Transportation Plan

JANUARY 2022







ACKNOWLEDGEMENTS

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TABLE OF CONTENTS

LIST OF FIGURES

LIST OF TABLES

CHAPTER 1: SETTING THE STAGE

The *2045 Regional Transportation Plan* (RTP) for the Central Lane Metropolitan Planning Organization (referred to in this Plan as CLMPO or Central Lane MPO) is the Eugene-Springfield urban area's long-range transportation planning document. It represents a coordinated planning process between local jurisdictions and the region's transportation agency and presents the region's goals for a safe, accessible, and efficient multimodal transportation system that will accommodate forecasted growth through a 2045 horizon year. The RTP supports policy direction and priorities identified in local planning documents to guide the project, programs, plans, and management strategies for the regional transportation system through 2045.

The 2045 RTP is an update to the CLMPO's 2040 RTP and is compliant with the requirements of the current federal transportation act, Fixing America's Surface Transportation (FAST) Act of 2015. The 2045 RTP supports forecasted land use, population, and employment growth allocations with a fiscally constrained list of projects and strategies. The 2045 RTP is also the CLMPO's first to establish a performance-based planning and programming framework to achieve the region's goals and measure progress along the way.

Transportation is at a crossroad with multiple competing demands on the current multimodal system, climate change impacts not limited to wildfires and water shortages, a global pandemic, the fundamental need for equity and housing, cutting edge innovations in technology and autonomous vehicles, and stresses on fiscal resources. These conditions make travel demand and needed forecasting increasingly challenging, but also increasingly important. This RTP is intended to provide a flexible and strategic framework from which to meet the current and future needs of the Central Lane MPO's growing community.

Two bicyclists wait to board a bus in Springfield.

CENTRAL LANE METROPOLITAN PLANNING ORGANIZATION

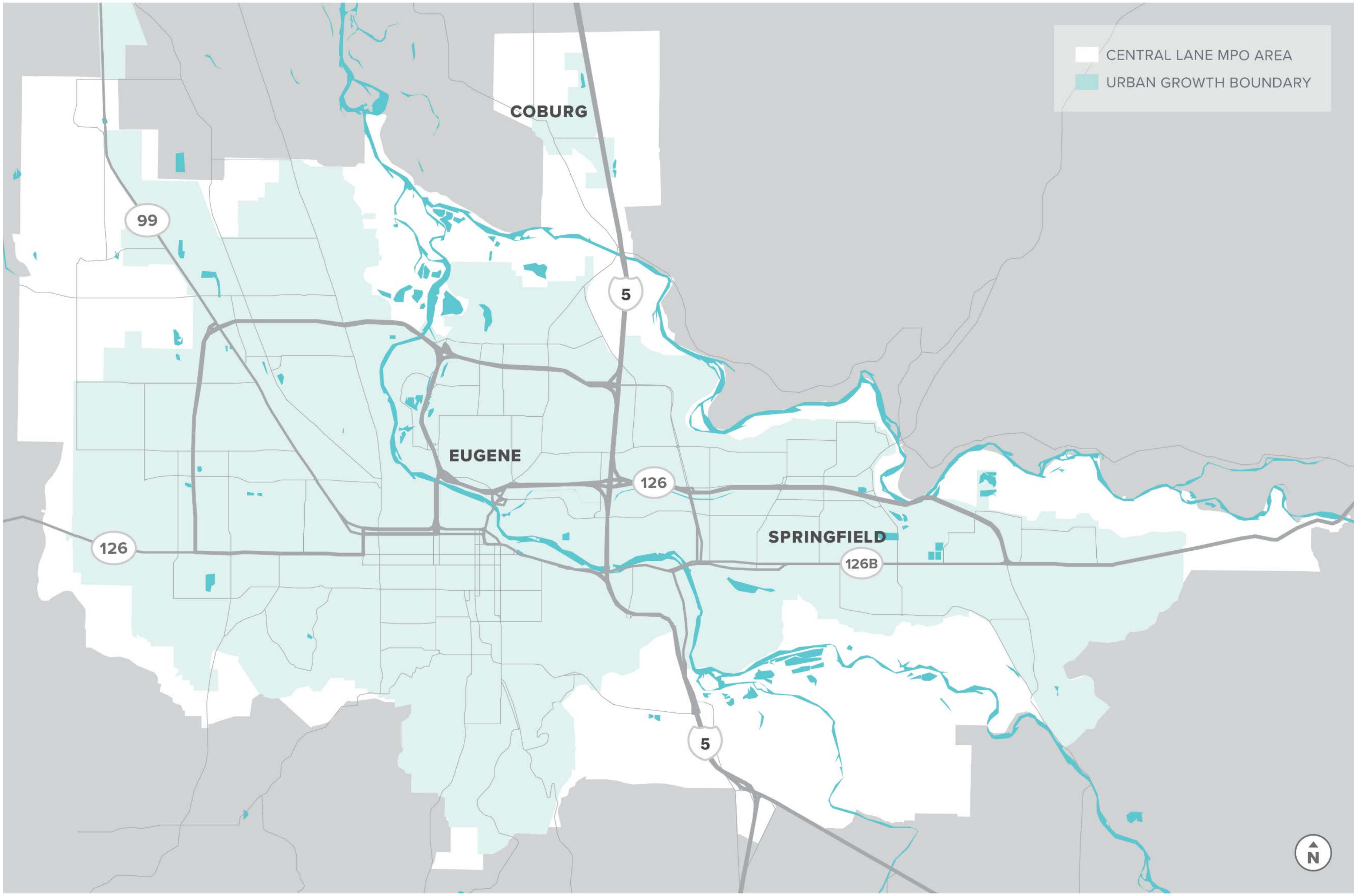
Federal legislation requires that any urbanized area with a population greater than 50,000 must have a Metropolitan Planning Organization (MPO). MPOs ensure that existing and future expenditures for transportation projects and programs are based on a continuous, cooperative, and comprehensive planning process. Among other functions and requirements, MPOs cooperate with state agencies and public transportation operators to program federal funds for eligible transportation projects. The Governor of Oregon designated LCOG as the MPO for the for the urban area which now includes the cities of Eugene, Springfield, and Coburg. CLMPO is one of over 400 MPOs across the country and one of 10 MPOs in Oregon. As such, CLMPO is the lead agency for regional transportation planning and distributing federal transportation dollars, serving as a forum for cooperative transportation decision-making by channeling federal funding for transportation projects and programs through a sound planning process that is comprehensive, cooperative, and continuing. Partner agencies include the cities of Eugene, Springfield, and Coburg, Lane County, Lane Transit District, and the Oregon Department of Transportation (ODOT).

CLMPO's policy board and decision-making body is called the Metropolitan Policy Committee (MPC). MPC is composed of public officials from Springfield, Eugene, Lane County, Coburg, Lane Transit District, and ODOT. Additional details on the decision-making structure as it relates to this planning effort are depicted in the *Decision-Making Structure* section below.

Intergovernmental coordination is a foundational role for CLMPO. This coordination is facilitated through the development of the Unified Planning Work Program and budget. Please see Appendix A for a summary of the interagency coordination that guides CLMPO's work and follows the framework identified in 23 Code of Federal Regulation (CFR) 450.316.

The MPO planning area covers the area within the urban growth boundaries of Eugene, Springfield, and Coburg and a small area of Lane County adjacent to these urban areas, as shown in Figure 1.

FIGURE 1. CLMPO PLANNING AREA



It is CLMPO's responsibility to meet federal requirements to receive funding as the U.S. Congress authorizes funding for transportation improvements nationally through multi-year authorization legislation. The primary source of federal requirements addressed in this Plan is the FAST Act. The FAST Act is federal transportation legislation that authorizes funding and establishes the requirements for the metropolitan transportation planning process that governs CLMPO's activities. The FAST Act was signed into law in 2015 and includes the requirement for transportation performance management, which defines the decision-making framework for selecting transportation projects and programs that are tied to national goal areas. In addition, system performance is tracked by applying a combination of measures and targets to assess ongoing progress towards these goals.

In combination, these requirements call for development of a multimodal transportation system plan that is integrated with the region's land use plans and meets federal and state planning requirements.

In addition to the federal requirements addressed with this RTP, CLMPO is required to maintain a Congestion Management Process (CMP). This process is documented in Appendix B and summarized in Chapter 2. The connections between the RTP and CMP are described in Chapter 2.

REGIONAL TRANSPORTATION PLAN

The federally required metropolitan transportation planning process establishes a continuous, cooperative, and comprehensive regional framework for multimodal transportation planning. As part of this process, CLMPO is required to produce an RTP that:

- Describes long-range goals, objectives, and needs for the next 20 to 25 years
- Supports the seven national goal areas summarized in Figure 2.
- Considers projects and strategies that address the ten federal planning factors shown in Figure 3.

The RTP is a blueprint to guide investments for all forms of travel – motor vehicle, transit, bicycle, and walking – and the movement of goods and freight throughout the CLMPO area. It identifies current and future transportation needs, investments needed to meet those needs, and what funds the region expects to have available over the next 25 years. The RTP is updated every four years to reflect changing conditions in the region and respond to federal and state regulatory developments.

The 2045 CLMPO RTP presents the region's vision for a multimodal transportation system that addresses future growth and demographic trends. The RTP builds upon and supports policy direction and priorities identified in local planning documents to guide the development and management of the regional transportation system through 2045.

FIGURE 2. NATIONAL PLANNING GOALS

NATIONAL PLANNING GOALS

1. **SAFETY**
   To achieve a significant reduction in traffic fatalities and serious injuries on all public roads.

2. **INFRASTRUCTURE CONDITION**
   To maintain the highway infrastructure asset system in a state of good repair.

3. **CONGESTION REDUCTION**
   To achieve a significant reduction in congestion on the National Highway System.

4. **SYSTEM RELIABILITY**
   To improve the efficiency of the surface transportation system.

5. **FREIGHT MOVEMENT AND ECONOMIC VITALITY**
   To improve the national freight network, strengthen the ability of rural communities to access national and international trade markets, and support regional economic development.

6. **ENVIRONMENTAL SUSTAINABILITY**
   To enhance the performance of the transportation system while protecting and enhancing the natural environment.

7. **REDUCED PROJECT DELIVERY DELAYS**
   To reduce project costs, promote jobs and the economy, and expedite the movement of people and goods by accelerating project completion through eliminating delays in the project development and delivery process, including reducing regulatory burdens and improving agencies' work practices.

FIGURE 3. FEDERAL PLANNING FACTORS

FEDERAL PLANNING FACTORS

1. Support the economic vitality of the metropolitan area, especially by enabling global competitiveness, productivity, and efficiency
2. Increase the safety of the transportation system for motorized and non-motorized users
3. Increase the security of the transportation system for motorized and non-motorized users
4. Increase accessibility and mobility of people and freight
5. Protect and enhance the environment, promote energy conservation, improve the quality of life, and promote consistency between transportation improvements and State and local planned growth and economic development patterns
6. Enhance the integration and connectivity of the transportation system, across and between modes, for people and freight
7. Promote efficient system management and operation
8. Emphasize the preservation of the existing transportation system
9. Improve the resiliency and reliability of the transportation system and reduce or mitigate stormwater impacts of surface transportation
10. Enhance travel and tourism

Federal Planning Factor 9 "Improve the resiliency and reliability of the transportation system and reduce or mitigate stormwater impacts of surface transportation" and Planning Factor 10 "Enhance travel and tourism" were added to 23 CFR 450.306(b)(9) and required in RTPs after CLMPO's 2040 RTP was adopted. CLMPO staff prepared white papers to consider how both may be integrated into this RTP. Please see the following Appendices:

- Appendix C: Planning Factor 9 White Paper
- Appendix D: Planning Factor 10 White Paper

COORDINATION WITH THE CONGESTION MANAGEMENT PROCESS AND INTELLIGENT TRANSPORTATION SYSTEMS PLAN

CLMPO's RTP was developed in conjunction with two other regional plans: the Congestion Management Process (CMP) and the Intelligent Transportation Systems (ITS) Plan. The combination of the RTP, CMP, and ITS Plans uniquely connects the region's technology and transportation options priorities and strategies to address growth, congestion, environmental hazards, and transportation advancements. Figure 4 depicts the relationship between the three plans. As shown, projects from the ITS Plan are incorporated into the RTP. The CMP will inform the planning and investment decisions embedded in the RTP and subsequent implementation through projects, programs, and other implementation activities.

This integrated and concurrent approach to update the RTP, CMP, and ITS Plans resulted in an integrated set of strategies, solutions, and implementation measures.

FIGURE 4. RELATIONSHIP BETWEEN REGIONAL AND LOCAL TRANSPORTATION PLANS

PUBLIC INVOLVEMENT AND DECISION-MAKING PROCESS

The RTP's Public Involvement Plan (Appendix E) established a collaboration between CLMPO staff and the public to inform and provide direction throughout the RTP development. The CLMPO conducted outreach throughout the RTP update to share information about the project with the public and solicit input about transportation needs and funding priorities (See Appendix F for the full summary). CLMPO conducted surveys to understand how members of the public currently use the transportation system and their preferences for future developments. Due to the impact of the COVID-19 pandemic, all public engagement activities were conducted online, remotely, and through mailers, and included:

- An online open house
- A travel behavior survey
- Outreach with regional advisory committees and community groups

Online Open House

To gather feedback to inform the update of the RTP, the project team developed an online open house that included an issues map and asked people to respond to a series of questions about their thoughts and ideas regarding transportation needs and funding priorities. To increase participation from those who may not have access to the internet or who may not have known about the online open house, a bilingual mailer in Spanish and English was sent to traditionally underrepresented or excluded community members with the same questions that were in the online open house. Additionally, the team reached out to Downtown Languages to distribute a bilingual paper survey. This survey had the same questions that were in the online open house.

Advertisements for the online open house were made through the project website, social media posts, news releases to the local media, bilingual (Spanish/English) mailer and flyer, email blasts and presentations at community group meetings.

Overall, 190 people participated, with 125 participating in the online open house, 46 completing and sending back the mailer, and 19 completing the bilingual survey. Online open house participants were given the opportunity to identify specific transportation system locations in the CLMPO area where they have concerns, issues, or ideas for improvement. Seventy-nine unique users submitted a total of 268 comments. Comments from the online open house came from nine different zip codes.

Table 1 provides a summary of the number of comments by responder home region.

TABLE 1: ONLINE OPEN HOUSE RESPONDERS HOME REGION

HOME OF RESPONDER (ZIP CODE)	NUMBER OF COMMENTS
SOUTH EUGENE (97405)	29
WEST EUGENE (97402)	19
CENTRAL EUGENE (97401)	16
NORTHWEST EUGENE (97404)	13
CENTRAL SPRINGFIELD (97477)	11
EAST SPRINGFIELD/UNINCORPORATED (97478)	5
SOUTHEAST EUGENE (97403)	5
COBURG (97408)	4
UNINCORPORATED PLEASANT HILL (97455)	1

Overall, people were most focused on safety, with the primary concern being bike/pedestrian safety at intersections. The next most common concern centered on bike/pedestrian safety due to lack of bike lanes, narrow sidewalks, and/or bad signage. The third most common theme across the comments was network connectivity and connections between the different modes of transportation.

Figure 5 and Figure 6 provide snapshots of the public engagement conducted through the online open house, with a full list of the comments provided in Appendix F.

FIGURE 5. SNAPSHOT OF ONLINE OPEN HOUSE MENU

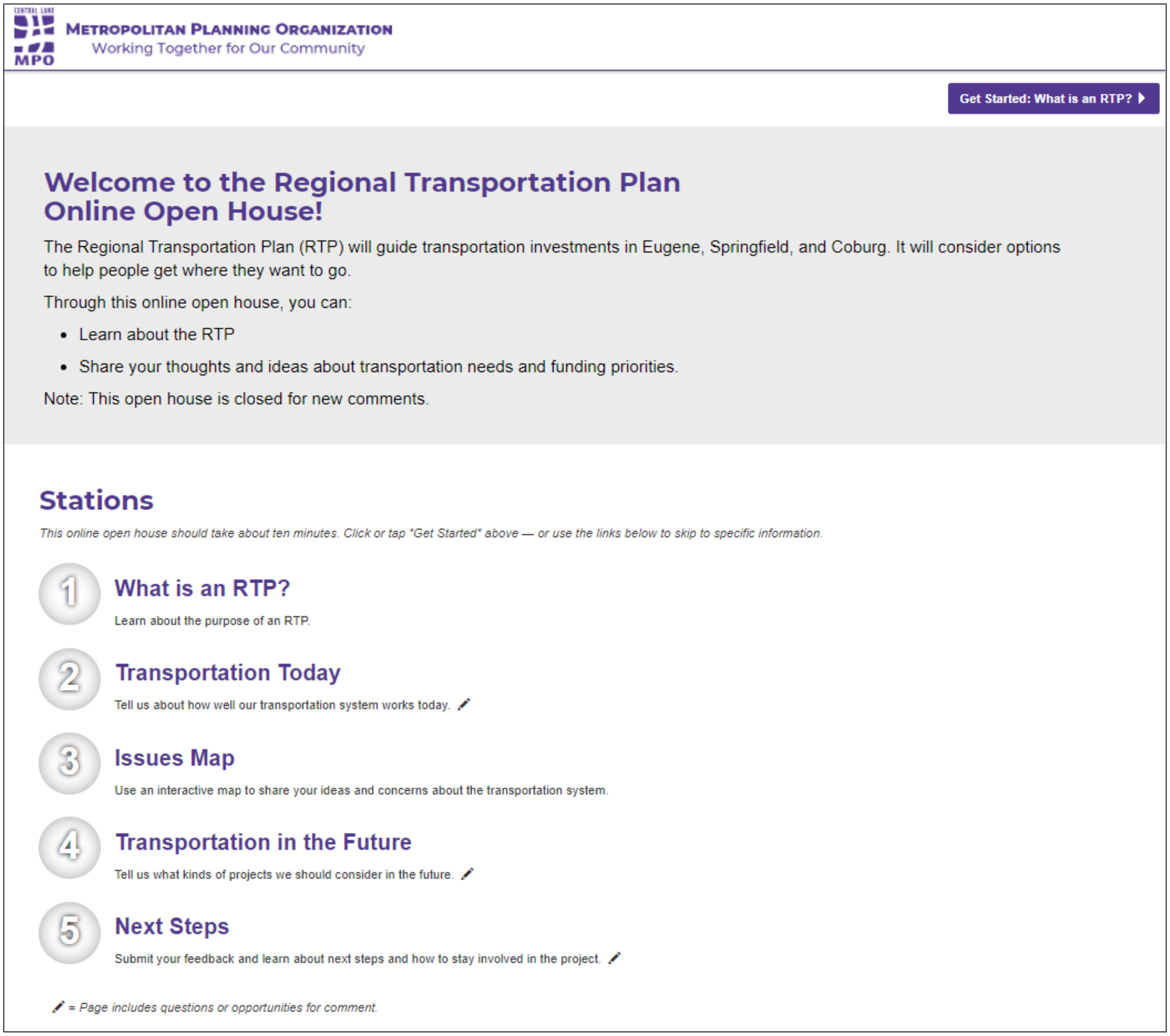


FIGURE 6. SNAPSHOT OF ISSUES MAP GENERATED THROUGH ONLINE OPEN HOUSE

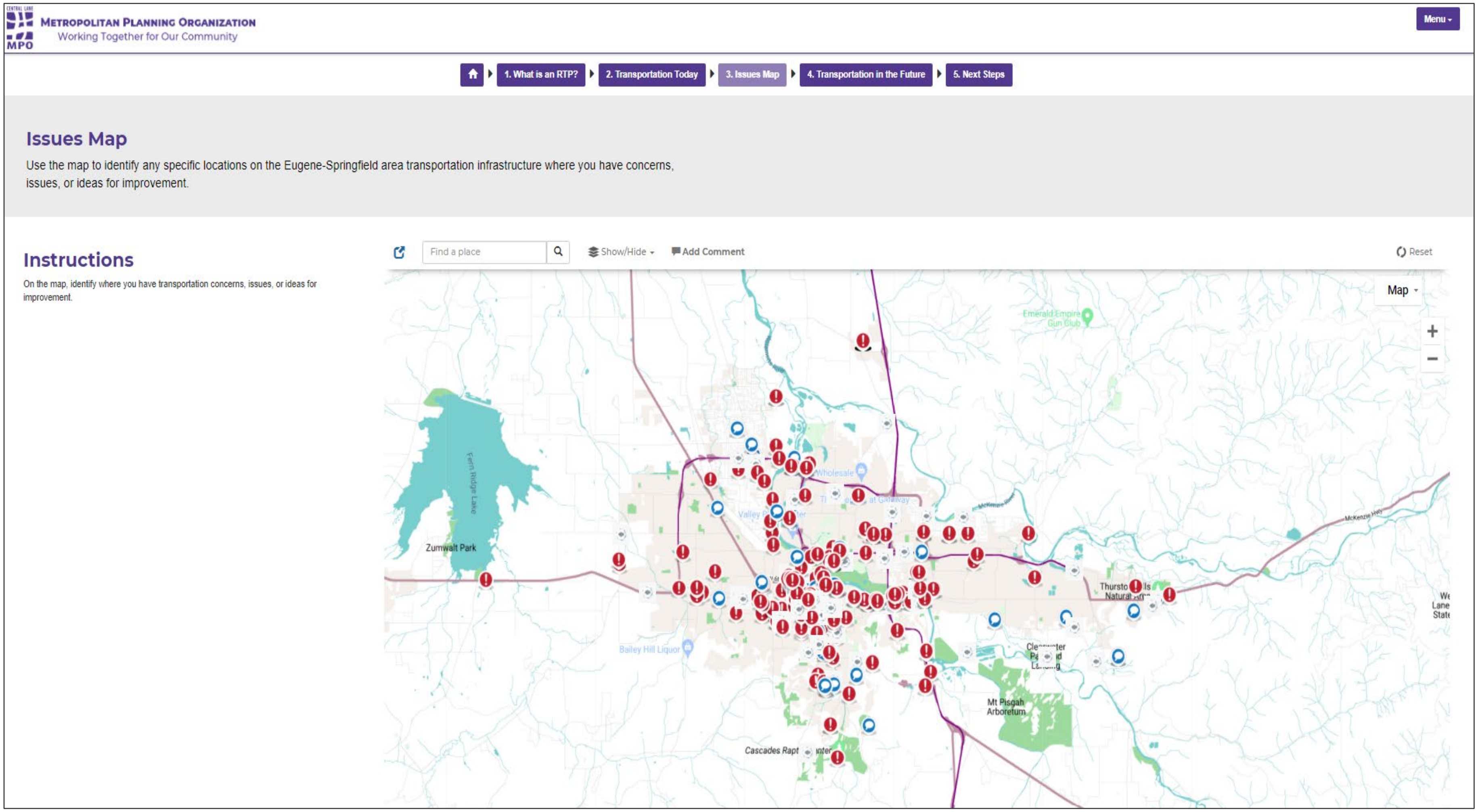
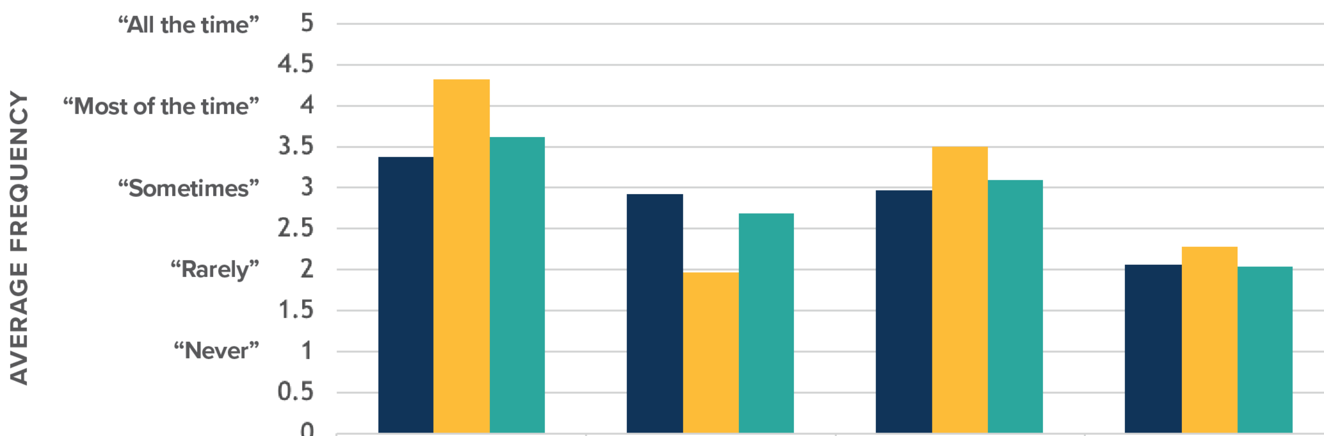


Figure 7 summarizes data from the online open house and data from the bilingual mailer for how often people use various modes of transportation. The data from the online open house have been converted from qualitative data to quantitative data where "All the time" equates to 5, "Most of the time" to 4, "Sometimes" to 3, "Rarely" to 2, and "Never" to 1, which aligns with the rating scale used in the mailer. Driving or riding in a car or other vehicle is the most used mode of transportation.

FIGURE 7. MODE USE SURVEY – FREQUENCY OF TRAVEL MODE USE



	Driving or riding in a car or other motor vehicle	Riding a bike	Walking	Taking the bus
Online Open House	3.37	2.91	2.95	2.05
Bilingual Mailer	4.33	1.97	3.50	2.28
Combined	3.62	2.69	3.09	2.03

The bilingual survey was developed as an alternative to the online open house, which was offered in English. Originally, the survey was offered in Spanish only and posted on the home page of the online open house as an opportunity for Spanish-speakers to answer the same questions that were in the open house. There were no initial responses to the Spanish Language survey; therefore, English translations of all the questions were added to the survey to make it bilingual so that it could be shared with students of Downtown Languages, a nonprofit in the Eugene-Springfield area that provides language, literacy, and other educational programs. Students from Downtown Languages who completed the survey between May 1-31, and who provided their contact information, were provided a $20 Visa gift card. Of 22 total responses, 19 people completed the survey and left their contact information.

Travel Barriers and Benefits Survey

A travel barriers and benefits survey conducted between June 25 and July 10, 2020 provides insights into regional perceptions towards travel and a better understanding of travel priorities and behavior. This survey was a follow-up to a similar survey conducted by DHM Research in 2014 and is intended to become a regular part of the public involvement process in upcoming RTP updates to provide a temporal snapshot of travel behaviors and perceptions. The survey was a hybrid of telephone and text-to-online. The sample size of 502 residents was statistically significant for the

CLMPO region and was sufficient to assess opinions generally and to review findings by multiple subgroups, including age, gender, area, and party affiliation. Appendix G provides a thorough report of the survey, responses, and findings. The summary of observations included:

- Expanding bus transportation, reducing traffic congestion, and improving road conditions are the top transportation issues for residents of the CLMPO Area.
- Driving alone is the most frequently used mode of transportation followed by driving with others in the household and walking.
- The top reasons people bike and walk for transportation are for enjoyment and for health benefits.
- There is a desire among some residents to bike or walk more often for transportation purposes.
- The top reasons people ride the bus are limited car access, financial considerations, and enjoyment.
- There is a desire among some residents to ride the bus more often for transportation purposes.
- Some residents are interested in programs that promote multimodal transportation options.
- Nearly half of residents believe telecommuting for work and school are more likely in the future.

Regional Advisory Groups and Committees

CLMPO staff conducted outreach with regional advisory committees and community groups, including:

- The Eugene Active Transportation Committee
- The Springfield Bicycle and Pedestrian Advisory Committee
- 350 Eugene
- Eugene InMotion
- League of Women Voters
- Confederated Tribes of the Coos, Lower Umpqua and Siuslaw Indians
- Confederated Tribes of the Siletz Indians
- Lane Independent Living Alliance
- Our Children's Trust
- Asian Pacific Island Community Action Team
- Centro Latino Americano
- Active Bethel Citizens
- 4J Safe Routes to School
- Springfield Safe Routes to School
- Bethel Safe Routes to School
- Springfield Alliance for Equality and Respect
- Catholic Community Services of Lane County
- Springfield Planning Commission
- Lane Kids
- Equity and Community Consortium
- Grupo Latino de Accion Directa of Lane County

- Lane County Equity and Access Advisory Board
- University of Oregon LiveMove
- Better Eugene Springfield Transportation
- Lane Community College, Native American Student Program
- University of Oregon Tribal Government Relations
- Amazon Neighbors
- Cal Young Neighbors
- Churchill Neighbors
- Downtown Neighborhood Association
- Fairmount Neighbors
- Far West Neighbors
- Friendly Area Neighbors
- Goodpasture Island Neighbors
- Harlow Neighbors
- Industrial Corridor
- Jefferson Westside Neighbors
- Laurel Hill Valley Citizens
- Northeast Neighbors
- River Road Community Organization
- Santa Clara Community Organization
- South University Neighborhood Association
- Southeast Neighbors
- Southwest Hills Neighborhood Association
- Whitaker Community Council
- Neighborhood Leaders Council
- City of Eugene's Community Bulletin

Additional outreach with local, state, and federal stakeholders and partners was sought through the RTP's Air Quality Conformity Determination (Appendix I) and Environmental Analysis (Appendix H) interagency coordination. Please see those documents for a full summary of interagency coordination for those components, which in brief included:

- Eugene Airport
- ODOT
- United States Environmental Protection Agency
- United State Army Corps of Engineers
- Oregon Department of Environmental Quality
- Oregon State Historic Preservation Office
- Oregon Division of State Lands
- Oregon Department of Land Conservation and Development

- National Marine Fisheries Service
- United States Fish and Wildlife Service
- Oregon Department of Fish and Wildlife
- Lane Regional Air Protection Agency
- Confederated Tribes of the Grand Ronde Community in Oregon
- Confederated Tribes of Siletz Indians
- Confederated Tribes of Coos, Lower Umpqua, and Siuslaw Indians
- University of Oregon Tribal Government Relations
- Lane Community College Native American Student Program

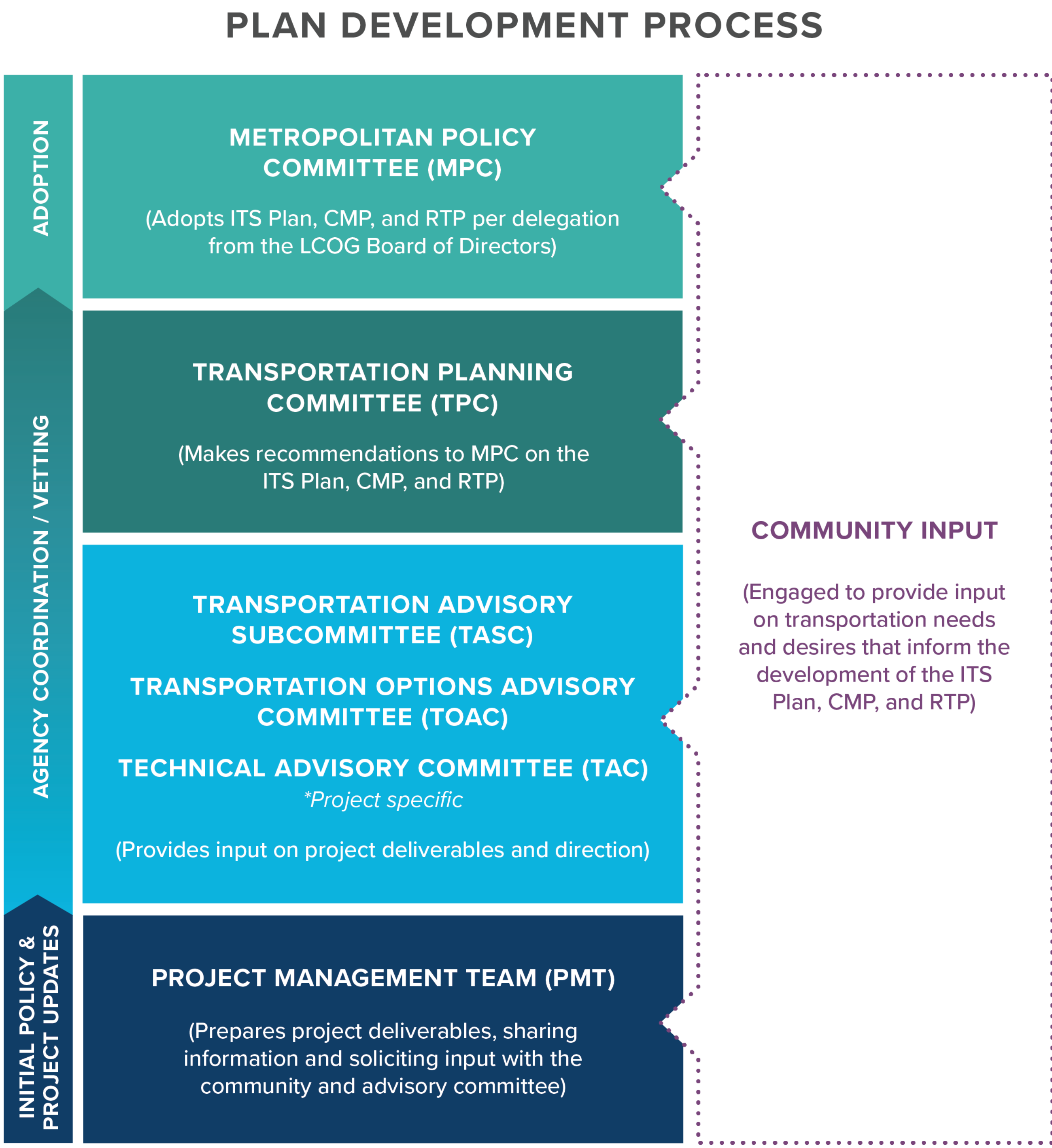
DECISION-MAKING STRUCTURE

Figure 8 displays the regional transportation decision-making structure, which primarily utilized standing committees composed of agency staff members and stakeholders. Community input from public involvement informed the decision-making process and project direction. MPC provided project feedback and direction throughout the RTP update and is the ultimate decision-maker. The Transportation Planning Committee (TPC) is composed of staff representation from the cities of Eugene, Springfield, and Coburg, Lane County, Lane Transit District, and ODOT. TPC is a technical and planning advisory committee that provides recommendations to the MPC. The Transportation Advisory Subcommittee (TASC) is a subcommittee to TPC. It is an advisory committee with a full multimodal purview. The Transportation Options Advisory Committee (TOAC) advises on active modes of travel and regional programs promoting and supporting safe and equitable transportation options including Safe Routes to School (SRTS) and the Safe Lane Coalition.

A Technical Advisory Committee (TAC) was established specifically for the ITS planning efforts. The ITS Plan's TAC was composed of transportation operations, planning, and design staff from the cities of Eugene, Springfield, and Coburg, Lane County, Lane Transit District, and ODOT. The TAC provided strategic direction, identified priorities for ITS implementation in the region and had the opportunity to review and comment on all ITS Plan-related deliverables. The members of the TAC agreed on the final project list that is incorporated into the RTP.

The Project Management Team (PMT) coordinated and provided guidance for the project. The PMT included CLMPO staff and the consultant team.

FIGURE 8. CLMPO COMMITTEE STRUCTURE FOR TRANSPORTATION DECISION-MAKING



REGIONAL MULTIMODAL TRANSPORTATION SYSTEM

The regional transportation system supports the mobility of residents and visitors within, through, to, and from the CLMPO area. The RTP's focus is on the regional multimodal transportation facilities that are defined both by the function they serve and where they are located. Facilities are included in the regional transportation system based on their function within the regional transportation system rather than their geometric design, ownership, or physical characteristics.

The regional transportation system includes:

1. Regional motor vehicle network facilities, including all state-owned transportation facilities and all city- or county-owned arterial facilities, shown in Figure 9.
2. Regional active transportation facilities, including:
   - Pedestrian facilities, primarily sidewalks, shown in Figure 10.
   - Bicycling facilities, including bike lanes and shared streets with bicycling street markings, shown in Figure 11.
   - Regional trails, shown in Figure 12.
3. Transit network facilities and the Lane Transit District service area, shown in Figure 13 and Figure 14 respectively.
4. Passenger intermodal facilities, including the Eugene Airport, Eugene Depot/Amtrak Station, and park and rides where multiple modes may come together, shown in Figure 15.
5. Freight network and freight-related intermodal facilities, shown in Figure 16.

Together, these facilities constitute an integrated and interconnected system that supports the region’s land uses and provides travel options.

A school bus drives past a pedestrian crossing.

REGIONAL MOTOR VEHICLE NETWORK

Federal Functional Classification is the system by which roads are grouped according to the type of service and amount of traffic the facility carries. Functional Classification is used to determine design standards of roads and determines Federal Aid funding eligibility. Federal Functional Classification is assigned to all public roads using federal guidelines and is approved by the Federal Highway Administration (FHWA). After each U.S. Decennial Census, the FHWA requires states to review and update their Federal Aid Urban Boundaries and Federal Functional Classification. CLMPO, along with the State of Oregon, will begin this review process in the summer of 2022 once the urban data are received from the U.S. Census Bureau. It is a process that will require cooperation of all local agencies within the region that own or manage public roads.

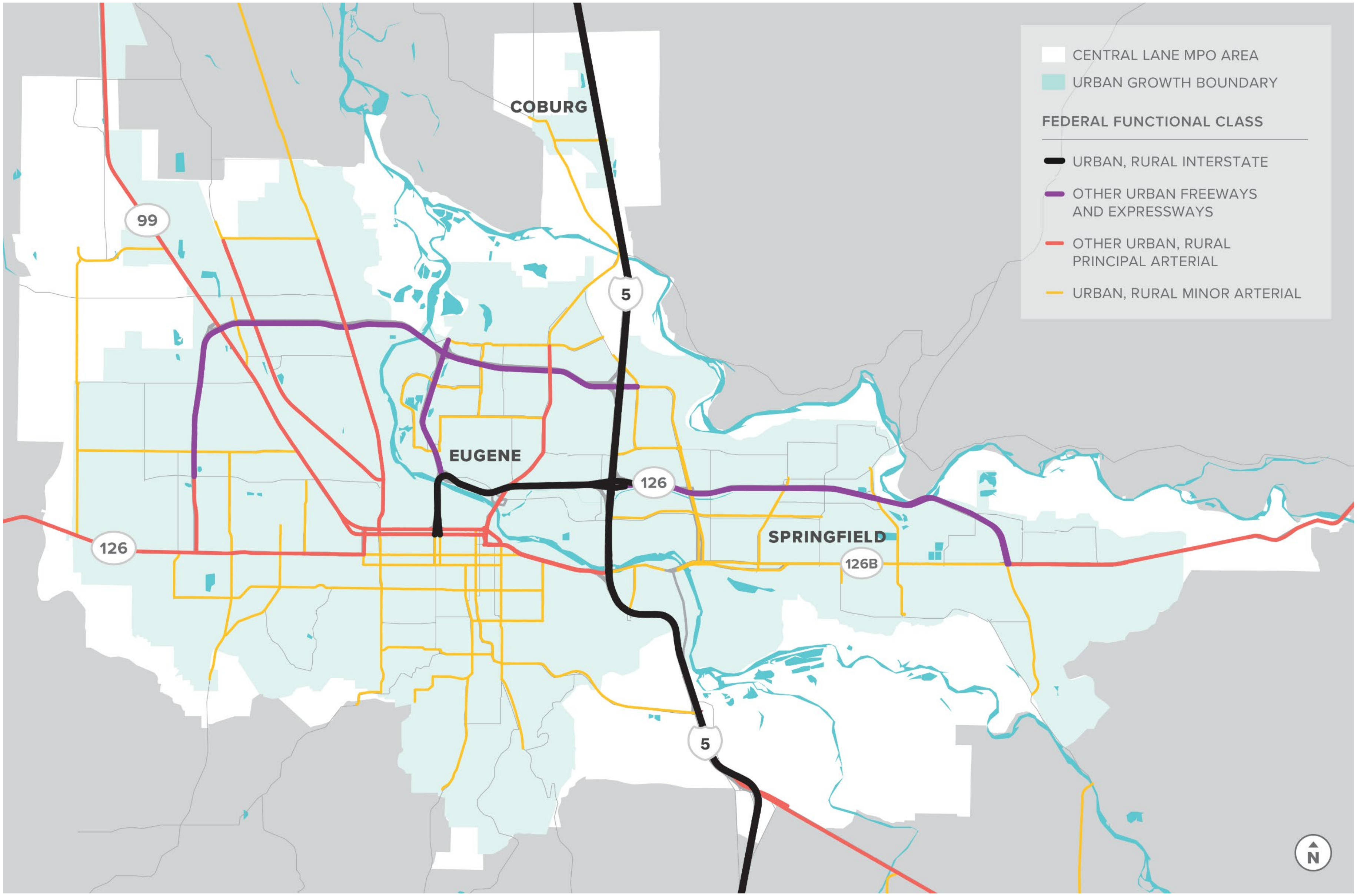
Federal Aid eligible roads include roads federally designated as:[1]

- Interstate (Urban and Rural)
- Freeways and Expressways (Urban and Rural)
- Principal Arterial (Urban and Rural)
- Minor Arterial (Urban and Rural)

The Federal Functional Classification of Roadways is shown in Figure 9.

[1] In addition to the eligible roads listed and shown in Figure 9, Major Collectors and Minor Arterials (both Urban and Rural) are also eligible for Federal Aid. For the purposes of the regional scale of this RTP, they were not included in the mapping.

FIGURE 9. FEDERAL FUNCTIONAL CLASSIFICATION OF ROADWAYS



REGIONAL PEDESTRIAN AND BICYCLE NETWORKS

Walking and biking are essential modes of transportation, serving critical connections and offering opportunity and choice in the multimodal transportation system that supports people, places, and the economy.[2] Investing in walking and biking can help create a safer, more connected, and accessible system. The benefits resulting from walking and biking networks to the local economy, health, safety, sustainability, and accessibility are well documented:

Economic Growth Benefits

A growing body of research has shown that walking and biking can contribute to a healthy economy. Benefits range from relatively direct impacts for users, such as reductions in travel costs, to more indirect impacts, such as growth in businesses related to the bike industry or congestion relief for converting short trips to walking or biking. Increases in walking and biking have potential direct and indirect impacts to the state or local economy through:

- Growth in active transportation-related industries (e.g. bike shops, bike and walking tour companies)
- Jobs created through design and construction projects related to pedestrian and bicycle improvements
- The ability for people to access employment through what may be their only source of transportation
- Increased ability for some industries to attract and retain employees due to the presence of transportation choices
- The attraction of out-of-state spending from visitors who participate in walking or bicycle tourism
- Improved livability and community attractiveness

Health Benefits

Investing in pedestrian and bicycle infrastructure, supporting educational and encouragement programs, and supporting active transportation options help to encourage physical activity for better health and may reduce health care costs by decreasing rates of chronic disease. This can be particularly beneficial when educating and encouraging youth to participate in these activities so they can learn to be more active at an early age. In addition to walking and biking, connections to transit are also essential to health, as access to transit is critical in helping those who cannot or choose not to drive to reach needed health services such as medical care.

For older adults, accessibility is a critical issue. This need will continue as the population of older adults is expected to increase significantly across the state. In addition, having places for older adults to walk and bike may help to maintain their muscle mass, which can prevent falls and reduce hospitalizations.

[2] Oregon Bicycle and Pedestrian Plan: https://www.oregon.gov/odot/Planning/Documents/OBPP.pdf

Beyond access to health services and the benefits of physical activity, access to walking or biking can be important in creating transportation options that allow for increased mobility and reduce the possibility of isolation, which can lead to mental and physical health issues.

Safety also plays a role in overall community health and health care costs, where safety improvements can help to reduce personal injuries and deaths. Other important findings about the correlation of walking and biking with improved health include:

- Active transportation facilities that are designed to be comfortable, safe, accessible, and near desirable destinations are more likely to attract a wide range of users, including people who suffer from an increased health risk due to inactivity
- Physical activity and health care cost benefits are greatest if people with increased health risks use walking and biking facilities

Four bicyclists cross an intersection using the designated bicycle crossing.

Environmental Benefits

Walking and biking are zero emission modes that play an important role in reducing fuel consumption, air and noise pollution, and carbon emissions. Increasing walking and biking for transportation is a key strategy in helping Oregon and CLMPO achieve greenhouse gas (GHG) reduction goals. As transportation is one of the highest emitting sectors, contributing to about one third of all GHG emission in the state, strategies for reducing transportation-related emissions are essential.

The ODOT *Statewide Transportation Strategy: A 2050 Vision for Greenhouse Gas Reduction* (STS) estimates the potential for people to walk or bike shorter distances is great, and that it would take approximately 40 percent of people who currently drive shorter distances to walk or bike instead in order to achieve the GHG reduction levels shown in the STS vision. According to the U.S.

Environmental Protection Agency (EPA), for every one mile pedaled or walked instead of driven, nearly one pound of carbon dioxide is saved.

The role walking and biking can play in reducing emissions is further emphasized in research that shows that motor vehicle trips contribute to disproportionately high levels of per-mile emissions, and if short trips shift from driving to walking or biking, the amount of air pollutants can be reduced.

Mobility Benefits

For people walking and biking, safe and appropriate facilities that offer direct connections to destinations and routes and provide end-of-trip accommodations, such as bicycle parking, encourage higher levels of mobility. Improving or preserving ease of movement on walking and biking networks also promotes accessibility to key destinations and improved connectivity to other modal systems, such as public transportation.

Transportation disadvantaged, including, but not limited to, mobility-limited individuals, low-income households, communities of color, seniors, youth, persons with disabilities, and those with limited English proficiency, often do not have access to a car or cannot drive. The availability of walking and biking options is critical to meeting these populations' needs.

The availability, quality, and connectivity of walking and biking facilities is especially important for older adults and people with disabilities. These individuals may not drive due to issues of poor health, limited physical or mental abilities, concerns with safety, or because they have no car. Access to modes of travel other than driving is essential to not only their mobility, but also their independence. These non-driving groups are more isolated than their driving counterparts, especially those living in rural or suburban communities and/or communities of color.

For youth, it is important to recognize the benefits of having a safe and well-connected network to access schools and other frequent destinations, such as neighborhood parks. Since school aged children often rely on walking and biking to access destinations, it is important to build a safe and robust walking and biking network so that younger populations can use the transportation system.

To ensure pedestrians' mobility, the transportation system requires frequent and safe street crossings and short distances between origins and destinations. For people who bicycle, enhanced mobility may result from protected bike lanes, bicycle parking, and other transit-oriented amenities that make it easier to integrate a bicycling trip with use of public transportation, which can be essential in making longer trips.

To further assure mobility for all users, the Americans with Disabilities Act (ADA) is instrumental in setting forth design requirements and regulations to make walking and biking options available and accessible to all.

Walkability Action Institute

The Center for Chronic Disease and Prevention (CDC) and National Association of Chronic Disease Directors (NACDD) assert that all states and communities should be designed to support physical activity and non-motorized forms of transportation so that people can have the policy, system, and environmental supports needed to engage in active lifestyles, whether recreationally or through essential daily functions like commuting to and from work, to community destinations, and/or places of interest (community events, schools, shopping, etc.).

In 2019, the CDC and NACDD collaborated for the fifth year in a row to host a Walkability Action Institute (WAI) as a multi-day "course" for interdisciplinary teams and a CLMPO team was accepted to attend. Team members represented the Lane County Public Health, Eugene's mayor, Eugene's Traffic Operations, Springfield's Planning Commission, Lane Transit District planning, and CLMPO. Through the WAI, the CLMPO team developed an Action Plan with SMART (Specific, Measurable, Attainable, Realistic, and Timely) goals to coordinate community events that cross jurisdictional boundaries; develop a tactical urbanism implementation plan; align health and transportation data and performance measures to better inform policy, project, and programmatic decision-making around health and equity; and integrate partnerships between health and transportation throughout Lane County Public Health and transportation planning processes.

The Action Plan establishes clear goals and attainable actions, some of which have been achieved, including tactical urbanism projects. Other identified actions remain as opportunities to pursue and will be pursued in future planning and collaboration efforts.

Current Regional Pedestrian and Bicycle Networks

Walking is the most basic form of transportation, whether using a mobility device or strolling. Everyone walks, and while some choose to take their entire trip by foot, others connect to different modes by walking, such as to and from their car or the bus stop. Walking is an active form of transportation and a low-cost travel option. For purposes of this RTP, every time the term "walk" or "walking" is referenced, it is inclusive of those who stroll by foot or are using a mobility device such as a wheelchair or mobility scooter. The regional inventory of the pedestrian network is shown in Figure 10.[3] Pedestrian facilities include sidewalks, access ramps, crosswalks, and furnishings that create pedestrian-friendly streets such as benches and lighting. The presence of a sidewalk network and other developed pedestrian paths is an important ingredient for a walkable environment.

The regional bicycle network is shown in Figure 11. The regional bicycle network includes traditional bike lanes, as well as some emerging facility types that are considered more comfortable for people who bike, including shared use paths, neighborhood greenways, and protected and buffered bike lanes. The regional bicycle routes work together to form a comprehensive network spanning jurisdictional boundaries that allows people to bike to transit, schools, employment centers, parks, natural areas, and shopping.

The regional trail network is shown in Figure 12. Regional trails are a critical part of the active transportation network. Trails provide some of the most comfortable and safe facilities for walking and bicycling. They not only provide recreational opportunities but offer significant off-street connectivity between regional on-street transportation facilities.

[3] Based on available data from prior collection efforts and may not include recent improvements to the system.

FIGURE 10. REGIONAL PEDESTRIAN NETWORK

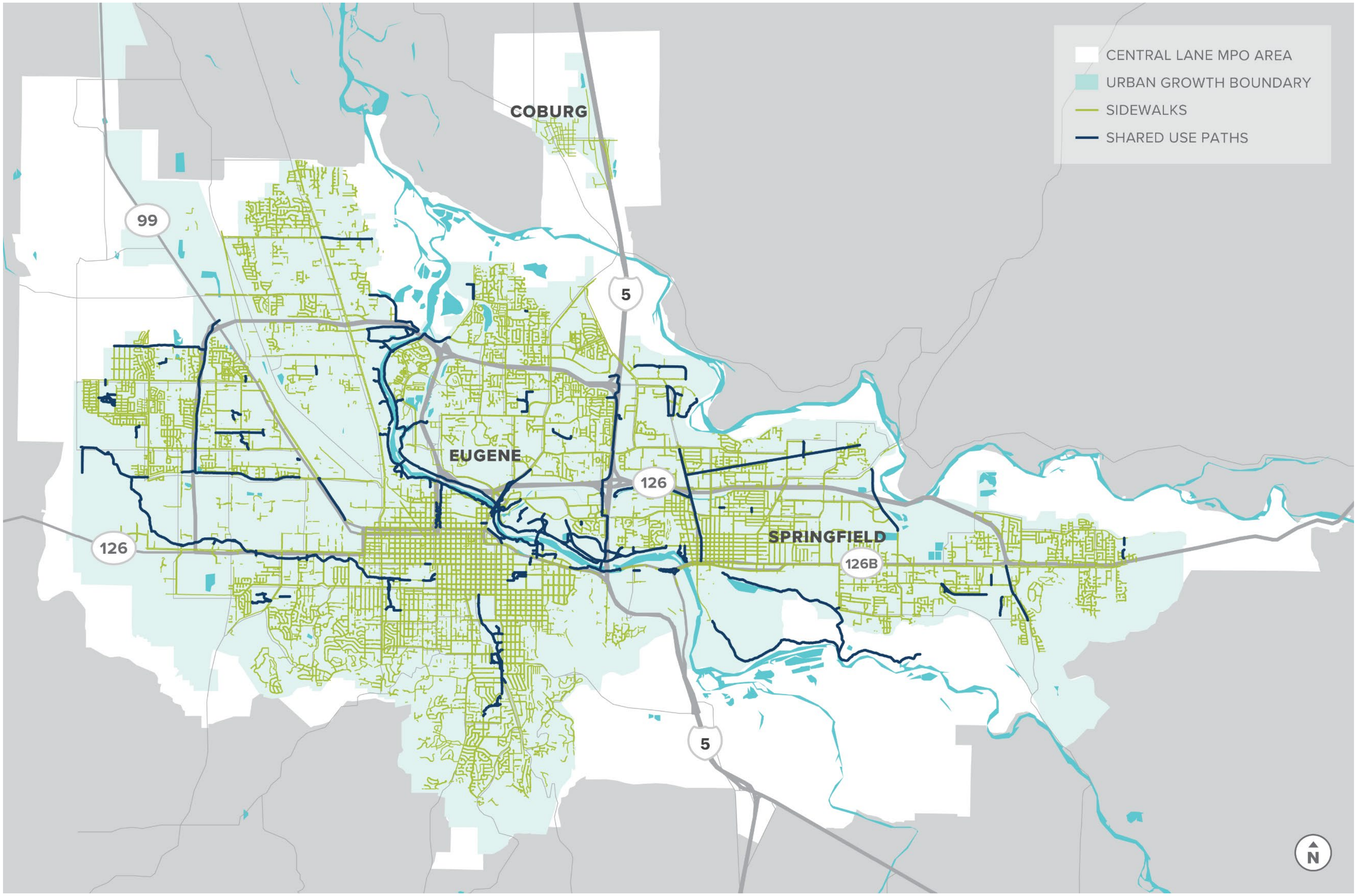


FIGURE 11. REGIONAL BICYCLE NETWORK

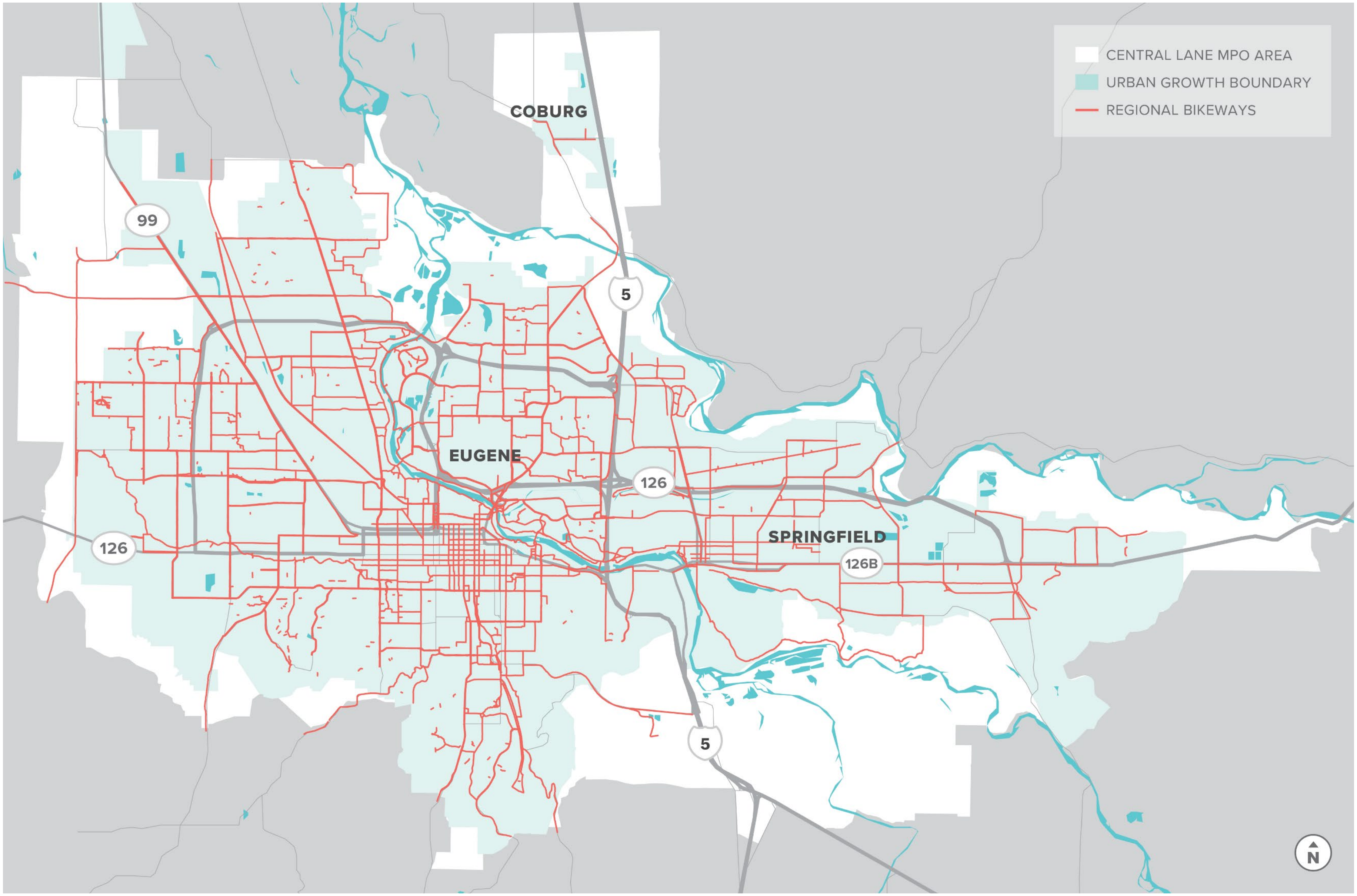
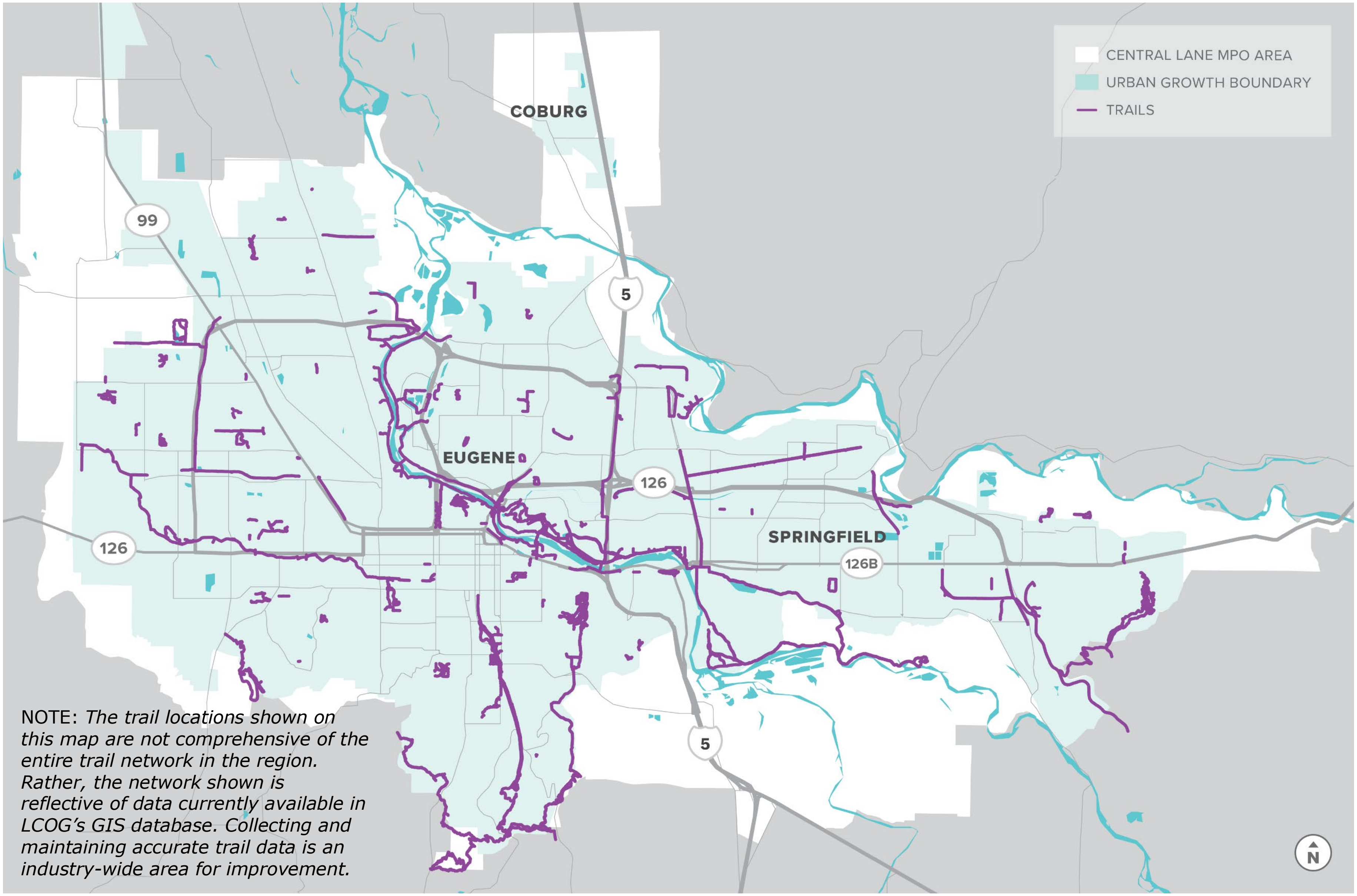


FIGURE 12. REGIONAL TRAIL NETWORK



REGIONAL TRANSIT NETWORK

Transit is a critical component of the transportation system, meeting the needs of many of the region's residents and visitors and interacting with all other modes. Investing in both intercity and intracity transit is also a key component to meeting several, if not all, of the RTP goals; supporting economic vitality, promoting better health; meeting environmental commitments, providing equitable access, making travel safer and communities more secure, contributing to resilience:[4]

Supporting Economic Vitality

The economic and community benefits of public transportation are far-ranging. Public transportation contributes to the efficient movement of people, which is essential to keeping businesses economically competitive.

Public transportation supports tourism and economic development, providing access to rural and scenic areas. Workers in rural areas rely on public transportation to connect their communities to employment centers. Public transportation can facilitate efficient use of land and provide people options to move through congested roadways. Buses and high capacity transit help optimize use of roadway capacity, benefiting drivers as well as freight movement. Less parking is needed in areas with robust public transportation systems, freeing up land for higher value uses. Public transportation is critical to an integrated transportation system, one where users have multiple modes and options that are all connected to form a single system.

Many employers make location decisions based on access to a skilled workforce. Highly skilled workers are often attracted to places with transportation options and to companies that can offer transportation benefits, such as transit passes. Public transportation offers a win-win: employees save on their commute costs and companies pay less for parking acquisition, management, and maintenance.

Promoting Better Health

Most people walk or bike to reach public transportation, contributing to more physical activity and better individual and community health. Physical activity fights chronic diseases such as heart disease, cancer, depression, and diabetes.

Public transportation can improve air quality. Poor air quality caused by vehicle emissions can aggravate asthma, chronic lung or other respiratory illnesses, and cardiovascular disease, particularly for children and older adults. Compared with private vehicles, public transportation produces 95 percent less carbon monoxide, 90 percent fewer volatile organic compounds (VOCs), and about half as much nitrogen oxide per passenger mile—meaning fewer emissions and less negative impact on community health.

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[4] Benefits of public transportation are referenced from the Oregon Public Transportation Plan: https://www.oregon.gov/odot/Planning/Documents/OPTP_V1_FINAL_Feb2019.pdf

Finally, public transportation connects many who cannot drive to visit friends and families and connect with the broader community. Social isolation is increasingly a public health concern, especially for older adults and people with disabilities. Public transportation helps keep individuals connected and engaged in communities, combating social isolation and further improving public health.

Meeting Environmental Commitments

Public transportation minimizes air pollution by providing more fuel-efficient travel alternatives. GHG reduction planning throughout the state reveals that public transportation is critical to meeting climate change goals; communities are unlikely to meet these goals without it. The *Statewide Transportation Strategy: A 2050 Vision for Greenhouse Gas Reduction* identifies public transportation as a key tool for helping the state meet its legislatively established goal of reducing transportation GHG emissions 75 percent below 1990 levels by 2050. The CLMPO region is committed to supporting the state in this established goal.

Providing Equitable Access

The CLMPO region values the livelihood and contributions of all its people, making equity vital to healthy and vibrant communities. Public transportation is an important tool for addressing equitable access to opportunity, including employment, affordable housing, education, and other community resources.

Public transportation also provides affordable access to opportunities for people with lower incomes, and other transportation disadvantaged people, making the community more livable and affordable for many. Public transportation is an alternative to private automobiles for youth, older adults, and people with disabilities who cannot drive.

Making Travel Safer and Communities More Secure

As one of the safest travel means available in its own right, public transportation also improves safety by reducing crashes. Both transit riders and other vehicle drivers benefit. Per passenger mile, light rail riders have $1/30^{th}$ the fatality rate of automobiles, and bus passengers are $1/60^{th}$ as likely to be fatally injured while traveling compared with automobile drivers. When use of public transportation increases in a community, crash rates tend to decline for all users of the transportation system, including pedestrians, bicycle riders, motorists, and transit passengers.

Research shows that policies to increase walking, cycling, and travel by public transportation typically reduce total crime in an area. More activity and “eyes on the street” can make a community feel safer, and good design for transit stops and stations can enhance safety and security even further. Transit design best practices increasingly incorporate Community Protection through Environmental Design (CPTED) principles, which emphasize designing safety and security into the environment of a specific area, including elements such as clear sightlines, good lighting, and reducing isolated spaces.

Contributing to Resilience

Public transportation can play an important role in planning for and managing emergencies and disasters, particularly for evacuations and recovery. The CLMPO region is vulnerable to fires, flooding, and earthquakes. Public transportation agencies are important players at the table for emergency management and recovery planning.

Lane Transit District

Lane Transit District serves much of Lane County including the cities of Eugene, Springfield, Coburg, Creswell, Cottage Grove, Veneta, Lowell, Junction City, and the McKenzie Bridge River Valley out to McKenzie Bridge. Lane Transit District also provides contracted service from the CLMPO area to and from Oakridge. Lane Transit District's network is made up of local and regional bus routes, stations, and park and ride facilities. It also features the EmX Bus Rapid Transit (BRT) system that connects west Eugene to the Gateway area in Springfield. The BRT route is more frequent than the other bus routes and carries more transit riders than the rest of the regional and local bus system. Figure 13 shows a snapshot of the Lane Transit District transit network and Figure 14 shows the Lane Transit District service boundary.

Emerald Express Bus Station on 11th Street in Eugene.

Lane Transit District maintains a *Lane Coordinated Public Transit-Human Services Transportation Plan (Lane Coordinated Plan).* The Lane Transit District Board of Directors adopted the most recent version in 2019. Federal transit law requires that projects selected for funding under the Enhanced Mobility for Individuals and Individuals with Disabilities (Section 5310) Program be "included in a locally developed, coordinated public transit-human services transportation plan," and that the plan be "developed and approved through a process that included participation by seniors, individuals with disabilities, representatives of public, private, and nonprofit transportation and human services providers and other members of the public" utilizing transportation services. These coordinated plans identify the transportation needs of individuals with disabilities, older adults, and people with low incomes, provide strategies for meeting these needs, and prioritize transportation services for funding and implementation.[5] LCOG transportation coordinators from the Senior & Disabilities Services participate in the planning and implementation of this Plan. Strategies and projects to support the identified needs are included in the RTP projects list.

RideSource

Lane Transit District provides Dial-a-Ride, or paratransit service, called RideSource. RideSource is a specialized service for seniors, people with disabilities, and people who are eligible for transportation benefits through the Oregon Health Plan. The RideSource ADA service is an origin-to-destination service within the Eugene-Springfield metropolitan area and is available to people traveling within the urban area who are unable to access the bus due to a disability.

[5] https://www.transit.dot.gov/funding/grants/coordinated-public-transit-human-services-transportation-plans

FIGURE 13. REGIONAL TRANSIT NETWORK

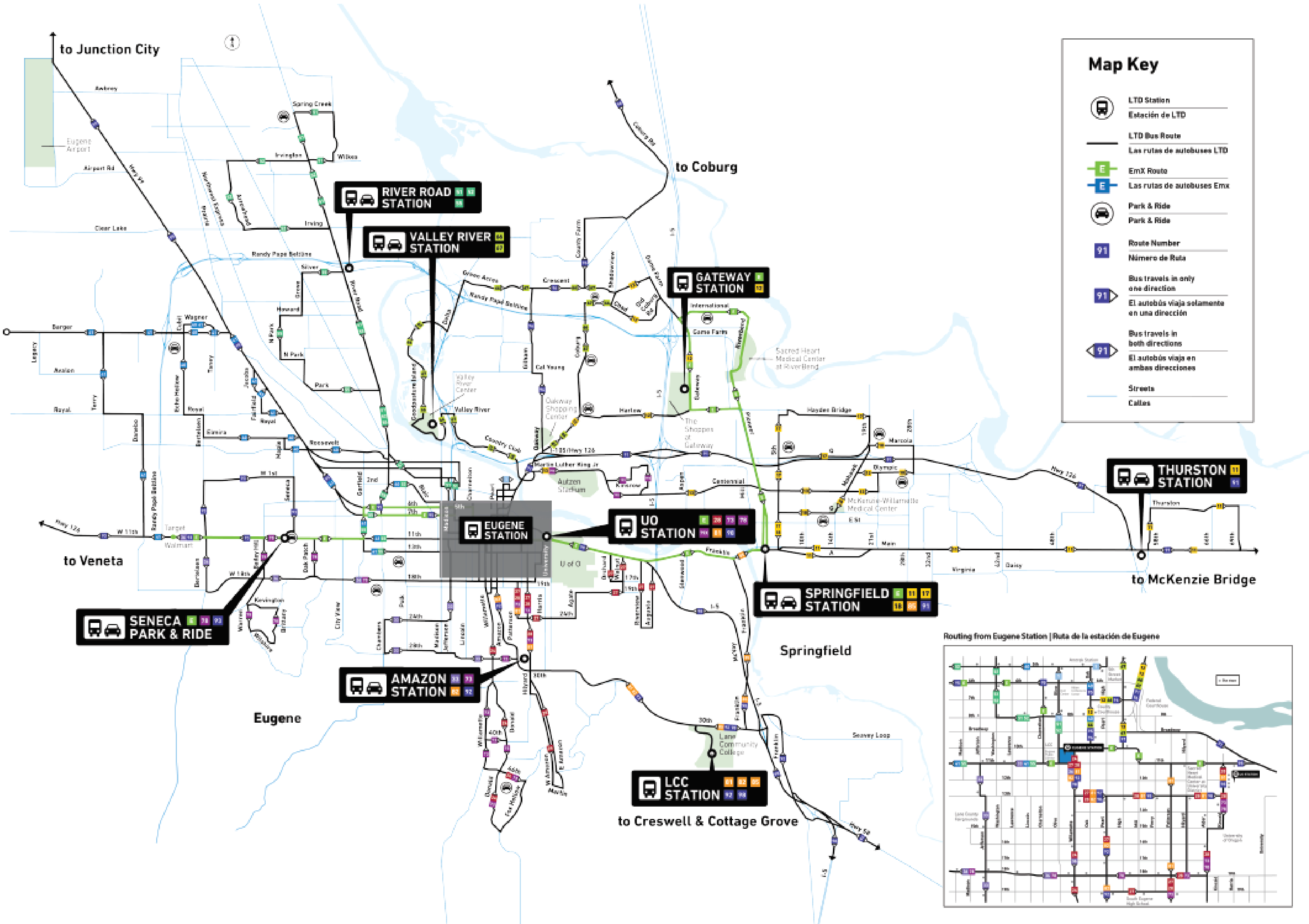
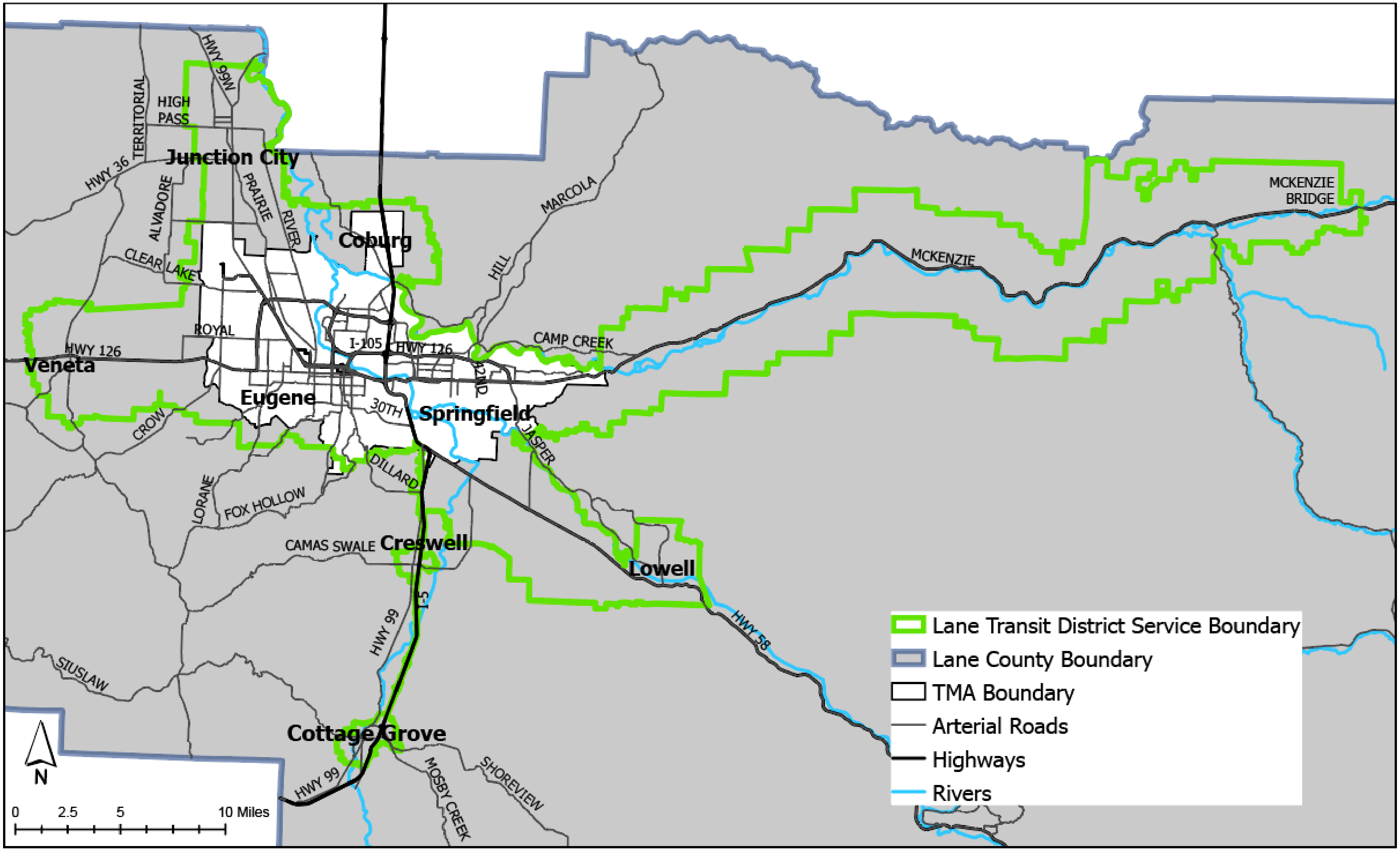


FIGURE 14. LANE TRANSIT DISTRICT SERVICE AREA

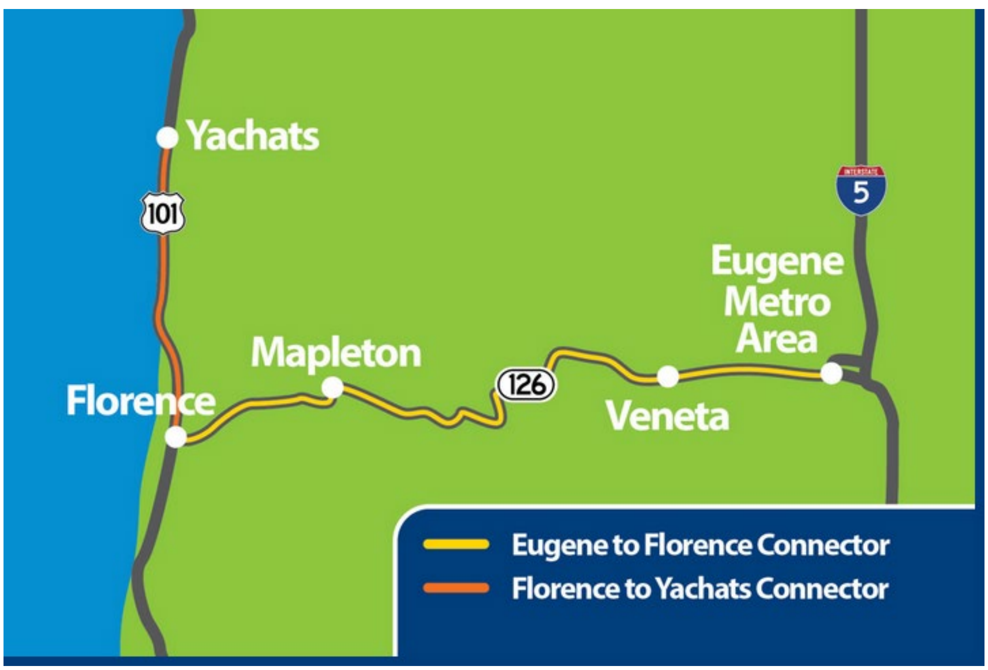


Intercity Bus Routes

LCOG provides intercity bus routes via its public transportation service called Link Lane. Link Lane operates two intercommunity routes: the Eugene-Florence Connector and the Florence-Yachats Connector.

The Eugene-Florence bus operates in partnership with the Confederated Tribes of Coos, Lower Umpqua and Siuslaw Indians, seven days per week with two routes per day. The Florence-Yachats Connector runs four routes Monday through Saturday.

Link Lane bus stop at the Amtrak Station in Eugene.



Link Lane bus routes.

The CLMPO area is also served by BoltBus, FlixBus, Cascades Point, and Eugene to Bend daily bus services. BoltBus markets itself as a "premium brand of service launched in 2008 offering safe, non-stop premium level bus transportation…"[6] In 2012 Bolt Bus expanded operations to the West Coast and now connects Eugene from the 5th Street Market to Vancouver, BC, Canada with stops in Albany, OR; Portland, OR; Bellingham, WA; and Seattle, WA in between. The service on the west coast and Canada is exclusively owned and operated by Greyhound Lines, Inc.

FlixBus launched in 2013 in Germany and in 2018 launched in the United States, "…providing America with a new alternative in long-distance travel."[7] Trips originate and terminate at Agate Street and 15th Avenue to and from stops in Corvallis, OR; Salem, OR; Portland, OR; Olympia, WA; Tacoma, WA; and Seattle, WA.

Cascades Point bus service is a four-route intercity bus service provided by ODOT.[8] The service functions like a thruway bus service for Amtrak making direct connections to passenger rail service and selling tickets through Amtrak's system. The routes served by Point include Northwest (Portland-Astoria), Cascades (Portland-Eugene), Eastern (Bend-Ontario), and Southwest (Klamath Falls-Brookings). The Eugene-Springfield Amtrak station is the southern terminus of the Cascades Route, a 3-hour ride stopping in Albany, Salem, Woodburn, Tualatin, and at the northern terminus in Portland. There are currently four trips per day in each direction.

The Eugene to Bend daily bus services is provided by Pacific Crest Bus Lines.[9] This route leaves from the Bend Hawthorne Station at 7:00AM. Stops are at the Eugene Greyhound Station (9:45AM) and the Eugene Amtrak Station (10:10AM). The return trip departs from the Eugene Amtrak Station at 11:10AM; with a stop at the Eugene Greyhound Station (11:20AM) and final stop at the Bend Hawthorne Station (2:15PM).

REGIONAL PASSENGER INTERMODAL FACILITIES

Figure 15 shows regional facilities that accommodate or serve as transfer points to interconnect various transportation modes for the movement of people. This includes the Eugene Airport, Amtrak Station in Eugene, Greyhound Bus Station in Springfield, and park-and-ride lots. These intermodal locations serve as important hubs that allow both local and regional travelers to transfer to other modes of travel. These other modes include air, rail, and bus. Each of these modes helps to serve multiple travelers and is less impactful to the transportation system than if each traveler drove alone for the duration of their trip. Maintaining accessibility to these regional transfer points is critical to maintain the use of these modes for discretionary travel options.

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[6] https://www.boltbus.com/faq/

[7] https://www.flixbus.com/company/about-us

[8] Oregon-Point, Oregon-point.com

[9] https://pacificcrestbuslines.com/eugene-to-bend/

Eugene Airport (EUG)

The Eugene Airport (EUG) is a small-hub airport and the second largest airport in Oregon. It serves an area encompassing 91 zip codes with a population of approximately 730,3803. Additional information about connecting destinations for EUG is listed in Chapter 3.

Amtrak Station in Eugene

The Amtrak station in Eugene is located in downtown Eugene and experiences approximately 85,000 passengers per year, as recorded in 2019.[10] It is served by Amtrak's *Coast Starlight* passenger train and the *Amtrak Cascades* corridor. The *Coast Starlight* runs along the West Coast between Seattle and Los Angeles making major stops in Portland and the San Francisco Bay area. The Coast Starlight carried 426,029 passengers during fiscal year 2019, an increase of approximately 2% from 2018.[11] The Amtrak station is also the southern terminus of the *Amtrak Cascades* corridor, connecting the Central Lane MPO area to Vancouver, British Columbia as the northern terminus, with stops in Seattle and Portland. Eleven trains operate along the corridor each day, with two between Vancouver, BC and Portland, three between Seattle and Portland, one from Portland to Eugene, and three between Eugene and Seattle. No train travels directly through the length of the corridor. Ridership in 2019 was estimated to be 802,895 total riders for the year, with approximately 2,200 riders daily.[12]

The Amtrak Station also serves as a hub for the Link Lane Eugene-Florence Connector, Pacific Crest Bus Line's Eugene to Bend Route, and the Cascades Point bus service.

Greyhound Bus Station

Greyhound Lines, Inc. is the largest provider of intercity bus transportation serving 2,400 destinations and nearly 16 million passengers each year throughout the United States and Canada.[13] Greyhound offers same-day and early-next-day package delivery; BoltBus operations; premium city-to-city service; Greyhound Connect (a service that connects rural communities to larger Greyhound markets); and has interline partnerships with a number of independent bus lines across the United States.

The Greyhound Bus Station is in downtown Springfield. Regional stops are also made at the Amtrak Station in downtown Eugene and via the BoltBus in Eugene's 5th Street Market.

Lane Transit District Park and Rides

Lane Transit District has 17 park and rides throughout the Central Lane MPO area. There are also five additional park and rides in rural communities providing service into and out of the MPO area, one each in in Creswell, Veneta, and Cottage Grove, and two in Junction City. Park and ride lots allow commuters to easily and conveniently connect with transit or their carpool or vanpool. Parking is free and available on a first-come, first-served basis.[14]

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[10] Amtrak Fact Sheet, Fiscal Year 2019, State of Oregon.

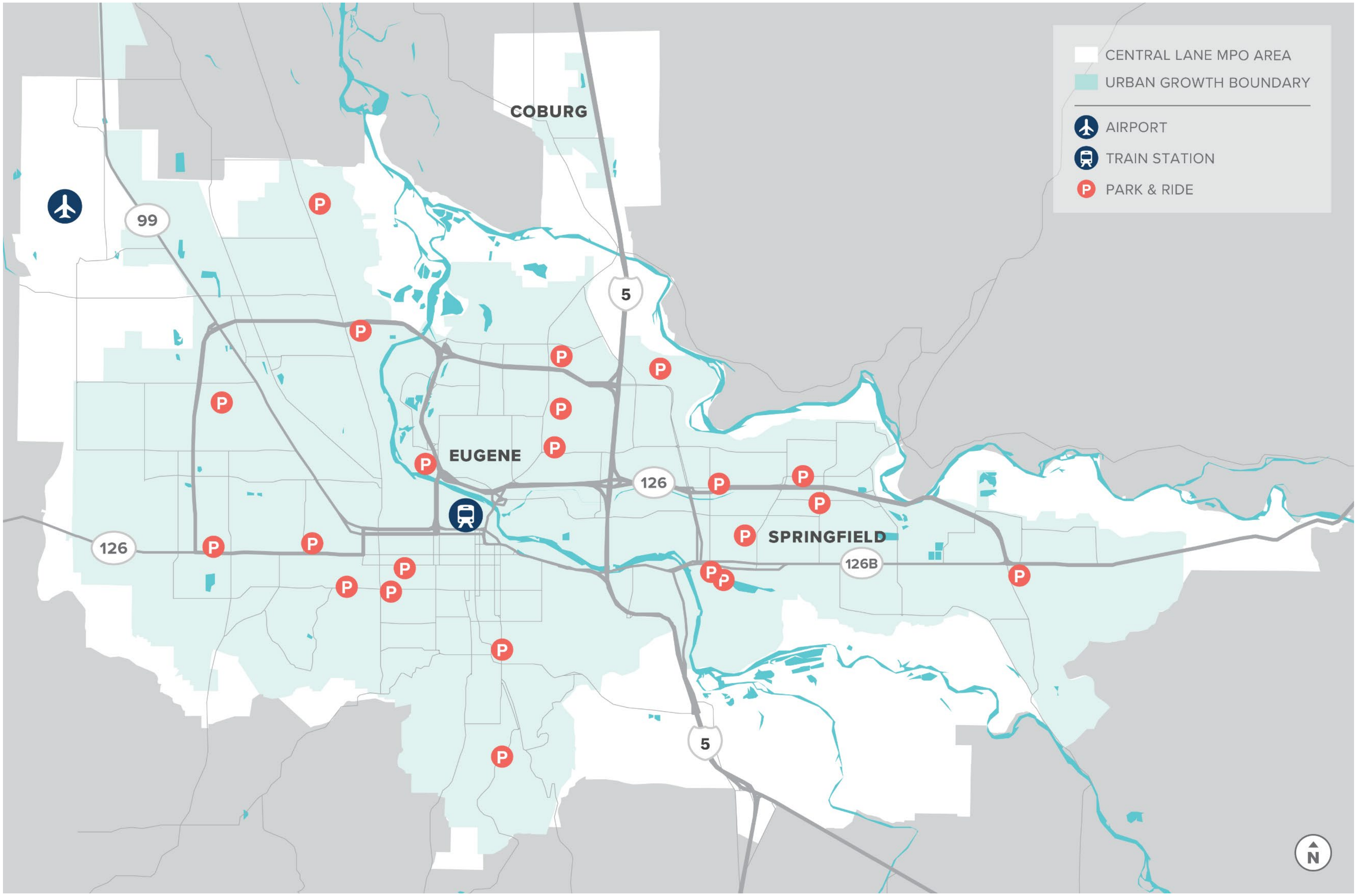
[11] Amtrak FY 19 Year End Ridership.

[12] Amtrak FY 20 Year End Ridership

[13] https://www.greyhound.com/en/about

[14] Lane Transit District, Park & Ride Locations.

FIGURE 15. REGIONAL PASSENGER INTERMODAL FACILITIES



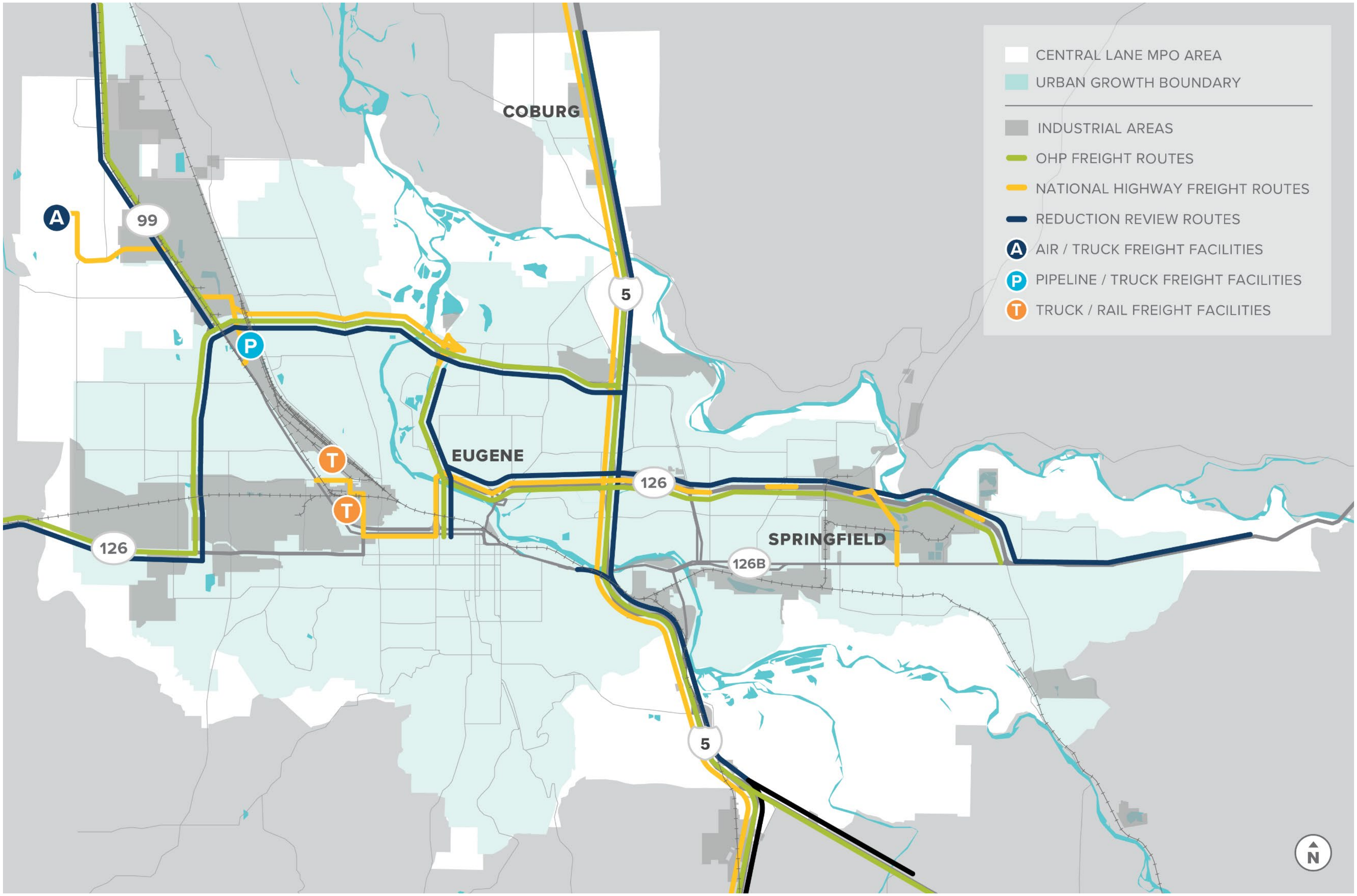
REGIONAL FREIGHT NETWORK

The regional freight network shown in Figure 16 identifies the transportation networks and facilities that serve the region and the state's freight mobility needs. It addresses the needs for freight through-traffic as well as regional freight movements and provides access to employment, industrial areas, and commercial districts. It includes freight routes designated in the *Oregon Highway Plan* (OHP) and federally designated freight routes.

The transport and distribution of freight occurs via the regional freight network, which is a combination of interconnected publicly- and privately- owned networks and terminal facilities. Rail, pipeline, air, and freight routes connect the region to markets and suppliers beyond local boundaries. Inside the region, freight routes and other arterial streets distribute freight moved by truck to air and pipeline terminal facilities, rail yards, industrial areas, and commercial centers.

The freight network is a critical element to enable goods movement and a healthy economy. The freight network allows the transport of goods into, out of, and within the region. The transport of freight allows companies to acquire the raw materials or products necessary to conduct their business, which may include the manufacture of goods or sales of product to consumers. Similarly, the freight network allows companies within the region to transport their finished goods or products to the end consumer and/or to the next step of the supply chain. Maintaining both the inbound and outbound flow of goods is critical for the prosperity of business within the region and providing residents with the goods they need.

FIGURE 16. REGIONAL FREIGHT NETWORK



CHAPTER 2: GOALS, OBJECTIVES AND PERFORMANCE MEASURES

This chapter presents the CLMPO 2045 RTP goals, objectives, performance measures, and performance targets that collectively will guide transportation planning and investment decisions in the region through 2045.

GOALS, OBJECTIVES, AND PERFORMANCE MEASURES

The CLMPO RTP employs a performance-based planning and programming approach, focusing on outcomes-based goals to guide the region's transportation planning and decision-making. The outcomes-based approach allows for better prioritization and tracking of system performance to help track progress towards realizing a multimodal transportation system that meets the region's needs and achieves its goals.

Specific measurable objectives and quantifiable performance measures to track the region's progress are established in this chapter as a framework to work towards achieving the RTP goals.

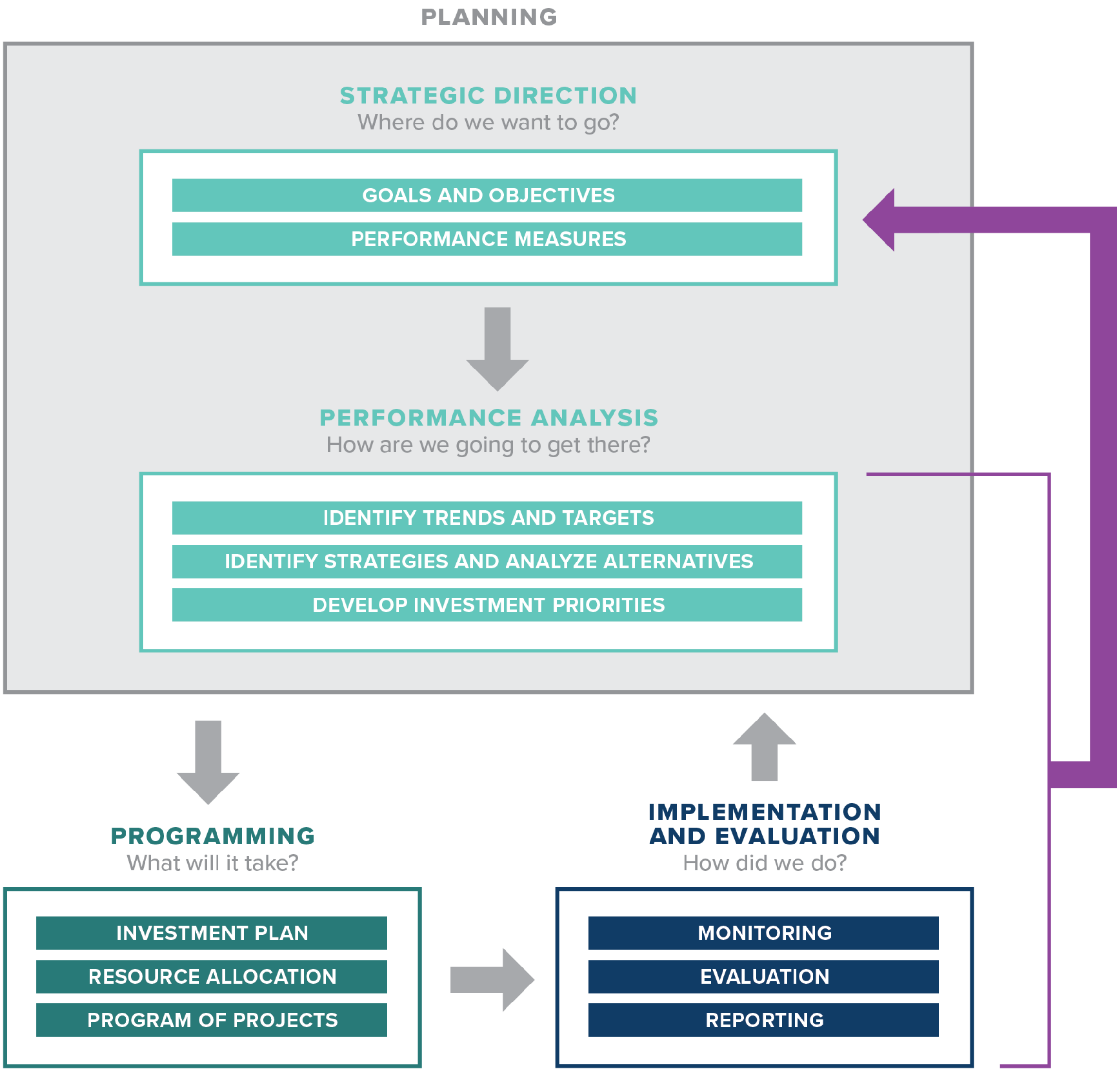
For the purpose of this Plan, the following definitions apply:

- **Goal** – States a desired outcome toward which actions are focused to make progress toward a long-term vision.
- **Objective** – An attainable target that the community attempts to reach in striving to meet a goal. An objective may also be considered as an intermediate point that will help fulfill the overall goal.
- **Performance Measure** – Predetermined indicators monitored during the life of the RTP as a method of evaluating the plan's effectiveness. To provide numerical targets needed to assess plan progression, *benchmarks* are established for each performance measure at five-year intervals.

Objectives are focused and measurable outcomes of the goals, while performance measures track progress towards achieving the objectives. The performance measures support the outcomes-based framework reflected in the plan's goals and objectives and serve as the dynamic link between RTP goals and Plan implementation. These performance measures draw from federal and state legislation and regional policies. They are aspirational and support the region's performance-based planning and programming framework shown in Figure 17.

Together, the goals, objectives and performance measures provided direction for developing the regional projects recommended in Chapter 5. Chapter 6 reports findings on how well the RTP performs across a broad array of measures relative to the plan's performance targets.

FIGURE 17. RTP PERFORMANCE-BASED PLANNING AND PROGRAMMING FRAMEWORK



Source: FHWA Performance Based Planning and Programming Guidebook, September 2013.

RTP GOALS

Regional goals establish the organizing framework and direction for transportation planning in the CLMPO area. They reflect MPC direction, stakeholder feedback, and public input, and are intended to be consistent with and support local and state plans. The RTP goals are summarized in Figure 18 and are each considered of equal importance so are not presented in order of importance; similarly, they are not intended to be weighted or prioritized in any context throughout the RTP. The RTP goals and objectives provide a foundation for transportation policy, plans, projects, and programs completed within the region. As local and regional circulation patterns are intertwined, continual coordination between local jurisdictions and the region is critical to achieving these regional goals. Look for each goal's icon from Figure 18 throughout this document to find where it is referenced throughout the RTP.

FIGURE 18. RTP GOALS

TRANSPORTATION CHOICES	People throughout the region have access to affordable, healthy, active, and shared transportation options that safely and conveniently connect them with their destinations while reducing reliance on driving alone and minimizing transportation related pollution.
SAFETY, SECURITY, AND RESILIENCY	The transportation system is resilient, safe, and secure for people and goods.
HEALTHY PEOPLE AND ENVIRONMENT	The regional transportation system provides safe and comfortable travel options that support active and healthy living and protect and preserve biological, water, cultural and historic resources. Lower-polluting transportation options are encouraged, and transportation greenhouse gas emissions are reduced.
EQUITY	The regional transportation system eliminates transportation related disparities and barriers and ensures equitable access to destinations.
ECONOMIC VITALITY	The transportation system is reliable, affordable, and efficient. It supports the prosperity of people and businesses by connecting them to destinations throughout the region and beyond.
RELIABILITY AND EFFICIENCY	The region prioritizes a range of travel options to manage and optimize the transportation system and ease congestion so people and goods can reliably and efficiently reach their destinations.
SYSTEM ASSET PRESERVATION	Strategically preserve, maintain, operate, and plan for current and future system assets to maximize transportation investments.

Note: Goals are not presented in order of importance, nor are they intended to be weighted or prioritized in any context throughout the RTP.

RTP OBJECTIVES

Objectives for each of the seven RTP goals are further reflection of stakeholder feedback and public input and are intended to be consistent with and support local and state plans. In some cases, specific objectives may support more than one goal. For example, "Complete gaps in regional bicycle and pedestrian networks, including paths" is listed under Goal 1: Transportation Choices, Goal 3: Healthy People and Environment, Goal 4: Equity, and Goal 6: Reliability and Efficiency. In addition, performance measures and the connection to federal planning factors (as detailed in Chapter 1) are provided for each goal, with more details provided in the "Performance Measures" section later in this Chapter.

GOAL 1: TRANSPORTATION CHOICES

People throughout the region have access to affordable, healthy, active, and shared transportation options that safely and conveniently connect them with their destinations while reducing reliance on driving alone and minimizing transportation-related pollution.

OBJECTIVES

- Increase the percentage of trips made using active and low carbon transportation modes while reducing vehicle miles traveled within our region.
- Complete gaps in regional bicycle and pedestrian networks, including paths.
- Increase the number of households and areas of employment with access to current and planned frequent transit service, bicycle network, and walk network.
- Increase travel options that serve popular destinations.
- Eliminate fatal and serious injury crashes for all modes of travel.
- Improve public health by providing safe, comfortable, and convenient transportation options that support active living and physical activity for all ages and abilities to meet daily needs and access services.
- Develop a multimodal transportation system that allows all to access employment, education, and services.
- Leverage technological advances, including intelligent transportation systems solutions, to increase efficiency of travel across all modes for all travelers, but particularly for vulnerable populations.
- Increase access to outreach, education, incentives, and other tools that increase shared trips and use of travel options.
- Support regional travel and tourism with a multimodal transportation system, including passenger rail and intercommunity transit access, that provides visitors and tourists with travel options to access regional destinations.
- Support state efforts to transition Oregon to cleaner, low carbon fuels and increase the adoption of more fuel-efficient vehicles and alternative fuel vehicles, including electric and hydrogen vehicles.

PERFORMANCE MEASURES

- Miles traveled
- Mode share
- System completeness
- Access to transit

CONNECTION TO FEDERAL PLANNING FACTORS

#4. Accessibility and Mobility

#6. Connectivity

#9. Resilience

GOAL 2. SAFETY, SECURITY AND RESILIENCY

The transportation system is resilient, safe, and secure for people and goods.

OBJECTIVES	PERFORMANCE MEASURES
• Eliminate fatal and serious injury crashes for all modes of travel. • Reduce the transportation system's vulnerability to natural disasters and climate change. • Reduce the transportation system's vulnerability to crime and terrorism. • Increase the security of transportation system data associated with existing and emerging technologies. • Eliminate barriers that people of color, low-income people, youth, older adults, people with disabilities and other historically excluded communities face meeting their travel needs. • Improve public health by providing safe, comfortable, and convenient transportation options that support active living and physical activity for all ages and abilities to meet daily needs and access services. • Strive to reduce vehicle-related greenhouse gas emissions and congestion through more sustainable street, bike, pedestrian, transit, and rail network design, location, and management. • Reduce the impact of roadway incidents on the regional arterial roadway network and frequent transit routes. • Develop a transportation system that is adaptable and flexible to changing needs and conditions.	• Safety **CONNECTION TO FEDERAL PLANNING FACTORS** #2. Safety #3. Security #9. Resilience

GOAL 3. HEALTHY PEOPLE AND ENVIRONMENT

The regional transportation system provides safe and comfortable travel options that support active and healthy living and protect and preserve biological, water, cultural, and historic resources. Lower-polluting transportation options are encouraged, and transportation greenhouse gas emissions are reduced.

OBJECTIVES

- Increase the percentage of trips made using active and low carbon transportation modes while reducing vehicle miles traveled within our region.
- Complete gaps in regional bicycle and pedestrian networks, including paths.
- Increase the number of households and areas of employment with access to current and planned frequent transit service, bicycle network, and walk network.
- Increase travel options that serve popular destinations.
- Eliminate barriers that people of color, low-income people, youth, older adults, people with disabilities and other historically excluded communities face meeting their travel needs.
- Protect natural, cultural, and developed resources from the negative impacts of transportation.
- Reduce transportation-related air and water pollutants.
- Improve public health by providing safe, comfortable, and convenient transportation options that support active living and physical activity for all ages and abilities to meet daily needs and access services.
- Strive to reduce vehicle-related greenhouse gas emissions and congestion through more sustainable street, bike, pedestrian, transit, and rail network design, location, and management.
- Develop a multimodal transportation system that allows all to access employment, education, and services.
- Increase access to outreach, education, incentives, and other tools that increase shared trips and use of travel options.
- Reduce percentage of income required to meet household transportation costs.
- Support state efforts to transition Oregon to cleaner, low carbon fuels and increase the adoption of more fuel-efficient vehicles and alternative fuel vehicles, including electric and hydrogen vehicles.

PERFORMANCE MEASURES

- Miles Traveled
- Mode Share
- System Completeness

CONNECTION TO FEDERAL PLANNING FACTORS

#4. Accessibility and Mobility

#5. Environment, energy, conservation, quality of life

#6. Connectivity

#9. Resilience

GOAL 4. EQUITY

The regional transportation system eliminates transportation-related disparities and barriers and ensures equitable access to destinations.

OBJECTIVES

- Increase the percentage of trips made using active and low carbon transportation modes while reducing vehicle miles traveled within our region.
- Complete gaps in regional bicycle and pedestrian networks, including paths.
- Increase the number of households and areas of employment with access to current and planned frequent transit service, bicycle network, and walk network.
- Increase travel options that serve popular destinations.
- Eliminate fatal and serious injury crashes for all modes of travel.
- Eliminate barriers that people of color, low-income people, youth, older adults, people with disabilities and other historically excluded communities face meeting their travel needs.
- Develop a multimodal transportation system that allows all to access employment, education, and services.
- Support transportation investments that address the transportation needs of historically excluded communities and provide increased mobility options and access.
- Leverage technological advances, including intelligent transportation systems solutions, to increase efficiency of travel across all modes for all travelers, but particularly for vulnerable populations.
- Increase access to outreach, education, incentives, and other tools that increase shared trips and use of travel options.
- Reduce the percentage of income required to meet household transportation costs.
- Increase the transportation options to regional job centers.

PERFORMANCE MEASURES

- System Completeness
- Access to Jobs
- Access to Services
- Access to Transit

CONNECTION TO FEDERAL PLANNING FACTORS

#4. Accessibility and Mobility

#6. Connectivity

GOAL 5. ECONOMIC VITALITY

The transportation system is reliable, affordable, and efficient. It supports the prosperity of people and businesses by connecting them to destinations throughout the region and beyond.

OBJECTIVES

- Increase the number of households and areas of employment with access to current and planned frequent transit service, bicycle network, and walk network.
- Increase travel options that serve popular destinations.
- Strive to reduce vehicle-related greenhouse gas emissions and congestion through more sustainable street, bike, pedestrian, transit, and rail network design, location, and management.
- Develop a multimodal transportation system that allows all to access employment, education, and services.
- Reduce percentage of income required to meet household transportation costs.
- Increase access to industry and freight intermodal facilities to facilitate efficient goods movement.
- Build an integrated and connected system of regional arterial roadways, freight routes and intermodal facilities, transit, bicycling and walking facilities.
- Support regional travel and tourism with a multimodal transportation system, including passenger rail and intercommunity transit access, that provides visitors and tourists with travel options to access regional destinations.

PERFORMANCE MEASURES

- Miles Traveled
- Travel Time
- Vehicle Hours of Delay
- Congestion
- Access to Jobs

CONNECTION TO FEDERAL PLANNING FACTORS

#1. Economic Vitality

#9. Resilience

#10. Travel and tourism

GOAL 6. RELIABILITY AND EFFICIENCY

The region prioritizes a range of travel options to manage and optimize the transportation system and ease congestion so people and goods can reliably and efficiently reach their destinations.

OBJECTIVES

- Increase the percentage of trips made using active and low carbon transportation modes while reducing vehicle miles traveled within our region.
- Complete gaps in regional bicycle and pedestrian networks, including paths.
- Strive to reduce vehicle-related greenhouse gas emissions and congestion through more sustainable street, bike, pedestrian, transit, and rail network design, location, and management.
- Leverage technological advances, including intelligent transportation systems solutions, to increase efficiency of travel across all modes for all travelers, but particularly for vulnerable populations.
- Increase the number of people and businesses with easy access to travel information.
- Reduce the impact of roadway incidents on the regional arterial roadway network and frequent transit routes.
- Increase access to outreach, education, incentives, and other tools that increase shared trips and use of travel options.
- Develop new revenue sources to address current transportation system preservation, maintenance, and operational needs and prepare for future investments to meet increased travel demand.
- Increase access to industry and freight intermodal facilities to facilitate efficient goods movement.
- Build an integrated and connected system of regional arterial roadways, freight routes and intermodal facilities, transit, bicycling and walking facilities.

PERFORMANCE MEASURES

- Miles Traveled
- Travel Time
- Congested Miles of Travel

CONNECTION TO FEDERAL PLANNING FACTORS

#1. Economic Vitality

#7. Efficiency

#9. Reliability

#10. Travel and tourism

GOAL 7. SYSTEM ASSET PRESERVATION

Strategically preserve, maintain, operate, and plan for current and future system assets to maximize transportation investments.

OBJECTIVES	PERFORMANCE MEASURES
• Increase the percentage of trips made using active and low carbon transportation modes while reducing vehicle miles traveled within our region. • Reduce the transportation system's vulnerability to natural disasters and climate change. • Preserve and maintain transportation system assets to maximize their useful life and minimize project construction and maintenance costs. • Develop a transportation system that is adaptable and flexible to changing needs and conditions. • Develop new revenue sources to address current transportation system preservation, maintenance, and operational needs and prepare for future investments to meet increased travel demand.	• Travel Time • Congested Miles of Travel • Vehicle Hours of Delay • Congestion **CONNECTION TO FEDERAL PLANNING FACTORS** #8. Preservation #9. Resilience

PERFORMANCE MEASURES AND TARGETS

The RTP's performance measures are intended to track progress towards meeting regional goals such as environmental quality, economic vitality, and equity of access to essential services and destinations. These measures play important roles in understanding whether the transportation system is meeting the community's needs.

The performance measures support the region's transportation planning and decision-making process to monitor and project future system performance. These performance measures include both federal measures (Figure 20) and regional measures (Figure 21). Chapter 6 of the RTP reports on the comprehensive evaluation of Plan performance using the federal and regional performance measures.

There are several types of performance measures and targets described in this plan. Some performance measures are more regional in nature and are intended to be monitored and tracked over time towards a stated direction of performance. Other performance measures are specific to the transportation system and are used to predict the future as part of an evaluation process using forecasted data. They are often applied at a system, corridor, or project scale and provide a basis for evaluating alternatives and making decisions on future transportation investments.

Federal Performance Management

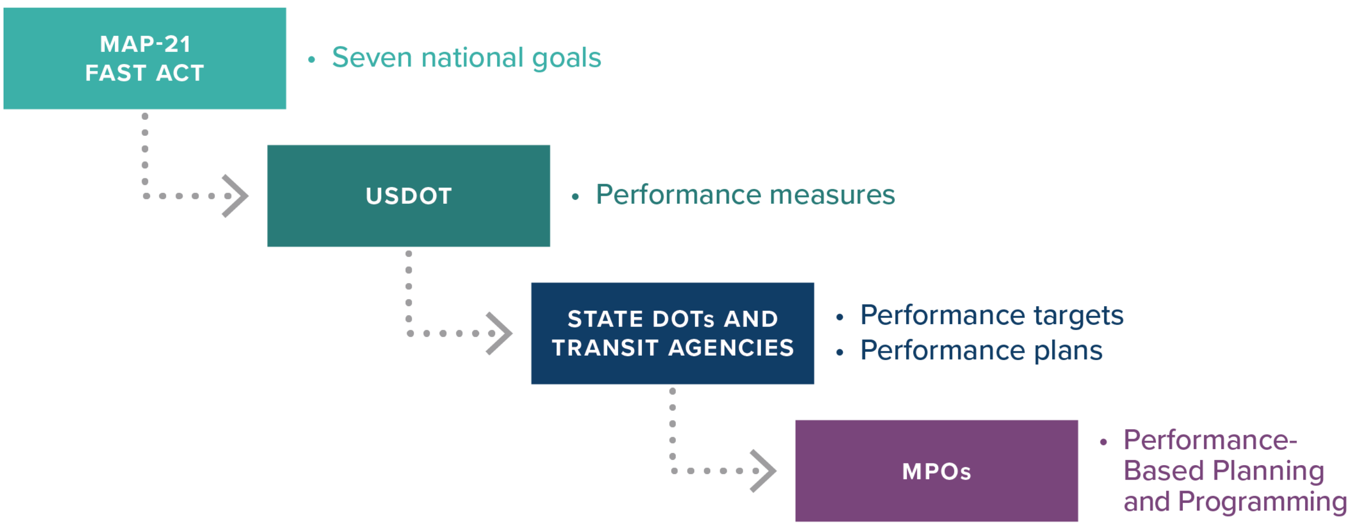
Performance measures are indicators of progress towards attaining a goal, objective, or target. Current federal legislation requires state departments of transportation (state DOTs), MPOs, and transit agencies to conduct performance-based planning and programming (PBPP) by setting data-driven performance targets for specific transportation performance measures and program investments that are expected to result in achievement of the targets (23 CFR Parts 450 and 771 and 49 CFR Part 613). The federal transportation performance measures, which were prescribed through federal rulemaking, address the seven national goal areas:

1. Improving Safety
2. Maintaining Infrastructure Condition
3. Reducing Traffic Congestion
4. System Reliability
5. Improving the Efficiency of the System and Freight Movement
6. Protecting the Environment
7. Reducing Delays in Project Delivery

Performance management is a strategic approach to connect decision-making and investment to help achieve performance goals, as shown in Figure 19.

FIGURE 19. FEDERAL PERFORMANCE MANAGEMENT FRAMEWORK

TO INCREASE ACCOUNTABILITY AND TRANSPARENCY:



The federal performance measures identified in Figure 20 are part of a larger requirement of the MPO. Following guidance from FHWA and the Federal Transit Administration (FTA), State DOTs are required to develop targets for each identified performance measure within one year of guidance being issued. In the subsequent 180 days, MPOs are either required to support the state's targets or develop their own regionally specific targets. This coordination between the MPOs and State DOTs in performance management and target setting is also supported by the Moving Ahead for Progress in the 21st Century (MAP-21) Act.[15] In the state of Oregon, ODOT and the state's MPOs established a "Coordination Process in Setting, Monitoring, and Reporting State Performance Measure Targets" which provides an overview of the required coordination and collaboration between ODOT and MPOs in setting and maintaining federal performance measures.

Consistent with this Coordination Process, CLMPO participated as ODOT estimated and established statewide performance targets for each federal performance measure. Upon ODOT's adoption of performance targets, the CLMPO MPC elected to support the state's adopted targets. CLMPO continues to coordinate with ODOT for monitoring and reporting requirements.

The federal performance measures and targets supported by the CLMPO are described in the following section.

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[15] In addition to MAP-21 requiring coordination between state DOT's and MPOs, state DOTs are also required to coordinate with local agencies and public transportation providers when setting performance targets.

Federal Performance Measure and Targets

The federal performance measures are categorized into three performance management groups:

- PM 1: Safety
- PM 2: Transportation Asset Management: Pavement and Bridge Condition
- PM 3: National Highway System Performance: System Reliability, Freight, Congestion, and Air Quality

FIGURE 20: FEDERAL PERFORMANCE MEASURES

FEDERAL PERFORMANCE MEASURES

1 PAVEMENT CONDITION	Percentage of pavements of the Interstate System in Good condition Percentage of pavements of the Interstate System in Poor condition Percentage of pavements of the non-Interstate NHS in Good condition Percentage of pavements of the non-Interstate NHS in Poor condition
2 BRIDGE CONDITION	Percentage of NHS bridges by deck area classified as in Good condition Percentage of NHS bridges by deck area classified as in Poor condition
3 NATIONAL HIGHWAY SYSTEM PERFORMANCE	Percent of the person-miles traveled on the Interstate that are reliable (Interstate Travel Time Reliability measure) Percent of the person-miles traveled on the non-Interstate NHS that are reliable (Non-Interstate Travel Time Reliability measure) Truck Travel Time Reliability Index (Freight Reliability measure)
4 CONGESTION MITIGATION AND AIR QUALITY	Total Emissions Reduction of PM-10 from Funded CMAQ Projects
5 SAFETY	Fatalities (People) Fatality Rate (People per 100 Million Vehicle Miles Traveled (VMT)) Serious Injury (People) Serious Injury Rate (People per 100 Million VMT) Nonmotorized Fatalities and Serious Injuries (People)

FTA has established additional performance measures and reporting requirements for transit asset management (TAM) and transit safety. Performance metrics for TAM focus on maintenance of the regional transit system in a state of good repair. Transit assets to be monitored include:

- Non-revenue support equipment and maintenance vehicles
- Revenue vehicles (rolling stock)
- Rail infrastructure including tracks, and signals, and guidance systems; and
- Transit facilities including stations, parking structures, and administrative offices.

Lane Transit District was granted Tier II agency status[16] because it operates fewer than 100 vehicles in revenue service in any one mode during peak regular service. Lane Transit District participates in a Group TAM Plan with ODOT. The Lane Transit District Board adopted this Plan in December 2018. ODOT is tracking performance targets on an annual basis for Tier II transit agencies. These targets are posted annually on ODOT's Transit Asset Management site.[17]

Table 2 lists the specific Performance Measures and Targets currently adopted in the Oregon Tier II Providers Group TAM Plan.

TABLE 2. OREGON TIER II GROUP TAM PLAN PERFORMANCE TARGETS

ASSET TYPE	2017	2018
EQUIPMENT - AUTOMOBILES	40%	40%
ROLLING STOCK - OVER THE ROAD BUS	20%	20%
ROLLING STOCK - BUS	40%	40%
ROLLING STOCK - CUTAWAY	40%	40%
ROLLING STOCK - VAN	40%	40%
ROLLING STOCK - MINIVAN	40%	40%
ROLLING STOCK - SUV	40%	40%
ROLLING STOCK - AUTOMOBILE	40%	40%
FACILITIES - PASSENGER / PARKING FACILITIES	10%	10%
FACILITIES - ADMINISTRATIVE / MAINTENANCE FACILITIES	10%	10%

Additionally, On July 19, 2018, the FTA published the *Public Transportation Agency Safety Plan* (PTASP) Final Rule (49 CFR §673.15) regulating how Chapter 53 grantees would have to implement federally mandated safety standards. The rule's effective date was July 19, 2019, and the compliance date was July 20, 2020. Four performance measures must be included:

- Fatalities[18]

[16] Transit agencies are designated as Tier I or Tier II based on vehicles operated in maximum service. Tiers determine which type of TAM plan to develop and which TAM plan elements are required.

[17] https://www.oregon.gov/ODOT/RPTD/Pages/Transit-Asset-Management.aspx

[18] Total number of fatalities reported to the National Transit Database and rate per total vehicle revenue miles by mode.

- Injuries[19]
- Safety events[20]
- System reliability[21]

Lane Transit District adopted its PTASP in January 2020. The adopted safety measures and targets are shown in Table 3. Performance targets are based on the safety performance measures established under the National Public Transportation Safety Plan.

TABLE 3. SAFETY PERFORMANCE TARGETS

MODE OF TRANSIT SERVICE	FATALITIES	INJURIES	SAFETY EVENTS	SYSTEM RELIABILITY
FIXED ROUTE BUS	0	36	2.5/100k	7,241 miles
BUS RAPID TRANSIT	0	36	2.5/100k	7,241 miles

State and CLMPO Performance Targets

MAP-21 and the FAST Act required the U.S. Department of Transportation (USDOT) to establish transportation performance measures related to safety, pavement and bridge condition, system performance, and CMAQ funded projects (Figure 20). ODOT set performance targets for these measures and Central Lane MPO has acted by supporting the state targets. MPOs are required to incorporate performance measures and targets into their RTPs and Metropolitan Transportation Improvement Plans.

Table 4 shows the State target for the pavement condition, bridge condition, National Highway System Performance, and CMAQ performance measures. The State has calculated a statewide baseline for each measure and has also provided the baseline for each MPO as reflected in Table 3.

[19] Total number of injuries reported to the National Transit Database and rate per total vehicle revenue miles by mode.

[20] Total number of safety events (reportable derailments, collisions, fires, and evacuations) reported to the National Transit Database and rate per total vehicle revenue miles by mode.

[21] Mean distance between major mechanical failures by mode.

TABLE 4. FEDERAL PERFORMANCE MEASURES AND STATE TARGETS

PERFORMANCE MEASURE	TARGET
PAVEMENT CONDITIONS	
1. PERCENTAGE OF PAVEMENTS OF THE INTERSTATE SYSTEM IN GOOD CONDITION	35%
2. PERCENTAGE OF PAVEMENTS OF THE INTERSTATE SYSTEM IN POOR CONDITION	0.5%
3. PERCENTAGE OF PAVEMENTS OF THE NON-INTERSTATE NHS IN GOOD CONDITION	50% (2 yr), 50% (4 yr)
4. PERCENTAGE OF PAVEMENTS OF THE NON-INTERSTATE NHS IN POOR CONDITION	10% (2 yr), 10% (4 yr)
BRIDGE CONDITION	
5. PERCENTAGE OF NHS BRIDGES BY DECK AREA CLASSIFIED AS IN GOOD CONDITION	10%
6. PERCENTAGE OF NHS BRIDGES BY DECK AREA CLASSIFIED AS IN POOR CONDITION	3%
NATIONAL HIGHWAY SYSTEM PERFORMANCE	
7. PERCENT OF THE PERSON-MILES TRAVELED ON THE INTERSTATE THAT ARE RELIABLE (INTERSTATE TRAVEL TIME RELIABILITY)	78%
8. PERCENT OF THE PERSON-MILES TRAVELED ON THE NON-INTERSTATE NHS THAT ARE RELIABLE (NON-INTERSTATE TRAVEL TIME RELIABILITY)	78%
FREIGHT MOVEMENT ON INTERSTATE SYSTEM	
9. TRUCK TRAVEL TIME RELIABILITY (TTTR) INDEX (FREIGHT RELIABILITY)	1.45
CONGESTION MITIGATION AND AIR QUALITY ON ROAD MOBILE SOURCE EMISSIONS	
10. TOTAL EMISSIONS REDUCTION OF PM-10 FROM FUNDED CMAQ PROJECTS	PM-10 363 (2 yr kg/day), PM-10 726.4 (4 yr kg/day)

** The mid-sized and small MPOs all have between 0 and 10 percent in good condition.*

*** Calculated as sum of emissions reductions from all projects funded with CMAQ dollars from 2014 to 2017. Central Lane and Salem-Keizer MPO did not receive CMAQ funding during this period and, therefore, were not included but will be moving forward. Four-year target values reflect estimated emissions benefits for projects that are currently programmed in the STIP for 2018-2022. Two-year target values are set as one-half of the four-year target.*

Table 5 lists the safety targets adopted by the State in the Oregon Transportation Safety Action Plan. The Plan adopted annual targets based on a five-year rolling average in order to even out the data over a period of time.

TABLE 5. STATE PERFORMANCE TARGETS - SAFETY

BASE PERIOD (YEARS)	FATALITIES (PEOPLE)	FATALITY RATE (PEOPLE PER 100 MILLION VMT)	SERIOUS INJURY (PEOPLE)	SERIOUS INJURY RATE (PEOPLE PER 100 MILLION VMT)	NONMOTORIZED FATALITIES AND SERIOUS INJURIES (PEOPLE)
2021 BASELINE (2014-2018 DATA)	448	1.48	1,739	5.03	257
2022 TARGET (2015-2019 DATA)	444	1.46	1,722	4.98	254

Regional Performance Measures

In addition to the performance targets the MPO needs to monitor and report on for federal compliance, several performance measures specific to the region were identified for this RTP. Figure 21 defines the regional performance measures and their associated RTP goals. Chapter 6 of the RTP will report the evaluation of these (and federal) performance measures.

FIGURE 21. HOW THE RTP PERFORMANCE MEASURES REPRESENT RTP GOALS

PERFORMANCE MEASURES		ASSOCIATED GOALS
1 MILES TRAVELED	System-wide number of miles traveled	
2 TRAVEL TIME	Travel times between key origin-destinations	
3 CONGESTED MILES OF TRAVEL	Congested miles of travel on the major regional roadway network	
4 VEHICLE HOURS OF DELAY	Daily vehicle hours of delay	
5 CONGESTION	Locations on the regional roadway network that are congested	
6 MODE SHARE	Percent of non-drive alone trips (walking, bicycling, transit, and shared ride trips)	
7 SYSTEM COMPLETENESS	Completeness of regional sidewalks and bikeways	
8 ACCESS TO JOBS	Number of jobs accessible within a reasonable travel time (20 minutes) by driving, transit, bicycling, and walking	
9 ACCESS TO SERVICES	Access to community services within a reasonable travel time (20 minutes) by driving, transit, bicycling, and walking	
10 ACCESS TO TRANSIT	Number and share of households within 1/4 mile of transit	
11 ACCESS TO HIGH CAPACITY TRANSIT	Number and percent of households within 1/4 mile of frequent transit	
12 SAFETY	Transportation-related crashes	
13 GREENHOUSE GAS EMISSIONS	Transportation-related greenhouse gas emissions	

CONGESTION MANAGEMENT PROCESS

The Congestion Management Process (CMP) lays out the process used by CLMPO to manage congestion (Appendix B). Congestion management is the application of strategies to improve transportation system performance and reliability by reducing the adverse impacts of vehicle congestion on the movement of people and goods. A CMP is a systemic and regionally accepted approach for managing congestion. It provides accurate, up-to-date information on transportation system performance and assesses alternative strategies that meet state and local needs. The CMP is reflective of regional congestion issues as well as the CLMPO area's regional goals and objectives.

The FHWA requires all MPOs that have urban areas with a population of over 200,000, designated as Transportation Management Areas (TMA), to have a CMP.

According to Code of Federal Regulation (CFR), 23CFR450.320(a) and (b), TMAs shall cooperatively address congestion management through a process that provides for a safe and effective integrated management and operation of the multimodal transportation system…through the use of travel demand reduction and operational management strategies.

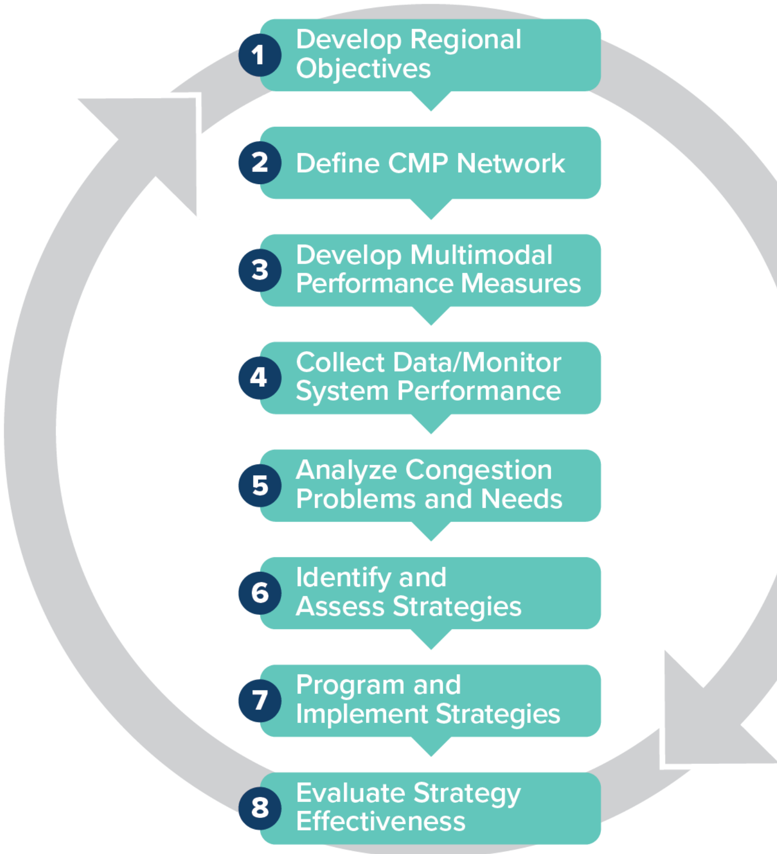
OVERVIEW OF THE CLMPO CMP

Federal guidelines provide local MPOs with discretion in how the CMP is conducted so that the approach used by the CLMPO can better reflect the community goals and policies that influence the types of solutions and investment priorities for managing congestion.

The CMP reports on performance trends and regional strategies to address underperforming elements of the transportation system and includes a list of high-priority strategies, projects, and studies identified to address key areas.

The CMP is organized around the same eight actions that are described by the FHWA and illustrated in Figure 22. The diagram shows a progression of planning activities and the iterative nature of the ongoing MPO regional planning process. The CLMPO has the freedom to vary the level of effort for each of the action areas, depending on the available funding for data collection and the extent and depth of analysis that might be required to inform key strategy decisions.

FIGURE 22. CONGESTION MANAGEMENT PROCESS STEPS



Source: Congestion Management Process Guidebook, Figure 2, FHWA, April 2011.

HOW THE CMP FITS INTO THE REGIONAL PLANNING PROCESS

The CMP is a core part of the regional transportation planning process.

The goals and objectives of the RTP inform and update the CMP purpose and goals, which in turn govern the underlying performance measures and reporting tools. New CMP strategy outcomes could require subsequent focused transportation studies and special plans, such as a regional Transportation System Management and Operations (TSMO) Plan or Corridor Study to further evaluate and refine possible solutions and priorities. The RTP was done in close coordination with the regional ITS Plan update to better integrate the strategies, solutions, and implementation measures for each planning document. Finally, key recommendations of those special studies feed back into the implementation process and are considered during the monitoring action step.

The CMP must establish a least cost planning approach that is then used before implementing projects that significantly increase capacity. This approach utilizes lower cost alternative travel demand reduction strategies and operational management strategies that could mitigate problems prior to the implementation of more costly strategies, such as major capacity enhancing capital projects. If such strategies cannot improve existing conditions and adding capacity is warranted, "*the CMP must identify strategies to manage the single occupant vehicle (SOV) facility safely and effectively, along with other travel demand reduction and operational management strategies appropriate for the corridor*" (23CFR450.320(e)).

CLMPO strives to put a focus on TSMO strategies and increasing the number of transportation options to reduce the number of single-occupancy vehicles to reduce congestion instead of increasing capacity on roadway facilities. Roadway capacity improvements are a last resort in the strategy toolbox and should only be applied as needed. The MPO coordinates and partners with regional Transportation Options (TO) programs, which include SRTS, Individualized Marketing, and other programs that support walking, biking, transit, rideshare, and telecommuting.

Examples of CMP Toolkit Strategies include promoting a regional commuter benefit program, parking management, turning movement enhancements, ramp metering, incident management, transit signal priority, new and improved park and ride facilities, freight capacity investments, and grade-separated railroad crossings. Strategies consisting of large capital projects that are meant to increase roadway capacity are also included in the strategies list, but generally are a last resort as these require significantly more capital investment and do not produce the same long-term results as active transportation options. Some of the strategies can be applied at the regional scale, but most are applied to individual corridors based on the existing facility deficiencies.

A bus departs from the Santa Clara transit facility.

CHAPTER 3: REGIONAL ASSESSMENT

The regional transportation system plays an important role in the way residents and visitors live, work, and play. Decisions made in the regional planning process affect people's ability to move around safely using their mode of choice and are critical to the region's future. This Chapter describes population and employment growth trends, demographics, and travel trends for insights into how the system is currently used and how to manage and plan for the future.

KEY DESTINATIONS

The CLMPO region is defined, in part, by its major activity centers, or key destinations. These key destinations substantially influence travel patterns uniquely. It is important to understand the places that impact travel patterns so that transportation planning efforts can best serve the region's needs.

MAJOR ACTIVITY CENTERS

The Eugene-Springfield metropolitan area is the second largest population center in the state and is a regional and international destination for education, sports, medical services, and recreational activities.

Key destinations and attractions are shown in Figure 23, and include:

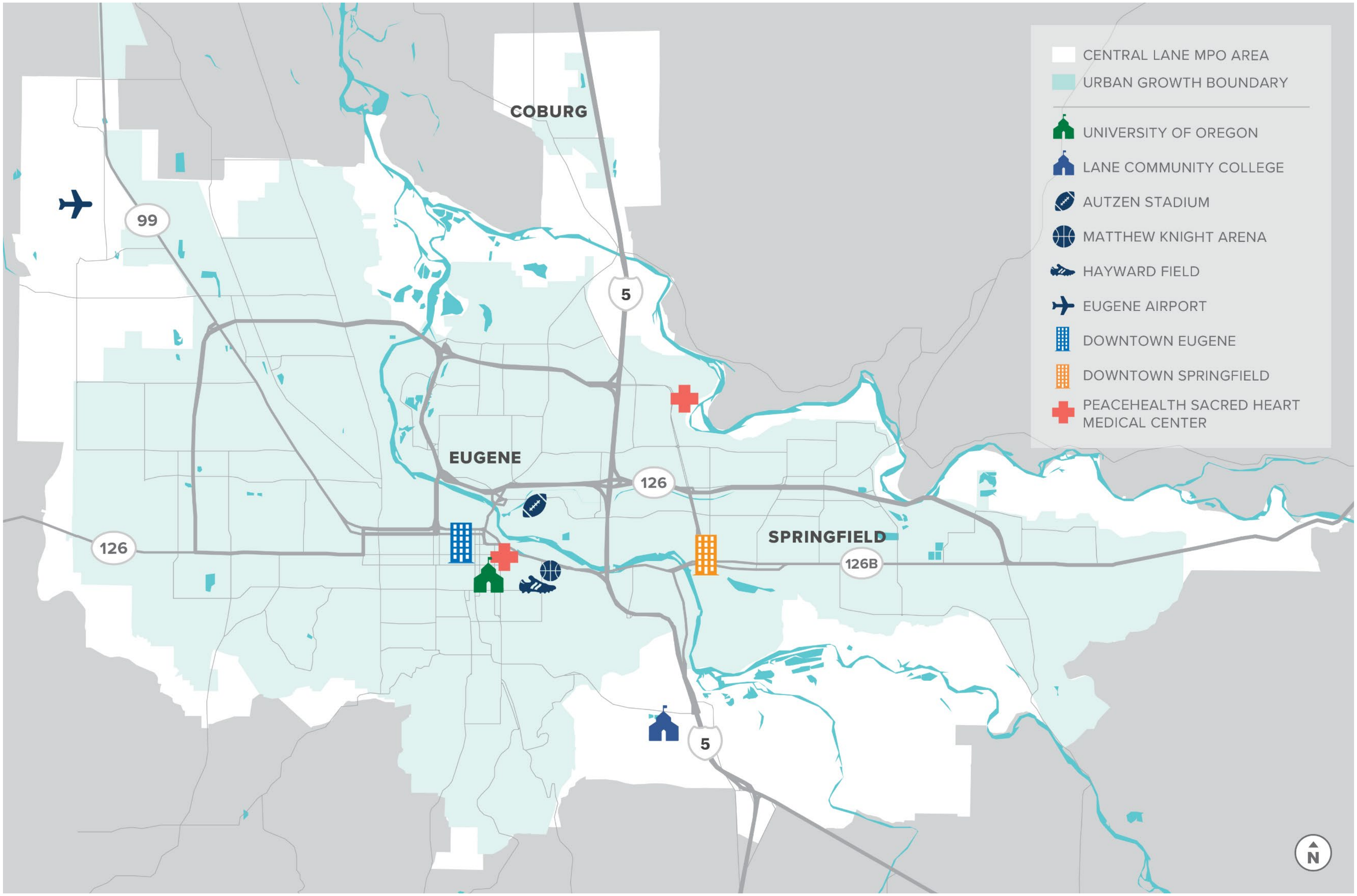
- **The University of Oregon.** The school's total 2020 enrollment of undergraduate and graduate students was 22,7601. Students come from all 50 states, the District of Columbia, two U.S. territories, and 99 countries. Of the current enrolled students, 52% are Oregon residents, 38% are from out of state, and 10% are international students.
- **Lane Community College.** The school serves more than 25,000 students per year through transfer, career technical, and personal enrichment programs.
- **University of Oregon Ducks Athletics.** Sporting events are a major draw; particularly to Hayward Field, Autzen Stadium, and the Matthew Knight Arena. The University of Oregon completed a renovation of Hayward Field in 2020 to a world-class track and field facility. It will host collegiate track and field meets, including upcoming NCAA Championships, as well as the 2022 World Athletics Championships.
- **The Eugene Airport.** EUG is a small-hub airport and the second largest airport in Oregon. It serves an area encompassing 91 zip codes with a population of approximately 730,3803. It provides nonstop service to Portland, Seattle, San Francisco, Los Angeles, Denver, Salt Lake City, Las Vegas, Chicago, Palm Springs, and Phoenix-Mesa. Connections to anywhere in the world are available through eight airlines operating at EUG, including Aha, Avelo, Alaska Airlines, Allegiant Air, American Airlines, Delta Air Lines, Southwest, and United Airlines.
- **Downtown Eugene.** Attractions include the Hult Center for the Performing Arts, the expanded 5th Street Public Market, Saturday Market and Lane County Farmers Market, art galleries, restaurants, local shops, The John G. Shedd Institute for the Arts, the McDonald Theatre, WOW Hall, Broadway Metro, Actors Cabaret of Eugene and Ballet Fantastique, Lane Community College Downtown Campus, and the Eugene Public Library. The City of Eugene is currently transforming its Downtown Riverfront property. The 16 acres of riverfront property, vacant and inaccessible for decades, will become a vibrant riverfront district and community destination. It will connect the City's downtown and campus areas along the Willamette River. Construction on

the Riverfront Park started in May 2020 and is expected to be completed by the end of 2021. Park improvements will include river overlooks, walking paths, and connectivity with the riverbank path system.

- **Downtown Springfield.** Attractions include a diverse array of local shops, galleries, and restaurants as well as the Richard E. Wildish Community Theater, Springfield Museum, and Springfield Public Library.
- **Peace Health Sacred Heart Medical Center Hospitals.** The two hospitals in the region at Riverbend in Springfield and at the University District in Eugene offer state-of-the art medical care.

Destinations beyond the MPO boundary in Lane County that bring visitors to the area are described in the following section.

FIGURE 23. CLMPO MAJOR ACTIVITY CENTERS



REGIONAL VISITORS AND TOURISM

Eugene, the University of Oregon, and South Willamette Valley Wine Country draw visitors to the region for leisure, sporting events, and business. Large events in the region that attract visitors include conferences in Eugene and sporting events at the University of Oregon. According to the Eugene Airport activity logs, the number of passengers served has grown rapidly at an average rate of 6% annually since 2010, surpassing 1.2 million in 2019.

Per the Oregon Travel Impacts County Estimates, Lane County (and primarily the Central Lane region) averaged more than three million overnight person trips per year from 2016-2019, with 0.5% growth year over year. The economic opportunities provided by these visitors supports more than 6% of the jobs in Lane County.

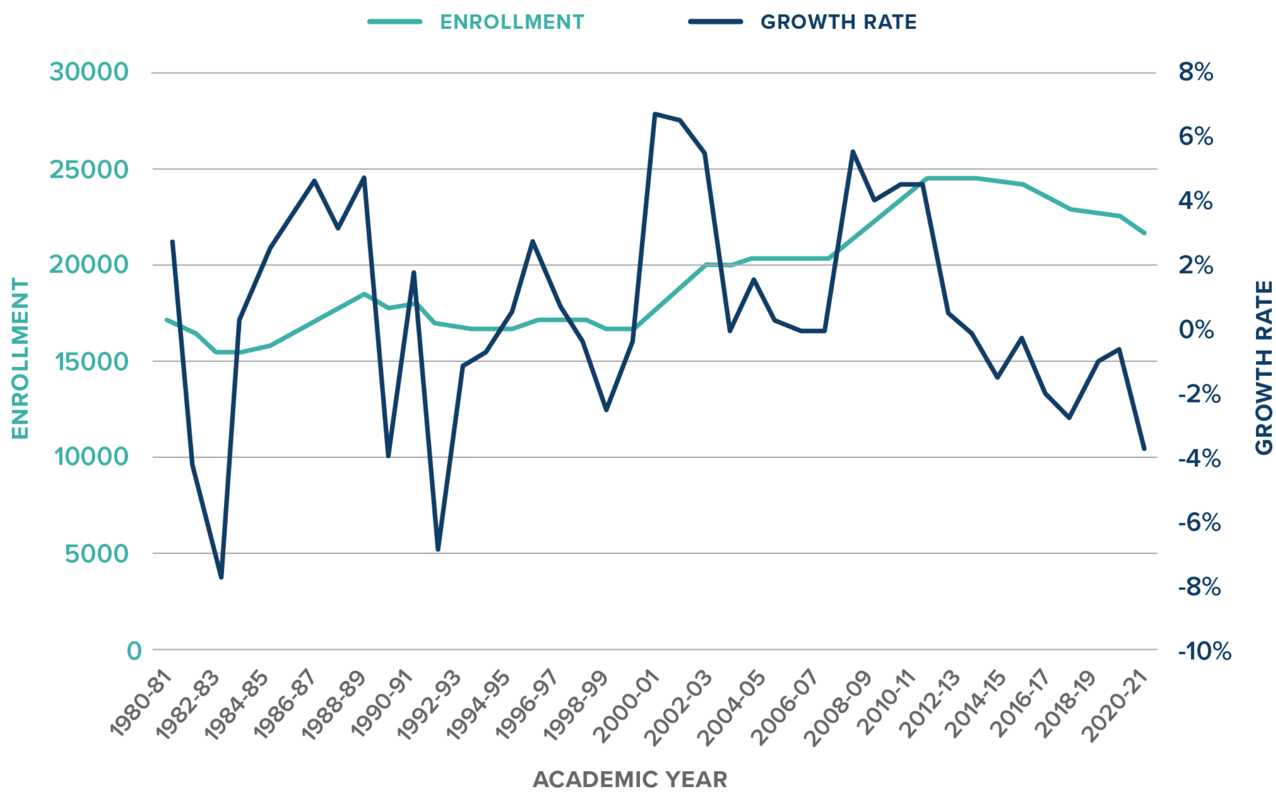
Popular recreational activities also draw visitors and residents to travel within the region:

- The Central Lane area is a hub for outdoor recreation offering access to the Oregon coast, Cascade Mountain region, hiking, biking, waterfalls, covered bridges, water recreation, and more.
- The Central Lane area is also a hub for the South Willamette Valley wine region which is often ranked as a top wine destination.

UNIVERSITY OF OREGON

The University of Oregon is a Tier 1 research institution with nine schools and colleges. The 295-acre campus continues to grow with the recent addition of the Phil and Penny Knight Campus for Accelerating Scientific Impact and the transformed Hayward Field. It is located east of downtown Eugene and is connected to the rest of the region through the City of Eugene's 13th Avenue Bikeway, the EmX bus rapid transit line, and Franklin Boulevard. Student enrollment has grown since the University opened its doors in 1876, as shown in Figure 24, though recent years have shown a decreased enrollment.

FIGURE 24. UNIVERSITY OF OREGON HISTORICAL ENROLLMENT



Source: UO Office of Institutional Research.

EMPLOYMENT GROWTH

Sustained economic development and growth indicates a healthy vibrant community due to employment stability and a larger tax base. However, while growth can contribute to economic health, impacts must be addressed, including ensuring that the multimodal transportation system and services are in place to meet the growth needs. The balance of economic viability and quality of life is a challenge but also a goal of this RTP.

The region's current employment of over 127,000 jobs has increased by 15,000 jobs over the past 15 years. Most of these jobs are in Eugene's urban core near the University of Oregon. A high density of jobs is also concentrated in north Springfield between I-5 and the McKenzie River, and along the north side of the Willamette River in Eugene, as seen in Figure 25.

Table 6 summarizes the current and projected employees working in each area of the region. Eugene currently holds approximately 70 percent of the region's employment. However, the rate of employment growth in Springfield (42 percent) is forecasted to slightly outpace Eugene's employment growth rate (38 percent) over the next 25 years. Even with increased growth in these areas, Eugene is forecasted to contain approximately 69 percent of employees in the region in 2045.

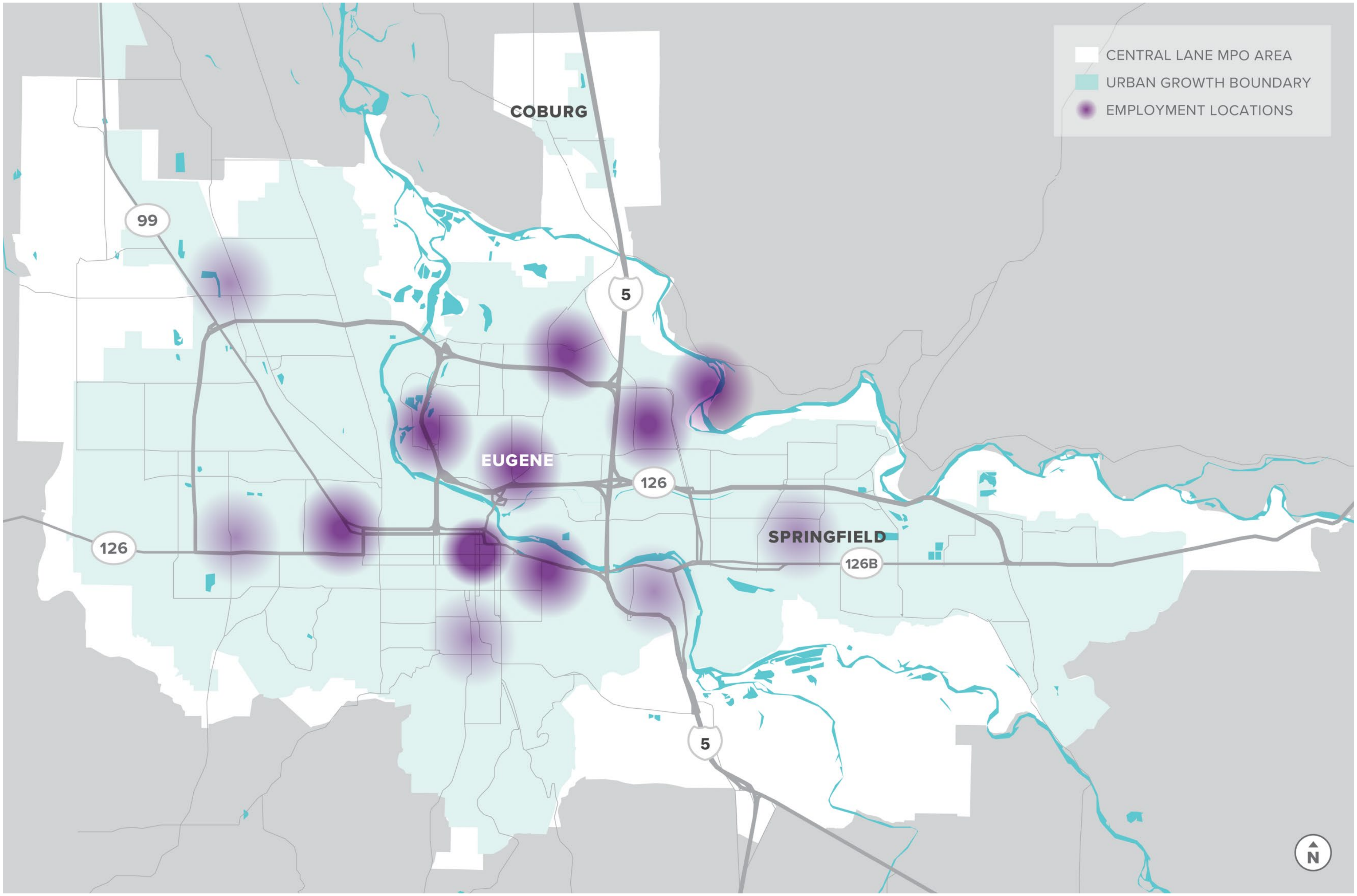
TABLE 6. CURRENT AND FORECASTED EMPLOYMENT (EMPLOYEES) IN THE REGION

JURISDICTION	2016 ESTIMATE	2045 FORECAST	PERCENT CHANGE
LANE COUNTY UNINCORPORATED*	5,032	6,716	33%
COBURG	1,533	2,121	38%
EUGENE	89,184	122,855	38%
SPRINGFIELD	32,039	45,571	42%
CLMPO	127,788	177,263	39%

Source: Oregon Employment Department 2018; LCOG 2020.

** Unincorporated Lane County area is located inside the MPO modeling area. The MPO modeling area is slightly larger than the MPO area, and includes the unincorporated Lane County area, Coburg, Eugene, and Springfield.*

FIGURE 25. WHERE PEOPLE WORK (HIGHEST DENSITIES)



REGIONAL POPULATION TRENDS

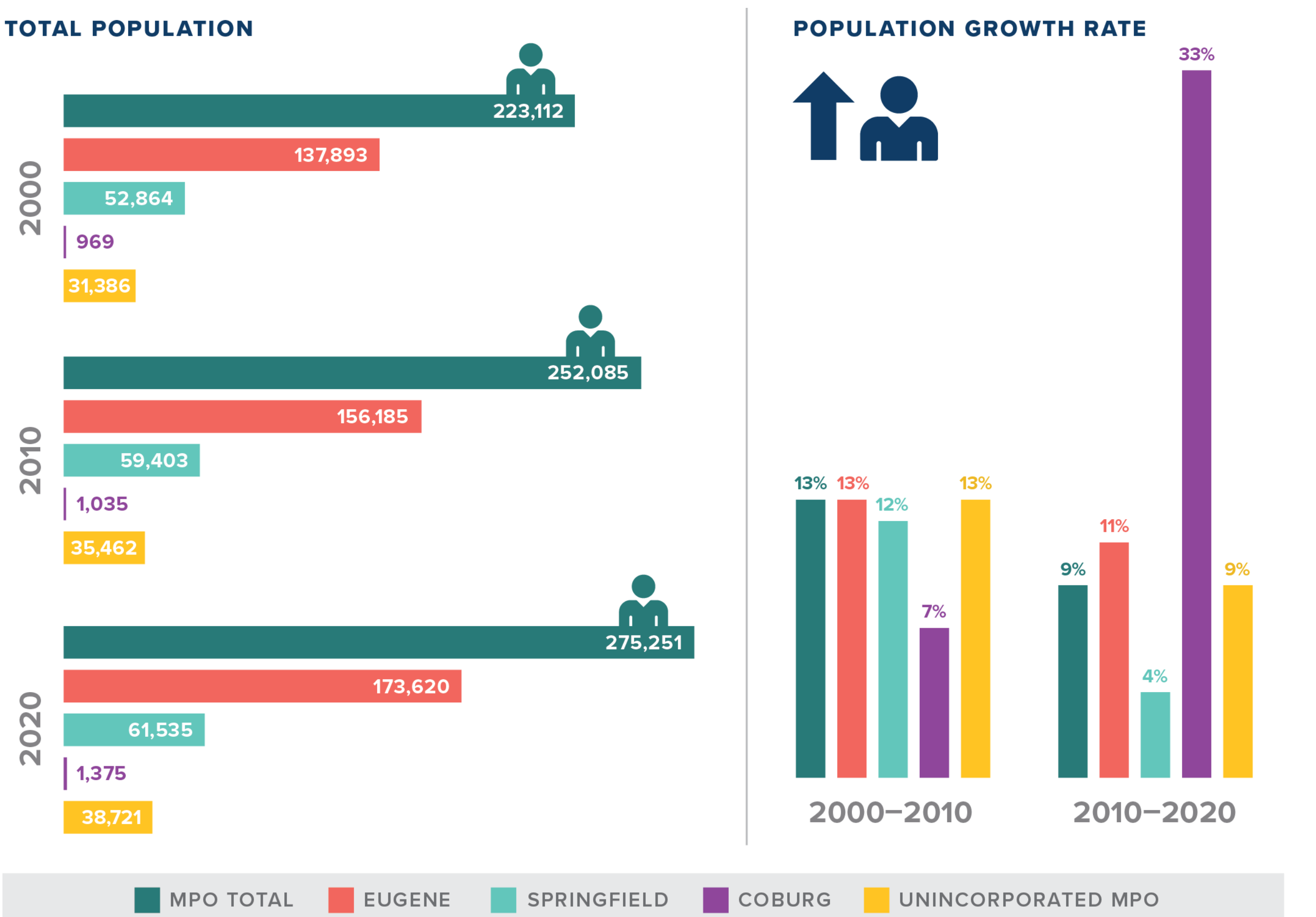
The following sections describe how the population is changing in the Central Lane region.

POPULATION GROWTH

The Central Lane region is growing, and that growth is expected to continue through 2045. Since 2000, Central Lane has grown about 1% each year, adding around 50,000 residents to the current population of 275,000. The growth has been happening throughout the region, with the cities of Eugene, Springfield, and Coburg each growing over 15 percent during this 25-year period. Figure 26 summarizes regional growth trends.

Of the Central Lane region's total population, 85 percent live in Eugene or Springfield, with 173,620 and 61,535 respectively. Figure 27 shows areas with higher concentration of population density by household. The densest areas are within Eugene's urban core and the University of Oregon campus. Other areas with high population densities include Springfield south of Main Street, households near the Shoppes at Gateway, and northern and western Eugene.

FIGURE 26. REGIONAL POPULATION GROWTH TRENDS FROM 2000-2020



CLMPO's 2016 population was 267,981. By 2045, the population is forecasted to grow to 320,684, a 20% increase. The population forecast for 2016 was used to develop regional land use estimates and relies on the Certified Population Estimates prepared by Portland State University's Population Research Center (PRC). PRC also released a Lane County population forecast in 2019 that provides 2019 baseline population and a 2045 population forecast for Lane County, Eugene, Springfield, and Coburg. The CLMPO boundary extends beyond the Coburg, Eugene, and Springfield city limits into unincorporated Lane County. The base population and population forecast are both adjusted to include the number of people inside the MPO area that are outside of city limits. Table 7 lists the current and forecasted populations for the CLMPO area.

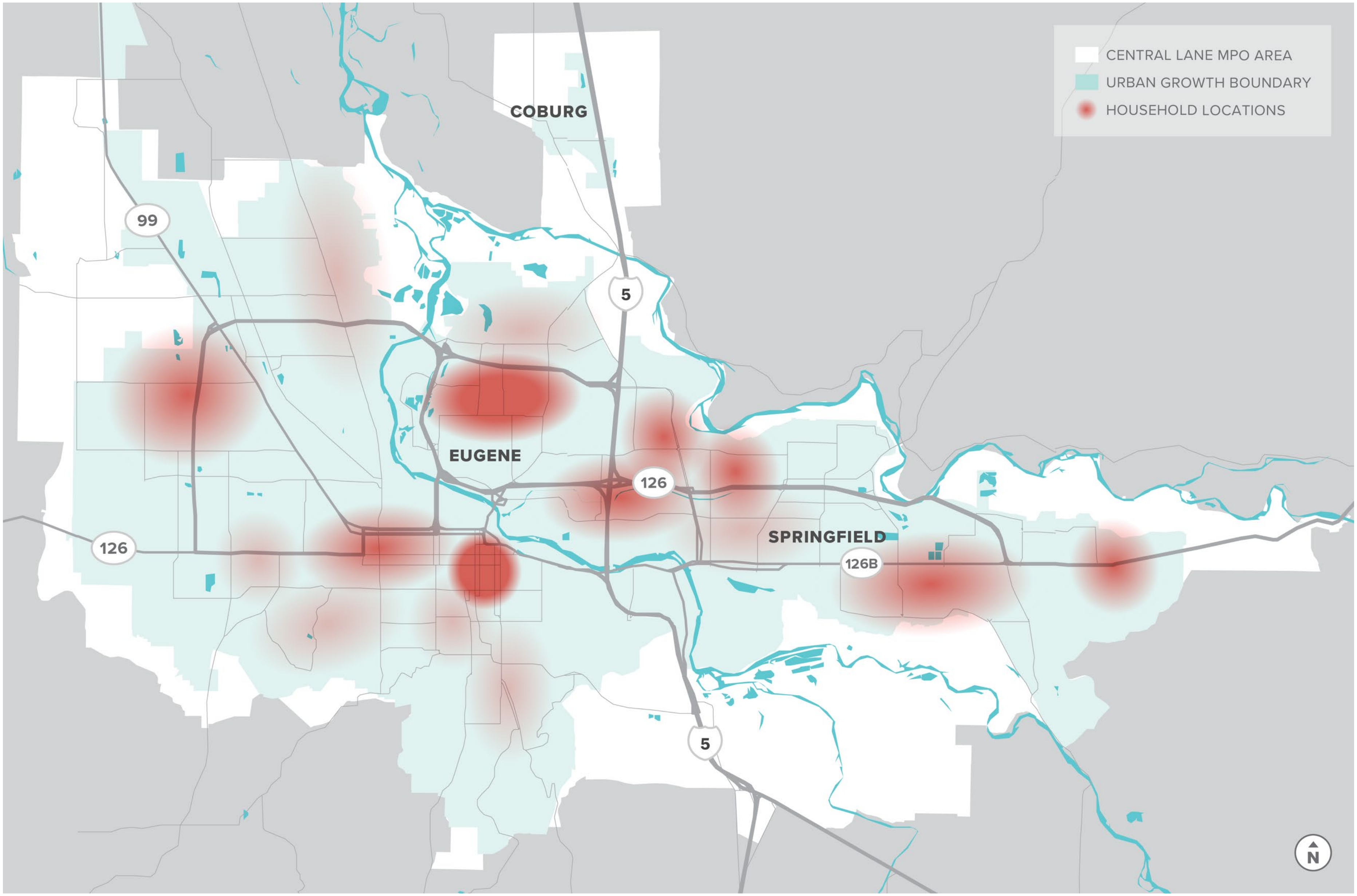
TABLE 7. CLMPO CURRENT AND FORECASTED POPULATION

JURISDICTION	2016 ESTIMATE	2045 FORECAST	PERCENT CHANGE
LANE COUNTY UNINCORPORATED*	8,121	8,705	7%
COBURG	1,104	1,694	53%
EUGENE	189,135	233,625	24%
SPRINGFIELD	69,621	76,660	10%
CLMPO TOTAL	267,981	320,684	20%

Source: Population Research Center, Portland State University, 2015, 2019, American Community Survey 5-Year Estimates; LCOG 2020.

** Unincorporated Lane County area is located inside the MPO modeling area. The MPO modeling area is slightly larger than the MPO area, and includes the unincorporated Lane County area, Coburg, Eugene, and Springfield.*

FIGURE 27. WHERE PEOPLE LIVE (HIGHEST DENSITIES)



REGIONAL DEMOGRAPHICS

Like the rest of the United States, the Central Lane region's demographic make-up is changing.[22] As the population of the region has grown in the past 10 years, several demographic trends have emerged. Key demographic trends highlighted in the section are based on the classifications of the Central Lane MPO's nondiscrimination policy and procedures, referred to as the Title VI Plan, which addresses integration of nondiscriminatory practices in transportation planning, public participation, and decision-making.[23] Title VI refers to requirements of the federal Civil Rights Act of 1964 and other legislation that direct the fair treatment and meaningful involvement of all people – regardless of race, color, national origin, disability, age, gender, or income status – in programs and activities receiving federal funding, including for transportation issues. One of the key purposes of Title VI is to ensure that public funds are not spent in a way that encourages, subsidizes, or results in discrimination. The intent is to eliminate barriers and conditions that prevent groups and persons from receiving access, participation, and benefits from federally assisted programs, services, and activities.

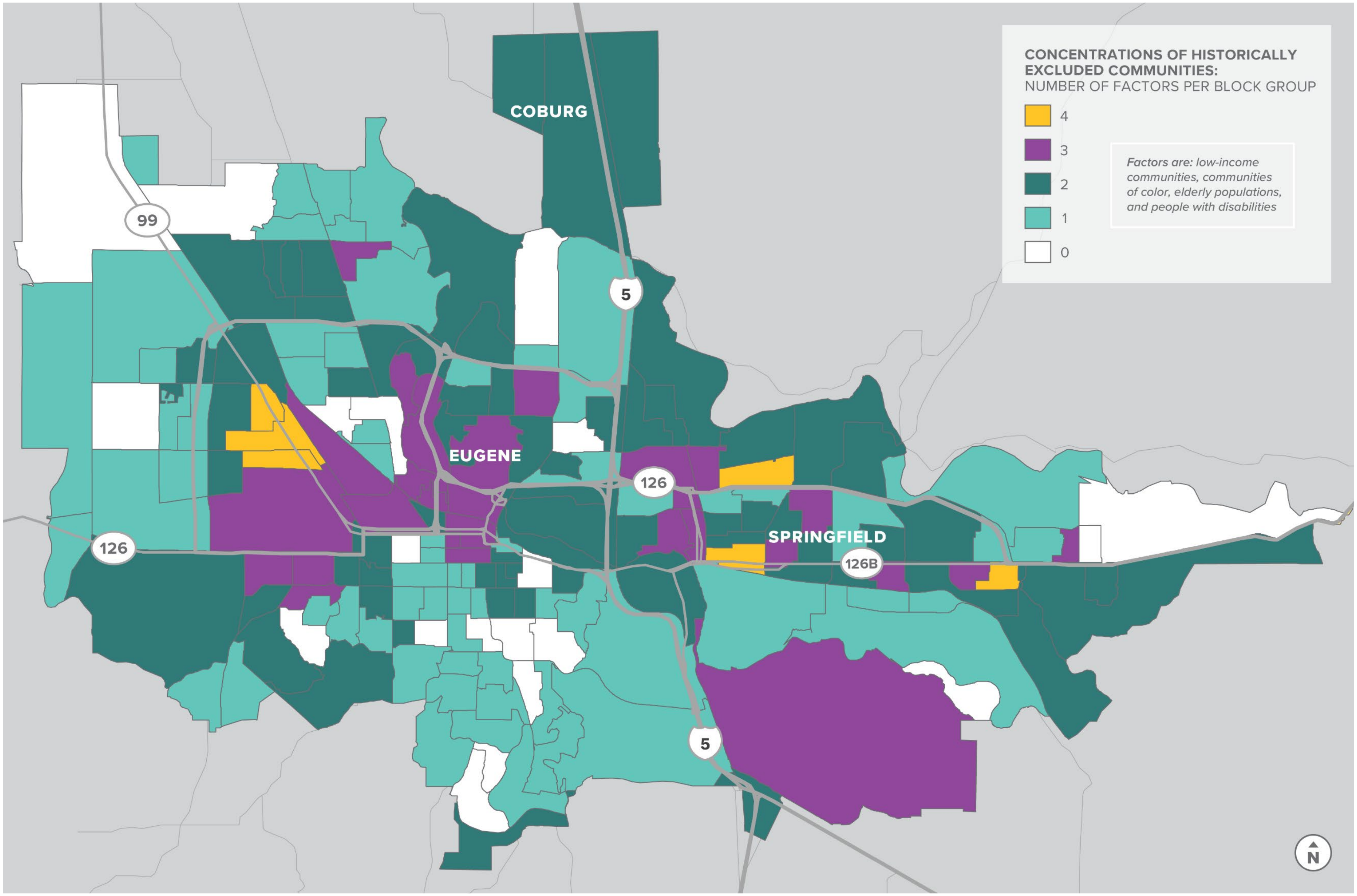
Notably, the remainder of this Plan will substitute the Title VI designation of "Communities of Concern" with the term "Historically Excluded Communities" to better illustrate the reasoning behind specific considerations for the Title VI-designated communities. This recognizes the fact that the benefits and burdens of transportation investments have not been fairly distributed, with the majority of burdens being placed on low-income communities, communities of color,[24] elderly populations, and people with disabilities.[25] The CLMPO is responsible for evaluating the impact of proposed transportation investments on population groups that may be traditionally underserved or underrepresented.

The following sections will describe the current geographic location and general growth patterns of Historically Excluded Communities. Understanding where Historically Excluded Communities are located and how the region's demographics are changing will help the CLMPO better target public outreach and transportation-related projects, programs, and activities.

Figure 28 geographically locates concentrations of Historically Excluded Communities throughout the region by Census block group. The figure indicates the block groups where concentrations of low-income communities, communities of color, elderly populations, and people with disabilities are higher than the region-wide average. Most Census block groups (164 of the 184) in the region include one or more Historically Excluded Community.

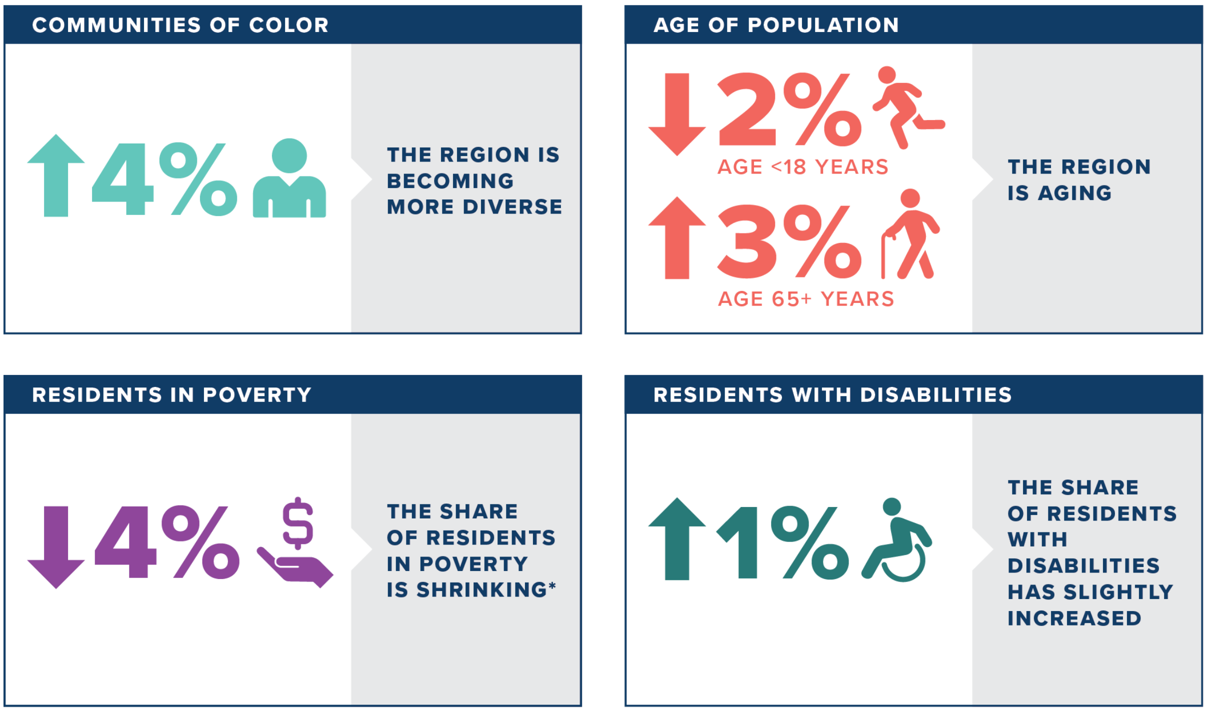
[22] Communities of Concern: 2015-2019 American Community Survey (5-year ACS)
[23] Central Lane MPO Title VI Plan, June 2015. The Title VI Plan includes additional information and resources regarding the region's Historically Excluded Communities.
[24] Communities of Color will be used to replace the Title VI designation of "Minority" throughout this Plan.
[25] People with Disabilities will be used to replace the Title VI designation of "Disabled" throughout this Plan.

FIGURE 28. CONCENTRATIONS OF HISTORICALLY EXCLUDED COMMUNITIES



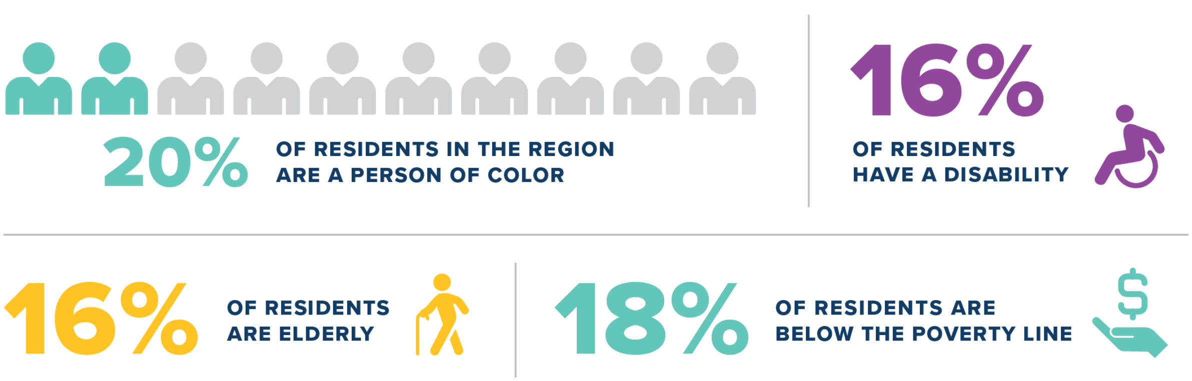
Generally, the population is getting more diverse, more educated, wealthier, and older. Figure 29 summarizes these trends over the last decade.[26] A current snapshot of the region's demographics is shown in Figure 30.

FIGURE 29. REGIONAL DEMOGRAPHIC TRENDS (2010 - 2019)



** A discussion on the houseless population in the region is provided below.*

FIGURE 30. PERCENTAGE OF HISTORICALLY EXCLUDED COMMUNITIES IN THE REGION



[26] U.S. Census Bureau 1-year ACS estimates for the Eugene urbanized Area. This closely approximates the Central Lane MPO area

These trends reinforce the need to meet the diverse needs of all communities in the region when planning for the future of the transportation system. Further, each of these communities have unique needs.

Communities of Color

In 2010, 18 percent of the region identified as a person of color.[27] By 2019, this number increased to 22 percent. Higher representation of communities of color tend to center around the west Eugene and Springfield areas. These communities have historically been excluded from the planning process yet are impacted by policy and funding decisions. According to the *2020 Lane County Health Equity Report*, data show higher rates of poverty, lower median income, and fewer educational opportunities for people of races/ethnicities that have borne the brunt of racist policies and practices.[28]

As noted in Chapter 1, the public involvement process included outreach to communities of color through bilingual surveys. Specific outreach efforts to reach communities of color will continue to be included in future planning efforts.

Income

The median household income for the region was estimated to be $57,325 in 2019, which is approximately 80 percent of the amount for the state of Oregon.[29] This is an increase from the previous year, following the trend of yearly increases in median household income since 2012 in the region. Major employers in the region include PeaceHealth Medical Group and the University of Oregon, each with just under 6,000 employees, and Lane Community College, Sacred Heart Medical Center University District, Walmart, and Kendall Automotive Group with 1,000 to 2,000 employees each.[30]

The percent of the population living in poverty has decreased steadily since 2010. In 2010, 19 percent of the population was below the poverty level. That number decreased to 15 percent by 2019. The block groups with the highest percentage of households in poverty are generally located in Eugene's urban core, downtown Springfield, and clustered around the University of Oregon. In addition, many residents in Springfield and Eugene are struggling as evidenced by other indicators, as 19% of Eugene residents and 28% of Springfield residents receive food stamp benefits (SNAP), and 49% of students from the three Public School Districts in Eugene and Springfield are eligible for free and reduced lunch.[31]

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[27] Consistent with the Title VI plan, a "minority" was defined as all persons who identified themselves as non-white or Hispanic.

[28] *Lane County Health Equity Report*, 2020.

[29] 2019 American Community Survey data, Eugene-Springfield, OR Metro Area.

[30] Comprehensive Housing Market Analysis for Eugene-Springfield, Oregon, 2019. 2019 data collected from the U.S. Bureau of Labor Statistics.

[31] *Eugene and Springfield Community Profile and Needs, 2020 Consolidated Plan for Housing & Community Development*.

People living in poverty are less likely to own a car and may be more dependent on public transit or use other modes of non-automotive transportation.

Unhoused Individuals

While Census data show poverty is decreasing in the region, the unhoused crisis is a growing regional issue. The number of people experiencing homelessness in Lane County has been steadily increasing in recent years with a large portion (69%) of homeless people experiencing unsheltered homelessness.[32] According to a 2019 Homeless Point in Time (PIT) Count conducted by volunteers for Lane County, 2,165 total people were experiencing homelessness, where 462 individuals stayed in Emergency Shelter, 106 individuals were in Transitional Housing, and 1,633 individuals, families, and children were without shelter.[33] The total number of homeless people was an increase of 32% from 2018. This information is important to consider alongside traditionally collected data such as the Census to ensure that transportation needs of all individuals throughout the region are being considered.

Age

The median age of individuals living in the region is 39 years old, approximately the same as compared to the entire state of Oregon.[34] In the past 10 years, the percent of the region age 65 and older has increased, while the percent of the region under 18 has decreased. The number of people under 18 years has remained constant as the population has grown. However, the number of people 65 and older has increased in the past 10 years. The number of people aged 65 and older was recorded as 33,319 in 2010 and increased to 47,071 in 2019.

As the population gets older, it is important to provide for more mobility choices since mobility options for elderly people may be limited. Many people cannot drive after a certain age due to decrease in eyesight and other mobility issues. Public transportation can be a good option for elderly people. There are high concentrations of elderly people in the region that live outside of the urban core in Eugene and Springfield who may not have access to any transit options.

[32] Lane County Shelter Feasibility Study, December 2018.
[33] *2019 Point in Time Count Report*, May 2019
[34] 2019 American Community Survey data, Eugene-Springfield, OR Metro Area.

Two bicyclists use a bikeway in Central Lane County.

People with Disabilities

In the cities of Eugene and Springfield, about 32,438 people, or 16%, live with one or more disabilities. People with Disabilities are defined by Title VI as the percentage of people who reported at least one of six disability types: difficulty in hearing, vision, cognition, ambulatory, self-care, or independent living. The highest reported disabilities include ambulatory (8%), cognitive (8%), and difficulty with independent living (7%).[35] Census block groups with a high percentage of people with disabilities tend to center around the urban core of Eugene and Springfield.

People with disabilities may be more likely to depend on public transportation as a mobility option. Public transportation options include Lane Transit District's RideSource ADA service.

Education

While education is not included in the Title VI reporting, education levels have the potential to impact regional commute patterns. For example, workers with higher degrees may be more likely to have jobs that allow them to work from home. The education level of the region's residents has been increasing since 2010. The percent of the population over 25 that have no high school degree or equivalence was 10 percent in 2010. That number has decreased to six percent in 2019. The

[35] *Eugene and Springfield Community Profile and Needs, 2020 Consolidated Plan for Housing & Community Development.*

percent of the population with a bachelor's degree or higher was 31 percent in 2010, and that number has increased to 35 percent in 2019.

During the COVID-19 pandemic, travel patterns during commute hours drastically changed as a portion of the region's workers were required to work from home while other service jobs and essential workers were still making commutes. The long-term impact of the ability for a portion of jobs in the region to be done from home on commute trends is still being measured.

REGIONAL TRAVEL TRENDS

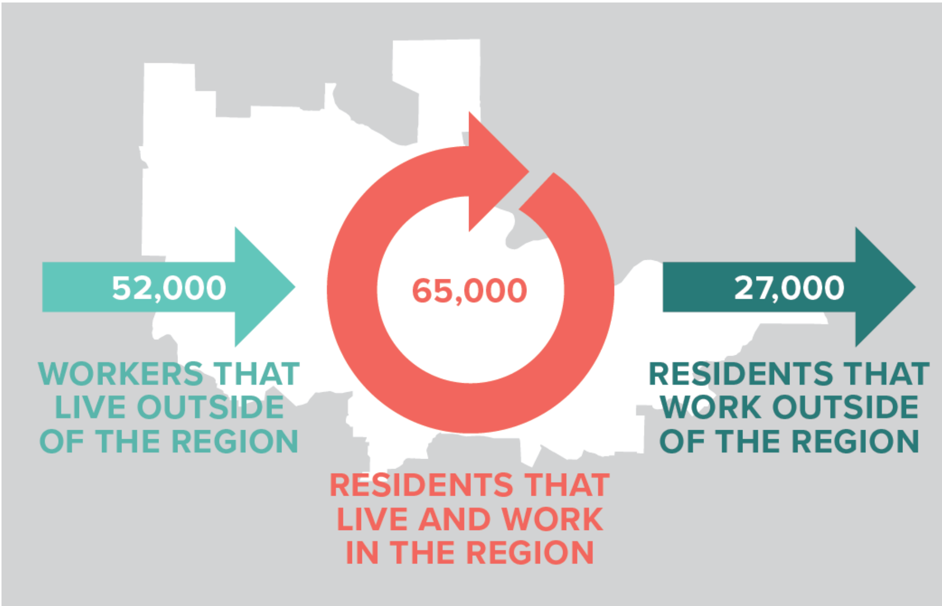
Regional travel trends are following suit with area growth and change. Monitoring evolving travel trends and the needs of both residents and visitors will help local agencies determine where and when transportation investments would be the most equitable and impactful. The following sections detail regional travel trends. Data in this section partially rely on the CLMPO travel demand model and land use allocation model (described further in Chapter 6). The travel model uses known information about the transportation system and peoples' travel decisions (from prior travel surveys) to estimate current and future travel trends and conditions. This tool helps to fill in the gaps between the collection of new travel surveys and other travel data.

REGIONAL COMMUTE PATTERNS

Understanding regional commute patterns is important to successfully plan to serve the employment sector. Regional commute trends are shown in Figure 31. According to the U.S. Census Bureau, CLMPO has 65,000 residents who both live and work within the region, 52,000 workers who live outside of the region and commute in for work, and 27,000 residents who live in the region who commute out of the region for work.[36]

[36] Source data from U.S. Census Bureau available through On The Map https://onthemap.ces.census.gov/

FIGURE 31. REGIONAL COMMUTE PATTERNS



Intraregional Commute

Most Eugene residents also work in Eugene (59 percent), with about 11 percent commuting to Springfield, one percent to Coburg and the remainder outside of the region (29 percent). About 44 percent of employees in Eugene also live there, with 13 percent living in Springfield and the remainder living outside of the region.

About 26 percent of Springfield residents also work in Springfield, with about 43 percent commuting to Eugene, one percent to Coburg, and the remainder outside of the region (30 percent). Of the people working in Springfield, about half live in Springfield or Eugene, with the remaining half coming from outside of the region.

Most Coburg residents work in Eugene (41 percent), with 15 percent working in Springfield and 36 percent working in areas outside of the region. Only about eight percent of people live and work in Coburg. For those commuting to Coburg, most come from Eugene (29 percent) or Springfield (15 percent). About two percent of employees in Coburg also live there, with the remainder commuting from outside the region. Table 8 summarizes where residents living in the three urban areas work.

TABLE 8. REGIONAL COMMUTE PATTERNS – WHERE RESIDENTS WORK

WHERE RESIDENTS LIVE	WHERE RESIDENTS WORK
EUGENE	59% work in Eugene 11% work in Springfield 1% work in Coburg
SPRINGFILED	43% work in Eugene 26% in Springfield 1% work in Coburg
COBURG	41% work in Eugene 15% work in Springfield 8% work in Coburg

Interregional Commute

As shown in Figure 31, approximately 52,000 workers in the region live externally and commute into the region. Approximately 52 percent of these workers reside in Lane County. These external commuters also live in Linn (seven percent), Douglas (five percent), Marion (four percent), and Benton (four percent) counties, among others. These residents primarily rely on regional transportation facilities, including I-5, for travel into and out of the region daily.

Approximately 27,000 residents commute outside the region to jobs. Approximately a third of these residents work elsewhere in Lane County. These residents also work in Marion (nine percent), Linn (five percent), and Benton counties (three percent), among others.

DAILY VEHICLE MILES TRAVELED

Daily vehicle miles traveled (VMT) is used to quantify the amount of all vehicle travel and includes trips made by automobile, freight, and transit within, entering, leaving, or passing through the MPO area (Table 9). This metric is calculated using the regional travel model and considers the product of total vehicle trips and the distance for each of those trips. The automobile represents the majority of VMT. The reported freight trips include medium and large trucks[37] and are vital for the movement of goods in and through the region. The presence of these freight trips can indicate an active economy. Transit miles round out the region’s VMT and contribute towards the combined 5,170,000 daily vehicle miles traveled within, to, and through the region. While transit trips are reported as vehicle miles, these trips include multiple travelers within the vehicle.

[37] Delivery vans and smaller vehicles that serve e-commerce retailers are typically not reflected in these model projections.

TABLE 9. DAILY VEHICLE MILES TRAVELED

VEHICLE TYPE	TOTAL REGIONAL DAILY VEHICLE MILES TRAVELED	PERCENT SHARE
AUTOMOBILE	4,250,000	82 %
FREIGHT	910,000	18 %
TRANSIT	10,000	<1 %
TOTAL	5,170,000	100 %

Note: Regional VMT is estimated using the regional travel demand model[38]

MODE SHARE

A variety of modes can be used to get around the region. For shorter or recreational trips, active transportation modes, such as walking and biking, or transit (where available) are common options. Longer trips are typically candidates for transit or motor vehicle travel. There are other constraints or limitations that may determine the mode used for a specific trip.

Commute Mode Share

According to 5-year American Community Survey (ACS) Journey-to-Work data, mode share for commuters in the CLMPO area[39] has remained relatively constant for the last 10 years. Table 10 highlights the share of commute trips by mode in 2009 and 2019. On average, almost 70 percent of people commute to work using single-occupant motor vehicles. About 11 percent of residents carpool to work and the remaining work from home, walk, bike, take transit, or use some other means of travel.

About six percent of workers in the CLMPO region worked from home pre-COVID, and that figure likely increased due to COVID-19. It is unknown at this time how many of those workers will continue to telework after the threat of COVID-19 passes, but it seems likely that a higher percentage of workers will continue teleworking, at least part time. Any increase in the remote work share will change the demand on the transportation system. It is possible that the share of the workers needing to travel during the morning and evening peak commute times decreases and/or travel increases during off-peak times.

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[38] A regional travel model is used to estimate these figures on a regional basis. Significant recent updates and enhancements to the model mean that values reported in prior plans (such as the 2004 RTP) were different and are not appropriate for providing a consistent comparison.

[39] CLMPO area is defined as the "Eugene Urbanized Area" in the ACS.

TABLE 10. REGIONAL COMMUTE MODE SHARE (2009 - 2019)

VEHICLE TYPE	2009	2019
DRIVE ALONE	70%	69%
CARPOOLED	10%	11%
PUBLIC TRANSIT	5%	4%
BICYCLE	6%	4%
WALK	5%	5%
WORK FROM HOME	4%	6%
OTHER	< 1%	1%

Overall Mode Share

The 2020 regional travel mode share estimates (for all trips) are summarized in Table 11. These estimates are broader than the ACS data, which focus on commute trips. Increasing the non-drive alone mode share (i.e., walking, bicycling, transit, and shared ride) reduces the impact that each person trip has on the transportation system by shifting users to more space-efficient travel options.

TABLE 11. REGIONAL TRIPS MODE SHARE

TRAVEL MODE	2020
DRIVE ALONE	54%
CARPOOLED	28%
PUBLIC TRANSIT	4%
BICYCLE	5%
WALK	9%
TOTAL NON-AUTO	18%

Note: Regional mode share is estimated using the regional travel demand model[40]

[40] A regional travel model is used to estimate these figures on a regional basis. Significant recent updates and enhancements to the model mean that values reported in prior plans (such as the 2004 RTP) were different and are not appropriate for providing a consistent comparison. Mode share is determined by information collected through the household travel survey.

SAFETY

As the number of vehicle miles traveled increases throughout the region, monitoring the safety of all roadways is critical to understanding how the transportation network is serving the area's travel needs.

Figure 32 shows the location of fatal and serious injury crashes that have occurred over the last four years.[41] Several corridors experienced multiple fatalities during this period, including OR 99, I-105, OR 126 Business (Main Street), Hayden Bridge Way, and River Road. During this period, there were 53 total fatalities from crashes, or approximately one per month.

Figure 33 shows the location of bicycle and pedestrian related crashes, with additional severity detail. Crashes involving these modes typically result in greater severity due to the vulnerability of these users, who are not protected with seatbelt and other safety devices inside a vehicle frame. Crash locations include areas with higher pedestrian and bicycle activity (downtown Eugene), and include other regional clusters such as Santa Clara, Springfield's Main Street, Harlow Road, and Mohawk Boulevard.

Crash data are compiled and reported annually by ODOT and include summaries by cities and the county. These data include incidents on the roadways reported from law enforcement, emergency responders, motorists, bicyclists, and pedestrians. Research is showing a disparity in crash data; particularly underreporting crashes involving bicycle and pedestrians. This is noted in recognition of the issue.

[41] For safety analyses, typically three years of crash data are reported as standard for the National Highway Transportation Safety Administration (NHTSA). At the time of the development of this Plan, 2019 crash data were being processed and produced. For that reason, the figures and tables in this report include the most recently available data to compensate for some of the less granular detail in 2019 data.

FIGURE 32. REGIONAL FATAL AND SERIOUS INJURY CRASHES (2016-2019)

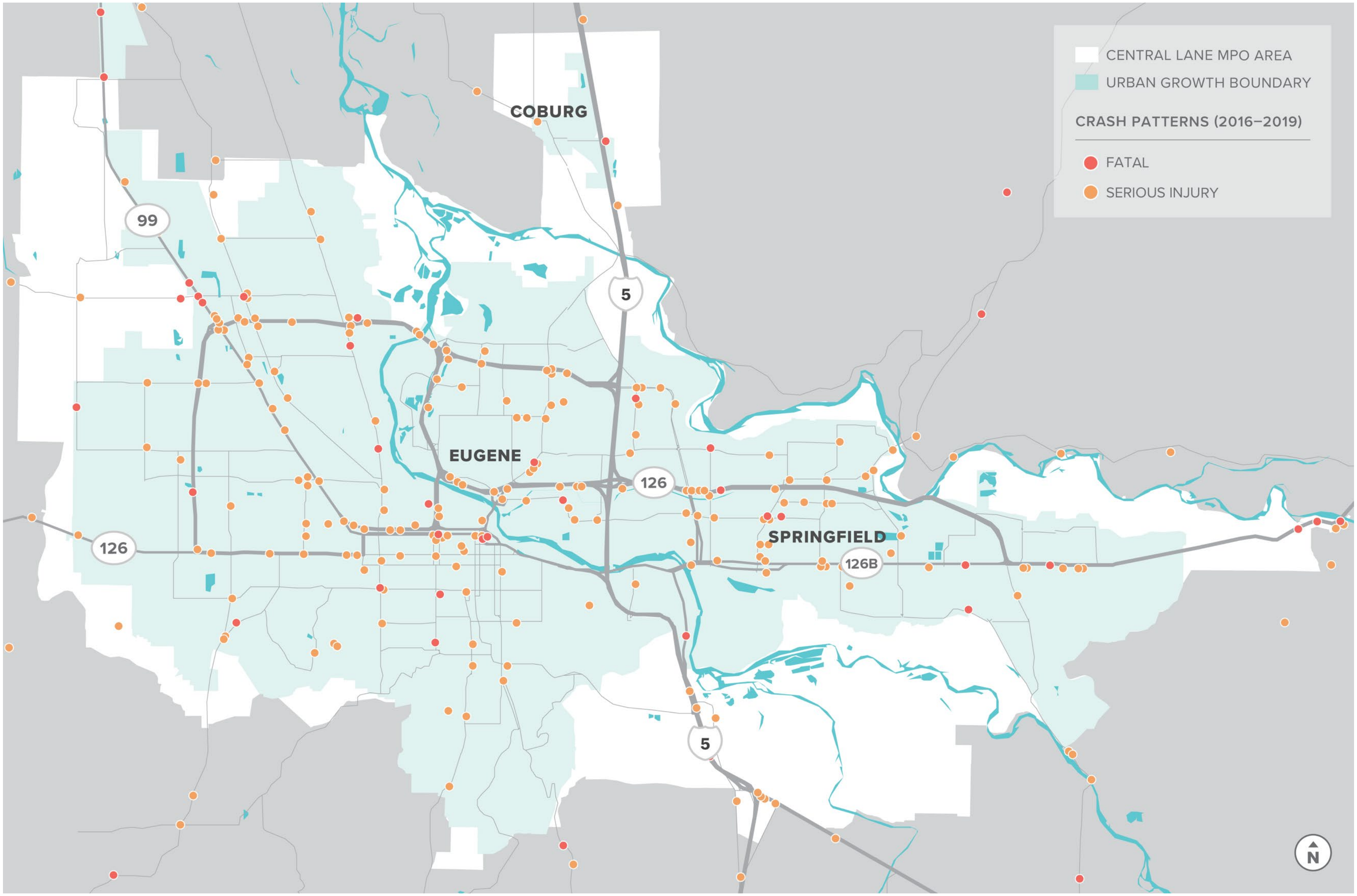
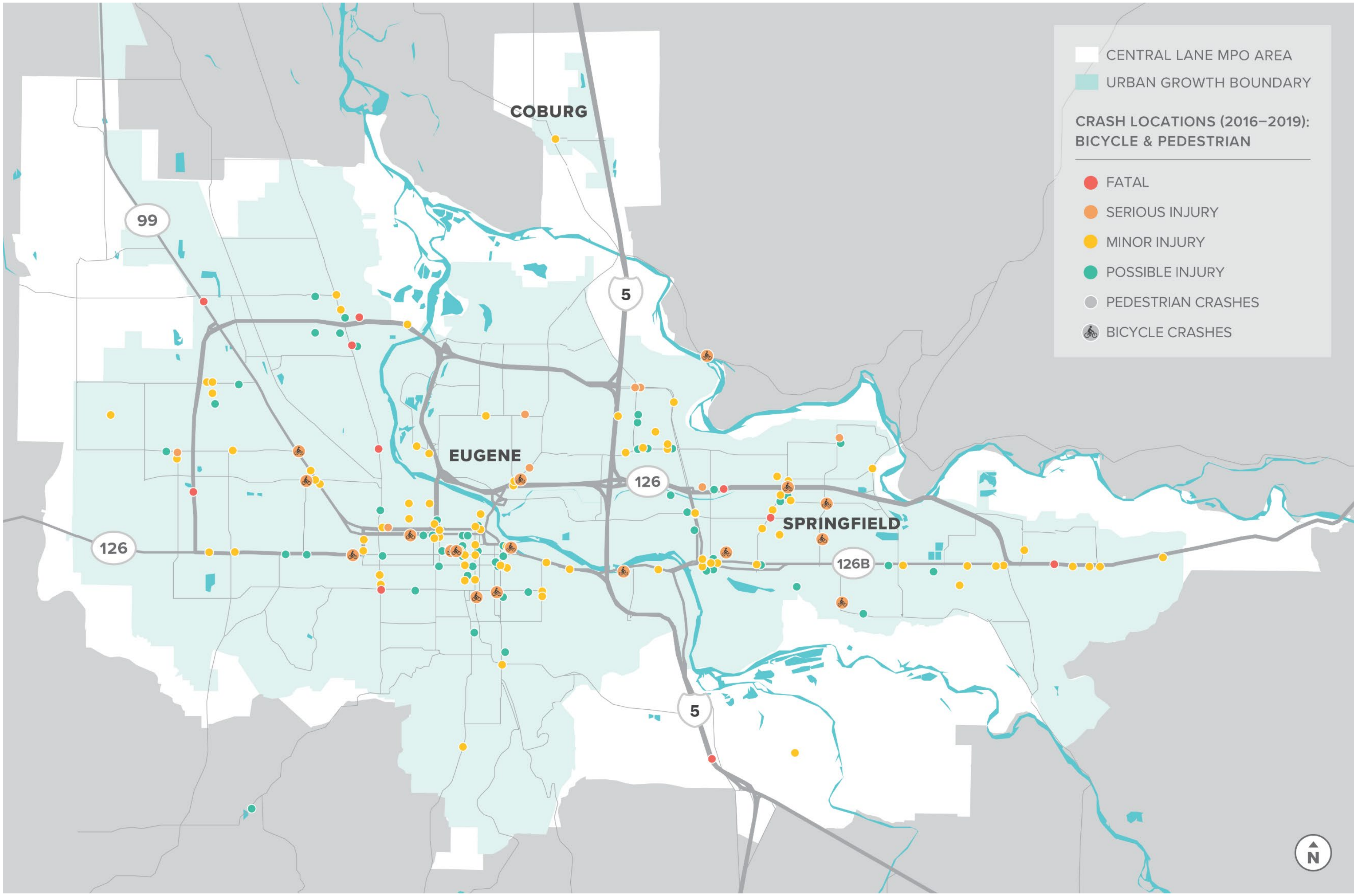


FIGURE 33. REGIONAL BICYCLE AND PEDESTRIAN CRASHES (2016-2019)



CHAPTER 4: FINANCIAL FRAMEWORK

CLMPO's transportation system is financially supported by the federal and state governments via formula-based funding for planning and construction calculated based on residential populations and through competitive grant programs. Local agencies and jurisdictions support the system through capital project funding; operations, maintenance, and preservation funding; and transit funding.

Federal law requires the planned transportation investments in the RTP be financially constrained based on reasonably foreseeable forecast of future revenues. The forecasted revenues needed to fund the plan's projects and programs over the next 25 years are included in the Constrained List.

OVERVIEW OF REVENUE SOURCES

Transportation projects are typically designed and built by ODOT, Lane County, the MPO's city jurisdictions, and Lane Transit District using federal, state, and local funding sources. These sources are assumed in the revenue forecasts as resources to fund this Plan's projects and programs. This section discusses the funding sources and their applicability. Figure 34 provides a summary of federal, state, and local funding sources (this summary is not intended to be inclusive of every source).

FIGURE 34. HOW THE SYSTEM IS FUNDED

FEDERAL FUNDING SOURCES

FEDERAL HIGHWAY ADMINISTRATION PROGRAMS

- Surface Transportation Block State and Urban Programs (STBG-U and STBG-S)
- Metropolitan Planning Funds (PL)
- Congestion Mitigation and Air Quality Improvement Program (CMAQ)
- National Highway Performance Program (NHPP)
- Highway Safety Improvement Program (HSIP)
- Highway Infrastructure Program
- Transportation Alternatives State and Urban
- Other FHWA Discretionary Programs

FEDERAL TRANSIT ADMINISTRATION PROGRAMS

- FTA 5303 Metropolitan Transportation Planning
- FTA 5307 Urbanized Area Formula Program
- FTA 5309 Capital Investment Grants
- FTA 5310 Enhancement Mobility of Seniors and Individuals with Disabilities
- FTA 5337 Rural Area Formula Grants
- FTA 5339 Bus and Bus Facilities
- Other FTA Discretionary Programs

STATE FUNDING SOURCES

- Oregon State Highway Fund – taxes on motor fuels, taxes on heavy trucks, and driver and vehicle fees
- Lottery funds
- Cigarette tax revenue
- Custom license plate fees
- General fund resources
- A variety of transportation-related permits and fees
- HB 2014 (2017) Transportation Funding Package

LOCAL FUNDING SOURCES

- LTD Employer Tax and Self-Employed Tax
- Local Gas Tax
- User Fees
- Tax Increment Financing
- City of Eugene Street Bond
- City of Springfield Street Bond
- System Development Charges (SDCs)
- City of Eugene Parking Enterprise Fund
- LTD Fares
- LTD Advertising Funds

POTENTIAL FUNDING SOURCES

- Emergency relief
- Rebuilding American Infrastructure with Sustainability and Equity

FEDERAL FUNDING SOURCES

Federal funding is provided by the federal government through ODOT for the CLMPO region. Funding allocations are based on population and program regulations set by FAST Act. CLMPO receives funding from FHWA and FTA programs. The federal funding assumptions are based on historic trends and assumed rate of growth through the RTP horizon year. Table 12 lists CLMPO's federal funding sources from the FHWA, and Table 13 lists the CLMPO's federal funding sources from the FTA Programs.

TABLE 12. FEDERAL FUNDING SOURCES – FEDERAL HIGHWAY ADMINISTRATION PROGRAMS

FUNDING SOURCE	DESCRIPTION AND REVENUE ASSUMPTIONS
SURFACE TRANSPORTATION BLOCK GRANT STATE AND URBAN PROGRAMS (STBG-U AND STBG-S RESPECTIVELY)	*Description:* Program provides flexible funding that may be used by states and localities for projects to preserve and improve the conditions and performance on any federal-aid highway, bridge and tunnel projects on any public road, pedestrian and bicycle infrastructure, and transit capital projects, including intercity bus terminals. *Assumption:* CLMPO will continue to receive funds based on historical allocations.
METROPOLITAN PLANNING FUNDS (PL FUNDS)	*Description:* Program provides funding to MPOs to conduct planning activities required by Title 23 of the U.S. Code 134.[42] *Assumption:* CLMPO will continue to receive funds based on historical allocations.
CONGESTION MITIGATION AND AIR QUALITY IMPROVEMENT PROGRAM (CMAQ)	*Description:* Program provides formula funding for projects to reduce congestion and improve air quality. CLMPO became CMAQ eligible in FY2018. *Assumption:* CLMPO will continue to receive funds based on historical allocations.
NATIONAL HIGHWAY PERFORMANCE PROGRAM (NHPP)	*Description:* Program funds projects to achieve national performance goals for improving infrastructure condition, safety, mobility, and freight movement, consistent with state and metropolitan planning; construction, reconstruction, or operational improvement of highway segments; construction, replacement, rehabilitation, and preservation of bridges, tunnels, and ferryboats and ferry facilities; inspection costs and the training of inspection personnel for bridges and tunnels; bicycle and pedestrian infrastructure; intelligent transportation systems; and environmental restoration, as well as natural habitat and wetlands mitigation within NHS corridors. *Assumption:* CLMPO will continue to receive funds based on historical allocations.

[42] https://www.govinfo.gov/content/pkg/USCODE-2011-title23/html/USCODE-2011-title23-chap1-sec134.htm

FUNDING SOURCE	DESCRIPTION AND REVENUE ASSUMPTIONS
HIGHWAY SAFETY IMPROVEMENT PROGRAM (HSIP)	*Description:* A core Federal-aid program with the purpose to achieve a significant reduction in traffic fatalities and serious injuries on all public roads, including non-State-owned roads and roads on tribal land. The HSIP requires a data-driven, strategic approach to improving highway safety on all public roads with a focus on performance. *Assumption:* CLMPO will continue to receive funds based on historical allocations.
HIGHWAY INFRASTRUCTURE PROGRAM	*Description:* Program provides funding for necessary charging infrastructure along corridor-ready or corridor-pending alternative fuel corridors, and the bridge replacement and rehabilitation program. *Assumption:* CLMPO will continue to receive funds based on historical allocations.
TRANSPORTATION ALTERNATIVES STATE AND URBAN	*Description:* The FAST Act eliminates the MAP-21 Transportation Alternatives Program (TAP) and replaces it with a set-aside of Surface Transportation Block Grant (STBG) program funding for transportation alternatives (TA). These set-aside funds include all projects and activities that were previously eligible under TAP, encompassing a variety of smaller-scale transportation projects such as pedestrian and bicycle facilities, recreational trails, SRTS projects, community improvements such as historic preservation and vegetation management, and environmental mitigation related to stormwater and habitat connectivity. *Assumption:* CLMPO will continue to receive funds based on historical allocations.
OTHER FHWA DISCRETIONARY PROGRAMS	*Description:* Competitive programs where FHWA solicits for candidates and selects projects for funding based on applications received. *Assumption:* CLMPO will evaluate funding opportunity and determine project applicability on an as available basis.

TABLE 13. FEDERAL FUNDING SOURCES - FEDERAL TRANSIT ADMINISTRATION PROGRAMS

FUNDING SOURCE	DESCRIPTION AND REVENUE ASSUMPTIONS
FTA 5303 METROPOLITAN TRANSPORTATION PLANNING	*Description:* Program provides funding and procedural requirements for multimodal transportation planning in metropolitan areas and states. Planning needs to be cooperative, continuous, and comprehensive, resulting in long-range plans and short-range programs reflecting transportation investment priorities. *Assumption:* CLMPO and Lane Transit District will continue to receive funds based on historical allocations.
FTA 5307 URBANIZED AREA FORMULA PROGRAM	*Description:* Program makes federal resources available to urbanized areas and to governors for transit capital and operating assistance in urbanized areas and for transportation-related planning. *Assumption:* CLMPO and Lane Transit District will continue to receive funds based on historical allocations.
FTA 5309 CAPITAL INVESTMENT GRANTS	*Description:* Program funds transit capital investments, including heavy rail, commuter rail, light rail, streetcars, and bus rapid transit. Federal transit law requires transit agencies seeking CIG funding to complete a series of steps over several years. *Assumption:* CLMPO and Lane Transit District will continue to receive funds based on historical allocations.
FTA 5310 ENHANCEMENT MOBILITY OF SENIORS AND INDIVIDUALS WITH DISABILITIES	*Description:* provides formula funding to states for the purpose of assisting private nonprofit groups in meeting the transportation needs of older adults and people with disabilities when the transportation service provided is unavailable, insufficient, or inappropriate to meeting these needs. The program aims to improve mobility for seniors and individuals with disabilities by removing barriers to transportation service and expanding transportation mobility options. This program supports transportation services planned, designed, and carried out to meet the special transportation needs of seniors and individuals with disabilities in all areas – large urbanized (over 200,000), small urbanized (50,000-200,000), and rural (under 50,000). Eligible projects include both "traditional" capital investment and "nontraditional" investment beyond the ADA complementary paratransit services. *Assumption:* CLMPO and Lane Transit District will continue to receive funds based on historical allocations.
FTA 5337 STATE OF GOOD REPAIR GRANTS	*Description:* Program provides capital assistance for maintenance, replacement, and rehabilitation projects of high-intensity fixed guideway and bus systems to help transit agencies maintain assets in a state of good repair. Additionally, SGR grants are eligible for developing and implementing Transit Asset Management plans. *Assumption:* CLMPO and Lane Transit District will continue to receive funds based on historical allocations.

FUNDING SOURCE	DESCRIPTION AND REVENUE ASSUMPTIONS
FTA 5339 BUS AND BUS FACILITIES	*Description:* Program provides funding to states and transit agencies through a statutory formula to replace, rehabilitate, and purchase buses and related equipment and to construct bus-related facilities. *Assumption:* CLMPO and Lane Transit District will continue to receive funds based on historical allocations.
OTHER FTA DISCRETIONARY PROGRAMS	*Description:* Competitive programs where FTA solicits for candidates and selects projects for funding based on applications received. *Assumption:* CLMPO and Lane Transit District will evaluate funding opportunity and determine project applicability on an as available basis.

STATE FUNDING SOURCES[43]

Oregon's State Highway Fund collects resources from three main sources:

- Taxes on motor fuels, including gas tax and diesel tax.
- Taxes on heavy trucks, including the weight mile tax and truck registrations.
- Driver and vehicle fees, including licenses and vehicle title and registration.

Under the Oregon Constitution, State Highway Fund fees and taxes must be spent on roads, including bikeways and walkways within the highway right of way. State funds can be used for both construction projects and the day-to-day maintenance and operations of the state's roads.

Formulas set in state statute distribute 50 percent of State Highway Fund revenues (after deducting the costs of collecting the revenue) to cities and counties.

Other State Funding

ODOT also receives revenue from several other state sources, including:

- Lottery funds, including lottery bond proceeds directed to the ConnectOregon program.
- Cigarette tax revenues, dedicated to transit services for seniors and disabled people.
- Custom license plate fees, dedicated to operating passenger rail.
- General fund resources for senior and disabled transit and passenger rail service.
- A variety of transportation-related permits and fees.
- HB 2017 (2017) Transportation Funding Package passed by the 2017 legislature created a number of new revenue sources for transportation:
    - A 0.5 percent vehicle dealer privilege tax on new car sales, which funds rebates for electric vehicles and provides ongoing funding for the multimodal ConnectOregon program.

[43] https://www.oregon.gov/odot/About/Pages/Transportation-Funding.aspx

- A 0.1 percent employee payroll tax ($1 for $1,000 in payroll) improves public transportation service in both rural and urban communities. This tax went into effect July 1, 2018.
- A $15 tax on the sale of new bicycles with tires over 26 inches and cost at least $200 goes to Connect Oregon for off-road bicycle and pedestrian paths that serve commuters.

LOCAL FUNDING SOURCES

The CLMPO regional partners include the Cities of Eugene, Springfield, and Coburg, Lane County, and Lane Transit District. Each have revenue sources beyond the state and federal sources that are used to pay for programs and capital projects, as well as roadway preservation, operations, and maintenance. In addition, some new streets are built by developers, but this does not provide a discretionary funding source for general transportation needs. Table 14 lists CLMPO's local funding sources.

TABLE 14. LOCAL FUNDING SOURCES

FUNDING SOURCE	DESCRIPTION
LANE TRANSIT DISTRICT EMPLOYER TAX AND SELF-EMPLOYMENT TAX	A local employer tax and self-employment tax in the Lane Transit District generates a total of approximately $38,000,000 annually. The employer tax is expected to generate $36.1 million in FY 2020, and the self-employment tax is expected to generate $1.9 million. The tax rate is set at seventy-four one hundredths of 1% increasing by one one hundredth of 1% each year to eight tenths of 1% in 2025. These funds are primarily used for Lane Transit District operations. They can be used as match for federal and state funding, and a portion of the funds are set aside most years to serve as match funding for state and federal funding.
LOCAL GAS TAX	The City of Eugene has had a local five cent gas tax in place since 2003. The tax raises approximately $3,000,000 per year. The revenues from the local gas tax are dedicated to the reconstruction, repair, maintenance, operation and preservation of city-owned roads and streets. The gas tax ordinance stipulates that no revenue shall be used for capacity-enhancing street improvements. As with the state gas tax, constitutional restrictions prevent revenue from being spent directly on public transit. By policy, the revenues raised from the local fuel tax have been limited to capital preservation projects and have not been used for street operations such as patching potholes, striping the streets, or keeping streetlights lit.
USER FEES	Fees paid by those who use the system. Transportation user fees are collected in the form of taxes on motor fuel at both the state and local level, and by state fees for licensing and registration of drivers and vehicles, as well as weight mile taxes imposed on the trucking industry.

FUNDING SOURCE	DESCRIPTION
TAX INCREMENT FINANCING	The City of Springfield has tax increment financing through its two urban renewal districts created by the City – one in Glenwood and one in Downtown. In an urban renewal district, additional taxes resulting from increases in assessed value are sequestered and made available to the district, which then uses those revenues to support debt service on urban renewal bonds used to finance projects within the district. At this point the revenues of either have not risen to the level deemed adequate to support bond issuance but that may occur within the CIP period of 2018-2022.
CITY OF EUGENE STREET BOND	In 2017, Eugene voters approved the third five-year street bond measure to help with the backlog of street repair projects in Eugene. The Bond generates about $8 million per year that will be spent on 91 road repairs on 78 streets through 2023. The bond also reserves $1 million per year for pedestrian and bicycle capital projects. Voters originally approved the street bond in 2008 and then again in 2012.
CITY OF SPRINGFIELD STREET BOND	Bond Measure 20-296 passed during the November 6, 2018 election. For the average homeowner, the bond cost is about $0.50 cents per $1,000 of assessed value each year for five years starting July 1, 2019. The bond was based upon assessed value, not market value. The median assessed value of a residential property was $160,000. At that value, a homeowner pays approximately $79 per year in estimated taxes, which is about $6.58 per month. Bond Measure funds raised go toward street repair projects only.
SYSTEM DEVELOPMENT CHARGES	System Development Charges (SDCs) are fees that help fund construction or expansion of public infrastructure which is necessary to support community growth. SDCs are charged to increase capacity for travel for auto, transit, bicycle, and pedestrian trips. SDCs are typically collected at the time a building permit is issued. SDCs can be either reimbursement SDCs, based on the value of unused capacity available to future system users, or improvement SDCs, used to fund future capital improvements to increase the system capacity. Developments cannot be charged twice for the same capacity.
CITY OF EUGENE PARKING ENTERPRISE FUND	The City of Eugene Parking Enterprise fund is funded through parking fees paid in city-owned parking garages, surface parking lots, on-street parking meters, and parking fines charged for improperly parked vehicles.
LANE TRANSIT DISTRICT FARES	Lane Transit District passenger fares generated just over $6.8 million in FY 2018. These fares can be used to fund both capital projects and operations but are primarily used to fund ongoing operations.
LANE TRANSIT DISTRICT ADVERTISING FUNDS	Lane Transit District has opportunities on buses, in buses, and at bus stops for advertisements.

POTENTIAL FUNDING SOURCES

Additional influxes of funding are always a potential. Typically, additional and unpredicted revenue has come from competitive grant awards. However, unforeseen circumstances, like the COVID-19 relief response, bring emergency relief funds. Given the nature of these funding sources and purposes, this list (Table 15) is not inclusive, and sources are not included in the fiscally constrained revenue forecasts.

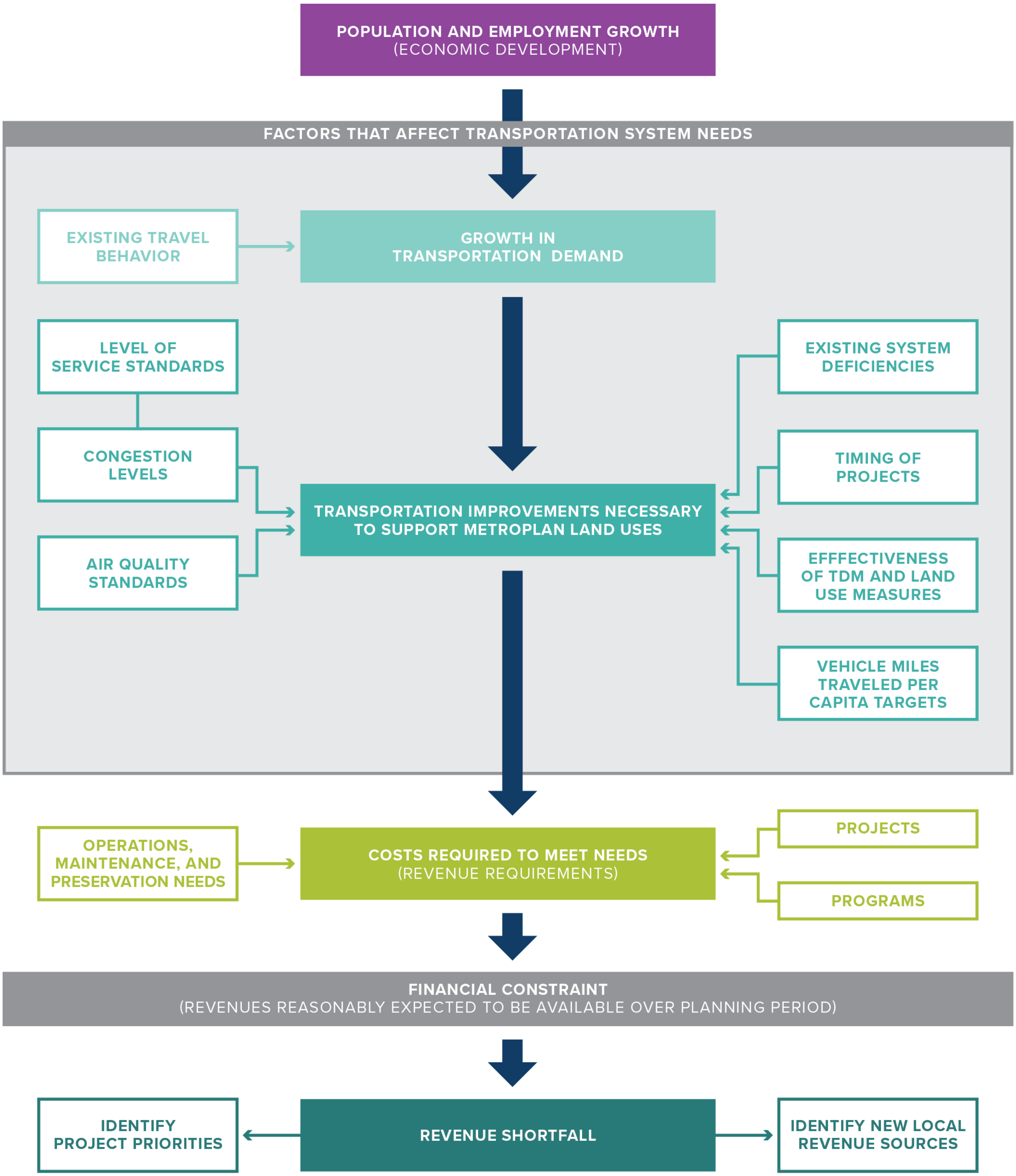
TABLE 15. POTENTIAL FUNDING SOURCES

FUNDING SOURCE	DESCRIPTION
EMERGENCY RELIEF	Federal or State governments may provide funding in the form of direct relief payments, grants, or other means in response to economic crisis related to a pandemic, natural hazard, or other cause.
REBUILDING AMERICAN INFRASTRUCTURE WITH SUSTAINABILITY AND EQUITY (RAISE)	The U.S. Department of Transportation published a Notice of Funding Opportunity (NOFO) to apply for $1 billion in Fiscal Year (FY) 2021 discretionary grant funding through the RAISE grants on April 13, 2021. Projects for RAISE funding will be evaluated based on merit criteria that include safety, environmental sustainability, quality of life, economic competitiveness, state of good repair, innovation, and partnership. Within these criteria, the Department will prioritize projects that can demonstrate improvements to racial equity, reduce impacts of climate change, and create good-paying jobs. The deadline to submit an application was July 12, 2021.

COST FORECAST ESTIMATE FOR RTP PROJECTS AND PROGRAM INVESTMENTS 2020 TO 2045

The level of transportation needs and the amount of revenues available to pay for the needs depend on several key factors, such as travel behavior and the timing and demands to allocate finite resources throughout the transportation system. Figure 35 illustrates some of the interrelationships among key factors contributing to the RTP's financial constraint.

FIGURE 35. CONTRIBUTORS TO FINANCIAL CONSTRAINT



As presented, transportation improvements necessary to support the region's current and future land use patterns arise from several sources. Population and employment growth and existing travel behavior contribute to a growth in transportation demand. Increased demand necessitates adding to the existing system for all modes through specific system improvements. The need for system improvements is also affected by deficiencies in the existing system, decisions about system standards (such as level of service/congestion and pavement condition) to be provided on the region's transportation facilities, and the level and effectiveness of strategies like TO measures; investments in bicycle, pedestrian, and transit modes; future land use patterns; and the timing of projects.

System improvement needs can also be affected by the requirement to meet national air quality standards and the VMT per capita targets specified in the state's Transportation Planning Rule. In some cases, where an improvement reduces congestion, air quality can be improved. An improvement that has the effect of significantly increasing the number of vehicle trips can cause a decrease in air quality. Overall, the CLMPO area is expected to experience improved air quality over the next 20 years. In isolation, major system improvements can appear to have the effect of increasing VMT per capita.

In addition to system improvements, the Plan must also consider the resources required for adequate operations, maintenance, and preservation (OM&P) of the existing and future transportation system. The need for ongoing OM&P applies to all parts of the overall system including roadways, transit vehicles, bikeways, and sidewalks. The level of OM&P need is affected by the general size of the system and the function of the roadway system (freeway, arterial, and collector).

The combination of project and program costs and the costs of OM&P activities represents the total costs required to meet future transportation needs in the region. The region's ability to provide for these needs is constrained by the revenues reasonably expected to be available over the 25-year planning period. Project and program costs are represented in Table 16; OM&P costs are represented in Table 17.

OM&P cost forecasts are projections of real 2020 costs to 2045 using a 3.1% inflation factor. It is reasonably assumed the agencies listed in Table 17 will continue to receive adequate funding for the OM&P costs through this Plan's horizon year.

TABLE 16. RTP PROJECTS AND PROGRAM COST

RTP PROJECTS AND PROGRAMS	PROJECT AND PROGRAM COSTS 2020 THROUGH 2045
ROADWAY PROJECTS	$1,963,000,000
BIKE AND PEDESTRIAN PROJECTS	$797,000,000
TRANSIT PROJECTS	$152,000,000
PROGRAMS	$12,500,000
STUDIES	$5,800,000
TOTAL	$2,930,300,000

TABLE 17. OPERATIONS, MAINTENANCE, AND PRESERVATION COSTS BY AGENCY

AGENCY	OM&P COSTS 2020 THROUGH 2045
COBURG	$9,244,000
EUGENE	$938,020,000
LANE COUNTY	$158,576,000
SPRINGFIELD	$104,835,000
LANE TRANSIT DISTRICT	$220,996,000
ODOT	TBD
TOTAL	$1,431,653,000

REVENUE FORECAST ESTIMATE FOR RTP PROJECTS AND PROGRAM INVESTMENTS 2020 TO 2045

The Central Lane MPO transportation program is funded by a mix of federal, state, local, and private sources. Revenue and sources have remained relatively stable historically. However, the need outpaces funding availability, resulting in a gap to realizing the fully envisioned multimodal transportation system.

The RTP revenue forecast is a reasonable estimate based on historic revenue and foreseeable funding. These revenues support the constrained transportation investments and programs included in the plan. Funding comes from a variety of federal, state, local, and private funding sources. Overall, CLMPO has forecasted $1.65 billion in revenues over the course of the Plan horizon year of 2045. The total transportation costs, the Constrained list plus the Illustrative list in Chapter 5, are estimated at $2.93 billion, leaving an approximate funding gap of $1.26 billion.

For revenue forecasting, the rate of growth per funding source is determined by using the current year dollars and extrapolating it out over the Plan horizon year using a 3.1% inflation factor. All dollars have a base year of 2020. Revenue assumptions in this RTP are based on existing federal, state, and local source allocations and future private sources. CLMPO participates in the statewide task force of MPO representatives working with ODOT to develop updated revenue forecasts.

Projects and programs are presented in Chapter 5. Project cost estimates in the year of expenditure are calculated with an inflation rate of 3.1% from current cost to implementation year.

Two bicyclists walk their bikes across the street at a pedestrian crossing.

DEVELOPMENT OF CONSTRAINED PLAN

As described at the beginning of the financial plan, the RTP is required to be constrained by revenue "reasonably expected to be made available" and demonstrate its ability to support the land use pattern present in the local comprehensive plans. The revenue shortfalls identified above can be addressed through either one of two primary means: a prioritization of needs (and the resulting movement of low-priority unfunded needs to a future project list, otherwise referred to as an illustrative list), or the development of new revenue sources.

Funding the full RTP vision will take longer than this Plan's 2045 horizon date and will cost more than the $1.65 billion in revenues forecasted through that timeframe. The project list in Chapter 5 has been constrained to the revenue forecast and represents the projects and programs anticipated to be funded within the next 25 years. The Constrained Project list forecasted cost is $1.65 billion.

The options below present possible strategies to address the anticipated revenue shortfall, suggesting factors to consider in establishing priorities and outlining the range of new revenue sources that may be considered to advance Illustrative projects and realize the RTP vision more fully by 2045.

1. INCREASED FEDERAL AND STATE TAXES AND FEES

Develop a united front to support state and federal efforts to develop additional transportation resources and obtain an equitable share of those resources for the metro area.

2. ACCEPT LOWER LEVEL OF SERVICE

Establishing a set of needs within the limits of available resources can be accomplished by assigning a priority to specific projects or categories of projects. The major issues surrounding the level and priority of transportation system needs can be identified by assessing the tradeoffs that come with varying the acceptable level of congestion on roadways. A key policy tool in this discussion is level of service (LOS) standards. These standards are set to reflect the region's willingness to accept a certain level of congestion on its roadway system. Generally, lowering LOS standards will have the effect of reducing the need for system improvements. Accepting increased congestion allows some system improvements to be postponed. Conversely, maintaining higher LOS will require more system improvements to reduce the amount of congestion. Table 18 highlights some of the tradeoffs associated with different levels of congestion.

TABLE 18. TRADEOFFS WITH DIFFERENT LEVELS OF CONGESTION

POLICY CHOICE	IMPACT ON STANDARD	POTENTIAL TRADEOFFS
ACCEPT MORE VEHICULAR CONGESTION	LOWER LEVEL OF SERVICE FOR MOTOR VEHICLES	• Reduce system improvement costs • May reduce air quality in some areas • Increase hours of delay • Increase vehicle operating costs • Increase accidents • Increase traffic infiltration into neighborhoods • Increase use of active modes
ACCEPT LESS VEHICULAR CONGESTION	RAISE LEVEL OF SERVICE FOR MOTOR VEHICLES	• Increase system improvement costs • Improve air quality in specific areas • Reduce hours of delay • Reduce vehicle operating costs • Reduce accidents • Reduce traffic infiltration of neighborhoods • Reduce use of active modes

Other policy tools exist that can affect vehicular congestion levels. This Plan is based on the use of a range of land use, TO, and ITS measures to address the issues associated with congestion. In the long run (beyond the 25-year planning horizon), land use measures implemented in the planning period can have an effect on congestion levels. TO measures can be used in the short run to affect demand at specific locations, though voluntary measures can only contribute to a reduction in congestion, not provide the full solution.

Thus, the primary set of actions available to address vehicular congestion in the planning period are the system improvement actions described in other sections of this chapter. Development of system improvement priorities should be based on a consideration of some of the tradeoffs highlighted above. In particular, it will be important to identify which projects can be postponed without significant degradation to the roadway system’s LOS. These might include ODOT freeway projects, interchanges, or local projects without identified funding sources.

3. SPECIAL ROAD FUNDING OPPORTUNITIES

Identify special road funding opportunities to take advantage of state and federal resources such as Immediate Opportunity Funds, federal demonstration grants, or state or federal economic development grants.

4. STORMWATER MANAGEMENT

Establish a stormwater utility fee for the area between the city limits and the urban growth boundary (UGB) and apply user fee revenues to augment Lane County Road fund expenditures on roadway drainage projects.

Use Eugene and Springfield stormwater SDCs for the eligible drainage component of eligible Lane County Road modernization projects within the UGB.

5. TRANSPORTATION UTILITY FEE

A Transportation Utility Fee (TUF), or transportation system maintenance fee, is analogous to a stormwater user fee. Each developed property within an area is charged a monthly fee for their anticipated use of the transportation system. These fees are determined by a methodology that is usually based on the trip-making characteristics of the land use type and becomes a fixed fee for that user. The fees can be collected on water utility bills just as sanitary and stormwater fees are currently. The fees can be set to generate any amount of revenue but are typically designed to cover a portion of ongoing OM&P or to pay for preservation activities. The revenue is flexible and may be used for any purpose reasonably related to use of the public-sector transportation system, including maintenance of off-street bike and pedestrian facilities. These fees are typically not used for capacity-increasing projects because they are paid by existing users of the system.

6. INCREASED SYSTEMS DEVELOPMENT CHARGES

There are several potential revenue-enhancing revisions to the existing Coburg, Eugene, and Springfield SDC methodologies and rate structures that could be explored.

The transportation SDC methodologies could be revised to include the impact on county arterials and collectors and to ensure that, wherever possible, the combination of assessments and SDCs cover 100 percent of the costs of the local arterial and collector street projects. One estimate showed that such a revision in the Eugene-Springfield area would increase revenues by approximately $7.6 million over 20 years, increasing the transportation SDCs by about 21%.

The transportation SDC could also be expanded in the future to include capacity increasing transit facilities should transit revenues be insufficient to maintain the current level of service as growth occurs.

Another component that could be added to the local SDC rate structure would be one that addresses the local contributions Coburg, Eugene, and Springfield make to state roadway projects. These local expenditures on state projects are not currently included in the calculation of the SDCs.

It should be noted that there is a shortage of housing affordable to people who earn low and moderate incomes in the Eugene-Springfield area and increasing SDC rates could exacerbate this issue. Any SDC rate increases should be done sensitively considering the impacts on different groups.

7. TRANSFER OF JURISDICTION

A transfer of certain ODOT facilities to local jurisdictions in exchange for state assumption of locally owned segments of the National Highway System might allow for the use of local revenues (assessments and SDCs) on facilities that are unlikely to be improved by the state during the planning period.

Modernization projects could then be funded from a combination of assessments, transportation, and stormwater SDCs—revenue sources that are currently unavailable at the state level. However, in addition to handing over responsibility for costs, a transfer of ODOT facilities would also result in a reduction in revenues to the local ODOT district office because those revenues are partly dependent on total lane miles within the district. This reduction in revenue would result in the ODOT system improvements line item still showing a shortfall.

8. ACCEPT LOWER STANDARDS IN OPERATIONS, MAINTENANCE, AND PRESERVATION

The standards applied to the OM&P of the transportation system determine the need for transportation revenues. This strategy consists of revisiting those standards to determine whether or not they are in line with priorities. In addition to the LOS (congestion) standard discussed above, other OM&P standards could be changed. Two possible strategies of this type are to eliminate maintenance on local gravel roads or on unimproved streets (streets with a thin surface treatment). Eliminating maintenance on metro area gravel local roads would save an estimated $1.6 million over 20 years. Eliminating maintenance on unimproved local streets would save about $5.8 million over the same period.

9. BOND MEASURES

Property tax-based measures, including capital bonds and levies, may be used to fund transportation activities. Both Eugene and Springfield have recently included street preservation projects in a bond levy.

10. REGIONAL TRANSPORTATION TAXES

Eugene and Springfield currently impose local gas tax equivalents of 5¢ and 3¢ per gallon, respectively. Coburg currently imposes a local gas tax equivalent of 3¢ per gallon (non-diesel). Additional local or regional gas taxes and/or vehicle registration fees, or an increase in the existing tax, could be developed to fund the remainder of the gap in financing for the non-state road network. Each 1¢ of gas tax would generate about $1.2 million countywide. The current state tax is 30¢ and is shared among the state, counties, and cities. A simple gas tax does not include a comparable weight-mile tax for trucks, such as what the state currently has.

Motor vehicle registration fees may be imposed by counties with a county-wide vote. The registration fee may not exceed that of the state, currently $86 per two-year period for a passenger car. The funds must be shared with the cities within the county. Two or more counties may act jointly. In 2015, Lane County proposed a $35 per year vehicle registration fee which, if it had been approved by a majority of Lane County voters, would have generated $11 million per year for road repairs. The measure did not pass.

11. BRIDGE TOLLS

Bridge tolls may be used to provide revenues for the construction of specific bridges. For example, tolls could be used to fund the construction of new river crossings. These tolls could be removed when construction has been paid in full or could remain in place to fund OM&P of the bridge.

12. BROADENED ASSESSMENT PRACTICES

Under Oregon law, local improvement districts may be used to assess property owners for improvements that benefit the properties. Local agencies use local improvement districts to assess property owners for the initial street improvement resulting in a fully improved street, usually including curbs, gutters, and sidewalks. Some jurisdictions have begun using improvement districts to assess property owners for preservation and reconstruction projects. Other jurisdictions are using them to fund ongoing operations and maintenance activities through an annual assessment. These may occur when streets need pavement overlays or when the street has reached the end of its useful life and needs to be reconstructed. The potential yield from this policy has not been estimated but potentially could fund a significant portion of the preservation needs. Remonstrance provisions in local codes may preclude the use of this tool unless property owners approve.

13. POSTPONE PROJECT TO ILLUSTRATIVE PROJECTS LIST

Prioritize projects and postpone projects based on availability of revenue. Postponed projects would be moved to the appropriate Illustrative project list within the RTP, pending availability of additional revenues.

CHAPTER 5: REGIONAL PROJECTS

This Chapter provides the range of transportation programs and projects needed to meet the transportation needs of people and freight through 2045 as evaluated through setting the region's goals and objectives (Chapter 2) and assessing current and forecast travel demand and transportation system performance (Chapters 3 and 6).

The transportation solutions contained in this chapter include projects, programs, and plans that will collectively support the region's transportation goals and objectives for transportation choices; safety, security, and resiliency; healthy people and environment; equity; economic vitality; reliability and efficiency; and system asset preservation.

There are transportation strategy solutions to address the travel demand side as well as system supply side, strategies to increase the efficiency of the existing regional transportation system, and, to a lesser extent, strategies to provide for capacity expansion to accommodate growth. There are solutions requiring construction of capital projects, solutions requiring planning applications with consideration for multiple transportation modes, and solutions requiring emerging technology and intelligent transportation systems to address needs.

In developing a balanced transportation system, it is not only capacity deficiencies that must be addressed but also preservation and maintenance of the existing regional transportation system and solutions to make for a safer transportation for the mobility of people and freight. Transportation options and choices for all modes must be made available to a community with diverse residents and businesses.

CLMPO consulted with the Cities of Coburg, Eugene, and Springfield, Lane County, Lane Transit District, and ODOT for the regional programs, plans, and project list development. Programs, plans, and projects included on the list 1) advance one or more of the region's transportation goals, 2) provide regionally significant[44] benefit, and 3) are fiscally constrained. Fiscal constraint, as defined in Chapter 4, refers to project or program costs within reasonably expected revenues over the planning period.

The primary sources of the projects contained in this list are public outreach feedback and partner agencies' transportation plans, including:

- City of Coburg's Transportation System Plan
- City of Eugene's Transportation System Plan
- City of Springfield's Transportation System Plan
- Lane County's Transportation System Plan
- Lane Transit District's Long-Range Transit Plan, Transit Tomorrow, and Coordinated Plan

[44] Regionally significant project means a transportation project (other than projects that may be grouped in the TIP and/or STIP or exempt projects as defined in EPA's transportation conformity regulations (40 CFR part 93, subpart A)) that is on a facility that serves regional transportation needs (such as access to and from the area outside the region; major activity centers in the region; major planned developments such as new retail malls, sports complexes, or employment centers; or transportation terminals) and would normally be included in the modeling of the metropolitan area's transportation network. At a minimum, this includes all principal arterial highways and all fixed guideway transit facilities that offer an alternative to regional highway travel.

- ODOT's *Oregon Transportation Plan* and *Oregon Highway Plan*

This Chapter presents the projects, plans, and programs as well as major foundations that influence project development and design. Together, these elements are intended to achieve the RTP's goals and objectives.

RELATIONSHIP BETWEEN LONG RANGE PLANS AND IMPROVEMENT PROGRAMS

The RTP establishes the regional list of projects which may be programmed for federal funding. It is directly related to the Metropolitan Transportation Improvement Program (MTIP) which derives projects either directly from the RTP or indirectly from the goals and policies within it. The RTP is the long-range policy and planning document while the MTIP is the short-term implementation document that enables those planned project to begin work. Specifically, the MTIP lists the projects from this RTP that have committed funding or reasonably available funding and are intended to begin a phase of work during the four years of the MTIP.

Similar to the RTP, the *Oregon Transportation Plan* (OTP) is a long-range planning and policy document adopted by the Oregon Transportation Commission. It serves as the state's transportation system plan and a framework for prioritizing transportation improvements and funding. All projects that have FHWA and/or FTA funding, are regionally significant, and/or are in an MPO's MTIP must also be programed into the Statewide Transportation Improvement Program (STIP), which, like the MTIP, is a four-year list of projects planned for implementation.

An update to the OTP is currently underway and will replace the version adopted in 2006. Once the OTP update is complete in 2023, ODOT will update the Oregon Highway Plan, which will replace a version adopted in 1999. In updating these Plans, ODOT is considering a range of trends, opportunities, and uncertainties, such as continual population growth, increasing freight volume, dramatic technological changes, and the threat of climate change impacts on communities and the transportation system.[45] This RTP considers the same range of trends and is equally committed to realizing a transportation system that is resilient and that accommodates multiple users with different needs.

Figure 36 shows the relationship between the RTP, MTIP, OTP and STIP.

[45] https://www.oregon.gov/odot/Planning/Pages/Plan-Development.aspx

FIGURE 36. RELATIONSHIP BETWEEN THE RTP, MTIP, OTP, AND STIP

OREGON TRANSPORTATION PLAN

- Long-term
- Developed by OTC
- Multimodal
- Serves as state transportation system plan
- Framework for prioritizing transportation improvements and funding

STATEWIDE TRANSPORTATION IMPROVEMENT PROGRAM

- Four-year listing of projects planned for implementation
- All FHWA and FTA funded projects
- All regionally significant projects requiring federal approval or permit
- Includes all MTIP projects approved by MPOs
- Financially constrained by year

REGIONAL TRANSPORTATION PLAN

- The broad framework plan for the MPO
- Has both long- and short-range policies, strategies, and actions
- Lists projects needed within 25 years
- Contains cost estimates and finding sourcces
- Provides a framework for choosing future projects
- Updated about every four years
- Includes the transportation demand management element

METROPOLITAN TRANSPORTATION IMPROVEMENT PROGRAM

- Four-year list of priority projects
- Consistent with Regional Transportation Plan
- Financially constrained by year
- Updated about every three years

FOUNDATIONAL PROGRAMS, PLANS, AND ELEMENTS

MAINTENANCE OF THE EXISTING REGIONAL TRANSPORTATION SYSTEM

A top priority in planning for the regional transportation system is maintaining the existing system. Maintenance addresses the day-to-day activities needed to keep the transportation system in good working order and daily operations that keep the system safe, clean, reliable, and efficient. Such activities include incident response, filling potholes, repairing bridges, maintaining drainage ditches, installing guardrails, plowing snow, removing rocks, and efficiently operating traffic signals. Local jurisdictions, ODOT, and Lane Transit District monitor the condition and operation of the existing system and program maintenance projects.

This RTP gives maintenance a high priority in the programming of transportation funds and reports on funding these needs in Chapter 4. The RTP supports the routine, regularly scheduled and necessary maintenance work identified by local jurisdictions. At the statewide level, maintenance, preservation, and safety are primary policy and financing considerations.

PRESERVATION OF THE EXISTING REGIONAL TRANSPORTATION SYSTEM

Preservation of the existing regional transportation system is also important to protect the significant investments already made. Preservation can prolong the life of the existing transportation system through such projects as repaving roads and shared use paths, rehabilitating bridges, seismic retrofit, and rock fall protection. Preservation needs are identified through the Pavement Management System (PMS) and local needs analysis. The RTP is highly supportive of prioritizing such project needs. System maintenance and preservation is addressed in Chapter 4.

BRIDGES

Bridge crossings are a vital part of the transportation infrastructure. ODOT evaluates and summarizes the condition of bridges located on the Oregon state highway system every year. The bridge network is evaluated using ODOT's key performance measure and National Bridge Inspection standards established by FHWA.[46]

Lane County's Bridge Projects Crew is headquartered at the County's Public Works Road Maintenance Division on North Delta Highway and performs bridge maintenance throughout the County. Lane County's *June 2017 Road and Bridge Maintenance Report* found that, "…county road pavements are currently rated in good or very good condition and bridges are rated in fair to very good condition. However, current funding and pavement and bridge preservation activities fall short of what is needed to protect these assets. If pavement and bridge conditions decline due to inadequate preventative maintenance, higher rehabilitation and reconstruction costs will result in the long-term…"[47] Per the Lane County Road and Bridge Projects: FY 2019/2020 – 2024/2025, the County uses the statewide bridge inspection program, which assesses bridge conditions and recommends repair, maintenance, and rehabilitation to extend the life of the bridge, to establish priorities for bridge rehabilitation and preservation.

SAFETY

Safety is a primary concern for the CLMPO, and it is a key consideration in transportation planning, programming, and development.

LCOG partnered with Lane County in 2017 to create the Safe Lane Transportation Coalition (SLTC). SLTC works to reduce the number of severe and fatal crashes in Lane County by using the strengths of the member organizations to influence and establish transportation safety policies, programs, and practices. The coalition accomplishes this through selecting and implementing specific strategies that address Driving Under Influence of Intoxicants (DUII) prevention, speed reduction, and general transportation safety education and outreach.

SLTC grew out of the *CLMPO Regional Safety and Security Plan.*[48] In 2015, CLMPO and Lane County began collaborating on an innovative planning process to address the growing need to prioritize safety throughout the region's transportation system. The result of that effort was *The Safe Lane*, a safety action plan that established a regional vision and goals that set the groundwork for systematic changes to the region's transportation system. The plan includes strategies and performance measures to track progress throughout implementation. *The Safe Lane* is closely aligned with the goals of ODOT's T*ransportation Safety Action Plan*. *The Safe Lane* envisions a future culture of safety that prioritizes safety for all people regardless of mode and recognizes the importance of every life traveling on the region's transportation network. This vision provides a

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[46] https://www.oregon.gov/odot/Bridge/Pages/BCR.aspx

[47] https://p1cdn4static.civiclive.com/UserFiles/Servers/Server_3585797/File/Government/County%20Departments/County%20Performance%20Auditor/RBM_2017_01.pdf

[48] https://www.lcog.org/sites/default/files/fileattachments/transportation/mpo/page/3493/clmpo_regional_.pdf

new way of thinking about death and severe injuries on the regional transportation network as something preventable rather than inevitable.

The 2005 Federal transportation legislation Safe, Accountable, Flexible, Efficient, Transportation Equity Act (SAFETEA-LU) both established safety as federal priority and required safety as a separate planning factor. This priority has been maintained through both subsequent transportation bills including MAP-21 and most recently the 2015 FAST Act. As an MPO, CLMPO recognizes the importance of meeting the federal requirements of performance-based planning and the role of safety within that model. Furthermore, this region has experienced increasing fatal and severe injuries over the past few years and the MPO and its partner jurisdictions have refocused efforts on transportation safety. There is a strong desire throughout the region to go beyond fulfillment of federal requirements. The number of traffic deaths in Oregon rose 27% between 2014 and 2015, the largest increase in 50 years. While vehicle and technology improvements over the last few decades have helped to improve road safety, the numbers from 2015 mark an increase in crashes locally, throughout Oregon, and across the country. These fatalities and severe crashes deeply impact families and broader communities, and the *CLMPO Safety and Security Plan's* framework is focused on reducing the number of severe-injury and fatal traffic collisions in the region.

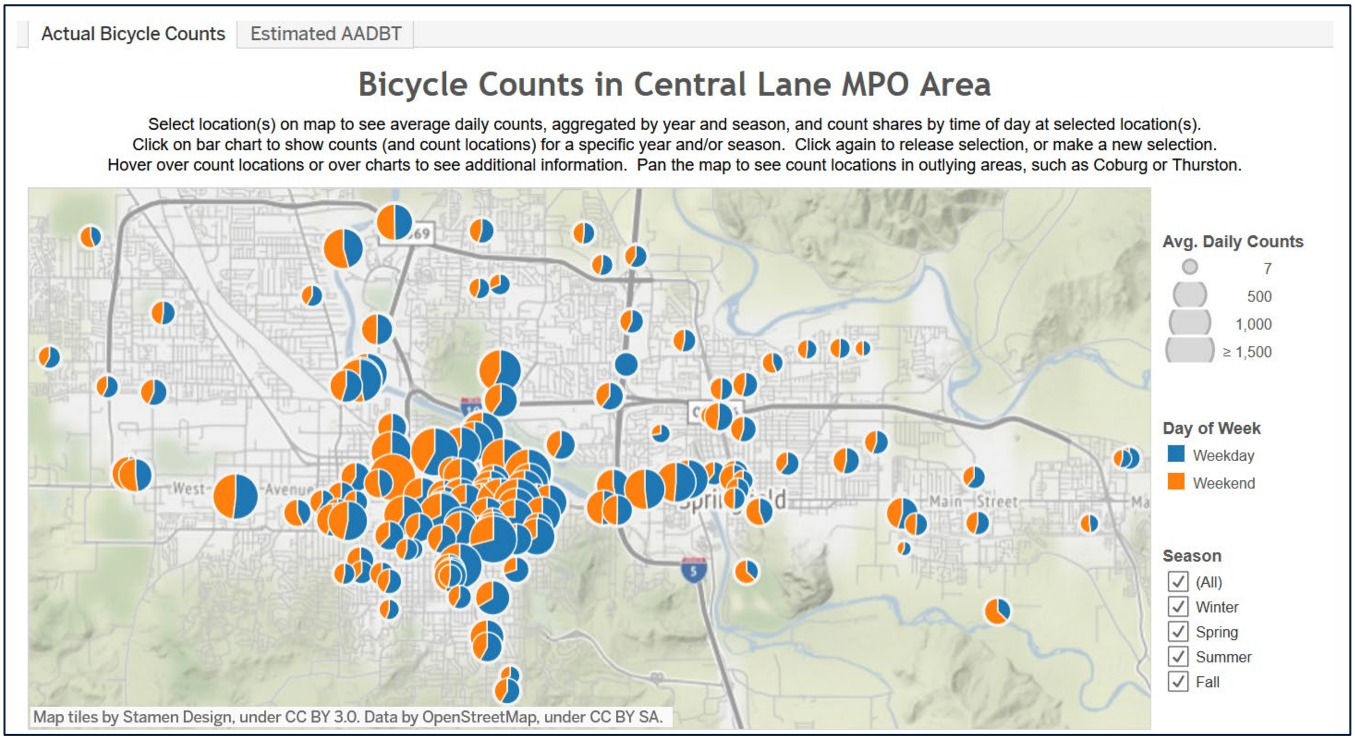
DATA PORTAL

CLMPO maintains a Data Portal which is designed to provide access to transportation-related data as well as tools to help visualize data in useful ways. CLMPO staff are continually evolving, expanding, and improving the Data Portal as presentation styles and needs to analyze various themes emerge. It is an important source of data and of monitoring trends. Themes currently presented in the Portal are:

- Crash data
- Traffic count data
- Commuter data
- Transit data
- Demographic and socioeconomics
- Transportation options

Figure 37 shows a screenshot of the Bicycle Counts Portal.

FIGURE 37. CLMPO DATA PORTAL FOR BICYCLE COUNTS



ACTIVE TRANSPORTATION

The RTP supports the planning, development, and maintenance of inter- and intracity transit, and pedestrian and bicycle facilities as critical components to the regional transportation network and to achieving the regional goals. Lane Transit District and local jurisdictions program projects to provide for better transit, pedestrian, and bicycle facilities throughout the region and connections beyond. Local TSPs support this through policies, programs, and projects. Examples of upcoming projects to provide a more connected bicycle and pedestrian network include these projects in the City of Eugene: Broadway pedestrian enhancements, Amazon and 34th Avenue pedestrian and bicycle bridge, Hilyard extension two-way conversion, Oakway Road at Coburg Road roundabout, Grant Street pedestrian and bicycle bridge, and the Jay Street Bridge.

Reduced reliance on automobiles is dependent on this region developing a connected and adequate bicycle and pedestrian network that gets people where they want to go safely and efficiently and provides easy access to the transit system. The list of regional projects in this chapter contains many projects that focus on completing the region’s network of sidewalks, bicycle infrastructure, and paths. The project list also contains Lane Transit District’s fiscally constrained list of capital and system enhancement and fleet maintenance projects. Several of Lane Transit District’s stops and resources are shared with intercity bus providers including Link Lane and Cascade Point. This RTP supports continued coordination to enhance and enable the transition and connections between modes and transit service providers. The intercity service providers do not currently receive capital or operational funding through the MPO and so are not in included in the regional projects lists.

This RTP recommends a regional planning effort, led by CLMPO, to develop a regional *Active Transportation Plan*. Several needs have been identified through this RTP's public involvement, stakeholder feedback, and internal evaluation of data that must be considered in the development of the region's *Active Transportation Plan*, including:

- Plan for safe connections to destinations beyond the MPO urban area. Of particular interest identified through public involvement is a bicycle/pedestrian connection between Eugene and Coburg. However, other surrounding destinations should also be evaluated.
- Determine a regional nomenclature around naming bicycle and pedestrian facilities and integrate it into both regional and local planning documents. The intent is to eliminate confusion when referring to the type of infrastructure at all stages of its lifecycle: planning, programming, design, and implementation.
- Develop a more robust GIS dataset for bicycle and pedestrian infrastructure. Incomplete bicycle and pedestrian data limits opportunities to analyze and assess performance and completeness of the bicycle and pedestrian network and how it is serving the region. A complete dataset, including sidewalk and bike lane inventories, will open opportunities for enhanced understanding of how the system is performing and where and how to focus investments.
- Integrate this plan with other CLMPO efforts and priorities, including safety and tactical urbanism.
- Address the upstream and downstream measures related to public health and safety. These measures are more qualitative and nuanced in nature and are included as an action item to this RTP. An example of this effort is measuring access to employment and transit via walking and biking through the lens of the quality of the walking and biking facilities.

At the time of this RTP's adoption, Lane County is in the process of creating its first *Bicycle Master Plan* for rural roads and paved paths outside of the Eugene-Springfield urban area. One of its goals is to improve the connectivity of regional bicycling between rural communities and the urban area. A CLMPO *Active Transportation Plan* would continue this work within the urban area.

Funding for this effort is not identified, but this RTP recommends seeking funding opportunities and initiating this effort prior to the next RTP update process so that findings, projects, and data can be incorporated.

TRANSPORTATION OPTIONS/TRANSPORTATION DEMAND MANAGEMENT

Transportation Options (TO), also referred to as Transportation Demand Management (TDM), are strategies to reduce travel demand (specifically that of private single-occupancy vehicles), or to redistribute this demand in space or time, making the region's transportation system more efficient. The RTP supports TO as a strategy to maximize the efficiency of the existing transportation system.

CLMPO has a robust regional TO program collaborating with partners to offer a coordinated menu of tools, encouragement, information, and activities to promote walking, biking, car and vanpooling, telework, and transit use to reduce vehicle trips on the regional transportation system. TO programs are implemented through partnerships with local and state agencies. Current programs include:

- Individualized Marketing Campaigns (branded as Smart Trips in CLMPO region)
- GetThere platform for rideshare and incentive programs
- Micromobility including PeaceHealth Rides bike share and future scooter share
- Transit group pass and youth pass
- Congestion management programs
- Vanpools
- Park and Rides

CLMPO supports SRTS programming in all school districts within the MPO boundary (Bethel School District, Eugene 4J School District, and Springfield School District). SRTS programs aim to create safe, healthy, convenient, and fun opportunities for children to use active transportation for the school commute. These initiatives promote livable, vibrant communities, increase physical activity, and improve unsafe walking, biking, and skating conditions throughout the community. This includes a commitment to providing safe bicycle and pedestrian infrastructure and reducing crash rates in all communities, including those with low-income families and non-English speakers.

COVID-19 conditions have had a dramatic impact on telecommuting rates since restrictions went into place March 2020. It remains to be seen what returning to work post-restrictions will resemble.

TRANSPORTATION SYSTEM MANAGEMENT AND OPERATIONS

Transportation system management and operations (TSMO) are strategies to optimize the performance of the multimodal infrastructure, preserve capacity, and improve the security, safety, and reliability of the transportation system. It includes efforts to operate the multimodal transportation system and activities to manage travel demand, thus crossing over political, modal, and jurisdictional boundaries. It emphasizes the door-to-door experience, regardless of travel mode, and requires agencies to look beyond a project or a corridor and consider the impacts of the entire transportation system.[49] Strategies might include improved bicycle and pedestrian crossings,

[49] https://ops.fhwa.dot.gov/tsmo/

traveler information, ramp management, and mobility on demand. TSMO is identified in the RTP's CMP as a key strategy towards addressing congestion within the region.

Intelligent Transportation Systems

Intelligent Transportation Systems (ITS) leverage technology and support systems to help achieve a safer and more effective, equitable, and multimodal transportation system for the mobility of people, goods, and services. It is also a TSMO strategy. Regional partners have employed ITS for many years, regionally collaborating on effective management of the system. This RTP supports continued use of ITS strategies as an effective tool to achieving the RTP goals at a lower impact and cost than projects that add roadway capacity.

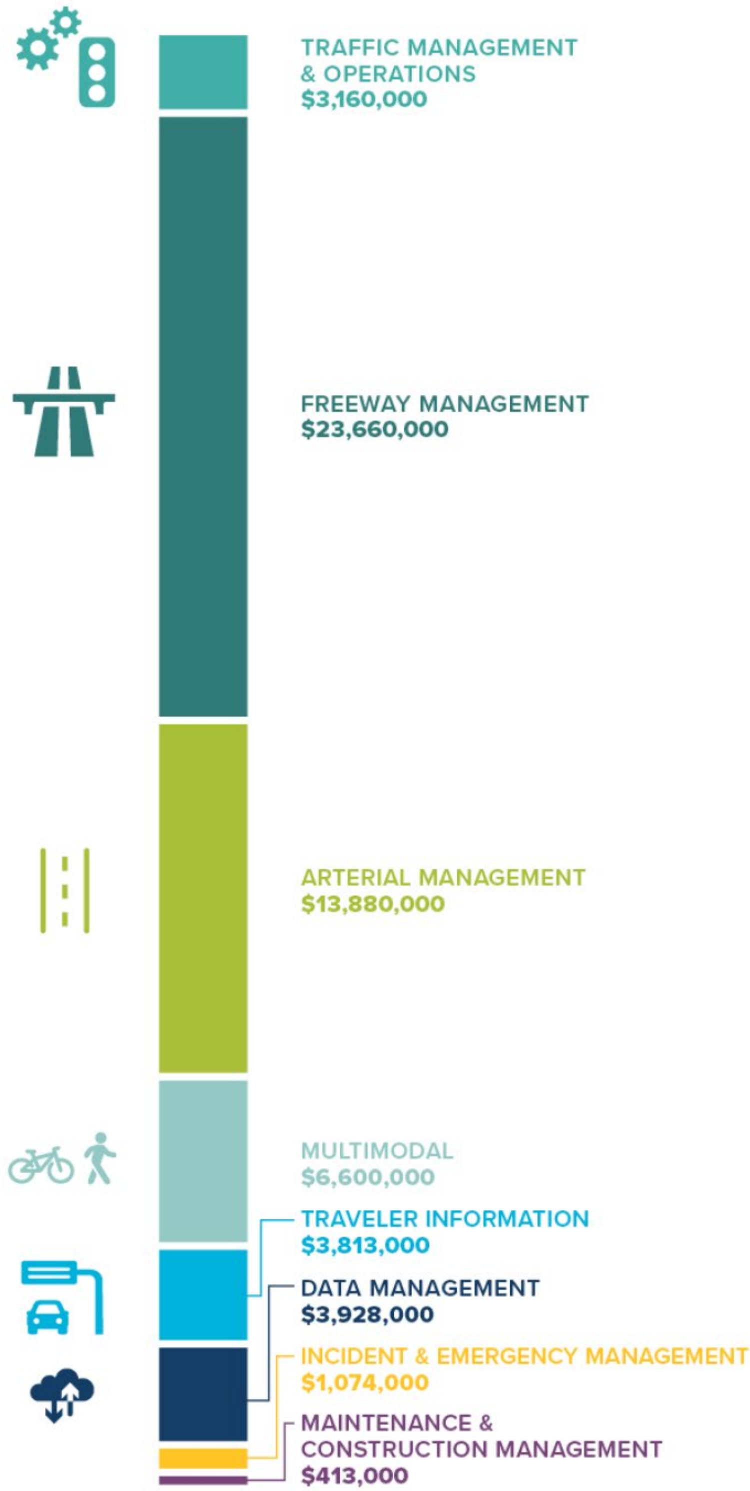
The CLMPO's 2021 ITS Plan was developed consistent with the development of this RTP in partnership with the Cities of Eugene, Springfield, and Coburg, Lane County, and Lane Transit District. ODOT partially funded the ITS Plan and is also a partner. Projects and strategies identified in the ITS Plan are integrated into the RTP project list.

The ITS Plan identifies projects and practices within the following categories:

- Traffic management and operations
- Public transportation management
- Traveler information
- Incident and emergency management
- Maintenance and construction management
- Data management and performance measurement

Figure 38 shows the breakdown of ITS project cost estimates by category.

FIGURE 38. ITS PROJECT COST ESTIMATES BY CATEGORY



The ITS Plan projects were identified to address the needs of the CLMPO area as identified in the Current Conditions and User Needs chapters of the ITS Plan. Figure 39 illustrates the proposed Deployment Plan projects that involve physical infrastructure installation. Not all projects are shown on the map because some projects are:

- System based and involve technology upgrades rather than physical installations, or
- Specific locations have not yet been identified for the deployment of a proposed solution.

The project list, as shown in Table 19, details project number, project title, a brief description, lead agency, illustrative cost, associated strategy, and which ITS Plan goals are addressed.

FIGURE 39. ITS DEPLOYMENT PLAN – SPECIFIC LOCATION BASED PROJECTS

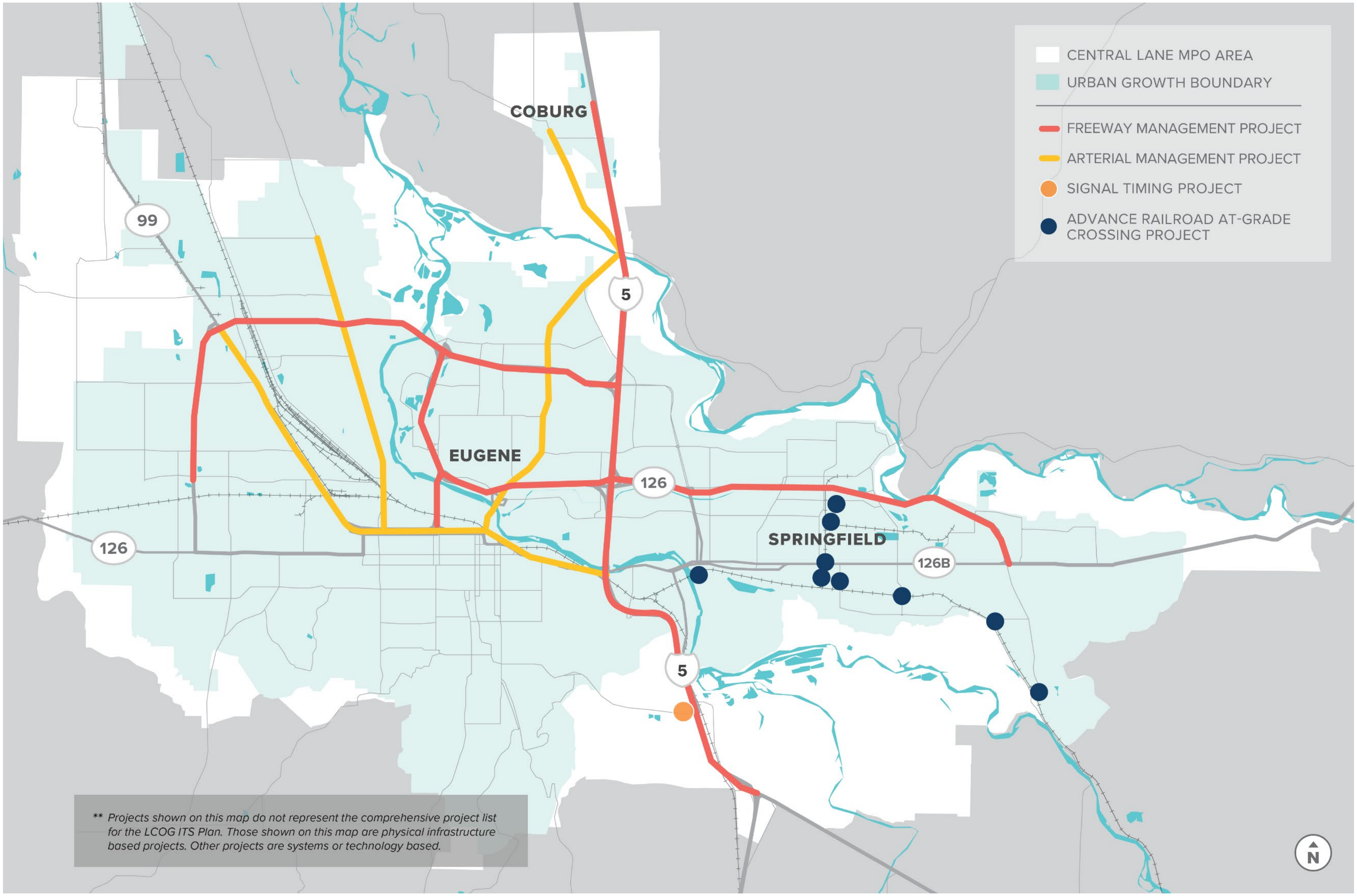


TABLE 19. ITS PLAN PROJECTS

PROJECT NO.	PROJECT TITLE[50]	DESCRIPTION	LEAD AGENCY	PLANNING LEVEL COST	STRATEGY	ITS PLAN GOALS ADDRESSED
FM-01	I-5 ACTIVE TRANSPORTATION MANAGEMENT	Installation of traffic operational systems on I-5 from Goshen to Coburg	ODOT	$3.28M	Freeway Management	1, 2, 3
FM-02	BELTLINE HIGHWAY ACTIVE TRANSPORTATION MANAGEMENT	Installation of traffic operational systems on Beltline Highway from I-5 to Roosevelt Boulevard	ODOT	$5.46M	Freeway Management	1, 2, 3
FM-03	EUGENE-SPRINGFIELD HIGHWAY (OR126) ACTIVE TRANSPORTATION MANAGEMENT	Installation of traffic operational systems on OR126 from I-5 to Main Street (Springfield)	ODOT	$5.24M	Freeway Management	1, 2, 3
FM-04	I-105 ACTIVE TRANSPORTATION MANAGEMENT	Installation of traffic operational systems on I-105 from I-5 to OR99	ODOT	$4.36M	Freeway Management	1, 2, 3
FM-05	DELTA HIGHWAY ACTIVE TRANSPORTATION MANAGEMENT	Installation of traffic operational systems on Delta Highway from I-105 to Beltline Highway	ODOT	$3.48M	Freeway Management	1, 2, 3
AM-01	PACIFIC HIGHWAY (OR99) ARTERIAL ACTIVE TRAFFIC MANAGEMENT SYSTEM	Installation of traffic operational systems on Pacific Highway (OR99) from Beltline Highway to I-5	ODOT	$1.84M	Arterial Corridor Management	1, 2, 4, 5
AM-02	RIVER ROAD ARTERIAL ACTIVE TRAFFIC MANAGEMENT SYSTEM	Installation of traffic operational systems on River Road from OR99 to Irvington Drive/Wilkes Drive	Eugene	$2.08M	Arterial Corridor Management	1, 2, 4, 5

[50] Active Transportation Demand Management is defined by the FHWA as the dynamic management, control, and influence of travel demand, traffic demand, and traffic flow of transportation facilities. Through the use of available tools and assets, traffic flow is managed and traveler behavior is influenced in real-time to achieve operational objectives, such as preventing or delaying breakdown conditions, improving safety, promoting sustainable travel modes, reducing emissions, or maximizing efficiency.

PROJECT NO.	PROJECT TITLE[50]	DESCRIPTION	LEAD AGENCY	PLANNING LEVEL COST	STRATEGY	ITS PLAN GOALS ADDRESSED
AM-03	COBURG ROAD ARTERIAL ACTIVE TRAFFIC MANAGEMENT SYSTEM	Installation of traffic operational systems on Coburg Road from Pearl Street to OR99	Eugene	$2.08M	Arterial Corridor Management	1, 2, 4, 5
TM-01	REGIONAL VIRTUAL TRAFFIC OPERATION CENTER	Develop center-to-center (C2C) communications between agency traffic management centers and emergency operations centers (EOC)	Multi-Agency	$750K	Traffic Management & Operations	2, 3, 4, 5
TM-02	UPGRADE CENTRAL SIGNAL SYSTEM	Upgrade central traffic signal system, and integrate with regional ATMS	Multi-Agency	$1.10M	Traffic Management & Operations	2, 4, 5
TM-03	TRAFFIC SIGNAL OPERATION ENHANCEMENTS	Upgrade legacy traffic signal controllers to ATC signal controllers. Implement advanced signal operations on select corridors	Multi-Agency	$1.50M	Traffic Management & Operations	2, 4
TM-04	30TH AVENUE SIGNAL TIMING	Signal timing coordination at McVay/I-5 Ramp and Eldon Shafer Drive (Lane Community College)	Multi-Agency	$40K	Traffic Management & Operations	2, 5
TM-05	COMMUNICATION NETWORK UPGRADES	Upgrade communication plans to meet future needs of the agencies (microwave/cellular/fiber)	Multi-Agency	$840K	Traffic Management & Operations	4, 5
TM-06	ACTIVE SIGN UPGRADE	Provide communication to existing speed feedback signs/rectangular rapid flashing beacons (RRFB)/school zone flashers	Multi-Agency	$100K	Traffic Management & Operations	2, 4
TM-07	LANE COUNTY COMMUNICATIONS	Implement communications to Lane County signal and Intelligent Transportation System (ITS) devices	Lane County	$1.00M	Traffic Management & Operations	1, 2, 4, 5

PROJECT NO.	PROJECT TITLE[50]	DESCRIPTION	LEAD AGENCY	PLANNING LEVEL COST	STRATEGY	ITS PLAN GOALS ADDRESSED
TM-08	ADVANCE RAILROAD CROSSING WARNING SYSTEMS	Install train detection and warning systems at multiple at-grade crossings	Spring-field	$1.02M	Traffic Management & Operations	1, 2, 3
MM-01	REAL TIME CUSTOMER INFORMATION	Deploy real-time dynamic message signs at key locations such as transit centers and major stops	Lane Transit District	$800K	Multimodal Operations	3, 4
MM-02	ELECTRONIC FARE COLLECTION	Improve and expand the electronic fare collection system on Lane Transit District buses	Lane Transit District	$1.00M	Multimodal Operations	2, 4
MM-03	TRANSIT MANAGEMENT SYSTEM UPGRADE	Replace lifecycle equipment on Lane Transit District buses including AVL, CAD, and APC system	Lane Transit District	$2.00M	Multimodal Operations	2, 4
MM-04	PARATRANSIT SYSTEM UPGRADE	Upgrade technology on paratransit vehicles including AVL and CAD	Lane Transit District	$750K	Multimodal Operations	2, 4
MM-05	TRANSIT SYSTEM SECURITY	Implementation of surveillance video from transit stations and buses back to Lane Transit District dispatch	Lane Transit District	$1.50M	Multimodal Operations	1, 4
MM-06	BUS RAPID TRANSIT EXPANSION	Expand EmX service on an additional corridor in Eugene	Multi-Agency	$2.00M	Multimodal Operations	2, 5
MM-07	TRANSIT SIGNAL PRIORITY	Implement next generation transit signal priority on EmX and major bus routes in Eugene	Eugene	$950K	Multimodal Operations	2, 4, 5
MM-08	FREIGHT MOBILITY	Enhanced detections systems on freight corridors to provide truck priority	Multi-Agency	$450K	Multimodal Operations	1, 2, 4
TI-01	ADVANCED PARKING MANAGEMENT AND INFORMATION	Implement smart parking at major parking facilities – including parking sensors, parking information message boards at key approaches	Multi-Agency	$750K	Traveler Information	2, 3, 4

PROJECT NO.	PROJECT TITLE[50]	DESCRIPTION	LEAD AGENCY	PLANNING LEVEL COST	STRATEGY	ITS PLAN GOALS ADDRESSED
TI-02	ARTERIAL TRAVELER INFORMATION	Integrate travel information from all jurisdictions into real time (travel time/delays). Provide travel time through mobile application and dynamic signs on major arterial corridors.	Multi-Agency	$3.00M	Traveler Information	2, 3, 4, 5
DM-01	PERFORMANCE REPORTING	Develop automated data collection and performance reporting system, including transit performance monitoring	Multi-Agency	$600K	Data Collection & Management	6
DM-02	DATA MANAGEMENT – ATSPM, SAFETY ANALYTICS	Upgrade signal controllers, communication, enhance detection and cameras to collect and archive operational data for analysis tools and safety analytics	Multi-Agency	$2.50M	Data Collection & Management	1, 2, 6
IM-01	INCIDENT MANAGEMENT OPERATIONAL PLANS	Develop transportation-specific incident management operational and evacuation plans that includes protocols for field devices	Multi-Agency	$300K	Incident & Emergency Management	1, 2, 5
IM-02	SPECIAL EVENT MANAGEMENT SYSTEMS	Management of special events to include signal timing plans, portable dynamic message signs, parking management and interface with U of O operation center	Multi-Agency	$750K	Incident & Emergency Management	2, 3, 5
MC-01	MAINTENANCE, CONSTRUCTION, AND WORK ZONE MANAGEMENT	Develop an information system that contains details about regionwide maintenance and construction activities including work zone management and monitoring	Multi-Agency	$850K	Maintenance & Construction Management	2, 3, 5

EMERGING TRANSPORTATION TECHNOLOGIES

Transportation services are poised for profound changes over the 25-year planning horizon with the emergence of new technologies that bring automation to transportation and lead to growth in transportation services being provided by autonomous vehicles. At this time, it is not yet clear how automation will impact the transportation sector. The RTP supports equipment and technology investments which promote equitable and safe urban mobility solutions.

CONGESTION MANAGEMENT PROCESS

CLMPO is a designated TMA because it has a population greater than 200,000. In addition to meeting all the specified metropolitan planning process requirements, MPOs representing TMAs must meet additional requirements, including a CMP that provides for the effective management of new and existing facilities through the use of travel demand reduction and operational management strategies. The CMP serves as the process for identifying deficient regional travel corridors, for evaluating non-SOV alternatives to address congestion, and for managing the performance of the system. An overview of the CLMPO CMP is provided in Chapter 2.

The CMP Toolbox of Strategies includes the following categories:

1. TO and TDM
2. TSMO and ITS
3. Transit operational improvements
4. Freight and goods movements
5. Roadway capacity improvements

The region prioritizes strategies from the first four categories.

TRANSPORTATION PLANNING AND THE ENVIRONMENT

The interrelationships between transportation planning, project development, and both natural and human environments are acknowledged in federal, state, regional, and local policies and practices. This RTP's goals include ***Goal 3 Healthy People and Environment:*** *The regional transportation system provides safe and comfortable travel options that support active and healthy living and protect and preserve biological, water, cultural and historic resources. Lower-polluting transportation options are encouraged, and transportation greenhouse gas emissions are reduced.*

A balanced transportation system meeting regional travel needs should balance with the need to protect the environment and provide for a healthy community. Environmental considerations and stewardship include air quality, climate change, stormwater, noise, curbing urban sprawl, habitat, cultural resource protection, historic preservation, environmental justice, and active living.

Federal legislation requires RTPs to discuss environmental mitigation activities[51] and potential areas to carry out these activities, including activities that may have the greatest potential to restore and maintain the environmental functions affected by the plan (23 CFR §450.324(f)(10)). As transportation projects are developed, environmental analyses are carried out to ensure that identified environmental impacts can be avoided, minimized, and/or mitigated. More detailed information on the laws and guidance that pertain to consideration of the environment and environmental mitigation in the regional transportation planning processes can be found in Appendix H Environmental Analysis of this document. Included in the Environmental Analysis is an overview of how environmental elements are addressed in the CLMPO region, potential environmental mitigation measures, and mapped data that can be used in the integration of environmental and transportation decision-making.

A sunset near the transit center at Centennial Boulevard.

ENVIRONMENTAL QUALITY

Air Quality: The Region's Air Quality Attainment Status

In August 1987, the Eugene-Springfield area was designated by US-EPA as a PM_{10} non-attainment area due to measured violations of the 24-hour PM_{10} standard (52 FR 29383). In August 1994, US-EPA approved the attainment plan (State Implementation Plan (SIP)) classifying the area as 'moderate' (59 FR 43483 August 24, 1994). Smoke from residential wood heating was determined to be the major contributor. The establishment of a mandatory home wood heating curtailment program was identified as a remedy to reduce wood burning emissions during stagnant air episodes in winter. Continued enforcement of existing controls on local industrial sources was also mandated. The EPA also approved PM_{10} control strategies in the SIP as Reasonably Available Control Technology and Reasonably Available Control Measures (RACT/RACM). No transportation control measures (TCM)

[51] Environmental mitigation strategies are defined in 23 CFR §450.104 as strategies, policies, programs, and actions that, over time, will serve to avoid, minimize, rectify, reduce, or eliminate impacts to environmental resources associated with the implementation of a long-range statewide transportation plan or metropolitan transportation plan.

were identified, and no transportation emissions budget was determined. US-EPA determined that the area was exempted from regional emissions analysis for PM_{10} but that project level conformity requirements continued to apply.

In January 2012, Lane Regional Air Protection Agency (LRAPA) submitted a revision to the Oregon PM_{10} SIP demonstrating attainment and describing a 10-year Limited Maintenance Plan (LMP). US-EPA approved the plan, and the area was re-designated as in attainment effective June 10, 2013 (78 FR 21547). The final LMP is included in Appendix I. Per the final LMP, the Eugene-Springfield area met the following EPA criteria to qualify for an LMP:

1. The area should attain the NAAQS.
2. The average 24-hour PM_{10} design value for the area based upon recent 5 years of data should not exceed 98 ug/m^3 (micrograms per cubic meter) and the annual design value should not exceed 40 ug/m^3. (The annual PM_{10} NAAQS was revoked by the EPA on December 18, 2006.)
3. The area should expect only limited growth in on-road motor vehicle PM_{10} emissions.

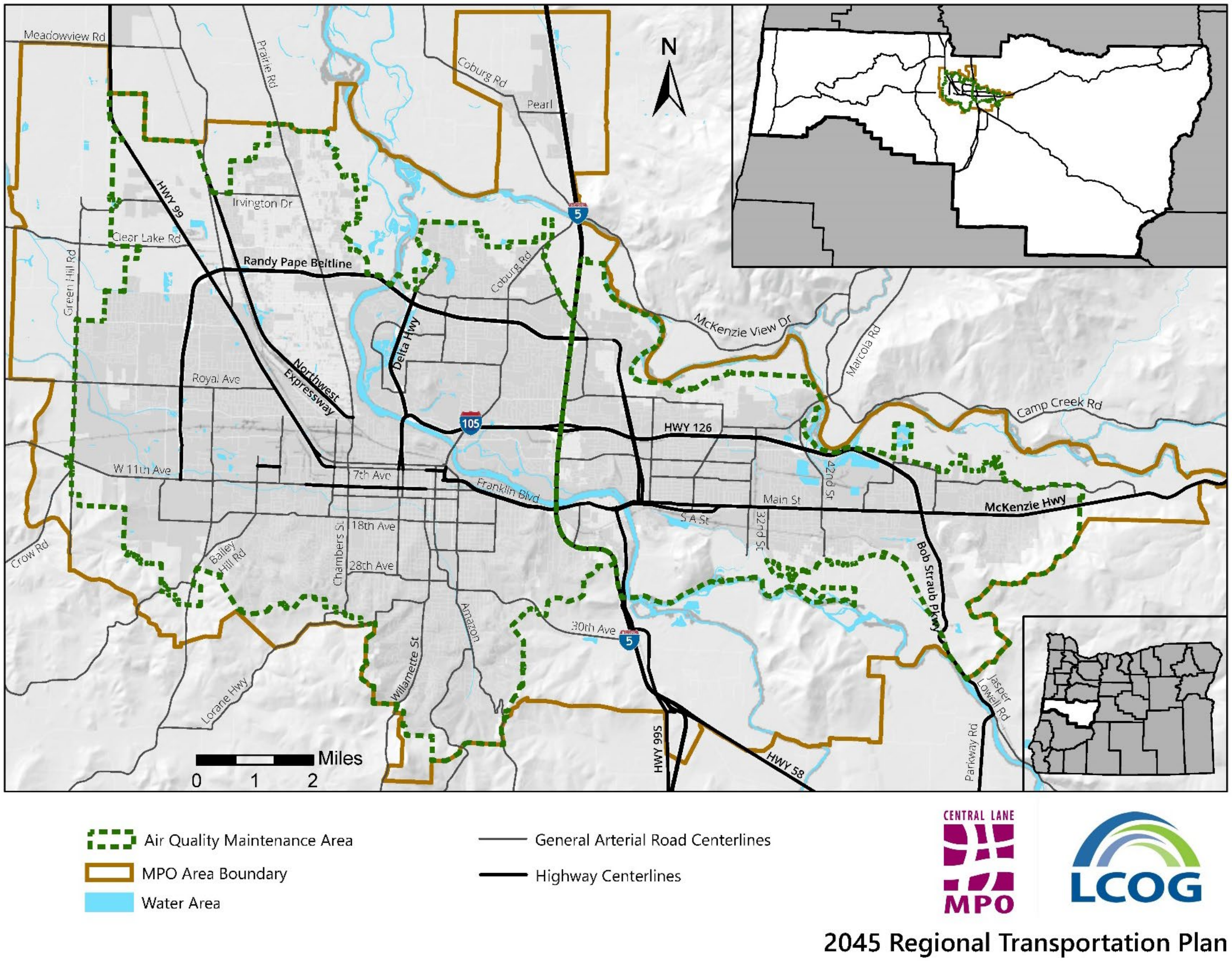
The LMP identified that the area's 24-hour PM_{10} design value of 66 µg/m^3 (2006-2008) was well below the LMP qualifying critical design value of 98 µg/m^3. The inventory analysis also demonstrated that only limited growth in PM_{10} emissions from motor vehicles was expected and that these emissions were unlikely to cause a future violation. No TCMs were identified, and no transportation budget was established. There are no contingency measures that involve transportation sources.

With the approval of the LMP, the area continues to be exempt from performing a regional emissions analysis for PM_{10} and there is no 'budget' test. The area, however, must meet project level conformity analyses and must also respond to transportation conformity criteria as specified in 78 FR 21547 and, in particular, in 40 CFR 93.109(e).

The 2045 RTP Air Quality Conformity Determination is included as Appendix I. It provides additional information on air quality in the region, a history of the region's air quality status, and planning-level indication of project level conformity analysis requirements. It finds that, "The CLMPO area currently meets all federal clean air standards. PM_{10} levels remain low, below the LMP threshold. Of the other criteria pollutants that are monitored, carbon monoxide levels are extremely low and show no sign of rebounding. The area is in compliance with the standards for ozone and particle pollution 2.5 microns and smaller, though vigilance is needed to ensure that this remains so. Pursuant to 40 CFR Section 93 this conformity determination for the CLMPO 2045 RTP meets all the requirements under the conformity rule."

The CLMPO Air Quality Maintenance Area is shown inFigure 40.

FIGURE 40. CLMPO AIR QUALITY MAINTENANCE AREA



Water Quality

Transportation projects must address water quality impacts. Water quality is a significant issue in the Pacific Northwest. The transportation system—including paved streets and sidewalks, parking lots, and driveways—creates a vast network of impervious surfaces in the urban landscape. Urban stormwater runoff from impervious surfaces can carry heavy metals and petroleum products directly into nearby streams and waterways, impairing surface and groundwater quality and damaging sensitive aquatic ecosystems. Stormwater systems in the CLMPO area convey water from streets and properties via a system of catch basins, pipes, ditches, and waterways that drain directly into the Willamette River and its tributaries, such as Amazon Creek in Eugene and the McKenzie River in Springfield.[52] Transportation projects often include measures to mitigate for the construction of impervious surfaces. Bioswales, street trees, and other forms of green infrastructure[53] are becoming part of the design for many transportation projects.

Transportation system impacts on water quality are addressed in more detail in Appendix H Environmental Analysis and Appendix C Planning Factor 9.

RESILIENCE AND RELIABILITY

The 2015 FAST Act introduced a new planning factor that MPOs must consider during the transportation planning process. Specifically, Planning Factor 9 requires MPOs to address how they will "improve the resiliency and reliability of the transportation system and reduce or mitigate stormwater impacts of surface transportation" (23 CFR 450.306(b)(9)). Additionally, MPOs should consult with agencies responsible for natural hazard mitigation and risk reduction in the development of the metropolitan transportation plan (23 CFR 450.316(b)). The plan must also assess capital investments and explore strategies to reduce the vulnerability of infrastructure to natural disasters (23 CFR 450.324(g)(7)). Appendix C Factor 9 White Paper explores integration of Planning Factor 9 into the RTP. This analysis will serve as a resource for CLMPO's continued commitment to planning for a resilient and reliable transportation system.

The following sub-sections explore greenhouse gas emissions, seismic resilience, and stormwater as they relate to the transportation system. The Factor 9 White Paper also focuses on other hazardous threats to the CLMPO transportation system including drought, extreme weather, geomagnetic disturbance, landslides, riverine flooding, volcanic hazards, and "non-natural" hazards. These threats are consistent with those identified in the Eugene-Springfield and Lane County *Multi-Jurisdictional Natural Hazard Mitigation Plans*.

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[52] The Federal Clean Water Act of 1972 prohibits any release of pollutants into waters of the United States without a National Pollutant Discharge Elimination System (NPDES) Permit, which regulates the amount of certain pollutants permissible in a discharge. Large- and medium-sized cities with municipal separate stormwater sewer systems (MS4s) that discharge untreated stormwater into local waterbodies—including Eugene and Springfield—are required to obtain NPDES Permits.

[53] *Green infrastructure* is the range of measures that use plant or soil systems, permeable pavement or other permeable surfaces or substrates, stormwater harvest and reuse, or landscaping to store, infiltrate, or evapotranspirate stormwater and reduce flows to sewer systems or to surface waters.

Greenhouse Gas (GHG) Emissions

The state has taken steps toward addressing greenhouse gas emissions as they relate directly to transportation. ORS 468A.205 set a goal of achieving GHG levels at least 75% below 1990 levels by 2050 and directed "state and local governments, businesses, nonprofit organizations, and individual residents to prepare for the effects of global warming and by doing so, prevent and reduce the social, economic, and environmental effects of global warming." House Bill 2001 (2009), also known as the Jobs and Transportation Act, directed both the Eugene-Springfield and the Portland Metropolitan Areas to conduct local scenario planning to explore how to meet emissions reduction targets. The state-set target for CLMPO was a 20% reduction below 2005 levels by 2035. The bill required CLMPO to consider the target in its scenario planning, not to adopt it. The results of that effort are discussed below.

The Oregon Sustainable Transportation Initiative (OSTI), a partnership between ODOT and the Department of Land Conservation and Development (DLCD), leads the implementation of a statewide effort to reduce GHG emissions from transportation, which accounts for 31% of emissions in Oregon. Senate Bill 1059 (2010) directed OSTI to develop the Oregon Statewide Transportation Strategy (STS), a two-year scenario planning process to identify short- and long-term strategies to reduce emissions, which was adopted by the Oregon Transportation Commission (OTC) on March 20, 2013. The STS identifies 18 strategies, with 133 elements in six categories: vehicle and engine technology advancements, fuel technology advancements, enhanced system and operations performance, transportation options, efficient land use, and pricing and funding mechanisms.

The state has recently taken actions to implement and strengthen statewide GHG emissions reductions targets. In September 2019, Governor Brown directed ODOT, DLCD, the Department of Energy, and the Department of Environmental Quality to form a four-agency working group to create a work plan for implementing STS. In March 2020, Executive Order 20-04 revised Oregon's previous targets to a 45% reduction below 1990 levels by 2035 and an 80% reduction below 1990 levels by 2050 (up from 75% by 2050 established by ORS 468A.205). In June 2020, ODOT formed a new Climate Office to implement the Executive Order. An initial draft of the four-agency working group's two-year work plan, called *Every Mile Counts*, identifies three key objectives and several priority actions that will help achieve the revised goals.

Table 20 outlines planning efforts recently undertaken in the CLMPO area that relate directly to regional resilience. Several of these existing efforts are discussed in further detail below.

TABLE 20. CLMPO EXISTING EFFORTS

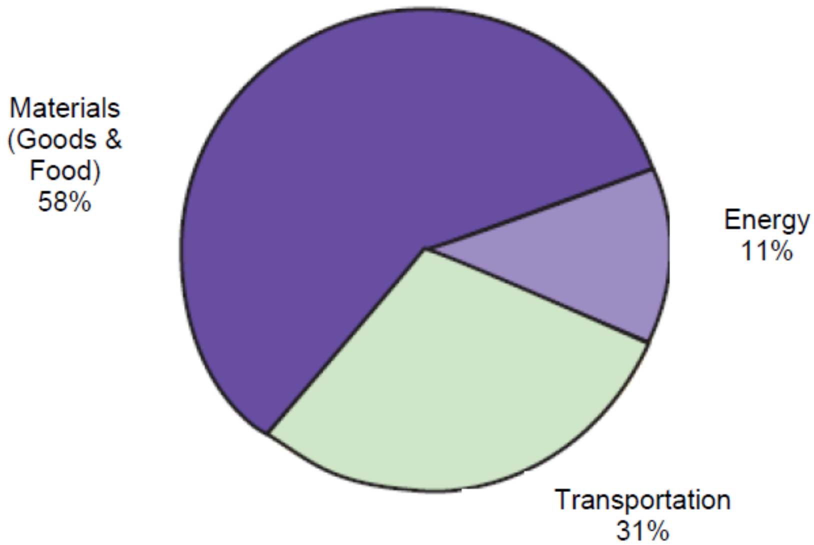
PLANNING EFFORT	DESCRIPTION
EUGENE-SPRINGFIELD METROPOLITAN REGION GREENHOUSE GAS INVENTORY (2010)	Identifies major sources of greenhouse gas emissions in the Eugene-Springfield area
REGIONAL TRANSPORTATION OPTIONS PLAN (2014)	Recommends core transportation options programs and services
CENTRAL LANE SCENARIO PLANNING (2015)	Explores how to meet the DLCD-set GHG emissions reduction target of 20% below 2005 levels by 2035 in the Eugene-Springfield Metropolitan Region
CENTRAL LANE SCENARIO PLANNING HEALTH IMPACT ASSESSMENT (2015)	Documents regional health impacts and related cost savings to anticipated reductions in GHG emissions associated with policies under consideration as part of the scenario planning process
CLMPO STRATEGIC ASSESSMENT (UNDERWAY)	Builds on the results of the Central Lane Scenario Planning work and the *Eugene Transportation System Plan* scenario findings to test and quantify what regional policies, programs, and investment actions, grouped to make scenarios, will allow the MPO to achieve its long range local and State planning vision and goals; intended to guide the policy development and investment strategy options of the RTP update

Eugene-Springfield Metropolitan Region Greenhouse Gas Inventory (2010)

In 2010, CLMPO conducted a Greenhouse Gas Inventory for the Eugene-Springfield Metropolitan Area. The region is responsible for an estimated 3.2 million metric tons of GHG emissions per year, which accounts for 4.6% of total state emissions.[54] The inventory found that the average Eugene household emits 31.9 metric tons of carbon dioxide equivalent annually, a figure that is lower than for households of the Portland Metro area and the United States. The report attributes relatively lower household footprints to three main factors: abundant sources of hydropower used for clean energy, lower per capita vehicle travel due to local planning efforts to reduce sprawl and encourage transportation options, and lower estimated consumption of goods attributable to lower incomes. The inventory groups emissions sources into three broad categories: Transportation, Materials, Energy (Figure 41).

[54] Note: The inventory looked at emissions between July 2005 and June 2006.

FIGURE 41. MAJOR SOURCES OF EUGENE-SPRINGFIELD GREENHOUSE GAS EMISSIONS



Source: Central Lane Metropolitan Planning Organization, Greenhouse Gas Inventory.

The inventory found that a majority of transportation-related emissions were the result of passenger transportation and local freight:

- Local passenger transport, including all cars and light trucks in the region – 17%
- Other passenger transport, including long-distance passenger travel by air, inter-city rail, inter-city bus, cars, and light trucks – 12.4%
- Local freight, including vehicles weighing more than 10,000 pounds – 1.3%
- Transit, including fuel consumption for buses and other transit fleet vehicles – 0.3%

Central Lane Scenario Planning (2015)

The 2009 Jobs and Transportation Act (JTA) required the CLMPO area to conduct local scenario planning to explore how to meet a DLCD-set GHG emissions reduction target of 20% below 2005 levels by 2035. CLMPO's Scenario Planning effort concluded in 2015. Though the major goal was GHG reduction, CLMPO's plan took a broader approach that also incorporated social equity, public health, and economic health (Table 21). This planning effort concluded that under the direction of current policy (the Reference Scenario), the region would only see a 3% reduction in per capita GHG emissions from 2005 levels by 2035. The region will not meet the 75% target without a mix of strategies—the Preferred Scenario consists of a balanced approach toward investment in seven areas: active transport, fleet and fuels, transit, pricing, parking management, education and marketing, and roads. According to the 2015 report, the Preferred Scenario will require new sources of revenue to fully implement.[55] CLMPO was not required to adopt a Preferred Scenario as part of this process.

[55] Central Lane Metropolitan Planning Organization, *Central Lane Scenario Planning*.

TABLE 21. CLMPO SCENARIO PLANNING GOALS ABOVE AND BEYOND GHG REDUCTIONS

GOAL	CRITERIA
FOSTER ECONOMIC VITALITY	• Driving costs as a percentage of household income • Average household income by housing type • Average parking costs • Value of time lost to congestion
IMPROVE PUBLIC HEALTH	• Physical activity per capita • Health benefits from increased walking and biking • Cost savings due to reduced disease burden • Change in the number of fatal or severe injury accidents
ENHANCE EQUITY	• Driving costs as a percentage of household income • Average household income by housing type

Central Lane Scenario Planning Health Impact Assessment (2015)

As part of the scenario planning effort in 2015, CLMPO partnered with Lane County Public Health to conduct a Health Impact Assessment (HIA) to determine regional health impacts and related cost savings of anticipated reductions in GHG emissions associated with the policies under consideration. The strategies espoused by the Scenario Planning process focus on reducing Vehicle Miles Traveled (VMT) as the primary mechanism through which CLMPO can affect substantive changes in GHG emissions; improving fuel economy of the vehicle fleet and reducing the carbon intensity of fuels used, though important strategies, are generally outside the control of the MPO.

Climate change presents a threat to human health and well-being through severe weather, wildfire, air quality, and food-, water-, and vector-born illness, so human health is an important co-benefit of GHG emissions reductions. The HIA found that the strategies and investments considered through the Scenario Planning process could prevent 20 premature deaths per year and save the region over $30 million in health care costs. Active transport would have the largest impact on health – 95% of deaths avoided and 99% of illnesses avoided were associated with increased physical activity. The study concluded that strategies and investments that increase active transportation, and therefore physical activity, are key to maximizing public health benefits.

Seismic Resilience

The Pacific Northwest and the State of Oregon are vulnerable to seismic hazards from four sources: shallow crustal earthquakes, deep intraplate earthquakes resulting from the subduction of the Juan de Fuca Plate beneath the North American Plate, very large subduction zone earthquakes that occur along the boundary between the Juan De Fuca and North American Plates, and volcanic activity. Oregon is subject to far less frequent, but bigger and potentially more damaging earthquakes than its seismically active neighbors, Washington and California. In geologic terms, Oregon is a mirror of northern Japan, where the 9.0 Tohoku earthquake and subsequent tsunami caused widespread devastation and sparked the Fukushima Daiichi nuclear disaster in 2011. Oregon is located along what is known as the "Ring of Fire," an arc of subduction zones in the Pacific Ocean marked by frequent and often catastrophic seismic activity. The Pacific Plate is moving east and subducting under the coasts of Northern California, Oregon, Washington, and Southern British Columbia along a 620-mile fault known as the Cascadia Subduction Zone (CSZ).

There is a clear and imminent threat from the CSZ in Oregon. According to the *Eugene-Springfield Area Multi-Jurisdictional Natural Hazard Mitigation Plan*, the odds of a powerful CSZ earthquake with magnitude 8.0 or greater in the next 50 years are roughly one in three. Such an earthquake will cause several minutes of severe ground shaking, large tsunamis, and widespread damage. In the past 10,000 years, the entire fault has ruptured (i.e. moved) with a magnitude 9.0 or greater 20 times, three quarters of the fault has ruptured with a magnitude 8.5-8.8 two to three times, and just the Southern portion has ruptured with a magnitude 7.6-8.5 nineteen times.[56] The most recent rupture along the CSZ fault occurred in January 1700 and caused tsunamis that hit the coasts of Oregon, Washington, and Japan. These earthquakes strike at variable time intervals, but the 320-year span since the last event is among the largest. According to the *Oregon Resilience Plan*, "there is no scientific doubt that another great subduction earthquake will strike the Pacific Northwest; the questions now are how soon, how large, and how destructive that earthquake will be." [57]

As a next step in planning for seismic resilience, this RTP recommends following the lead of Portland Metro, which has designated a network of regional Emergency Transportation Routes (ETRs)—priority routes used to facilitate life-saving response activities following an emergency—to complement the statewide system of Lifeline Routes. In 2019, upon recommendation in its 2018 RTP, Portland Metro partnered with the Regional Disaster Planning Organization to update its ETRs, which were designated in 1996 and last updated in 2006. Funding for the project came from FEMA's (Federal Emergency Management Agency) Urban Areas Security Initiative (UASI) grant, which funds projects that enhance regional preparedness and expand regional collaboration in major metropolitan areas.[58]

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[56] Cities of Eugene and Springfield, *Natural Hazards Mitigation Plan*.

[57] Oregon Seismic Safety Policy Advisory Commission, *The Oregon Resilience Plan*, 4.

[58] Eligibility for the UASI program is determined through an analysis of relative risk of terrorism faced by the 100 most populous Metropolitan Statistical Areas in the United States. Per the 2021 UASI Program Guidance, the Portland Area is the only eligible urban area in Oregon.

There are four types of ETRs:

1. **Local Emergency Response Streets** are a network of streets in a single jurisdiction that facilitate ordinary fire, police, and medical emergencies.
2. **Local Emergency Transportation Routes** are pre-designated routes used during a large-scale event in the initial response phase and early recovery to transport first responders, fuel, supplies, and patients. Local ETRs connect regional nodes to destinations of local importance (e.g. staging areas, essential infrastructure, and intermodal transfer points) and add redundancy to the Tier 2 and 3 Statewide Lifeline Routes.
3. **Regional Emergency Transportation Routes** are pre-designated routes that move first responders and supplies across jurisdictional boundaries among regional nodes and connect population centers, critical infrastructure, and services of regional importance. Regional ETRs also connect Statewide Lifeline Routes and local ETRs.
4. **Statewide Lifeline Routes** are state-owned roadways identified by ODOT as critical to emergency response and recovery activity. Lifeline Routes connect regions of statewide importance; as described above, there are a few key north-south and east-west routes.

As an implementation strategy, this RTP recommends, engaging in a similar planning effort, led by CLMPO, to identify and prioritize a regionally accepted and catalogued network of Regional ETRs that provide connectivity to critical infrastructure, essential facilities, Statewide Lifeline Routes, population centers, and vulnerable communities following Metro's model.

Stormwater Impact to the Transportation System

Effective stormwater management is critical for mitigating issues related to both water quality and quantity. Roads, paved trails, parking lots, and other impervious surfaces ubiquitous to the urban landscape can alter natural hydrology and prevent water from absorbing into the ground, and instead direct large volumes of runoff into nearby streams, rivers, and lakes and/or wastewater treatment plants, pipelines, and reservoirs. Stormwater runoff carries pollutants, nutrients, and bacteria that can impair the quality of nearby waterbodies and harm wildlife. Excess stormwater during a heavy rain event can also collect in lower-lying areas and, without sufficient pervious ground to absorb it, can cause flooding that poses a direct risk to human life and property. An increase in the frequency of heavy rainfall associated with climate change will exacerbate issues relating to street flooding and increase the need for effective stormwater management.

The primary threat stormwater poses to the transportation system is from street flooding. Inundation and washouts from heavy rainfall can block roads, damage assets, and interrupt utilities, while debris buildup can block drainage systems, which further contributes to flooding. Flooding can cause long-term damage to infrastructure through scour and erosion. Street flooding can also cause damage to property, and, in extreme cases, flash flooding can be life threatening.

The Eugene-Springfield Area and Lane County *Multi-Jurisdictional Natural Hazards Mitigation Plans* each recommend transportation-related strategies to mitigate stormwater flooding (Table 22).

TABLE 22. SELECTED TRANSPORTATION-RELATED STRATEGIES

GOAL	CRITERIA	PLAN
STORMWATER IMPROVEMENTS	Projects include culvert replacements and streambank stabilization. Using prioritization criteria, the highest priority stormwater capital projects are selected for inclusion in the Cities' Capital Improvement Programs. Projects prioritization criteria include whether a project addresses a potential risk to life or property (e.g. flooding), and whether it resolves an ongoing repetitive issue.	Eugene-Springfield Area Multi-Jurisdictional Natural Hazards Mitigation Plan
UPGRADE CULVERTS AND STORMWATER DRAINAGE SYSTEMS	For locations with repetitive flooding, flood damage, or road closures, determine and implement mitigation measures such as upsizing culverts or storm water drainage ditches.	Lane County Multi-Jurisdictional Natural Hazard Mitigation Plan
CONSTRUCTION OF STORMWATER DETENTION / RETENTION PONDS	Reduce localized flooding, decrease damage to road infrastructure, and increase natural watershed potential.	Lane County Multi-Jurisdictional Natural Hazard Mitigation Plan

Green streets that incorporate green infrastructure into their design can help mitigate the negative effects of stormwater runoff generated by the transportation system. Green infrastructure uses both natural and engineered features that replicate natural systems to help slow, infiltrate, and filter stormwater runoff. Examples include bioretention cells, rain gardens, bioswales, street trees, and natural features in the landscape, such as wetlands. Green infrastructure has numerous co-benefits that may help achieve other RTP goals. Figure 42 provides examples of co-benefits as summarized in Portland Metro's RTP. Since it is a table from the Metro RTP, it does not have a one-for-one cross walk with goals from the CLMPO RTP but is intended to provide context for the co-benefits of green infrastructure. Policies that promote the use of green infrastructure as a means to address stormwater management throughout the region could be considered.

FIGURE 42. EXAMPLES OF HOW GREEN INFRASTRUCTURE CAN HELP ACHEIVE GOALS

RTP Goal	Examples of how green Infrastrucutre can help achieve RTP goals
Vibrant Communities	Green infrastructure, including trails, parks, street trees, vegetation, and bioswales, contribute to community beautification and public health by connecting people with nature in their daily lives.
Shared Prosperity	Green infrastructure can promote economic growth as a valued public amenity, create construction and maintenance jobs, add to property value, support walkable and bikeable communities, businesses and commercial districts, and lower the costs associated with climate change.
Transportation Choices	Green streets can promote active travel and access to transit by providing enjoyable routes that are shaded and buffered from traffic.
Reliability and Efficiency	Green infrastructure treatments, such as access management and medians with bioswales, can be designed to support reliability and efficiency by reducing crashes and conflicting movements.
Safety and security	Street trees and other green infrastructure can help calm traffic to desired speeds, provide welcoming places that increase security, and improve resiliency and reduce impacts of major storm events.
Healthy Environment	Green infrastructure can enhance and protect the natural environment by supporting clean air and water, filtering stormwater runoff, reducing erosion, protecting, creating and connecting habitat for birds, fish and other wildlife.
Healthy People	Green infrastructure can reduce water, air, noise and light pollution, encourage active lifestyles and link people to trails, parks and nature that enhance human health and well-being.
Climate Leadership	Trees and green infrastructure can support climate adaptation by cooling streets, parking lots and buildings, better managing stormwater and reducing the urban heat island effect. Trees and vegetation can be managed to sequester greenhouse gases to help mitigate climate change.
Equitable Transportation	Clean air and water and access to nature can be improved and habitat can be preserved and enhanced when green infrastructure is provided in historically marginalized communities.
Fiscal stewardship	Protecting the environment and natural resources today can save money for the future and reduce infrastructure construction and maintenance costs.
Transparency and Accontability	All stakeholders can be represented, including those that cannot speak for themselves – wildlife and the natural environment. Performance-based planning includes considering environmental effects throughout the planning process.

Source: Portland Metro, 2018 Regional Transportation Plan, 3-53.

REGIONAL SYSTEM CAPACITY IMPROVEMENTS

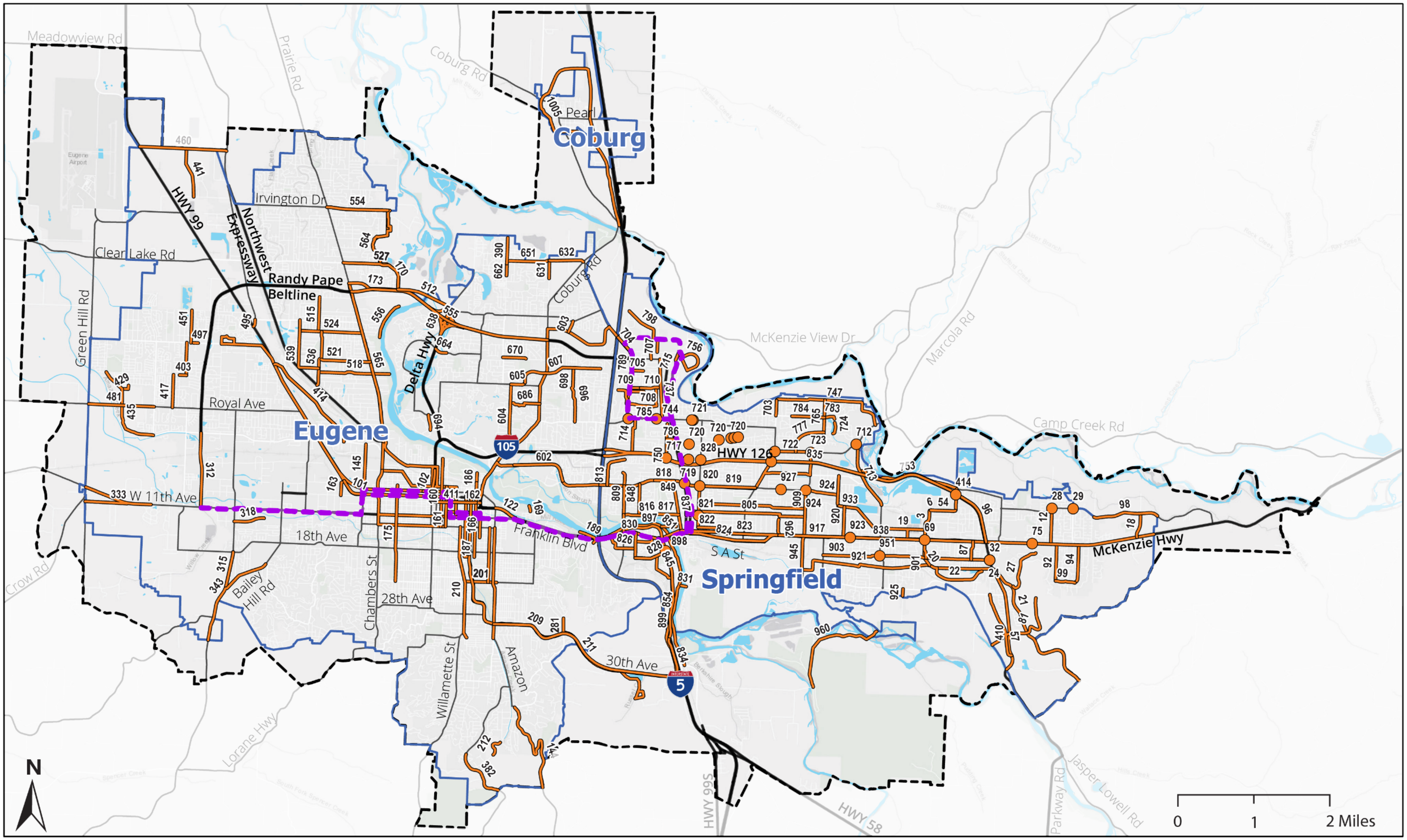
The following figures and tables show the location of transportation capital projects identified through the metropolitan planning process to address capacity deficiencies for all modes as well as solutions to make for a safer transportation system for the mobility of people and freight. All transportation modes are addressed and, holistically, the project list is intended to achieve RTP goals.

Figure 43, Figure 44, and Figure 45 provide the geographic context for the RTP's financially constrained projects for which a location has already been determined, and Table 23, Table 24, Table 25, Table 26, Table 27, Table 28, Table 29, Table 30, Table 31, Table 32, Table 33, Table 34, Table 35, and Table 36 present the RTP's financially constrained project list. Each project is identified by its name, geographic limits, description, primary jurisdiction, estimated cost in 2021 dollars, estimated year of construction within a five-year window, estimated year of construction cost representing the five-year window, project length, RTP number, and federal functional class. Cost estimates are from partnering agencies' planning documents and are planning level estimates. They have been inflated to current year.

Table 27 is a project list called Urban Standards and contains projects that will build roads located in the MPO consistent with their functional class design standards. In most cases, but not all, these projects are on Lane County roads that were traditionally built to serve rural needs and are a two-lane roadway similar to Game Farm Road in Eugene (shown in the photo to the right). The ultimate designs for urban standards projects are intended to respond to adjacent increases in densities and multi-modal access needs; project descriptions include constructing sidewalks, curbs, gutters, and bike lanes where applicable.

Appendix J contains the RTP's illustrative project list which includes projects that cannot be implemented with available funds. If additional funds are identified, projects from this list may be amended into the financially constrained list.

FIGURE 43. FINANCIALLY CONSTRAINED RTP PROJECT LIST



2045 RTP Financially Constrained Projects

- Urban Growth Boundaries
- MPO Area Boundary
- Water Area
- Bus Rapid Transit
- Constrained RTP Projects
- Constrained RTP Projects
- Highways
- Arterial Roads

CENTRAL LANE MPO

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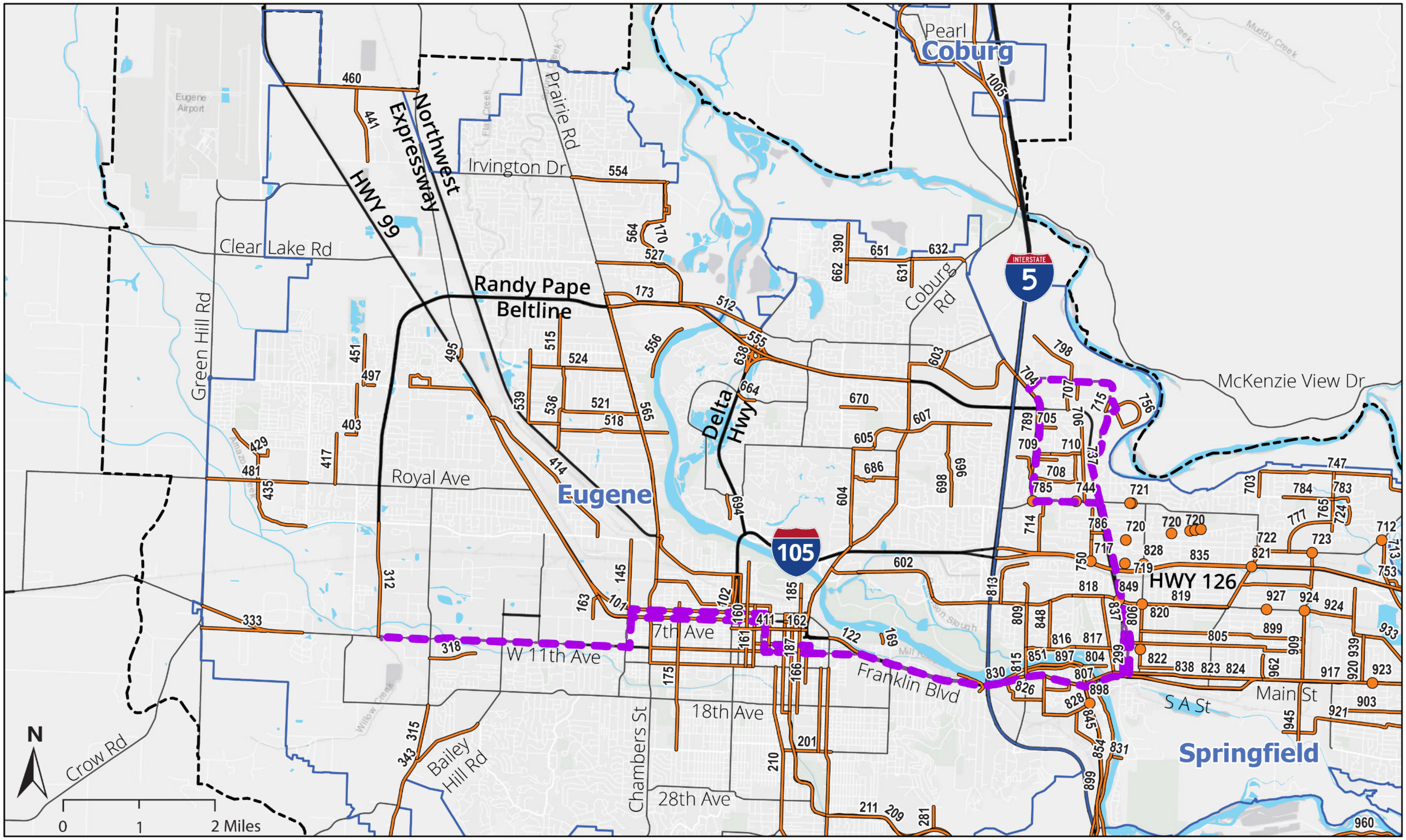
FIGURE 44. FINANCIALLY CONSTRAINED PROJECT LIST - ENLARGED AREA WEST



2045 RTP Financially Constrained Projects

- Urban Growth Boundaries
- MPO Area Boundary
- Water Area
- Bus Rapid Transit
- Constrained RTP Projects
- Constrained RTP Projects
- Highways
- Arterial Roads

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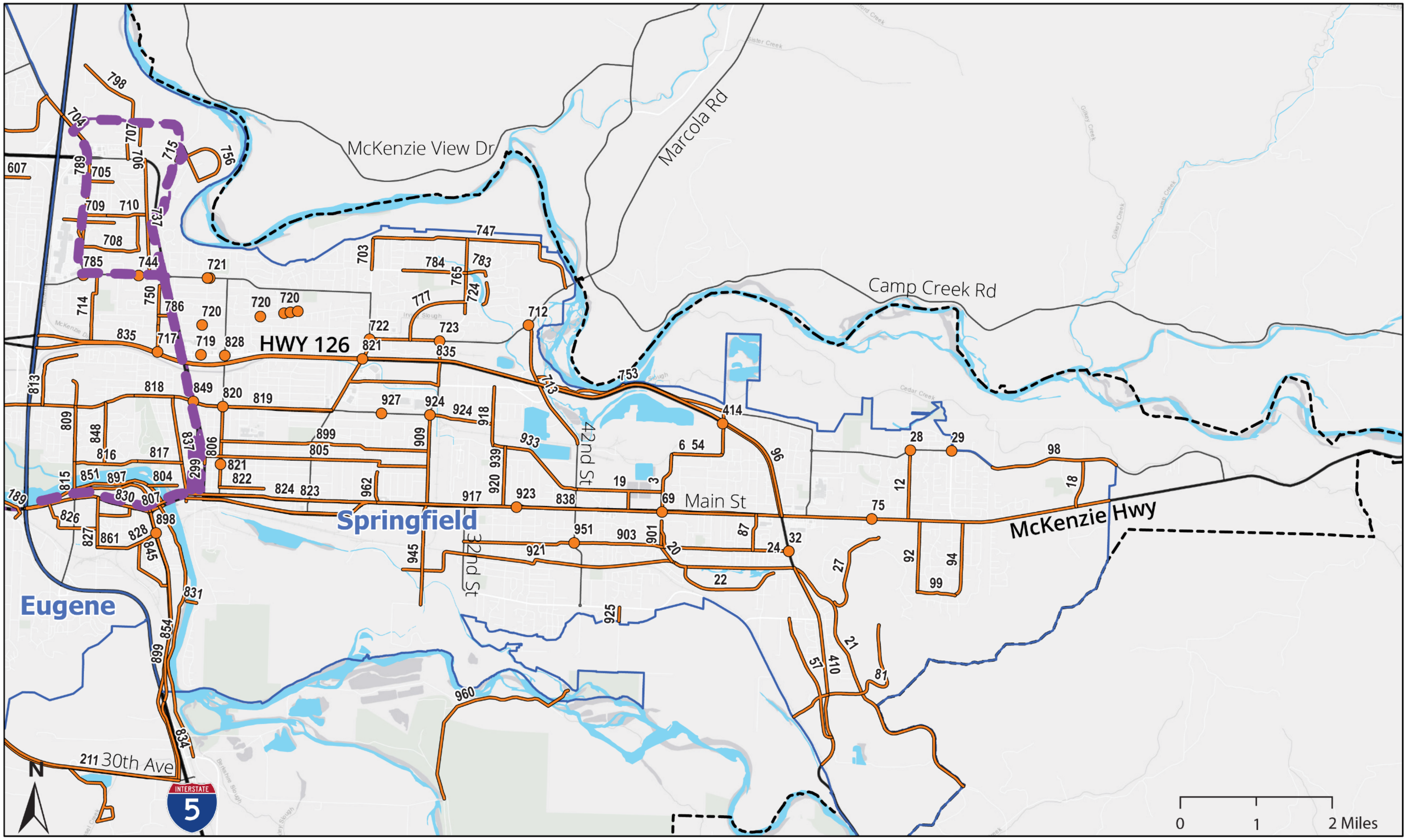
FIGURE 45. FINANCIALLY CONSTRAINED RTP PROJECT LIST - ENGLARGED AREA EAST



2045 RTP Financially Constrained Projects

- Urban Growth Boundaries
- MPO Area Boundary
- Water Area
- Bus Rapid Transit
- Constrained RTP Projects
- Constrained RTP Projects
- Highways
- Arterial Roads

CENTRAL LANE MPO

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CONSTRAINED PROJECTS: AUTO

TABLE 23. PROJECT CATEGORY: NEW ARTERIAL LINK OR INTERCHANGE

PROJECT CATEGORY: NEW ARTERIAL LINK OR INTERCHANGE											
Name	Geographic Limits	Description	Primary Jurisdiction	Air Quality Status[59]	Est. Cost (2021)	Est. Year of Construction (5-Year Window)	Year of Construction Cost Range		Length	RTP #	Federal Functional Class
Beltline Local Arterial Bridge	Beaver Street to Delta Highway	Construct new 2-lane arterial bridge over the Willamette River connecting Green Acres Road with Division Ave. Include modifications to Beltline/Delta ramps consistent with the Beltline Highway Facility Plan	ODOT, Lane County, City of Eugene	ODOT has conducted project hot spot analysis and during IAC meeting December 2020 found this project was not a project of local air quality concern.	$118,800,000	2025-2029	$134,230,467	$151,665,137	0.95	512	Minor arterial
Eugene-Springfield Highway (also referred to as SR-126 and OR 126)	at Main Street	Construct interchange (intersection improvements needed to calm traffic and integrate multi-modal access at the intersection of two five-lane roadways – SR-126 is currently two travel lanes in each direction with left turn lanes onto Main Street; Main Street is two lanes in each direction with turn lanes onto SR-126 and Bob Straub Parkway.)	ODOT	**Non-exempt**	$50,000,000	2030-2034	$65,810,925	$74,358,848	0	27	Other Freeways and Expressways
Eugene-Springfield Highway (also referred to as SR-126 and OR 126)	at 52nd Street	Construct interchange (intersection improvements needed to calm traffic and integrate multimodal access – SR-126 is currently two travel lanes in each direction with a center median and turn lane; 52nd Street is one travel lane in each direction with a turn lane; intersection lacks sidewalks, pedestrian/ADA accessibility)	ODOT	**Non-exempt**	$40,000,000	2025-2029	$45,195,444	$51,065,703	0	30	Other Freeways and Expressways
			Project Category Subtotal		**$208,8000,000**		**$245,236,836**	**$277,089,688**			

TABLE 24. PROJECT CATEGORY: ADDED FREEWAY LANES OR MAJOR INTERCHANGE IMPROVEMENTS

PROJECT CATEGORY: ADDED FREEWAY LANES OR MAJOR INTERCHANGE IMPROVEMENTS											
Name	Geographic Limits	Description	Primary Jurisdiction	Air Quality Status	Est. Cost (2021)	Est. Year of Construction (5-Year Window)	Year of Construction Cost Range		Length	RTP #	Federal Functional Class
Randy Pape Beltline Highway	Roosevelt Boulevard to W. 11th Avenue	Add lanes on Belltine Highway and provide intersection improvements at the W. 11th Avenue and Roosevelt Boulevard intersections.	ODOT, Eugene	**Non-exempt**	$28,100,000	2030-2034	$36,985,740	$41,789,673	1.1	312	Other Principal Arterial
Delta/Beltline Interchange	Delta at Beltline	Interim/safety improvements; replace/revise existing ramps; widen Delta Highway bridge to five lanes	ODOT	**Non-exempt**	$20,000,000	2020-2024	$19,398,642	$21,918,256	0.25	638	Other Freeways and Expressways
Eugene-Springfield Highway (OR 126)	@ Mohawk Boulevard Interchange	Add lanes on ramps	ODOT	**Non-exempt**	$2,000,000	2030-2034	$2,632,437	$2,974,354	0.68	821	Other Freeways and Expressways
				Project Category Subtotal	**$50,100,000**		**$59,016,819**	**$66,682,283**			

[59] IAC will review all projects at time of project development for determination of project level conformity and hot spot analysis.

TABLE 25. PROJECT CATEGORY: ARTERIAL CAPACITY IMPROVEMENTS

PROJECT CATEGORY: ARTERIAL CAPACITY IMPROVEMENTS											
Name	**Geographic Limits**	**Description**	**Primary Jurisdiction**	**Air Quality Status**	**Est. Cost (2021)**	**Est. Year of Construction (5-Year Window)**	**Year of Construction Cost Range**		**Length**	**RTP #**	**Federal Functional Class**
Main Street/48th Street	Intersection of Main Street and 48th Street	Construct traffic control improvements	Springfield	**Exempt** 40 CFR 93.126, Safety – Projects that correct, improve, or eliminate a hazardous location or feature	$300,000	2025-2029	$338,966	$382,993	0	69	Other Principal Arterial
Main Street/Mountaingate Drive	Intersection of Main Street and Mountaingate Drive	Construct traffic control improvements	Springfield	**Exempt** 40 CFR 93.126, Safety – Projects that correct, improve, or eliminate a hazardous location or feature	$900,000	2025-2029	$1,016,897	$1,148,978	0	75	Other Principal Arterial
42nd Street/Marcola Road	Intersection of 42nd Street and Marcola Road	Construct roundabout	Springfield	**Exempt** 40 CFR 93.126, Safety – Projects that correct, improve, or eliminate a hazardous location or feature; Traffic control devices and operating assistance other than signalization projects	$2,800,000	2020-2024	$2,715,810	$3,068,556	0	712	Minor Arterial
Harlow Road/Pheasant Boulevard	Intersection of Harlow Road and Pheasant Boulevard	Construct traffic control improvements	Springfield	**Exempt** 40 CFR 93.126, Safety – Projects that correct, improve, or eliminate a hazardous location or feature	$500,000	2030-2034	$658,109	$743,588	0	744	Minor Arterial
Gateway Street/Harlow Road	Intersection of Gateway Street and Harlow Road	Construct traffic control improvements	Springfield	**Exempt** 40 CFR 93.126, Safety – Projects that correct, improve, or eliminate a hazardous location or feature	$2,910,000	2030-2034	$3,830,196	$4,327,685	0.5	785	Minor Arterial
Gateway/Beltline Road	International Way to Postal Way	Improve intersections and realign Gateway	Springfield	**Exempt** 40 CFR 93.126, Safety – Projects that correct, improve, or eliminate a hazardous location or feature; Traffic control devices and operating assistance other than signalization projects	$20,000,000	2025-2029	$22,597,722	$25,532,851	0.9	789	Other Freeways and Expressways
Q Street/5th Street	Intersection of Q Street and 5th Street	Intersection improvements - Construct right turns to the eastbound and northbound approaches or a roundabout.	Springfield	**Exempt** 40 CFR 93.126, Safety – Projects that correct, improve, or eliminate a hazardous location or feature; Traffic control devices and operating assistance other than signalization projects	$550,000	2030-2034	$723,920	$817,947	0.5	828	Minor Arterial
Centennial Boulevard/28th Street	Intersection of Centennial Boulevard and 28th Street	Construct roundabout	Springfield	**Exempt** 40 CFR 93.126, Safety – Projects that correct, improve, or eliminate a hazardous location or feature	$1,800,000	2035-2040	$2,759,903	$3,215,046	0	924	Minor Arterial
Centennial Boulevard/21st Street	Intersection of Centennial Boulevard and 21st Street	Construct traffic control improvements	Springfield	**Exempt** 40 CFR 93.126, Safety – Projects that correct, improve, or eliminate a hazardous location or feature	$290,000	2035-2040	$444,651	$517,980	0	927	Minor Arterial
South 42nd Street/Daisy Street	Intersection of South 42nd Street and Daisy Street	Traffic control improvements - Construct a traffic signal or a roundabout	Springfield	**Exempt** 40 CFR 93.126, Safety – Projects that correct, improve, or eliminate a hazardous location or feature; Traffic control devices and operating assistance other than signalization projects	$1,800,000	2020-2024	$1,745,878	$1,972,643	0	951	Minor Arterial
Gateway Street	International Way to UGB	Construct 5 lane cross section (currently 3 lane cross section)	Springfield	**Non-exempt**	$950,000	2025-2029	$1,073,392	$1,212,810	0.63	704	Minor Arterial
42nd Street	Marcola Road to RR Tracks	Modify to 3 lane cross section with stripped bicycle lanes and traffic controls at Marcola Rd and the OR126 westbound ramps	Springfield	**Non-exempt**	$6,000,000	2020-2024	$5,819,593	$6,575,477	1.05	713	Minor Arterial
Daisy Street/Bob Straub Parkway	Intersection of Daisy Street and Bob Straub Parkway	Traffic control improvements or undercrossing of Bob Straub Parkway	Lane County	**Exempt** 40 CFR 93.126, Safety – Projects that correct, improve, or eliminate a hazardous location or feature	$3,000,000	2030-2034	$3,948,655	$4,461,531	0	32	Minor Arterial

PROJECT CATEGORY: ARTERIAL CAPACITY IMPROVEMENTS											
Name	**Geographic Limits**	**Description**	**Primary Jurisdiction**	**Air Quality Status**	**Est. Cost (2021)**	**Est. Year of Construction (5-Year Window)**	**Year of Construction Cost Range**		**Length**	**RTP #**	**Federal Functional Class**
Franklin Boulevard (OR 126)	I-5 to RR Tracks south of Franklin Blvd/McVay Hwy	Multimodal urban standards and intersection control improvements	Springfield	**Exempt** 40 CFR 93.126, Safety – Projects that correct, improve, or eliminate a hazardous location or feature	$35,000,000	2020-2024	$33,947,624	$38,356,948	1.29	830	Other Principal Arterial
Franklin Boulevard (OR 225)/East 19th Avenue	Intersection of McVay Hwy and East 19th Ave	Construct a new 2 lane roundabout (currently this intersection does not have traffic controls)	Springfield	**Exempt** 40 CFR 93.126, Safety – Projects that correct, improve, or eliminate a hazardous location or feature; Traffic control devices and operating assistance other than signalization projects	$2,500,000	2025-2029	$2,824,715	$3,191,606	0	898	Minor Arterial
Franklin Boulevard (OR 225)	East 19th Avenue to I-5	Construct 2 or 3 lane cross-section as needed with sidewalks, bicycle facilities and transit facilities consistent with Main Street/McVay Hwy Transit Feasibility Study and Springfield TSP project T-3.	Springfield	**Non-exempt**	$47,000,000	2030-2034	$61,862,269	$69,897,317	1.34	899	Minor Arterial
Marcola Road/19th Street	Intersection of Marcola Road and 19th Street	Construct right-turn lane on westbound approach or a roundabout	Springfield	**Exempt** 40 CFR 93.126, Safety – Projects that correct, improve, or eliminate a hazardous location or feature; Traffic control devices and operating assistance other than signalization projects	$320,000	2020-2024	$310,378	$350,692	0	722	Minor Arterial
28th Street/Marcola Road	Intersection of 28th Street and Marcola Road	Construct a roundabout (intersection is currently signalized)	Springfield	**Exempt** 40 CFR 93.126, Safety – Projects that correct, improve, or eliminate a hazardous location or feature; Traffic control devices and operating assistance other than signalization projects	$1,900,000	2030-2034	$2,500,815	$2,825,636	0	723	Minor Arterial
W. 11th Avenue	Green Hill Road to Terry Street	Upgrade to 5-lane urban facility with 2 lanes in each direction, a center lane, sidewalk, and multiuse path (currently a 2 lane roadway)	ODOT, Eugene	**Non-exempt** Determined not a project of local air quality concern per IAC meeting July 2021	$12,300,000	2030-2034	$16,189,487	$18,292,277	1	333	Other Principal Arterial
Martin Luther King Jr. Blvd.	Leo Harris Parkway West to Centennial Loop	Add center turn lane on Martin Luther King Jr. Blvd. (currently a 4 lane cross section between Leo Harris Parkway West and Centennial Loop)	Eugene	**Exempt** 40 CFR 93.126, Safety – Projects that correct, improve, or eliminate a hazardous location or feature; Traffic control devices and operating assistance other than signalization projects	$6,700,000	2024-2028	$7,342,616	$8,296,319	0.21	602	Minor Arterial
Barger Drive	West of Primrose Street to where the street widens to two lanes in each direction west of Randy Papé Beltline Highway	Widen Barger Drive to provide a second through lane in each direction	Eugene	**Non-exempt**	$1,900,000	2024-2028	$2,082,234	$2,352,688	0.14	497	Minor Arterial
Franklin Blvd.	Alder Street to Walnut Street	4 travel lanes, central planter strip and bus lanes, roundabouts, and shared use paths on both sides	Eugene	**Non-exempt**	$43,500,000	2025-2029	$49,150,045	$55,533,952	1	119	Other Principal Arterial
				Project Category Subtotal	**$192,920,000**		**$223,883,875**	**$253,075,520**			

TABLE 26. PROJECT CATEGORY: NEW COLLECTORS

PROJECT CATEGORY: NEW COLLECTORS											
Name	**Geographic Limits**	**Description**	**Primary Jurisdiction**	**Air Quality Status**	**Est. Cost (2021)**	**Est. Year of Construction (5-Year Window)**	**Year of Construction Cost Range**		**Length**	**RTP #**	**Federal Functional Class**
Riverbend Drive	Extend to International Way	Construct 3-lane cross section with sidewalks and bike lanes	Springfield	**Non-exempt**	$1,600,000	2020-2024	$1,551,891	$1,753,460	0.19	715	Major Collector
Improvements to serve Riverbend Area	Baldy View Lane, McKenzie-Gateway Loop and Off-Street Path Connections	Improve Baldy View Lane, construct a McKenzie-Gateway Loop connector/new collector and construct off-street path connections. See Springfield 2035 TSP Figure 6.	Springfield	**Non-exempt**	$10,200,000	2030-2034	$13,425,429	$15,169,205	0.86	756	Collector

PROJECT CATEGORY: NEW COLLECTORS											
Name	**Geographic Limits**	**Description**	**Primary Jurisdiction**	**Air Quality Status**	**Est. Cost (2021)**	**Est. Year of Construction (5-Year Window)**	**Year of Construction Cost Range**		**Length**	**RTP #**	**Federal Functional Class**
79th Street	Thurston Road to Main Street	New 2 lane collector	Springfield	**Non-exempt**	$8,200,000	2035-2040	$12,572,891	$14,646,319	0.37	18	Minor Collector
Improvements within Jasper-Natron Area	Jasper-Natron Area between Bob Straub Parkway, Jasper Road and Mt. Vernon Road	Construct multiple roadways to serve planned development. See Springfield 2035 TSP Figure 6.	Springfield	**Non-exempt**	$67,000,000	2030-2034	$88,186,639	$99,640,856	1.35	33,36, 39, 42, 45, 48, 51, 57	Collector
New Collector	Bob Straub Parkway to Mountaingate Drive and Future Local	Construct a new collector with a three-lane cross-section with sidewalks and bicycle facilities	Springfield	**Non-exempt**	$4,300,000	2020-2024	$4,170,708	$4,712,425	1.03	81	Major Collector
19th Street	Hayden Bridge Road to Yolanda Avenue	Extend existing street as 2-lane collector with sidewalks and bicycle facilities	Springfield	**Non-exempt**	$2,400,000	2030-2034	$3,158,924	$3,569,225	0.33	703	Minor Collector
V Street	31st Street to Marcola Road	Construct a new collector with a three-lane cross-section with sidewalks and bicycle facilities.	Springfield	**Non-exempt**	$9,000,000	2020-2024	$8,729,389	$9,863,215	0.65	777	Collector
Yolanda Avenue	31st Street to 35th Street	Construct Yolanda Avenue from 31st Street to 33rd Street with sidewalks and bicycle facilities, add sidewalks and bicycle facilities from 33rd Street to 35th Street	Springfield	**Non-exempt**	$9,900,000	2030-2034	$13,030,563	$14,723,052	0.2	783	Minor Collector
North Gateway Collector	Maple Island Road/ Royal Caribbean Way to International	Construct a new collector with a three-lane cross-section with sidewalks and bicycle facilities.	Springfield	**Non-exempt**	$4,300,000	2025-2029	$4,858,510	$5,489,563	0.63	798	Collector
Franklin Riverfront Collector	Franklin Blvd/McVay to west portion of Franklin riverfront	Collector to serve Glenwood redevelopment area along riverfront north of Franklin Blvd.	Springfield	**Non-exempt**	$7,700,000	2020-2024	$7,468,477	$8,438,528	0.7	897	Collector
48th Street	Aster Street to Daisy Street	Extend South 48th Street with a two-lane cross-section with a parallel multi-use 12-foot wide path and roundabout intersection treatment at Daisy Street and South 48th Street	Springfield	**Non-exempt**	$3,600,000	2025-2029	$4,067,590	$4,595,913	0.3	901	Major Collector
New Collector	Game Farm Road East to International Way	Construct new 3- lane collector with sidewalks and bicycle facilities	Springfield	**Non-exempt**	$6,300,000	2030-2034	$8,292,176	$9,369,215	0.18	707	Major Collector
Maple Island Road	Game Farm Road/Deadmond Ferry Road to Beltline Road	Extend Maple Island Road with a 2-lane cross-section with sidewalk, bicycle facilities, intersection at Beltline	Springfield	**Non-exempt**	$3,100,000	2020-2024	$3,006,790	$3,397,330	0.11	706	Minor Collector
New Collector	Laura Street - Pioneer Parkway	Construct new 3-lane collector with sidewalks and bicycle facilities in or near the EWEB powerline corridor with a right-in/right-out intersection at Pioneer Parkway; In the Springfield TSP, PB-7 is required to serve as sidewalk and bikeway	Springfield	**Non-exempt**	$3,300,000	2030-2034	$4,343,521	$4,907,684	0.12	786	Collector
Centennial Boulevard/ Industrial Avenue	28th Street to 35th Street	Extend with a 3-lane cross-section	Springfield	**Non-exempt**	$9,500,000	2030-2034	$12,504,076	$14,128,181	0.5	924	Major Collector
Commercial Avenue	Extend between 42nd Street and 48th Street and a north/south extension to serve development to the north between 42nd and 48th (see TSP map)	Extend with a 3-lane cross-section	Springfield	**Non-exempt**	$19,000,000	2035-2040	$29,132,309	$33,936,593	0.84	19	Major Collector
New Collector	Holly Street - South 48th Street to South 57th Street	Construct new collector with 2-lane cross-section with sidewalks and bicycle facilities	Springfield	**Non-exempt**	$5,300,000	2025-2029	$5,988,396	$6,766,206	0.94	22	Minor Collector
Mallard Avenue	Gateway Street to Oriole Street	Change Mallard Avenue to a two-lane cross-section with sidewalks and bicycle facilities and extend Mallard Avenue to Gateway Street with a two-lane cross-section with sidewalks and bicycle facilities	Springfield	**Non-exempt**	$3,000,000	2035-2040	$4,599,838	$5,358,409	0.18	709	Minor Collector
Q Street	@ Laura Street	Construct traffic controls, extend the second westbound through-lane through the Laura Street intersection, and construct a westbound right-turn lane	ODOT, Springfield	**Non-exempt**	$1,600,000	2025-2029	$1,807,818	$2,042,628	0	717	Major Collector
W. 13th Avenue	Bertelsen Road to Dani Street	New major collector	Eugene	**Non-exempt**	$3,600,000	2020-2024	$3,491,756	$3,945,286	1	318	Major collector

PROJECT CATEGORY: NEW COLLECTORS											
Name	**Geographic Limits**	**Description**	**Primary Jurisdiction**	**Air Quality Status**	**Est. Cost (2021)**	**Est. Year of Construction (5-Year Window)**	**Year of Construction Cost Range**		**Length**	**RTP #**	**Federal Functional Class**
Colton Way Extension	Royal Avenue to Legacy Extension	New major collector	Eugene	**Non-exempt**	$3,700,000	2025-2029	$4,180,579	$4,723,578	0.7	429	Major collector
Legacy Extension	Adelman Loop to Roosevelt Blvd	New major collector	Eugene	**Non-exempt**	$17,500,000	2025-2029	$19,773,007	$22,341,245	1.4	435	Major collector
Awbrey to Enis Connector	Awbrey Lane to Enid Road	New major collector	Eugene	**Non-exempt**	$7,400,000	2030-2034	$9,740,017	$11,005,110	0.8	441	Major collector
Gilham-County Farm Connection	Gilham to County Farm Road	New neighborhood collector	Eugene	**Non-exempt**	$2,800,000	2020-2024	$2,715,810	$3,068,556	0.7	651	Minor Collector
Shadowview Road	Shadowview Road to Coburg Road via Spectrum Avenue	Extend neighborhood collector with two travel lanes and sidewalks on both sides	Eugene	**Non-exempt**	$3,200,000	2020-2024	$3,103,783	$3,506,921	0.3	603	Minor Collector
Crow Road/West 11th Avenue/Pitchford area	Crow Road/West 11th Avenue/Pitchford area	Construct collectors and other facilities within Crow Road/West 11th Avenue/Pitchford area needed to serve future development	Eugene	**Non-exempt**	$21,300,000	2025-2029	$24,066,574	$27,192,487	1.3	333	Collectors
				Project Category Subtotal	**$238,800,000**		**$297,967,461**	**$338,291,190**			

TABLE 27. PROJECT CATEOGRY: URBAN STANDARDS

PROJECT CATEGORY: URBAN STANDARDS											
Name	**Geographic Limits**	**Description**	**Primary Jurisdiction**	**Air Quality Status**	**Est. Cost (2021)**	**Est. Year of Construction (5-Year Window)**	**Year of Construction Cost Range**		**Length**	**RTP #**	**Federal Functional Class**
Game Farm Road South	Mallard Road to Harlow Road	Upgrade to 2-lane urban facility (currently a 2-lane roadway; modify to include sidewalks and bicycle facilities)	Lane County, Springfield	**Exempt** 40 CFR 93.126, Safety – Widen lanes/resurfacing; Air Quality – Bike and ped facilities	$4,100,000	2030-2034	$5,396,496	$6,097,426	0.93	737	Local
Hayden Bridge Road / 23rd St	19th Street to Marcola Rd	Upgrade to 2-lane urban facility (currently a 2-lane roadway; modify to include sidewalks and bicycle facilities)	Lane County, Springfield	**Exempt** 40 CFR 93.126, Safety – Widen lanes/resurfacing; Air Quality – Bike and ped facilities	$12,000,000	2030-2034	$15,794,622	$17,846,124	1.78	747	Minor Collector
31st Street	Hayden Bridge Road to U Street	Upgrade to 2 lane urban facility (currently a 2-lane roadway; modify to include sidewalks and bicycle facilities)	Lane County, Springfield	**Exempt** 40 CFR 93.126, Safety – Widen lanes/resurfacing; Air Quality – Bike and ped facilities	$3,800,000	2030-2034	$5,001,630	$5,651,272	0.58	765	Minor Collector
Laura Street	Old Laura Street to Scotts Glen Drive	Upgrade to 3-lane urban facility (currently a 3-lane roadway; modify to include sidewalks and bicycle facilities)	Lane County, Springfield	**Exempt** 40 CFR 93.126, Safety – Widen lanes/resurfacing; Air Quality – Bike and ped facilities	$1,575,000	2020-2024	$1,527,643	$1,726,063	0.4	750	Major Collector
Aspen Street	Centennial Boulevard to West D Street	Upgrade to 2 lane urban facility (currently a 2-lane roadway; modify to include sidewalks and bicycle facilities)	Lane County, Springfield	**Exempt** 40 CFR 93.126, Safety – Widen lanes/resurfacing; Air Quality – Bike and ped facilities	$2,800,000	2030-2034	$3,685,412	$4,164,095	0.44	809	Minor Collector
48th Street	Main Street to G Street	Upgrade to 2 lane urban facility (currently a 2-lane roadway; modify to include a multi-use path on one side of street)	Springfield	**Exempt** 40 CFR 93.126, Safety – Widen lanes/resurfacing; Air Quality – Bike and ped facilities	$600,000	2025-2029	$677,932	$765,986	0.48	3	Major Collector
52nd Street	OR 126E to G Street	Upgrade to 2 lane urban facility (currently a 2-lane roadway; modify to include a multi-use path on one side of street)	Springfield	**Exempt** 40 CFR 93.126, Safety – Widen lanes/resurfacing; Air Quality – Bike and ped facilities	$250,000	2020-2024	$242,483	$273,978	0.2	6	Major Collector
G Street	48th Street to 52nd Street	Upgrade to 2 lane urban facility (currently a 2-lane roadway; modify to include a multi-use path on one side of street)	Springfield	**Exempt** 40 CFR 93.126, Safety – Widen lanes/resurfacing; Air Quality – Bike and ped facilities	$370,000	2020-2024	$358,875	$405,488	0.31	54	Major Collector
Thurston Road	Weaver Road to UGB	Upgrade to 3 lane urban facility (currently a 2-lane roadway; modify to include sidewalks and bicycle facilities)	Springfield	**Non-Exempt**	$4,800,000	2035-2040	$7,359,741	$8,573,455	0.61	98	Minor Collector

PROJECT CATEGORY: URBAN STANDARDS

Name	Geographic Limits	Description	Primary Jurisdiction	Air Quality Status	Est. Cost (2021)	Est. Year of Construction (5-Year Window)	Year of Construction Cost Range		Length	RTP #	Federal Functional Class
28th Street	Centennial Boulevard to Main Street	Upgrade to 3 lane urban facility (currently a 3-lane roadway with narrow sidewalk and no bicycle facilities; modify to include standard sidewalks and bicycle facilities); provide intersection and signal improvements at Main Street	Springfield	**Non-exempt**	$4,300,000	2030-2034	$5,659,740	$6,394,861	0.7	909	Major Collector
35th Street	Olympic Street to Commercial Avenue	Upgrade to 3-lane urban facility (currently a 2-lane roadway; modify to 3 lanes with sidewalks and bicycle facilities)	Springfield	**Non-exempt**	$3,600,000	2020-2024	$3,491,756	$3,945,286	0.46	918	Major Collector
Commercial Avenue	35th Street to 42nd Street	Upgrade to 3-lane urban facility (currently a 2-lane roadway; modify to 3 lanes with sidewalks and bicycle facilities)	Springfield	**Non-exempt**	$4,500,000	2025-2029	$5,084,487	$5,744,892	0.81	933	Major Collector
S. 28th Street	Main Street to South F Street	Upgrade to 3-lane urban facility (currently a 2-lane roadway; modify to 3 lanes with sidewalks and bicycle facilities)	Springfield	**Non-exempt**	$6,000,000	2020-2024	$5,819,593	$6,575,477	0.67	945	Major Collector
21st Street	D Street to Main Street	Upgrade to 3-lane urban facility (currently a 2-lane roadway with on-street parking and sidewalks; modify to 3 lanes with sidewalks and bicycle facilities)	Springfield	**Non-exempt**	$2,300,000	2030-2035	$3,027,303	$3,526,543	0.2	962	Minor Collector
36th Street	Commercial Avenue to Main Street	Upgrade to 3-lane urban facility (currently a 2-lane roadway with on-street parking and sidewalks; modify to 3 lanes with sidewalks and bicycle facilities)	Springfield	**Non-exempt**	$3,000,000	2035-2040	$4,599,838	$5,358,409	0.47	920	Minor Collector
Clearwater Lane	South of Jasper Road within the Springfield UGB	Upgrade to 2 lane urban facility (currently a 2-lane roadway; modify to 2 lanes with sidewalks and bicycle facilities)	Lane County, Springfield	**Exempt** 40 CFR 93.126, Safety – Widen lanes/resurfacing; Air Quality – Bike and ped facilities	$470,000	2025-2029	$531,046	$600,022	0.11	925	Local
Mallard Avenue	Oriole St. to Game Farm Road	Upgrade to 2 lane urban facility (currently a 2-lane roadway with on-street parking; modify to 2 lanes with sidewalks and bicycle facilities). And extend Mallard Avenue to Gateway Street with a 2-lane cross-section with sidewalks and bicycle facilities.	Springfield	**Non-exempt**	$4,530,000	2020-2024	$1,454,898	$1,643,869	0.31	710	Local (current)
East 17th Avenue	Glenwood Blvd. to Henderson Ave.	Upgrade to 3-lane urban facility (currently a 2-lane roadway; modify to 3 lanes with sidewalks and bicycle facilities)	Springfield	**Non-exempt**	$1,900,000	2030-2034	$2,500,815	$2,825,636	0.52	826	Minor Collector
Henderson Avenue	Franklin Boulevard to East 19th Avenue	Upgrade to 3-lane urban facility (currently a 2-lane roadway; modify to 3 lanes with sidewalks and bicycle facilities)	Springfield, Lane County	**Non-exempt**	$3,400,000	2035-2040	$5,213,150	$6,072,864	0.39	827	Local (current)
East 19th Avenue	Henderson Avenue to McVay Hwy	Upgrade to 3-lane urban facility (currently a 2-lane roadway; modify to 3 lanes with sidewalks and bicycle facilities)	Springfield	**Non-exempt**	$3,500,000	2030-2034	$4,606,765	$5,205,119	0.49	828	Minor Collector
Yolanda Avenue	23rd Street to 31st Street	Upgrade to 2-lane urban facility (currently a 2-lane roadway; modify with sidewalks and bicycle facilities)	Lane County	**Exempt** 40 CFR 93.126, Safety – Widen lanes/resurfacing; Air Quality – Bike and ped facilities	$460,000	2025-2029	$519,748	$587,256	0.8	784	Minor Collector
Bertelsen Road	18th Avenue to Bailey Hill Road	Upgrade to minor arterial standards with two travel lanes, center turn lane, bike lanes, sidewalks on both sides, and planting strips (currently a 2-lane roadway)	Eugene	**Non-exempt**	$3,900,000	2025-2029	$3,782,735	$4,274,060	0.6	315	Minor Arterial
Bailey Hill Road	Warren St to Eugene UGB	Construct to Eugene's minor arterial standards, including two travel lanes, center turn lane, and bike lanes, planter strip, and sidewalks on both sides (currently a 2-lane roadway)	Eugene, Lane County	**Non-exempt**	$9,200,000	2020-2024	$8,923,375	$10,082,398	1.6	343	Minor Arterial
Bethel Drive	Highway 99 to Roosevelt Blvd	Upgrade to 2-lane urban facility (currently a 2-lane roadway without sidewalks; modify to include sidewalks and bike lanes)	Eugene	**Exempt** 40 CFR 93.126, Safety – Widen lanes/resurfacing; Air Quality – Bike and ped facilities	$11,800,000	2025-2029	$13,332,656	$15,064,382	1.68	414	Minor Collector
Royal Avenue	Green Hill Road to Terry Street	Upgrade to minor arterial standards with two travel lanes, center turn lane, bike lanes, sidewalks on both sides, and planting strips (currently a 2-lane roadway)	Eugene	**Non-exempt**	$11,200,000	2020-2024	$10,863,240	$12,274,223	1.01	481	Minor Arterial
Hunsaker Lane / Beaver Street	River Road to Division Avenue	Upgrade to major collector standards with two travel lanes, center turn lane, bike lanes, sidewalks on both sides, and planting strips (currently a 2-lane roadway)	Lane County, Eugene	**Non-exempt**	$9,300,000	2020-2024	$9,020,369	$10,191,989	1.14	527	Major Collector

PROJECT CATEGORY: URBAN STANDARDS											
Name	**Geographic Limits**	**Description**	**Primary Jurisdiction**	**Air Quality Status**	**Est. Cost (2021)**	**Est. Year of Construction (5-Year Window)**	**Year of Construction Cost Range**		**Length**	**RTP #**	**Federal Functional Class**
Wilkes Drive	River Road to River Loop 1	Upgrade to major collector standards with two travel lanes, center turn lane, bike lanes, sidewalks on both sides, and planting strips (currently a 2-lane roadway)	Lane County, Eugene	**Non-exempt**	$7,000,000	2025-2029	$7,909,203	$8,936,498	0.93	554	Major Collector
North Gilham Road	Ayres Road to Ashbury Drive	Upgrade to minor arterial standards with two travel lanes, center turn lane, bike lanes, sidewalks on both sides, and planting strips (currently a 2-lane roadway)	Eugene, Lane County	**Non-exempt**	$1,500,000	2020-2024	$1,454,898	$1,643,869	0.3	662	Minor Collector
County Farm Road	North-to-South Section	Upgrade to major collector standards with two travel lanes, center turn lane, bike lanes, sidewalks on both sides, and planting strips (currently a 2-lane roadway)	Lane County, Eugene	**Non-exempt**	$4,400,000	2025-2029	$4,267,701	$4,822,016	0.62	631	Major Collector
County Farm Road	West-to-East Section	Upgrade to major collector standards with two travel lanes, center turn lane, bike lanes, sidewalks on both sides, and planting strips (currently a 2-lane roadway)	Eugene	**Non-exempt**	$3,200,000	2025-2029	$3,615,635	$4,085,256	0.53	632	Major Collector
Goodpasture Island Road	Delta Highway to Happy Lane	Upgrade to minor arterial standards with two travel lanes, center turn lane, bike lanes, sidewalks on both sides, and planting strips (currently a 2-lane roadway)	Eugene	**Non-exempt**	$163,000	2030-2034	$214,544	$242,410	0.19	664	Minor Arterial
Fox Hollow Road	Donald Street to the UGB	Upgrade Fox Hollow Rd consistent with major collector standards	Eugene, Lane County	**Exempt** 40 CFR 93.126, Safety – Widen lanes/resurfacing; Air Quality – Bike and ped facilities	$5,700,000	2030-2034	$7,502,445	$8,476,909	0.9	382	Major Collector
				Project Category Subtotal	**$135,618,000**		**$153,440,774**	**$174,078,131**			

TABLE 28. PROJECT CATEGORY: STUDY

PROJECT CATEGORY: STUDY										
Name	**Geographic Limits**	**Description**	**Primary Jurisdiction**	**Air Quality Status**	**Est. Cost (2021)**	**Est. Year of Construction (5-Year Window)**	**Year of Construction Cost Range**		**Length**	**RTP #**
Interchange Area Management Plan at OR126E (Expressway) and Main St	Interchange of OR 126E at Main Street in Springfield	The Interchange Area Management Plan (IAMP) will establish an agreement between the City of Springfield and ODOT regarding transportation solutions and/or land use/policy actions needed at this interchange area and how to best balance and manage transportation and land use issues over time. The IAMP is a tool in protecting the function and operations of the state highway interchanges and the supporting local street network.	ODOT, Springfield	**Exempt** 40 CFR 93.126, Other – Planning and technical studies	$250,000	2025-2029	$282,472	$319,161	1.5	96
OR126 Expressway Management Plan	I-5 to Main Street in Springfield	The facility plan will establish an agreement between the City of Springfield and ODOT for managing access on OR 126 Expressway between I-5 and Main Street in Springfield.	ODOT, Springfield	**Exempt** 40 CFR 93.126, Other – Planning and technical studies	$750,000	2030-2034	$987,164	$1,115,383	6.5	835
Main Street/Highway 126	I-5 east to Springfield UGB	The facility plan will establish an agreement between the City of Springfield and ODOT for managing access on Main Street/Highway 126 between I-5 and the Springfield UGB.	Springfield, ODOT	**Exempt** 40 CFR 93.126, Other – Planning and technical studies	$150,000	2020-2024	$145,490	$164,387	6	838
Study to assess multimodal improvements at Beltline Highway and Gateway	Gateway Street between International Way and Gateway Loop	Assess, evaluate, and identify multimodal improvements for Gateway Street at Beltline Highway.	Springfield, ODOT	**Exempt** 40 CFR 93.126, Other – Planning and technical studies	$800,000	2020-2024	$775,946	$876,730	0.36	608
Circulation study at Pioneer Parkway/Q Street/Laura Street	Pioneer Parkway/Q Street/Laura Street	Circulation study to improve safety, access, and capacity at Pioneer Parkway/Q Street/Laura Street	Springfield, ODOT	**Exempt** 40 CFR 93.126, Other – Planning and technical studies)	$300,000	2025-2029	$338,966	$382,993	0.35	718
Main Street (OR126B) crossing study	OR 126 between 5th Street and 15th Street	Study a new crossing of OR 126 between 5th Street and 15th Street	Springfield, ODOT	**Exempt** 40 CFR 93.126, Other – Planning and technical studies	$200,000	2035-2040	$306,656	$357,227	0.79	823
Centennial Boulevard operational improvements study	Centennial Boulevard from Prescott Lant to Mill Street	Operational improvements study of Centennial Boulevard between Prescott Lane and Mill Street	Springfield	**Exempt** 40 CFR 93.126, Other – Planning and technical studies	$100,000	2030-2034	$131,622	$148,718	0.29	818

PROJECT CATEGORY: STUDY

Name	Geographic Limits	Description	Primary Jurisdiction	Air Quality Status	Est. Cost (2021)	Est. Year of Construction (5-Year Window)	Year of Construction Cost Range		Length	RTP #
Pioneer Parkway at Centennial Boulevard Intersection Study	Pioneer Parkway at Centennial Boulevard	Intersection study to improve pedestrian safety at the intersection of Pioneer Parkway and Centennial Boulevard	Springfield	**Exempt** 40 CFR 93.126, Other – Planning and technical studies	$75,000	2020-2024	$72,745	$82,193	0	849
Centennial Boulevard operational improvements study	Centennial Boulevard from Mohawk Boulevard to Pioneer Parkway	Operational improvements study of Centennial Boulevard between Mohawk Boulevard and Pioneer Parkway	Springfield	**Exempt** 40 CFR 93.126, Other – Planning and technical studies	$75,000	2020-2024	$72,745	$82,193	1.08	819
Mohawk Boulevard/Olympic Street/18th Street/Centennial Triangle study of safety and operational improvements	Mohawk Boulevard/Olympic Street/18th Street/Centennial triangle	Study of safety and operational improvements at the Mohawk Boulevard/Olympic Street/18th Street/Centennial triangle	Springfield	**Exempt** 40 CFR 93.126, Other – Planning and technical studies	$100,000	2020-2024	$96,993	$109,591	0.9	916
Bridge Study at the Walnut Road/West D Street to Glenwood Boulevard/Franklin Boulevard intersection	Intersection of Walnut Road/West D Street to Glenwood Boulevard/Franklin Boulevard	Study of a new bridge at the Walnut Road/West D Street to Glenwood Boulevard/Franklin Boulevard intersection	Springfield	**Exempt** 40 CFR 93.126, Other – Planning and technical studies	$750,000	2035-2040	$1,149,960	$1,339,602	0.28	815
Main Street/South A Street Study	Main Street/South A from Mill Street to 21st Street	Study of multimodal improvements from on Main Street/South A Street from Mill Street to 21st Street	Springfield	**Exempt** 40 CFR 93.126, Other – Planning and technical studies	$150,000	2020-2024	$145,490	$164,387	2.98	824
Glenwood Industrial Area Refinement Study	Glenwood industrial area	Refinement study specific to the Glenwood Industrial Area	Springfield	**Exempt** 40 CFR 93.126, Other – Planning and technical studies	$150,000	2030-2034	$197,433	$223,077	0.82	829
Glenwood – Dorris Ranch pedestrian and bicycle bridge study	Across the Willamette River between Glenwood and Dorris Ranch	Study a new pedestrian bicycle bridge crossing the Willamette River and connecting Glenwood and Dorris Ranch	Springfield	**Exempt** 40 CFR 93.126, Other – Planning and technical studies	$750,000	2035-2040	$1,149,960	$1,339,602	0.08	831
Main Street (OR126B)	Facility Plan	20th St to 72nd St	Springfield, ODOT	**Exempt** 40 CFR 93.126, Other – Planning and technical studies	$1,000,000	In progress	$912,481	$1,031,000	2.23	917
South 28th Street to South 32nd Street East/west connectivity study	Between South 28th Street and South 32nd Street (South of Main Street)	Study opportunities for east/west connectivity between South 28th Street and South 32nd street (south of Main Street)	Springfield	**Exempt** 40 CFR 93.126, Other – Planning and technical studies	$100,000	2025-2029	$112,989	$127,664	0.33	918
Study crossing of OR 126 near Thurston	OR 126 near Thurston High School	Study a new crossing of OR 126 Near Thurston High School	Springfield, ODOT	**Exempt** 40 CFR 93.126, Other – Planning and technical studies	$200,000	2025-2029	$225,977	$255,329	0.32	26
Connectivity Study south of OR 126 and Jessica Street	South of OR 126 and adjacent to Springfield's eastern UGB (see Springfield TSP, Figure 8: Transit and Study Projects, Project S-16)	Study connectivity options for the area of Springfield south of OR 126 and along the eastern UGB	Springfield	**Exempt** 40 CFR 93.126, Other – Planning and technical studies	$100,000	2030-2034	$131,622	$148,718	1.89	31
River Crossings	Along the Willamette River	Study ways to increase capacity over the Willamette River to address bridge crossing congestion issues including improvements to an aging Ferry Street Bridge structure and investigation of transit route options for access into downtown via or around the Ferry Street Bridge in conjunction with either Martin Luther King Jr. Boulevard or Coburg Road transit improvements.	Eugene	**Exempt** 40 CFR 93.126, Other – Planning and technical studies	$100,000	2025-2029	$112,989	$127,664	…	TBD **
Improvements to North-South travel and circulation south of downtown Eugene	Downtown Eugene to South Eugene	Evaluate north/south circulation options on the Oak/Pearl and Hilyard/Patterson Streets couplets.	Eugene	**Exempt** 40 CFR 93.126, Other – Planning and technical studies	$100,000	2025-2029	$112,989	$127,664	5.49	210
I-105 off-ramp study	I-105 at 6th Avenue	Analyze options to address weaving, operational and safety considerations at the I-105 southbound off-ramp onto 6th Avenue	ODOT, Eugene	**Exempt** 40 CFR 93.126, Other – Planning and technical studies	$100,000	2025-2029	$112,989	$127,664	0.44	102
Northwest Expressway study of safety and functionality	Northwest Expressway at the Randy Pape Beltline Highway Ramp termini and other locations	Study opportunities to improve the safety and functionality of Northwest Expressway as a major arterial street including by making intersection improvements at the Randy Pape Beltline Highway ramp termini and other locations, by improving signage, and by making other changes to the street	ODOT, Eugene, Lane County	**Exempt** 40 CFR 93.126, Other – Planning and technical studies	$100,000	2025-2029	$112,989	$127,664	0.35	557
Green Hill Road design study	Entire length of Greenhill Road	Study to determine preferred design solution for the entire corridor	Lane County, Eugene	**Exempt** 40 CFR 93.126, Other – Planning and technical studies	$500,000	2025-2029	$564,943	$638,321	4.27	485, 454

PROJECT CATEGORY: STUDY										
Name	**Geographic Limits**	**Description**	**Primary Jurisdiction**	**Air Quality Status**	**Est. Cost (2021)**	**Est. Year of Construction (5-Year Window)**	**Year of Construction Cost Range**		**Length**	**RTP #**
Beltline Highway environmental study	River Road to Delta Highway	Environmental Study	ODOT	**Exempt** 40 CFR 93.126, Other – Planning and technical studies	$2,000,000	2018-2021	$1,824,963	$2,000,000	3.46	555
Coburg Freight Connector Study	North of the city of Coburg between Coburg Road and I-5	Study to determine alignment for a new east-west freight route connection between Coburg Rd and I-5, north of the city of Coburg	Lane County, Coburg, ODOT	**Exempt** 40 CFR 93.126, Other – Planning and technical studies	$250,000	2020-2024	$242,483	$273,978	NA	TBD **
Goshen North Connector Study	McVay Highway to Goshen limits	Implement a study to identify the location of a road that provides local walking, bicycling, and transit use as an alternative of I-5.	Lane County	**Exempt** 40 CFR 93.126, Other – Planning and technical studies	$415,000	2025-2029	$468,903	$529,807	NA	TBD **
Autzen-UO Campus Gondola/Aerial Tram Study	UO Campus to Autzen Stadium Complex	Study the feasibility of a gondola or aerial tram to connect the University of Oregon to the Autzen Stadium area.	University of Oregon, Eugene	**Exempt** 40 CFR 93.126, Other – Planning and technical studies	$150,000	2020-2024	$145,490	$164,387	1	TBD **
Ferry Street Bridge Circulation Study	Ferry Street Bridge to Broadway	Evaluate ending the Ferry Street Bridge Viaduct at 6th Avenue to better connect with the downtown street grid	Eugene	**Exempt** 40 CFR 93.126, Other – Planning and technical studies	$200,000	2025-2029	$225,977	$255,329	NA	TBD **
Lower Coburg Road Traffic Flow Study	Oakway Road to Ferry Street Bridge	Study to develop design concepts for making traffic flow better for all modes on lower Coburg Road	Eugene	**Exempt** 40 CFR 93.126, Other – Planning and technical studies	$200,000	2020-2024	$193,986	$219,183	NA	TBD **
				Project Category Subtotal	**$10,115,000**		**$10,644,026**	**$12,329,808**		

***Note: These projects were added after the maps and the analysis were complete. However, these projects will be included in future mapping and analysis.*

TABLE 29. PROJECT CATEGORY: TRANSIT ORIENTED DEVELOPMENT IMPLEMENTATION

PROJECT CATEGORY: TRANSIT ORIENTED DEVELOPMENT IMPLEMENTATION								
Name	**Geographic Limits**	**Description**	**Primary Jurisdiction**	**Air Quality Status**	**Est. Cost (2021)**	**Est. Year of Construction (5-Year Window)**	**Year of Construction Cost Range**	
Planning	Various Locations	Planning for implementation of Key Corridor/Mixed Use development	Eugene	**Exempt** 40 CFR 93.126, Other – Planning activities conducted pursuant to titles 23 and 49 U.S.C.	$3,100,000	2020-2024	$3,006,790	$3,397,330
Planning	Various Locations	Planning for implementation of Key Corridor/Mixed Use development	Springfield	**Exempt** 40 CFR 93.126, Other – Planning activities conducted pursuant to titles 23 and 49 U.S.C.	$3,100,000	2020-2024	$3,006,790	$3,397,330
				Project Category Subtotal	**$6,200,000**		**$6,013,580**	**$6,794,660**

CONSTRAINED PROJECTS: TRANSIT

TABLE 30. PROJECT CATEGORY: BUSES AND BUS MAINTENANCE

PROJECT CATEGORY: BUSES AND BUS MAINTENANCE										
Name	**Geographic Limits**	**Description**	**Primary Jurisdiction**	**Air Quality Status**	**Est. Cost (2021)**	**Est. Year of Construction (5-Year Window)**	**Year of Construction Cost Range**		**Length**	**RTP #**
Bus Purchases	N/A	Purchase of new buses for fleet expansion and for bus replacement buses	Lane Transit District	**Exempt** 40 CFR 93.126, Mass Transit – Purchase of new buses	$67,790,000	2021-2025	$67,790,000	$76,594,978	-	1110
Bus Purchases	N/A	Purchase of new buses for fleet expansion and for bus replacement buses	Lane Transit District	**Exempt** 40 CFR 93.126, Mass Transit – Purchase of new buses	$31,460,000	2026-2030	$36,648,149	$41,408,234	-	1110
Bus Purchases	N/A	Purchase of new buses for fleet expansion and for bus replacement buses	Lane Transit District	**Exempt** 40 CFR 93.126, Mass Transit – Purchase of new buses	$55,000,000	2031-2035	$74,636,170	$84,330,370	-	1110
Bus Purchases	N/A	Purchase of new buses for fleet expansion and for bus replacement buses	Lane Transit District	**Exempt** 40 CFR 93.126, Mass Transit – Purchase of new buses	$55,000,000	2036-2040	$86,944,611	$98,237,506	-	1110
Bus Purchases	N/A	Purchase of new buses for fleet expansion and for bus replacement buses	Lane Transit District	**Exempt** 40 CFR 93.126, Mass Transit – Purchase of new buses	$55,000,000	2041-2045	$101,282,869	$114,438,105	-	1110
				Project Category Subtotal	**$264,250,000**		**$367,301,799**	**$415,009,193**		

TABLE 31. PROJECT CATEGORY: FREQUENT TRANSIT NETWORK

PROJECT CATEGORY: FREQUENT TRANSIT NETWORK										
Name	**Geographic Limits**	**Description**	**Primary Jurisdiction**	**Air Quality Status**	**Est. Cost (2021)**	**Est. Year of Construction (5-Year Window)**	**Year of Construction Cost Range**		**Length**	**RTP #**
Enhanced Corridor	Study corridors include: Highway 99, River Road, Coburg Road, Martin Luther King Jr. Boulevard/Centennial Boulevard, 30th Avenue/Lane Community College, Main Street - McVay Highway, Valley River Center	LTD system improvements to safety, addressing operational issues related to travel time and improvements to passenger amenities	Lane Transit District	**Non-Exempt**	$25,000,000	2021-2025	$25,000,000	$28,247,152	-	1117
Enhanced Corridor		LTD system improvements to safety, addressing operational issues related to travel time and improvements to passenger amenities	Lane Transit District	**Non-Exempt**	$25,000,000	2026-2030	$29,122,814	$32,905,462	-	1117
Enhanced Corridor		LTD system improvements to safety, addressing operational issues related to travel time and improvements to passenger amenities	Lane Transit District	**Non-Exempt**	$25,000,000	2031-2035	$33,925,532	$38,331,986	-	1117
Enhanced Corridor		LTD system improvements to safety, addressing operational issues related to travel time and improvements to passenger amenities	Lane Transit District	**Non-Exempt**	$25,000,000	2036-2040	$39,520,278	$44,653,412	-	1117
Bus Rapid Transit (EmX)		EmX system improvements to safety, addressing operational issues related to travel time and improvements to EmX passenger amenities	Lane Transit District	**Non-Exempt**	$65,000,000	2021-2025	$65,000,000	$73,442,596	-	1115
Bus Rapid Transit (EmX)		EmX system improvements to safety, addressing operational issues related to travel time and improvements to EmX passenger amenities	Lane Transit District	**Non-Exempt**	$65,000,000	2026-2030	$75,719,316	$85,554,202	-	1115
Bus Rapid Transit (EmX)		EmX system improvements to safety, addressing operational issues related to travel time and improvements to EmX passenger amenities	Lane Transit District	**Non-Exempt**	$65,000,000	2031-2035	$88,206,382	$99,663,164	-	1115
Bus Rapid Transit (EmX)		EmX system improvements to safety, addressing operational issues related to travel time and improvements to EmX passenger amenities	Lane Transit District	**Non-Exempt**	$65,000,000	2036-2040	$102,752,722	$116,098,871	-	1115
				Project Category Subtotal	**$360,000,000**		**$459,247,044**	**$518,896,845**		

TABLE 32. PROJECT CATEGORY: GENERAL STOPS AND STATIONS

PROJECT CATEGORY: GENERAL STOPS AND STATIONS										
Name	**Geographic Limits**	**Description**	**Primary Jurisdiction**	**Air Quality Status**	**Est. Cost (2021)**	**Est. Year of Construction (5-Year Window)**	**Year of Construction Cost Range**		**Length**	**RTP #**
Passenger Boarding Improvements	Various	Ongoing effort to maintain and/or improve the passenger boarding experience. Improvements include additions or replacements of pads, benches, and shelters	Lane Transit District	**Exempt** 40 CFR 93.126, Mass Transit – Construction of small passenger shelters and information kiosks. Other – Transportation enhancement activities	22,975,000	2021-2025	$22,975,000	$25,959,133	-	1130
Passenger Boarding Improvements	Various	Ongoing effort to maintain and/or improve the passenger boarding experience. Improvements include additions or replacements of pads, benches, and shelters	Lane Transit District	**Exempt** 40 CFR 93.126, Mass Transit – Construction of small passenger shelters and information kiosks. Other – Transportation enhancement activities	$14,000,000	2026-2030	$16,308,776	$18,427,059	-	1130
Passenger Boarding Improvements	Various	Ongoing effort to maintain and/or improve the passenger boarding experience. Improvements include additions or replacements of pads, benches, and shelters	Lane Transit District	**Exempt** 40 CFR 93.126, Mass Transit – Construction of small passenger shelters and information kiosks. Other – Transportation enhancement activities	$12,700,000	2031-2035	$17,234,170	$19,472,649	-	1130
Passenger Boarding Improvements	Various	Ongoing effort to maintain and/or improve the passenger boarding experience. Improvements include additions or replacements of pads, benches, and shelters	Lane Transit District	**Exempt** 40 CFR 93.126, Mass Transit – Construction of small passenger shelters and information kiosks. Other – Transportation enhancement activities	$20,700,000	2036-2040	$32,722,790	$36,973,025	-	1130
Passenger Boarding Improvements	Various	Ongoing effort to maintain and/or improve the passenger boarding experience. Improvements include additions or replacements of pads, benches, and shelters	Lane Transit District	**Exempt** 40 CFR 93.126, Mass Transit – Construction of small passenger shelters and information kiosks. Other – Transportation enhancement activities	$12,700,000	2041-2045	$23,387,135	$26,424,799	-	1130
				Project Category Subtotal	**$83,075,000**		**$112,627,871**	**$127,256,665**		

CONSTRAINED PROJECTS: BIKE/PED

TABLE 33. PROJECT CATEGORY: MULTI-USE PATHS WITHOUT ROAD PROJECT

PROJECT CATEGORY: MULTI-USE PATHS WITHOUT ROAD PROJECT

Name	Geographic Limits	Description	Primary Jurisdiction	Air Quality Status	Est. Cost (2021)	Est. Year of Construction (5-Year Window)	Year of Construction Cost Range		Length	RTP #	Federal Functional Class
Coburg Loop Phase IV	Starts from the "bend" in segment 2; north along the west side of North Coburg Industrial Way; connecting to the Trails End Park	Construct a new multi-Use Path	Coburg	Outside PM10 air quality maintenance area	$800,000	2020-2024	$775,946	$876,730	475	1005	...
McKenzie River Path	42nd Street to 52nd Street	Construct a new multi-use 12 foot wide path from the existing McKenzie Levee path at 42nd St to 52nd St	Springfield	**Exempt** 40 CFR 93.126, Air Quality – Bike and ped facilities	$3,700,000	2025-2029	$4,180,579	$4,723,578	1.55	753	Other urban Freeways and Expressways
McKenzie Gateway Path	Extend existing Path to Maple Island Road	Construct a new multi-use 12-foot wide path from the end of the existing Riverbend Hospital path to Maple Island Road	Springfield	**Exempt** 40 CFR 93.126, Air Quality – Bike and ped facilities	$3,000,000	2030-2034	$3,948,655	$4,461,531	1.3	759	...
Booth Kelly Road	South 28th Street to South 49th Place	Construct a new multi-use 12-foot wide path from South 28th St to South 49th St	Springfield	**Exempt** 40 CFR 93.126, Air Quality – Bike and ped facilities	$2,817,000	2020-2024	$2,732,299	$3,087,186	2.14	921	...
Glenwood Area Willamette River Path (A)	From end of existing path, east of I-5, to Willamette River bridges	Construct a new multi-use 12-foot wide path from the end of the existing path, east of I-5 to Willamette River bridges	Springfield, Willamalane	**Exempt** 40 CFR 93.126, Air Quality – Bike and ped facilities	$2,500,000	2020-2024	$2,424,830	$2,739,782	1.22	851	...
Springfield - Mt. Pisgah Connector	Middle Fork Path to Buford Park Road	Construct a new multi-Use Path and bridge across the Willamette River	Willamalane, Lane County, Springfield	**Exempt** 40 CFR 93.126, Air Quality – Bike and ped facilities	$4,423,000	2030-2034	$5,821,634	$6,577,784	2.78	960	...
New multi-use path	Flamingo Avenue to Gateway Street south of Game Bird Park	Construct a new 12-foot wide multi-use path	Springfield	**Exempt** 40 CFR 93.126, Air Quality – Bike and ped facilities	$70,000	2025-2029	$79,092	$89,365	0.23	711	...
Wayside Loop	Manor Drive to Riverbend Path	Construct a new multi-use 12-foot wide path from Wayside Lane/Ann Court to the existing Sacred Heart Medical Center-Riverbend path	Springfield	**Exempt** 40 CFR 93.126, Air Quality – Bike and ped facilities	$80,000	2025-2029	$90,391	$102,131	0.1	759	...
Anderson Lane	By-Gully path to Centennial Blvd.	Add signing and striping on Anderson St and West Quinalt St for bicycle facilities and construct 12-foot wide multi-use path between Anderson Lane and Quinalt St	Springfield	**Exempt** 40 CFR 93.126, Air Quality – Bike and ped facilities	$90,000	2030-2034	$118,460	$133,846	0.59	813	...
Glenwood Bicycle / Pedestrian Bridge	Downtown Springfield and Glenwood	Build bridge between Downtown Springfield and Glenwood or modify existing Willamette River Bridges	Springfield	**Exempt** 40 CFR 93.126, Air Quality – Bike and ped facilities	$10,300,000	2020-2024	$9,990,301	$11,287,902	0.22	804	...
Haul Road	Daisy Street to Booth Kelly Road	Construct a new multi-use 12-foot-wide path in the Haul Road right-of-way	Springfield	**Exempt** 40 CFR 93.126, Air Quality – Bike and ped facilities	$326,000	2020-2024	$316,198	$357,268	0.14	20	...
Haul Road Path	South 49th Place to UGB	Construct a new multi-use 12-foot-wide path	Springfield	**Exempt** 40 CFR 93.126, Air Quality – Bike and ped facilities	$3,600,000	2030-2034	$4,738,387	$5,353,837	3.32	21	...
Glenwood Area Willamette River Path (B)	Springfield Bridges to Seavey Loop Road	Construct a new multi-use path	Springfield	**Exempt** 40 CFR 93.126, Air Quality – Bike and ped facilities	$2,900,000	2025-2029	$3,276,670	$3,702,263	1.59	854	...
Fern Ridge West Connector	Royal Street to Fern Ridge Path	Construct a new multi-use path	Eugene, Lane County	**Exempt** 40 CFR 93.126, Air Quality – Bike and ped facilities	$125,000	2020-2024	$121,242	$136,989	0.8	426	
Spring Boulevard Connector	Central Boulevard to Spring Boulevard	Construct a new shared use path	Eugene	**Exempt** 40 CFR 93.126, Air Quality – Bike and ped facilities	$554,000	2025-2029	$625,957	$707,260	0.22	281	...
Avalon Street	Candlelight Drive to N Danebo	Construct a new multi-use path	Eugene	**Exempt** 40 CFR 93.126, Air Quality – Bike and ped facilities	$87,000	2030-2034	$114,511	$129,384	0.36	403	...
West Bank Path Completion	Formac to Owosso Bridge	Construct new concrete multi-use path for Riverbank trail system	Eugene	**Exempt** 40 CFR 93.126, Air Quality – Bike and ped facilities	$900,000	2036-2040	$872,939	$986,322	0.59	556	...
South Bank Path	Autzen Connector to Rail underpass	Construct a new multi-use path	Eugene	**Exempt** 40 CFR 93.126, Air Quality – Bike and ped facilities	$5,770,000	2036-2040	$5,596,508	$6,323,417	0.51	169	...

PROJECT CATEGORY: MULTI-USE PATHS WITHOUT ROAD PROJECT											
Name	**Geographic Limits**	**Description**	**Primary Jurisdiction**	**Air Quality Status**	**Est. Cost (2021)**	**Est. Year of Construction (5-Year Window)**	**Year of Construction Cost Range**		**Length**	**RTP #**	**Federal Functional Class**
E. 30th Avenue Path	Hilyard to Spring	Construct a new multi-use path	Eugene	**Exempt** 40 CFR 93.126, Air Quality – Bike and ped facilities	$2,749,000	2025-2029	$3,106,057	$3,509,490	1.16	209	Minor Arterial
W. 7th Avenue Path	W. 5th Avenue to Garfield Street	Construct a new multi-use path	Eugene	**Exempt** 40 CFR 93.126, Air Quality – Bike and ped facilities	$951,000	2025-2029	$1,074,522	$1,214,087	0.4	101	Other urban Freeways and Expressways
I-5 Off-Ramp Path	South Bank Path to Riverview Street	Construct a new multi-use path	Eugene	**Exempt** 40 CFR 93.126, Air Quality – Bike and ped facilities	$639,000	2025-2029	$721,997	$815,775	0.32	189	Other urban Freeways and Expressways
W. Amazon Drive Path	Martin Street to southern section of W. Amazon Drive	Construct a new multi-use path	Eugene	**Exempt** 40 CFR 93.126, Air Quality – Bike and ped facilities	$709,000	2030-2034	$687,682	$777,002	0.36	212	…
Division Avenue Sidewalk Path	Lone Oak Ave. to Beaver Street	Construct a new multi-use path	Eugene	**Exempt** 40 CFR 93.126, Air Quality – Bike and ped facilities	$701,000	2025-2029	$792,050	$894,926	0.54	512	Other urban Freeways and Expressways
Franklin Boulevard Sidewalk Path	Alder Street to Millrace Park Path	Construct a new multi-use path	Eugene	**Exempt** 40 CFR 93.126, Air Quality – Bike and ped facilities	$273,000	2025-2029	$308,459	$348,523	0.18	122	Other Urban Principle Arterial
West Bank Path Extension	Division Avenue (at Beaver Street) to Wilkes Drive	Construct new concrete multi-use path to extend Riverbank path system	Eugene	**Exempt** 40 CFR 93.126, Air Quality – Bike and ped facilities	$3,209,000	2025-2029	$3,112,512	$3,516,784	1.62	564	Urban Collector
Beaver-Wilkes Multi-Use Path	Beaver Street to Wilkes street along Eugene's UGB	Construct a separated multi-use path facility	Lane County	**Exempt** 40 CFR 93.126, Air Quality – Bike and ped facilities	$2,700,000	2025-2029	$3,050,692	$3,446,935	2	170	…
Bob Straub Parkway	57th Street to Jasper Road	Construct multi-use path on both sides of Bob Straub Parkway	Lane County	**Exempt** 40 CFR 93.126, Air Quality – Bike and ped facilities	$ 3,000,000	2030-2035	$3,948,655	$4,599,838	1.6	410	Minor Arterial
Berkley Park Path	Wilson Street to Fern Ridge Path	Construct a new multi-use path	Eugene	**Exempt** 40 CFR 93.126, Air Quality – Bike and ped facilities	$521,825	2025-2029	$589,603	$666,184	0.13	TBD**	…
River Road/Santa Clara Pedestrian & Bicycle Bridge	Grove Street to Ruby Avenue	Construct a new pedestrian and bicycle bridge	Eugene	**Exempt** 40 CFR 93.126, Air Quality – Bike and ped facilities	$12,000,000	2025-2029	$13,558,633	$15,319,711	0.20	TBD**	…
North Delta Path	East side of north Delta Road from Stapp Drive to Ayres Road	Construct a new multi-use path	Eugene	**Exempt** 40 CFR 93.126, Air Quality – Bike and ped facilities	$600,000	2020-2024	$581,959	$657,548	0.44	TBD**	…
				Project Category Subtotal	**$70,094,825**		**$77,357,420**	**$87,543,378**			

***Note: These projects were added after the maps and the analysis were complete. However, these projects will be included in future mapping and analysis.*

TABLE 34. PROJECT CATEGORY: MULTI-USE PATHS WITH ROAD PROJECT

PROJECT CATEGORY: MULTI-USE PATHS WITH ROAD PROJECT											
Name	**Geographic Limits**	**Description**	**Primary Jurisdiction**	**Air Quality Status**	**Est. Cost (2021)**	**Est. Year of Construction (5-Year Window)**	**Year of Construction Cost Range**		**Length**	**RTP #**	**Federal Functional Class**
Beaver Street –Hunsaker Lane	Division Ave to River Road	Construct consistent with Beaver-Hunsaker Corridor Study recommendations	Lane County, Eugene	**Exempt** 40 CFR 93.126, Air Quality – Bike and ped facilities	$9,300,000	2020-2024	$9,020,369	$10,191,989	1.5	173	…
				Project Category Subtotal	**$9,300,000**		**$9,020,369**	**$10,191,989**			

TABLE 35. PROJECT CATEGORY: ON-STREET LANES OR ROUTES WITH ROAD PROJECT*

PROJECT CATEGORY: ON-STREET LANES OR ROUTES WITH ROAD PROJECT*											
Name	**Geographic Limits**	**Description: Lane or Route Component of Road Project**	**Primary Jurisdiction**	**Air Quality Status**	**Est. Cost for Entire Project (2021)**	**Est. Year of Construction (5-Year Window)**	**Year of Construction Cost Range**		**Length**	**RTP #***	**Federal Functional Class**
Aspen Street	Menlo Loop to West D Street	Stripe bicycle lanes on the roadway	Lane County, Springfield	See project 809					0.58	809	Minor Collector
42nd Street	Marcola Road to Railroad Tracks	Striped bicycle lane on the roadway	Springfield	See project 713					1.1	713	Minor Arterial
Extend South 48th St to Daisy St	Daisy St and South 48th St	Extend S. 48th St with a two-lane cross-section with a parallel multi-use 12-foot wide path and roundabout intersection treatment at Daisy St and 48th St	Springfield	See project 901					0.3	901	…
28th Street	Centennial Boulevard to Main Street	Stripe bicycle lanes on the roadway	Springfield	See project 909					0.7	909	Urban Collector
35th Street	Olympic Street to Commercial Avenue	Stripe bicycle lanes on the roadway	Springfield	See project 918					0.57	918	Urban Collector
Commercial Street	35th Street to 42nd Street	Stripe bicycle lanes on the roadway	Springfield	See project 933					0.7	933	Urban Collector
S. 28th Street	Main St to South F St	Stripe bicycle lanes on the roadway	Springfield	See project 945					0.51	945	Urban Collector
21st Street	D Street to Main Street	Stripe bicycle lanes on the roadway	Springfield	See project 962					0.2	962	Minor Collector
Green Hill Road	Barger Drive to West 11th Avenue	Stripe bicycle lanes on the roadway	Lane County, Eugene	See project 454					2.27	454	Minor Arterial
				Project Category Subtotal	**NA (part of larger project)**		**NA (part of larger project)**	**NA (part of larger project)**			

Projects on this list are a lane or route component of roadway projects listed in other categories. For project identification and consistency, projects on this list are associated with the same project number of which they are a component.

TABLE 36. PROJECT CATEGORY: ON-STREET LANES OR ROUTES WITHOUT ROAD PROJECT

PROJECT CATEGORY: ON-STREET LANES OR ROUTES WITHOUT ROAD PROJECT											
Name	**Geographic Limits**	**Description**	**Primary Jurisdiction**	**Air Quality Status**	**Est. Cost (2021)**	**Est. Year of Construction (5-Year Window)**	**Year of Construction Cost Range**		**Length**	**RTP #**	**Federal Functional Class**
66th Street	Thurston Road to Main Street	Stripe bicycle lanes on the roadway	Springfield	**Exempt** 40 CFR 93.126, Air Quality – Bike and ped facilities	$25,000	2020-2024	$24,248	$27,398	0.55	12	Minor Collector
S. 67th Street	Ivy Street to Main Street	Add shared-use signing and striping and construct sidewalks to fill gaps	Springfield	**Exempt** 40 CFR 93.126, Air Quality – Bike and ped facilities	$160,000	2025-2029	$180,782	$204,263	0.3	92	Minor Collector
S. 70th Street	Main Street to Ivy Street	Add shared-use signing and striping	Springfield	**Exempt** 40 CFR 93.126, Air Quality – Bike and ped facilities	$50,000	2025-2029	$56,494	$63,832	0.6	94	Minor Collector
Ivy Street	S. 67th Street to S. 70th Street	Add shared-use signing and striping	Springfield	**Exempt** 40 CFR 93.126, Air Quality – Bike and ped facilities	$20,000	2030-2034	$26,324	$29,744	0.3	99	Minor Collector
Yolanda Avenue	23rd Street to 31st Street	Stripe bicycle lanes on the roadway	Springfield, Lane County	**Exempt** 40 CFR 93.126, Air Quality – Bike and ped facilities	$20,000	2016-2019	$17,169	$18,815	0.8	784	Minor Collector

PROJECT CATEGORY: ON-STREET LANES OR ROUTES WITHOUT ROAD PROJECT											
Name	**Geographic Limits**	**Description**	**Primary Jurisdiction**	**Air Quality Status**	**Est. Cost (2021)**	**Est. Year of Construction (5-Year Window)**	**Year of Construction Cost Range**		**Length**	**RTP #**	**Federal Functional Class**
5th Street	Centennial Boulevard to A Street	Add bicycle facility signing and striping	Springfield	**Exempt** 40 CFR 93.126, Air Quality – Bike and ped facilities	$50,000	2020-2024	$48,497	$54,796	0.35	806	Urban Collector
Mill Street	Centennial Boulevard to Main Street	Restripe for bicycle facilities with signing	Springfield	**Exempt** 40 CFR 93.126, Air Quality – Bike and ped facilities	$90,000	2020-2024	$87,294	$98,632	0.99	837	Urban Collector
Nugget, 15th, 17th, 19th in Glenwood	Glenwood	Stripe bicycle lanes on the roadway	Lane County	**Exempt** 40 CFR 93.126, Air Quality – Bike and ped facilities	$160,000	2020-2024	$155,189	$175,346	1.58	845	Minor Collector
Rainbow Drive	Centennial Boulevard to West D Street	Restripe for bicycle facilities with signing	Springfield	**Exempt** 40 CFR 93.126, Air Quality – Bike and ped facilities	$60,000	2020-2024	$58,196	$65,755	0.55	848	Minor Collector
G Street	5th Street to 28th Street	Stripe bicycle lanes on the roadway	Springfield	**Exempt** 40 CFR 93.126, Air Quality – Bike and ped facilities	$75,000	2020-2024	$72,745	$82,193	1.6	899	Major Collector
36th Street	Commercial Street to Main Street	Stripe bicycle lanes on the roadway	Springfield	**Exempt** 40 CFR 93.126, Air Quality – Bike and ped facilities	$3,000,000	2020-2024	$2,909,796	$3,287,738	0.3	939	Minor Collector
48th/G/52nd	High Banks Road to Aster Street	Construct a new multi-use 12-foot wide path from High Banks Road to Aster St.	Springfield	**Exempt** 40 CFR 93.126, Air Quality – Bike and ped facilities	$1,600,000	2025-2029	$1,807,818	$2,042,628	1.2	6	Urban Collector
Virginia Ave / Daisy Street	South 32nd St to Bob Straub Parkway	Add bicycle facility signing and striping	Springfield	**Exempt** 40 CFR 93.126, Air Quality – Bike and ped facilities	$130,000	2020-2024	$126,091	$142,469	2.58	903	Major Collector
Pioneer Parkway	Pioneer Parkway at D, E, and F Streets	Add crosswalks on Pioneer Parkway with signage	Springfield	**Exempt** 40 CFR 93.126, Safety – Pavement marking; Air Quality – Bike and ped facilities	$80,000	2020-2024	$77,595	$87,673	...	299	Major Collector
D, E, or F Streets	5th Street to 28th Street	Add bicycle facility signing and striping	Springfield	**Exempt** 40 CFR 93.126, Air Quality – Bike and ped facilities	$190,000	2020-2024	$184,287	$208,223	2.52	805	Major Collector
Hartman Lane/Don Street	South of Harlow Road to OR 126	Add signing and striping for bicycle facilities and construct sidewalks to fill gaps	Springfield	**Exempt** 40 CFR 93.126, Air Quality – Bike and ped facilities	$180,000	2020-2024	$174,588	$197,264	0.55	714	...
Oakdale Street/Pheasant Street/et al.	Game Farm Road to Gateway Road	Add signing and striping for bicycle facilities	Springfield	**Exempt** 40 CFR 93.126, Air Quality – Bike and ped facilities	$80,000	2016-2019	$68,675	$75,261	1.14	708	Minor Arterial
West D	Mill Street to D Street Path	Add bicycle facility signing and striping	Springfield	**Exempt** 40 CFR 93.126, Air Quality – Bike and ped facilities	$10,000	2020-2024	$9,699	$10,959	0.36	817	Minor Collector
West D	Aspen Street to D Street Path	Add bicycle facility signing and striping; construct sidewalks to fill gaps	Springfield	**Exempt** 40 CFR 93.126, Air Quality – Bike and ped facilities	$190,000	2025-2029	$214,678	$242,562	0.49	816	Minor Collector
A Street	5th Street to 10th Street	Restripe for bicycle facilities with signing	Springfield	**Exempt** 40 CFR 93.126, Air Quality – Bike and ped facilities	$40,000	2020-2024	$38,797	$43,837	0.35	822	Major Collector
33rd Street	V Street to EWEB Path	Add shared-use signing and striping	Springfield	**Exempt** 40 CFR 93.126, Air Quality – Bike and ped facilities	$10,000	2025-2029	$11,299	$12,766	0.18	724	...
Mountaingate Drive	Mountaingate Entrance to Dogwood Street	Add shared-use signing and striping, construct sidewalks and drainage improvements to fill gaps	Springfield	**Exempt** 40 CFR 93.126, Air Quality – Bike and ped facilities	$260,000	2030-2024	$342,217	$284,937	0.77	27	Minor Collector
Hayden BridgeWay/Grovedale Drive	Hayden Bridge Way/3rd Street, Hayden Bridge	Add a crosswalk and RRFB	Lane County	**Exempt** 40 CFR 93.126, Safety – Pavement marking; Air Quality – Bike and ped facilities	$260,000	2025-2029	$293,770	$331,927	0.01	721	Major Collector
EWEB Path	Path crossings of 2nd Street, 9th Street, 11th Street, Rose Blossom Drive, Debra Street, 15th Street, 33rd Street and 35th Street	Improve path crossings to emphasize path priority and improve safety	Springfield	**Exempt** 40 CFR 93.126, Safety – Pavement marking; Air Quality – Bike and ped facilities	$50,000	2020-2024	$48,497	$54,796	0.76	720	...

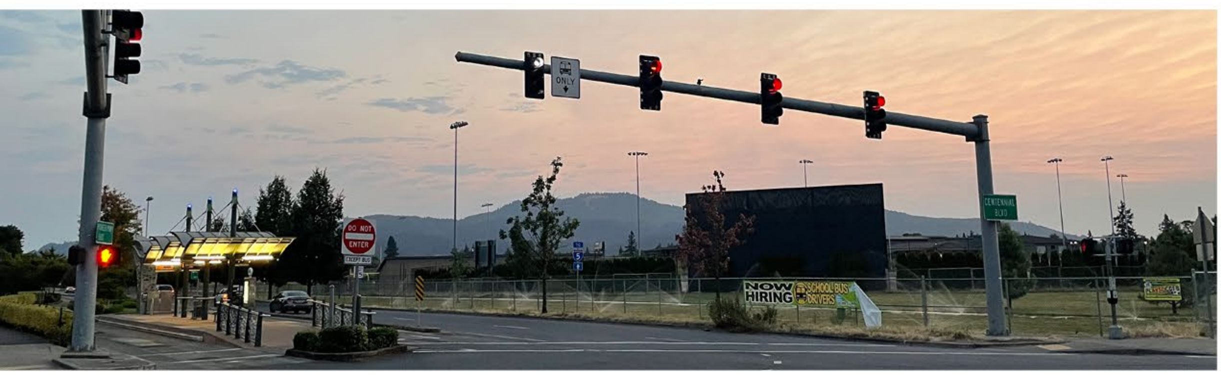
PROJECT CATEGORY: ON-STREET LANES OR ROUTES WITHOUT ROAD PROJECT

Name	Geographic Limits	Description	Primary Jurisdiction	Air Quality Status	Est. Cost (2021)	Est. Year of Construction (5-Year Window)	Year of Construction Cost Range		Length	RTP #	Federal Functional Class
2nd Street/Q Street	2nd Street/Q Street	Add a crosswalk with RRFB	Springfield	**Exempt** 40 CFR 93.126, Safety – Pavement marking; Air Quality – Bike and ped facilities	$90,000	2020-2024	$87,294	$98,632	0	719	Urban Collector
5th Street	At Centennial Boulevard	Add bicycle facilities through the intersection	Springfield	**Exempt** 40 CFR 93.126, Air Quality – Bike and ped facilities	$560,000	2020-2024	$543,162	$613,711	0	820	Major Collector
5th Street	@ D Street	Add bicycle facility signing and striping to improve visibility	Springfield	**Exempt** 40 CFR 93.126, Air Quality – Bike and ped facilities	$10,000	2025-2029	$11,299	$12,766	0	821	Major Collector
Main Street	@ 38th Street	Add a mid-block crosswalk with a RRFB	Springfield	**Exempt** 40 CFR 93.126, Safety – Pavement marking; Air Quality – Bike and ped facilities	$90,000	2030-2034	$118,460	$133,846	0	923	Other Urban Fwys & Expressways
Bob Straub Parkway	@ Daisy Street	Add a pedestrian/bicycle signal and crossing, coordinate with Springfield TSP's R-44	Lane County, Springfield	**Exempt** 40 CFR 93.126, Safety – Pavement marking; Air Quality – Bike and ped facilities	$90,000	2020-2024	$87,294	$98,632	0	24	Minor Arterial
Thurston Road	@ 66th Street	Add crosswalk with RRFB	Springfield	**Exempt** 40 CFR 93.126, Safety – Pavement marking; Air Quality – Bike and ped facilities	$90,000	2025-2029	$101,690	$114,898	0	28	Urban Collector
Thurston Road	69th Street	Add crosswalk with RRFB	Springfield	**Exempt** 40 CFR 93.126, Safety – Pavement marking; Air Quality – Bike and ped facilities	$90,000	2025-2029	$101,690	$114,898	0	29	Urban Collector
Citywide	Citywide	Install mid-block crossings City-wide with RRFBs	Springfield	**Exempt** 40 CFR 93.126, Safety – Pavement marking; Air Quality – Bike and ped facilities	$4,400,000	2025-2029	$4,971,499	$5,617,227	0	TBD**	...
Oakway Road	Coburg Road to Cal Young Road	Protected Bike Lane	Eugene	**Exempt** 40 CFR 93.126, Safety – Pavement marking; Air Quality – Bike and ped facilities	$2,184,000	2025-2029	$2,118,332	$2,393,474	0.96	604	Minor Arterial
Cal Young Road	Willakenzie Road to Oakway Road	Protected Bike Lane	Eugene	**Exempt** 40 CFR 93.126, Safety – Pavement marking; Air Quality – Bike and ped facilities	$508,000	2025-2029	$492,726	$556,724	0.22	605	Minor Arterial
Willakenzie Road	I-5 Path to Cal Young Road	Protected Bike Lane	Eugene	**Exempt** 40 CFR 93.126, Safety – Pavement marking; Air Quality – Bike and ped facilities	$3,141,000	2025-2029	$3,046,557	$3,442,262	1.38	607	Urban Collector
River Road	Division Avenue to Northwest Expressway	Protected Bike Lane	Eugene	**Exempt** 40 CFR 93.126, Safety – Pavement marking; Air Quality – Bike and ped facilities	$4,441,000	2025-2029	$4,307,468	$4,866,949	2.49	565	Urban Principal Arterial
Garfield Street	Roosevelt Boulevard to W. 6th Avenue	Stripe bicycle lanes on the roadway	Eugene	**Exempt** 40 CFR 93.126, Safety – Pavement marking; Air Quality – Bike and ped facilities	$93,000	2020-2024	$90,204	$101,920	0.68	145	Urban Collector
Lincoln Street	W 5th Ave to W 13th Ave	Protected Bike Lane	Eugene	**Exempt** 40 CFR 93.126, Safety – Pavement marking; Air Quality – Bike and ped facilities	$1,419,000	2020-2024	$1,376,334	$1,555,100	0.61	161	...
McKinley Street	5th Avenue to 7th Avenue	Stripe bicycle lanes on the roadway	Eugene	**Exempt** 40 CFR 93.126, Safety – Pavement marking; Air Quality – Bike and ped facilities	$26,000	2020-2024	$25,218	$28,494	0.19	163	Urban Collector

PROJECT CATEGORY: ON-STREET LANES OR ROUTES WITHOUT ROAD PROJECT											
Name	**Geographic Limits**	**Description**	**Primary Jurisdiction**	**Air Quality Status**	**Est. Cost (2021)**	**Est. Year of Construction (5-Year Window)**	**Year of Construction Cost Range**		**Length**	**RTP #**	**Federal Functional Class**
Mill Street	10th Avenue to 15th Avenue	Stripe bicycle lanes on the roadway	Eugene	**Exempt** 40 CFR 93.126, Safety – Pavement marking; Air Quality – Bike and ped facilities	$91,000	2020-2024	$88,264	$99,728	0.76	166	…
Polk Street	5th Avenue to 24th Avenue	Stripe bicycle lanes on the roadway	Eugene	**Exempt** 40 CFR 93.126, Safety – Pavement marking; Air Quality – Bike and ped facilities	$250,000	2020-2024	$242,483	$273,978	1.0	175	Urban Collector
High Street	E 6th Avenue to E 19th Avenue	Protected Bike Lane	Eugene	**Exempt** 40 CFR 93.126, Safety – Pavement marking; Air Quality – Bike and ped facilities	$2,267,000	2020-2024	$2,198,836	$2,484,434	0.99	187	Minor Arterial
High Street	E 4th Avenue to E 6th Avenue	Bike Lane	Eugene	**Exempt** 40 CFR 93.126, Safety – Pavement marking; Air Quality – Bike and ped facilities	$16,500	2020-2024	$16,004	$18,083	0.15	186	Minor Arterial
8th Avenue	Lincoln St to E Broadway	Protected Bike Lane	Eugene	**Exempt** 40 CFR 93.126, Air Quality – Bike and ped facilities	$1,221,000	2020-2024	$1,184,287	$1,338,110	0.53	162	Urban Collector
E 24th Avenue	Willamette Street to Alder Street	Protected Bike Lane	Eugene	**Exempt** 40 CFR 93.126, Air Quality – Bike and ped facilities	$1,189,000	2020-2024	$1,153,249	$1,303,040	0.52	201	Minor Arterial
Prairie Road	Maxwell Road to Highway 99	Stripe bicycle lanes on the roadway	Eugene	**Exempt** 40 CFR 93.126, Safety – Pavement marking; Air Quality – Bike and ped facilities	$19,000	2020-2024	$18,429	$20,822	0.15	495	Minor Arterial
Gilham Road	Ashbury to Ayers Road	Stripe bicycle lanes on the roadway	Eugene	**Exempt** 40 CFR 93.126, Safety – Pavement marking; Air Quality – Bike and ped facilities	$83,000	2020-2024	$80,504	$90,961	0.61	662	Minor Collector
Valley River Way (A)	Valley River Drive to Valley River Connector	Sidewalk Path	Eugene	**Exempt** 40 CFR 93.126, Air Quality – Bike and ped facilities	$465,000	2025-2029	$451,018	$509,599	0.23	694	Urban Collector
Franklin Blvd.	Brooklyn to Willamette River	Stripe bicycle lanes on the roadway	Springfield	**Exempt** 40 CFR 93.126, Air Quality – Bike and ped facilities	$34,000	2020-2024	$32,978	$37,261	0.25	807	Other Urban Principal Arterial
McVay Highway (OR99)	I-5 to 30th Ave	Stripe bicycle lanes on the roadway	ODOT	**Exempt** 40 CFR 93.126, Air Quality – Bike and ped facilities	$96,000	2020-2024	$93,113	$105,208	0.71	834	Urban Minor Arterial
Highway 99	Prairie Rd to Barger Dr	Stripe bicycle lanes on the roadway	Eugene	**Exempt** 40 CFR 93.126, Air Quality – Bike and ped facilities	$44,000	2020-2024	$42,677	$48,220	0.33	TBD**	Other Freeways and Expressways
				Project Category Subtotal	**$31,797,500**		**$32,055,678**	**$36,114,617**			

***Note: These projects were added after the maps and the analysis were complete. However, these projects will be included in future mapping and analysis.*

CHAPTER 6: MEASURING PLAN OUTCOMES



This chapter reports on the comprehensive evaluation of Plan performance using the federal and regional performance measures, introduced in Chapter 2. Evaluating the performance of the region's transportation system is necessary to understand whether the region will achieve the goals of this RTP and provide the best return on public investments.

PERFORMANCE BASED PLANNING AND PROGRAMMING

Performance measures serve as the link between RTP goals and Plan implementation. The cyclical performance measurement process includes Plan development, evaluation, implementation, and monitoring. Evaluation of the planned regional transportation system projects and programs against a set of outcomes-focused performance measures provides valuable information to the public and decision-makers on whether the RTP investment decisions are helping achieve the desired outcomes. See Chapter 2 for additional discussion of performance measures; the federal performance measure and targets; the state-set targets for federal performance measures (supported by CLMPO); and the list of regional performance measures used for Plan evaluation, including the goals that they support.

As detailed in Chapter 2, the CLMPO uses performance-based planning and programming as an effective way to understand the consequences and benefits of investment and programming decisions. As part of this process, the RTP's goals, objectives, and performance measures provide a strategic direction and help guide regional transportation planning and decision-making.

SYSTEM PERFORMANCE EVALUATION

The system evaluation process will be used during subsequent RTP updates, which under federal law occur every four years (based on air quality designation as an attainment area;[60] see Appendix I for information on the region's air quality status). For the current and future updates, the CLMPO will review its goals and objectives for the regional transportation system and develop and refine an investment strategy that includes regional infrastructure projects and programs.

The RTP system measures changes between current conditions (2020) and the 2045 planning horizon for the transportation projects identified in the fiscally constrained project list (Chapter 5). It is important to note that there are some limitations to evaluating the RTP within the performance measures framework. While it does aid significantly in monitoring and evaluating system performance, there are some nuances that are not captured in the future year analysis because the data to analyze them are not available; most specifically in the TO programming, TDM efforts, and ITS related strategies.

PERFORMANCE METHODOLOGY AND MODELING

The performance measures included in this Plan were evaluated using a combination of tools and methods to provide a more robust analysis. To measure the effectiveness of the project list identified in Chapter 5, each performance measure is reported for the current year (2020) and the future year (2045), which assumes complete build out of the fiscally constrained project list. These

[60] National Ambient Air Quality Standard (NAAQS)

results will help the CLMPO understand how the transportation system is serving the needs of the region, and where additional attention should be focused in future Plan and project list updates.

A new regional travel demand model and land use allocation model were developed for this RTP. Both are consistent with the local partners' comprehensive land use plans and transportation system plans to model the future conditions of the system. Other datasets, including Streetlight and Regional Integrated Transportation Information System (RITIS) were used to supplement evaluation of existing system performance and conditions. Streetlight and RITIS include sampled and aggregated real-world data about travel in the region. These sampled data are available through various technology sources including in-dash navigation systems and mobile phones.

A pedestrian crossing with Rectangular Rapid Flashing Beacons.

Regional Travel Model

The newly developed regional travel model is a four-step travel model and has a framework modeled after the Portland Metro MPO's Kate model.

The CLMPO travel demand model is built on a EMME software platform and uses the typical four-step modeling process to determine the total trips, which route and mode they are likely to take:

- Trip Generation – Households are the primary producer of trips and employment sites are the primary attractors. The productions and attractions are converted to vehicle trips that enter and leave each zone.
- Trip Distribution – Determining in which zone a trip might end, the trip distribution examines the attractiveness of zones based on proximity and travel time. The higher a zone's attractiveness, the larger the gravitational pull.
- Mode Choice – Several modes of transportation are offered within the travel demand model. The mode choice step accounts for whether people drive alone, carpool, walk, bike or use transit.
- Assignment – During the trip assignment step, it is determined which path each respective trip will take from its zone of origin to its destination.

The new model includes the following enhancements relative to prior model generations:

- Household survey data update
- New land use allocation method (UrbanSim)
- University model (including group quarters)
- Bike model update

These enhancements allow the model to better capture existing travel trends related to where trips begin/end and the mode of travel. In general, the travel demand model replicates roadway networks, captures driver and transit rider travel behavior, and uses algorithms calibrated to local conditions to analyze future roadway infrastructure needs. The travel demand model uses a supply and demand principle and requires input from multiple datasets:

- The supply side uses information on the existing roadway network and transit routes, which determine capacity, trip volume, and travel speed. Roadway information needed includes functional classification, number of lanes, and type of intersection control. Transit information needed includes routes, service hours, and service frequencies.
- The demand side is represented through various socioeconomic datasets about the region's population and employment. Population information needed includes the number of people, location of households, and income. Employment information needed includes the number of workers by employment site and type, and major sector.

CLMPO staff developed population and employment data for both the 2020 base and the 2045 forecast year. All socioeconomic and land use data are represented in the models in transportation analysis zones (TAZs).[61] Interaction among the region's 666 TAZs occurs as each zone produces and attracts person trips. The population, household, and employment information assigned to each zone determines the number of trips that are produced and/or attracted. The generated trips are for various purposes, such as work, school, and more, and the number per household and breakout by purpose is calibrated throughout the CLMPO region.

Once the travel demand model produces ridership and traffic volumes, internal model rules are calibrated by adjusting factors and components until it replicates known travel patterns. During the travel demand model validation, modeled transit usage and traffic volumes are compared to actual ridership and traffic counts. Once the modeled results match the traffic counts, within an acceptable range of error, the model is ready for use. See Appendix K for a detailed "model cookbook" documenting the CLMPO travel demand model.

Land Use Model

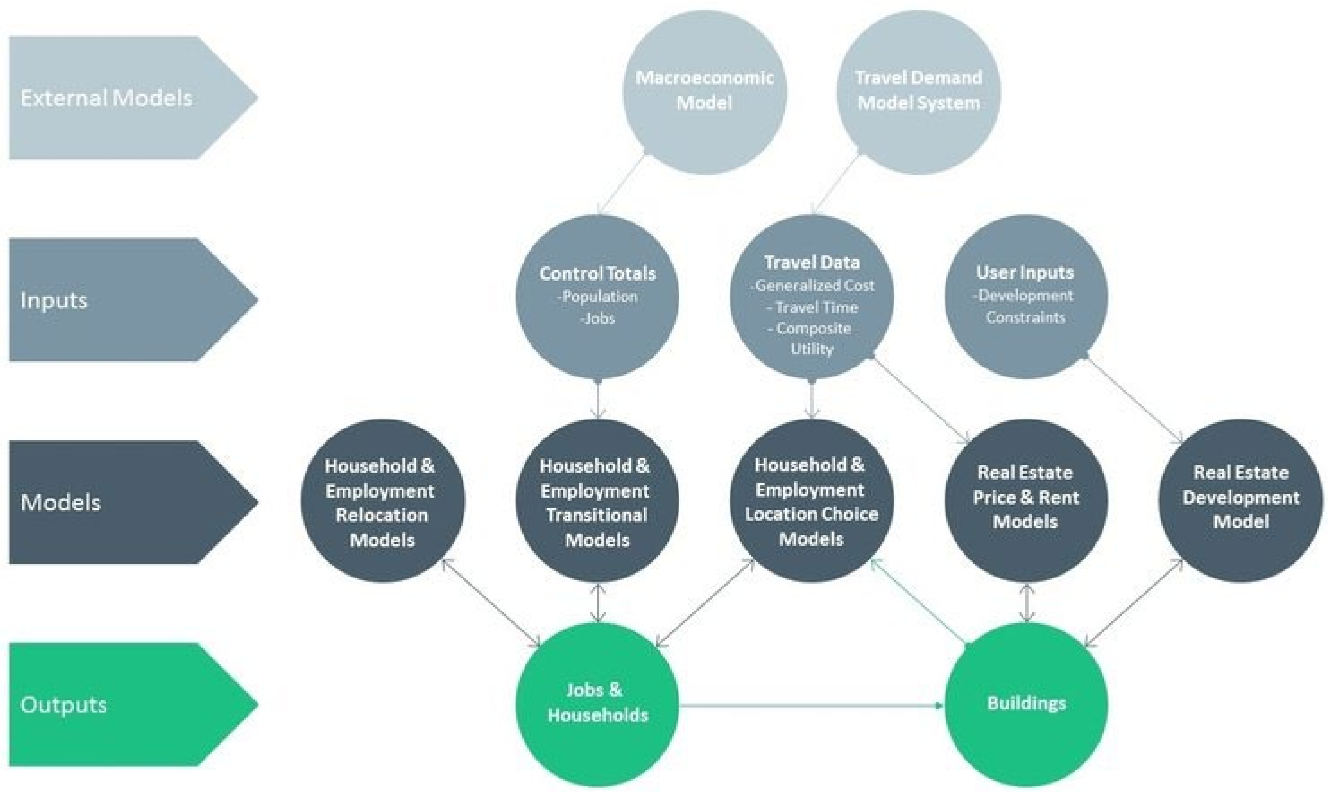
The newly developed land use allocation model is created by UrbanSim. UrbanSim simulates real estate markets by representing the choices of individual households and businesses (or jobs) making location choices. Locations and buildings can be represented at full detail, meaning individual buildings and individual parcels, or can be aggregated into building types and Census blocks or zones to represent locations.

[61] Defined units of geography, or areas, used in travel demand modeling to represent spatial distribution of trip origins and destinations. They also contain population, employment, and other spatial attributes important to impact travel demand.

UrbanSim models are built using local data for each metropolitan area, and the parameters for each model are estimated using advanced statistical methods to ensure that the model actually reflects local conditions. The model structure is such that households and businesses (jobs) move and make location choices as the regional economy grows, and real estate developers add housing and nonresidential buildings in response to changes in demand and subject to local development constraints. Price and rent models predict the pricing outcomes in the real estate market and adjust to reconcile shifts in demand and supply. Figure 46 uses a simplified flowchart to illustrate this process.

The land use allocation model supplies the base and future year population, household, and employment information to the travel model. See Appendix L for documentation on the CLMPO land use allocation model.

FIGURE 46. URBANSIM MODEL STRUCTURE ILLUSTRATION



FUTURE GROWTH TRENDS

Population and employment are forecasted to grow through 2045, placing increased demands on the region's transportation system. These changes in travel demands may require evolving system management, more choices for getting around, and targeted improvements to make the system safer and more efficient. These decisions ultimately influence the modes people have as an option and the routes people may take to get to their destinations. Forecasting the scale and location of future growth is critical to evaluating the transportation system.

Oregon land use planning regulations require each city to have an urban growth boundary (UGB) to foster compact urban growth and preservation of agricultural and forest lands. The RTP reflects and supports the land uses and growth allocations within the UGBs of the cities of Eugene, Springfield, Coburg, and a small additional portion of Lane County adjacent to these urban areas.

The current estimates and 2045 future year projections of population and employment used in the system performance analysis for the CLMPO area are summarized in the following sections. These assumptions about regional population and employment are incorporated into the regional travel demand model to forecast travel growth and conditions for the region.

Population Growth

Portland State University's PRC Certified Population Estimates serve as consistent statewide population forecasts, including the baseline and 2045 forecasted population for Lane County, Eugene, Springfield, and Coburg. Since the CLMPO boundary extends into unincorporated Lane County but does not cover the entire County, the current and forecasted population of this area was adjusted to include only the number of people inside the MPO area.

As shown in Table 37, CLMPO is expected to continue growing through 2045. As of 2016, CLMPO's population was 267,981. By 2045, the population is forecasted to grow to 320,684, a 20 percent increase. Coburg and Eugene are expected to have the largest population growth percentagewise, with a 53 percent and 24 percent increase, respectively.

TABLE 37. REGIONAL POPULATION GROWTH FORECAST

JURISDICTION	2016 ESTIMATE	2045 FORECAST	PERCENT CHANGE
LANE COUNTY UNINCORPORATED*	8,121	8,705	7%
COBURG	1,104	1,694	53%
EUGENE	189,135	233,625	24%
SPRINGFIELD	69,621	76,660	10%
CLMPO TOTAL	267,981	320,684	20%

Source: Population Research Center, Portland State University, 2015, 2019, American Community Survey 5-Year Estimates; LCOG 2020.

** Unincorporated Lane County area IS LOCATED inside the MPO Modeling area. THE MPO MODELING AREA IS SLIGHTLY larger THAN the MPO area, AND INCLUDES THE UNINCORPORATED LANE COUNTY AREA, COBURG, EUGENE, AND SPRINGFIELD.*

The densest areas in 2045 will likely still be within Eugene's urban core and the area around the University of Oregon campus. Other areas with high population densities will include the western area and along Highway 126 in Springfield and northern and western Eugene as seen in Figure 47. The projected areas of growth indicate where additional density is projected to occur relative to existing development.

Employment Growth

By 2045, the region is expected to have 177,263 jobs as projected by the Oregon Employment Department and LCOG to capture job growth specific to the MPO boundary. This is a 39 percent increase from the current employment of 127,788 jobs, which outpaces the projected population increase of 17 percent. The urban areas have projected employment growth of approximately 40 percent, with growth in the unincorporated Lane County area approximately 33 percent. Regional employment growth forecasts are summarized in Table 38.

Most of these jobs are projected to be in Eugene's urban core near the University of Oregon. A high density of jobs is also concentrated in north Springfield between I-5 and the McKenzie River, and along the north side of the Willamette River in Eugene. In addition, employment is expected to grow significantly from 2020 around Eugene Airport between Highway 99 & Clear Lake Road as well as Highway 126 and S A Street between Randy Papé Beltline and 42nd Street (Figure 48).

TABLE 38. REGIONAL EMPLOYMENT GROWTH FORECAST (EMPLOYEES)

JURISDICTION	2016 ESTIMATE	2045 FORECAST	PERCENT CHANGE
LANE COUNTY UNINCORPORATED*	5,032	6,716	33%
COBURG	1,533	2,121	38%
EUGENE	89,184	122,855	38%
SPRINGFIELD	32,039	45,571	42%
CLMPO	127,788	177,263	39%

Source: OED 2018; LCOG 2020.

**Unincorporated Lane County area is located inside the MPO Modeling area. The MPO modeling area is slightly larger than the MPO area, and includes the Unincorporated Lane County Area, Coburg, Eugene, and Springfield.*

FIGURE 47. FORECASTED 2045 HOUSEHOLD HIGH DENSITY LOCATIONS AND GROWTH AREAS

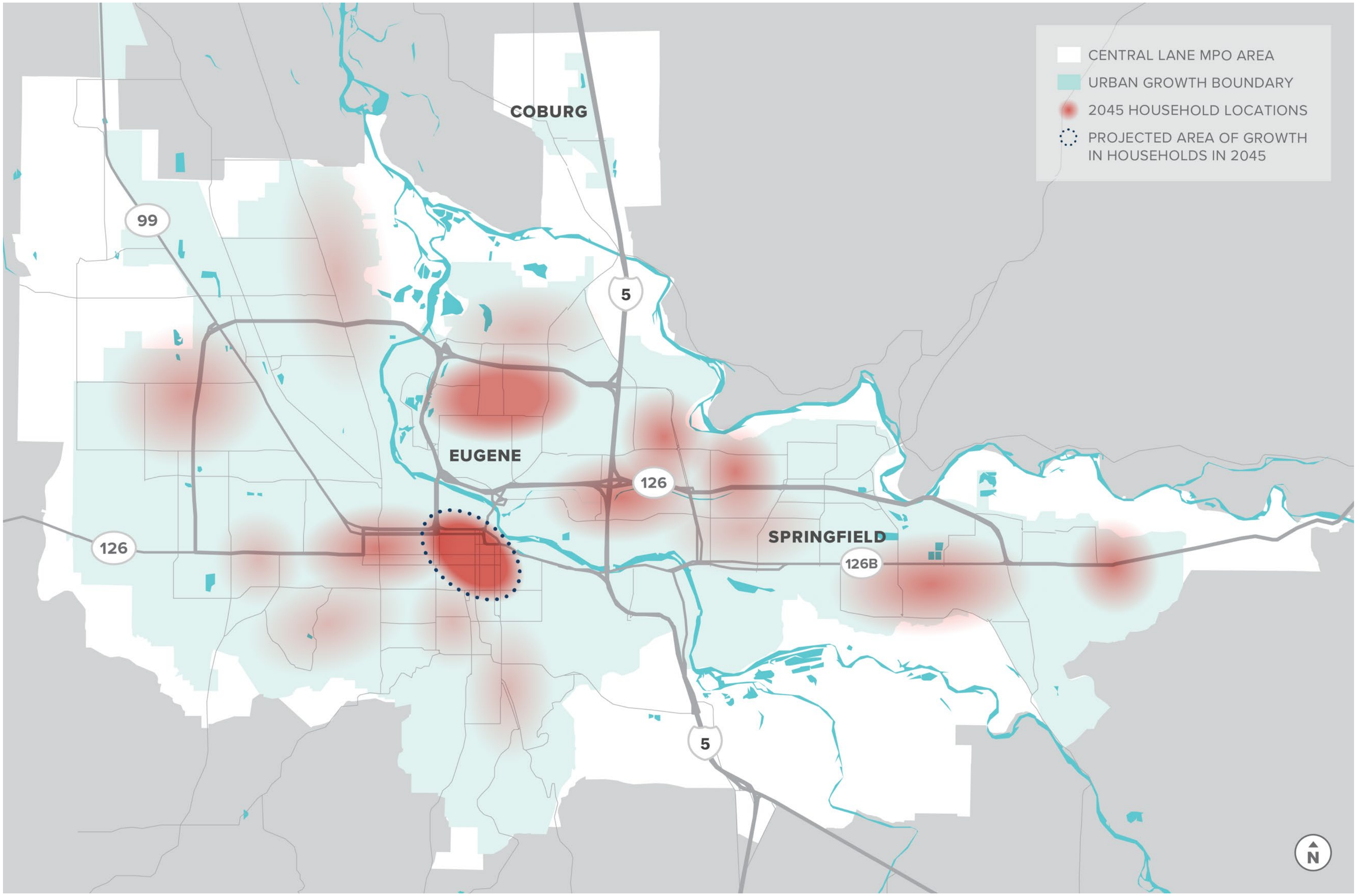
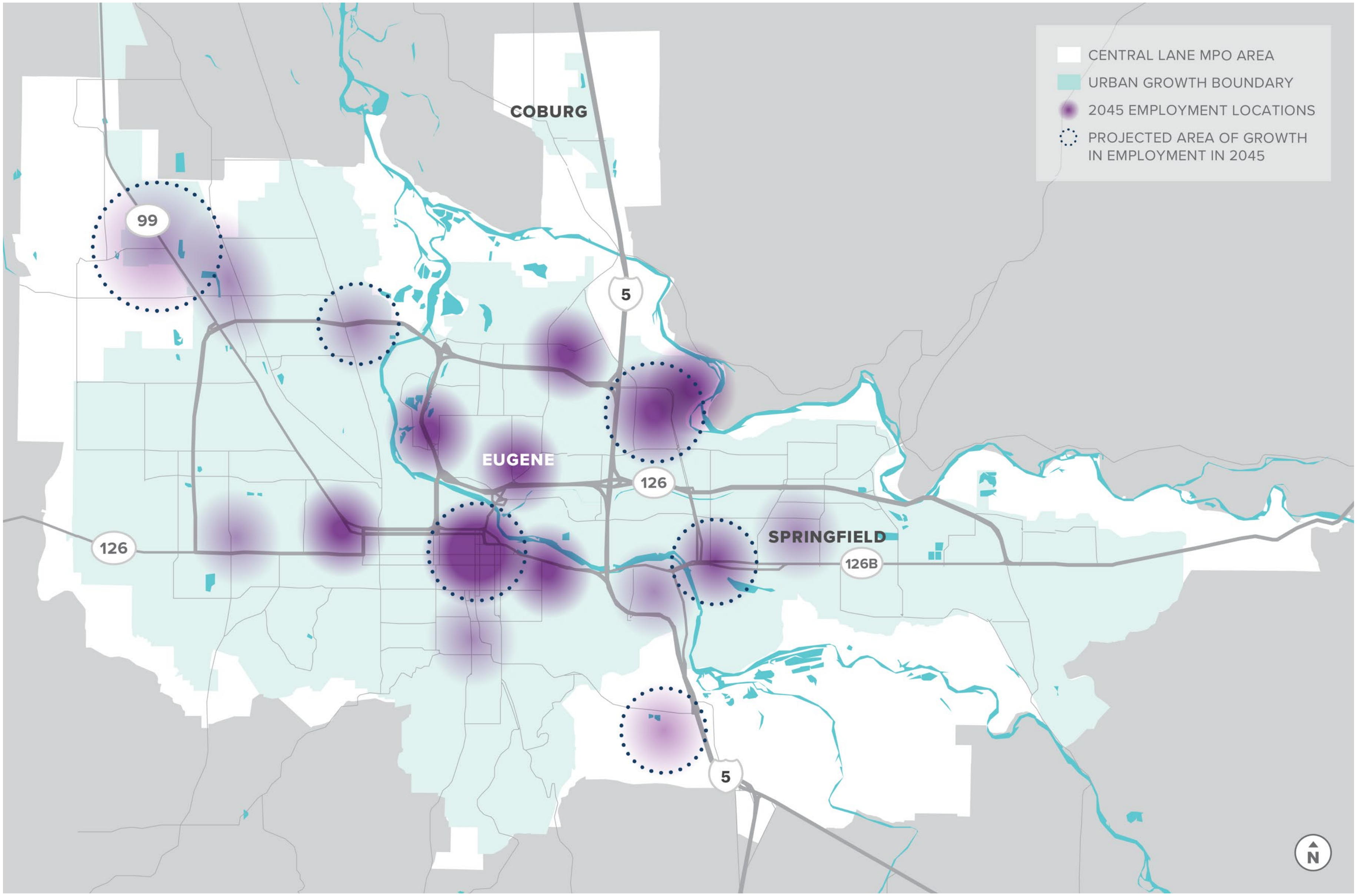


FIGURE 48. 2045 FORECASTED EMPLOYMENT HIGH DENSITY LOCATIONS AND GROWTH AREAS



FEDERAL PERFORMANCE MEASURE EVALUATION

MAP-21 and the FAST Act required USDOT to establish transportation performance measures related to safety, pavement and bridge condition, system performance, and CMAQ funded projects. Refer to Chapter 2 for an overview of these performance measures.

Table 39 reports state and CLMPO performance against federal performance measures and targets. At a statewide level, each target is met by the current baseline measurement. At the CLMPO level, the data used to establish each performance measure baseline have a lot of variability. This is evidenced in performance measures 4, 5 and 6. CLMPO's current baseline status does not meet the target. By supporting the state targets, the MPO will work with ODOT and local jurisdictions as part of a statewide effort to plan for and fund projects that try to achieve the targets. Additional years of data to come in the future may also find that the CLMPO will meet these targets.

Pedestrians cross the street at a pedestrian crossing.

TABLE 39. FEDERAL PERFORMANCE MEASURES AND TARGETS

PERFORMANCE MEASURE	TARGET	CLMPO/STATE BASELINE	DATA SOURCE
PAVEMENT CONDITIONS			
1. PERCENTAGE OF PAVEMENTS OF THE INTERSTATE SYSTEM IN GOOD CONDITION	35%	61% (46% statewide)	Highway Performance Monitoring System (HPMS)
2. PERCENTAGE OF PAVEMENTS OF THE INTERSTATE SYSTEM IN POOR CONDITION	0.5%	0% (0.1% statewide)	HPMS
3. PERCENTAGE OF PAVEMENTS OF THE NON-INTERSTATE NHS IN GOOD CONDITION	50% (2 yr), 50% (4 yr)	50% (64% statewide)	HPMS
4. PERCENTAGE OF PAVEMENTS OF THE NON-INTERSTATE NHS IN POOR CONDITION	10% (2 yr), 10% (4 yr)	11% (6.5% statewide)	HPMS
BRIDGE CONDITION			
5. PERCENTAGE OF NHS BRIDGES BY DECK AREA CLASSIFIED AS IN GOOD CONDITION	10%	5%* (13.8% statewide)	National Bridge Inspection Standard
6. PERCENTAGE OF NHS BRIDGES BY DECK AREA CLASSIFIED AS IN POOR CONDITION	3%	5% (2.2.% statewide)	National Bridge Inspection Standard
NATIONAL HIGHWAY SYSTEM PERFORMANCE			
7. PERCENT OF THE PERSON-MILES TRAVELED ON THE INTERSTATE THAT ARE RELIABLE (INTERSTATE TRAVEL TIME RELIABILITY)	78%	98.7% (81% statewide)	National Performance Management Research Data Set (NPMRDS) and HPMS
8. PERCENT OF THE PERSON-MILES TRAVELED ON THE NON-INTERSTATE NHS THAT ARE RELIABLE (NON-INTERSTATE TRAVEL TIME RELIABILITY)	78%	90.4% (84% statewide)	NPMRDS and HPMS
FREIGHT MOVEMENT ON INTERSTATE SYSTEM			
9. TRUCK TRAVEL TIME RELIABILITY (TTTR) INDEX (FREIGHT RELIABILITY)	1.45**	1.25 (1.36 statewide)	Truck Travel Time Reliability measured from the NMPRDS
CONGESTION MITIGATION AND AIR QUALITY ON ROAD MOBILE SOURCE EMISSIONS			

PERFORMANCE MEASURE	TARGET	CLMPO/STATE BASELINE	DATA SOURCE
10. TOTAL EMISSIONS REDUCTION OF PM-10 FROM FUNDED CMAQ PROJECTS	PM-10 363 (2 yr kg/day), PM-10 726.4 (4 yr kg/day)	NA (520.469 statewide)***	Air Quality CMAQ Public Access System

** The mid-sized and small MPOs all have between 0 and 10 percent in good condition.*

*** The freight performance measure assesses the reliability of travel time for trucks on the Interstate system by comparing days with extremely high delay to days with average delay. To determine the reliability of a segment, the TTTR measure is calculated as the ratio of the longer travel times (95th percentile) to a "normal" travel time (50th percentile). The TTTR's of interstate segments are then used to create the TTTR Index for the entire Interstate system and the CLMPO portion using a weighted aggregate calculation for the worst performing times of each segment. The higher the ratio, the worse the reliability.*

**** Calculated as sum of emissions reductions from all projects funded with CMAQ dollars from 2014 to 2017. Central Lane and Salem-Keizer MPO did not receive CMAQ funding during this period and, therefore, were not included but will be moving forward. 4-year target values reflect estimated emissions benefits for projects that are currently programmed in the STIP for 2018-2022. 2-year target values are set as one-half of the 4-year target.*

REGIONAL SYSTEM PERFORMANCE EVALUATION OUTCOMES

The following sections provide analysis of each of the 13 regional performance measures. Each measure has an icon bar with an arrow showing its intent or direction needed to go to meet the RTP goals and a circle with a fill amount to show whether or not it meets the intent. Vehicle miles traveled, for example, would need to go down (direction) to meet the RTP's goals (intent). However, the total vehicle miles traveled is forecasted to increase with the RTP's current fiscally constrained project list. It must be noted that data and tools available at this time are not sophisticated enough to capture the strategies and efforts around TO, TDM, and ITS that help to move the dial on these measures towards the region's expected direction. Additionally, the analysis is limited to the RTP's fiscally constrained project list. Additional funding would also help to move the needle on meeting the RTP's goals.

Data sources used for performance measures are referenced in each measure and include:

- CLMPO regional travel demand model (and land use inputs from the land use model)
- Regional Integrated Transportation Information System (RITIS)
- LCOG Geographic Information System (GIS) Databases
- Field confirmation

Transportation data sources continue to increase with the emergence of connected vehicles and technology advancement. CLMPO would like to continue exploring the use of emerging data sources and advancement in transportation data collection technology.

Miles Traveled

Description: System-wide number of miles traveled (total and share of overall travel) within the CLMPO area

Measures:

- Vehicle miles traveled (VMT) (total, per capita, per employee)
- Freight miles traveled (total, per capita, per employee)
- Transit miles traveled (total, per capita, per employee)

Data Source: Travel demand model

Findings: Table 40 indicates the total daily miles traveled for all vehicles completing trips that start and end within the CLMPO area in 2020 and 2045. These data are also summarized per capita (person) and per employee. The trips that begin and end within the region represent those that can be more directly influenced with land use and transportation policies, programs, and projects. As shown in **Error! Reference source not found.**, vehicle miles traveled within the CLMPO are increase in the future. The 6% increase in VMT per capita indicates a combination of increased trips per person and increased average trip length.

TABLE 40. TOTAL DAILY VEHICLE MILES TRAVELED FOR INTERNAL (STARTING AND ENDING WITHIN CLMPO) TRIPS

VEHICLE MILES TRAVELED	2020 BASE YEAR	2045 FUTURE YEAR	CHANGE
TOTAL	3,230,936	4,006,861	+24%
PER PERSON	11.7	12.5	+6%
PER EMPLOYEE	24.3	22.8	-6%

Regional trips into, out of, and through the region also contribute to travel on the vehicular network. Table 41, Table 42, Table 43, and Table 44 indicate how total miles traveled for all vehicles, passenger vehicles, freight, and transit are predicted to change between 2020 and 2045. Overall vehicle miles traveled (total auto, freight, and transit miles traveled) per capita is expected to increase in the future. By 2045, transit miles traveled per person is forecasted to increase by 25 percent from 0.04 to 0.05, and total vehicle miles traveled per person increases by about 10 percent, from 18.8 to 20.8 between 2020 and 2045. Miles traveled by any mode are higher per employee than per capita.

The trends shown in Table 43 indicate that freight will become an increasingly large amount of the traffic for the CLMPO regional roadway system. An increase in freight traffic helps support economic vitality in the region as well as ensuring all residents are getting the goods they need from both within and outside of the region.

TABLE 41. TOTAL DAILY VEHICLE MILES TRAVELED (PASSENGER, FREIGHT, AND TRANSIT)

VEHICLE MILES TRAVELED	2020 BASE YEAR	2045 FUTURE YEAR	CHANGE
TOTAL	5,167,710	6,657,335	+29%
PER PERSON	18.8	20.8	+11%
PER EMPLOYEE	38.7	37.8	-2%

TABLE 42. TOTAL DAILY PASSENGER AUTO VEHICLE MILES TRAVELED

PASSENGER AUTO VEHICLE MILES TRAVELED	2020 BASE YEAR	2045 FUTURE YEAR	CHANGE
TOTAL	4,245,644	5,405,992	+27%
PER PERSON	15.4	16.9	+10%
PER EMPLOYEE	31.8	30.7	-3%

TABLE 43. TOTAL DAILY FREIGHT MILES TRAVELED

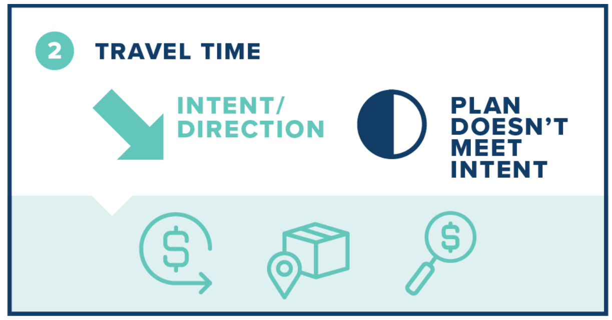
FREIGHT MILES TRAVELED	2020 BASE YEAR	2045 FUTURE YEAR	CHANGE
TOTAL	911,793	1,235,888	+36%
PER PERSON	3.3	3.9	+18%
PER EMPLOYEE	6.8	7.0	-3%

TABLE 44. TOTAL DAILY TRANSIT MILES TRAVELED

TRANSIT MILES TRAVELED	2020 BASE YEAR	2045 FUTURE YEAR	CHANGE
TOTAL	10,272	15,454	+50%
PER PERSON	0.04	0.05	+25%
PER EMPLOYEE	0.08	0.09	+13%
PER PASSENGER	0.27	0.22	-19%

A parking garage in downtown Eugene.

Travel Time



Description: Travel time between key origins and destinations

Measures:

- Motor vehicle travel time between key regional origin-destination pairs
- Freight travel time between key freight origin-destination pairs
- Transit travel time between key origin-destination pairs

Data Source: Travel demand model, Streetlight, RITIS, and ACS data

Findings: Several corridors throughout the region are regional corridors, shown in Figure 49. These regional corridors are critical for connecting travel between important origins and destinations. Measuring travel time along corridors of interest is used to understand how the time it takes travelers to access jobs, services, and recreational activities changes over time. It can be helpful to understand where the most significant increases in travel times are occurring so that future projects, programs, and policies can attempt to maintain or improve the flow of traffic today and in the future.

For the travel time performance measure, travel times were observed using real-time probe data through the RITIS platform. The platform uses disaggregated Bluetooth location data from passenger and freight vehicles to calculate travel speeds, travel times, and more on roadways throughout the state of Oregon. These data established the existing travel times for these corridors. The regional travel model was used to compare the change in future 2045 travel time relative to the existing year model. The resulting corridor summaries are shown in Figure 50 (Passenger Vehicle and Freight Corridors) and Figure 51 (Transit Corridors).

In nearly all locations, travel times increase between 2020 and 2045. Travel times are projected to increase for the passenger vehicle and freight corridors overall by approximately ten percent (generally ranging from five to sixteen percent). The most significant increase identified is along I-5, where travel times are projected to increase approximately 25 percent by 2045.

Transit travel time changes are projected to be more nuanced, with travel on some corridors (or directions of travel) having nominal increases or even projected decreases (improvements) relative to existing travel time. Travel time on Main Street (OR 126) east of Bob Straub and Main Street/South A Street (including couplet) is projected to decrease by approximately 25 percent with planned service enhancements along this corridor.

In the future, consideration for additional performance measures may include pedestrian and bicycle travel time to measure the convenience of these travel modes. Continued updates to the regional travel demand model and availability of new data sources may enable these summaries.

FIGURE 49. REGIONAL CORRIDORS OF INTEREST FOR TRAVEL TIME SUMMARY

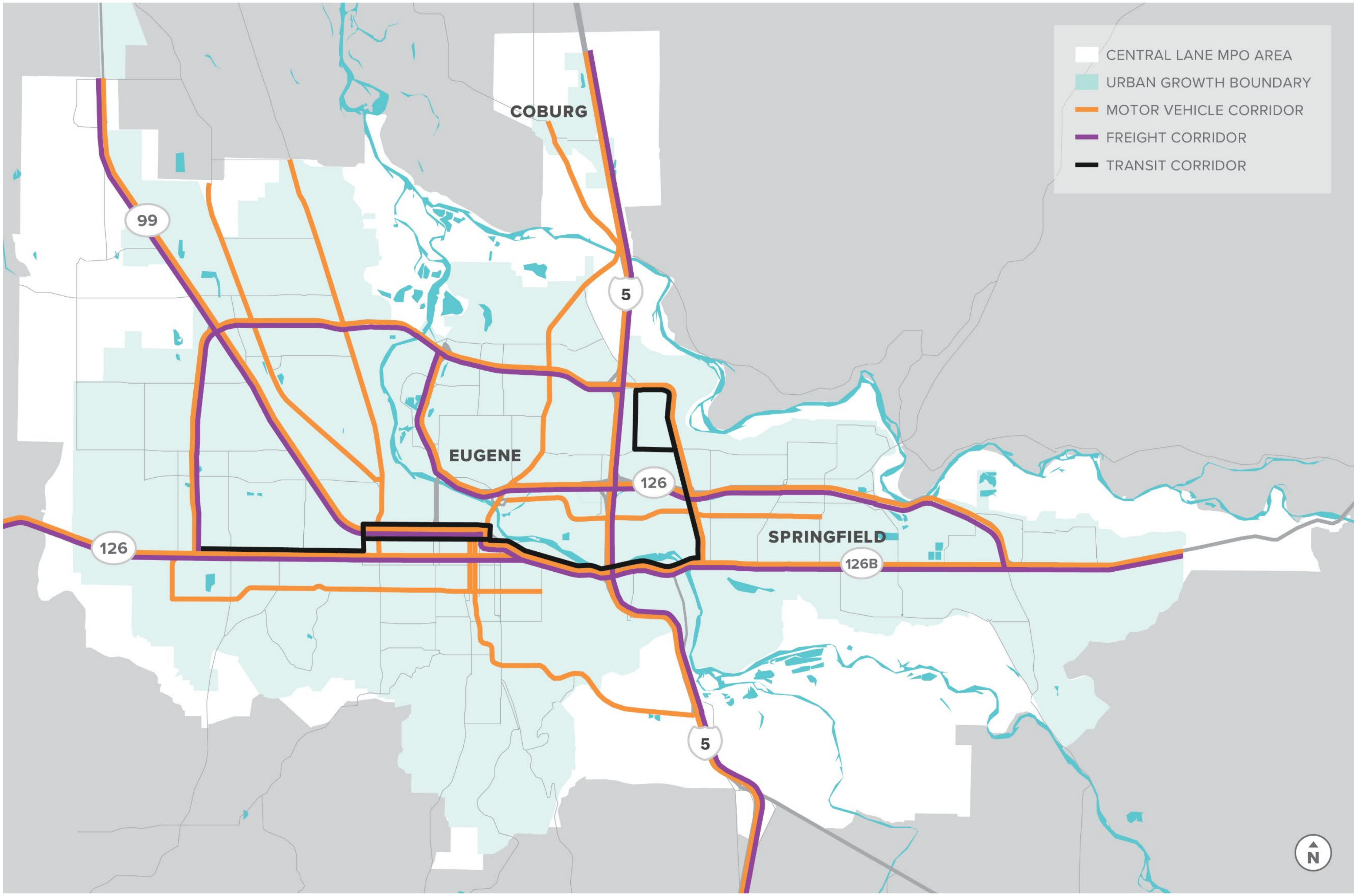


FIGURE 50. REGIONAL TRAVEL TIME INCREASE FROM 2020 TO 2045 (PASSENGER VEHICLE AND FREIGHT CORRIDORS)

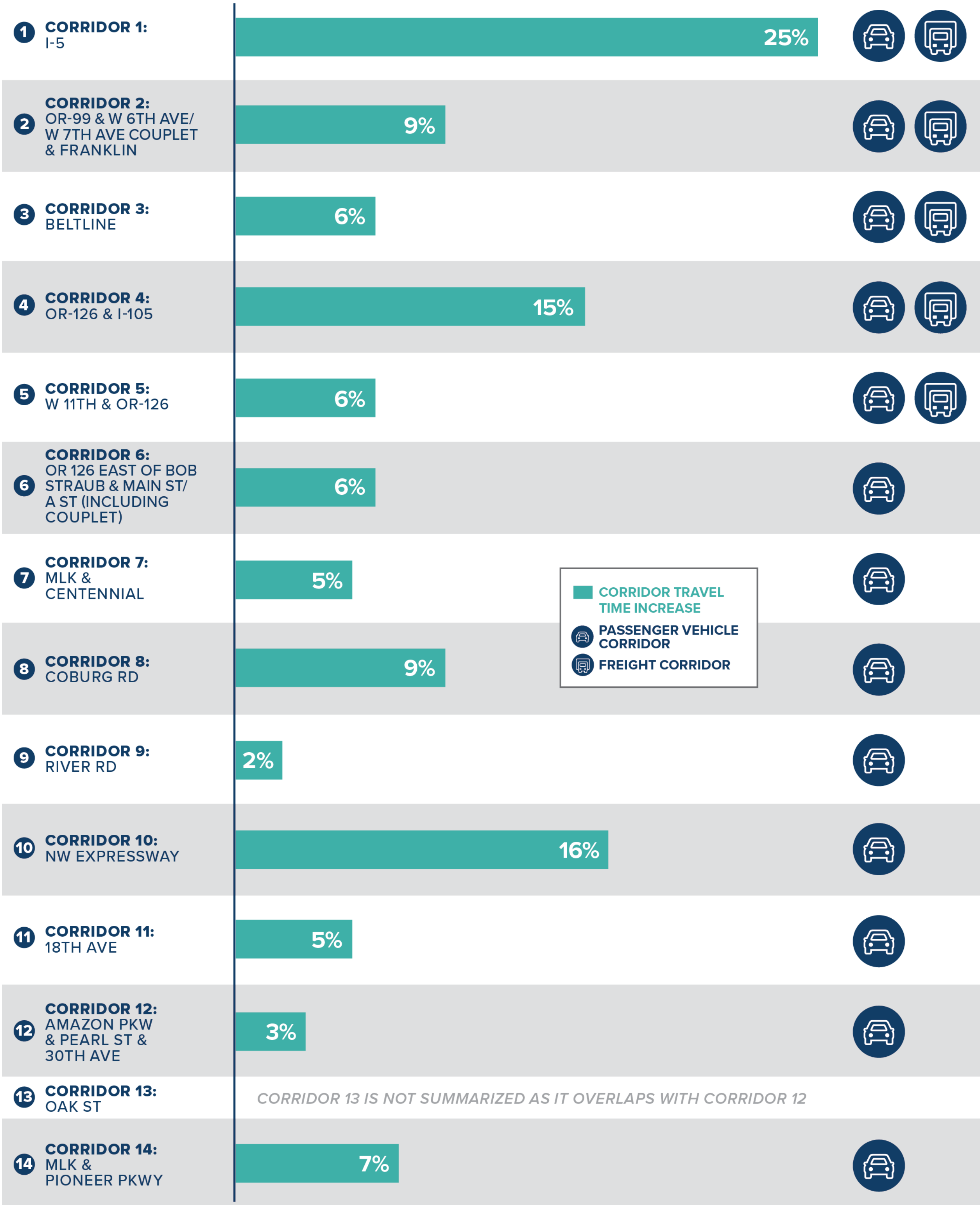
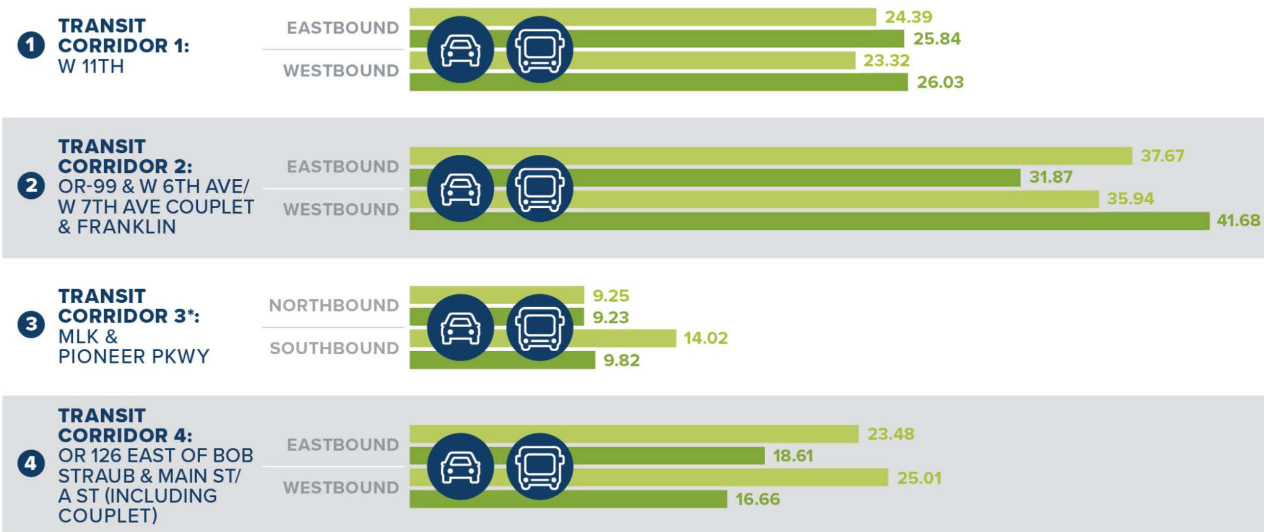


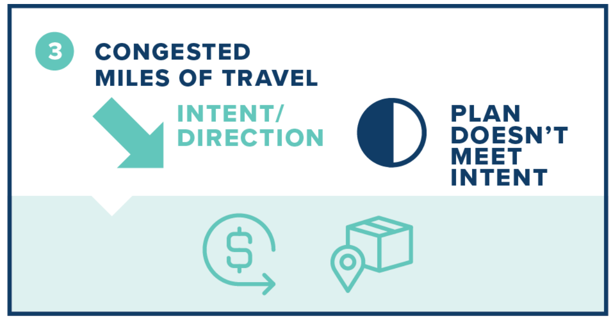
FIGURE 51. REGIONAL TRAVEL TIME SUMMARY BY TRANSIT CORRIDOR (MINUTES)



The model has EmXa and EmXb in Base Year; and XNSa and XNSb in year 2045 coded parallel on Beltline/ MLK/ Pioneer Way. So a rider in the model has alternative travel times. The two routes in the model change routing while looping in northern terminus. The total here reflects the fastest time.

BASE YEAR MODEL
FUTURE NO-BUILD MODEL
PASSENGER VEHICLE CORRIDOR
TRANSIT CORRIDOR

Congested Miles of Travel Network



Description: Miles of congested or severely congested regional corridors.

Measures:

- Miles of congested regional corridors
- Miles of severely congested regional corridors

Data Source: Travel demand model

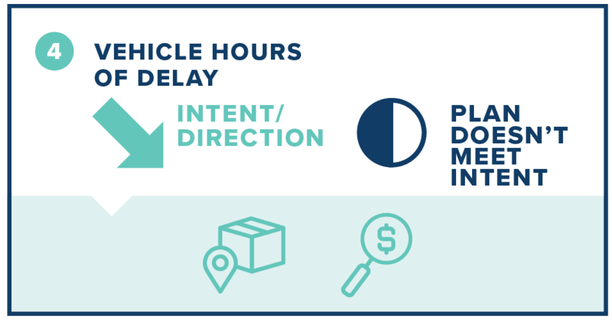
Findings: This performance measure helps highlight how often travelers in the region are experiencing congestion based on travel during the weekday evening peak period. For this measure, a *congested corridor* is defined as a corridor where the volume-to-capacity (v/c) ratio is equal to or greater than 0.90 and less than 1.0. *Severely congested* corridors are defined as having volume-to-capacity ratios over 1.0. Table 45 shows the cumulative regional congestion increasing between today and 2045. The related Congestion measure (appears later in this chapter) indicates the specific locations within the region that are projected to be congested.

TABLE 45. CONGESTED MILES OF TRAVEL

CONDITION	CURRENT YEAR (2020)	FUTURE YEAR (2045)	CHANGE
ALL ROADS (MILES)	1,284	1,360	+5.9%
CONGESTED ROADS (MILES)	11	36	+227.2%
SEVERELY CONGESTED ROADS (MILES)	13	22	+69.2%
PORTION CONGESTED (%)	0.9%	2.7%	+1.8%
PORTION SEVERELY CONGESTED (%)	1.0%	1.6%	+0.6%

Growth in segments of congested and severely congested conditions will outpace the increase in new roadway network. While an increase in the amount of time travelers will spend in congestion is expected to occur, the effects of regional congestion are still overall limited as over 95 percent of miles are driven in uncongested conditions.

Vehicle Hours of Delay (VHD)



Description: VHD is the magnitude of congestion accounting for both the degree of delay and the volume of delayed traffic at those locations.[62]

Measures:

- Passenger VHD
- Truck VHD

Data Source: Travel demand model

Findings: This performance measure is sensitive to both the number of vehicles that are experiencing delay, as well as the degree of delay for each vehicle. This measure combines (multiplies) those factors to highlight where the highest volumes of people are spending time in congestion and provides the ability to target critical congestion locations. Table 46 lists the sum of daily VHD by vehicle type. As traffic volumes and delays on the regional network grow, the total VHD will increase approximately 75 percent for passenger vehicles and 117 percent for trucks.

TABLE 46. REGIONAL VEHICLE HOURS OF DELAY (VHD) - PM PEAK HOUR PER DAY

MODE	CURRENT YEAR (2020)	FUTURE YEAR (2045)	CHANGE
ALL VEHICLES	2,237	3,968	77%
PASSENGER VEHICLE	2,104	3,679	75%
TRUCK	133	289	117%

Locations in the region that are congested and severely congested are reported in the following measure, however the future locations that are projected to influence the increase in VHD include:

- I-105 from downtown Eugene to Delta Highway
- Coburg Road from downtown Eugene to I-105
- OR 126 from I-5 to Mohawk Boulevard
- I-5 from Glenwood Boulevard to OR 126

Future transportation improvements that are targeted to reduce traffic volume and/or delay at these locations (mode/route shift, mobility enhancement, etc.) can provide significant congestion benefits.

[62] For this performance measure, congestion was assumed to be anything slower than free-flow speed along a given corridor.

Congestion

Description: Locations on the regional roadway network that are congested

Measures:

- Locations on the regional roadway network that are congested or severely congested[63]

Data Source: Travel demand model

Findings: To complete the summary of congestion-related performance measures, Figure 52 (current year, 2020) and Figure 53 (future year, 2045) show the locations of congestion from the regional travel demand model. Notably, because the locations of congestion shown in the figures are outputs from the model they do not show every location of congestion that a traveler may experience from day to day. The model is intended to provide an estimation of the most frequently experienced congestion throughout the year, when in reality these conditions may vary by day.

The orange highlighting on Figure 52 and Figure 53 represent congested locations, while the red highlights severely congested locations. Congestion is predicted to increase in several places throughout the region, notably:

- I-5 between Coburg and Eugene-Springfield
- Beltline Highway between Coburg Road and Delta Highway
- Highway 9 and surrounding roadways near the Eugene Airport
- OR 126 near the intersection with Beltline Highway
- The western end of downtown, specifically where Highway 99 transitions to the W 6th Ave/W 7th Ave couplet
- I-5 and Franklin Boulevard east of the Glenwood area and south of Lane Community College (E 30th Ave)

Increased congestion in these locations with will increase travel time and may influence travel decisions (destination and mode) made by travelers. As regional population and travel continues to grow, there are not sufficient funds/resources to address congestion from the traditional strategy of adding lanes and capacity to existing facilities. Rather, other regional strategies will be needed to support residents, employees, and visitors getting access to jobs, goods, and services within the region.

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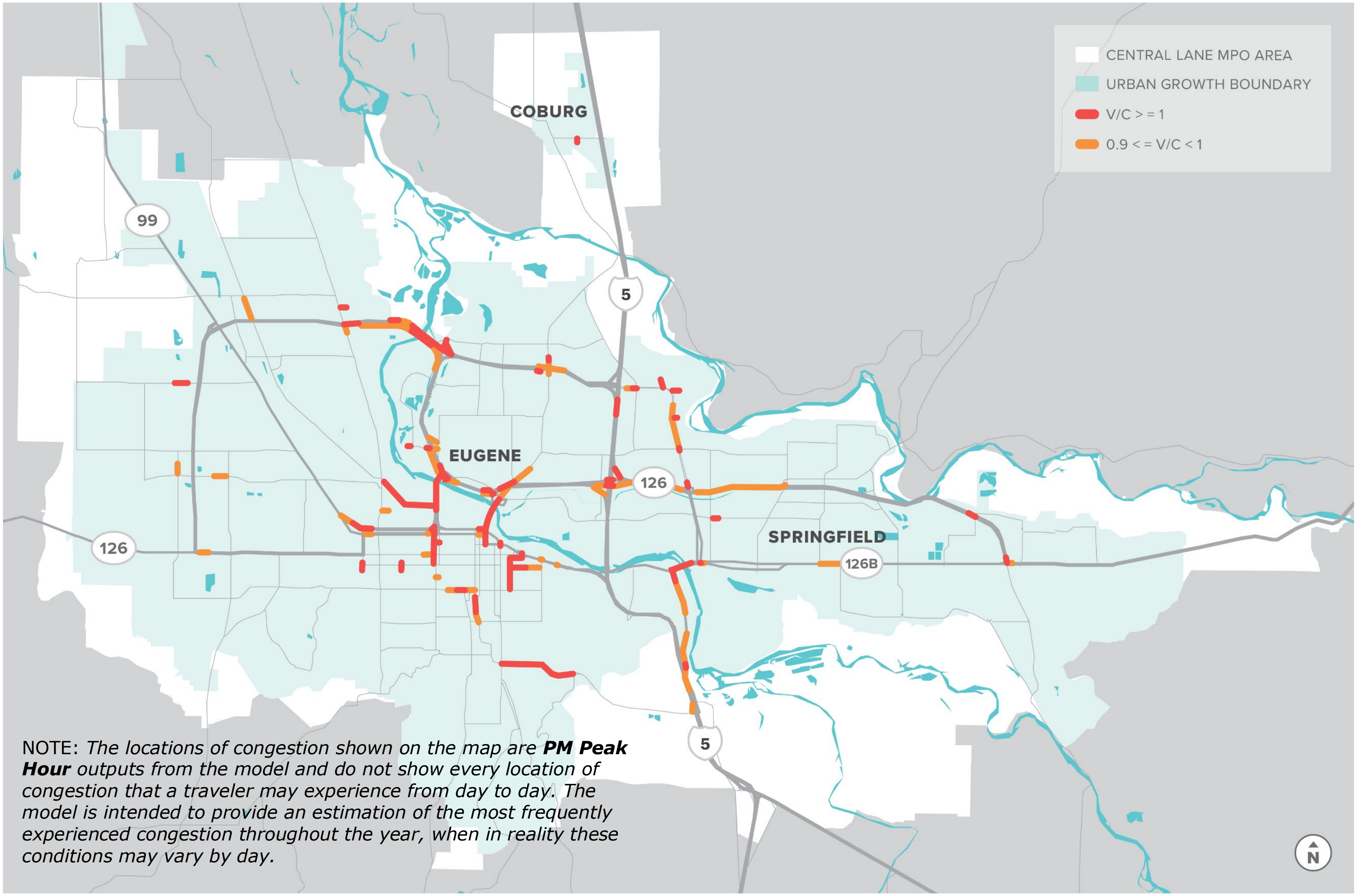
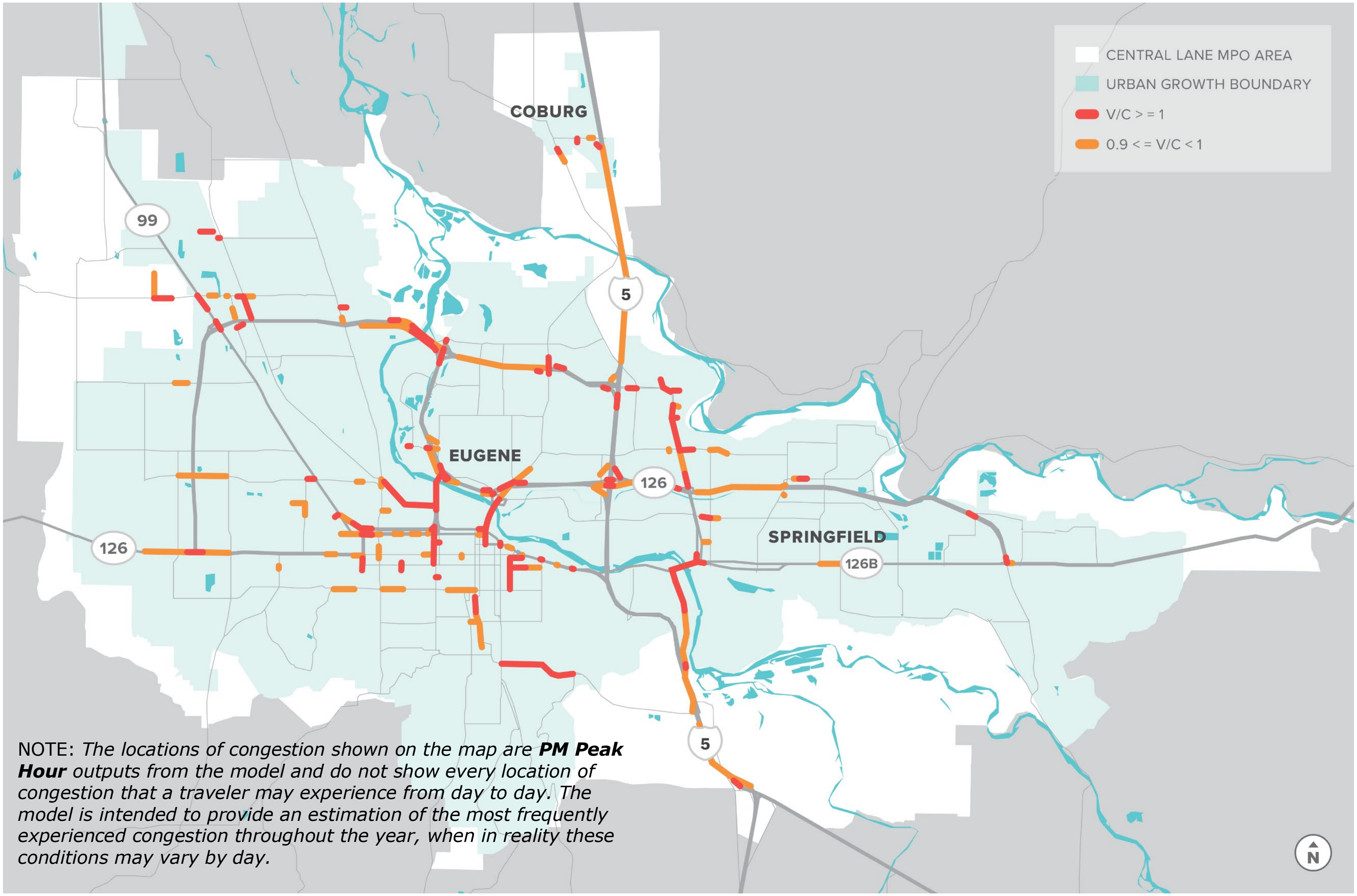
[63] Volume-to-capacity (V/C) is used to report how full a street is with traffic volume relative to the carrying capacity. For this measure, a *congested corridor* is defined as a corridor where the v/c ratio is equal or greater than 0.90 and less than 1.0. *Severely congested* corridors are defined as having volume-to-capacity ratios over 1.0.

FIGURE 52. REGIONAL CONGESTED CORRIDORS (CURRENT YEAR 2020, PM PEAK HOUR)



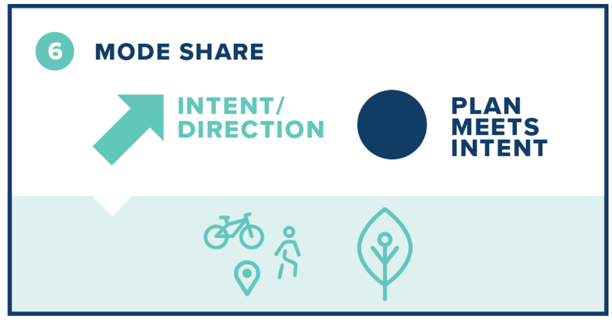
NOTE: *The locations of congestion shown on the map are* ***PM Peak Hour*** *outputs from the model and do not show every location of congestion that a traveler may experience from day to day. The model is intended to provide an estimation of the most frequently experienced congestion throughout the year, when in reality these conditions may vary by day.*

FIGURE 53. REGIONAL CONGESTED CORRIDORS (FUTURE YEAR 2045, PM PEAK HOUR)



NOTE: *The locations of congestion shown on the map are* ***PM Peak Hour*** *outputs from the model and do not show every location of congestion that a traveler may experience from day to day. The model is intended to provide an estimation of the most frequently experienced congestion throughout the year, when in reality these conditions may vary by day.*

Mode Share



Description: Percent of non-drive alone trips

Measures:

- Walking, bicycling, transit, and shared ride usage
- Person trips
- Transit trips on congested corridors

Data Sources: Travel demand model and ACS data

Findings: Mode share summarizes the total number of trips throughout the region by travel mode. There are several benefits that occur when travelers decide to take travel modes besides driving in a car alone as a single occupant vehicle (SOV), including:

- Reduced congestion with fewer vehicles on the roadway
- Reduced emissions from fewer vehicles on the roadway and/or less congestion related emissions
- Increased number of people receiving health benefits from active transportation such as walking and biking
- Lower expenditures spent on transportation

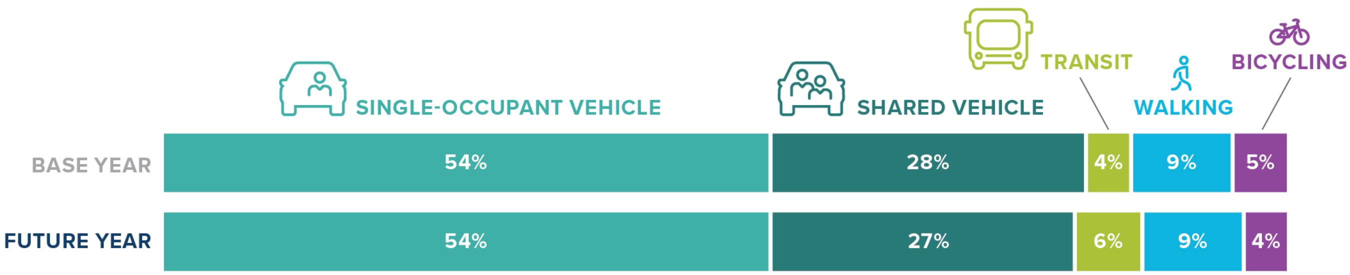
The region is growing and the total daily person trips is projected to increase approximately 20 percent over the next 25 years, as shown in Table 47. With the increase in daily trips, the importance of mode share will become an increasing critical factor in how the transportation system operates.

TABLE 47. TOTAL DAILY PERSON TRIPS

CURRENT YEAR (2020)	FUTURE YEAR (2045)	CHANGE
1,017,709	1,234,481	+21%

Mode share and the mode that individual travelers use for each trip can be influenced by many factors including trip purpose, available options, cost, and trip distance. Broad strategies and targeted projects and programs can influence mode share and improve access. However, short- and longer- term fluctuations in mode share may also occur due to a variety of factors that are beyond the direct influence of transportation planning, including market-driven fuel pricing and weather. The travel demand model is used to estimate current and future mode split based on traveler behavior and the planned system. However, this analysis tool does not capture some of the many shorter-term and longer-term influences that may dictate a traveler's mode choice. Figure 54 summarizes the region's projected mode share using the travel demand model.

FIGURE 54. REGIONAL MODE SHARE (2020 BASE YEAR AND 2045 FUTURE YEAR)



As the region grows, most modes of travel will experience similar growth and are not projected to significantly shift from current patterns, as shown in Figure 54. However, the share of transit trips is projected to have an overall increase of 2 percent of trips, or 84 percent relative to current usage. Table 48 summarizes the current year and future year projections for daily trips by mode.

TABLE 48. DAILY WALKING, BICYCLING, TRANSIT, AND SHARED VEHICLE PERSON TRIPS

MODE	CURRENT YEAR (2020)	FUTURE YEAR (2045)	CHANGE
WALKING	94,639	109,634	+16%
BICYCLING	46,822	54,619	+17%
TRANSIT	38,070	69,940	+84%
SHARED VEHICLE	287,245	334,718	+16%

With increased regional congestion in 2045, additional trips are projected to shift to transit modes along congested corridors (Table 49). While transit travel currently represents five percent of person-miles traveling on congested corridors, that figure is projected to increase to 14 percent in 2045.

TABLE 49. TRANSIT TRIPS ON CONGESTED CORRIDORS

	CURRENT YEAR (2020)	FUTURE YEAR (2045)	CHANGE
TRANSIT PERSON MILES	1,120 5% of total person miles	5,795 14% of total person miles	+517%
TRANSIT MILES	25 6% of total transit miles	57 12% of total transit miles	+228%

The region is headed towards a more even distribution of the travel modes residents choose. The combined share of transit, walking, and biking trips is projected to increase slightly from 18 percent to 19 percent. However, there is still potential to increase the percentage of non-SOV trips like transit, walking, and biking. Table 50 summarizes the trip length for SOV trips. A trip that is under five miles in length taken via passenger vehicle may have the potential to be replaced by walking, biking, or taking transit. As listed in Table 50, 56 percent of SOV trips are less than five miles long, which provide opportunities for shifts to other travel modes.

TABLE 50. SINGLE OCCUPANT VEHICLE (SOV) TRIP LENGTH DISTRIBUTION

TRIP DISTANCE	OTHER MODES THAT COULD SERVE TRIP	CURRENT YEAR (2020) TRIPS	CURRENT YEAR (2020) SOV PORTION	FUTURE YEAR (2045) TRIPS	FUTURE YEAR (2045) SOV PORTION
LESS THAN ¾ MILE	Walk, Bike, Transit	38,699	6%	47,832	6%
¾ TO 3 MILES	Bike, Transit	189,287	28%	229,384	27%
3 TO 5 MILES	Transit	149,377	22%	182,291	22%
OVER 5 MILES	Shared Ride (HOV)	293,092	44%	379,826	45%
TOTAL	N/A	670,455	100%	839,332	100%

An EmX bus departing from a station.

System Completeness

Description: Completeness of regional sidewalks and bikeways

Measures:

- Mapping of regional pedestrian and bicycle networks completed
- Mapping of regional pedestrian and bicycle facilities completed within ¼ mile of high frequency transit stops and within equity focused areas

Data Sources: GIS, field confirmation

Findings: A connected walking and biking system can provide safe and comfortable travel options for people of all ages and abilities in the CLMPO region. The System Completeness performance measure provides a snapshot of how well-connected the bicycle and pedestrian networks are throughout the region. This measure can also track the amount of investment the region puts into active transportation relative to where they would like to be. This performance measure is calculated using GIS and field confirmation. Notably, the amount of data tracking bikeway and sidewalk availability and quality is continuing to improve with advancements in technology but is not considered to be entirely comprehensive at this time. Given constraints with data limitations including a complete regional sidewalk inventory, CLMPO staff present this measure from a qualitative perspective for this RTP. Figure 55 shows the bicycle network system completeness, Figure 56 shows the pedestrian and shared-use path completeness, and Figure 57 shows the bicycle and pedestrian system completeness within ¼ mile of a high capacity transit stop, which is assumed to be a reasonable distance for transit riders to walk to a transit stop.

Each figure displays the current network with the current data availability along with the bicycle and pedestrian projects from the RTP project list to show the complete system once the RTP's fiscally constrained project list is fully built. Each figure is also displayed with the region's socio-economic indicators to demonstrate where projects are planned in relationship with socio-economic indicators.

Increasing the system completeness will make active transportation modes more viable for regional travelers. Biking and walking facilities are particularly important surrounding transit facilities so that riders can get to transit stops safely. The completion of these facilities will help improve access to transit and can encourage modal shifts for walking, biking, and transit.

FIGURE 55. BICYCLE NETWORK SYSTEM COMPLETENESS

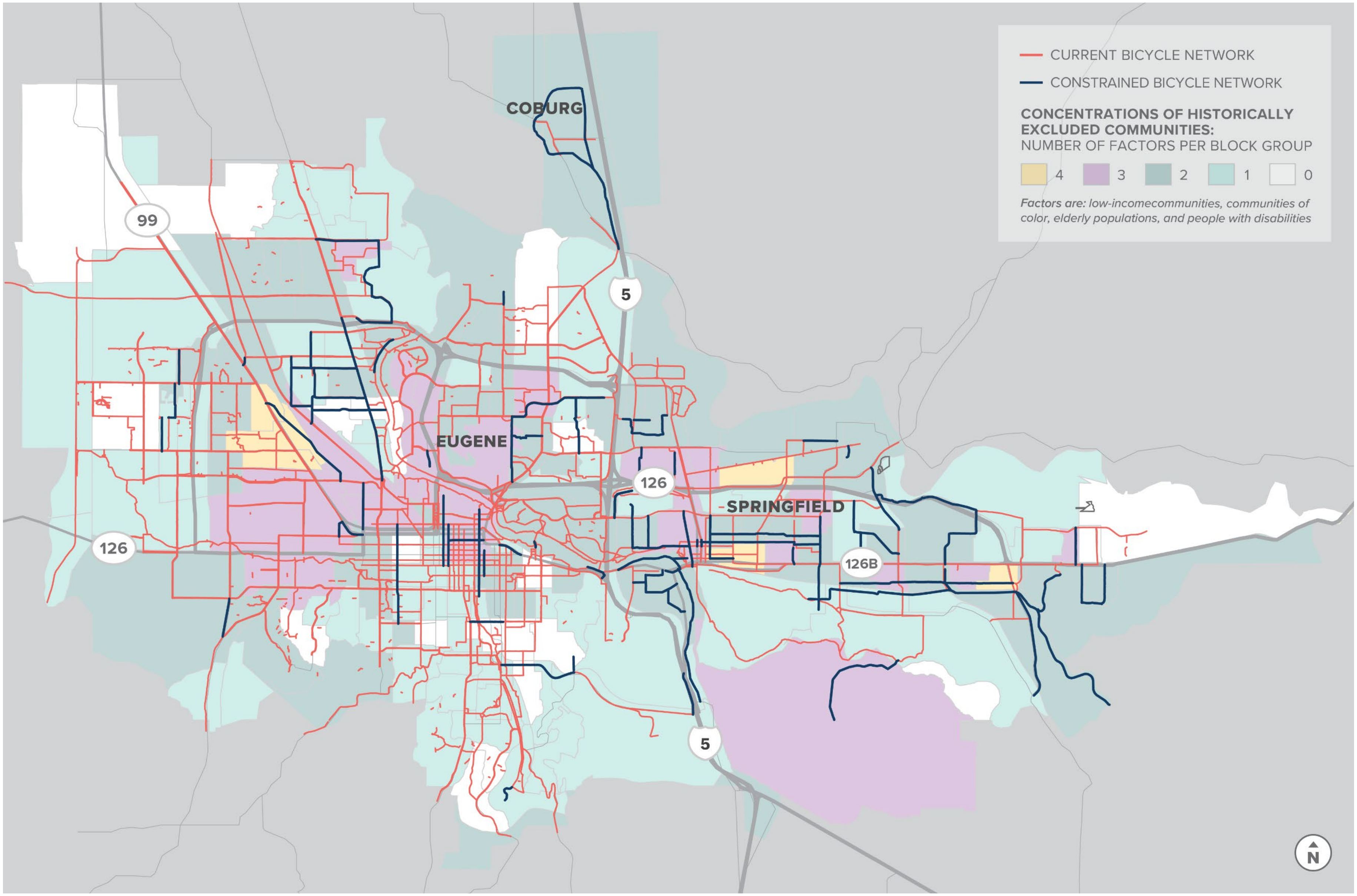


FIGURE 56. SIDEWALK AND SHARED USE PATH SYSTEM COMPLETENESS

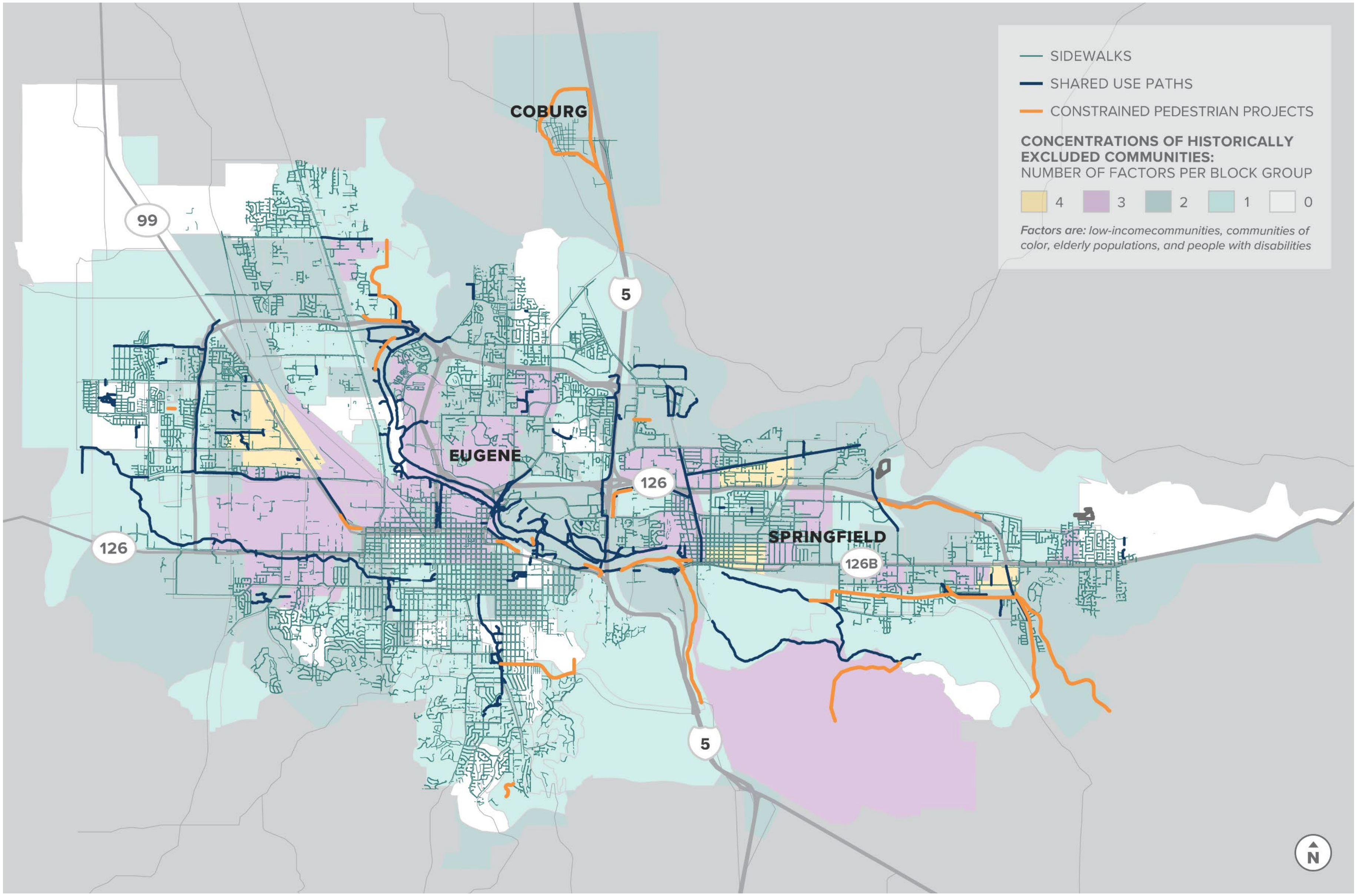
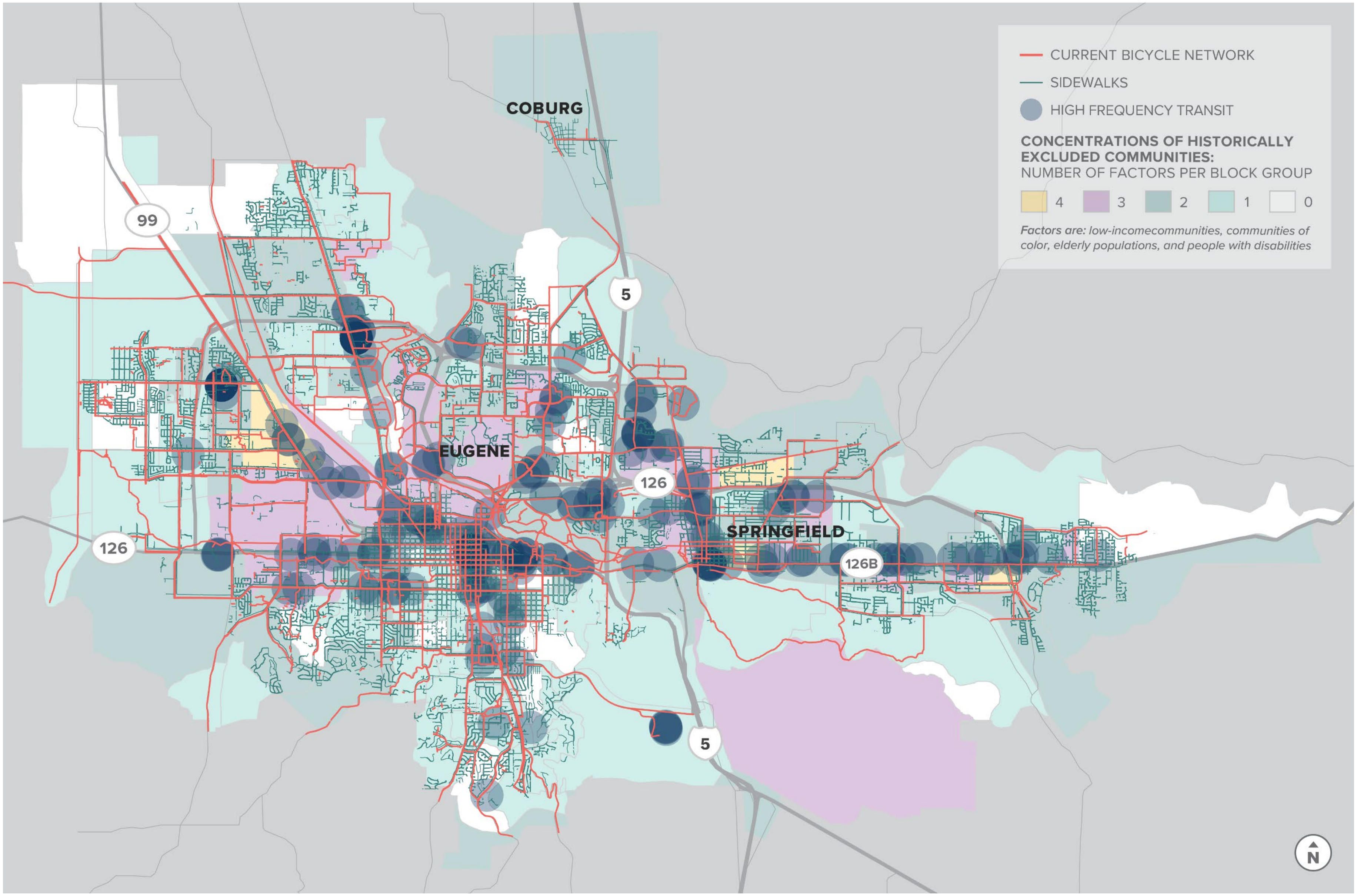


FIGURE 57. BICYCLE AND PEDESTRIAN SYSTEM COMPLETENESS WITHIN ¼ MILE OF A HIGH CAPAPCITY TRANSIT STOP



Access to Jobs

Description: Number of jobs accessible within a reasonable travel time

Measures:

- Jobs accessible by households within the following commute travel times/distances:
  - 20-minute drive for passenger vehicles
  - 20-minute travel time for transit riders
  - ¾-mile distance by walking[64]
  - 3⅓-mile distance by biking[65]

Data Sources: Travel demand model, GIS, and ACS data

Findings: Access to jobs within reasonable travel times is critical for travelers across the region. As congestion increases, it is important to monitor the impact on accessibility for communities. In general, the CLMPO area considers travel time to a destination to be "accessible" if it takes 20 minutes or less, regardless of mode. Table 51 lists the portion of jobs accessible by passenger vehicle, walking, biking, and transit as estimated by the regional travel demand model.

TABLE 51. JOBS ACCESSIBLE BY PASSENGER VEHICLE IN THE AVERAGE HOUSEHOLD

MODE	CURRENT YEAR (2020)	FUTURE YEAR (2045)	CHANGE
PASSENGER VEHICLE	100% (133,407)	100% (176,139)	0%
BIKING	25%	26%	+1%
WALKING	1.5%	2%	+0.5%
TRANSIT	82%	92%	+10%

Currently, over 80% of jobs accessible by passenger vehicle are also accessible by taking transit, however, walking and biking to jobs is more difficult. As the number of jobs increases in the future year, so do accessible opportunities for other modes. To enable this potential modal shift, jobs should be located near areas that are well connected to transit, sidewalk, and bikeway systems.

[64] FHWA standard assumption is average travel speed of 4 feet per second for 20 minutes. In 20 minutes this would result in nearly a mile of walking, but the shorter ¾-mile threshold accounts for terrain or obstruction to pedestrian travel.

[65] FHWA assumption is average travel speed of 12 mph for 20 minutes. In 20 minutes this would result in nearly 4 miles of biking, but the shorter 3 1/3-mile threshold accounts for terrain or obstruction to bicycle travel.

Access to Services

Description: Number of services (food, education, employment, and/or healthcare) accessible within a reasonable travel time

Measures:

- Services accessible by households within the following reasonable travel times/distances:
  - 20-minute drive for passenger vehicles
  - 20-minute total travel time for transit riders
  - ¾-mile distance by walking[66]
  - 3 ⅓-mile distance by biking[67]

Data Sources: Travel demand model, GIS, and ACS data

Findings: In addition to accessing jobs, access to services is important for travelers across the CLMPO region. The same accessibility thresholds for access to jobs also apply to access to services. Table 52 lists the portion of services accessible by passenger vehicle, walking, biking, and transit as estimated by the regional travel demand model.

TABLE 52. SERVICES ACCESSIBLE BY MODE THE AVERAGE HOUSEHOLD[68]

MODE	CURRENT YEAR (2020)	FUTURE YEAR (2045)	CHANGE
PASSENGER VEHICLE	100% (465)	100% (465)	0%
BIKING	22%	23%	+1%
WALKING	2%	2.5%	+0.5%
TRANSIT	81%	96%	+15%

The availability, location, and number of services are not assumed to change from 2020 levels for purposes of the analysis. Despite this limitation, the number of services accessible by transit increases between the current and future years. This may be due to expansion of services from Lane Transit District or added efficiency within their existing transit services.

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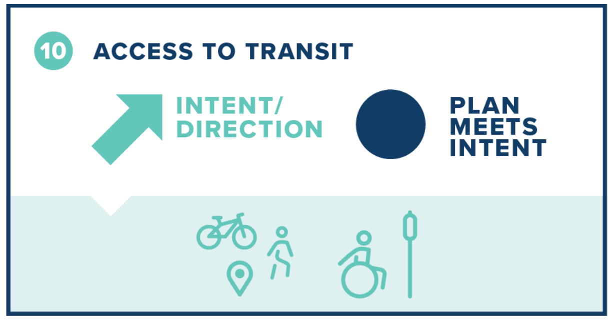
[66] FHWA standard assumption is average travel speed of 4 feet per second for 20 minutes. In 20 minutes this would result in nearly a mile of walking, but the shorter ¾-mile threshold accounts for terrain or obstruction to pedestrian travel.

[67] FHWA assumption is average travel speed of 12 mph for 20 minutes. In 20 minutes this would result in nearly 4 miles of biking, but the shorter 3 1/3-mile threshold accounts for terrain or obstruction to bicycle travel.

[68] Passenger vehicle serves as the benchmark mode. Walking, biking, and transit modes are benchmarked to the number of services that are accessible by passenger mode.

Access to Transit



Description: Number of households within ¼ mile of a transit stop

Measures:

- Number of households within ¼ mile of a transit stop

Data Sources: Travel demand model and GIS

Findings: As highlighted in the two previous performance measures, being located near transit increases a household's ability to access nearly all jobs and services within the CLMPO area. The Access to Transit performance measure tracks how many households are located within ¼ mile of a transit stop. The threshold of ¼ mile represents a reasonable amount of distance and time the average person would walk to a transit stop. This performance measure is reported during the current year only, as specific locations of future transit stops is not known at this time. Currently 95 percent of households in the CLMPO region are located within ¼ mile of a transit stop. Improving accessibility to these locations by completing the pedestrian and bicycle system gaps will enable increased transit use in the future. Lane Transit District explored changes to their system throughout the region with their *Transit Tomorrow* plan.[69]

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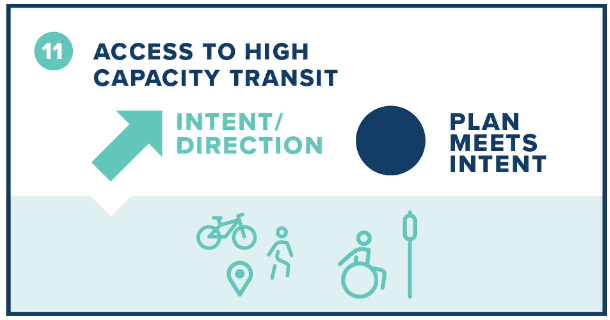
[69] The *Transit Tomorrow Plan* was initiated and later put on hold under the COVID-19 pandemic.

Access to High Capacity Transit



Description: Number of households within ¼ mile of a high capacity transit stop

Measures:

- Number of households within ¼ mile of a high capacity transit stop (15 minute frequency or less)

Data Sources: Travel demand model and GIS

Findings: As highlighted in the previous performance measures, being located near transit increases a household's ability to access nearly all jobs and services within the CLMPO area. This measure tracks how many households are located within ¼ mile of a high capacity transit stop. The threshold of ¼ mile represents a reasonable amount of distance and time the average person would walk to a transit stop. This performance measure is reported during the current year only, as specific locations of future transit stops is not known at this time. Currently 40 percent of households in the CLMPO region are located within a reasonable distance to a transit stop for high capacity transit. Improving accessibility to these locations by completing the pedestrian and bicycle system gaps will enable increased transit use in the future. Lane Transit District is currently exploring changes to their system throughout the region with their *Transit Tomorrow* plan.[70] Access to high capacity transit for historically excluded populations is further explored in Appendix H Environmental Analysis.

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[70] The *Transit Tomorrow Plan* was initiated and later put on hold under the COVID-19 pandemic. Lane Transit District's Board of Directors postponed the project review until the community can "participate in a meaningful way," https://www.ltd.org/transit-tomorrow/.

Safety

Description: Transportation-related collisions

Measures:

- Vehicle, pedestrian, and bicyclist fatal and serious injury crashes
- Vehicle, pedestrian, and bicyclist fatalities where alcohol is a factor
- Vehicle fatalities where a passenger is unrestrained
- Motorcyclist fatalities, helmeted and un-helmeted
- Fatalities where a driver's age is 20 or under

Data Sources: ODOT crash and crash severity data, CLMPO Data Portal

Findings: While future crash data are difficult to project at a regional scale, evaluation of recent data provides information on recent trends. Crash data can be used to monitor progress towards safety goals and is continually collected through Oregon's collection of crash reports (filed by police or others) and ODOT's Crash Analysis & Reporting Unit. The latest available data are for 2019. Table 53 summarizes the fatal and serious injury crashes over the last five year period, including those that involved pedestrians and bicycles. Crashes involving these modes typically result in greater severity due to the vulnerability of these users (not protected with seatbelt and other safety devices inside a vehicle frame).

TABLE 53. FATAL AND SERIOUS INJURY CRASHES BY YEAR

TYPE	2015	2016	2017	2018	2019	5-YEAR TOTAL
FATAL CRASHES (ALL)	18	16	8	17	16	75
- PEDESTRIAN FATALITY	2	0	3	2	3	10
- BICYCLE FATALITY	0	0	2	0	2	4
SERIOUS INJURY (ALL)	78	76	81	87	85	407
- PEDESTRIAN SERIOUS INJURY	4	5	5	3	8	25
- BICYCLE SERIOUS INJURY	5	5	7	7	6	30

In general, crashes that included alcohol as a factor had a disproportionately higher occurrence of high severity. As noted in Table 54, alcohol was a factor in about five percent of total crashes, but nearly half (45 percent) of all crashes involving a fatality. Alcohol also contributed to a higher share of serious injury (eight percent) and moderate injury (nine percent) crashes than the rate of crashes involving alcohol (five percent). Alcohol-related crashes comprised a lower share of minor injury and property damage only crashes (four percent each).

TABLE 54. NUMBER OF CRASHES WHERE ALCOHOL WAS A FACTOR WITHIN THE URBAN GROWTH BOUNDARY (2016-2019)

SEVERITY OF CRASH	NUMBER OF CRASHES RELATED TO ALCOHOL	ALCOHOL WAS A FACTOR IN THIS PORTION OF CRASHES WITH THE SEVERITY
ALL CRASHES	610	5%
FATAL	24	45%
SERIOUS INJURY	25	8%
MODERATE INJURY	146	9%
MINOR INJURY	159	4%
PROPERTY DAMAGE ONLY	256	4%

Table 55 summarizes fatalities by key attributes such as use of seatbelts, motorcyclist-involved crashes, and age of driver, all of which are typically reported as NHTSA Core Safety Measures.

TABLE 55. CRASH FATALITIES IN THE URBAN GROWTH BOUNDARY BY YEAR (2016-2019)

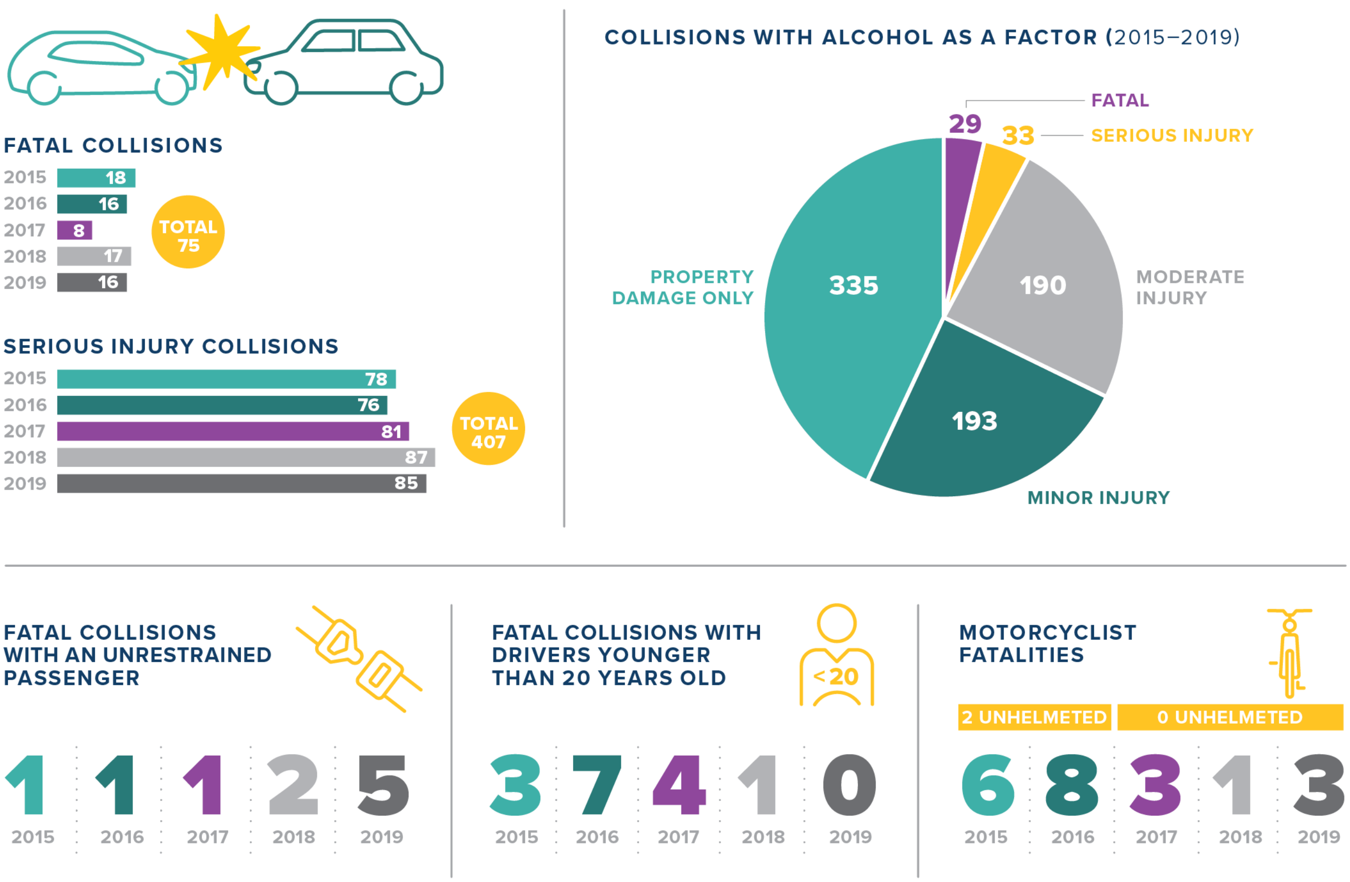
ATTRIBUTES	2016	2017	2018	2019	FOUR YEAR TOTAL
TOTAL	13	8	17	16	53
PASSENGER UNRESTRAINED	1	1	2	5	9
MOTORCYCLIST HELMETED*	3	1	3	3	10
MOTORCYCLIST UNHELMETED*	0	0	0	0	0
DRIVERS YOUNGER THAN 20 YEARS OLD	1	3	2	4	10

** All motorcyclists involved in fatal crashes were wearing helmets during this time period (2016 – 2019)*

Figure 58 provides an overview of other crash attributes.

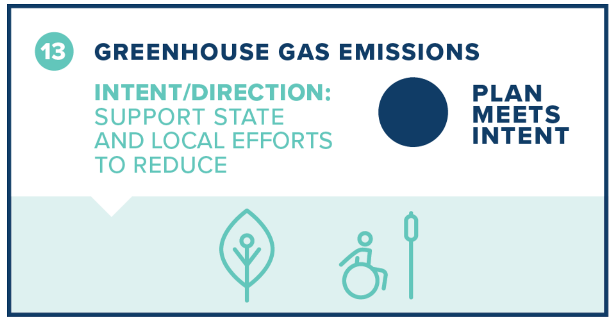
FIGURE 58. CRASH TREND SUMMARY (2015 TO 2019)

HIGH-LEVEL SAFETY REVIEW: ANALYSIS FROM 2015–2019



Note: *This data is reported for the "Eugene Springfield Urban Area"*
Source: *LCOG Online Data Portal, ODOT Crash Data, and NHTSA Core Safety Measures*

Transportation-Related Greenhouse Gas Emissions



Description: Support local and state efforts to reduce transportation-related GHG emissions

Measures:

- Actions taken to support local and state efforts to achieve a 20% reduction in GHGs by 2040 from light vehicles[71] consistent with the state goal to, by 2050, achieve GHG levels that are at least 75 percent below 1990 levels.[72]

Data Sources: Travel demand model, VisionEval model, *Central Lane Scenario Planning Final Report* June 2015,[73] ODOT, and local Climate Action Plans

Findings: Transportation accounts for roughly 38% of Oregon's GHG pollution. To meet state and local pollution reduction goals, several actions are needed, including improving vehicle efficiency, making fuel cleaner, and reducing how much vehicles travel. The first two of these three actions are largely handled at the state and federal levels. For example, Oregon's Clean Fuels Program and Federal vehicle efficiency laws respectively. The third, reducing how much people in the region drive, is primarily addressed at the local level.

The state's GHG goal is, "By 2050, achieve greenhouse gas levels that are at least 75 percent below 1990 levels" (Oregon Revised Statute 468A.205). This region also has a strong commitment towards lowering transportation-related GHGs as demonstrated through the existing efforts listed in Table 56.

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[71] "Light vehicles" means motor vehicles with a gross vehicle weight rating of 10,000 pounds or less (i.e. passenger vehicles, light duty trucks and sport utility vehicles)

[72] Oregon Revised Statute 468A.205 and Oregon Administrative Rule 660-044-0025

[73] While the *2015 Central Lane Scenario Planning Final Report* references the target in place at the time which was a 20 percent reduction below 2005 by 2035, this draft measure is looking towards the current legislation with the horizon year of 2040 for this RTP target. The preferred scenario from the *Final Report* met the target of a 20 percent reduction in GHGs by 2035 and is understood to meet a 20 percent reduction by 2040 with the assumptions in place at the time of scenario planning work.

TABLE 56. CLMPO EFFORTS TO SUPPORT LOCAL AND STATE EFFORTS TO REDUCE GHG

PLANNING EFFORT	DESCRIPTION
EUGENE-SPRINGFIELD METROPOLITAN REGION GREENHOUSE GAS INVENTORY (2010)	Identifies major sources of greenhouse gas emissions in the Eugene-Springfield area
CENTRAL LANE SCENARIO PLANNING (2015)	Explores how to meet the DLCD-set GHG emissions reduction target of 20% below 2005 levels by 2035 in the Eugene-Springfield Metropolitan Region
CENTRAL LANE SCENARIO PLANNING HEALTH IMPACT ASSESSMENT (2015)	Documents regional health impacts and related cost savings to anticipated reductions in GHG emissions associated with policies under consideration as part of the scenario planning process
CLMPO STRATEGIC ASSESSMENT (UNDERWAY)	Builds on the results of the Central Lane Scenario Planning work and the *Eugene Transportation Plan* scenario findings to test and quantify what regional policies, programs, and investment actions, grouped to make scenarios, will allow the MPO to achieve its long range local and State planning vision and goals; intended to guide the policy development and investment strategy options of the RTP update

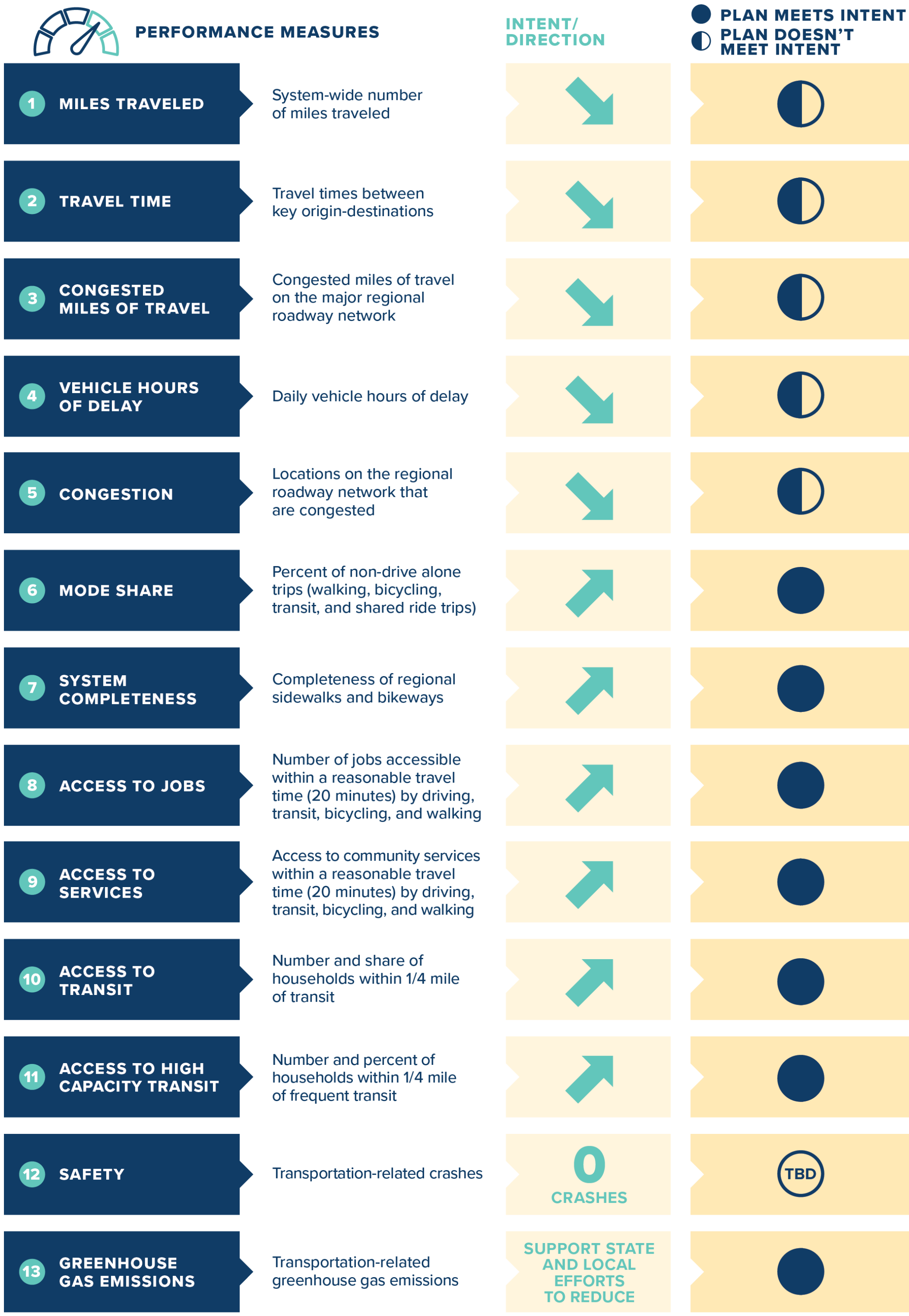
In addition to the efforts listed in Table 56, other regional actions related to reducing transportation-related GHG emissions include:

- City of Eugene's Climate Recovery Ordinance
- Lane Transit District's Climate Action Policy
- Lane County's *Climate Action Plan*
- A regional focus on supporting travel by public transportation transit, biking, walking, and shared occupancy vehicle

Additional legislation at the state and federal level is anticipated. The State's Climate-Friendly and Equitable Communities Rulemaking was initiated in September 2020 and is scheduled for adoption in spring 2022. It will result in an update to Oregon's Transportation Planning Rule and related administrative rules with a focus on meeting transportation-related GHG reduction goals. At the federal level, a proposed GHG measure was removed from the MAP-21 and FAST Act legislation, but it is anticipated that future transportation bills will reintroduce a related measure.

Summary of Regional OutcomesFigure 59 summarizes future trend alignment with targets, which helps CLMPO determine where to focus policies to better achieve the region's transportation goals.

FIGURE 59. REGIONAL PERFORMANCE MEASURE EVALUATION SUMMARY



CHAPTER 7: THE FUTURE OF THE REGION

HOW THE PLAN WILL BE USED

The RTP aligns transportation priorities, investments, and performance monitoring. These components of the RTP will continue to inform project implementation, progress towards regional goals, and future Plan updates.

The performance-based planning and programming framework establishes a mechanism to evaluate how well the Plan is performing and complying with federal requirements between Plan updates. CLMPO will coordinate the Plan implementation monitoring program in cooperation with implementing agencies. The ongoing Plan monitoring process includes the following four major components:

1. **Review trends, assumptions, and new opportunities**

   The first component of the Plan monitoring process includes awareness of how the region and transportation needs are changing. As the region changes and continues to evolve, it is important to consider new solutions and opportunities to address the region's transportation needs. These may include advancements in technology, information systems, or research that improve the best practices of traditional solutions.

2. **Inventory planning, program, and capital investment actions taken to implement RTP objectives**

   The second component of the Plan monitoring process involves documenting and tracking the planning, program, and capital investment actions local jurisdictions, and regional and state agencies apply to address RTP objectives. These actions are summarized in Chapter 5 of this RTP but will continue to evolve between Plan updates.

3. **Analyze transportation system performance using performance measures**

   The third component of the Plan monitoring process involves collecting data to assess transportation system performance in relation to the performance measures from Chapter 2 of this RTP. This analysis will provide a comprehensive view of how the transportation system is performing. The analysis will indicate when additional actions need to be taken. CLMPO may identify additional performance measures as needed throughout the planning period.

4. **Recommended actions and corrective steps, including potential Plan amendments during the next update cycle**

   The fourth component of the Plan monitoring process involves identifying actions and making recommendations as to how the Plan can be implemented most effectively. In many cases, these actions will involve increased or decreased emphasis on existing policies and implementation actions. In other cases, Plan monitoring will indicate that new or modified policies and implementation actions are necessary. Modifications to the Plan will most often be made during the regular Plan update process, occurring every four years. Should modifications need to be made to the Plan between updates, the Plan amendment process will be used.

EVOLVING IMPACTS ON THE REGION

Recent growth trends continue to shape the region and influence regional transportation needs and priorities. The influences of these trends and incremental growth are generally captured through regional population and travel forecasting that is incorporated into periodic updates of regional plans. In addition to these typical growth trends, there are several areas that are rapidly evolving, difficult to predict, and could have increased influence on future regional planning efforts. As each of these areas continue to evolve, they may require additional focused study to assess impacts on future RTP updates.

CHANGING POPULATION DEMOGRAPHICS

While changing population demographics are a typical occurrence, the rate of change will likely be influenced by other considerations noted in this section. In turn, changing population demographics may influence future modal strategies/priorities or how information is communicated (medium/language). Further, the aging population will also continue to influence modal strategies and priorities to account for needs of older populations including modal options beyond driving alone.

LONG-LASTING IMPACTS OF THE COVID-19 PANDEMIC

Initial transportation assessments of the COVID-19 pandemic conducted in Spring 2020 were that traffic volumes and congestion decreased as restrictions were placed on businesses and the transition to remote work environments. Since that time, many streets have experienced a return to (or are approaching) pre-pandemic traffic volumes. The long-lasting impacts of the pandemic will likely be shaped through several variables that will continue to evolve over the coming months and years:

- **Growth of e-commerce and shift from commercial storefront to residential delivery** – This may not yield a reduction in trips but will likely shift the types and patterns of trips as additional delivery vans visit residential areas.
- **Remote work flexibility** – Opportunities vary by job type, but it is likely that employees in certain sectors will be working remotely more frequently, reducing the number of weekly commute trips. In some cases, an employee may be working remotely a couple of days a week, while in other cases employees may transition to a 100 percent remote configuration and may not even reside in the same city/region as their employer.

Additional time and further research will enhance understanding of the lasting effects of the pandemic, which will be addressed in future RTP update cycles.

CLIMATE CHANGE

The CLMPO and other local, state, and federal agencies are actively creating policies to reduce and mitigate the impacts of climate change. The Oregon Statewide Transportation Strategy (STS) identified the initial framework and strategies to reduce the impacts of climate change. In spring 2020, Governor Brown issued Executive Order 20-04 to reduce and regulate GHG emissions, which triggered a series of activities through various state departments. The ODOT Climate Office was formed and is currently leading work efforts related to transportation electrification and to incorporate GHG considerations into the STIP. In addition to ODOT initiatives, cross-agency efforts and implementation including Department of Energy, DEQ, and DLCD are identified in *Every Mile Counts*. Of note, a Climate-Friendly and Equitable Communities rulemaking advisory committee is currently developing draft rules (projected LCDC adoption in Spring 2022) in six areas that will guide future transportation planning efforts in the region and around the state:

- Climate-friendly areas
- High quality bike, pedestrian, transit improvements
- Reduce parking mandates
- Limit use of congestion standards
- Transportation project prioritization
- Electric vehicle charging

EQUITY

Historically, benefits and burdens of transportation investments have not been fairly distributed, with the majority of burdens being placed on low-income communities, communities of color, elderly populations, and people with disabilities. The future of transportation planning will prioritize the input and needs of these communities that have been historically excluded from planning processes. This will include robust engagement strategies, government agency transparency, and transportation projects, programs, and activities that are tailored to the needs of each community.

The impact transportation has on the health and livability of communities is also continuing to be explored. Like the rest of the country, Lane County has a history of systemically disadvantaging certain populations based on race that has led to inequities in health outcomes, health behaviors, and the social determinants of health.[74] The social determinants of health include access to food, healthcare, and employment opportunities that can all be linked to the transportation system. As the interconnectedness of several disciplines is explored further, the role of the transportation system and its access and environmental impact will continue to be key factors in improving social and health equity for the communities in the Central Lane region.

On a state-wide policy level, the current Climate-Friendly and Equitable Communities rulemaking will directly influence these future efforts in Oregon.

HOUSING AND EMPLOYMENT

Housing and employment trends and locations may continue to evolve due to several associated factors noted here, including the pandemic and current rulemaking efforts. Rulemaking efforts may influence future local Comprehensive Plan changes. In addition, House Bill 2001 provides additional flexibility for housing types within single family zoning and may provide for increased residential densities.

[74] *Lane County Health Equity Report* 2020.

TECHNOLOGY

The significant influence that technology has on the transportation system continues to evolve. The growth of smartphones and related technology has (and will continue to) influenced:

- **Travel information and route planning** – This includes all modes, including current motor vehicle travel time, transit schedule and arrivals, pedestrian routes, TNC and rideshare opportunities, and micromobility opportunities. While route planning and selection of these modes has traditionally been a process focused on a single selected mode, there is now movement towards centralized payment platforms for all transportation users across different parking, transit, and micromobility platforms. This transition may further enable the use of multiple modes of travel due to these linkages with improved planning and payment systems.
- **Trip making behavior** – As noted with pandemic influences, technology is enabling both e-commerce growth and remote work opportunities.

In addition, technology advancements for both in-vehicle and roadway systems continue to advance. Additional technology in vehicles is continuing to assist improved awareness of system conditions and adjacent objects through cameras and other sensors. Improved technologies and advancements in connected vehicle technologies will provide opportunities to improve safety through reducing crashes and optimizing traffic flow. The cascading effects of these changes have been theorized and will continue to be incorporated into future plan updates as these changes influence travel behaviors.

INTELLIGENT TRANSPORTATION SYSTEMS PLAN

The ITS Plan was developed concurrently with this RTP for the first time in the region's history. Historically, the two plans have been developed separately with different stakeholder groups. Combining the two efforts allows the RTP to better integrate ITS solutions with other traditional capacity expansion focused solutions to solve congestion issues on the region's transportation system. The use of technology on the existing roadway footprint can be more cost effective and can prolong the need for local agencies and ODOT to invest significant funding in roadway expansion and the associated maintenance and operating costs.

The region can continue to leverage technology to solve transportation congestion and safety on the roadway network. Future updates to the ITS plan will continue to inform opportunities for monitoring plan progress (data and performance measures) and provide additional opportunities to further leverage technology.

ONGOING WORK

There are several ongoing efforts that could impact the region's transportation future funding and priorities.

Safe Lane Transportation Coalition

SLTC is a collaborative effort between governmental agencies, safety advocates, and the public to reduce crashes in Lane County. Funded partially through ODOT's Safe Communities program, in 2022 the coalition will receive additional federal funding to implement safety efforts such as marketing and education campaigns, safety analysis in Springfield, and a tactical urbanism program.

Transportation Options

CLMPO reorganized the Regional Transportation Options (TO) programming in 2020. The new structure prioritizes collaboration with regional partners, flexible programming (including pilots), and working with historically excluded populations. CLMPO continues to support regional and statewide TO work with internal staff as well as subcontracting work to the City of Eugene TO programs. The TO program continues to support SRTS Programming in all three school districts within the CLMPO boundary, Eugene 4J, Bethel School District, and Springfield School District.

Transit Tomorrow

Lane Transit District is currently undergoing an update to their long-range transit plan. This could impact the way CLMPO residents are served by transit, potentially increasing frequency so that more people in the region have access to 15-minute service. Due to the COVID-19 pandemic, Lane Transit District's Board of Directors has postponed the community input opportunity for the plan until the community can participate in a meaningful way.

Eugene Smart City Action Plan

The City of Eugene is creating a *Smart City Action Plan* in 2021/2022. This plan will use technology and data improvements to strategically address the challenges of climate change, economic development, housing affordability, homelessness, and equity. The project will help Eugene to improve the efficiency of city service delivery, advance local climate action and resilience, and increase equity and prosperity for the community using technology and data as strategic tools to achieve these goals.

Oregon Household Activity Survey

The Oregon Modeling Steering Collaborative (OMSC) will be deploying the next Oregon Household Activity Survey (OHAS) during this RTP's four-year cycle. OHAS is a collaborative and coordinated multi-agency effort. Transportation analysts, planners, and decision-makers rely on these types of periodic travel surveys to provide a "snapshot" of current household travel behavior. The data collected through this household travel survey effort will be critical for updating and improving the CLMPO travel demand model, which is the region's foundational analytical tool used to support transportation planning, because it will provide a comprehensive picture of personal travel behavior that is lacking in other data sources.

The OMSC is a collaborative forum that promotes coordination and knowledge/information sharing across the many agencies that are responsible for travel modeling within Oregon and Southwest Washington. The OMSC's mission is to ensure that transportation agency partners around the state continue to have the right analytical tools, and the skills and expertise needed to help answer important planning and policy questions about Oregon's transportation system, growth and development, and its economy. CLMPO staff participate in OMSC and will be actively engaged in the OHAS.

Proposed American Jobs Infrastructure Bill

The American Jobs Plan is a proposal to spend $2 trillion on U.S. infrastructure over 8 years. The plan includes large allocations of funding for physical infrastructure like roads, transit systems, and broadband, which could be distributed throughout the CLMPO region. The funding could integrate with ongoing planning efforts, such as the *Lane County Communications Plan* (currently in contracting), that will plan out a high-speed communications network for the county including the CMLPO area.

GLOSSARY

Access management

Measures that regulate access to streets, roads, and highways from public roads and private driveways while simultaneously preserving traffic flow on the surrounding road system in terms of safety, capacity, and speed. Measures may include but are not limited to restrictions on the siting of interchanges, restrictions on the type and amount of access to roadways, and the use of physical controls, such as signals and channelization, including raised medians, to reduce impacts of approaching road traffic on the main facility.

Accessibility

Physical proximity and ease of reaching destinations throughout the urban metropolitan area.

Active transportation

Any self-propelled, human-powered mode of transportation, such as walking or bicycling.

Air Quality Conformity Determination (AQCD)

An air quality conformity determination for a transportation plan or program is a finding that proposed transportation activities will not impede an area from continuing to meet air quality standards and will not cause or contribute to new air quality violations. The report is required in areas that have previously been determined to have violated standards for at least one of six pollutants identified by US-EPA.

Alternative modes

Means of travel such as rail, transit, bicycles, and walking that provide transportation alternatives to the use of the automobile.

Americans with Disabilities Act (ADA)

Federal civil rights legislation signed into law in 1990 that includes requirements for accessible public transportation services for persons with disabilities. Services include complimentary or supplemental paratransit services for persons who are unable to use regular bus service due to a disability in areas where fixed-route transit service is operated. All new construction and modifications must be accessible to individuals with disabilities. For existing facilities, barriers to services must be removed if readily achievable.

Autonomous vehicle (AV)

Also known as a driverless car, self-driving car, or robotic car, AVs use sensors and advanced control systems to operate independently of any input from a human driver. Transportation experts have developed a five-level system to distinguish between different levels of automation.

Average daily traffic (ADT)

The average number of vehicles passing a specified point in a typical 24-hour timeframe.

Baseline

A minimum or starting point used for comparisons.

Benchmarks

Target objectives for the RTP's Performance Measure assessment method. Benchmarks are required by the Transportation Planning Rule for use in evaluating progress at five-year intervals. Transportation system plans must be amended to include new or additional efforts where benchmarks are not met.

Bicycle

A vehicle having two tandem wheels, a minimum of 14 inches in diameter, propelled solely by human power, upon which a person or persons may ride. A three-wheeled adult tricycle is considered a bicycle. In Oregon, a bicycle is legally defined as a vehicle. Bicyclists have the same right to the roadways and must obey the same traffic laws as the operators of other vehicles.

Bicycle facilities

A general term denoting improvements and provisions made to accommodate or encourage bicycling, including parking facilities, all bikeways, and shared roadways not specifically designated for bicycle use.

Bike lane

A portion of a roadway that has been designated by striping, signing, and pavement markings for the preferential or exclusive use of bicyclists.

Bike share

A shared transport service in which bicycles are made available for shared use to individuals on a short-term basis within a defined service area.

Bus rapid transit (BRT)

Bus Rapid Transit is a bus route along an identified corridor that includes investments that improve bus reliability, speed, comfort, and convenience. Elements of a BRT project would include capital investment in improved stops and stations, exclusive or semi-exclusive lanes, limited stops, transit signal priority, and similar treatments. BRT also includes high frequency service, with peak periods served by buses arriving every fifteen minutes or less. In the Eugene-Springfield area, higher levels of investment have been branded as Emerald Express (EmX). Lower levels of investment are described as Enhanced Corridor (EC) investments. While Enhanced and EmX Corridors use the same types of investments, EmX has been developed to be a high level of investment with more use of exclusive lanes, branded buses, distinct stations with many amenities, among other features. Enhanced Corridors could be, but are not necessarily, considered bus rapid transit under current Federal Transit Administration guidelines.

Capacity

The maximum rate of flow at which persons or vehicles can be reasonably expected to traverse a point or uniform segment of a lane or roadway during a specified time period under prevailing roadway, traffic, and control conditions; capacity is usually expressed as vehicles per hour or persons per hour.

Capital improvement program (CIP)

A plan for future capital infrastructure and program expenditures that identifies each capital project, its anticipated start and completion, and allocates existing funds and known revenue sources for a given period.

Census block

Statistical areas bounded by visible features, such as streets, roads, streams, and railroad tracks, and by nonvisible boundaries. Census blocks nest within all other tabulated Census geographic entities and are the basis for all tabulated data.

Census block group

Statistical divisions of Census tracts, generally defined to contain between 600 and 3,000 people. Used to present data and control block numbering. Census block groups consist of clusters of Census blocks within the same Census tract that have the same first digit of their four-digit Census block number.

Center turn lane

Also called a two-way left-turn lane (TWLTL). A lane in the middle of a two-way street that provides left turn access to and from adjacent properties and roadways, while minimizing impacts of left turning vehicles on through traffic. Center TWLTL pavement markings consist of a normal broken yellow line and a normal solid yellow line to delineate the edges of a lane that can be used by traffic in either direction as part of a left-turn maneuver. A TWLTL is followed by a single direction left turn lane(s) or traversable median or non-traversable median on the approach to a signalized intersection. TWLTLs have been used to reduce rear-end, head-on, and turning-related crashes occurring on two-lane roads.

Climate change

Any significant change in the measures of climate lasting for an extended period of time. Climate change includes major variations in temperature, precipitation, or wind patterns, among other environmental conditions, that occur over several decades or longer. Changes in climate may manifest as a rise in sea level, as well as increase the frequency and magnitude of extreme weather events now and in the future.

Commute

Regular travel between home and a fixed location (e.g., work, school).

Conformity

Also known as transportation conformity. Transportation conformity is required by the Clean Air Act section 176(c) (42 U.S.C. 7506(c)) to ensure that federal funding and approval are given to highway and transit projects that are consistent with ("conform to") the air quality goals established by a state air quality implementation plan (SIP). Conformity, to the purpose of the SIP, means that transportation activities will not cause new air quality violations, worsen existing violations, or delay timely attainment of the national ambient air quality standards.

Congestion

A condition characterized by unstable traffic flows that prevents movement on a transportation facility at optimal legal speeds. Recurrent congestion is caused by constant excess volume compared with capacity. Nonrecurring congestion is caused by incidents such as bad weather, special events, and/or traffic wrecks.

Congestion management process (CMP)

A planning document that lays out the process used to manage congestion. This includes the application of strategies to improve transportation system performance and reliability by reducing the adverse impacts of vehicle congestion on the movement of people and goods.

Connectivity

The degree to which the local and regional street, pedestrian, bicycle, transit, and freight systems in a given area are connected.

Constrained budget

The budget of federal, state, and local funds the Central Lane MPO can reasonably expect through 2045 under current funding trends – presumes some increased funding compared to current levels.

Constrained Regional Transportation Plan project list

Projects in the Regional Transportation Plan that are reasonably expected to be funded with available revenue sources.

Crash

A violent collision, typically of one vehicle with another (vehicles include bicyclists, motorcyclists, freight trucks, school buses, transit buses, etc.), a pedestrian, or with stationary objects such as a pole or guard rail.

Delay

The additional travel time for vehicle travel, as measured by the time to reach destinations at posted speed limits (free-flow speed) versus traveling at a slower congested speed. Delay can be expressed in several different ways, including total delay in vehicle – hours, total delay per vehicle miles traveled (VMT) and share of delay by time period, day of week or speed range.

Demand

The amount and type of travel people choose. Many factors can affect travel demand, including demographics, quality of facilities, quality and price of alternatives, and land use patterns. Changes to these factors, due to trends or by design, can affect travel activity and therefore costs and problems such as congestion, crashes, and emissions.

Demographics

Statistical data relating to the population and particular groups within it.

Density

The quantity of people or things in a given area or space. In an urban context, density often refers to the number of developed units in a specific area of land, determined by the zoning code. For example, residential density is measured by dwelling units per acre. Other common measures of density include population density (residents per acre) and employment density (jobs per acre).

Destination

The place to which someone or something is going.

Diverse

Including or involving people from a range of different social, racial, and economic backgrounds.

E-Commerce

Commercial transactions conducted electronically on the internet.

Efficiency

Achieving maximum productivity with minimum congestion or expense.

Electric vehicle (EV)

Vehicles that use electric motors for propulsion instead of or in addition to gasoline motors.

Emergency transportation routes (ETRs)

Priority routes used during and after a major regional emergency or disaster to move people and response resources, including the transport of first responders (e.g., police, fire, and emergency medical services), fuel, essential supplies, and patients.

Emerging transportation technologies

A blanket term to refer to new developments in transportation technology. This may be in reference to technologies like automated vehicles or smart phones and services that operate using these technologies, like bike share.

Emissions

The production or discharge of something, in the case of transportation, primarily coming from burning fossil fuel.

Employer-based commute programs

Work-based travel demand management programs that can include transportation coordinators, employer-subsidized transit pass programs, ride-matching, carpool and vanpool programs, telecommuting, compressed or flexible work weeks, and bicycle parking and showers for bicycle commuters.

Equity

Recognizes that each person has different circumstances and allocates the exact resources and opportunities needed to reach an equal outcome.

Fixing America's Surface Transportation (FAST) Act

Federal transportation legislation that authorizes funding and establishes the requirements for the metropolitan planning process that governs CLMPO's activities. The FAST Act was signed into law in 2015 and includes the requirement for transportation performance management, which defines the decision-making framework for selecting transportation projects and programs that are tied to national goal areas.

Facility

The fixed physical assets (structures) enabling a transportation mode to operate (including travel, as well as the loading and unloading of passengers). This includes streets, throughways, bridges, sidewalks, bikeways, transit stations, bus stops, ports, air and marine terminals, and rail lines.

Federal Highway Administration (FHWA)

The federal agency responsible for administering roadway programs and funds. The FHWA implements transportation legislation approved at the congressional level that appropriates all federal funds to state and local governments.

Federal Transit Administration (FTA)

The federal agency responsible for administering transit programs and funds. The FTA provides financial and technical assistance to local public transit systems, including buses, subways, light rail, commuter rail, trolleys, and ferries. FTA also oversees safety measures and helps develop next-generation technology research.

Fiscal constraint

Refers to project or program cost within reasonably expected revenues over the planning period.

Forecast

Projection of population, employment, or travel demand for a given future year.

Freeway

A design for a throughway in which all access points are grade-separated. Direction travel lanes are usually separated by a physical barrier, and access and egress points are limited to on- and off-ramp locations or a very limited number of at-grade intersections.

Freight mobility

The efficient movement of goods from point of origin to destination.

Functional classification

Street classification system that describes streets according to their purpose and capacity. The four main categories are detailed below. Note that the jurisdictions in the Central Lane MPO may have slightly differing classifications for arterial and collector streets.

Functional classification, Local

All streets that are not collectors or arterials. These facilities serve primarily to provide direct access to abutting land and access to the higher order systems. They offer the lowest level of mobility and usually contain no bus routes. Service to through traffic movement is usually discouraged.

Functional classification, Collector

A street designed to provide both land access service and traffic circulation within residential neighborhoods, commercial, and industrial areas. The primary function of a collector street is to distribute local trips to the arterial system.

Functional classification, Minor arterial

Includes all arterials not classified as principal arterials and offers a lower level of traffic mobility than the higher street classifications. Such facilities may carry local bus routes and provide intra-community continuity, but ideally should not penetrate identifiable neighborhoods.

Functional classification, Principal arterial

A street that serves the major centers of activity of a metropolitan area, the highest traffic volume corridors, and the longest trip needs. Principal arterials should carry a high proportion of the total urban area travel on a minimum of mileage and provide important intra-urban as well as inter-city bus routes.

Goal

States a desired outcome toward which actions are focused to make progress toward a long-term vision.

Greenhouse gas emissions (GHGs)

The six gases identified by the Oregon Greenhouse Gas Mandatory Reporting Advisory Committee as contributing to global climate change include: carbon dioxide (CO_2), nitrous oxide (N_2O), methane (CH_4), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), and sulfur hexafluoride (SF_6).

Green infrastructure

A network of multi-functional green spaces and environmental features, both natural and engineered, that use or replicate natural systems to better manage stormwater, protect streams and enhance wildlife corridors—trees, soils, water, and habitats. Examples include: permeable paving, vegetated swales, rain gardens, green streets, green roofs, green walls, urban forestry, street trees, parks, green corridors such as trails, and other low impact development practices.

Health impact assessment

A combination of procedures, methods, and tools by which a policy, program, or project may be evaluated as to its potential effects on the health of a population and the distribution of these effects within the population.

High-occupancy vehicle (HOV)

Any passenger vehicle carrying more than one person. The term HOV is sometimes used to refer to lanes on large-volume roadways that are specifically set aside for the exclusive use of carpools, vanpools, and buses.

Highway

A design for a throughway in which access points are a mix of separate and at-grade.

Historically excluded communities

Communities of people that have been historically excluded from critical aspects of social participation including voting, education, housing, and more. Historical marginalization is often a result of systematic exclusion based on devaluation of any individual existing outside of the dominant culture. For purposes of the RTP, this includes people of color, people with limited English proficiency, people with lower-incomes, older adults, and people living with a disability.

Horizon year

The final year of the long-range planning period. Typically compared to the "Baseline."

Implementation actions

Specific measures for achieving RTP policies.

Individualized marketing

Travel demand management programs focused on individual households. These programs involve individualized outreach to households that identify household travel needs and ways to meet the needs with less vehicle travel.

Induced demand

Refers to the process whereby improvements in the transportation system intended to alleviate congestion and delay result in additional demand for the transportation segment, offsetting some of the improvement's potential benefits.

Intelligent Transportation Systems Technology (ITS)

The application of a broad range of advanced communications technologies that are integrated with transportation infrastructure and vehicles to improve the efficiency and safety of the transportation systems. ITS can include both vehicle-to-vehicle communication (which allows cars to communicate with one another to avoid crashes) and vehicle-to-infrastructure communication (which allows cars to communicate with the roadway) to identify congestion, crashes, or unsafe driving conditions; manage traffic flow; or provide alternate routes for travelers.

Intergovernmental coordination

Relating to or conducted between two or more governments.

Intermodal

Connecting individual modes of transportation and/or accommodating transfers between such modes. Intermodal transportation emphasizes the transfer of people or freight in a single journey through connections, provides options to facilitate trip making, and promotes coordination among transportation providers.

Intermodal Surface Transportation Efficiency Act (ISTEA) of 1991

The 1991 federal transportation funding legislation that provides for a new direction in transportation planning, with an emphasis to protect the environment and reduce congestion, relying on the most efficient transportation modes, and providing increased flexibility to state and local governments on the use of federal funds.

Jurisdiction

The territory or sphere of activity over which the legal authority of an institution extends.

Land use

Describes the human use of land. It represents the economic and cultural activities that are practiced in a given place.

Land use allocation model

Land use allocation models use economic theories and simplified statistical methods to explain and predict changes in land uses based on economic theories and social behaviors. They produce household and land use information that is integrated with transportation models to simulate the interdependent relationships between land uses and the transportation network. They also help determine the various impacts to the transportation network of various land use policies

Level of service

A qualitative rating of how well a unit of transportation supply (e.g., street, intersection, sidewalk, bikeway, transit route, ferry) serves its current or projected demand.

RATING	CHARACTERISTICS
A	Virtually free flow; completely unimpeded
B	Stable flow with slight delays; reasonably unimpeded
C	Stable flow with delays; less freedom to maneuver
D	High density but stable flow
E	Operation conditions at or near capacity; unstable flow
F	Forced flow; breakdown conditions

Local jurisdiction

For the purpose of this plan, this term refers to a city or county within the metropolitan boundary.

Long-range planning

A blueprint for a region's long-term transportation projects.

Major investment study (MIS)

A method of analyzing and evaluating the transportation needs and related problems of a corridor or subarea within a region. The MIS may identify a multimodal set of investment and policy options to address identified needs and problems, develop measures of benefits, calculate costs, and determine impacts. The process is intended to provide decision-makers with better and more complete information on the options available for addressing identified transportation problems before decisions are made.

Median

The middle value of a range of values.

Metro Plan

The *Eugene-Springfield Metropolitan Area General Plan, 1987 Update*, amendments incorporated as of July 1997, 1998 Reprint. The official document adopted by local governments that contains the general, long-range policies on how the community's future development should occur.

Metropolitan Planning Organization (MPO)

The organizational entity designated by law to have the lead responsibility for developing transportation plans and programs for urbanized areas of 50,000 or more in population. MPOs are established by agreement of the Governor and units of general purpose local government that together represent 75 percent of the affected population of an urbanized area. Lane Council of Governments is the MPO for the Eugene-Springfield metropolitan area (referred to in this Plan as CLMPO or Central Lane MPO).

Mitigation

Planning actions taken to avoid an impact altogether, minimize the degree or magnitude of the impact, reduce the impact over time, rectify the impact, or compensate for the impact. Mitigation includes:

- Avoiding the impact altogether by not taking a certain action or parts of an action.
- Minimizing impacts by limiting the degree or magnitude of the action and its implementation.
- Rectifying the impact by repairing, rehabilitating, or restoring the affected environment.
- Reducing or elimination the impact over time by preservation and maintenance operations during the life of the action.
- Compensating for the impact by replacing or providing substitute resources or environments.

Mixed-use development

A development that has a mixture of land uses that may include office and other commercial uses, residential uses, parks, and public places, and supporting public facilities and services.

Mobility

The ease with which a person is able to travel from place to place. It can be measured in terms of travel time.

Modal split

The proportion of total persons using a particular mode of travel.

Mode

A means of moving people and/or goods. Modes may include motor vehicles, public transit, bicycles, railroads, airplanes, waterways, pipelines, and pedestrian walkways.

Mode choice

The ability to choose one or more modes of transportation.

Mode share

The percentage of travelers using a particular type of transportation.

Motorcycle

A motor vehicle with motive power having a seat or saddle for the use of the rider and designed to travel on not more than three wheels in contact with the ground. The National Highway Traffic Safety Administration defines "motorcycle" to include mopeds, two or three-wheeled motorcycles, off-road motorcycles, scooters, mini-bikes, and pocket bikes.

Moving Ahead for Progress in the 21st Century Act (MAP-21)

Reauthorization of Federal highway funding, signed into law by President Obama in July 2012. Subsequent adoption of the FAST Act does not replace MAP-21 in all areas of regulation of transportation safety planning and funding, so both must be referenced.

Multimodal

Refers to the diversity of transportation options for the same trip. Also, an approach to transportation planning or programming that acknowledges the existence of or need for transportation options.

National Highway System (NHS)

Title 23 of the U.S. Code section 103 states that the purpose of the NHS is to provide an interconnected system of principal routes that serve major population centers, international border crossings, ports, airports, public transportation facilities, intermodal transportation facilities, major travel destinations, meet national defense requirements, and serve interstate and inter-regional travel. Facilities included in the NHS are of regional significance.

Network

Connected routes forming a cohesive system.

Objective

An attainable target that the community attempts to reach in striving to meet a goal. An objective may also be considered as an intermediate point that will help fulfill the overall goal.

Oregon Highway Plan (OHP)

Document that outlines the policies and strategies that will guide the Highway Division's operation and fiscal activities during the 1999-2020 period. The OHP is a statewide mode plan that is part of the *Oregon Transportation Plan* (OTP).

Oregon Statewide Planning Goals

A mandated statewide program for land use planning in place since 1973. The foundation of the program is a set of 19 goals that express the state's policies on land use and related topics such as natural resources (Goal 5), housing (Goal 10), and transportation (Goal 12).

Oregon Transportation Commission (OTC)

The OTC is a five-member governor-appointed government agency that manages the state highways and other transportation in the state of Oregon, in conjunction with the Oregon Department of Transportation.

Oregon Transportation Plan (OTP)

The comprehensive, long-range plan for a multimodal transportation system for the state that encompasses economic efficiency, orderly economic development, safety, and environmental quality. The OTP was adopted by the Oregon Transportation Commission in 2006.

Origin

The point or place where a trip begins.

Overlay zone

A set of zoning specifications that is imposed on an area, in addition to the underlying zoning district's requirements.

Pandemic

An outbreak of a disease prevalent over a whole country or the world. In the context of this planning effort, the coronavirus infectious disease (COVID-19) pandemic began in early 2020 and is still ongoing.

Paratransit

Transit alternative known as *special* or *specialized* transportation that often includes flexibly scheduled and routed transportation services that use low-capacity vehicles, such as vans, to operate within normal urban transit corridors or rural areas. Services usually cater to the needs of persons who cannot use standard mass transit services. Common patrons are the elderly and persons with disabilities.

Park-and-ride

Public parking lots whose primary purpose is to provide access to public transportation services. These parking areas may function as shared use parking areas.

Major park-and-rides

In general, this type of park-and-ride includes capacity for 100 cars or more. A major park-and-ride generally includes buses operating on-site and passenger amenities such as a larger style bus shelter, lighting, and passenger information and may include restrooms for operators. Major park-and-rides are not transfer points and usually are on-street bus stops.

Minor park-and-rides

A minor park-and-ride is smaller in scale than a major park-and-ride, with capacity for fewer than 100 cars. Buses typically will not operate on-site. Buses may serve the park-and-ride via an on-street bus stop, which may include a bus turnout and standard bus shelter adjacent to the bus stop. A minor park-and-ride generally is a public parking lot less than two acres in size. These stops are not transfer points and the bus stop is on-street.

Parking management

Management strategies designed to address the supply and demand for vehicle parking that result in more efficient use of parking resources. They contribute to balancing the travel demand within the region among the modes of transportation.

Passenger intermodal facilities

Facilities that accommodate or serve as transfer points to interconnect various transportation modes for the movement of people. Examples include the Eugene Airport, Eugene Amtrak Station, and intercity bus stations.

Passenger rail

Intercity passenger rail is part of the state transportation system. Amtrak is the company that controls the railroads that carry passengers in the United States. Amtrak provides service south to California, east to the rest of the continental United States, and north to Canada. It is a transit system that operates, in whole or part, on a fixed guideway.

Passenger train

A railroad train for only passengers, rather than goods.

Passenger vehicle

Motor vehicles with at least four wheels, used for the transport of passengers, and comprising no more than eight seats in addition to the driver’s seat. Light commercial vehicles are motor vehicles with at least four wheels, used for the carriage of goods.

Pavement condition rating (PCR)

Pavement condition ratings provide an assessment of pavement condition. Local and state road agencies use a pavement management process that provides, analyzes, and summarizes information for use in selecting and implementing cost-effective pavement construction, rehabilitation, and maintenance programs designed to accommodate current and forecasted traffic.

Pedestrian

A person traveling on foot, in a wheelchair, or in another health-related mobility device.

Pedestrian facility

A facility provided for the benefit of pedestrian travel, including walkways, protected street crossings, crosswalks, plazas, signs, signals, pedestrian-scale street lighting, and benches.

Per capita

For each person.

Performance measure

Predetermined indicators monitored during the life of the RTP as a method of evaluating the plan's effectiveness. To provide numerical targets needed to assess plan progression, *benchmarks* are established for each performance measure at five-year intervals.

Person trip

A movement from one address to another by one person by any mode.

Policy

Statement adopted as part of a plan to provide a specific course of action that moves the community towards attainment of its goals.

Posted speed

The speeds indicated on signs along the roadway. When speeds differ from statutory speeds there must be a posted sign indicating the different speed.

Probe data

Data generated by monitoring the position of individual vehicles (i.e., probes) over space and time rather than measuring characteristics of vehicles or groups of vehicles at a specific place and time.

Protected bike lane

Also referred to as a bike lane or cycle track. This is a bike lane that is physically separated from auto traffic. Typically they are created using planters, curbs, parked cars, or posts and are essential for creating a complete network of bike-friendly routes. For bicyclists, safety increases significantly when there is a physical separation from motorists through infrastructure.

Public health

The health of the population as a whole, especially as monitored, regulated, and promoted by the state.

Public transportation

Also called Transit. Any form of transportation open to the general public. Public transportation can include buses, trains, streetcars and trolleys, Dial-A-Ride, Mobility on Demand, bike share, electric scooters, etc.

Regional freight system

Identifies the transportation networks and freight facilities that service the region and state's freight mobility needs.

Regional roadway system

Streets with classifications of arterial and major collector.

Regional Transportation Plan (RTP)

A long-range transportation plan that is developed and adopted for the CLMPO planning area covering a planning horizon of at least 20 years. In non-attainment and maintenance areas, RTPs are updated every four years through the metropolitan transportation planning process. The RTP is a blueprint to guide investments for all forms of travel – motor vehicle, transit, bicycle, and walking – and the movement of goods and freight throughout the CLMPO area. The plan identifies and analyzes the needs of the metropolitan region and creates a framework for implementing policies and project priorities.

Regional transportation system

The system is limited to facilities of regional significance, generally including regional arterials and throughways, high capacity transit and regional transit systems, regional multi-use trails with a transportation function, bicycle and pedestrian facilities that are located on or connect directly to other elements of the regional transportation system, air terminals, as well as regional pipeline and rail systems.

Reliability

This term refers to consistency or dependability in travel times, as measured from day to day and/or across different times of day. Variability in travel times means travelers must plan extra time for a trip.

Resiliency

The ability to anticipate, prepare for, and adapt to changing conditions and withstand, respond to, and recover rapidly from disruptions.

Ride-hailing services

Also known as transportation network companies or TNCs. This includes companies like Uber and Lyft that use apps to connect passengers with drivers who provide rides in their personal vehicles.

Rideshare

A transportation demand management strategy where two or more people share a trip in a vehicle to a common destination or along a common corridor. Private passenger vehicles are used for carpools, and some vanpools receive public/private support to help commuters.

Road users

A motorist, passenger, public transportation operator or user, truck driver, bicyclist, motorcyclist, or pedestrian, including a person with disabilities.

Roadway capacity

The maximum sustainable flow rate at which vehicles or persons reasonably can be expected to traverse a point or uniform segment of a lane or roadway during a specified time period under given roadway, geometric, traffic, environmental, and control conditions.

Roundabout

A circular intersection with yield control on all approaches, islands to separate flows of traffic from each other and pedestrians, and geometric features to slow down traffic. Roundabouts have many benefits over stop-controlled and signalized intersections. They have proven safety benefits, often have lower delays, can lead to less congestion, can reduce the need for widening, reduce speeds in and around the roundabout, and as a result can benefit the surrounding community.

Safety (in transportation)

Protection from death or bodily injury from a crash through design, regulation, management, technology, and operation of the transportation system.

Safe Routes to School (SRTS)

A comprehensive engineering/education program focused on youth school travel that aims to create safe, convenient, and fun opportunities for students to walk, take transit, or roll (bike, scooter, mobility device, etc.) to and from school. The Safe Routes to School program incorporates the following six E's: equity, engagement, engineering, education, encouragement, and evaluation.

Shared trips

Trips taken by multiple passengers traveling in a single vehicle, including carpools, vanpools, transit trips, bike share, and some ride-hailing or car share trips.

Single-occupancy vehicle (SOV)

A vehicle, usually referring to a private automobile, that is carrying only one person.

Social determinants of health

Conditions in the environments where people are born, live, learn, work, play, worship, and age that affect a wide range of health, functioning, and quality of life outcomes and risks. There are five domains: Economic Stability, Education Access and Quality, Health Care Access and Quality, Neighborhood and Built Environment, and Social and Community Context. Access to food, education, healthcare, employment opportunities, and more can be linked to the transportation system.

Special transportation area (STA)

As defined by the *Oregon Highway Plan*, STAs are designated existing or future compact, mixed-use areas within an urban growth boundary in which growth management considerations outweigh the considerations underlying the highway level-of-service policy. STAs include central business districts, transit-oriented development areas, and other activity centers that emphasize non-auto travel. They are high-density areas with an interconnected local street network. They are not located on interstates or limited-access highways and are not encouraged on major designated freight routes.

Stakeholders

Individuals and organizations with an interest in or who are affected by the transportation planning process, including federal, state, regional, and local officials and jurisdictions, institutions, community groups, transit operators, freight companies, shippers, non-governmental organizations, advocacy groups, the general public, and people who have been traditionally underrepresented or excluded.

State highways

In Oregon, a network of roads that are owned and maintained by the Highway Division of ODOT, including Oregon's portion of the Interstate Highway System.

State Implementation Plan (SIP)

An air quality plan mandated by the Federal Clean Air Act that contains procedures to monitor, control, maintain, and enforce compliance with federal air quality standards.

Statewide Transportation Improvement Program (STIP)

Statewide budget and programming document for funding. Required by the Intermodal Surface Transportation Efficiency Act (ISTEA) legislation as a prioritized, fiscally constrained list of transportation projects that covers, at a minimum, a three-year period. STIPs are compiled by ODOT in order to program authorized levels of federal funding.

Strategy

Involves setting goals, determining actions to achieve the goals, and mobilizing resources to execute the actions. A strategy describes how the ends (goals) will be achieved by the means (resources).

Strategic Plan

Defines the desired direction and outcomes to guide decisions for allocating resources to pursue a strategy.

Street

Generally, a gravel, concrete, or asphalt-surfaced facility. The term collectively refers to arterial, collector, and local streets that are located in mixed-use corridors, industrial areas, employment areas, and neighborhoods. While the focus for streets has been on motor vehicle traffic, they are designed as multimodal facilities that accommodate bicycles, pedestrians, and transit, with an emphasis on vehicle mobility and special pedestrian infrastructure on transit streets.

Supply

The capacity of specific transportation infrastructures and modes over a time period.

Sustainable

A method of using a resource such that the resource is not depleted or permanently damaged.

Sustainability

Using, developing, and protecting resources in a manner that enables people to meet current needs and provides that future generations can meet future needs, from the joint perspective of environmental, economic, and community objectives.

Systems development charge (SDC)

A fee collected from new development by local governments to pay for offsite public facility improvements to mitigate impacts associated with development. SDCs are imposed on development projects by local governments to cover the capital costs for certain types of infrastructure and public facilities needed to serve those developments. Under Oregon's SDC Act of 1989, transportation facilities are eligible capital improvements that may be funded by SDCs. Examples include arterial and collector streets; acquisition of street rights-of-way, easements, and other property interests necessary to construct a capital improvement; and traffic control devices.

System efficiency

Strategies that optimize the use of the existing transportation system, including traffic management, employer-based commute programs, and individualized marketing.

System management

A set of strategies for increasing travel flow on existing facilities through improvements.

Target

A numerical goal or state direction to be achieved for which quantifiable or directional targets may be set, assigning a value to what the RTP is trying to achieve. Targets are expressed in quantitative terms and provide an important measure of progress toward achieving different goals within a timeframe specified for it to be achieved.

Throughways

Controlled access (on-ramps and off-ramps), freeways, and major highways.

Traffic

Movement of motorized vehicles, non-motorized vehicles, and pedestrians on transportation facilities. Often traffic levels are expressed as the number of units moving over or through a particular location during a specific time period.

Traffic calming

A variety of techniques designed to reduce the speed and impacts of motor vehicle traffic. It is an attempt to mix the different modes of transportation and to create an efficient mix between them. Examples in this region include road humps, bulb outs at intersections, and roundabouts.

Traffic management

Strategies that improve transportation system operations and efficiency, including ramp metering, active traffic management, traffic signal coordination, and real-time traveler information regarding traffic conditions, incidents, delays, travel times, alternate routes, weather conditions, construction, or special events.

Transit station

Major transit station

Provides room for three or more buses for customer transfers and to facilitate bus operations. A major transit station typically includes a larger facility than minor stations to accommodate passenger transfers (to three or more routes and/or serves major destinations) and may include parking for customers and restrooms for Lane Transit District employees or the public. A major station is usually an off-street facility.

Minor transit station

Provides room for two or three buses. Minor transit stations are primarily large bus turnouts near key intersections to facilitate customer transfers (to two to four routes) or bus operations. Minor stations may include parking. Typically, a minor transit station is an on-street facility.

Transit-oriented development (TOD)

A mix of residential, retail, and office uses, and a supporting network of roads, bicycle, and pedestrian ways focused on a major transit stop designed to support a high level of transit use. The key features of transit-oriented development include:

- A mixed-use center at the transit stop, oriented principally to transit riders and pedestrian and bicycle travel from the surrounding area;
- High density of residential development proximate to the transit stop sufficient to support transit operation and neighborhood commercial uses within the TOD; and
- A network of roads, and bicycle and pedestrian paths to support high levels of pedestrian access within the TOD and high levels of transit use.

Transportation analysis zones

A unit of geography most commonly used in conventional transportation planning models, attributing socio-economic data to geographic locations to calculate travel patterns.

Transportation demand management (TDM)

Also known as transportation options. The application of a set of strategies that affect when, where, and how much people travel in order to make more efficient use of transportation infrastructure and services. Strategies include offering other modes of travel such as walking, bicycling, ride-sharing, and vanpool programs; education such as individualized marketing, policies, and regulations; and other combinations of incentives and disincentives that are intended to reduce drive alone vehicle trips on the transportation network.

Transportation disadvantaged

Persons who are unable to transport themselves or purchase transportation and have no form of transportation. This population group consists of low-income groups, persons with disabilities, those who are not old enough to drive and older adults. Therefore, the transportation disadvantaged must rely on public transit or paratransit services for their transportation needs.

Transportation improvement program (TIP)

Required by the Intermodal Surface Transportation Efficiency Act (ISTEA) legislation as a prioritized fiscally constrained list of transportation projects that covers, at a minimum, a three-year period. TIPs are compiled by a metropolitan planning organization in order to program authorized levels of federal funding.

Transportation options (TO)

A program intended to increase the number of transportation options to reduce the number of single-occupant vehicles and to reduce congestion instead of increasing capacity on roadway facilities.

Transportation Planning Rule (TPR)

An Oregon state planning administrative rule, adopted by the Land Conservation and Development Commission to implement state land use planning Goal 12, *Transportation*. The TPR requires ODOT, MPOs, Counties, and Cities to prepare a Transportation System Plan to identify transportation facilities and services to meet state, regional, and local needs, as well as the needs of the transportation disadvantaged and the needs for movement of goods and services to support planned industrial and commercial development.

Transportation system

Various transportation modes or facilities serving as single unit or system.

Transportation system management and operations (TSMO)

A set of strategies for increasing travel flow on existing facilities through improvements such as ramp metering, traffic signal synchronization, incident response, and access management.

Transportation system plan (TSP)

A plan for one or more transportation facilities that are planned, developed, operated, and maintained in a coordinated manner to supply continuity of movement between modes, and within and between geographic and jurisdictional areas. Specific requirements are detailed in the Transportation Planning Rule.

Travel demand model

A technique for predicting future human choices in travel by using current travel trends in conjunction with future population, employment, and land use projections.

Travel time

The measure of time that it takes to reach another place in the region from a given point for a given mode of transportation. Stable travel times are a sign of an efficient transportation system that reliably moves people and goods throughout the region.

Travel time reliability

Refers to consistency or dependability in travel times, as measured from day to day and/or across different times of day. Variability in travel times means travelers must plan extra time for a trip.

Trip

A one-way movement of a person or vehicle between two points.

Unhoused individuals

Individuals without permanent shelter.

Urban growth boundary (UGB)

The politically defined boundary around an urban area beyond which no urban improvements may occur. In Oregon, UGBs are defined so as to accommodate projected population and employment growth within a 25-year planning horizon. A formal process has been established for periodically reviewing and updating the UGB so that it meets forecasted population and employment growth.

Urban standards

Standards for all arterial and collector streets that include curb, gutter, underground drainage, and sidewalks, unless otherwise noted. When provisions for bicycles are anticipated, they are specifically mentioned.

Vehicle miles of travel (VMT)

Each mile traveled by a private vehicle. For example, one vehicle that makes a five-mile car trip would generate five vehicle miles of travel. A requirement of the state Transportation Planning Rule is to reduce vehicle miles traveled per capita.

Vision Zero

A system and approach to public policy developed by the Swedish government which stresses safe interaction between roads, vehicles, and users. Highlighted elements include a moral imperative to preserve life, and that the system conditions and vehicle be adapted to match the capabilities of the people that use them.

Volume-to-capacity (V/C) ratio

This is a measure of potential roadway capacity. A ratio expressing the relationship between the existing or anticipated volume of traffic on a roadway and the designed capacity of the facility. V/C standards set ratios as a minimum operating standard. Deficiencies can be addressed by lowering traffic volumes through demand management, transit, etc.; by increasing capacity through access management, signal timing, adding lanes, etc.; or a combination of methods.

Vulnerable users

Refers to groups of people that are more vulnerable to being killed or seriously injured in traffic crashes. Vulnerable users are pedestrians, bicyclists, motorcycle operators, children, older adults, construction workers, people with disabilities, people of color, and people with low income.

ACRONYMS

ACS	American Community Survey
ADA	Americans with Disabilities Act
ADT	Average daily traffic
AV	Autonomous vehicle
BRT	Bus rapid transit
CDC	Center for Chronic Disease and Prevention
CFR	Code of Federal Regulation
CIP	Capital improvement program
CMAQ	Congestion Mitigation and Air Quality Improvement Program
CMP	Congestion Management Process
CLMPO	Central Lane Metropolitan Planning Organization
CSZ	Cascadia Subduction Zone
DEQ	Department of Environmental Quality
DLCD	Department of Land Conservation and Development
EmX	Lane Transit District's Emerald Express bus route
EPA	U.S. Environmental Protection Agency
ETR	Emergency transportation route
EUG	Eugene Airport
EV	Electric vehicle
FAST	Fixing America's Surface Transportation Act
FEMA	Federal Emergency Management Agency
FHWA	Federal Highway Administration
FTA	Federal Transit Administration
FY	Fiscal year
GHG	Greenhouse gas emissions
GIS	Geographic Information System
HIA	Health Impact Assessment
HOV	High-occupancy vehicle
HPMS	Highway Performance Monitoring System
ISTEA	Intermodal Surface Transportation Efficiency Act
ITS	Intelligent transportation systems

JTA	2009 Jobs and Transportation Act
LCDC	Land Conservation and Development Commission
LCOG	Lane Council of Governments
LMP	Limited Maintenance Plan
LOS	Level of service
LRAPA	Lane Regional Air Pollution Authority
LTD	Lane Transit District
LUM	Land use measures
MAP-21	Moving Ahead for Progress in the 21st Century
MPC	Metropolitan Policy Committee
MPO	Metropolitan Planning Organization
MTIP	Metropolitan Transportation Improvement Program
NAAQS	National Ambient Air Quality Standards
NACDD	National Association of Chronic Disease Directors
NHS	National Highway System
NHTSA	National Highway Transportation Safety Administration
NPMRDS	National Performance Management Research Data Set
OM&P	Operations, maintenance, and preservation
OAR	Oregon Administrative Rules
ODOT	Oregon Department of Transportation
OHAS	Oregon Household Activity Survey
OHP	Oregon Highway Plan
OMSC	Oregon Modeling Steering Collaborative
OSTI	Oregon Sustainable Transportation Initiative
OTC	Oregon Transportation Commission
OTP	Oregon Transportation Plan
PM	Particulate matter
PMS	Pavement management system
PMT	Project management team
PRC	Portland State University's Population Research Center
RAC	Lane County Roads Advisory Committee
RACM	Reasonably Available Control Measures

RACT	Reasonably Available Control Technology
RITIS	Regional Integrated Transportation Information System
ROW	Right-of-way
RRFB	Rectangular rapid flashing beacons
RTP	Regional Transportation Plan
SAFTEA-LU	Safe, Accountable, Flexible, Efficient Transportation Equity Act
SDC	Systems development charge
SIP	State Implementation Plan
SLTC	Safe Lane Transportation Coalition
SOV	Single occupant vehicle
SRTS	Safe Routes to School
STA	Special transportation areas
STBG-S	Surface Transportation Block Grant State Program
STBG-U	Surface Transportation Block Grant Urban Program
STFAC	Special Transportation Fund Advisory Committee
STIF	Statewide Transportation Improvement Fund
STIP	Statewide Transportation Improvement Program
STP	Surface Transportation Program
STS	ODOT's *Statewide Transportation Strategy: A 2050 Vision for GHG Reduction*
TA	Transportation Alternatives
TAC	Technical Advisory Committee
TAM	Transit asset management
TAP	Transportation Alternatives Program
TASC	Transportation Advisory Subcommittee
TAZ	Transportation analysis zones
TCM	Transportation control measure
TDM	Transportation demand management
TIP	Transportation improvement program
TMA	Transportation management area
TO	Transportation options
TOAC	Transportation Options Advisory Committee
TOD	Transit-oriented development

TPC	Transportation Planning Committee
TPR	Transportation Planning Rule
TRIP	Transportation Rule Implementation Project
TSI	Transportation system improvements
TSMO	Transportation system management and operation
TSP	Transportation System Plan
TUF	Transportation utility fee
UASI	Urban Areas Security Initiative
UGB	Urban growth boundary
UPWP	Unified Planning Work Program
USDOT	United States Department of Transportation
V/C	Volume to capacity
VHD	Vehicle hours of delay
VMT	Vehicle miles of travel
WAI	Walkability Action Institute

Appendix A: Consultation and Cooperation

Purpose

Intergovernmental coordination is a foundational role for the Central Lane MPO. This coordination is facilitated through the development of the Unified Planning Work Program and budget, specific review procedures for major planning projects such as the Regional Transportation Plan and Metropolitan Transportation Improvement Program, and active and meaningful participation on advisory committees. This appendix summarizes the interagency coordination that guides CLMPO's work and follows the framework identified in 23 CFR 450.316.[1] This defines how CLMPO conducts consultation with other governments, agencies or stakeholders that are affected by the regional transportation system during the transportation planning process. The process for CLMPO public participation is identified in the Public Participation Plan.

Partners in Planning

The coordination of CLMPO's planning activities with state and federal transportation planning and management efforts is accomplished in numerous ways.

- **Planning Agencies**- The following jurisdictions participate in regular advisory meetings to ensure coordination and cooperation.
    - City of Eugene
    - City of Springfield
    - City of Coburg
    - Lane County
    - Lane Transit District
    - Oregon Department of Transportation

- Staff and elected officials participate in the following committees

[1] Appendix X describes Public Involvement for this Regional Transportation Plan. The Public Participation Plan describes participation policies and procedures for CLMPO activities.

- Metropolitan Policy Committee: The policy board of the Central Lane MPO is the Metropolitan Policy Committee (MPC), and the geography of this body is determined by the distribution of population and development within the central Lane County area. After each census the Central Lane MPO redefines the boundaries of the urbanized area and adjusts its membership accordingly. The MPO works in cooperation with MPC, local government, state and federal agencies and the public to improve transportation in the Central Lane County region. All meetings are open to the public, and public participation is encouraged.
- Transportation Planning Committee: The Central Lane MPO is supported by several additional committees. MPC has appointed the Transportation Planning Committee (TPC) which contains staff-level participation from the various local governments within the Central Lane MPO area, primarily planners and engineers. All meetings are open to the public, and public participation is encouraged. The following subcommittees provide input to TPC:
  - The Technical Advisory Sub-Committee (TASC) is a subcommittee to TPC of technical staff.
  - The Transportation Options Advisory Committee is a subcommittee to TPC and provides input on Transportation Options planning and programs.
  - The Safe Lane Coalition provides a collaborative space to create education and programs that improve safety outcomes in the CLMPO and Lane County.
- Lane Area Commission on Transportation: The Central Lane MPO also works closely with the Lane Area Commission on Transportation (Lane ACT). Lane ACT is an advisory body to the Oregon Transportation Commission (OTC) established to provide a forum for stakeholders to collaborate on transportation issues affecting Lane County and to strengthen state/local partnerships in transportation. For more information visit the State of Oregon's ACT page.

- State and federal planning agencies: Federal and State representatives are invited to monthly TPC and MPC meetings. The following coordination meetings support ongoing conversation around CLMPO planning issues.
  - Quarterly Coordination CLMPO certification meetings
  - Quarterly ODOT/Transit/MPO Coordination
  - MTIP/STIP Quarterly Meeting

Consultation Procedure Documents

Listed below are the consultation procedure documents as required by the FAST-ACT and by the Code of Federal Regulations under sections CFR 450.210 and CFR 450.316.

1) The MPO/ODOT/Transit agreement[2] is required by 23 CFR 450.314 which provides a matrix of the roles and responsibilities between the three agencies regarding long-range and short-range financial planning used in the preparation of transportation plans and programs; the collection, analysis and reporting of federally required performance measures; and the annual listing of obligated projects. This document is updated every 5-10 years. The most recent version of this agreement (IGA 32794) was executed on February 9, 2019
2) Central Lane MPO Public Participation Plan seeks to ensure broad public participation during the development, review, and refinement of regional transportation programs. The intent is to involve the public early in the transportation planning process and to include a variety of public involvement opportunities. The Central Lane MPO Public Participation Plan was approved October 1, 2015 by the Metropolitan Policy Committee (MPC).
   The Public Participation Plan:
   a. Ensures that all MPO transportation plans, programs, and projects include adequate public involvement prior to action by the Metropolitan Policy Committee.
   b. Explain and describe how the public can be involved in the transportation planning process.
3) Coordinated human services transportation plan: The Lane Coordinated Transportation Plan, adopted by Lane Transit District "unified, comprehensive strategy for public transportation service delivery that identifies the transportation needs of individuals with disabilities, older adults, and individuals with limited income, laying out strategies for meeting these needs, and prioritizing services," that is developed through a public process.
4) Program of Projects Cooperative Procedures Intergovernmental Agreement between the MPO and Lane Transit District outlines the cooperative procedures associated with LTD's Program of Projects. This outlines the process in which the Metropolitan Transportation Improvement Program fulfills the federal requirements of public outreach for the Program of Projects.
5) Lane Council of Governments' intercommunity transit line *Link Lane* provides bus routes that connect communities within and beyond Lane County. The service is provided by Lane Council of Governments in partnership with the Confederated Tribes of Coos, Lower Umpqua and Siuslaw Indians and is funded by Oregon's Statewide Transportation Improvement Fund. The partnership is described in the *Florence-Eugene Pilot Bus Route* Intergovernmental Agreement.

Interagency air quality conformity consultation

The CLMPO conducts an interagency air quality conformity consultation and report for the RTP and the MTIP. An air quality conformity determination (AQCD) for a transportation plan or program is a finding that proposed transportation activities will not impede this area from continuing to meet air quality standards and will not cause or contribute to new air quality violations. The report is required in areas that have previously been determined to have violated standards for at least one of six pollutants identified by US-EPA. In the Eugene-Springfield area, that pollutant is coarse particulate matter (PM_{10}).

CLMPO is the lead agency responsible for making the conformity determination for the RTP and RTP amendments, MTIP and MTIP amendments, and preparing and distributing the draft and final

[2] Current agreement can be found online: ODOT/MPO/Public Transportation Provider Agreement

documents. The determination is done in direct coordination with the interagency consultation group (IAC) consisting of representatives from several state and federal agencies, including Department of Environmental Quality (DEQ), Department of Transportation (DOT), Environmental Protection Agency (EPA), Federal Transit Authority (FTA), Lane Regional Air Protection Agency (LRAPA), and ODOT. This process includes draft document review, discussion meetings, and thirty-day public involvement period.

Environmental Consultation

The Fixing America's Surface Transportation (FAST) Act requires MPOs to consider how the RTP will protect and enhance the environment and discuss environmental mitigation activities and potential areas to carry out these activities. CLMPO's 2045 RTP addresses these requirements in RTP Appendix H Environmental Analysis.

Per 23 CFR §450.306(g)(10), MPOs must consult with state and local agencies responsible for land use management, natural resources, environmental protection, conservation, and historic preservation concerning the development of the transportation plan, including a comparison of transportation plans with state conservation plans or maps and a comparison of transportation plans to inventories of natural or historic resources. In accordance with this federal regulation, the CLMPO consulted with Federal, State, local, and Tribal entities responsible for land use management, natural resources, environmental protection, conservation, and historic preservation.

The agencies listed below were solicited for feedback on RTP Appendix H Environmental Analysis prior to the public comment period. CLMPO received comments from the Department of State Lands and the US Army Corps of Engineers (documented in RTP Appendix F). This feedback has been incorporated into the final Environmental Analysis draft.

Category	Type	Agency (Contact Title)
Airport Operators	City	Eugene Airport (Assistant Airport Director)
Disaster Mitigation	State	Oregon Department of Transportation
	State	Oregon Department of Transportation
Environmental Protection	Federal	U.S. Environmental Protection Agency
	Federal	U.S. Army Corps of Engineers (Eugene Section Chief)
	State	Oregon Department of Transportation Environmental R2 (Environmental Manager)
	State	Oregon Department of Environmental Quality
Freight Management	State	Oregon Department of Transportation Freight (Freight Program Manager)
General	State	Oregon Department of Transportation
Historic Preservation	State	Oregon State Historic Preservation Office (Deputy State Historic Preservation Officer)
Land Use Management	State	Oregon Division of State Lands (Aquatic Resource Planner)
	State	Oregon Department of Land Conservation and Development
Natural Resources	Federal	National Marine Fisheries Service
	Federal	U.S. Fish and Wildlife Service
	State	Oregon Department of Fish and Wildlife (District Fish Biologist)
	Local	Lane Regional Air Protection Agency (Executive Director)
	Local	Lane Regional Air Protection Agency (Operations Manager)

	Local	Lane Regional Air Protection Agency (Air Monitoring and Data Quality Coordinator)
Tribes	Tribes	Confederated Tribes of the Grand Ronde Community in Oregon (Manager, Historic Preservation)
	Tribes	Confederated Tribes of Siletz Indians (Transportation Planner)
	Tribes	Confederated Tribes of Coos, Lower Umpqua, and Siuslaw Indians
	Tribes	University of Oregon Tribal Government Relations (Tribal Liaison)
	Tribes	Lane Community College Native American Student Program (Program Coordinator)

Tribal Consultation

Land Acknowledgment

The CLMPO boundary resides within ancestral and unceded traditional territories of the Chelamela, Kalapuya, Siuslaw, and Winefelly Peoples. The Indigenous peoples of this land never surrendered lands or resources to the United States. Following treaties between 1851 and 1855, Kalapuya people were dispossessed of their indigenous homeland by the United States government and forcibly removed to the Coast Reservation in Western Oregon. Today's descendants of the Kalapuya are citizens primarily of the Confederated Tribes of Grand Ronde Community of Oregon and the Confederated Tribes of the Siletz Indians of Oregon. We give our respect and appreciation to all the Kalapuya generations stewarding this land and to the many more tribes who have ancestral connections to this land. Additionally, we recognize the historical and ongoing legacy of colonialism and acknowledge this as a point of reflection for us all as we work towards dismantling colonial practices.

We express our respect for all federally recognized Tribal Nations of Oregon. This includes the Burns Paiute Tribe, the Confederated Tribes of the Coos, Lower Umpqua and Siuslaw Indians, the Confederated Tribes of the Grand Ronde Community of Oregon, the Confederated Tribes of Siletz Indians of Oregon, the Confederated Tribes of the Umatilla Indian Reservation, the Confederated Tribes of Warm Springs, the Coquille Indian Tribe, the Cow Creek Band of Umpqua Tribe of Indians, and the Klamath Tribes. We also express our respect for all other displaced Indigenous peoples who call Oregon home.

Tribal Government Consultation

The United States Government's relationship with Tribal governments is set forth in the Constitution of the United States, treaties, statutes, judicial decisions, and Executive Orders and Presidential memorandums. Therefore, to the greatest extent practicable and to the extent permitted by law, CLMPO consults with tribal governments prior to taking actions that have substantial direct impact on federally recognized tribal governments. To ensure that the rights of sovereign tribal governments are fully respected, all such consultations are to be open and candid so that tribal governments may evaluate for themselves the potential impact of relevant proposals.

Confederated Tribes of the Coos, Lower Umpqua and Siuslaw Indians and the Confederated Tribes of Siletz Indians are both contacted during the RTP and MTIP update period to determine their interest in participating in the RTP or TIP update, the extent they would like to participate and the means of receiving information and commenting on the draft documents.

General Transportation Consultation

Other agencies and organizations are also notified through the public outreach process discussed in the Public Participation Plan. Results of the consultation will be recorded and added to the record of the document as appropriate. Some consultation will coincide with the defined public review period for a document, and as such will be 30-days in duration. Comments received will be summarized and responded to as appropriate and included in the final RTP or MTIP.

Appendix B: Congestion Management Process

TABLE OF CONTENTS

LIST OF FIGURES

LIST OF TABLES

BACKGROUND AND INTRODUCTION

The Central Lane Metropolitan Planning Organization (Central Lane MPO) is the designated Metropolitan Planning Organization (MPO) for the Eugene-Springfield urban area and is responsible for carrying out cooperative, continuous, and comprehensive planning processes for making transportation investment decisions; preparing and maintaining a long-range multimodal transportation plan; and preparing a transportation improvement program to provide for transportation investments meeting metropolitan transportation needs. The Central Lane MPO was established in 1974 and covers the urban growth boundaries of the cities of Eugene, Springfield, Coburg, and a small area of Lane County adjacent to these urban areas. The Congestion Management Process (CMP) is a combined effort of the Central Lane MPO partner agencies: the Cities of Eugene, Springfield, and Coburg, Lane County, Lane Transit District, and ODOT.

This document lays out the process used by Central Lane MPO to manage congestion. Congestion management is the application of strategies to improve transportation system performance and reliability by reducing the adverse impacts of vehicular congestion on the movement of people and goods. A CMP is a systematic and regionally accepted approach for managing vehicular congestion that provides accurate, up-to-date information on transportation system performance and assesses alternative strategies that meet state and local needs. The CMP is reflective of regional congestion issues as well as regional goals and objectives that are specific to the Central Lane MPO area.

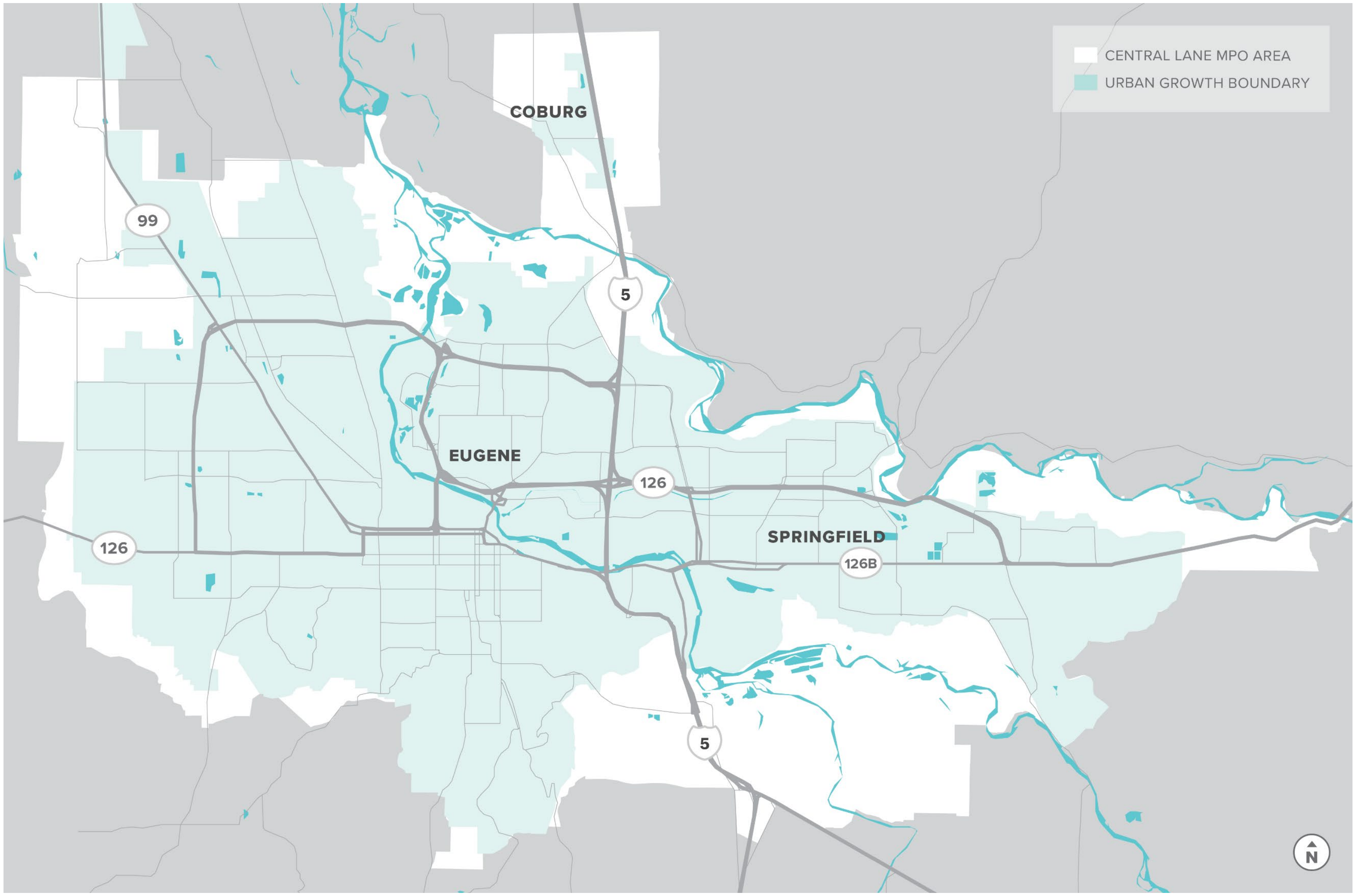
The Federal Highway Administration (FHWA) requires all MPOs that have urban areas with a population of over 200,000, designated as Transportation Management Areas (TMAs), to have a CMP.

According to Code of Federal Regulation (CFR), 23CFR450.320(a) and (b), TMAs shall cooperatively address congestion management through a process that provides for a safe and effective integrated management and operation of the multimodal transportation system…through the use of travel demand reduction and operational management strategies.

PLANNING AREA

The Central Lane MPO is governed by a policy board composed of elected representatives from member jurisdictions, referred to as the Metropolitan Policy Committee (MPC). Member jurisdictions of the MPC include Eugene, Springfield, Coburg, Lane County, Lane Transit District, and the Oregon Department of Transportation. Staffing for the MPO is provided through the Lane Council of Governments. Figure 1 below illustrates the Central Lane MPO Planning Area and the cities' urban growth boundaries.

FIGURE 1: CENTRAL LANE MPO AREA



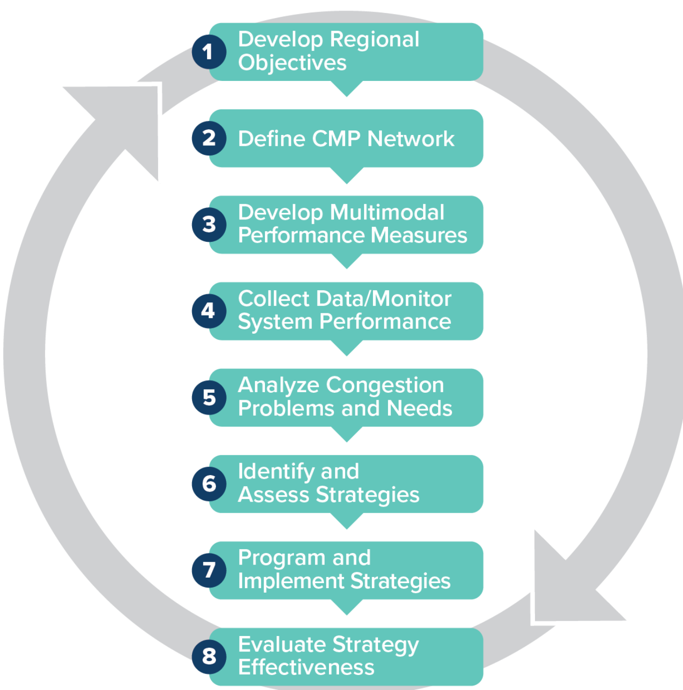
OVERVIEW OF CENTRAL LANE MPO CMP

Federal guidelines provide MPO agencies with discretion on how to develop the CMP. Central Lane MPO's approach reflects the RTP goals and includes policies that influence the types of solutions and investments to manage vehicular congestion consistent with the regional goals.

The CMP reports on performance trends and regional strategies and uses this to address the transportation system's congested corridors with a list of high-priority strategies, projects, and studies.

This CMP document is organized around the eight actions that are described by the FHWA and illustrated in Figure 2. The Figure shows a progression of planning activities, or steps, and the iterative nature of the ongoing MPO regional planning process. Subsequent sections of this CMP are organized by these eight steps. Central Lane MPO has the freedom to vary the level of effort for each of the action areas, depending on the available funding for data collection, and the extent and depth of analysis that might be required to inform key strategy decisions.

FIGURE 2: CONGESTION MANAGEMENT PROCESS STEPS



Source: Congestion Management Process Guidebook, Figure 2, FHWA, April 2011.

HOW THE CMP FITS INTO THE REGIONAL PLANNING PROCESS

The CMP is intended as a core part of the metropolitan transportation planning process. This process spans from the goal-making stages to implementation. The regional planning process is documented in the Regional Transportation Plan (RTP), with support from the Intelligent Transportation System (ITS) Plan and CMP, among others. These three plans are all established at the MPO level and are intended to support local planning efforts reflected in Transportation System Plan (TSPs).

The goals and objectives of the RTP inform and update the CMP purpose and goals (Step 1), which in turn govern the underlying performance measures (Step 3). In Step 6, Identify and Assess Strategies, new CMP strategy outcomes could require subsequent focused transportation studies and special plans, such as a regional Transportation System Management and Operations (TSMO) Plan, Corridor Studies, or an ITS Plan to further evaluate and refine possible solutions and priorities. Finally, key recommendations of those special studies feed back into the implementation process (Step 7) and are considered during the monitoring action step (Step 4).

LATEST CHANGES TO CENTRAL LANE MPO CMP

The latest FHWA Transportation Planning Certification Review,[1] from October 2019, noted areas to be addressed by the Central Lane MPO CMP in future reporting cycles. This CMP incorporates these corrective actions and recommended changes which are summarized below in Tables 1 and 2. The applicable section of the federal code is 23 CFR 450.322.

[1] Transportation Management Area Planning Certification Review for Eugene-Springfield, OR Transportation Management Area, FHWA, October 2019.

TABLE 1: CORRECTIVE ACTIONS FOR THE CMP

CORRECTIVE ACTION	SUMMARY	CENTRAL LANE MPO RESPONSE
CMP OBJECTIVES	Develop "SMART" regional objectives for congestion management that clearly define and support the region's goals for congestion management.	Objectives are defined in "Step 1 - Develop Regional Objectives". SMART characteristics are a part of the "Central Lane MPO Performance Measures" section.
CMP DATA COLLECTION, SYSTEM MONITORING, AND ANALYSIS (A)	Develop CMP data collection and system monitoring program/plan to ensure data are available to support performance measures	See "Step 4 – Collect Data and Monitor System Performance"
CMP DATA COLLECTION, SYSTEM MONITORING, AND ANALYSIS (B)	Develop a process to identify congested areas using CMP performance measures, to identify underlying causes of congestion, and document analysis and results to be used in the strategy evaluation and identification process.	See "Step 5 - Analyze Congestion Problems and Needs"
CMP STRATEGIES (A)	Develop and use a process for identifying, evaluating, and selecting strategies for congested CMP corridors to help the region meet congestion objectives.	See "Step 6 - Identify and Assess Strategies"
CMP STRATEGIES (B)	Document an implementation schedule for selected CMP strategies on congested corridors and link to RTP and TIP project prioritization process	See "Step 7 - Program and Implement Strategies"
CMP STRATEGIES (C)	Develop a process to evaluate system-level and strategy effectiveness to ensure implemented strategies are addressing congestion.	See "Step 8 - Evaluate Strategy Effectiveness"

TABLE 2: RECOMMENDATIONS FOR THE CMP

RECOMMENDATION	SUMMARY	CENTRAL LANE MPO RESPONSE
CMP NETWORK EVALUATION	Evaluate the identified CMP corridors with current data and information to ensure CMP network is still appropriate and consider an interconnected multimodal network.	See "Step 2 -Define CMP Network" section. More details provided in RTP.
CMP MULTIMODAL PERFORMANCE MEASURES AND DATA DEVELOPMENT PLAN	Consider a wider array of PMs to include bicycle, pedestrian, freight, accessibility, land use, or non-recurring congestion PMs, and ensure the four existing PMs are still relevant. Consider regional and/or corridor, segment, or intersection level performance measures. Consider PM data that can be used to identify and assess congestion, location, effectiveness, and progress of the congestion.	See "Central Lane MPO Performance Measures" section and RTP.
CMP STRATEGIES	Include a comprehensive list of strategies that fall under each of the existing broad groups of strategies	See "CMP Strategy Toolbox" section
ITS PLAN	Review and update the ITS Architecture and Plan to complement the RTP planning and Transportation Improvement Program (TIP) and programming	ITS Plan has been updated concurrently with the RTP update

GROWTH TRENDS

The pace of growth in land development and population influences the demand for travel of all types. Central Lane MPO tracks development trends on a regular basis to provide a context for understanding how the intensity of development and its proximity to major corridors might impact vehicular congestion over time. Oregon land use planning regulations require each city to have an urban growth boundary (UGB) to foster compact urban growth and preservation of agricultural and forest lands. The growth in the RTP is developed to be consistent with land uses and growth allocations from the UGBs of the cities of Eugene, Springfield, Coburg, and a small area of Lane County adjacent to these urban areas. Significant growth in the region poses a challenge to providing adequate mobility, with an additional 45,000 residents and almost 40,000 new jobs by 2045 placing greater travel demands on the system. Further details are provided in the RTP.

RELEVANT DOCUMENTS

Relevant Central Lane MPO CMP resources, reports, and documents include the following:

- Central Lane MPO RTP, previous and current versions
- Central Lane MPO ITS Plan
- City of Coburg's Transportation System Plan
- City of Eugene's Transportation System Plan
- City of Springfield's Transportation System Plan
- Lane County's Transportation System Plan
- Lane Transit District's Long-Range Transit Plan, Transit Tomorrow, and Coordinated Plan
- Oregon Department of Transportation's Oregon Transportation Plan and Oregon Highway Plan

STEP 1 - DEVELOP REGIONAL OBJECTIVES

The first step of the CMP is to develop regional planning objectives for congestion management. Since the CMP is meant to be an integral part of the regional transportation planning process, the RTP goals were incorporated into the CMP to ensure consistency in regional strategies working towards ensuring efficient use of resources and fulfilling regional transportation goals.

REGIONAL TRANSPORTATION PLAN GOALS AND OBJECTIVES

The RTP goals and objectives provide a foundation for transportation plans, projects, and programs completed within the region. Goals describe desired outcomes, while objectives are focused and measurable outcomes of goals. For each goal area, the RTP identifies a series of regional objectives, performance measures, and targets that are applied to track progress toward achieving the goal over time. Each goal and objective were developed in concert with public and stakeholder involvement and local plans, TSPs in particular. The goals are as follows:

1. **Transportation Choices:** People throughout the region have access to affordable, healthy, active, and shared transportation options that safely and conveniently connect them with their destinations while reducing reliance on driving alone and minimizing transportation related pollution.

2. **Safety, Security and Resiliency:** The transportation system is resilient, safe, and secure for people and goods.

3. **Healthy People and Environment:** The regional transportation system provides safe and comfortable travel options that support active and healthy living and protect and preserve biological, water, cultural and historic resources. Lower-polluting transportation options are encouraged, and transportation greenhouse gas emissions are reduced.

4. **Equity:** The regional transportation system eliminates transportation related disparities and barriers and ensures equitable access to destinations.

5. **Economic Vitality:** The transportation system is reliable, affordable, and efficient. It supports the prosperity of people and businesses by connecting them to destinations throughout the region and beyond.
6. **Reliability and Efficiency:** The region prioritizes a range of travel options to manage and optimize the transportation system and ease congestion so people and goods can reliably and efficiently reach their destinations.
7. **System Asset Preservation:** Strategically preserve, maintain, operate, and plan for current and future system assets to maximize transportation investments.

The objectives pertinent to the CMP are summarized in Table 3. See the 2045 RTP for the complete list of objectives.

TABLE 3: GOALS AND OBJECTIVES

OBJECTIVES	GOAL 1	GOAL 2	GOAL 3	GOAL 4	GOAL 5	GOAL 6	GOAL 7
Increase percentage of active and low-carbon transportation mode trips while reducing VMTs	✓		✓	✓		✓	✓
Complete gaps in regional bicycle and pedestrian networks	✓		✓	✓		✓	
Eliminate all modes' fatal and serious injury crashes	✓	✓		✓			
Leverage ITS solutions to increase efficiency of travel	✓			✓		✓	
Strive to reduce vehicle-related greenhouse gas emissions and congestion through more sustainable infrastructure		✓	✓		✓	✓	
Reduce the impact of roadway incidents on arterial roadway network and frequent transit routes		✓				✓	
Develop a transportation system that is adaptable and flexible to changing needs and conditions		✓					✓
Increase access to industry and freight intermodal facilities to facilitate efficient goods movement					✓	✓	
Build an integrated and connected system of regional arterial roadways, freight routes and intermodal facilities, transit, bicycling and walking facilities					✓	✓	

The RTP objectives are periodically monitored by Central Lane MPO to report to member agencies on their collective progress towards regional plan goals. Objectives are monitored by using performance measures as described in Step 3: Develop Multimodal Performance Measures. Data and tools available to measure on-going progress include travel time data, crash data, transit data, and Geographic Information System (GIS) layers that describe existing and planned walking and bicycling infrastructure and a collection of bike trip counters on key regional pathways.

ADDITIONAL OBJECTIVES FOR FEDERAL REPORTING PURPOSES

Federal regulations require that data collection support key performance measures to better understand other dimensions of congestion. Measures that specifically address the extent and duration of vehicular congestion are important per federal regulations. These additional objectives are to be included in the Congestion Management System reports. In addition to the objectives noted above in Table 3, the following new objectives are recommended to respond to federal CMP requirements more completely, as outlined in the Fixing America's Surface Transportation (FAST) Act:

- Reduce total hours of system congestion
- Reduce single-occupant vehicle (SOV) demand

STEP 2 - DEFINE CMP NETWORK

As mentioned in the introduction section, the Central Lane MPO planning area includes the UGBs of Eugene, Springfield, and Coburg, and a small area of Lane County adjacent to these urban areas. The transportation facilities within the region include the major motor vehicle system of freeways, highways, arterials, and other regionally significant roadways. The corridors defined below as part of the CMP network are used to assess regional transportation congestion. The subsequent steps are built off this network.

CMP CORRIDORS

The corridors of interest for the CMP are shown in Figure 3 and the detailed extents are provided in Table 4. These corridors are split into two tiers. The intent of this is to include the critical regional routes where data is readily available in Tier 1 and to include the remainder of the corridors analyzed in the RTP in Tier 2. Tier 1 includes critical regional routes with the most need for congestion relief and includes most of the National Highway System (NHS) routes. For assessing which corridors were congested enough to be in Tier 1, travel time reliability and v/c ratio performance measure maps were used. Tier 2 includes the remainder of the RTP corridors. Tier 2 corridors will be evaluated when resources are available and congestion management strategies may be applied as needed.

FIGURE 3: CORRIDORS OF INTEREST

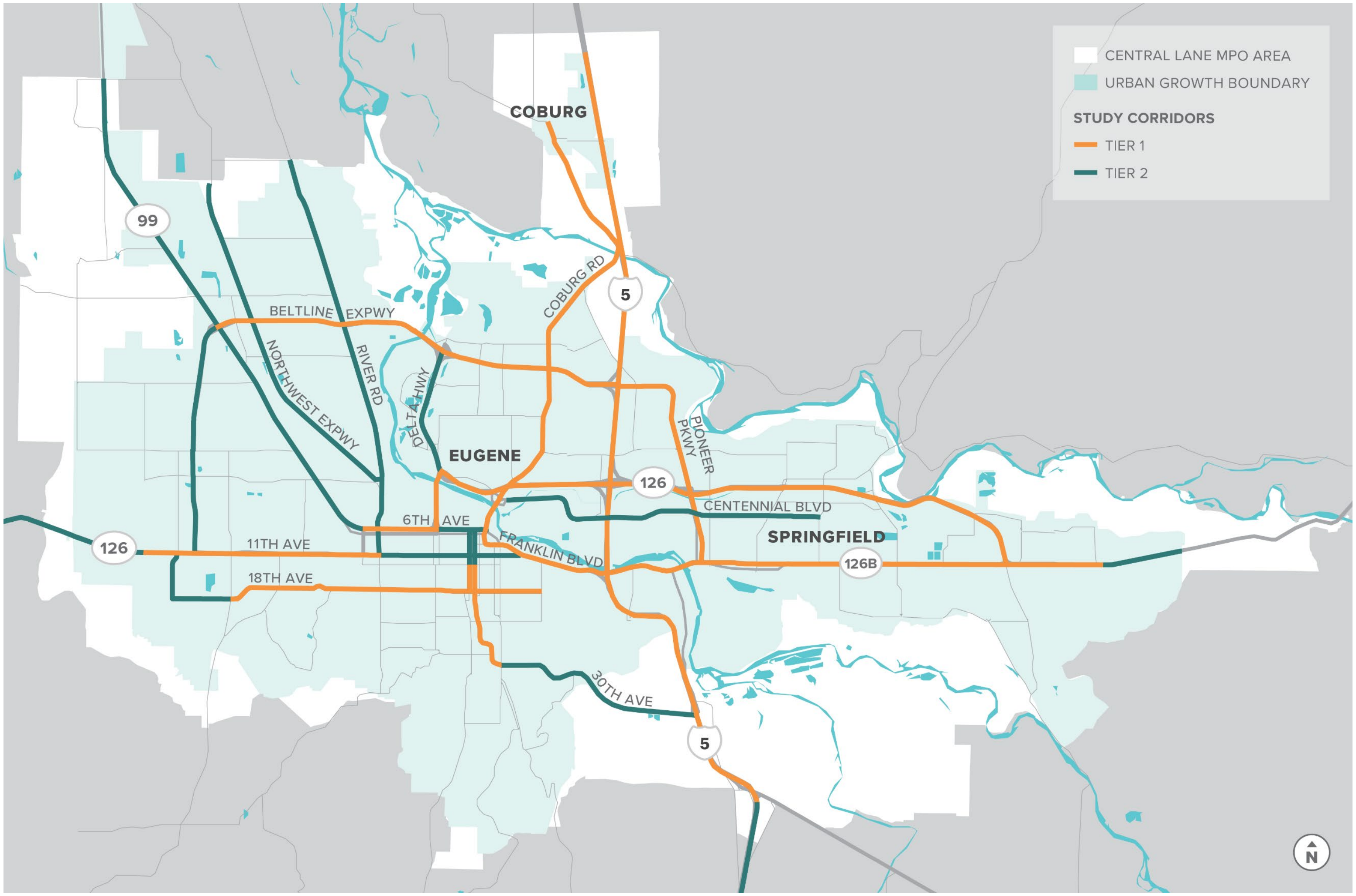


TABLE 4: CORRIDORS OF INTEREST EXTENTS

CORRIDOR	TIER 1	TIER 2
I-5	Goshen Ave to north boundary of Coburg	Dillard Rd to Goshen Ave
OR-99 & W 6TH AVE/W 7TH AVE COUPLET & FRANKLIN BLVD	Garfield St to Jefferson St & Mill St in Eugene to OR-225	Meadowview Rd to Garfield St & Jefferson St to Mill St in Eugene
BELTLINE EXPRESSWAY	OR-99 to I-5	W 11th Ave to OR-99
DELTA HWY & I-105	7th Ave to I-5	Beltline to I-105
OR-126	I-5 to Main St	N/A
W 11TH AVE	Terry St to Chambers St	Fisher Rd to Terry St & Chambers St to Franklin Blvd
MAIN ST/A ST COUPLET & OR 126	Franklin Blvd in Springfield to 70th St	70th St to east boundary of Springfield
COBURG RD	E 6th Ave to W Van Duyn St	N/A
18TH AVE	Bertelsen Rd to Agate St	Willow Creek Rd/ W 11th Ave to Bertelsen Rd
AMAZON PKWY & PEARL ST/OAK ST COUPLET & 30TH AVE	13th Ave to 30th Ave	E 6th Ave to 13th Ave & 30th Ave to I-5
CENTENNIAL BLVD & MARTIN LUTHER KING, JR BLVD	N/A	Club Rd to N 28th St
RIVER RD	N/A	Chamber St/ W 11th Ave to Beacon Dr
NORTHWEST EXPRESSWAY	N/A	River Rd to Awbrey Ln
PIONEER PKWY & MARTIN LUTHER KING, JR PKWY	S A St to Beltline/ Gateway St	N/A

STEP 3 - DEVELOP MULTIMODAL PERFORMANCE MEASURES

This step introduces the methods and metrics that are used to assess regional transportation congestion. This includes how each of the Central Lane MPO regional planning objectives are assigned specific performance measures and targets which are then used to inform system management decisions over time.

HOW THE CENTRAL LANE MPO DEFINES CONGESTION

For system management, it is important to apply a consistent methodology for measuring travel congestion. This CMP process uses objective measures of congestion to provide consistent results to decision-makers who are responsible for managing the transportation system. Vehicular congestion can be described using four general dimensions that provides insights on how best to manage and mitigate it. The four congestion dimensions are defined as follows[2]:

- **Intensity** – The relative severity of congestion that affects travel. Intensity has traditionally been measured through indicators such as volume-to-capacity ratio (v/c) or level of service (LOS) measures that consistently relate the different levels of congestion experienced on roadways.
- **Duration** – The amount of time the congested conditions persist before returning to an uncongested state.
- **Extent** – The number of system users or components (e.g., vehicles, pedestrians, transit routes, lane miles) affected by congestion, for example the proportion of system network components (roads, bus lines, etc.) that exceed a defined performance measure target.
- **Variability** – The changes in congestion that occur on different days or at different times of day. When congestion is highly variable due to non-recurring conditions, such as a roadway with a high number of traffic crashes causing delays, this impacts the system reliability.

Central Lane MPO has selected several quantitative performance measures that address congestion using each of these dimensions either separately or in combination. In addition to the vehicular congestion measures, several metrics that more fully define the system users' experience across all travel modes are further defined in the following sections.

[2] *Congestion Management Process: A Guidebook*, FHWA, 2011.

KEY PERFORMANCE MEASURE DEFINITIONS

Multimodal performance measures were developed for the Central Lane MPO planning objectives, to measure the progress addressing the various dimensions of congestion. These selected measures, defined in Table 5, will be used to track changing conditions, identify problem areas, and help communicate system performance to the public and decision makers.

TABLE 5: PERFORMANCE MEASURE DEFINITIONS

PERFORMANCE MEASURES	MEASURES
MILES TRAVELED	• Vehicle miles traveled (VMT) (total, per capita, per employee) • Freight miles traveled (total, per capita, per employee) • Transit miles traveled (total, per capita, per employee)
MODE SHARE*	• Walking, bicycling, transit and shared ride usage (total and share) • Person trips (total and share) • Transit trips on congested corridors
SYSTEM COMPLETENESS	• Total miles and percentage of regional pedestrian and bicycle networks completed • Total miles and percentage of regional pedestrian and bicycle facilities completed within ¼ mile of transit stops (by all stops and high frequency stops)
ACCESS TO TRANSIT	• Number and percent of households within ¼ mile of transit stops
SAFETY*	• Vehicle, pedestrian, and bicyclist fatal and serious injury crashes (total, per capita, and per VMT) • Vehicle, pedestrian, and cyclist fatalities where alcohol is a factor (total) • Vehicle fatalities where a passenger is unrestrained (total) • Motorcyclist fatalities, helmeted and un-helmeted (total) • Fatalities where a driver's age is 20 or under (total)
TRAVEL TIME*	• Motor vehicle travel time between key regional origin-destination pairs • Freight travel time between key freight origin-destination pairs • Transit travel time between key origin-destination pairs
VEHICLE HOURS OF DELAY*	• Passenger vehicle hours of delay (time accrued where v/c > = 0.90) • Truck hours of delay (time accrued where v/c > = 0.90)
CONGESTION	• Locations on the regional roadway network that operate with v/c ratios from 0.90 to less than 1.00
CONGESTED MILES OF TRAVEL	• Total and percent of VMT along congested regional corridors (0.90 <= v/c < 1.0) • Total and percent of VMT along severely congested regional corridors (v/c > 1.0)

* Federal performance measure

CENTRAL LANE MPO PERFORMANCE MEASURES

The list of selected congestion related performance measures as they relate to goals and data sources is shown in Table 6. The agencies who own and maintain the listed data sources are detailed in Table 7 in the next section.

TABLE 6: GOALS AND PERFORMANCE MEASURES

GOALS	PERFORMANCE MEASURE(S)	DATA SOURCE
TRANSPORTATION CHOICES	Miles Traveled, Mode Share, System Completeness, Access to Transit	Travel demand model, American Community Survey (ACS) data, GIS
SAFETY, SECURITY, AND RESILIENCY	Safety	Oregon Department of Transportation (ODOT) crash data
HEALTHY PEOPLE AND ENVIRONMENT	Miles Traveled, Mode Share, System Completeness	Travel demand model, ACS data, GIS
EQUITY	System Completeness, Access to Transit	Travel demand model, ACS data, GIS
RELIABILITY AND EFFICIENCY	Miles Traveled, Travel Time, Congested Miles of Travel	Travel demand model, RITIS
SYSTEM ASSET PRESERVATION	Travel Time, Congested Miles of Travel, Vehicle Hours of Delay, Congestion	Travel demand model, RITIS
ECONOMIC VITALITY	Miles Traveled, Travel Time, Vehicle Hours of Delay, Congestion	Travel demand model, RITIS, GIS

The scope of application of these measures ranges from corridor to region wide. The following sections call out which measure are regional, corridor, or for federal reporting.

REGIONAL MEASURES

The broader performance measures are representative of system-wide travel activity and general transportation performance. By comparing these measures over time, the trends can provide a useful context for understanding the overall state of the region. System-wide performance measures include the following:

- Miles Traveled
- Safety
- Mode Share
- System Completeness
- Access to Transit
- Vehicle Hours of Delay

- Congested Miles of Travel

CORRIDOR MEASURES

Going beyond the regional trends, several of the measures also can be applied to travel corridors within the urban areas to provide insights as to the underlying elements that may be contributing to the observed congestion. For example, when recurring vehicular congestion is identified based on peak period speed and delay data, the next level of evaluation within the affected segment of the corridor could consider the completeness of the multimodal system, and the compliance with current roadway design standards. Corridor-level safety analysis would focus on specific high-crash segments or intersections. This second level of performance review can assist in selecting the appropriate management strategy to address subpar conditions. Corridor-level measures include the following:

- Safety
- System Completeness
- Travel Time
- Vehicle Hours of Delay
- Congestion
- Congested Miles of Travel

FEDERAL REPORTING MEASURES

At this time, Central Lane MPO supports the state targets for each of the Federal performance measures. As such, the state collects and analysis the data necessary to report on the target status. However, the results should be submitted as part of the Congestion Management System Reports. This includes the following performance measures, which are a subset of the full list provided above. Note that the FHWA CMP Guidebook does not require specific performance measures, rather this list includes required measures from the FAST Act:

- Safety
- Mode Share
- Vehicle Hours of Delay
- Travel Time

STEP 4 – COLLECT DATA AND MONITOR SYSTEM PERFORMANCE

An important part of CMP is developing a data collection plan to support performance measures. Table 7 describes the data requirements for reporting performance measures for the CMP Corridors of Interest, as previously shown in Figure 3. The table indicates the data that is collected, who is responsible for collecting the data, and the frequency the data should be collected.

TABLE 7: DATA SOURCES FOR REGIONAL REPORTING

TRANSPORTATION SYSTEM DATA DESCRIPTION	RESPONSIBILITY	COLLECTION FREQUENCY
AVERAGE ANNUAL DAILY TRAFFIC (AADT)	LCOG/ODOT	1-3 years
AVERAGE DAILY TRUCK PERCENTAGE AT SELECT LOCATIONS	LCOG/ODOT	1-3 years
PEAK PERIOD MAXIMUM LOAD FACTOR ON BUS	Lane Transit District (LTD)	Annual
PEAK PERIOD LOAD FACTOR ON CORRIDOR	LTD	Annual
NUMBER OF BUSES PER PEAK HOUR	LTD	Annual
NUMBER OF PARK & RIDES / PERCENT USAGE	LTD	Annual
AVERAGE COLLISION RATE/MILLION VMT	ODOT	Annual
AVERAGE TRAVEL TIME INDEX AM/PM (PEAK)	RITIS/ODOT	Annual
LEVEL OF TRAVEL TIME RELIABILITY (PEAK)	RITIS/ODOT	Annual
FREIGHT TRAVEL TIME RELIABILITY (PEAK)	RITIS/ODOT	Annual
PRIORITY BIKE NETWORK COMPLETED	LCOG/Cities of Eugene, Springfield, and Coburg	Annual
PRIORITY WALKING NETWORK COMPLETED	LCOG/Cities of Eugene, Springfield, and Coburg	Annual

Note that Central Lane MPO is working on a strategy to have a central location for the storage of count data for the region, including information from partner agencies. This will help strengthen the count program. The MPO already has a Data Portal on its website that summarizes many of the other data sources in the above table. A screenshot of the Motorized Traffic Counts page in the Data Portal is shown in Figure 4. Table 8 further defines additional data needs and sources that are required for evaluating system performance based on federal requirements.

FIGURE 4: MOTORIZED TRAFFIC COUNTS IN THE DATA PORTAL

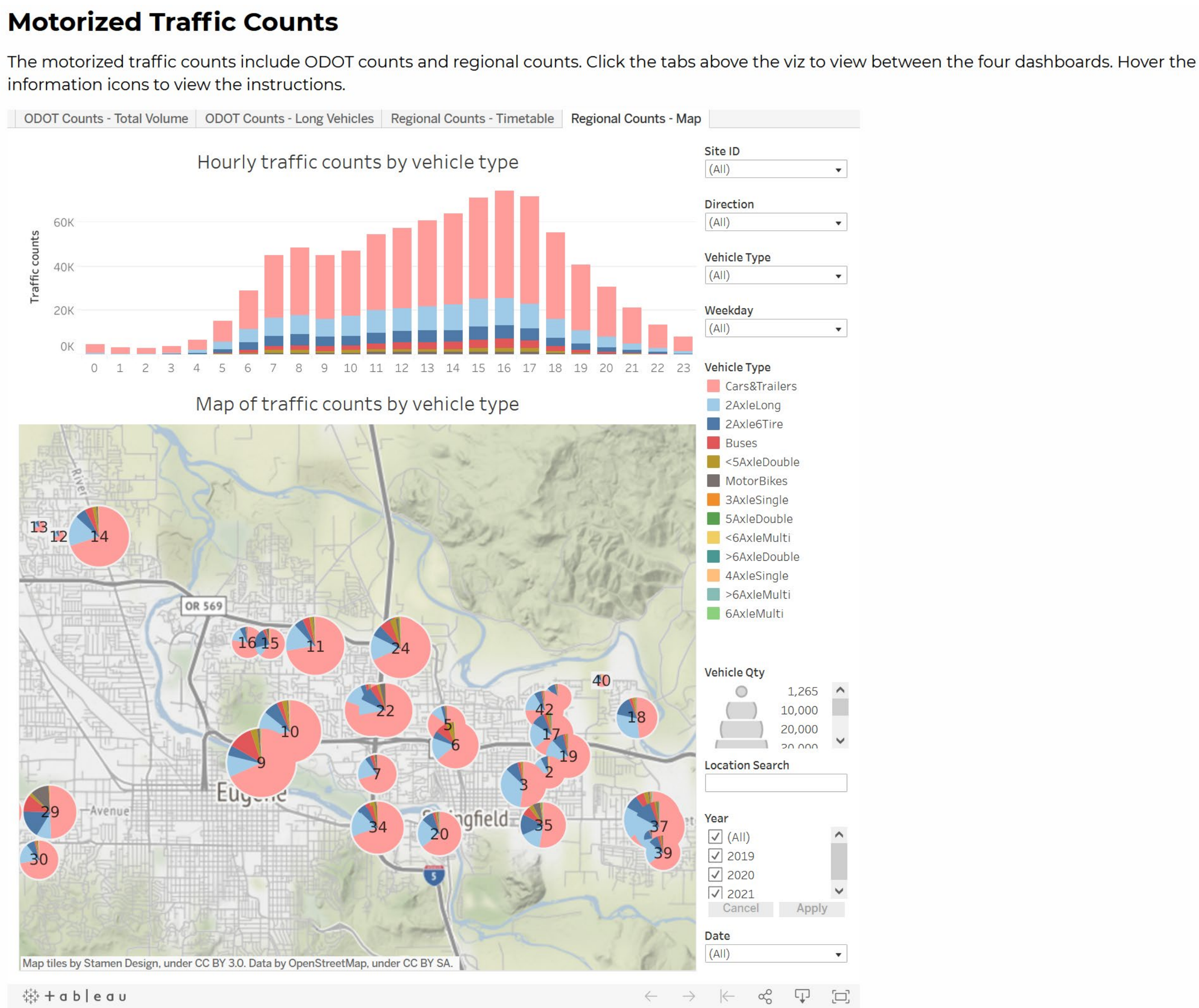


TABLE 8: DATA SOURCES FOR FEDERAL PERFORMANCE MEASURES

MEASURE	DATA SOURCES
DAILY VEHICLE MILES TRAVELED	Regional Travel Demand Model
SYSTEM RELIABILITY *	National Performance Management Research Data Set (NPMRDS)
FREIGHT RELIABILITY *	NPMRDS
PEAK HOURS OF EXCESSIVE DELAY	NPMRDS
NON-SINGLE OCCUPANCY VEHICLE MODE SHARE *	ACS Data on Journey to Work
PAVEMENT AND BRIDGE CONDITION *	ODOT bridge and pavement programs
TRANSIT ASSETS STATE OF GOOD REPAIR *	LTD Asset Management Plans

* FAST Act required performance measure

Some data sources are commonly available for MPOs and state transportation departments. For others, such as volume data, consistent data collection plans are in progress. Future improvements in this process may include getting count data from other new sources, such as passive data collection. One data source from Table 7 that may not be well-known is the RITIS platform. ODOT has a multi-year intergovernmental agreement[3] with the University of Maryland's CATT lab which produces the RITIS platform as a place to store and analyze INRIX speed data along with other ODOT provided information. This is the tool that will be used to provided travel time reliability and other speed-related measures for the regional network. Other passively collected probe data sources could be used in place of RITIS data, but it would require an additional data purchase. Probe data from NPMRDS is only available on NHS routes. ACS data estimates are provided on a yearly basis. Mode share data from the Travel Barriers and Benefits Survey, completed in July 2020, could also be used to supplement mode data from ACS. This survey asked participants how much they used each mode, which provides more nuance than the ACS data.

The regional travel demand model is updated with the RTP update. It uses data inputs from the household travel survey, census data, land use data, mode share, and traffic count data. Performance measures that can be pulled from the travel demand model include vehicle miles traveled, vehicle hours of delay, travel times, congested roadways, and roadway volumes. The travel demand model also provides forecasts of future conditions in the region.

[3] The current ODOT contract for RITIS data is for five years, starting January 2020.

STEP 5 - ANALYZE CONGESTION PROBLEMS AND NEEDS

Step 5, Analyze Congestion Problems and Needs, processes the collected data and produces the selected metrics that are identified in the performance measures section. Once collected, raw data must be translated into meaningful measures of performance. The purpose is to identify specific locations with vehicular congestion problems, and to identify the sources of these problems, then, interpret the results.

IDENTIFYING CONGESTED CORRIDORS

Once data has been transformed to allow comparisons between the various levels of congestion in the region, the definitions of unacceptable vehicular congestion must be applied to individual roadway segments. The result may be any of the following:

- A set of areas or corridors defined as congested based on the performance measures; these congested corridors may be used to denote areas where activities to address congestion are necessary and appropriate.
- A ranking of corridors throughout the region (sometimes ranked separately in categories based on the function/scale of the facility) to determine which corridors rank the highest in terms of congestion relief needs.
- An analysis of how well the region is meeting established congestion management objectives.

Often, specific benchmarks or targets are used to analyze data on either a corridor or regional level, to determine how close the system is to meeting the desired conditions.

There are several sources that Central Lane MPO can account for when analyzing data for the purpose of locating vehicular congestion problems, including:

- **Locations of major trip generators** – to understand congestion issues related to specific locations, it is often beneficial to have a knowledge of major trip generators (such as freight/intermodal facilities, major tourist attractions, stadiums/arenas, universities, hospitals, major employers, airports, and major shopping centers) and the typical traffic patterns, users, and times of high demand at these locations. For Central Lane MPO, these include special generators at the University of Oregon and associated stadiums.
- **Seasonal traffic variations** – traffic patterns can vary greatly due to seasonal changes in school-related trips, tourist activity, farming and farm equipment activity, weather conditions, and daylight conditions. When possible, data should be collected at times that will account for these variations, but data manipulation may be necessary to account for these in some cases.
- **Time-of-day traffic variations** – not all locations experience their highest demand during typical peak periods, especially in areas with heavy school traffic (which often coincides with the morning peak but has an earlier afternoon peak) or in areas with large employers with shift change times outside the typical peak period.
- **Work trips vs. non-work trips** – to the extent possible, it is helpful to understand the balance between work-related trips and non-work trips within an area, as the strategies to address these different trip types may differ.

INITIAL INVESTIGATION OF UNDERLYING CAUSES OF CRITICAL CORRIDORS

To understand which congestion mitigation strategies are appropriate within the context of a specific congested corridor (or within a subarea or region), it is also necessary to understand the causes of congestion. This investigation of the symptoms of vehicular congestion may require additional technical studies, however, an initial examination can be developed using readily available data and analysis conducted as part of the RTP. It may be appropriate to conduct formal technical analysis to complete this step.

Initial investigation techniques include the following types of analysis:

- Prepare candidate corridor condition mapping of speeds, reliability, and other congestion related measures
- Overlay multimodal system data related to high priority walking and biking system completeness
- Identify local major trip generators
- Overlay readily available facility data, such as access management quality, number of travel lanes, and the type of intersection traffic controls.
- Overlay previously calculated crash rates by corridor segment

These analyses are typically performed as part of the local TSP updates for the partner cities. The local agencies lead this process and then coordinate with Central Lane MPO. This process feeds into the Central Lane MPO RTP and CMP.

Once these data overlays are applied, the team reviews the composite information and prepares initial findings regarding the potential sources or critical factors associated with the congested corridors. It is also appropriate to distinguish between recurring and non-recurring congestion issues. This investigation phase serves as an essential bridge between the collection of system performance data and the potential solutions to address the identified deficiencies.

LOCAL AGENCY COORDINATION AND COLLABORATION

Coordination with local agencies is key to the initial investigation step discussed above. In addition to gathering input from individual partner agencies, Central Lane MPO also has existing committees that could provide input, including the MPC, with the associated Transportation Planning Committee (TPC) and Technical Advisory Sub-Committee (TASC). In addition, the Lane Area Commission on Transportation (ACT) could be involved as the pipeline for programming ODOT funds and projects.

STEP 6 - IDENTIFY AND ASSESS STRATEGIES

After completion of the data collection and system monitoring step, a range of alternative and innovative congestion management strategies are developed for Step 6: Identify and Assess Strategies. Effective congestion management strategies include the following characteristics:

- Supportive of plan objectives
- Appropriate for local context
- Clearly defined roles, responsibilities, and timing for implementation.

For the Central Lane MPO CMP, the master list of strategies chosen for further analysis is known as the CMP Toolkit of Strategies.

CMP STRATEGY TOOLBOX

To assist in the development of strategies, a Toolbox of Strategies was developed. Central Lane MPO evaluated ongoing congestion management strategies already employed throughout the region, researched the best examples from other model CMPs, and compiled a list of strategies that can be realistically applied to this region. The general CMP strategy categories include the following:

- Transportation Options (TO) & Travel Demand Management (TDM)
- ITS & TSMO
- Transit Operational Improvements
- Freight & Goods Movements
- Roadway Capacity Improvements

The results of the strategy compilation are summarized in Table 9 which includes a rough estimate of the level of staff time or capital resources required to implement, along with a listing of example strategies that could be applied. The specific recommendations for the study corridors are subject to further review by Central Lane MPO and their partner agencies.

TO strategies are informed by Central Lane MPO's 2014 Regional Transportation Options Plan (RTOP). This plan is no longer being updated so the strategies have been incorporated into this CMP. Central Lane MPO strives to put a focus on active transportation options, TSMO strategies, and TDM approaches to reduce the number of single-occupancy vehicles and to reduce vehicular congestion instead of increasing capacity on roadway facilities. Roadway capacity improvements are a last resort in the strategy toolbox and would only be applied under rare circumstances. The MPO coordinates how the TO program - which includes Safe Routes to School (SRTS) - is implemented, working closely with partner agencies like the City of Eugene, City of Springfield, and Lane Transit District to support their local projects.

Examples of Toolkit Strategies include promoting a regional commuter benefit program, parking management, turning movement enhancements, ramp metering, incident management, transit signal priority, new and improved park & ride facilities, freight capacity investments, and grade-separated railroad crossings. Strategies consisting of large capital projects that are meant to increase roadway capacity are also included in the strategies list, but generally are a last resort as these require significantly more capital investment, do not produce the same long-term results as alternative transportation options, and can lead to induced demand that eliminates the initial congestion relief benefit. Some of the strategies can be applied at the regional scale, but most are applied to individual corridors based on the existing facility deficiencies.

As a part of this process the evaluation of these strategies should be incorporated into local planning efforts and corridor studies. Should strategy analysis at the corridor-level determine that a particular strategy does not have a useful benefit, it should be removed from the corridor strategy listing. Strategies will also be updated based on emerging technologies that bring new options, as needed.

TABLE 9: CMP TOOLKIT STRATEGIES FOR STUDY CORRIDORS

STRATEGY CATEGORY	GENERAL EFFORT AND RESOURCES REQUIRED	STRATEGIES[4]
Transportation Options (TO)/ Travel Demand Management (TDM)	Low	• Ridesharing Services/Ride Matching • Active Travel Modes Outreach Events and Programs • Shift Peak Travel • Carpool/Walking/Biking Matching Services for Schoolchildren (including Safe Routes to School) • Parking Management • Parking Facility Management Informational Signs • Improvements for Walking and Bicycling • Bike Share Expansion • E-scooter Share
Operational Improvements/ Intelligent Transportation Systems (ITS)/ Transportation System Management and Operations (TSMO)	Medium/High	• Turning Movement Enhancements • Circulation Improvements • Limited Intersection Improvements • Signal Improvements • Ramp Metering • New or Converted HOV lanes • Access Management • Communication Networks • Traveler Information Services • Maintenance Management • Incident Management and Incident Response
Transit Operational Improvements	Medium/High	• Transit Service Expansion • General Transit Infrastructure Improvements • Transit Signal Priority • Park and Ride/Bike/Scoot Facilities - New or Improved
Freight/Goods Movement	Low/Medium/High	• Freight Operations Improvements • Freight Capacity Investments

[4] Strategies listed in this Toolkit are not intended to be inclusive of all potential strategies; additional opportunities may be identified.

STRATEGY CATEGORY	GENERAL EFFORT AND RESOURCES REQUIRED	STRATEGIES[4]
Roadway Capacity Improvements[5]	High	• Grade-separated Intersections or Railroad Crossings • Adding Capacity/Widening • New or Extended Roadways

STEP 7 - PROGRAM AND IMPLEMENT STRATEGIES

Another requirement of the CMP is to develop an implementation strategy that will move strategies forward and ensure that the five-year Metropolitan Transportation Improvement Program (MTIP) and RTP follow the CMP. Step 7 does just that and all CMP strategies that are recommended for implementation on the CMP Corridors should have the following elements:

- Priority
- Timeframe for Implementation
- Lead Agency
- Expected Funding Source

In general, there are three types of strategies within the CMP process: system or regional, corridor and project.

- System or regional level implementation of congestion management strategies occur through inclusion of strategies in the fiscally constrained RTP and the MTIP.
- At the corridor-level, more specific strategies such as bicycle and pedestrian improvements and operational improvements can be assessed in studies and implemented using a variety of funding sources.
- For larger projects, particularly capacity-adding projects, demand management and operational strategies should also be analyzed for incorporation into the project as part of the project development process.

This tiered approach to strategy implementation integrates the CMP into all aspects of MPO planning and allows a flexible and robust incorporation of congestion management. It also introduces the consideration of scale. Some MPOs are actively engaged in efforts to integrate transportation planning into the National Environmental Policy Act (NEPA) decision-making process, and one of the notable barriers is the difference in scale between regional analysis and project analysis. The CMP offers one way to bridge that gap by translating system-level understanding to inform project-level decisions.

[5] As previously stated, roadway capacity projects are last priority strategies as they are high cost and provide limited long-term benefits. They are not heavily featured in the Central Lane MPO long-range plans.

REGIONAL PRIORITIZATION OF STRATEGIES

Central Lane MPO is required to develop a process for allocating Surface Transportation Block Grant (STBG) federal funding as well as Congestion Mitigation and Air Quality (CMAQ) and Transportation Alternatives (TA) funds. These funds are allocated and programmed for eligible projects at the discretion of the MPO following federal guidelines. The MPO Policy Board has approved a process for the use of a set of screening or eligibility criteria and a set of evaluation criteria and guidelines to be applied to applications for federal funding. TDM and TO programs receive a minimum of ten percent of the annual federal funds to support TDM and TO efforts to address congestion management. Planning program activities receive 25 percent of the annual federal funds to address regional planning priorities including:

- Priorities established in the Unified Planning Work Program
- Compliance with federal transportation funding legislation including under the CMP
- Planning for Public Outreach and Participation
- State system regional project planning and NEPA activities
- Coordinated public transit and human services planning
- RTP implementation
- Local transportation planning and coordination as part of the regional system

The remaining 65 percent of federal funding allocations are programmed for preservation, project development, and modernization activities. Applications for funding of these activities are assessed and prioritized based on a set of eligibility factors and prioritization criteria approved by the MPO Policy Board. The four primary Regional Priority Factors include whether the proposed project does the following:

- Preserves or enhances transit services
- Reduces greenhouse gas emissions by reducing vehicular congestion, increasing operational efficiency, supporting active modes, and managing transportation demand
- Preserves existing transportation assets
- Improves safety

In addition, the federal application and prioritization process requires each jurisdiction to specifically describe how proposed projects address the following:

- Congestion reduction
- Connectivity
- Benefits to multiple modes
- Benefits to the freight system and freight movement
- Public health

CORRIDOR AND PROJECT STUDIES

In many cases, specific congestion management strategies may be identified through more detailed corridor studies and project development efforts. Because projects are most often implemented by agencies other than Central Lane MPO, this requires oversight by the MPO staff or a system to relay information on the effectiveness of associated strategies. Such information is crucial to achieving the full realization of the CMP as a continuous process. This step also represents the point at which consistency between planned/programmed projects and the CMP should be ensured, particularly for projects that will add capacity to roadways. Collaboration with partners at implementing agencies is a critical element of this step.

As projects are advanced to project development and environmental review, the CMP offers an opportunity to link planning and the NEPA process. This process can sometimes break down if project developers and designers are not aware of the CMP's congestion management objectives or the range of performance measures that are being used regionally to monitor performance.

STEP 8 - EVALUATE STRATEGY EFFECTIVENESS

Evaluation of strategy effectiveness is recommended to monitor outcomes of the CMP process. These can be either before and after studies or they can be conducted system-wide as an ongoing process once major new projects or programs have been implemented. The primary goal of this monitoring process is to ensure that implemented strategies are effective at addressing vehicular congestion as intended, and to make changes based on the findings, as necessary.

Two general approaches are used for this type of analysis:

- System-level performance evaluation — Regional analysis of historical trends to identify improvement or degradation in system performance, in relation to objectives; and
- Strategy effectiveness evaluation — Project-level or program-level analysis of conditions before and after the implementation of a congestion mitigation effort.

Study findings that show improvement in congested conditions due to specific implemented strategies can be used to encourage further implementation of these strategies, while negative findings may be useful for discouraging or downplaying the effectiveness of similar strategies in similar situations. The information learned from evaluation should inform the MTIP and RTP, as well as other steps within the CMP, notably Step 6, the identification and assessment of strategies.

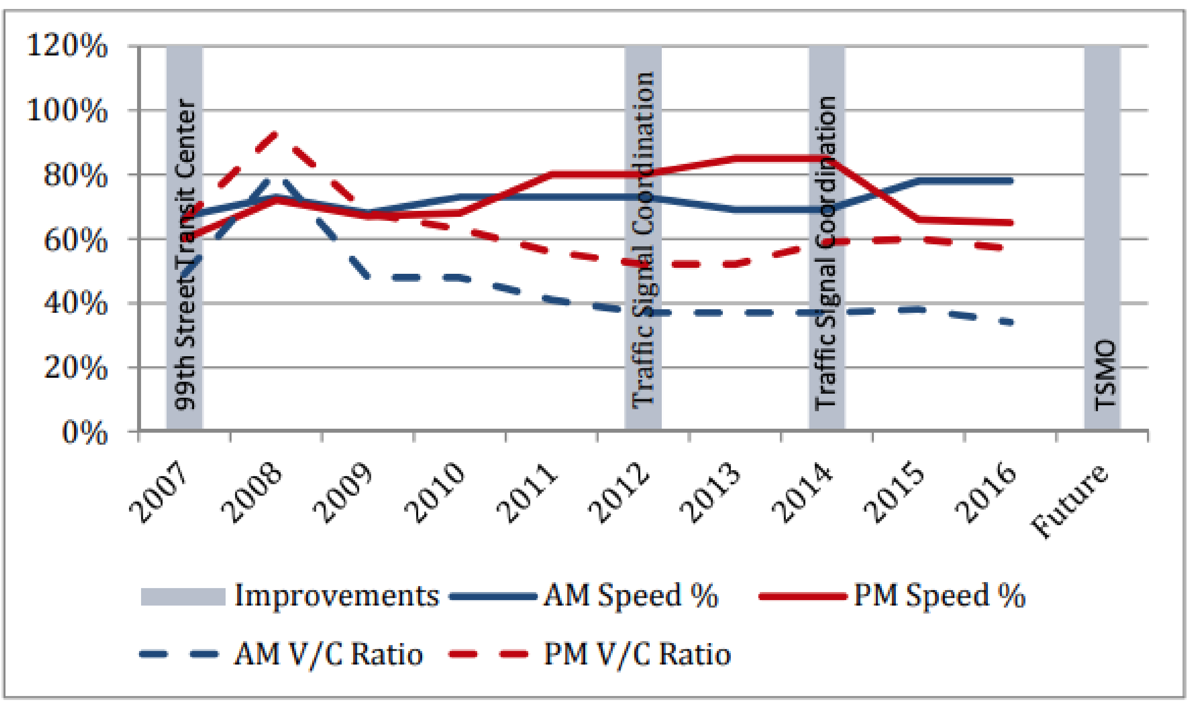
- **System-Level Evaluation**. Central Lane MPO could fund system-level studies to measure the effectiveness of congestion strategies or projects by examining conditions before and after, or with and without, a strategy of interest. For instance, a study could be conducted to quantify mode shifts of a TDM program, to quantify the speed improvements associated with traffic flow improvement projects, to examine the reduction in vehicle delay associated with operational strategies, or other similar types of impacts. These types of large-scale evaluations could be incorporated into the Unified Planning Work Program to follow significant changes in new policy implementation.
- **Project-Level Evaluation**. Central Lane MPO could develop guidance for evaluating strategies and require local project sponsors to conduct evaluations of their projects and programs.

Guidance can be provided on when an assessment should be done, what measures should be used, how data should be gathered, what methods should be used to analyze the data, and other aspects of evaluation studies.

Central Lane MPO could develop selection criteria to help partner agencies choose which CMP strategies are best candidates for post implementation evaluations and to provide guidance on how to conduct these studies. It will be important to design the studies to isolate, to the extent possible, the project benefits of a capital investment that are being assessed from other external influences. For example, changes in traffic demands on arterial corridors associated with seasonal traffic or major special generators may adversely influence the expected benefits of more efficient and responsive traffic signal control operations.

As an example of Project-Level Evaluation, Southwest Regional Transportation Commission (RTC) in Vancouver, Washington developed a time series of corridor performance conditions along 99th Street to illustrate the trends in speeds and system capacity following major CMP strategy implementation. As shown in Figure 5 below, the results show a mix of performance outcomes that show limited improvements for peak hour travel performance. These types of post-project findings could be incorporated into the Central Lane MPO Congestion Management System Reports to illustrate the benefits of major investments.

FIGURE 5: EXAMPLE OF SYSTEM MONITORING DIAGRAM AT PROJECT-LEVEL



Source: Southwest Washington RTC Congestion Management Plan, 2016.

CONCLUSION

This CMP includes a systematic process for determining acceptable mobility levels in the region, measuring the effectiveness of the transportation strategies on the transportation system, and prioritizing changes to strategies and project development standards as needed. Central Lane MPO will continue to establish and implement the most relevant and feasible CMP performance measures and congestion management strategies, which should be considered and refined iteratively in conjunction with other transportation planning processes.

Appendix C:

White Paper Addressing Federal Planning Factor 9 in Central Lane Metropolitan Organization's 2045 Regional Transportation Plan

CONTENTS

1. EXECUTIVE SUMMARY

Central Lane Metropolitan Planning Organization (CLMPO) is subject to the Fixing America's Surface Transportation (FAST) Act. The FAST Act requires Metropolitan Planning Organizations (MPOs) to develop long range transportation plans that address ten Federal Planning Factors:

1. Support the economic vitality of the metropolitan area, especially by enabling global competitiveness, productivity, and efficiency;
2. Increase the safety of the transportation system for motorized and non-motorized users;
3. Increase the security of the transportation system for motorized and non-motorized users;
4. Increase accessibility and mobility of people and freight;
5. Protect and enhance the environment, promote energy conservation, improve the quality of life, and promote consistency between transportation improvements and state and local planning growth and economic development patterns;
6. Enhance the integration and connectivity of the transportation system, across and between modes, for people and freight;
7. Promote efficient system management and operation;
8. Emphasize the preservation of the existing transportation system;
9. Improve the resiliency and reliability of the transportation system and reduce or mitigate stormwater impacts of the transportation system; and
10. Enhance travel and tourism.

Planning Factor 9 requires MPOs to consider how they will "improve the resiliency and reliability of the transportation system and reduce or mitigate stormwater impacts of surface transportation" *(23 CFR 450.306(b)(9)).* This Planning Factor was not required at the time of CLMPO's 2040 Regional Transportation Plan (RTP) adoption. The purpose of this white paper is to explore how to integrate Planning Factor 9 into CLMPO's 2045 RTP. The paper is divided into four main sections:

Introduction to Transportation Resilience

This section explores the themes of resilience and sustainability as they relate to transportation, provides background and Federal Highway Administration (FHWA) guidance on Planning Factor 9, and discusses the practical application of Planning Factor 9 by other MPOs.

Regulatory and Planning Context

This section discusses the federal, state, local, and regional regulatory and planning context, including local and regional efforts to address state and federal requirements around resilience and stormwater.

An Integrated Approach to Resilience & Sustainability

This section explores how to integrate resilience and sustainability into CLMPO's 2045 RTP. It discusses an MPO's potential role in security and emergency planning and FHWA guidance on vulnerability assessment. It then explores the known natural and non-natural hazards to the transportation system in the CLMPO area, including:

- Stormwater
- Climate change
- Seismic hazards
- Extreme weather

- Geomagnetic disturbance
- Landslides
- Riverine flooding
- Volcanic hazards
- "Non-Natural" hazards

Finally, this section explores transportation resilience within the context of the three pillars of sustainability: environment, equity, and economy.

Recommendations

This section provides recommendations for how CLMPO could address Planning Factor 9, including ideas for possible goals, objectives, and policies, as well as suggested next steps for integrating resilience into the transportation planning process. CLMPO has the option to take a broad, sustainability-based approach to planning for resilience that considers the environmental, equity, and economic feedback loops and linkages that contribute to or hinder the region's ability to survive disruptions. This section is intended to be a starting point for conversation around these themes. Recommendations for how to incorporate resilience and stormwater into the 2045 RTP include:

1. Thread resilience into the goals, objectives, and policies of all priority areas.
2. Thread resilience throughout the document where relevant.
3. Include a robust resilience section in the appendix.
4. Consider a broad range of hazards to the transportation system.
5. Conduct additional research and outreach to fill in gaps, strengthen analysis, and ensure consistency with local efforts.
6. Add resilience-related terms to the glossary.
7. Commit to taking positive steps as a region toward increasing transportation resilience beyond the RTP update. Next steps include:
   - Conduct a formal vulnerability assessment
   - Develop a local and regional Emergency Transportation Route network and prioritize retrofits
   - Incorporate resilience into project evaluation and development
   - Complete a Continuity of Operations Plan (COOP)
   - Consider becoming an official Eugene-Springfield Area Multi-Jurisdictional Natural Hazards Mitigation Plan Sub-Plan Holder
8. Identify potential funding sources to integrate these action items into planning.

2. INTRODUCTION TO TRANSPORTATION RESILIENCE

2.1 Resilience, Sustainability, and Transportation

A series of costly natural and human-caused disasters in recent decades have highlighted the vulnerability of our transportation infrastructure, the key role our transportation network plays in emergency response and long-term recovery, and the urgent need to plan for a transportation system that is able to withstand, recover quickly from, or adapt to both acute and slow-moving disruptions. The inclusion of transportation resilience into the Federal Planning Factors elevates it to a top priority for transportation planners.

There are three main themes central to resilience as a concept: first, the ability to absorb or resist shock; second, the ability to adapt to shock while maintaining critical functions; and, third, the time it takes to restore the system to normal functioning after an event, which may be different from how it functioned prior to the event. Because the transportation system is a network, or 'system of systems,' the goal of transportation resilience is to both reduce reliance on individual components of the system and reduce the exposure of critical assets to prevent spillover, or cascading, effects throughout the system.[1] The American Association of State Highway and Transportation Officials (AASHTO) has established five resilience principles relevant to transportation planners:[2]

1. Redesign to reduce or eliminate vulnerability
2. Improve ability to improvise during an event
3. Add redundancies in the system to improve ability to reroute traffic through one or more parallel components
4. Have backup components available to quickly replace disrupted function
5. Allow rerouting

Resilience depends on the complex interplay between environmental, social, and economic factors. Risk is not uniform across or within communities; both social and economic resilience play directly into a community or individual's ability to withstand an environmental disturbance or disaster. Because of these linkages, the concepts of resilience and sustainability are inextricably connected. A transportation system that is not resilient cannot be sustainable (and vice versa). Planners must therefore work to integrate these two interrelated concepts, rather than teasing them apart and treating them as individual concepts or goals.

The terms resilience and sustainability can take on different meanings in different contexts; it is therefore important for CLMPO to establish definitions for both as an initial step in this process. The FHWA defines resilience as "the ability to anticipate, prepare for, and adapt to changing conditions and withstand, respond to, and recover rapidly from disruptions."[3] This definition of resilience is broad and can be applied in both progressive (e.g. the ability to adapt to changing conditions) and regressive (e.g. how to

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[1] Weilant, Strong, and Miller, *Incorporating Resilience.*

[2] American Association of State Highway and Transportation Officials, *Effective All-Hazards Infrastructure Protection.*

[3] Federal Highway Administration, *Resilience and Transportation Planning*, 1.

maintain status quo or bounce back to a state of equilibrium) contexts. Instead, this white paper proposes the following definition for resilience:

> *Resilience is the ability of a socio-environmental system to survive and transform in order to sustain itself.*

This definition of resilience assumes that change, not equilibrium or stasis, is the natural state, and allows CLMPO to measure resilience by the transportation system's ability to transform in response to stresses both large (e.g. climate change) and small (e.g. everyday flooding events).

Sustainability, like resilience, has broad application over many contexts. The most commonly accepted definition of sustainability is the ability to "meet the needs of the present without compromising the ability of future generations to meet their own needs."[4] CLMPO proposes following the United Nations Educational, Scientific, and Cultural Organization (UNESCO) definition of sustainability:

> *Sustainability is a paradigm for thinking about the future in which environmental, societal, and economic considerations are balanced in the pursuit of an improved quality of life.*[5]

Together, these definitions of resilience and sustainability direct CLMPO to address transportation resilience through the three "pillars" of sustainability: environment, society (i.e. equity), and economy. With these definitions in mind, this paper covers a comprehensive, systems-level approach to resilience through the lens of sustainability in order to present relationships between social, economic, and environmental factors that contribute to risk and vulnerability, as well as adaptation and mitigation.

2.2 Planning Factor 9

2.2.1 2015 FAST Act Requirement

The 2015 Fixing America's Surface Transportation (FAST) Act introduced a new planning factor that MPOs must consider during the transportation planning process. Specifically, Planning Factor 9 requires MPOs to address how they will "improve the resiliency and reliability of the transportation system and reduce or mitigate stormwater impacts of surface transportation" *(23 CFR 450.306(b)(9))*. Additionally, MPOs should consult with agencies responsible for natural hazard mitigation and risk reduction in the development of the metropolitan transportation plan *(23 CFR 450.316(b))*. The plan must also assess capital investments and explore strategies to reduce the vulnerability of infrastructure to natural disasters *(23 CFR 450.324(g)(7))*.

2.2.2 FHWA Guidance on Planning Factor 9

Following the FAST Act's introduction of the new Planning Factor 9, the FHWA produced a fact sheet that provides high level guidance on its application. In the fact sheet, the FHWA focuses on the threat of climate change and extreme weather events to long-term investments in transportation infrastructure

[4] World Commission on Environment and Development, *Our Common Future*, 41.
[5] UNESCO 2019, "Sustainable Development."

and identifies the transportation planning process as a key opportunity to address climate resilience. According to the FHWA, there are four main opportunities to integrate resilience (Figure 2.1).

Figure 2.1: Integrating Resilience into Transportation Planning[6]

Regional Vision & Goals	Establish goals and performance measures relating to resilience.
Long Range Transportation Plan	Use information on resilience to help identify strategies and investment scenarios.
Project Evaluation & Prioritization	Use resilience in the evaluation and prioritization of projects.
Project Development	Incorporate resilience into project design and engineering.

Though the FHWA does not provide specific guidance on how MPOs are required to address Planning Factor 9, it has produced high level guidance and best practices on approaches to resilience. For example, since 2013, the FHWA has run a Climate Resilience Pilot Program to explore a variety of approaches to improving resilience. In a 2016 report, the FHWA identified three steps utilized by pilot participants in successful approaches to assessing vulnerability and integrating climate resilience into transportation decision-making (Figure 2.2).

Figure 2.2: Successful Approaches to Assessing Vulnerability and Integrating Climate Resilience[7]

Step 1	Define the Scope	– Identify key climate variables, sensitive assets, & impact thresholds – Articulate objectives – Select and characterize relevant assets – Consider geography, decision timeframe, coverage of assets & climate stressors, project budget & timeline, data availability, near-term priorities, existing studies, expertise of local partners, and a broad range of stressors (not just climate)
Step 2	Assess Vulnerability	– Collect and integrate data on assets – Develop climate inputs – Develop information on asset sensitivity to climate – Incorporate likelihood and risk – Identify and rate vulnerabilities – Assess asset criticality
Step 3 (pt. 1)	Integrate into Decision-Making	– Incorporate into asset management – Integrate into emergency and risk management – Contribute to long range transportation plan – Assist in project prioritization – Identify opportunities for improving data collection, operations, or designs – Build public support for adaptation investment – Educate and engage staff and decision-makers

[6] UNESCO 2019, “Sustainable Development.”

[7] Federal Highway Administration, *Climate Resilience Pilot Program*.

Step 3 (pt. 2)	Incorporate Results into Transportation Programs and Processes	– Develop resources to incorporate climate information into engineering design – Align assessments with long range planning – Streamline climate change adaptation planning with asset management – Engage and coordinate with various partners and stakeholders on adaptation projects

2.2.3 How MPOs are Incorporating Planning Factor 9

In 2018, the FHWA conducted a literature review to understand how MPOs are integrating resilience into the transportation planning process. The resulting white paper provides a broad understanding of how 52 DOTs and 101 MPOs are incorporating resilience into long range plans and programming documents.[8] The FHWA found that, in addition to federal- and state-level directives and requirements, DOTs and MPOs reported several reasons why they were integrating resilience, including: economic benefits, improved safety, maintaining mobility and operations, preparing to adapt to climate change, and responding to damage from catastrophic weather events. In practice, MPOs were integrating resilience into development of long-range plans, Transportation Improvement Plans, Transportation Asset Management Plans, and environmental reviews at several key points in the planning process:

- Incorporating resilience-specific goals and objectives that guide plan development
- Considering resilience when defining problems and needs addressed by the plan
- Considering resilience as part of criteria for evaluating projects
- Identifying, adopting, and implementing strategies that address vulnerabilities and achieve resilience goals
- Using performance measures to monitor how strategies are improving resilience

The FHWA found that the first step many MPOs took in assessing problems or needs was to understand the hazards and vulnerabilities that threatened their systems. Most MPOs achieved this through a formal vulnerability assessment, though some used scenario planning or workshops. Others considered the themes relating to climate, natural hazards, and resilience without any sort of formal or systematic assessment of vulnerability, though many discuss the need for such an assessment as an important next step in the planning process.

2.2.4 Survey of Regional Transportation Plans

Initial research for this white paper included a brief review of a select number of RTPs[9] from MPOs in Oregon and around the country to better understand how they are treating the themes of resilience and stormwater in their long-range planning (Figure 2.3). The RTPs selected for review were completed after passage of the FAST Act in 2015[10] and met one or more of the following criteria: 1) they were from an

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[8] Federal Highway Administration, *Integrating Resilience into Transportation Planning*

[9] Federal code refers to MPO long range transportation plans as Metropolitan Transportation Plans (MTPs), however, for the purpose of this white paper and to stay consistent with CLMPO's use of the term, Regional Transportation Plan (RTP) is used to describe CLMPO's plan and long-range transportation plans in general, except where specific mention is made to an MPO that refers to its own plan as an MTP.

[10] Note: MPOs were not required to develop RTPs that incorporate Planning Factor 9 until after May 27, 2018.

MPO in Oregon, 2) they were produced by MPOs with similar population and geography, or 3) they were from areas that have relatively robust regional approaches to resilience or stormwater management. Of the RTPs reviewed, six were from Oregon and five were from MPOs in other states. It is important to note that this review was not intended to be exhaustive, but rather to provide a basic understanding of what might be deemed adequate consideration of resilience and stormwater by the FHWA.

Figure 2.3: Regional Transportation Plans

Metropolitan Planning Organization	Location	Update Year & Planning Horizon
Albany Area Metropolitan Planning Organization (AAMPO)	Albany, OR	2018 – 2040
Bend Metropolitan Planning Organization (BMPO)	Bend, OR	2017 – 2040
Corvallis Area Metropolitan Planning Organization (CAMPO)	Corvallis, OR	2017 – 2040
Oregon Metro	Portland, OR	2018 – 2040
Rogue Valley Metropolitan Planning Organization (RVMPO)	Central Point, OR	2017 – 2042
Salem-Keizer Area Transportation Study (SKATS)	Salem, OR	2019 – 2043
Delaware Valley Regional Planning Commission (DVRPC)	Philadelphia, PA	2017 – 2045
New York Metropolitan Transportation Council (NYMTC)	New York, NY	2017 – 2045
Puget Sound Regional Council (PSRC)	Seattle, WA	2017 – 2040
Southwest Washington Regional Transportation Council (SWRTC)	Vancouver, WA	2019 – 2040
New Orleans Regional Planning Commission (NORPC)	New Orleans, LA	2019 – 2048

Review of the selected RTPs revealed considerable variation in the treatment of the themes of resilience and stormwater. MPOs took four main approaches, addressing Planning Factor 9 themes to varying degrees of depth and detail:

1. Incorporate resilience into goals, objectives, policies, or strategies (e.g. AAMPO, DVRPC, Metro, CAMPO, PSRC)
2. Address resilience in its own distinct section in the body of the RTP (e.g. Bend)
3. Weave discussion of resilience throughout other relevant sections (e.g. Metro, NORPC)
4. Include additional detail in the appendix (e.g. PSRC)

Of the 11 plans, two provide particularly useful examples for the treatment of resilience: PSRC's Regional Transportation Plan – 2018 and BMPO's 2040 Bend Metropolitan Transportation Plan. PSRC provides extensive detail pertaining to resilience in Appendix O: Resilience. Though resilience is discussed briefly in Chapter 2: Plan Investments and Chapter 5: Plan Implementation, Appendix O provides an in-depth, 32-page discussion of resilience in the PSRC area that defines the risks, establishes potential impacts in the region, and identifies actions being taken at multiple levels to address risks. PSRC's Appendix O provides an example for how CLMPO might structure a discussion of resilience that provides thoughtful insight and region-specific guidance.

BMPO was the only MPO under review to dedicate an entire chapter to resilience themes (Chapter 13: Security and Emergency Planning). Chapter 13 addresses disaster mitigation and, more specifically, the possible role of the MPO in security and emergency planning. This chapter defines the MPO's role in planning for and responding to every stage of a natural disaster. In Chapter 13, BMPO also discusses current security/emergency planning efforts that focus on or include transportation in the Bend area.

Of the plans reviewed, two provide useful examples for the treatment of stormwater: Metro's 2018 Regional Transportation Plan and PSRC's Regional Transportation Plan – 2018. Though Metro's plan does not have a dedicated stormwater section, Metro's approach is holistic in that it includes specific language around green infrastructure and recognizes that streets and parking resources should be employed to serve many functions, including nature corridors and stormwater management. Metro has shown long-term dedication to stormwater and green infrastructure and has published several handbooks addressing the nexus between livability, street design, and ecology, including the *Livable Streets Handbook*, *Green Streets: Innovative Solutions for Stormwater and Stream Crossings,* and *Wildlife Crossings: Providing Safe Passage for Urban Wildlife*.

PSRC's Regional Transportation Plan – 2018 briefly discusses transportation-related impacts to water quality in the body of the plan, including approaches to managing stormwater, such as reducing impervious surfaces and using low-impact materials. This plan's primary value with respect to stormwater is Appendix A: Policies and Mandates, which includes several very specific goals and policies relating to environmental stewardship and water quality that are derived from the region's management, environmental, economic, and transportation strategy known as VISION 2040. Appendix A outlines policy ideas that can be used for reference as CLMPO develops its own stormwater-specific policies. For example, the Water Quality Goal states: "The region will meet or do better than standards for established water quality. The quality of the water flowing out of the region–including Puget Sound–should be as good as or better than the quality of water entering the region."[11]

Although the three plans explored above may serve as models for the content and/or structure of CLMPO's efforts to address resilience and stormwater to fulfill Planning Factor 9, each one treats resilience and stormwater essentially as separate subjects, with limited, if any, overlap or interaction between the two. This white paper proposes that CLMPO take a more comprehensive approach to Planning Factor 9 that incorporates resilience and stormwater as inter-related elements of a sustainable system with a triple bottom line. To that end, a strong example of a more comprehensive, sustainability-focused approach is DVRPC's Connections 2045: Plan for Greater Philadelphia. In this plan, "Sustain the Environment" is listed as the first of several guiding principles, and there are many explicit and actionable goals and strategies relating to climate resilience, stormwater, air quality, green infrastructure, and other inter-related issues, including food production. Chapter 5: Taking Action also ties the sustainability principles and goals to direct actions in the region. Overall, this plan provides a valuable resource for environmentally focused goals, policies, and actions.

In the absence of specific guidelines or requirements from FHWA on precisely how to address Planning Factor 9, MPOs took a variety of approaches to considering resilience and stormwater. Following is a list of best practices and takeaways from this review intended to help guide CLMPO's development of these themes in the 2045 RTP (Figure 2.4).

[11] Puget Sound Regional Council, *Regional Transportation Plan – 2018*, 2.

Figure 2.4: Best Practices in RTP Treatment of Resilience and Stormwater

DO…	DON'T…
Include data and information on local context and specific threats, actions, recommendations, etc. and relate them directly and explicitly to transportation	Be too vague or general about local impacts or how they affect transportation
Use concise language to summarize the main points for readability (and reserve additional detail for appendices)	Overload the section with so much detail that the purpose/overall picture is lost, or that the average reader cannot understand it
Provide detail that can be used in the NEPA process	Use detail for NEPA as a stand-in for deeper analysis of resilience and stormwater themes
Consider interrelated themes in a holistic way	Relegate connected topics to individual silos that do not allow a systems-level perspective

3. REGULATORY AND PLANNING CONTEXT

3.1 Federal Regulatory Context

In addition to requirements relating to the FAST Act, several federal regulations, national directives, and executive orders establish requirements or recommendations that states and MPOs must consider resilience (Figure 3.1). This list may not be comprehensive, but it represents an effort to seek out relevant regulations and guidance.

Figure 3.1: Federal Regulations and Directives Guiding Transportation Resilience

Regulations for Facilities Repeatedly Damaged by Emergencies	US DOT requires State DOTs to evaluate whether "there are reasonable alternatives" to "roads, highways, and bridges that have required repair and reconstruction activities on two or more occasions due to emergency events."[12] MPOs are encouraged to consider these evaluations during the development of transportation plans and programs as well as environmental review.
Transportation Asset Management Plans (TAMPs)	State TAMPs must establish a process for full lifecycle planning for assets; develop a risk-based management plan; include a description of transportation assets and develop a risk management analysis that is informed by the evaluations of facilities repeatedly damaged by emergencies; and integrate the TAMP into state transportation planning processes.
Executive Order 13653 (revoked)	Executive Order 13653, Preparing the United States for the Impacts of Climate Change (November 1, 2013) ordered the nation to prepare for the impacts of climate change through climate preparedness and resilience. All federal agencies were directed to promote: (1) engaged and strong partnerships and information sharing at all levels of government; (2) risk-informed decision-making and the tools to facilitate it; (3) adaptive learning, in which experiences serve as opportunities to inform and adjust future actions; and (4) preparedness planning.[13] Though EO 13653 was revoked by Executive Order 13783, Promoting Energy Independence and Economic Growth (March 28, 2017)—which makes no reference to climate change or resilience—it laid the foundation for future orders about resilience, including FHWA Order 5520.
FHWA Order 5520	Under Executive Order 13653, FHWA Order 5520 (December 15, 2014) established FHWA policy on preparedness and resilience with respect to climate change and extreme weather.
Other Regulations and Guidance	– Robert T. Stafford Disaster Relief and Emergency Assistance Act (1988) – Disaster Mitigation Act (2000) – Presidential Policy Directive 8: National Preparedness (2011) – Presidential Policy Directive 21: Critical Infrastructure Security and Resilience (2013) – Department of Homeland Security National Infrastructure Protection Plan 2013: Partnering for Critical Infrastructure Security and Resilience – Executive Order 13636: Improving Critical Infrastructure Cybersecurity (2013) – National Environmental Policy Act (NEPA) environmental review processes

[12] Federal Highway Administration, *Integrating Resilience into Transportation Planning.*
[13] Executive Order 13653, 78 FR 66817 (2013)

3.2 State Regulatory and Planning Context

Oregon Statewide Planning Goal 7: Natural Hazards directs local communities to regulate development in hazard-prone areas. Specifically, local comprehensive plans are required to address floods (coastal and riverine), landslides, earthquakes and related hazards, tsunamis, coastal erosion, and wildfires.[14] The State of Oregon's Natural Hazards Mitigation Plan (NHMP) provides the most complete, up-to-date description of Oregon's natural hazards. Local jurisdictions rely on information presented in the State's plan to prepare their own local natural hazard mitigation plans. The State's NHMP is updated every five years and is currently undergoing an update.

Additionally, the State has taken steps toward addressing both greenhouse gas (GHG) emissions and seismic resilience as they relate directly to transportation.

Greenhouse Gas Emissions

ORS 468A.205 set a goal of achieving GHG levels at least 75% below 1990 levels by 2050 and also directed "state and local governments, businesses, nonprofit organizations, and individual residents to prepare for the effects of global warming and by doing so, prevent and reduce the social, economic, and environmental effects of global warming."[15] House Bill 2001 (2009), also known as the Jobs and Transportation Act, directed both the Eugene-Springfield and the Portland Metropolitan Areas to conduct local scenario planning to explore how to meet emissions reduction targets. The state-set target for CLMPO was a 20% reduction below 2005 levels by 2035. The bill required CLMPO to consider the target in its scenario planning, not to adopt it. The results of that effort are discussed below in Section 3.4 CLMPO Existing Efforts.

The Oregon Sustainable Transportation Initiative (OSTI), a partnership between the Oregon Department of Transportation (ODOT) and Department of Land Conservation and Development (DLCD), leads the implementation of a statewide effort to reduce GHG emissions from transportation, which accounts for 31% of emissions in Oregon. Senate Bill 1059 (2010) directed OSTI to develop the Oregon Statewide Transportation Strategy (STS), a two-year scenario planning process to identify short- and long-term strategies to reduce emissions, which was adopted by the Oregon Transportation Commission (OTC) on March 20, 2013. The STS identifies 18 strategies, with 133 elements in six categories: vehicle and engine technology advancements, fuel technology advancements, enhanced system and operations performance, transportation options, efficient land use, and pricing and funding mechanisms.

The State has recently taken actions to implement and strengthen statewide GHG emissions reductions targets. In September 2019, Governor Brown directed ODOT, DLCD, the Department of Energy, and the Department of Environmental Quality to form a four-agency working group to create a work plan for implementing STS. In March 2020, Executive Order 20-04 revised Oregon's previous targets to a 45% reduction below 1990 levels by 2035 and an 80% reduction below 1990 levels by 2050 (up from 75% by 2050 established by ORS 468A.205). In June 2020, ODOT formed a new Climate Office to implement the Executive Order. An initial draft of the four-agency working group's two-year work plan, called Every Mile

[14] Oregon Department of Land Conservation and Development, *Goal 7: Areas Subject to Natural Disasters and Hazards*.
[15] ORS 468A.205 (2)

Counts, identifies three key objectives and a number of priority actions that will help achieve the revised goals (Figure 3.2).

Figure 3.2: Multi-Agency Draft Work Plan Objectives and Priority Actions[16]

Objective	Priority Actions
Reduce Vehicle Miles Traveled Per Capita	**Statewide Trip Reduction Policy** – Require some businesses to implement policies that reduce employees' vehicle miles traveled (e.g. telecommuting, flexible work schedules, free transit passes, parking cash-out programs, bike/ped options, etc.) **Parking Management** – Limit growth of parking spaces, increase number of pay-to-park locations, raise parking rates, or other strategies to disincentivize driving
Support the Use of Cleaner Vehicles and Fuels	**Interagency Zero Emission Vehicle (ZEV) Action Plan** – Efforts to increase awareness of and access to ZEVs, improve charging infrastructure, increase state use of ZEVs **Transportation Electrification Infrastructure Needs Analysis** – ODOT required to complete analysis by June 2021 per the Executive Order; must consider rural needs and focus on meeting goals for ZEVs set in SB 1044 (2019) **Expand the Clean Fuels Program** – DEQ rulemaking process to extend and enhance requirements of existing program **Adopt New Emissions Standards and ZEV Requirements for Medium- and Heavy-Duty Trucks** – California's emissions standards and requirements for manufacturers to be considered
Consider GHG in Decision-Making	**Transportation Planning Rule** – Amend the TPR and other planning rules to require local governments to plan for transportation systems and land uses that reduce GHG emissions **Scenario and GHG Reduction Planning** – MPO Scenario planning supported by ODOT and DLCD to guide rulemaking **GHG Reduction Performance Measures** – State, local, and programmatic performance measures to be developed

Seismic Resilience

In addition to GHG emissions, ODOT and other State agencies have engaged in resilience planning with respect to statewide seismic risk that will be critical to CLMPO's assessment of the risk to and resilience of its own transportation system. Governor Brown issued a resiliency policy agenda in October 2018 called "Resiliency 2025: Improving Our Readiness for the Cascadia Earthquake and Tsunami," which re-emphasized the need to plan for seismic resilience.[17] The policy agenda follows in the footsteps of *The Oregon Resilience Plan: Reducing Risk and Improving Recovery for the Next Cascadia Earthquake and Tsunami*, prepared by the Oregon Seismic Safety Policy Advisory Commission in 2013, which maps priorities for policy and investment over the next 50 years. In 2012 and 2014, respectively, ODOT published the *Seismic Lifelines Evaluation, Vulnerability Synthesis, and Identification Report* and the *Oregon Highways Seismic Plus Report*, which identified lifeline corridors and specific seismic hazards

[16] ODOT, DLCD, ODOE, and DEQ, *Every Mile Counts.*
[17] Office of the Governor, *Resiliency 2025.*

affecting lifeline routes. These studies provide the basis for this paper's seismic analysis; see Section 4.3 Hazards to the CLMPO Area Transportation System for expected impacts from a Cascadia subduction zone earthquake in the CLMPO area.

3.3 Local Regulatory and Planning Context

CLMPO partner agencies have engaged in numerous efforts to address hazard mitigation, stormwater, and climate change in local policies and plans. CLMPO's planning around resilience should be consistent with these existing local efforts. Though a comprehensive review of each of the plans and policies discussed in this section is beyond the scope of this paper, they are critical to understanding the local landscape with respect to resilience and they should be taken into consideration throughout the transportation planning process.

Hazard Mitigation

A proactive approach to natural hazard mitigation—including policy changes, projects, and education and outreach—reduces the loss of life, property damage, and injury caused by natural hazards. It also makes financial sense; a report to congress by the National Institute of Building Science's Multi-Hazard Mitigation Council contends that every $1 spent on hazard mitigation saves up to $6.[18]

The Robert T. Stafford Disaster Relief and Emergency Assistance Act of 1988 (Stafford Act) and the Disaster Mitigation Act of 2000 (DMA 2000) provide the federal regulatory framework for local natural hazards mitigation planning. Specifically, DMA 2000 amended the Stafford Act to require local governments to develop NHMPs before they are eligible to receive federal disaster assistance. Figure 3.3 lists local NHMPs and related efforts.

Figure 3.3: Local Hazard Mitigation Plans

Jurisdiction	Plan	Description
Cities of Eugene and Springfield	**Eugene-Springfield Area Multi-Jurisdictional Natural Hazards Mitigation Plan (2020)**	Strategic, non-regulatory plan that provides the foundation for coordination and collaboration among participating agencies and the public; identifies and prioritizes future mitigation activities; and aids in meeting Federal requirements for assistance programs
Lane County, Cities of Coburg, Creswell, Dunes City, Florence, Oakridge, Veneta, Westfir	**Lane County Multi-Jurisdictional Hazard Mitigation Plan (2017)**	Plan supporting all of Lane County, including both rural and incorporated areas, in achieving a better understanding of natural hazards, the risk they pose, and committing to actions to minimize those risks
Cities of Eugene and Springfield	**Regional Climate and Hazards Vulnerability Assessment (2013)**	In support of the Eugene-Springfield Area Multi-Jurisdictional Hazards Mitigation Plan, staff from the City of Eugene and the City of Springfield engaged representatives from 11 sectors to collect information about adaptive capacity and vulnerability to specific hazards

[18] Cities of Eugene and Springfield, *Natural Hazards Mitigation Plan*.

Stormwater

Stormwater management is an issue of significant importance to transportation planning. The transportation system is composed primarily of impervious surfaces, which directly affects both water quality and quantity. Runoff from paved surfaces carries pollutants that, if left untreated, can contaminate local waterways and groundwater. Impervious surfaces also contribute to street flooding, which can damage property and cause loss of life.

The Federal Clean Water Act of 1972 prohibits any release of pollutants into waters of the United States without a National Pollutant Discharge Elimination System (NPDES) Permit, which regulates the amount of certain pollutants permissible in a discharge. Large- and medium-sized cities with municipal separate stormwater sewer systems (MS4s) that discharge untreated stormwater into local waterbodies—including Eugene and Springfield—are required to obtain NPDES Permits, develop a Stormwater Pollution Prevention Plan or Stormwater Management Plan, and implement measures to prevent pollutant discharge in stormwater runoff. Figure 3.4 presents a list of local stormwater plans.

Figure 3.4: Local Stormwater Plans

Jurisdiction	Plan	Description
City of Eugene	**Stormwater Management Manual (2014)**	Developed to implement the Stormwater Development Standards outlined in Eugene Code 9.6791 – 9.6797, which govern flood control, quality, flow control (headwaters), oil control, source controls, dedication of easements, and operation and maintenance
City of Eugene	**Comprehensive Stormwater Management Plan (1995)**	Establishes comprehensive public policy for addressing stormwater conveyance and urban stormwater quality issues
Lane County	**Stormwater Management Plan (2011)**	Proposed revisions to Lane County's original Stormwater Management Plan (2003) considered as part of Lane County's NPDES Phase II permit renewal application
City of Springfield	**Stormwater Management Facility Master Plan (2008)**	Provides a guide for comprehensive, efficient, and multi-objective management of the City's stormwater system
City of Springfield	**Stormwater Management Plan (2010)**	Provides policy and management guidance for activities affecting stormwater to help the City of Springfield fulfill State and Federal water quality requirements as well as local water resources management objectives
City of Coburg	**Water Master Plan (2016)**	A technical appraisal of the state of the current water system and needed improvements intended to help guide the planning or growth of the community and water system
City of Coburg	**TMDL Implementation Plan (2008)**	Describes the strategies the City will implement to reduce temperature, bacteria, and mercury pollution in the Upper Willamette sub-basin of the Willamette River as a requirement of the Willamette Basin TMDL as approved by the EPA in September 2006

Climate Change

The City of Eugene, Lane County, and Lane Transit District have developed policies around climate change that establish goals for GHG emissions reductions (Figure 3.5).

Figure 3.5: Local Climate Change Plans & Policies

Jurisdiction	Plan	Description
City of Eugene	**Climate Recovery Ordinance (2014)**	Set four goals for GHG reductions in Eugene, including two community goals and two City operations goals. Community: 1. Reduce community fossil fuel use by 50% of 2010 levels by 2030 2. Reduce total community GHG emissions to an amount that is no more than the City of Eugene's average share of a global atmospheric GHG level of 250 ppm by 2100, which was estimated in 2016 to require an annual average emission reduction level of 7.6%. City Operations: 1. All city of Eugene owned facilities and operations shall be carbon neutral by 2020, meaning no net release of GHGs. 2. Reduce the City of Eugene's use of fossil fuels by 50% compared to 2010 usage.
City of Eugene	**Climate Action Plan 2.0 (2019)**	Identifies research-based actions to help the city meet its climate goals and advance progress toward the Climate Recovery Ordinance
Lane County	**Climate Action Plan (in progress)**	Currently in the first of three phases that will include: 1. A GHG inventory to establish reductions targets (Phase I, complete) 2. A comprehensive countywide plan to establish goals and strategies (Phase 2) 3. A resiliency plan to identify adaptation strategies (Phase 3) 4. A suite of Action Initiatives supporting green jobs, clean energy projects, and climate-friendly industries 5. Open and transparent public communications to monitor progress toward goals 6. A Climate Advisory Committee to advise the Board of Commissioners on ongoing climate action work
Lane County	**Operational Greenhouse Gas Inventory (2020)**	The first phase of a three-phased approach to the development of the Climate Action Plan
Lane Transit District	**Climate Action Policy (2020)**	Establishes short-term and long-term goals for GHG reductions, including: 1. Purchasing 25 electric buses by 2023 2. Reducing GHG emissions by 75% by 2030 and phasing out fossil fuel vehicles in its fleet by 2035 3. Exploring emerging technology and working with partner jurisdictions, including Lane Council of Governments, to improve GHG emissions reductions

3.4 CLMPO Existing Efforts

CLMPO has undertaken recent planning efforts that relate directly to regional resilience and should be considered as part of this process (Figure 3.6).

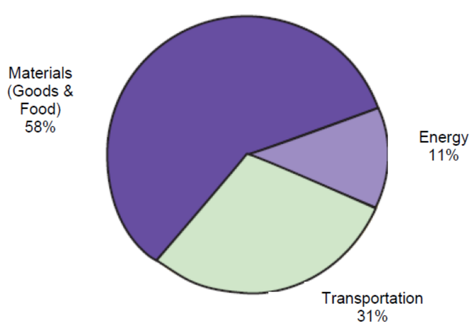
Figure 3.6: CLMPO Existing Efforts

Planning Effort	Description
Eugene-Springfield Metropolitan Region Greenhouse Gas Inventory (2010)	Identifies major sources of greenhouse gas emissions in the Eugene-Springfield area
Regional Transportation Options Plan (2014)	Recommends core transportation options programs and services
Central Lane Scenario Planning (2015)	Explores how to meet the DLCD-set GHG emissions reduction target of 20% below 2005 levels by 2035 in the Eugene-Springfield Metropolitan Region
Central Lane Scenario Planning Health Impact Assessment (2015)	Documents regional health impacts and related cost savings to anticipated reductions in GHG emissions associated with policies under consideration as part of the scenario planning process
CLMPO Strategic Assessment (underway)	Builds on the results of the Central Lane Scenario Planning work and the Eugene Transportation Plan scenario findings to test and quantify what regional policies, programs, and investment actions, grouped to make scenarios, will allow the MPO to achieve its long range local and State planning vision and goals; intended to guide the policy development and investment strategy options of the RTP update

Eugene-Springfield Metropolitan Region Greenhouse Gas Inventory (2010)

In 2010, CLMPO conducted a Greenhouse Gas Inventory for the Eugene-Springfield Metropolitan Area. The region is responsible for an estimated 3.2 million metric tons of GHG emissions per year, which accounts for 4.6% of total state emissions.[19] The inventory found that the average Eugene household emits 31.9 metric tons of carbon dioxide equivalent annually, a figure that is lower than for households of the Portland Metro area and the United States. The report attributes relatively lower household footprints to three main factors: abundant sources of hydropower used for clean energy, lower per capita vehicle travel due to local planning efforts to reduce sprawl and encourage transportation options, and lower estimated consumption of goods attributable to lower incomes. The inventory groups emissions sources into three broad categories (Figure 3.7).

Figure 3.7: Major Sources of Eugene-Springfield Greenhouse Gas Emissions[20]



[19] Note: The inventory looked at emissions between July 2005 and June 2006.

[20] Central Lane Metropolitan Planning Organization, *Greenhouse Gas Inventory*.

The inventory found that a majority of transportation-related emissions were the result of passenger transportation and local freight:

- Local passenger transport, including all cars and light trucks in the region – 17%
- Other passenger transport, including long-distance passenger travel by air, inter-city rail, inter-city bus, cars, and light trucks – 12.4%
- Local freight, including vehicles weighing more than 10,000 pounds – 1.3%
- Transit, including fuel consumption for buses and other transit fleet vehicles – 0.3%

Central Lane Scenario Planning (2015)

The 2009 Jobs and Transportation Act (JTA) required the CLMPO area to conduct local scenario planning to explore how to meet a DLCD-set GHG emissions reduction target of 20% below 2005 levels by 2035. CLMPO's Scenario Planning effort concluded in 2015. Though the major goal was GHG reduction, CLMPO's plan took a broader approach that also incorporated social equity, public health, and economic health (Figure 3.8). This planning effort concluded that under the direction of current policy (the Reference Scenario), the region would only see a 3% reduction in per capita GHG emissions from 2005 levels by 2035. The region will not meet the 75% target without a mix of strategies—the Preferred Scenario consists of a balanced approach toward investment in seven areas: active transport, fleet and fuels, transit, pricing, parking management, education and marketing, and roads. According to the 2015 report, the Preferred Scenario will require new sources of revenue to fully implement.[21] CLMPO was not required to adopt a Preferred Scenario as part of this process.

Figure 3.8: CLMPO Scenario Planning Goals Above and Beyond GHG Reductions

Goal	Criteria
Foster Economic Vitality	Driving costs as a percentage of household income Average household income by housing type Average parking costs Value of time lost to congestion
Improve Public Health	Physical activity per capita Health benefits from increased walking and biking Cost savings due to reduced disease burden Change in the number of fatal or severe injury accidents
Enhance Equity	Driving costs as a percentage of household income Average household income by housing type

Central Lane Scenario Planning Health Impact Assessment (2015)

As part of the scenario planning effort in 2015, CLMPO partnered with Lane County Public Health to conduct a Health Impact Assessment (HIA) to determine regional health impacts and related cost savings of anticipated reductions in GHG emissions associated with the policies under consideration. The strategies espoused by the Scenario Planning process focus on reducing Vehicle Miles Traveled (VMT) as the primary mechanism through which CLMPO can affect substantive changes in GHG emissions; improving fuel economy of the vehicle fleet and reducing the carbon intensity of fuels used, though important strategies, are generally outside the control of the MPO.

[21] Central Lane Metropolitan Planning Organization, *Central Lane Scenario Planning*.

Climate change presents a threat to human health and well-being through severe weather, wildfire, air quality, and food-, water-, and vector-born illness, so human health is an important co-benefit of GHG emissions reductions. The HIA found that the strategies and investments considered through the Scenario Planning process could prevent 20 premature deaths per year and save the region over $30 million in health care costs. Active transport would have the largest impact on health—95% of deaths avoided and 99% of illnesses avoided were associated with increased physical activity. The study concluded that strategies and investments that increase active transportation, and therefore physical activity, are key to maximizing public health benefits.

4. AN INTEGRATED APPROACH TO RESILIENCE & SUSTAINABILITY

4.1 MPO Role in Security and Emergency Management Planning

Though emergency response and public safety agencies in the region assume primary responsibility for planning for and responding to emergency situations, an MPO can also make a significant contribution to security and emergency planning efforts due to its existing role as a convener for cooperative decision-making and conduit for financial resources (Figure 4.1). While these options are dependent upon funding availability and policy board direction, an MPO may facilitate:

- Conducting a **vulnerability analysis** on the transportation system to understand risks and help prioritize strategies to address needs
- Analyzing the transportation network for **redundancies** to ensure efficient movement of people and supplies in the event of an emergency and to address choke points
- Analyzing the transportation network for **emergency transportation routes** and identifying gaps in the network

Figure 4.1: Potential MPO Roles in Security and Emergency Planning[22]

Stage of Incident	Possible MPO Role
Prevention and Preparedness	• Funding new strategies/technologies/projects that can help prevent events • Conducting vulnerability analyses on regional transportation facilities and services • Secure management of data and information on transportation system vulnerabilities • Providing a forum for security/safety agencies to coordinate surveillance, prevention, and preparedness strategies • Funding and coordinating regional transportation surveillance system that can identify potential danger prior to occurrence • Coordinating drills and exercises among transportation providers to practice emergency plans • Involving incident management/emergency response entities in planning processes • Coordinating with security officials in development of prevention and preparedness strategies • Hazardous route planning • Analyzing transportation network for redundancies in moving large numbers of people (e.g. modeling person and vehicle flows with major links removed or reversed, accommodating street closures, adaptive signal control strategies, impact of traveler information systems, strategies for dealing with “choke” points such as tollbooths) • Analyzing transportation network for emergency route planning/strategic gaps in network • Providing a forum for discussions on coordinating emergency response • Disseminating best practices in incident-specific engineering design and emergency response to agencies • Disseminating public information on options available for possible response • Funding communications systems and other technology to speed response to incidents

[22] Bend Metropolitan Planning Organization, *2040 Bend Metropolitan Transportation Plan*, 13-182. Adapted from: Georgia Institute of Technology. *The Role of the Metropolitan Planning Organization (MPO) in Preparing for Security Incidents and Transportation System Response,* Michael D. Meyer, Ph.D., P.E., 2004.

Monitoring	• Coordinating public information dissemination strategies • Funding communications systems for emergency response teams and agencies
Recovery	• Conducting transportation network analyses to determine the most effective recovery investment strategies • Acting as a forum for developing appropriate recovery strategies • Funding recovery strategies
Investigation	• Providing any data collected as part of surveillance/monitoring that might be useful for investigation
Institutional Learning	• Acting as a forum for regional assessment of organizational and transportation system response • Conducting targeted studies on identified deficiencies and recommending corrective action • Coordinating changes to multi-agency actions that will improve future responses • Funding new strategies/technologies/projects that will better prepare the region for the next event

4.2 Assessing Vulnerability

Vulnerability is a measure of a transportation system's or asset's sensitivity to risk, including its adaptive capacity, or ability to cope with current or expected future impacts. A vulnerability assessment is a key step in improving the resilience of the transportation system—in order to take steps to mitigate risk and therefore improve the resilience of the system, a transportation agency must first understand the risks that threaten the system as well as its existing capacity to deal with those risks.

The FHWA has provided guidance on assessing vulnerability associated with climate change and extreme weather intended for state DOTs, MPOs, and local jurisdictions called the *Vulnerability Assessment and Adaptation Framework*.[23] The framework is informed by 24 climate change resilience pilot programs the FHWA has conducted in partnership with transportation agencies across the country since 2010. It is a structured, step-by-step manual to help transportation agencies asses the vulnerability of their transportation systems and help them integrate adaptation into decision-making. There are seven steps in the framework:

1. **Articulate objectives and define study scope.** The first step involves narrowing the focus of the study and setting the parameters given time and resource constraints. The framework provides guidance on the selection of relevant asset and climate variables.

2. **Obtain asset data.** The framework provides best practices for collecting data, as well as guidance on the type of data that may be useful to collect for different assets.

3. **Obtain climate data.** The framework provides a variety of potential sources for local climate data.

4. **Assess vulnerability.** This step helps transportation agencies determine the risk level for a transportation asset or system by evaluating the system's exposure, sensitivity, and adaptive capacity.

[23] Filosa, et al., *Vulnerability Assessment and Adaptation Framework*

5. **Identify, analyze, and prioritize adaptation options.** Adaptation options can include natural, structural, or policy-based solutions. The framework provides guidance on the selection of appropriate options and walks through two evaluation methods to help prioritize them: multi-criteria analysis and economic analysis.

6. **Incorporate assessment results in decision-making.** The framework identifies strategies to integrate the results of the vulnerability assessment into transportation planning; project development and environmental review; project level design and engineering; transportation systems management, operations, and emergency management; and asset management.

7. **Monitor and revisit.** The process must be iterative as new data become available and conditions evolve.

It is important to note that the FHWA's *Vulnerability Assessment and Adaptation Framework* focuses exclusively on climate change vulnerability, but there are many other transportation-related risks, both natural and "non-natural," that can and should be included in a vulnerability analysis. In 2019, the Transportation Research Board funded research by the RAND Community Health and Environmental Policy Program to build on and expand the Vulnerability Assessment and Adaptation Framework for practical implementation by DOTs and MPOs.[24] The recommendations from this report include:

– Expand the objectives and scope of the framework to include shocks and stresses not directly tied to climate change, including cyberattacks
– Broaden asset data to include human and equipment assets, and identify criticality of these assets
– Expand hazard data to consider a wider array of hazards and determine whether they are systemwide or if they influence only a subset of assets
– Use indicators identified to assess the resilience of the system in a way that acknowledges the interaction of the criticality and exposure of the assets
– Engage stakeholders and decisionmakers to help weigh the trade-offs that come with prioritizing options
– Use an established critique, e.g. multicriteria decision analysis, economic analysis, benefit-cost analysis, or life cycle cost analysis, to facilitate prioritization
– Consider the benefits of investments in times of both normalcy and disruption

4.3 Hazards to the CLMPO Area Transportation System

There are numerous naturally occurring and human-caused hazards that can potentially affect the transportation system (Figure 4.2). This section focuses on hazardous threats to the CLMPO transportation system, including stormwater, climate change, seismic hazards, drought, extreme weather, geomagnetic disturbance, landslides, riverine flooding, volcanic hazards, and "non-natural" hazards.[25] The majority of the information on specific hazards and their potential effects in the region in this section are

[24] Weilant, Strong, and Miller, *Incorporating Resilience.*

[25] The threats listed are consistent with those identified in the Eugene-Springfield and Lane County Multi-Jurisdictional Natural Hazard Mitigation Plans. Further consultation with local agencies is necessary to ensure that all relevant risks to the local system are understood and considered.

derived from local hazard mitigation plans and the Oregon Resilience Plan.[26] Stormwater hazards are presented first as a required component of Planning Factor 9, followed by the two hazards most significant to the region (climate change and seismic hazards); the remaining natural hazards are presented alphabetically, with "non-natural" hazards—including pandemics—presented last.[27] This section refers to the work already conducted by local jurisdictions, including the Eugene-Springfield Area Multi-Jurisdictional Hazards Mitigation Plan and the Lane County Multi-Jurisdictional Hazard Plan.

MPOs have utilized formal transportation-specific vulnerability assessments to understand the full nature and extent of the risks to the transportation system. CLMPO has not conducted a formal vulnerability assessment on the transportation system in the CLMPO area but could explore this option as an action item in the 2045 RTP. Funding availability and policy board direction will determine the MPO's ability to conduct a vulnerability assessment.

Figure 4.2: Potential Hazards to the Transportation System[28]

Naturally Occurring	Tornadoes, high winds, electrical storms, ice storms, snowstorms and blizzards, floods, earthquakes, naturally occurring epidemics, landslides, hurricanes, typhoons, tropical storms, wildfires, droughts, dust/windstorms
Human-Caused (Intentional)	Misuse of resources, security breaches, theft, fraud or embezzlement, fire or arson, vandalism, sabotage (external and internal actors), workplace violence, bomb threats and other threats of violence, terrorist assaults (explosive, firearms, conventional weapons, chemical, biological radiological, nuclear agents), labor disputes or strikes, disruption of supply sources, rioting or civil disorder, war, hostage taking, aircraft, ship, or port hijacking
Human-Caused (Unintentional)	Voice and data telecommunications failures or malfunctions, unavailability of key personnel, human errors, power outages (external or internal), water outages, gas outages, HVAC systems failures or malfunctions, accidental damage to or destruction of physical plant and assets, accidental contamination or hazardous materials spills, accidents affecting transportation system, uninterruptible power supply (UPS) failure or malfunction, inappropriate training on emergency procedures

Stormwater

Expected Regional Impacts from Stormwater

Effective stormwater management is critical for mitigating issues related to both water quality and quantity. Roads, paved trails, parking lots, and other impervious surfaces ubiquitous to the urban landscape can alter natural hydrology and prevent water from absorbing into the ground, and instead direct large volumes of runoff into nearby streams, rivers, and lakes and/or wastewater treatment plants, pipelines, and reservoirs. Stormwater runoff carries pollutants, nutrients, and bacteria that can impair the quality of nearby waterbodies and harm wildlife. Excess stormwater during a heavy rain event can also collect in lower-lying areas and, without sufficient pervious ground to absorb it, can cause flooding that

[26] Unless otherwise noted, the source of information about the hazards presented in this sub-section is the Eugene-Springfield Area Multi-Jurisdictional Natural Hazards Mitigation Plan.

[27] At the time this white paper was written, the COVID-19 pandemic had prompted a partial economic shutdown and presented new challenges and opportunities for the transportation system. Though a full exploration of the effects of the pandemic on the transportation system are outside the scope of this paper—and will likely take years to fully comprehend—pandemics are briefly considered as a topic for a future white paper in the "non-natural" hazards sub-section.

[28] National Academies of Sciences, Engineering, and Medicine, *Continuity of Operations (COOP) Planning*

poses a direct risk to human life and property. An increase in the frequency of heavy rainfall associated with climate change will exacerbate issues relating to street flooding and increase the need for effective stormwater management.

Potential Impacts from Stormwater to the Transportation System

The primary threat stormwater poses to the transportation system is from street flooding. Inundation and washouts from heavy rainfall can block roads, damage assets, and interrupt utilities, while debris buildup can block drainage systems, which further contributes to flooding. Flooding can cause long-term damage to infrastructure through scour and erosion. Street flooding can also cause damage to property and, in extreme cases, flash flooding can be life threatening.

The potential effects of the transportation system on local water quality is addressed in Section 4.4.1 Sustainability Pillar 1: Environment.

Regional Efforts to Address Risk from Stormwater

The Eugene-Springfield Area and Lane County Multi-Jurisdictional Natural Hazards Mitigation Plans each recommend transportation-related strategies to mitigate stormwater flooding (Figure 4.3).

Figure 4.3: Selected Transportation-Related Strategies

Eugene-Springfield Area Multi-Jurisdictional Natural Hazards Mitigation Plan	
Stormwater Improvements	Projects include culvert replacements and streambank stabilization. Using prioritization criteria, the highest priority stormwater capital projects are selected for inclusion in the Cities' Capital Improvement Programs. Projects prioritization criteria include whether a project addresses a potential risk to life or property (e.g. flooding), and whether it resolves an ongoing repetitive issue.
Lane County Multi-Jurisdictional Natural Hazard Mitigation Plan	
Upgrade Culverts and Stormwater Drainage Systems	For locations with repetitive flooding, flood damage, or road closures, determine and implement mitigation measures such as upsizing culverts or storm water drainage ditches.
Construction of Stormwater Detention / Retention Ponds	Reduce localized flooding, decrease damage to road infrastructure, and increase natural watershed potential.

Potential MPO Strategy to Address Risk from Stormwater

Green streets that incorporate green infrastructure into their design can help mitigate the negative effects of stormwater runoff generated by the transportation system. Green infrastructure uses both natural and engineered features that replicate natural systems to help slow, infiltrate, and filter stormwater runoff. Examples include bioretention cells, rain gardens, bioswales, street trees, and natural features in the landscape, such as wetlands. Green infrastructure has numerous co-benefits that may help achieve other RTP goals (Figure 4.4). Policies that promote the use of green infrastructure as a means to address stormwater management throughout the region could be considered.

Figure 4.4: Examples of How Green Infrastructure Can Help Achieve RTP Goals[29]

RTP Goal	Examples of how green Infrastrucutre can help achieve RTP goals
Vibrant Communities	Green infrastructure, including trails, parks, street trees, vegetation, and bioswales, contribute to community beautification and public health by connecting people with nature in their daily lives.
Shared Prosperity	Green infrastructure can promote economic growth as a valued public amenity, create construction and maintenance jobs, add to property value, support walkable and bikeable communities, businesses and commercial districts, and lower the costs associated with climate change.
Transportation Choices	Green streets can promote active travel and access to transit by providing enjoyable routes that are shaded and buffered from traffic.
Reliability and Efficiency	Green infrastructure treatments, such as access management and medians with bioswales, can be designed to support reliability and efficiency by reducing crashes and conflicting movements.
Safety and security	Street trees and other green infrastructure can help calm traffic to desired speeds, provide welcoming places that increase security, and improve resiliency and reduce impacts of major storm events.
Healthy Environment	Green infrastructure can enhance and protect the natural environment by supporting clean air and water, filtering stormwater runoff, reducing erosion, protecting, creating and connecting habitat for birds, fish and other wildlife.
Healthy People	Green infrastructure can reduce water, air, noise and light pollution, encourage active lifestyles and link people to trails, parks and nature that enhance human health and well-being.
Climate Leadership	Trees and green infrastructure can support climate adaptation by cooling streets, parking lots and buildings, better managing stormwater and reducing the urban heat island effect. Trees and vegetation can be managed to sequester greenhouse gases to help mitigate climate change.
Equitable Transportation	Clean air and water and access to nature can be improved and habitat can be preserved and enhanced when green infrastructure is provided in historically marginalized communities.
Fiscal stewardship	Protecting the environment and natural resources today can save money for the future and reduce infrastructure construction and maintenance costs.
Transparency and Accontability	All stakeholders can be represented, including those that cannot speak for themselves – wildlife and the natural environment. Performance-based planning includes considering environmental effects throughout the planning process.

Climate Change

Expected Regional Impacts from Climate Change

According to the *Fourth Oregon Climate Assessment Report*,[30] the state of Oregon is already experiencing the effects of climate change. Since 1900, the Pacific Northwest has warmed two degrees Fahrenheit on average, and the warming trend appears to be accelerating. The year 2015 was Oregon's warmest on record, and the report points to the year's challenges as an indication of things to come: irrigation shortages, heat and drought impacts to agriculture, coastal fisheries losses, reduced recreation, wildfires,

[29] Portland Metro, *2018 Regional Transportation Plan,* 3-53.

[30] Mote, et al., *Fourth Oregon Climate Assessment Report.*

harmful algal blooms, impacts to drinking water, increased incidence of heat illness, record infectious disease cases, and increases in emergency food assistance. Following the record 2015, 2016 to 2018 were all warmer than the 1970 to 1990 average. The report lays out several troubling trends that can be expected in Oregon by 2100, including:

- Continued Warming – Oregon is expected to be four to nine degrees Fahrenheit warmer, depending on global emissions.
- Changes in Rainfall – Annual precipitation is projected to remain constant, but more of the precipitation will be concentrated in the winter months, leaving the summer months drier and at elevated risk for wildfires. Heavy winter rainfall may lead to landslides that close transportation corridors.
- Changes in Snowfall – Spring snowpack will continue to decline, particularly at lower elevations, which will directly affect surface and groundwater supply and will lead to water scarcity and economic losses. In winter, an increase in precipitation falling as rain will cause an increase in streamflow; in summer, flows could be as much as 50% lower in some basins, affecting the generation of hydroelectric power, leading to water scarcity in areas not served by reservoirs or groundwater, and negatively impacting commercial and tribal fisheries.
- Rising Seas – Seas could rise as much as 8.2 feet along the Oregon coastline as ice sheets melt irreversibly.
- Extreme Heat – By mid-century, most places will see an increase of 30 days over 86 degrees Fahrenheit, increasing health risks associated with extreme heat.
- Increasing Fire Risk – As summers get hotter and drier by mid-century, fire risk will increase. The Willamette Valley and Eastern Oregon will see the largest increases in risk.
- Impacts to Agriculture & Natural Resources – Though some regions may experience positive changes—such as a longer growing season—water scarcity, more pests and weeds, and reduced crop quality will increasingly be of concern. Timber production may be affected as trees experience drought stress from lower moisture content.

According to the International Panel on Climate Change (IPCC) Fifth Assessment Report, climate change is expected to increase displacement of people as migration patterns shift in response to extreme weather and long-term changes in climate.[31] For example, sea level rise alone may put up to 13.1 million people living on U.S. coasts at risk by 2100, which could spur a mass migration away from the coastline.[32] Though specific impacts of climate migration in Oregon and the CLMPO area are complex and relatively unknown, speculation by the media and the public that the Pacific Northwest could see an influx of climate migrants[33] from other areas of the country experiencing more severe climate change impacts has prompted some planners, policymakers, and researchers to consider whether long-term planning

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[31] International Panel on Climate Change, *Climate Change 2014 Summary for Policymakers*, 20.
[32] Kollipara, *Rising seas could displace more Americans.*
[33] The term "climate refugee" is commonly used to describe people displaced—either voluntarily or involuntarily—by changes to the natural environment caused by climate change, such as sea level rise or extreme heat. However, the term lacks an internationally recognized legal definition, and there is no legal mechanism by which individuals can seek climate refugee status. This white paper uses the term "climate migrant" to signify an individual displaced by environmental pressure.

decisions should account for an influx of population.[34] There is some evidence to suggest that people wanting to escape sea level rise, heat, wildfires, and other extreme weather conditions may consider the CLMPO area an attractive alternative. An influx of climate migrants to the CLMPO area would have important implications for transportation systems and infrastructure.

Potential Impacts of Climate Change to the Transportation System

In addition to risks to life and property, climate change poses many risks to transportation infrastructure. Figure 4.5 presents a summary of climate impacts on the highway system, though not all impacts apply to the CLMPO area. Most infrastructure was designed to meet the challenges of historic climate, not to withstand conditions expected as the climate warms.

Figure 4.5: Summary of Climate Impacts on the Highway System[35]

Climatic/Weather Change	Impact to Infrastructure	Impact to Operations/Maintenance
Temperature		
Change in extreme maximum temperature	– Premature deterioration of infrastructure – Damage to roads from buckling and rutting – Bridges subject to extra stresses through thermal expansion and increased movement	– Safety concerns for highway workers limiting construction activities – Thermal expansion of bridge joints, adversely affecting bridge operations and increasing maintenance costs – Vehicle overheating and increased risk of tire blowouts – Rising transportation costs (increase need for refrigeration) – Materials and load restrictions limit transportation options – Closure of roads because of increased wildfires
Change in range of maximum and minimum temperature	– Shorter snow and ice season – Reduced frost heave and road damage – Later freeze and earlier thaw of structures because of shorter freeze season lengths – Increased freeze-thaw conditions in selected locations creating frost heaves and potholes on road and bridge surfaces – Increased slope instability, landslides, and shoreline erosion from permafrost thawing leads to damaging roads and bridges due to foundation settlement (bridges and large culverts are particularly sensitive to movement caused by thawing permafrost) – Hotter summers in Alaska lead to increased glacial melting and longer	– Decrease in frozen precipitation would improve mobility and safety of travel through reduced winter hazards, reduce snow and ice removal costs, decrease need for winter road maintenance, and result in less pollution from road salt, and decrease corrosion of infrastructure and vehicles – Longer road construction season in colder locations – Vehicle load restrictions in place on roads to minimize structural damage due to subsidence and the loss of bearing capacity during spring thaw period (restrictions likely to expand in areas with shorter winters but longer thaw seasons)

[34] Binder and Jurjevich, *Winds of Change*, 2.
[35] National Academies of Sciences, Engineering, and Medicine, *Strategic Issues facing Transportation, Vol. 2.*

Climatic/Weather Change	Impact to Infrastructure	Impact to Operations/Maintenance
	periods of high stream flows, causing both increased sediment in rivers and scouring of bridge supporting piers and abutments	– Roadways built on permafrost likely to be damaged due to lateral spreading and settlement of road embankments – Shorter season for ice roads
Precipitation		
Greatest changes in precipitation levels	– If more precipitation falls as rain rather than snow in winter and spring, there will be an increased risk of landslides, slope failures, and floods from the runoff, causing road washouts and closures as well as the need for road repair and construction – Increasing precipitation could lead to soil moisture levels becoming too high (structural integrity of roads, bridges, and tunnels could be compromised leading to accelerated deterioration) – Less rain available to dilute surface salt may cause steel reinforcing in concrete structures to corrode – Road embankments could be at risk of subsidence/heave – Subsurface soils may shrink because of drought	– Regions with more precipitation could see increased weather-related accidents, delays, and traffic disruptions (loss of life and property, increased safety risks, increased risks of hazardous cargo accidents) – Roadways and underground tunnels could close due to flooding and mudslides in areas deforested by wildfires – Increased wildfires during droughts could threaten roads directly or cause road closures due to fire threat or reduced visibility – Clay subsurfaces for pavement could expand or contract in prolonged precipitation or drought, causing pavement heave or cracking
Increased intense precipitation, other change in storm intensity (except hurricanes)	– Heavy winter rain with accompanying mudslides can damage roads (washouts and undercutting), which could lead to permanent road closures – Heavy precipitation and increased runoff can cause damage to tunnels, culverts, roads in or near flood zones, and coastal highways – Bridges are more prone to extreme wind events and scouring from higher stream runoff – Bridges, signs, overhead cables, and tall structures could be at risk from increased wind speeds	– The number of road closures due to flooding and washouts will likely rise – Erosion will occur at road construction project sites as heavy rain events take place more frequently – Road construction activities could be disrupted – Increases in weather-related highway accidents, delays, and traffic disruptions are likely – Increases in landslides, closures, or major disruptions of roads, emergency evacuations, and travel delays are likely – Increased wind speeds could result in loss of visibility from drifting snow, loss of vehicle stability/maneuverability, lane obstruction (debris), and treatment chemical dispersion – Lightning/electrical disturbance could disrupt transportation electronic infrastructure and signaling, pose risk to personnel, and delay maintenance activity

Climatic/Weather Change	Impact to Infrastructure	Impact to Operations/Maintenance
Sea Level		
Sea level rise	– Erosion of coastal road base and undermining of bridge supports due to higher sea levels and storm surges – Temporary and permanent flooding of roads and tunnels due to rising sea levels – Encroachment of saltwater leading to accelerated degradation of tunnels (reduced life expectancy, increased maintenance costs and potential for structural failure during extreme events) – Further coastal erosion due to the loss of coastal wetlands and barrier islands removing natural protection from wave action	– Coastal road flooding and damage resulting from sea level rise and storm surge – Increased exposure to storm surges – More frequent and severe flooding of underground tunnels and other low-lying infrastructure
Hurricanes		
Increased hurricane intensity	– Increased infrastructure damage and failure (highway and bridge decks being displaced)	– More frequent flooding of coastal roads – More transportation interruptions (storm debris on roads can damage infrastructure and interrupt travel and shipments of goods) – More coastal evacuations

Regional Efforts to Address Risk from Climate Change

Local and regional efforts to address climate change include policies, programs, and projects aimed at both mitigation (reducing GHG emissions in order to curb the global rise in temperature) and adaptation (adjusting to the observed effects of climate change). Figure 4.6 provides an overview of CLMPO partner agency plans and policies to improve the region's resilience to climate change.[36] Regional adaptation strategies focusing on specific hazards are discussed individually in subsequent sections.

Figure 4.6: CLMPO and Member Agency Plans and Policies that Address Climate Change

Member Agency	Actions
CLMPO	– Central Lane Scenario Planning – Central Lane Scenario Planning Health Impact Assessment
City of Coburg	– Lane County Multi-Jurisdictional Hazard Mitigation Plan
City of Eugene	– Climate Action Plan 2.0 – Climate Recovery Ordinance – Eugene-Springfield Area Multi-Jurisdictional Natural Hazards Mitigation Plan – Regional Climate and Hazards Vulnerability Assessment
City of Springfield	– Eugene-Springfield Area Multi-Jurisdictional Natural Hazards Mitigation Plan – Regional Climate and Hazards Vulnerability Assessment
Lane County	– Lane County Multi-Jurisdictional Hazard Mitigation Plan

[36] Though this overview focuses on CLMPO partner agencies, CLMPO recognizes that numerous other local agencies and organizations are directly impacted by disruptions to the transportation system and are working to address climate change. Further coordination and consultation with these agencies could be pursued as a next step.

	– Lane County Climate Action Plan
Lane Transit District	– Climate Action Policy Statement and Fleet Procurement Goals *(in development)*
ODOT	– Eugene-Springfield Metropolitan Region Greenhouse Gas Inventory

Seismic Hazards

Expected Regional Impacts from Seismic Hazards

The Pacific Northwest and the State of Oregon are vulnerable to seismic hazards from four sources: shallow crustal earthquakes, deep intraplate earthquakes resulting from the subduction of the Juan de Fuca Plate beneath the North American Plate, very large subduction zone earthquakes that occur along the boundary between the Juan De Fuca and North American Plates, and volcanic activity. Oregon is subject to far less frequent, but bigger and potentially more damaging earthquakes than its seismically active neighbors, Washington and California. In geologic terms, Oregon is a mirror of northern Japan, where the 9.0 Tohoku earthquake and subsequent tsunami caused widespread devastation and sparked the Fukushima Daiichi nuclear disaster in 2011. Oregon is located along what is known as the "Ring of Fire," an arc of subduction zones in the Pacific Ocean marked by frequent and often catastrophic seismic activity. The Pacific Plate is moving east and subducting under the coasts of Northern California, Oregon, Washington, and Southern British Columbia along a 620-mile fault known as the Cascadia Subduction Zone (CSZ).

There is a clear and imminent threat from the CSZ in Oregon. According to the *Eugene-Springfield Area Multi-Jurisdictional Natural Hazard Mitigation Plan*, the odds of a powerful CSZ earthquake with magnitude 8.0 or greater in the next 50 years are roughly one in three. Such an earthquake will cause several minutes of severe ground shaking, large tsunamis, and widespread damage. In the past 10,000 years, the entire fault has ruptured (i.e. moved) with a magnitude 9.0 or greater 20 times, three quarters of the fault has ruptured with a magnitude 8.5-8.8 two to three times, and just the Southern portion has ruptured with a magnitude 7.6-8.5 nineteen times.[37] The most recent rupture along the CSZ fault occurred in January 1700 and caused tsunamis that hit the coasts of Oregon, Washington, and Japan. These earthquakes strike at variable time intervals, but the 320-year span since the last event is among the largest. According to the *Oregon Resilience Plan*, "there is no scientific doubt that another great subduction earthquake will strike the Pacific Northwest; the questions now are how soon, how large, and how destructive that earthquake will be." [38]

The *Oregon Resilience Plan* breaks the State of Oregon into four geographic zones based on relative risk: the Tsunami Zone, in which near total damage and major loss of life is expected; the Coastal Zone, in which severe shaking will damage the transportation network and isolate communities; the Valley Zone, in which moderate but widespread damage would disrupt life for a period of weeks or months; and the Eastern Zone, in which light damage would allow communities to recover quickly and become critical emergency response centers. The CLMPO area is in the Valley Zone.

CSZ simulations show that all of Oregon would experience two to four minutes of ground shaking, with coastal areas experiencing severe to violent shaking, cities along the I-5 corridor experiencing strong to

[37] Cities of Eugene and Springfield, *Natural Hazards Mitigation Plan*.

[38] Oregon Seismic Safety Policy Advisory Commission, *The Oregon Resilience Plan*, 4.

very strong shaking, and areas east of the Cascades experiencing light to moderate shaking. Without additional investment in seismic resilience, Oregon can expect severe damage to buildings and lifelines that would result in massive loss of life and long-term disruption to the economy. The region's transportation networks are a key factor in the state's recovery, first in facilitating emergency response and then restoring mobility. Without a coordinated and sustained effort to improve the resilience of the region, a CSZ earthquake will have devastating impacts:[39]

- The combined effects of the earthquake and tsunami could result in 1,250 to 10,000+ fatalities
- Tens of thousands of buildings will either collapse or be so damaged that they take months to years to repair
- The damage could produce 1 million truckloads of debris
- Disruptions to the liquid fuel supply from Washington State would affect all sectors of the economy, including those critical to emergency response and economic recovery
- Disruptions to businesses and the economy could last a month or more, causing businesses to close or relocate

Investing in the resilience of the transportation system makes financial sense. The *Oregon Highways Seismic Plus Report* estimates a $335 billion economic impact over seven years following a CSZ event, which could be reduced by 24% with pre-emptive seismic retrofitting.[40] Without further intervention to prepare buildings and lifelines, damage would be so extensive that the restoration of full service could take three months to one year in the southern Willamette Valley, more than one year in hard-hit coastal areas, and many more years in communities hit by a tsunami.

Potential Impacts of Seismic Hazards to the Transportation System

The Eugene-Springfield Area Multi-Jurisdictional Natural Hazards Mitigation Plan found that all sectors are extremely vulnerable to a CSZ earthquake and that our systems, infrastructure, and personnel are ill-prepared for a disaster on that scale. The first statewide building codes mandating seismic resistance for new construction did not appear until 1974, and it was not until 1993 that building codes addressed the impacts of a CSZ earthquake, which nearly doubled the forces used in earlier codes. This means that a majority of buildings in the state of Oregon were not designed to withstand the kind of intense shaking that will occur during a CSZ event. A Statewide Seismic Needs Assessment conducted by the Department of Geology and Mineral Industries (DOGAMI) in 2007 found that 50% of public school buildings and 25% of public safety buildings in Oregon are at high or very high risk of collapse. In 2013, when the *Oregon Resilience Plan* was published, only 409 of the state's 1,567 bridges, or 26%, had been designed to CSZ earthquake specifications.[41]

Earthquakes pose a particular risk to transportation infrastructure, which is both a vulnerable asset and a primary factor in the region's ability to recover from a significant seismic event. There are several specific threats associated with seismic activity:

- **Ground shaking** is the primary cause of damage from earthquakes

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[39] Oregon Seismic Safety Policy Advisory Commission, *The Oregon Resilience Plan.*

[40] ODOT, *Oregon Highways Seismic Plus Report*.

[41] Oregon Seismic Safety Policy Advisory Commission, *The Oregon Resilience Plan.*

– **Ground shaking amplification** refers to the way certain soils and soft sedimentary rocks can intensify shaking
– **Surface faulting** occurs when seismic activity causes displacement at the earth's surface
– **Landslides** can occur when unstable slopes are subject to shaking
– **Liquefaction** occurs when certain sediments become saturated with water and temporarily act like a fluid instead of a solid

Lifeline systems upon which emergency response and long-term recovery depend (including highways and pipelines that deliver and distribute petroleum required to repair broken links in the transportation system) are extremely vulnerable to ground failure caused by shaking, amplification, faulting, landslides, and liquefaction. A major dam failure would cause further damage to roads and bridges. Damage to the transportation system will initially hinder rescue operations, inspection of critical infrastructure for damage, and restoration of activities and services. Though ODOT has been working on seismic retrofits to the highway system, a large portion of the transportation network would be damaged and unusable following a CSZ event.

Immediately following a CSZ event, local roads and streets may provide the only access to critical facilities like hospitals, fire stations, and temporary food and housing. Much of the local road network would be subject to serious damage, but in some cases local roads and streets could provide redundancy for the state highway lifelines. Air transportation and public transit will also both play critical roles in emergency response. Until highway and rail transportation is restored, air transport will provide a critical lifeline for many of Oregon's residents who cannot be reached by other means of transportation immediately following a CSZ earthquake. As lifeline routes are restored, transit buses can assist in evacuations, transport emergency workers and supplies, and provide transportation to recovery-related jobs.

ODOT Efforts to Address Risk from Seismic Hazards

Between 2012 and 2014, ODOT participated in and led several massive efforts to address seismic resilience of the state transportation system, the products of which included the *Oregon Seismic Lifelines Identification Project* (2012), which identified lifeline routes and laid out ODOT's approach to establishing seismic resilience on the state's highway system; the *Oregon Resilience Plan* (2013), which looked at state- and sector-wide effects of a CSZ event in Oregon; and the *Oregon Highways Seismic Plus Report* (2014), which prioritized retrofits to the transportation system in five phases. The extensive research, data, and framework from these reports should form the foundation of CLMPO's approach to seismic resilience.

ODOT's approach to seismic lifeline routes relies on the Eastern Zone for a continuous North-South network that connects Central Oregon to Washington and California as well as several East-West corridors to connect to the vulnerable regions in the western part of the state. ODOT further breaks the lifeline system into three tiers to help prioritize retrofits and repairs first to facilitate immediate emergency response and then to restore general mobility:

> **Tier 1:** the backbone system that facilitates access to the hardest-hit regions, major population centers, and hubs for rescue and recovery operations. The *backbone system*—the minimum network of highway routes with the greatest potential to aid short-term rescue operations as well as long-term recovery—includes four routes:

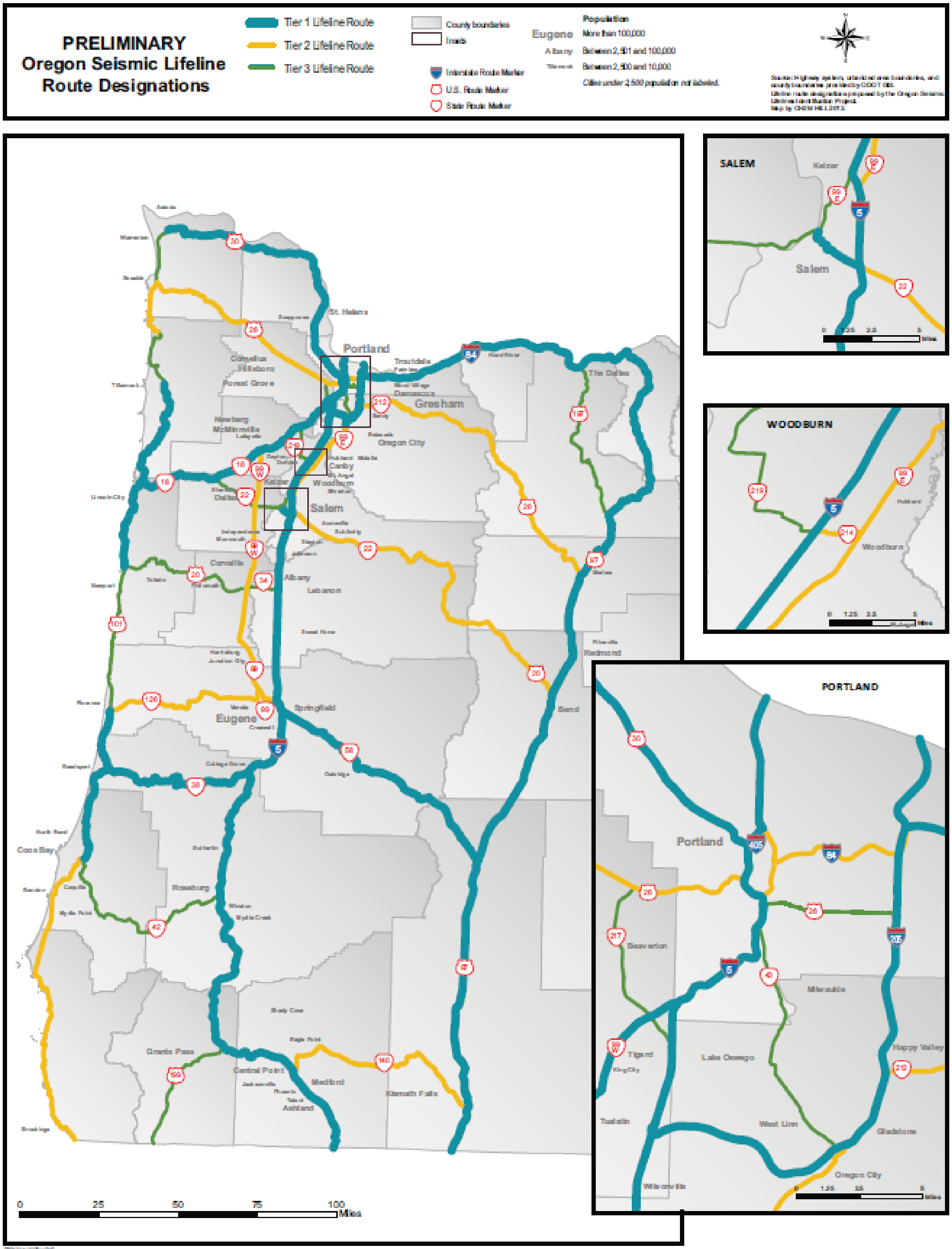
- I-5 from OR 58 (Eugene) to I-84 (Portland)
- I-84 from I-5 (Portland) to US 97
- US 97 from I-84 to the California border
- OR 58 from I-5 (Eugene) to US 97 (Bend)

Tier 2: a larger network that links most urban areas and provides lifeline route redundancy.

Tier 3: a more complete transportation network that provides access to rural areas including all of the Oregon coast, critical utilities, emergency response staging areas, and strategic freight corridors or facilities.

Eugene's location on both major East-West and North-South lifeline routes position it as a critical nexus in response and recovery following a CSZ event (Figure 4.7). Key Tier 1 lifeline routes through the CLMPO area include OR-58 and I-5; key Tier 2 lifeline routes include OR-126 and US-99W. Figure 4.8 shows the relative risks to these highways from landslide hazards, liquefaction, and dam failure.

Figure 4.7: Oregon Seismic Lifeline Route Designations[42]



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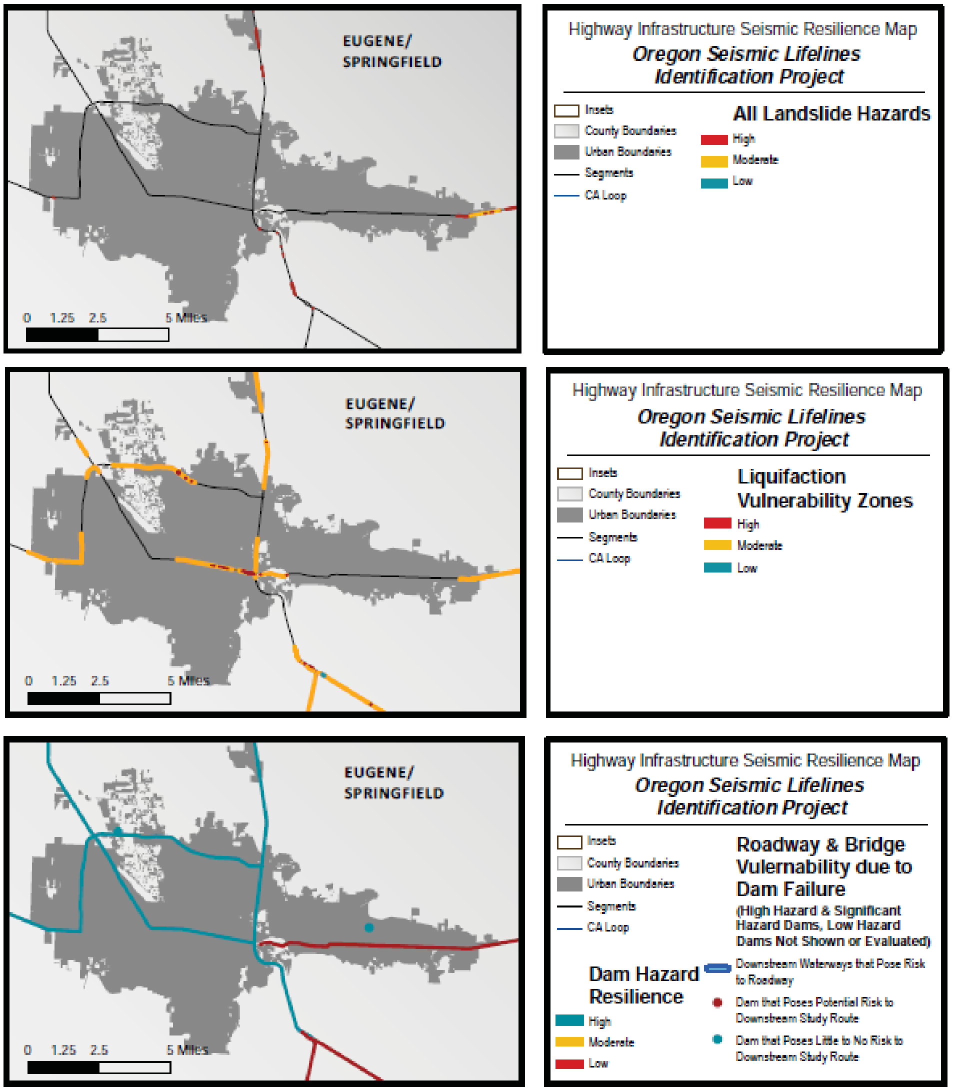
42 ODOT, *Oregon Highways Seismic Plus Report*, 65.

Figure 4.8: Risks to Eugene-Springfield Lifeline Routes from Landslides, Liquefaction, and Dam Failure[43]



Regional Efforts to Address Risk from Seismic Hazards

The Eugene-Springfield Area and Lane County Multi-Jurisdictional Natural Hazards Mitigation Plans both recommend several transportation-related strategies to mitigate earthquake hazards (Figure 4.9).

Figure 4.9: Selected Transportation-Related Strategies

Eugene-Springfield Area Multi-Jurisdictional Natural Hazard Mitigation Plan	
Local Active Transportation Infrastructure Evaluation	Evaluate off-street path bridges, crossing over the Willamette River, to complete a high-level seismic assessment of all major city bridges
Local Transportation Infrastructure Seismic Upgrades *(priority)*	Complete seismic improvements to three of the thirteen priority transportation structures

[43] ODOT, *Oregon Seismic Lifelines Identification Project*.

Emergency Fuels Assessment Phase II *(priority)*	Finish phase two of the Emergency Fuels Assessment for Lane County
Increased Fuel Capacity *(priority)*	Research methods to increase fossil fuel capacity around critical facilities; such as upgrading generator fuel tanks to high capacity tanks
Seismically Retrofit Eugene Fueling Station *(priority)*	Seismically retrofit fueling station and associated buildings to ensure it is usable after a Cascadia Subduction Zone earthquake
Earthquake Damage Study	In partnership with DOGAMI, update the earthquake damage estimate study for the Eugene-Springfield Area
Seismic Upgrades	Finish seismic upgrades to City owned facilities
Lane County Multi-Jurisdictional Natural Hazard Mitigation Plan	
Participate in ODOT Bridge Seismic Resiliency Planning Project	Increase bridge resiliency to seismic forces and response capability, decrease loss of life and property.

In 2017, ODOT requested Lane County to identify alternate routes to seismically vulnerable bridges and assess the costs to repair vulnerable bridges along local lifeline routes (Figure 4.10). According to the Eugene-Springfield Area Multi-Jurisdictional Natural Hazards Mitigation Plan, "The Glenwood area is planned to be freight off-load and redistribution point." [44]

Figure 4.10: Critical Bridges in the Eugene-Springfield Area[45]

Bridge	Sufficiency Rating	Est. Cost to Upgrade
Bridges that Must be Operational After Event		
08638: Belton over Willamette River	74	$2,000,000
08705: Debrick Slough WB on Ramp to Beltline	64	$450,000
Bridges Needed to Bring Help from I-5/Hwy 58		
016329: Glenwood Blvd over UPRR	93	$300,000
W6099C: Franklin Blvd over Hwy 1	55	$2,000,000
08051: Main Street over Willamette River (Springfield)	76	$2,250,000
Bridges Providing Critical Intercity Link to Access Hospital or other Vital Resource		
6648: Ferry Street Bridge over the Willamette (Eugene)	31	$2,000,000
09596: Mohawk Blvd over Hwy 126 (Springfield)	64	TBD

Potential CLMPO Strategy to Address Risk from Seismic Hazards

As a next step in planning for seismic resilience, CLMPO could follow the lead of Portland Metro, which has designated a network of regional Emergency Transportation Routes (ETRs)—priority routes used to facilitate life-saving response activities following an emergency—to complement the statewide system of Lifeline Routes. In 2019, upon recommendation in its 2018 RTP, Portland Metro partnered with the Regional Disaster Planning Organization (RDPO) to update its ETRs, which were designated in 1996 and last updated in 2006. Funding for the project came from FEMA's Urban Areas Security Initiative (UASI) grant, which funds projects that enhance regional preparedness and expand regional collaboration in major metropolitan areas. See Appendix 6.3 A Case for Establishing Regional Emergency Transportation Routes.

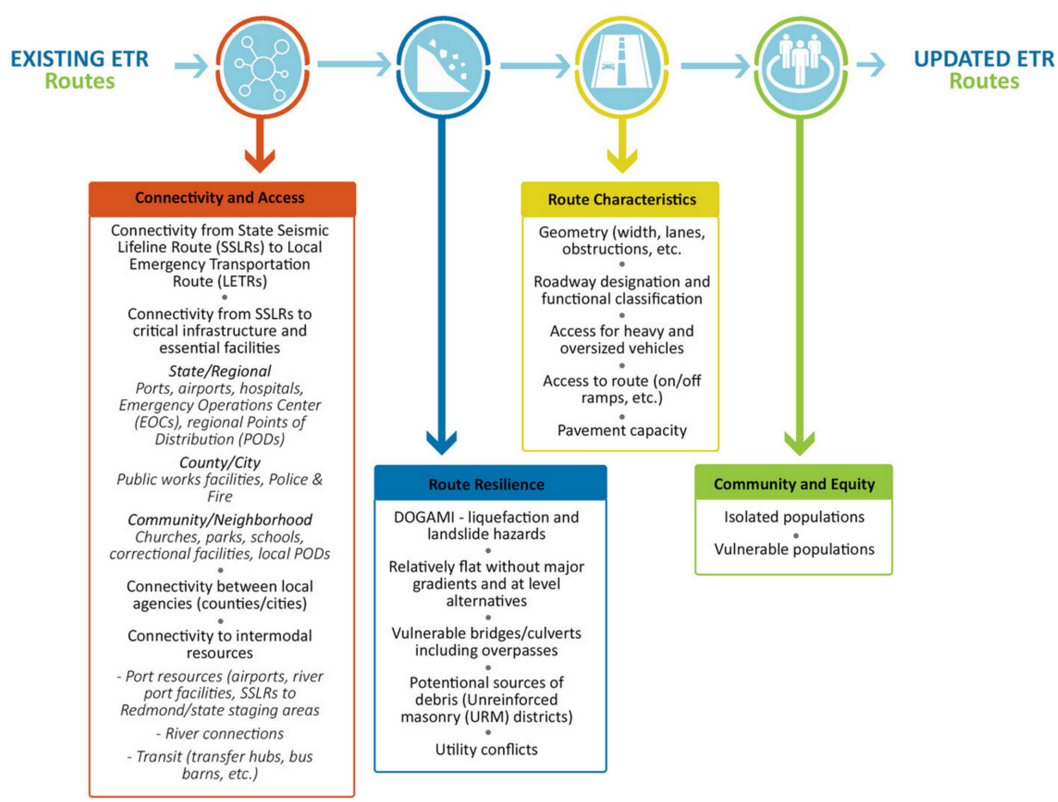
[44] Cities of Eugene and Springfield, *Natural Hazards Mitigation Plan,* 4-22.
[45] Ibid.

There are four types of ETRs:

1. **Local Emergency Response Streets** are a network of streets in a single jurisdiction that facilitate ordinary fire, police, and medical emergencies.
2. **Local Emergency Transportation Routes** are pre-designated routes used during a large-scale event in the initial response phase and early recovery to transport first responders, fuel, supplies, and patients. Local ETRs connect regional nodes to destinations of local importance (e.g. staging areas, essential infrastructure, and intermodal transfer points) and add redundancy to the Tier 2 and 3 Statewide Lifeline Routes.
3. **Regional Emergency Transportation Routes** are pre-designated routes that move first responders and supplies across jurisdictional boundaries among regional nodes and connect population centers, critical infrastructure, and services of regional importance. RETRs also connect Statewide Lifeline Routes and local ETRs.
4. **Statewide Lifeline Routes** are state-owned roadways identified by ODOT as critical to emergency response and recovery activity. Lifeline Routes connect regions of statewide importance; as described above, there are a few key north-south and east-west routes.

CLMPO could consider engaging in a similar planning effort to identify and prioritize its own RETRs following Metro's model (Figure 4.11).

Figure 4.11: Portland Metro's Process for Updating Regional ETRs[46]



[46] Regional Disaster Preparedness Organization, *Emergency Transportation Routes.*

Drought

Expected Regional Impacts from Drought

Drought is considered a slow-onset hazard, yet it poses a serious and far-reaching threat to the region. In the short term, drought causes a decline in water levels of streams, rivers, reservoirs, lakes, and ground water, which threaten water supplies and disrupt ecological processes; reduced agricultural productivity; and increased risk of wildfires. In the long-term, drought can have serious economic consequences. According to the National Oceanic and Atmospheric Association (NOAA), drought is the second most economically destructive weather-related hazard.[47]

There are three types of drought:

1. **Meteorological drought** occurs when precipitation drops below the regional average.
2. **Hydrological drought** occurs when decreased precipitation causes declines in soil moisture, groundwater, snowpack, streamflow, lakes, and reservoir levels.
3. **Agricultural drought** occurs when the available supply of water does not meet demands from agriculture, regardless of the status of meteorological drought.

Drought is not uncommon in Lane County. In 2001, 2014, and 2015, 100% of the county experienced severe drought. Droughts are expected to increase in frequency and severity in the Pacific Northwest due to climate change. More precipitation is expected to fall as rain rather than snow, shifting the timing of snowmelt and further exacerbating drought conditions.

Potential Impacts from Drought to the Transportation System

Drought conditions can increase the risk of dust storms and wildfires, which can affect visibility, compromise air quality, and lead to road closures. Drought coupled with high temperatures can cause subsidence and rail line buckling, threatening transportation assets and causing derailments. In Oregon, where shallow underground karst aquifers are prevalent, subsidence and sinkhole formation can occur when depleted aquifers collapse. Drought can also have severe impacts on other sectors that are highly dependent on the availability of water, such as energy, communications and information technology, emergency response, healthcare, and manufacturing. Economic consequences of prolonged drought may affect the availability of funding for transportation projects.

Regional Efforts to Address Risk from Drought

This paper did not identify transportation-specific efforts or policies to address drought.

Extreme Weather

Expected Regional Impacts from Extreme Weather

Extreme weather events happen infrequently and typically cause little damage in the CLMPO area. The region is susceptible to windstorms, winter storms, thunderstorms, hail, tornadoes, and severe heat. Windstorms and winter storms are most common to the area, though most winters produce little snowfall and the cities of Eugene and Springfield experience major falls of ten or more inches only every 10-20 years. Since 1937, there have been six recorded tornadoes in Lane County, which caused no deaths

[47] Cities of Eugene and Springfield, *Natural Hazards Mitigation Plan*.

and minimal damage. In 2014, the region experienced a record number of days with temperatures over 90, and 2017 witnessed one of the longest heat waves in history that lasted from the end of July through the beginning of August. Climate change may exacerbate extreme weather in the CLMPO area in several ways: higher summertime temperatures (both highs and lows), a decrease in total precipitation, and an increase in severe winter storms.

Potential Impacts from Extreme Weather to the Transportation System

Transportation infrastructure is susceptible to a variety of potential impacts from extreme weather. Storms of any kind can disrupt utilities and transportation, particularly if they lead to accumulation of snow or ice, downed trees, flooding, or landslides. Storms also cause delays and traffic accidents. Freezing conditions can hasten deterioration of roads that are already cracking, while higher temperatures degrade some asphalts, leading to softening, rutting, buckling, or migration of liquid asphalt. Extreme heat also accelerates deterioration of bridge infrastructure through thermal expansion of joints and paved surfaces as well as deterioration of steel, asphalt, protective cladding, coats, and sealants. Heat waves present health and safety risks for maintenance and construction crews and can delay construction. Heat can also cause vehicles to overheat and accelerate tire deterioration, as well as pose a barrier to active transportation modes.

Regional Efforts to Address Risk from Extreme Weather

The Eugene-Springfield Area and Lane County Multi-Jurisdictional Natural Hazards Mitigation Plans each recommend one transportation-related strategy to mitigate hazards from extreme weather (Figure 4.12).

Figure 4.12: Selected Transportation-Related Strategies

Eugene-Springfield Area Multi-Jurisdictional Natural Hazards Mitigation Plan	
Defective Tree Maintenance *(priority)*	Utilize contract crews to perform maintenance pruning. Provide clearance and mitigate defects, such as overextended branches prone to failure under increased loads, along major arterials and priority traffic routes. Unhealthy or structurally unsound trees will be removed and replanted.
Lane County Multi-Jurisdictional Natural Hazard Mitigation Plan	
Reduce the Impact of Tree Damage from Windstorms	Reduce cost in loss of property and cleanup, decrease disruptions in power and transportation.

Geomagnetic Disturbance

Expected Regional Impacts from Geomagnetic Disturbance

A geometric disturbance (GMD) refers to a naturally occurring pulse of energy, most commonly caused by solar flares. Most GMD events cause little to no damage. However, in severe cases, X-ray and UV radiation initially causes radio blackouts and GPS errors. Minutes to hours after initial impact, satellites can be electrified and damaged by particles (protons, electrons, and high atomic number and energy ions). After a day or more, clouds of magnetized plasma called coronal mass ejections can arrive, causing widespread power blackouts that damage anything plugged into a wall socket or running on electricity. The specific threat to the CLMPO area is unknown.

Potential Impacts of Geomagnetic Disturbance to the Transportation System

A severe GMD event could temporarily cripple or permanently damage Intelligent Transportation Systems (ITS) operations that are reliant on electricity, emphasizing the importance of redundancy and the ability to maintain communications and operations without power.

Regional Efforts to Address Risk from Geomagnetic Disturbance

This paper did not identify transportation-specific efforts or policies to address GMD.

Landslides

Expected Regional Impacts from Landslides

According to the Eugene-Springfield Area Multi-Jurisdictional Natural Hazards Mitigation Plan, though the probability of a landslide in the CLMPO area is high, the vulnerability is low, because local damage is expected to be geographically limited to where the slide occurs unless infrastructure or waterways are involved. Four types of landslides are possible in the region:

1. **Rockfalls** – abrupt movement of material that detaches from steep slopes or cliffs; can be caused by gravity, weathering, undercutting, and/or erosion
2. **Rotational Slides** – movement of a mass downward and outward along a concave rupture; common along roads constructed by cut and fill
3. **Translational Slides** – movement of a mass along a flat surface
4. **Flows** – slide material moves downhill as a semi-fluid mass that scours the slope along its path; typically moves rapidly and increases in volume along the way

Many natural and human factors increase the likelihood of landslides in the region, including geology, rainfall, seismic activity, volcanic activity, grading on slopes for development, structures and traffic loads, alterations to groundwater or drainage, removal or change of vegetation on steep slopes, and water content in soils and rock. Within the past 150 years, most landslides in the area have been smaller slides near waterways or related to development activity. The south hills of Eugene and Springfield are the areas most susceptible to slides, and Highway 126 is the most commonly affected state highway in the county.

Climate Change and earthquakes are both significant risk factors for landslides. Increased precipitation associated with Climate Change can destabilize slopes and cause landslides. In particular, there is an increased risk of landslides due to mixed rain and melting snow events in low- to mid-elevation mountains. Ground shaking during earthquakes can reactivate existing landslides, which tend to move farther and more quickly than new landslides, which typically only move a few inches to a few feet. A DOGAMI study in 2018 (IMS-60) revealed three times the number of historic landslides than were previously known to exist in the area. According to the study, there are over 700 slides covering 6% of the 230-square mile study area, which included the Cities of Eugene, Springfield, and Coburg, with a buffer to include surrounding populated areas of Lane County—including Goshen and Waterville—as the project budget and scope allowed.[48]

[48] Calhoun, et al., *Landslide Hazard and Risk Study*, 2.

Potential Impacts from Landslides to the Transportation System

Landslides can pose a direct threat to transportation infrastructure and to motorists. They can cause immediate injury or loss of life if debris strikes motorists, pushes them off the roadway, or buries them; if motorists hit debris in the roadway; or if motorists drive onto collapsed roadways. Landslides on the slope above a highway can also lead to long-term closures and disrupt utilities that share the right of way. In the event of a CSZ earthquake, landslides on major lifeline routes will impede rescue operations and hinder long-term recovery. Nearly every highway in western Oregon is susceptible to or affected by landslides, particularly in the Oregon Coast Range, where very high annual rainfall weakens slopes, and a large number of landslides occur each year.

Regional Efforts to Address Risk from Landslides

The Eugene-Springfield Area Multi-Jurisdictional Natural Hazards Mitigation Plan recommends one transportation-related strategy to mitigate landslide hazards (Figure 4.13).

Figure 4.13: Selected Transportation-Related Strategies

Eugene-Springfield Area Multi-Jurisdictional Natural Hazards Mitigation Plan	
Analysis of 2018 DOGMAI Landslide Study	Using the DOGAMI landslide study released the summer of 2018 (IMS-60), determine areas and buildings at risk from landslides and propose comprehensive land use policies and construction standards accordingly

Riverine Flooding

Expected Regional Impacts from Riverine Flooding

Lane County has more river miles of floodplain than any other county in the State of Oregon, and much of the CLMPO area is at risk of flooding.[49] Flooding threatens public health and safety and can damage economic prosperity. According to the Federal Emergency Management Agency (FEMA), flooding is the most common natural disaster.[50]

Possible sources of riverine flooding in the region include the Middle Fork of the Willamette River, the Willamette River, and the McKenzie River, as well as numerous smaller creeks and sloughs. Riverine flooding occurs most often in December and January as a result of winter rains. It is most commonly associated with La Niña weather patterns, which can bring prolonged rains and rapid snowmelt. Climate change is expected to cause less frequent but heavier rain and a higher proportion of precipitation falling as rain rather than snow, both of which will increase flood risk in watersheds and basins. The region has already seen a 12% increase in very heavy rain events between 1958 and 2012.

According to FEMA, the region has experienced six major flooding events since the 1860s, with the largest occurring in 1964 and the most recent in 1996. The CLMPO area is protected by several upstream flood control dams on both the McKenzie and Willamette Rivers, and Springfield is protected from the

[49] Lane County Website, *Floodplain Information.*
[50] The Pew Charitable Trust, *Repeatedly Flooded Properties.*

McKenzie River by the 42nd Street Levee.[51] These flood control structures, built in the 1940s through the 1960s, significantly reduced the risk of riverine flooding from larger rivers and tributaries. However, they do not protect against smaller streams, which still pose a flood risk to the area.

An additional, though less significant, flooding threat comes from the potential for dam or levee failure. The failure rate of dams is very low (less than 1%), and over one third of failures are caused by overtopping rather than collapse.[52] However, dam failure is a cascading risk associated with seismic activity, landslides, and volcanic activity. Though the probability is low, there are nine upstream dams that would cause widespread flooding to the CLMPO area if they were to fail.

Potential Impacts from Flooding to the Transportation System

The impacts from flooding to the transportation system range from property damage and risk to human life to road closures and service interruptions. For example, in February 1996, flooding in the Mohawk Valley between Marcola and Springfield closed many Lane County roads and I-5 was inundated just north of Eugene. High stream flows can also accelerate erosion and scour, which can compromise infrastructure.

Regional Efforts to Address Risk from Flooding

The Eugene-Springfield Area Multi-Jurisdictional Natural Hazards Mitigation Plan and the Lane County Multi-Jurisdictional Natural Hazard Mitigation Plan both recommend transportation-related strategies to mitigate riverine flooding (Figure 4.14). The Eugene-Springfield Area Multi-Jurisdictional Natural Hazards Mitigation Plan also cites several existing hazard mitigation strategies, including widening the focus of flood hazard mitigation to include the management of riparian vegetation; participating in the National Flood Insurance Program (NFIP) and the Community Rating System (CRS), which incentivizes local floodplain management policies and actions that exceed minimum standards set by the NFIP; and the 42nd Street levee, which Springfield owns, operates, and maintains.

Figure 4.14: Selected Transportation-Related Strategies

Eugene-Springfield Area Multi-Jurisdictional Natural Hazards Mitigation Plan	
Levee Certification *(priority)*	**Seek and maintain certification of the 42nd Street Levee and other flood control structures within Springfield**
Update Floodplain Maps	Actively seek funding to update the Eugene-Springfield floodplain maps focusing on the Willamette River through Eugene and the Mill Race, Willamette River through Glenwood, and the 42nd St Levee seclusion zone in Springfield

[51] According to the Eugene-Springfield Multi-Jurisdictional Natural Hazards Mitigation Plan, the 42nd Street levee must be recertified as structurally adequate to maintain its accreditation: “Areas protected by flood control levees, such as Springfield’s 42nd Street Levee, were originally mapped as being protected from the 100-year flood incident. However, in response to numerous levee failures during Hurricane Katrina, levees now must also be certified as being structurally adequate to retain their accreditation as flood control structures. If the City of Springfield is unable to obtain certification for the 42nd Street Levee, the next update of the flood control maps for the section of the McKenzie River paralleled by the levee may be prepared as if the levee was not in place. This would greatly increase the area of the City within the mapped 100-year floodplain” (2-36).
[52] Cities of Eugene and Springfield, *Natural Hazards Mitigation Plan*.

Lane County Multi-Jurisdictional Natural Hazard Mitigation Plan	
Make USACE Inundation Maps Available for Public Viewing	Inform the public on flood hazard to decrease loss of property.
Maintain and Enhance Community Rating System (CRS)	Increase the use of CRS to decrease costs of flood insurance.

Volcanic Hazards

Expected Regional Impacts from Volcanic Hazards

The volcanically active Cascade Range runs from British Columbia, through Washington and Oregon, to northern California, including twelve major volcanos and hundreds of lesser volcanic features. The most active mountain in the range, Mount St. Helens, has erupted over 14 times in the past 4,000 years. There are 20 active volcanoes along the crest of the Cascades in Oregon, including the Three Sisters and Mount Jefferson. Eruptions in the Oregon Cascades in the past 4,000 years have included three on Mt. Hood, four in the Sisters area, two in the Newberry Volcano area, and other minor eruptions near Mount Jefferson, the Santiam Pass near Mount Washington, and near the Belknap Crater.

The Three Sisters, fifty miles east of Springfield, pose the largest volcanic hazard to the region, though the probability of future occurrence is relatively low (one incident is expected within a 75- to 100-year period). Hazards from volcanic activity affecting the CLMPO area include ash falls and lahars. Ash falls from explosive eruptions can blanket hundreds or even thousands of miles downwind in rock fragments. Ash fall from an eruption as far away as Mount St. Helens could affect the CLMPO area, though the impacts would likely be minor in all but the most severe cases. Lahars, which are flows of mud, rock, and water that can move at speeds of 20 to 40 miles per hour, can cover everything in their path in mud and, near the source, can carry trees, houses, and even boulders. Existing communities located on lahar flows from historic eruptions put populated areas at risk from future eruptions. Lahars from the Three Sisters could enter the McKenzie River, which in turn may cause flooding and degrade water quality as far west as the Thurston area on the eastern edge of the metro area. Lahar impact areas in the CLMPO region are expected to look similar to FEMA floodplain maps of the McKenzie River.

Potential Impacts from Volcanic Hazards to the Transportation System

Ash falls can reduce visibility and air quality, impacting many modes of transportation. Lahars can cause damage to transportation assets and lead to road closures that hinder mobility.

Regional Efforts to Address Risk from Volcanic Hazards

The Eugene-Springfield Area Multi-Jurisdictional Natural Hazards Mitigation Plan recommends one strategy to mitigate volcanic hazards that may be relevant to transportation (Figure 4.15).

Figure 4.15: Selected Transportation-Related Strategies

Eugene-Springfield Area Multi-Jurisdictional Natural Hazards Mitigation Plan	
Lahar Risk Study	Evaluate the lahar risk to the McKenzie River Valley

Wildfires

Expected Regional Impacts from Wildfires

Dry summers, hilly topography, and abundant natural fuel sources, such as vegetation, make the CLMPO area susceptible to wildfires. The wildfire hazard is greatest in the hills of Eugene and Springfield, where forested areas with high fuel loads border development, and steep slopes cause faster spread of fire. In addition to the direct threat wildfires can pose to human life and property, they can impair air quality from hundreds of miles away and have significant implications for human health. Climate change will lead to higher average annual temperatures and reduced precipitation in spring, summer, and fall, which will exacerbate wildfire risk. The Eugene-Springfield Area Multi-Jurisdiction Natural Hazards Mitigation Plan, finalized in January of 2020, calculated a high probability that a wildfire will occur in the area within a 0- to 35-year period. By September of 2020, the CLMPO area was threatened by the Holiday Farm Fire, one of many burning simultaneously across the state, which had burned over 173,000 acres and destroyed 431 residences and 24 commercial buildings by October 2; prompted evacuations throughout the McKenzie River Valley, including the Thurston area of Springfield; and caused the worst air quality ever recorded in the Eugene-Springfield area. [53] [54]

Potential Impacts from Wildfires to the Transportation System

Fires cause immediate and direct impacts to transportation infrastructure and public safety. They also increase the long-term risk of erosion, flash flooding, and landslides, as burned areas devoid of vegetation increase runoff with heavy rain, destabilizing slopes. Reduced air quality due to wildfires directly impacts active transportation and can pose risks to public health, particularly for those with impaired lungs.

Regional Efforts to Address Risk from Wildfires

The Eugene-Springfield Area and Lane County Multi-Jurisdictional Natural Hazards Mitigation Plans both recommend transportation-related strategies to mitigate hazards from wildfire (Figure 4.16). Additionally, CLMPO's partner, Lane Regional Air Protection Agency (LRAPA), regulates, monitors, and reports on air quality in the region.

Figure 4.16: Selected Transportation-Related Strategies

Eugene-Springfield Area Multi-Jurisdictional Natural Hazards Mitigation Plan	
Fuels Reduction	Reduce fuels on public lands, focusing on the hillsides in the southern portions of both Cities
Update the Wildland-Urban Interface (WUI) Plan	Update the Eugene-Springfield WUI plan and address access routes
Species Specific Tree Removal	Identify and remove species with known failure profiles and potential defects. Plant or replant drought tolerant and disease, pest, and damage resistant tree species. Work with City departments, contractors and non-profits to complete this work.
Eugene-Springfield Area Multi-Jurisdictional Natural Hazard Mitigation Plan	
Maintain Vegetation Management Standards	Reduce wildfire fuels near structures and waterways.

[53] The Register-Guard, *Updates: Holiday Farm Fire*.
[54] McDonald, Rachael, *Hazardous Air Quality*.

“Non-Natural” Hazards

Expected Regional Impacts from “Non-Natural” Hazards

“Non-natural” hazards may include civil unrest, dam or levee failures, epidemics, and releases of hazardous materials. These hazards can be triggered as cascading impacts of other hazards, they can be the result of accidents, or they can be caused by acts of terror.

Potential Impacts of “Non-Natural” Hazards to the Transportation System

“Non-natural” hazards could cause widespread disruption to the transportation system. More in-depth research into “non-natural” hazards and their potential effects on the transportation system was beyond the scope of this white paper. However, they could be explored in a future white paper—as the current COVID-19 pandemic is demonstrating, “non-natural” hazards can cause unexpected challenges and opportunities.

Regional Efforts to Address Risk from “Non-Natural” Hazards

The Eugene-Springfield Area and Lane County Multi-Jurisdictional Natural Hazards Mitigation Plan both recommend strategies to mitigate hazards from “non-natural” hazards that may be relevant to transportation (Figure 4.17).

Figure 4.17: Selected Transportation-Related Strategies

Eugene-Springfield Area Multi-Jurisdictional Natural Hazards Mitigation Plan	
Vulnerable Populations Two Weeks Ready	Utilizing relevant vulnerable populations maps developed for the Lane Livability Consortium, develop an outreach plan to engage vulnerable populations to be Two Weeks Ready with emergency supplies.
Mass Evacuation *(priority)*	Develop and exercise a City evacuation plan
Lane County Multi-Jurisdictional Natural Hazard Mitigation Plan	
Load GIS layers of dam inundation areas into mass notification system	Accurately notify those in the path of dam inundation floodwaters in time to evacuate.

4.4 Addressing the Three Pillars of Sustainability

This white paper proposes that CLMPO approach resilience through the lens of sustainability to recognize the complex relationships and linkages between social, economic, and environmental factors that contribute to risk and vulnerability. This section explores how to address transportation resilience through the three "pillars" of sustainability: environment, equity, and economy. The sub-sections explore the complex interrelationships between transportation and each of the pillars:

Sustainability Pillar 1: Environment – This sub-section focuses on the documented effects of the transportation system on the natural environment. It considers climate change, air quality, water quality, and wildlife and habitat.

Sustainability Pillar 2: Equity – This sub-section explores the complex relationships between social equity and transportation policy, which has an enormous impact on public health, mobility, access to opportunity, and neighborhood quality.

Sustainability Pillar 3: Economy – This sub-section discusses how disruptions in the transportation system can cause cascading impacts to the economy and explores the wealth creation framework as a way to guide project prioritization.

4.4.1 Sustainability Pillar 1: Environment

This paper has already explored the numerous natural hazards that threaten the transportation system. The transportation system's impacts on the natural environment are also well documented: vehicle emissions impair air quality and contribute to climate change, urban stormwater runoff pollutes nearby waterbodies, transportation corridors fragment natural habitat, ecosystem disturbance allows invasive species to proliferate, and motor vehicles kill hundreds of millions of animals annually.[55]

These environmental impacts should be avoided, where possible, following the mitigation sequencing approach commonly used in wetlands compensatory mitigation under the Clean Water Act:

1. **Avoiding the impact** altogether by not taking certain action or parts of action
2. **Minimizing impacts** by limiting degree or magnitude of the action and its implementation by using appropriate technology, or by taking affirmative steps to avoid or reduce impacts
3. **Rectifying the impact** by repairing, rehabilitating, or restoring affected environment
4. **Reducing or eliminating the impact over time** by preservation and maintenance operations during life of action or project
5. **Compensating for the impacts** by replacing, enhancing, or providing substitute resources or environments
6. **Monitoring the impact** and taking appropriate corrective measures

"Eco-sustainable transportation" is an aspirational framework for transportation planning that goes beyond the traditional definition of sustainable transportation to mitigate the effects of the transportation system on the natural environment. Eco-sustainable transportation is defined as

[55] UC Davis Road Ecology Center, *Wildlife-Vehicle Conflict.*

"transportation systems where the ecological impacts have been minimized so as to pose no threat to ecological systems."[56] An ecological approach challenges us to understand the complex interactions between transportation systems and natural ecosystems.

Climate Change

Transportation is a major source of the greenhouse gas emissions that drive human-induced climate change. CLMPO's 2010 GHG Inventory for the Eugene-Springfield Metropolitan Area concluded that the region is responsible for an estimated 3.2 million metric tons of GHG emissions per year, 31% of which is caused by transportation. The expected regional impacts of climate change and effects on the transportation system are explored at length in Section 4.3 Hazards to the CLMPO Area Transportation System.

CLMPO's GHG Inventory and Scenario Planning efforts (described in Section 3.4 CLMPO Existing Efforts) have provided a broad understanding of GHG emissions sources in the region as well as a suite of strategies to meet the State-set 2050 target for emissions reductions from the transportation sector. The strategies focus heavily on transportation options (TO), parking strategies, and transit as the means to reduce single occupancy vehicle trips and produce other co-benefits, including health outcomes and congestion management. The regional TO program comprises a variety of efforts to encourage alternative transportation modes.

Air Quality

The transportation system has a direct and measurable effect on air quality. Five of the six criteria pollutants designated by the Clean Air Act controlled by the National Ambient Air Quality Standards (NAAQS)—carbon monoxide (CO), lead, nitrogen oxides, ozone, and particulate matter—are byproducts of our transportation modes and systems, and they all have adverse human and environmental health impacts.

LRAPA monitors air quality in the CLMPO area and provides the data necessary for CLMPO's air quality analysis. The Eugene-Springfield area is currently designated as a maintenance area for coarse particulate matter (PM_{10}) under the Clean Air Act. It was designated as a nonattainment area for PM_{10} in 1987, and in 2013 it was re-designated by the Environmental Protection Agency (EPA) to attainment with a 10-year limited maintenance plan, prepared by LRAPA, which requires analysis of certain transportation projects to ensure conformity prior to approval of the Transportation Improvement Program. In 2014, the region completed a 20-year maintenance period for CO, meaning air quality standards for CO have been met for the past 20 years. The area is currently in compliance with standards for ozone and $PM_{2.5}$.

Water Quality

The transportation system—including paved streets and trails, parking lots, and driveways—creates a vast network of impervious surfaces in the urban landscape that accounts for 65% of all impervious surface area.[57] Urban stormwater runoff from impervious surfaces can carry heavy metals and petroleum

[56] Transportation Research Board, *Ecology in Sustainable Transportation.*
[57] Portland Metro, *2018 Regional Transportation Plan.*

products directly into nearby streams and waterways, impairing surface and groundwater quality and damaging sensitive aquatic ecosystems.

The Federal Clean Water Act of 1972 prohibits any release of pollutants into waters of the United States without a National Pollutant Discharge Elimination System (NPDES) Permit, which regulates the amount of certain pollutants permissible in a discharge. Large- and medium-sized cities with municipal separate stormwater sewer systems (MS4s) that discharge untreated stormwater into local waterbodies—including Eugene and Springfield—are required to obtain NPDES Permits. The MS4s of both Eugene and Springfield convey water from streets and properties via a system of catch basins, pipes, ditches, and waterways that drain directly into the Willamette River and its tributaries, such as Amazon Creek in Eugene and the McKenzie River in Springfield.

Recent research from the National Marine Fisheries Service and Washington State University suggests that green infrastructure is an inexpensive, practical way to remove pollutants from stormwater runoff that adversely affects salmon.[58] Green infrastructure has numerous co-benefits, including urban temperature regulation, noise reduction, air purification, traffic calming, habitat, and aesthetic benefits, among many others. Many types of green infrastructure can be safely and effectively integrated into the transportation network, and local jurisdictions are already doing so through programmatic and regulatory actions, including environmental services, storm water programs, and Code requirements.

Figure 4.18: CLMPO and Member Agency Plans that Address Water Quality

Member Agency	Plans and Policies
City of Eugene	– Stormwater Management Manual (2014) – Comprehensive Stormwater Management Plan (1995)
Lane County	– Stormwater Management Plan (2011)
City of Springfield	– Stormwater Management Facility Master Plan (2008) – Stormwater Management Plan (2010)
City of Coburg	– Water Master Plan (2016) – TMDL Implementation Plan (2008)

Wildlife & Habitat

In addition to impairing air and water quality and actively altering the climate on which sensitive ecosystems depend, the transportation system threatens biodiversity by contributing to habitat fragmentation, generating noise and light pollution, and bringing vehicles and wildlife into direct conflict. Urban development directly disturbs ecosystems, which can lead to the proliferation of invasive species. It also disrupts the connectivity of forests, grasslands, and waterways that provide critical habitat for wildlife, which can alter food systems, increase temperatures, and change interactions among species. Habitat fragmentation is particularly detrimental to larger species with greater ranges. Fragmentation can be addressed by improving the permeability of transportation corridors, which act as barriers to wildlife movement. In addition to reducing the amount of contiguous habitat, noise and light pollution generated by the transportation system have deleterious effects on both wildlife and human health. Finally, motor

[58] Hillier, *Saving Salmon from Roadway Runoff.*

vehicles cause a shocking number of animal fatalities. One million vertebrates are struck and killed daily on the nation's roads.[59] These collisions also pose a significant safety threat to drivers.

4.4.2 Sustainability Pillar 2: Equity

Social equity and environmental resilience are interdependent. Vulnerability and risk are not distributed evenly within or across communities. People of color, low-income individuals, women, the elderly, and children often disproportionately bear the burden of natural hazards and climate change. Other factors that exacerbate risk include housing conditions (e.g. having a flammable roof or vegetation within ten meters of the home), social isolation (e.g. linguistic isolation, fear of public agencies, or geographic isolation), lack of health insurance, lack of access to a vehicle, disability status, or institutionalization status. The Eugene-Springfield Area Multi-Jurisdictional Natural Hazards Mitigation Plan identifies 15 variables that play a role in vulnerability to natural hazards:

- Age
- Income
- Residence
- Tenure
- Employment
- English skills
- Household type
- Disability
- Home insurance
- Health insurance
- Debt and savings
- Car
- Gender
- Injuries (hazard specific)
- Residence damage (hazard specific)

It is imperative to understand the complex interactions between transportation and social resilience, starting with equity. The transportation system has an enormous impact on public health, mobility, access to opportunity, and the quality of our neighborhoods. Auto dependence contributes to pollution, climate change, reduced physical activity, negative impacts on mental health, and traffic crashes. According to a 2009 PolicyLink report entitled, *Healthy, Equitable Transportation Policy*, "transportation policy *is*, in effect, health policy—and environmental policy, food policy, employment policy, and metropolitan development policy, each of which bears on health independently and in concert with the others."[60]

Transportation policy since World War II has prioritized highway development at the expense of public transportation, which has driven national growth and prosperity while also disproportionately harming low-income and Black, Indigenous, and People of Color (BIPOC) communities—who make up the majority of public transit users—by limiting their access to employment, education, health care, and other social and economic opportunities. The legacy of the highway system is one of inequality and discrimination—the practice of siting major highways in low-income and BIPOC neighborhoods displaced or physically divided entire communities, while the highway system itself has played a central role in promoting urban sprawl, increasing auto-dependence, and reinforcing segregation.

The combined legacy of land use, housing, and transportation policies from the mid-Twentieth Century continue to plague low-income communities and people of color. Residential segregation persists alongside large and growing gaps in income and wealth, which heavily influence transportation options and available infrastructure. Where people live matters—it strongly affects their mobility and access to

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[59] Goldfarb, *How Roadkill Became an Environmental Disaster.*
[60] Policy Link, Prevention Institute, and Converge Partnership, *Healthy, Equitable Transportation Policy,* 10.

opportunity and resources. Transportation costs also have an outsized burden on low-income families, who spend a larger portion of their incomes on transportation and often commute farther due to spatial mismatch between their communities and employment opportunities.

Transportation policy has created or exacerbated racial and socioeconomic disparities in public health and safety. People of color and low-income communities are more likely to live in proximity to major highways and the associated vehicle exhaust, which is linked to impaired lung development, lung cancer, heart disease, respiratory illness, and premature death. In addition to being less healthy, the transportation system is less safe for low-income communities and people of color. There is a higher incidence of pedestrian, cyclist, and motorist injuries in low-income neighborhoods, which typically have less pedestrian and bicycle infrastructure.[61] The transportation system also has a deeply troubling role to play in the increased rates of incarceration among BIPOC, particularly Black males. There are staggering racial disparities in the way people of color are treated by law enforcement, including traffic enforcement. For example, black and Hispanic drivers are more likely to be pulled over in "discretionary" (rather than safety) stops than white drivers and are significantly more likely to be searched or arrested. Whether due to latent racial bias or overt discrimination, these practices expose people of color to increased incarceration rates and a greater risk of injury and death during a police encounter.[62]

Title VI of the Civil Rights Act of 1964 prohibits "discrimination on the basis of race, color, and national origin, including matters related to language access for limited English proficient (LEP) persons."[63] Executive Order 12898, *Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations* of 1994 builds on Title VI and is intended "to prevent minority communities and low-income communities from being subject to disproportionately high and adverse environmental effects."[64] The 2045 RTP will include a Title VI analysis and plan to evaluate disproportionate impacts to these populations.

4.4.3 Sustainability Pillar 3: Economy

The movement of goods and people is an indicator of economic activity that relies heavily on the transportation system, which plays a key role in facilitating access to employment, goods, and services. According to the Transportation Research Board, in 2014 the estimated contribution of the transportation sector to GDP was valued at $1,001.9 billion.[65] Though its direct impacts can be difficult to measure and quantify, there are many ways in which investments in transportation infrastructure and services can support the economy and increase economic competitiveness:

- **Commuting** – make travel to work faster, more reliable, and cheaper; improve connections between employers and the specialized skill sets they require
- **Freight Delivery** – increase availability of specialized supplies, improve reliability and reduce costs of shipping

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[61] Sanchez, Stolz and Ma 2003, *Moving to Equity.*
[62] The Sentencing Project 2018, *Report to the United Nations.*
[63] FTA, *Circular 4702.1B, Title VI Requirements and Guidelines for FTA Recipients*, 12.
[64] FTA, *Circular 4703.1: Environmental Justice Policy Guidance for Federal Transit Administration Recipients*, 3.
[65] Firestone and White, *Economic Value*.

- **Production** – generate market efficiencies; support economies of scale, economies of specialization, and just in time production
- **Supply Chain** – reduce transportation costs, improve reliability, increase connectivity
- **Product to Consumer** – increase access to goods and services, reduce product delivery cost

Disruptions in the transportation system can cause cascading impacts to the economy by limiting mobility and access and interrupting the supply chains that provide raw materials and goods. A resilient transportation system that has the ability to withstand disruptions and adapt to changes can therefore help insulate a community from events that threaten economic stability.

Economic resilience goals should be integrated into the transportation planning process to ensure synergy. Economic outcomes from transportation projects are commonly measured by changes in employment, income, business output, GDP, building floor area, direct private investment, property values, and property tax revenue. However, a broader understanding of community outcomes can help contextualize transportation and related investments beyond jobs and return on investment. According to the National Association of Development Organizations (NADO), transportation is a key component of the wealth creation framework, which is a holistic approach to regional economic and community development that incorporates eight kinds of community capital:

1. Social – Trust, networks
2. Natural – Land, water, air, biodiversity
3. Political – Influence in decision-making
4. Built – Infrastructure and service
5. Individual – Skills, health, wellness
6. Cultural – Traditions, world view
7. Financial – Monetary resources available for investment
8. Intellectual – Knowledge, resourcefulness, creativity

According to the framework, a robust, resilient, and sustainable economy is one that promotes and sustains each form of capital rather than focusing on one or two at the expense of the others. Wealth creation initiatives are intentionally inclusive and focused on local ownership and control of assets. NADO suggests that the wealth creation framework may be useful in transportation planning efforts as a means to strengthen the linkages among the different kinds of capital to increase both transportation and economic resilience. Transportation infrastructure and services are part of a region's built capital, and investments to the transportation network support other kinds of capital—such as individual, intellectual, and social capital—by connecting people to employment, education, health services, and each other. Figure 4.19 illustrates ways in which the wealth creation framework may help guide project prioritization to support specific types of capital and ensure consistency with regional goals and vision.

Figure 4.19: Asset-Based Project Criteria for Transportation Projects

Type of Capital	Asset-Based Project Criteria
Built	– Does the project improve the condition of the existing network? – Can new capacity or services be maintained in the future without becoming a liability?
Political	– Is the project in line with the community or regional vision and supported by stakeholders?

	– Can project sponsors address any concerns that might impede project delivery?
Financial	– Is the project likely to retain or increase jobs that pay a living wage? – Is the project likely to leverage other investments? – Does the project support financial success of families, businesses, or other regional institutions? – Is there investment by the community in the form of matching funds or preliminary engineering?
Individual	– Does the project increase access to job sites within or near the region? – Does the project increase access to education, job training, or other sites to build skills? – Does the project increase access to healthcare or wellness? – Does the project help to avoid healthcare costs, e.g. by increasing active transportation or improving transportation safety?
Natural	– Does the project support revitalization or new development in areas targeted for growth? – Does the project avoid harm to natural resources? – Does the project include environmental services, such as green infrastructure to help manage stormwater runoff?
Social Capital	– Does the project facilitate people making connections with one another or building trust (e.g. connecting to a community center or place where people gather)?
Cultural	– Does the project enhance, complement, or protect the qualities like about their community or region? – Does the project avoid harm to local cultural or historical sites or resources? – Does the project improve access to locally important sites or events? – Does the project address mobility concerns of businesses involved in sectors important to regional identity? – Is the project in line with cultural norms, recognizing that norms change over time?
Intellectual	– Does the project support regional innovation? – Does the project invest in ITS? – Does the project prepare the region for evolving transportation technologies?

5. RECOMMENDATIONS

CLMPO has the option to take a broad, sustainability-based approach to planning for resilience that considers the environmental, equity, and economic feedback loops and linkages that contribute to or hinder the region's ability to survive disruptions. Recommendations for how to incorporate resilience and stormwater into the 2045 RTP include:

1. **Thread resilience into the goals, objectives, and policies of all priority areas.** As proposed to date, there are seven priorities the RTP will address: Transportation Choices, Safety and Security, Healthy People and Environment, Equity, Competitive Economy, Reliability and Efficiency, and Preservation. Resilience is currently incorporated into Safety and Security in the form of two objectives and one policy, which relate to the vulnerability of the system to various hazards as well as regional emergency response and recovery planning. CLMPO could consider making Resilience an eighth, stand-alone priority, as it is a large enough topic and a significant enough priority to warrant specific and explicit focus. CLMPO could also consider incorporating resilience more fully and more explicitly throughout the goals, objectives, and policies associated with the other seven priorities. The ideas for goals, objectives, and policies presented in Figure 5.1 are just some examples of how CLMPO could incorporate resilience into the 2045 RTP; they borrow heavily from the resources discussed above (including the RTPs of DVRPC, PSRC, and Metro, as well as the FHWA literature review) and are intended to be a starting point for conversation around these themes.

Figure 5.1: Ideas for Additional Goals, Objectives, and Policies

Resilience	<u>Goal:</u> Lead the development of resilient transportation systems and services that anticipate, prepare for, and adapt to both natural and non-natural hazards <u>Objectives:</u> – Reduce the transportation system's vulnerability to natural disasters, climate change, and hazardous incidents – Prepare the transportation system for the impacts of climate change – Increase the redundancy of the transportation system – Protect the transportation system against disaster, develop prevention and recovery strategies, and plan for coordinated emergency response – Avoid transportation-related development in hazard areas, e.g. steep slopes and floodplains <u>Strategies:</u> – Develop a local system of Emergency Transportation Routes that add redundancy to the state's Lifeline Routes – Conduct a formal vulnerability assessment for the region to evaluate risks to critical transportation assets and identify strategies and actions to reduce vulnerability – Consider climate and other natural and non-natural risks during transportation planning, project development, design, and management processes – Integrate green infrastructure into the transportation network when practicable to avoid, minimize, and mitigate negative environmental impacts of climate change, natural disasters, and extreme weather events

	– Coordinate and cooperate with federal, state, local, and other agencies involved in regional resiliency, transportation security planning, emergency response efforts, and recovery efforts – Incorporate resilience into project evaluation criteria – Use climate projections instead of historical data to plan, maintain, and construct system elements, e.g. pavement, bridges, and drainage systems – Develop a project-level checklist to evaluate facility risks and vulnerability due to natural and non-natural hazards at the time funding is programmed, and incorporate project design features to improve resiliency of facilities and infrastructure
Transportation Choices	Objectives: – Develop a multimodal transportation system that cultivates economic development, growth, and resiliency
Safety & Security	Objectives: – Reduce the transportation system's vulnerability to natural disasters and climate change Strategies: – Prioritize funding projects that improve both safety and efficiency
Healthy People & Environment	Objectives: – Design transportation improvements that protect the environment by preserving air and water quality, minimizing noise impacts and light pollution, preserving habitat connectivity, and encouraging energy conservation – Become a model for how diverse urban areas can fight against climate change – Minimize the amount of stormwater runoff that enters the region's streams – Protect natural resources and conserve scenic and historic areas and open spaces, including the urban tree canopy and other green infrastructure Strategies: – Integrate green infrastructure strategies in transportation planning and design to avoid, minimize, and mitigate adverse environmental impacts, improve water quality, and manage stormwater – Pursue a diverse set of strategies identified in the Central Lane Scenario Planning preferred scenario to reduce transportation-related greenhouse gas emissions – Identify, preserve, and enhance significant open spaces networks, wildlife corridors, and linkages across jurisdictional boundaries – Remove transportation-related barriers to wildlife movement and reconnect key habitat corridors – Support land use policies that promote compact development that reduces the need for travel in single occupancy vehicles – Support local policies that reduce impervious coverage – Promote the planting and stewardship of street trees in urban and suburban areas
Equity	Objectives: – Ensure that resilience infrastructure is accessible to the region's most vulnerable residents Strategies: – Engage vulnerable populations and ensure that the voices of underrepresented populations are included in conversations and decision-making about transportation resilience – Support local policies that prevent displacement – Support local policies that site affordable housing with transit-oriented development

Competitive Economy	Objectives: – Develop a multimodal transportation system that cultivates economic development, growth, and resiliency – Pursue a sustainable multimodal freight transportation system that supports the health of the economy, communities, and the environment through clean, green, and smart technologies and practices – Protect freight network assets that are vulnerable to natural hazards Strategies: – Use triple bottom line accounting, which considers social, environmental, and financial impacts, to guide decision-making
Reliability & Efficiency	Objectives: – Develop a resilient transportation network that can maintain or re-establish reliability and efficiency quickly following shocks and disruptions to facilitate emergency response and long-term recovery Strategies: – Incorporate asset-based project criteria for transportation projects following the wealth creation framework
Preservation	Objectives: – Preserve and maintain the region's motor vehicle, transit, and bike/ped infrastructure in a way that improves safety, security, and resiliency while minimizing life cycle cost and impact to the environment

2. **Thread resilience throughout the document where relevant.** Resilience is so interrelated with all other aspects of transportation planning that it should be integrated into the conversation rather than relegated to a distinct section where linkages may be obscured. That said, further detail about resilience should be included as an appendix.

3. **Include a robust resilience section in the appendix.** A complete section that discusses hazards, vulnerabilities, CLMPO's role in promoting transportation resilience, and local efforts to address resilience should be included for reference in the appendix.

4. **Consider a broad range of hazards to the transportation system.** Many resilience resources, including guidance from the FHWA, focus on climate change as the primary hazard. However, there are many efficiencies to be gained by considering a broad range of hazards together. It is critical to understand the vulnerability of our transportation system to a broad range of hazards, keeping in mind the cascading effects that can both exacerbate and be exacerbated by social equity, environmental, and economic linkages. Hazards may include climate change, seismic events, stormwater, riverine flooding, landslides, extreme weather, drought, wildfires, volcanic hazards, geometric disturbance, "non-natural" hazards (e.g. civil unrest, epidemics, releases of hazardous materials), and possibly others.

5. **Conduct additional research and outreach to fill in gaps, strengthen analysis, and ensure consistency with local efforts.** This white paper focused on how to incorporate resilience into the 2045 RTP, however, there are opportunities to advance this research in several ways. First, a much more robust outreach effort that incorporates feedback from related local, state, and federal agencies and organizations is needed to meet federal guidelines on

collaboration and to more fully understand the local context. Needs for additional research and outreach include: develop a more complete understanding of existing local plans, policies, and actions to address potential hazards to the transportation system; create a more specific set of potential strategies to address social and economic resilience; better integrate natural resource planning and transportation planning; and consider travel modes and their specific vulnerabilities to hazards and contributions to resilience planning efforts. See Appendix Section 6.1 Collaboration for recommendations about additional outreach and collaboration.

6. **Add resilience-related terms to the glossary.** See Appendix Section 6.2 Glossary for recommendations on terms to include.

7. **Commit to taking positive steps as a region toward increasing transportation resilience beyond the RTP update.** Next steps may include (in no particular order):

   - **Conduct a formal vulnerability assessment.** A vulnerability assessment is a key step in improving the resilience of the transportation system–in order to take steps to mitigate risk and therefore improve the resilience of the system, a transportation agency must first understand the risks that threaten the system as well as its existing capacity to deal with those risks. See Section 4.2 for a discussion of FHWA guidance on vulnerability assessment.

   - **Develop a local and regional Emergency Transportation Route network and prioritize retrofits.** Local and regional Emergency Transportation Routes complement and extend the Statewide Lifeline Routes, connecting across jurisdictions and providing access to staging areas, essential infrastructure, and intermodal transfer points. Portland Metro is currently in the process of updating its regional Emergency Transportation Routes; CLMPO could follow and learn from Metro's process.

   - **Incorporate resilience into project evaluation and development.** Use resilience in the evaluation and prioritization of projects and incorporate it into project design and engineering. Conduct research into how other agencies have successfully incorporated resilience goals and performance measures into project evaluation and development.

   - **Explore opportunities to develop a Continuity of Operations Plan (COOP) or similar internal emergency plan.** A COOP is only activated when a disturbance disrupts the internal operation of a transportation agency. COOPs support other emergency response plans by providing a roadmap to ensure continuous performance of essential functions and operations; protect essential facilities and assets; reduce or mitigate disruptions to operations; minimize loss of life, injury, and property damage; and help agencies recover and resume full services quickly and efficiently. COOPs establish procedures for alerting and activating employees, identifying critical agency or business functions, identifying alternate facilities that can house operations during a disruption, delegating authority or orders of succession, and resuming normal operations. FEMA and the Transportation

Research Board have provided guidance on COOP development, and CLMPO could follow the lead of other MPOs across the country that have developed their own COOPs.

- **Consider becoming an official Eugene-Springfield Area Multi-Jurisdictional Natural Hazards Mitigation Plan Sub-Plan Holder.** Sub-Plan Holders participate in the 5-year plan update cycle, hazard identification and risk assessment, and take part in annual mitigation action reviews. Becoming a Sub-Plan Holder can help improve communication and coordination as well as leverage individual capacities to implement comprehensive mitigation actions, share costs and resources, and avoid duplicating of efforts.

8. **Identify potential funding sources to integrate these action items into planning.** Get creative and look beyond traditional funding sources. Consider transportation's connections to other fields, such as public health and disaster management.

6. APPENDIX

6.1 Collaboration

In accordance with 23 CFR 450.316 and 23 CFR 450.324, CLMPO must consult with appropriate tribal, federal, state, and local agencies responsible for other planning activities affected by transportation, including state and local planned growth, economic development, tourism, natural disaster risk reduction, environmental protection, airport operations, or freight movements. In the 2045 RTP, CLMPO must document the agreed-upon consultation processes, any comments received, and the disposition of comments and how CLMPO addressed them.

Additional research is needed to identify agencies local to the CLMPO area to ensure that all appropriate entities are included in consultation. CLMPO would benefit from consultation specifically in pursuit of Planning Factor 9, including water resources management agencies and watershed councils, agencies or departments dealing with hazard mitigation and natural disaster risk reduction, agencies responsible for planning and regulation around air quality and climate change, public health agencies, and economic development agencies. Figure 6.1 presents some ideas for additional consultation that borrows heavily from Metro; this list is not comprehensive and should be considered a starting point.

Figure 6.1: Ideas for Additional Consultation

Agency Type	CLMPO List of Agencies to Consult
Tribal Governments	– Confederated Tribes of Coos, Lower Umpqua, and Siuslaw Indians – Confederated Tribes are Siletz Indians
Water Resources Management	– US Army Corps of Engineers – Oregon Water Resources Department – Oregon Department of Environmental Quality – Oregon Department of State Lands – Oregon Watershed Enhancement Board – Eugene Water and Electric Board – Springfield Utility Board – Rainbow Water District – Lane County Water Resources – City of Springfield Development and Public Works Department – City of Eugene Department of Public Works – City of Coburg Department of Public Works
Hazard Mitigation and Natural Disaster Risk Reduction	– Lane County Emergency Management – City of Eugene Emergency Management – City of Springfield Emergency Management – Lane Preparedness Coalition
Air Quality and Climate Change	– US Environmental Protection Agency – Oregon Department of Environmental Quality – Oregon Department of Energy – ODOT Climate Office – Lane Regional Air Protection Agency
Public Health	– Lane County Public Health

	– Oregon Health Authority
Economic Development	– City of Eugene Economic Development – City of Springfield Economic Development – City of Coburg Economic Development – Lane County Community & Economic Development Department – Business Oregon

6.2 Glossary

The following terms relate to Planning Factor 9 themes. Most terms in this section are pulled directly from Portland Metro's 2018 Regional Transportation Plan.

Adaptation – This term refers to adjustment in natural or human systems in anticipation of or response to a changing environment in a way that effectively uses beneficial opportunities or reduces negative effects.

Adaptive Capacity – This term refers to a system's ability to change in response to shocks and stresses to maintain normal functioning.

Climate change – Any significant change in the measures of climate lasting for an extended period of time. Climate change includes major variations in temperature, precipitation or wind patterns, among other environmental conditions, that occur over several decades or longer. Changes in climate may manifest as a rise in sea level, as well as increase the frequency and magnitude of extreme weather events now and in the future.

Emergency – Any human-made or natural event or circumstance causing or threatening loss of life, injury to person or property, and includes, but is not limited to, fire, explosion, flood, severe weather, drought earthquake, volcanic activity, spills or releases of oil or hazardous material, contamination, utility or transportation disruptions, and disease.

Emergency transportation routes – Priority routes used during and after a major regional emergency or disaster to move people and response resources, including the transport of first responders (e.g., police, fire and emergency medical services), fuel, essential supplies and patients.

Exposure – This term refers to whether an asset or system is located in an area experiencing direct effects of a hazard, such as climate change.

Environmental mitigation activities – Strategies, policies, programs, and actions that, over time, will serve to avoid, minimize, rectify, reduce or eliminate impacts to environmental resources associated with the implementation of a long range statewide transportation plan or metropolitan transportation plan.

Extreme events – This term refers to risks posed by climate change and extreme weather events. The definition does not apply to other uses of the term nor include consideration of risks to the transportation system from other natural hazards, accidents, or other human induced disruptions.

Extreme weather events – Significant anomalies in temperature, precipitation and winds and can manifest as heavy precipitation and flooding, heatwaves, drought, wildfires and windstorms (including tornadoes). Consequences of extreme weather events can include safety concerns, damage, destruction and/or economic loss. Climate change can also cause or influence extreme weather events.

Greenhouse gas emissions – The six gases identified in the Kyoto Protocol and by the Oregon Greenhouse Gas Mandatory Reporting Advisory Committee as contributing to global climate change: carbon dioxide (CO2), nitrous oxide (N2), methane (CH4), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), and sulfur hexafluoride (SF6). Greenhouse gases absorb solar radiation and act like a heat-trapping blanket in the atmosphere, causing climate change. More information is available at epa.gov/climate change.

Green infrastructure – A network of multi-functional green spaces and environmental features, both natural and engineered, that use or replicate natural systems to better manage stormwater, protect streams and enhance wildlife corridors—trees, soils, water and habitats. Examples include: permeable paving, vegetated swales, rain gardens, green streets, green roofs, green walls, urban forestry, street trees, parks, green corridors such as trails, and other low impact development practices.

Green streets – An innovative stormwater management approach that captures rain where it falls by using vegetation, soil and engineered systems to slow, filter and clean stormwater runoff from impervious surfaces.

Mitigation – Planning actions taken to avoid an impact altogether, minimize the degree or magnitude of the impact, reduce the impact over time, rectify the impact, or compensate for the impact. Mitigation includes:

(a) Avoiding the impact altogether by not taking a certain action or parts of an action.
(b) Minimizing impacts by limiting the degree or magnitude of the action and its implementation.
(c) Rectifying the impact by repairing, rehabilitating, or restoring the affected environment.
(d) Reducing or eliminating the impact over time by preservation and maintenance operations during the life of the action.
(e) Compensating for the impact by replacing or providing substitute resources or environments.

Resilience or resiliency – Resilience is the ability of a socio-environmental system to survive and transform in order to sustain itself.

Security (public and personal) – Protection from intentional criminal or antisocial acts while engaged in trip making through design, regulation, management, technology and operation of the transportation system.

Sensitivity – This term refers to how the asset or system fares when exposed to the hazard.

Sustainability – Sustainability is a paradigm for thinking about the future in which environmental, societal, and economic considerations are balanced in the pursuit of an improved quality of life

Sustainable – A method of using a resource such that the resource is not depleted or permanently damaged.

Vulnerability – Vulnerability in the transportation context is a function of the asset's or system's sensitivity, exposure, and adaptive capacity. Exposure refers to whether an asset or system is located in an area experiencing direct effects of a hazard; sensitivity refers to how the asset or system fares when exposed to the hazard; and adaptive capacity refers to the system's ability to change in response to shocks and stresses to maintain normal functioning.

6.3 A Case for Establishing Regional Emergency Transportation Routes

Proposed Project Summary

Emergency Transportation Routes (ETRs) are priority routes that facilitate lifesaving and life-sustaining response activities during an emergency. The transportation system in the Central Lane Metropolitan Planning Organization (CLMPO) region is vulnerable to numerous natural and non-natural hazards. Establishing a set of regional ETRs represents a key opportunity to enhance the transportation resilience of the region and contribute to security and emergency planning efforts led by emergency response and public safety agencies. This project would help address federal regional transportation planning requirements and is consistent with the 2021 transportation priorities of the Oregon Metropolitan Planning Organization Consortium (OMPOC). Project goals could include:

1. Designate a regionally accepted and catalogued network of regional ETRs that provide connectivity to critical infrastructure, essential facilities, population centers, and vulnerable communities.
2. Build a comprehensive dataset for use in future planning.
3. Develop a set of recommendations for follow-on work, including a prioritized list of potential retrofits needed to increase regional ETR resilience to hazards.

Background

What are Emergency Transportation Routes?

ETRs are priority routes targeted for rapid damage assessment and debris removal during an emergency to facilitate lifesaving and life-sustaining response activities. ETRs are expected to play a key role in post-disaster recovery efforts. There are four types of ETRs:

> **Local Emergency Response Streets** are a network of streets in a single jurisdiction that facilitate ordinary fire, police, and medical emergencies.
>
> **Local Emergency Transportation Routes** are pre-designated routes used during a large-scale event in the initial response phase and early recovery to transport first responders, fuel, supplies, and patients. Local ETRs connect regional nodes to destinations of local importance (e.g. staging

areas, essential infrastructure, and intermodal transfer points) and add redundancy to Statewide Lifeline Routes.

Regional Emergency Transportation Routes are pre-designated routes that move first responders and supplies across jurisdictional boundaries among regional nodes and connect population centers, critical infrastructure, and services of regional importance. Regional ETRs also connect Statewide Lifeline Routes and local ETRs.

Statewide Lifeline Routes are state-owned roadways identified by the Oregon Department of Transportation (ODOT) as critical to emergency response and recovery activity. Lifeline Routes connect regions of statewide importance via a few key north-south and east-west routes.

Why are Regional Emergency Transportation Routes Important?

The transportation system in the CLMPO area is vulnerable to numerous hazards, including stormwater, seismic hazards, climate change, extreme weather, geomagnetic disturbance, volcanic hazards, landslides, and “non-natural” hazards. The catastrophic wildfire events across the State of Oregon in 2020 underscored the vulnerability of the transportation system to natural hazards and the need to provide a set of clearly established emergency routes. Unfortunately, prolonged drought and record heat indicate earlier and possibly more severe wildfire seasons going forward in Oregon. Eighty percent of Lane County is currently experiencing severe to extreme drought; the Eugene-Springfield area is listed in the extreme category and at risk of high wildfire activity.[66]

There is also a clear and imminent threat from seismic activity along the Cascadia Subduction Zone (CSZ), a 620-mile fault that runs along the coast from Northern California to Southern British Columbia. The region’s transportation networks will play a key role in the state’s recovery following a CSZ earthquake, first in facilitating emergency response and then restoring mobility. Immediately following a CSZ event, local roads and streets may provide the only access to critical facilities like hospitals, fire stations, and temporary food and housing. Much of the local road network would be subject to serious damage, but in some cases local roads and streets could provide redundancy for the state highway lifelines. As lifeline routes are restored, transit buses can assist in evacuations, transport emergency workers and supplies, and provide transportation to recovery-related jobs. Identification and evaluation of ETRs prior to a catastrophic CSZ event will be critical to emergency response and will help prioritize investments in seismic retrofitting to prepare critical lifelines in the transportation system and reduce the anticipated economic impact.

What is the Role of the Central Lane Metropolitan Planning Organization?

CLMPO is subject to the Fixing America’s Surface Transportation (FAST) Act, which requires MPOs to develop long range transportation plans that address ten Federal Planning Factors. Planning Factor 9 requires MPOs to consider how they will “improve the resiliency and reliability of the transportation system and reduce or mitigate stormwater impacts of surface transportation” *(23 CFR 450.306(b)(9)).* The Planning Factor 9 White Paper presented to TASC in October of 2020 explores how to integrate resilience into CLMPO’s 2045 RTP. ETRs were identified as a key opportunity for CLMPO to enhance the

[66] https://www.drought.gov/states/oregon/county/Lane

transportation resilience of the region and contribute to security and emergency planning efforts led by emergency response and public safety agencies.

Additionally, OMPOC, comprising all eight MPOs in the State of Oregon, has identified improving the resiliency of the transportation system as a 2021 transportation priority in a June 2021 memo. The memo, directed to Congress and reviewed by the CLMPO Metropolitan Policy Committee, stated the case with urgency:

> *We ask Congress to advance resiliency as a key outcome in federal grant programs, dedicate funding to support capital projects to improve resiliency, and acknowledge that resiliency needs differ across the country, from flooding and coastal degradation, to earthquake preparedness, to fire safety…We need dedicated funds for planning, interagency coordination, maintenance and capital improvements to strengthen current emergency routes and identified lifelines. This type of coordinated, multi-jurisdictional planning is complicated, expensive, and valuable because it helps jurisdictions identify and prioritize needs…Investing now will also help accelerate response and recovery times within the region and help ensure equitable outcomes.*

As a next step in planning for seismic resilience, CLMPO could follow the lead of Portland Metro, which has designated a network of regional ETRs to complement the statewide system of Lifeline Routes. In 2019, upon recommendation in its 2018 RTP, Portland Metro partnered with the Regional Disaster Planning Organization (RDPO) to update its regional network of ETRs, which were designated in 1996 and last updated in 2006. A similar project led by CLMPO could leverage existing state and local efforts to identify and assess priority routes through the region, including ODOT's Statewide Lifeline Routes and Lane County's network of ETRs, designated in collaboration with ODOT.

To further enhance the transportation resilience of the region, CLMPO's effort could focus on identifying additional local and regional routes—particularly through the MPO area—to ensure that all critical facilities, population centers and vulnerable communities, Lane County ETRs, and Statewide Lifeline Routes are connected during an emergency. Lane County's effort to designate ETRs focused on establishing alternate routes on Lane County roads where there were either fewer seismically vulnerable bridges or lower rehabilitation and replacement costs. CLMPO's effort could expand on Lane County's ETR evaluation framework to include additional factors such as connectivity, access, route resilience, community, and equity following Portland Metro's model (see Figure 2 below). Additionally, bicycle and pedestrian infrastructure could be considered as part of the analysis.

Developing Regional Emergency Transportation Routes in the CLMPO Region

Key Partners & Stakeholders

Regional and multidisciplinary collaboration is key to ensuring that there is one set of regionally recognized ETRs through the CLMPO region. Key partners for designating regional ETRs will have expertise in emergency management, transportation planning, public works, engineering, operations, ports, and public transit. In addition to public engagement, an effort to designate regional ETRs in the CLMPO region could include:

- DOGAMI
- ODOT
- Lane County

- Transit Providers (LTD, LCOG, South Lane Wheels)
- Cities of Eugene, Springfield, Coburg, Creswell, Cottage Grove, Florence
- Transportation, emergency management, & public works departments of each jurisdiction
- University of Oregon
- Port of Siuslaw
- Association of Oregon Counties

Current Funding Opportunities

The following grant programs represent potential funding opportunities for establishing regional ETRs in the CLMPO region. Not all programs listed are currently available to the CLMPO region; many require a Presidentially declared disaster. There may be additional funding opportunities for transportation resilience associated with an infrastructure bill.

FUNDING PROGRAM	DESCRIPTION	ELIGIBILITY
BUILDING RESILIENT INFRASTRUCTURE AND COMMUNITIES (BRIC) HTTPS://WWW.OREGON.GOV/OEM/EMRESOURCES/GRANTS/PAGES/HMA.ASPX	Pre-disaster FEMA program that supports states, local communities, tribes and territories as they undertake hazard mitigation projects, reducing the risks they face from disasters and natural hazards. BRIC is a new FEMA pre-disaster hazard mitigation program that replaces the existing Pre-Disaster Mitigation (PDM) program. The BRIC program guiding principles are supporting communities through capability- and capacity-building; encouraging and enabling innovation; promoting partnerships; enabling large projects; maintaining flexibility; and providing consistency. State funds managed by state hazard mitigation officer (SHMO) under the state Hazard Mitigation Assistance program.	SHMO may apply on behalf of sub-applicants
STATE HOMELAND SECURITY PROGRAM (SHSP) HTTPS://WWW.FEMA.GOV/GRANTS/PREPAREDNESS/HOMELAND-SECURITY	FEMA program that supports implementation of state homeland security strategies to address planning, organization, equipment, training, and exercise needs to prevent, prepare for, protect against, and respond to, acts of terrorism and other catastrophic events. Eligible projects address an identified gap to prevent, prepare for, protect against, and respond to acts of terrorism or other catastrophic events, and support at least one of the state investment justifications.	Local and tribal units of government (including any council of government)
EMERGENCY MANAGEMENT PERFORMANCE GRANT (EMPG) HTTPS://WWW.FEMA.GOV/GRANTS/PREPAREDNESS/EMERGENCY-MANAGEMENT-PERFORMANCE	FEMA program that provides state, local, tribal and territorial emergency management agencies with the resources required for implementation of the National Preparedness System and works toward the National Preparedness Goal of a secure and resilient nation. The EMPG's allowable costs support efforts to build and sustain core capabilities across the prevention, protection, mitigation, response and recovery mission areas.	Counties, Tribes, Cities > 85,000

FUNDING PROGRAM	DESCRIPTION	ELIGIBILITY
TRANSIT SECURITY GRANT PROGRAM HTTPS://WWW.FEMA.GOV/GRANTS/PREPAREDNESS/TRANSIT-SECURITY	FEMA program that provides funding to eligible public transportation systems (which include intra-city bus, ferries and all forms of passenger rail) to protect critical transportation infrastructure and the traveling public from terrorism, and to increase transportation infrastructure resilience.	Lane Transit District
REGIONAL CATASTROPHIC PREPAREDNESS GRANTS HTTPS://WWW.FEMA.GOV/GRANTS/PREPAREDNESS/REGIONAL-CATASTROPHIC	FEMA program that supports the building of core capabilities essential to achieving the National Preparedness Goal of a secure and resilient nation by providing resources to close known capability gaps in Housing and Logistics and Supply Chain Management, encouraging innovative regional solutions to issues related to catastrophic incidents, and building on existing regional efforts.	Local governments as defined by 2 C.F.R. 200.64 (includes council of governments)
HAZARD MITIGATION GRANT PROGRAM (HMGP) HTTPS://WWW.OREGON.GOV/OEM/EMRESOURCES/GRANTS/PAGES/HMA.ASPX	Post-disaster FEMA program that provides funding to state, local, tribal and territorial governments to rebuild in a way that reduces, or mitigates, future disaster losses in their communities. This grant funding is available after a Presidentially declared disaster. State funds managed by SHMO under the state Hazard Mitigation Assistance program.	SHMO may apply on behalf of sub-applicants
HAZARD MITIGATION POST FIRE GRANT HTTPS://WWW.FEMA.GOV/GRANTS/MITIGATION/POST-FIRE	A subset of FEMA's post-disaster HMGP that provides Post Fire assistance to help communities implement hazard mitigation measures after wildfire disasters. Available in communities affected by fires resulting in a Fire Management Assistance Grant declaration on or after Oct 5, 2018.	States, tribes and territories
COMMUNITY DEVELOPMENT BLOCK GRANT- DISASTER RESILIENCE (CDBG-DR) HTTPS://WWW.HUDEXCHANGE.INFO/PROGRAMS/CDBG-DR/	HUD program that provides flexible grants to help cities, counties, and states to recover from Presidentially declared disasters, especially in low-income areas. CDBG-DR assistance may fund a broad range of recovery activities, including disaster relief, long-term recovery, restoration of infrastructure, housing, and economic revitalization. HUD allocates funds based on unmet recovery needs and notifies eligible States, cities, and counties if they are eligible.	State agencies, nonprofit organizations, economic development agencies, citizens, businesses
COMMUNITY DEVELOPMENT BLOCK GRANT –MITIGATION (CDBG-MIT) HTTPS://WWW.HUDEXCHANGE.INFO/PROGRAMS/CDBG-MIT/	HUD program that provides assistance in areas by recent disasters to carry out strategic and high-impact activities to mitigate disaster risks and reduce future losses. Mitigation activities are defined as activities that increase resilience to disasters and reduce or eliminate the long-term risk of loss of life, injury, damage to and loss of property, ad suffering and hardship by lessening the impact of future disasters.	Jurisdictions and nonprofit organizations within "Most Impacted and Distressed" (MID) areas resulting from a qualifying major disaster

Case Study: Portland

In 2019, upon recommendation in its 2018 RTP, Portland Metro partnered with the Regional Disaster Planning Organization (RDPO) to update its ETRs for the five-county Portland-Vancouver Metro Region, which were designated in 1996 and last updated in 2006. Funding for the project came from FEMA's Urban Areas Security Initiative (UASI) grant, which funds projects that enhance regional preparedness and expand regional collaboration in major metropolitan areas.[67]

With help from a team of consultants and Portland State University's Transportation Research and Education Center (TREC), Metro and RDPO evaluated the existing regional ETRs primarily through a seismic lens (including landslide risk) with GIS analysis. The update consisted of a literature review conducted by TREC, which included a summary of recent work and identified best practices and considerations for updating regional ETRs. A multi-disciplinary work group including over 30 representatives from 17 agencies provided expertise in emergency management, transportation planning, public works, engineering, operations, ports, and public transit.

The goals of the first phase of the update (2019-2021) were to designate an agreed-upon and catalogued network of regional ETRs, build a comprehensive dataset for use in future planning and update efforts, and conduct evaluation and analysis that will aid future phases of work. Phase 2 will involve prioritizing, operationalizing, and formalizing identified regional ETRs over a period of one to five years.

Phase 1 outcomes included:

- 195 designated routes (89 of which were new) connecting over 75% of State and regional critical infrastructure and essential facilities
- Enhanced visibility of regional ETRs through regional dialogue
- Regionally accepted network that provides adequate connectivity to critical infrastructure and essential facilities, as well as region's population centers and vulnerable communities, and connects to Statewide Lifeline Routes
- Comprehensive GIS database & online regional ETR viewer
- Regionally accepted set of recommendations for follow-on work

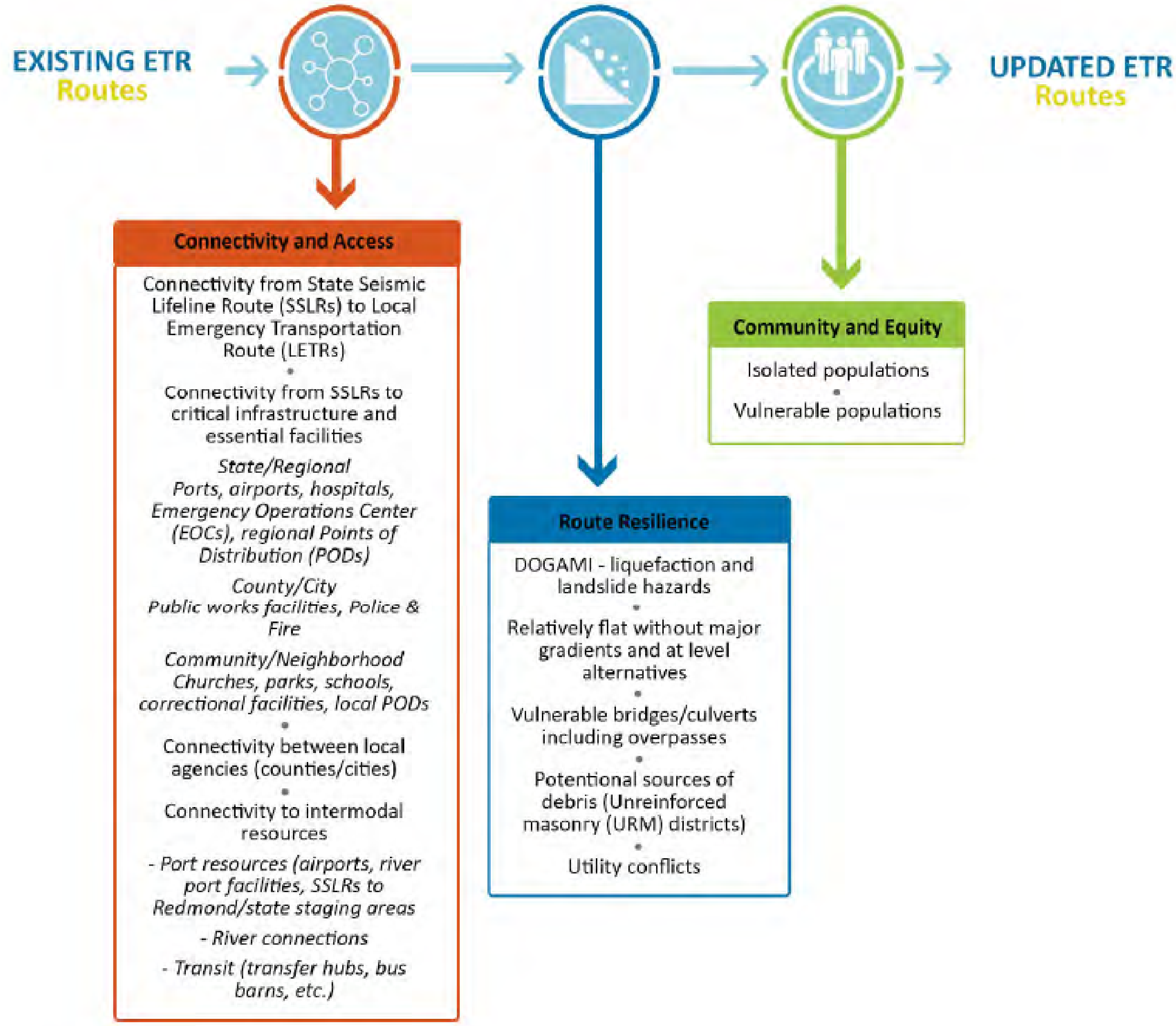
The project methodology (Figure 1) included defining key terms; compiling data on existing regional ETRs and detour routes, tunnels and culverts, essential facilities, critical infrastructure, ODOT bridge seismic vulnerability, geologic hazard data, current and projected population growth distribution, demographic data, designated over-dimensional freight routes, and utilities; developing and refining an evaluation framework for regional ETRs, including connectivity and access, route resilience, and equity (Figure 2); evaluating potential regional ETRs using GIS; conducting extensive stakeholder engagement; and recommending regional ETRs and future planning work.

[67] Eligibility is determined through an analysis of relative risk of terrorism faced by the 100 most populous Metropolitan Statistical Areas in the United States. Per the 2021 UASI Program Guidance, the Portland Area is the only eligible urban area in Oregon.

Figure 1: Phase 1 Methodology and Timeline

Note: RETR = Regional Emergency Transportation Route

Figure 2: Evaluation Framework



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Appendix D:

White Paper Addressing Federal Planning Factor 10 in Central Lane Metropolitan Organization's 2045 Regional Transportation Plan

CONTENTS

1. EXECUTIVE SUMMARY

Every five or six years, the United States Congress enacts a law to authorize funding for surface transportation programs. Congress typically uses these reauthorization acts to review, revise, and refine all aspects of federal surface transportation policy, including transportation planning. Since 1973, federal transportation law has placed the responsibility for carrying out the regional transportation planning process in urbanized areas on Metropolitan Planning Organizations (MPOs).

The most recently enacted reauthorization is the Fixing America's Surface Transportation (FAST) Act signed on December 4th, 2015. The FAST Act incorporates many of the aspects of and builds on its predecessor, the 2012 Moving Ahead for Progress in the 21st Century Act (MAP-21).

The FAST Act tasks MPOs with developing plans and programs to accomplish the Act's objectives within metropolitan areas, using a continuing, cooperative, and comprehensive process. The FAST Act reinforces MAP-21's emphasis on performance-based planning that considers measures and targets, identifies planning factors that the metropolitan transportation planning must address, requires that the process be certified as compliant with federal law, and designates the major products of the process.

The FAST Act has ten planning factors that the metropolitan transportation planning process must provide for consideration of projects, strategies and services that will:

1. Support the economic vitality of the metropolitan area, especially by enabling global competitiveness, productivity, and efficiency;
2. Increase the safety of the transportation system for motorized and non-motorized users;
3. Increase the security of the transportation system for motorized and non-motorized users;
4. Increase accessibility and mobility of people and freight;
5. Protect and enhance the environment, promote energy conservation, improve the quality of life, and promote consistency between transportation improvements and state and local planning growth and economic development patterns;
6. Enhance the integration and connectivity of the transportation system, across and between modes, for people and freight;
7. Promote efficient system management and operation;
8. Emphasize the preservation of the existing transportation system;
9. Improve the resiliency and reliability of the transportation system and reduce or mitigate stormwater impacts of the transportation system; and
10. Enhance travel and tourism.

The purpose of this white paper was to examine what other MPOs around the country are doing to implement and address Planning Factor 10: Enhance Travel and Tourism. This is a relatively new planning factor and other MPOs around the country are in the same position as the CLMPO trying to figure out how to address it in their upcoming RTP updates. Seven MPOs across the country were examined that each addressed this planning factor in different ways.

The CLMPO currently has all the tools to become one of the leading MPOs that implements Planning Factor 10. With the CLMPO's robust bicycle and transit network, transportation options program, attractive tourist destinations, and community partners like Travel Lane County, the CLMPO is in a great a position. The CLMPO can continue to strive to be at the forefront of enhancing travel and tourism by continuing to invest in and expand its current programs and infrastructure, and by researching programs that are not already in this region.

This MPO region is home to travel and tourist destinations that will only get better with more coordination between community organizations and by investing in more transportation options for both its residents and tourists.

2. PURPOSE

Central Lane Metropolitan Planning Organization (CLMPO) is subject to the Fixing America's Surface Transportation (FAST) Act. The FAST Act requires MPOs to develop long-range transportation plans that address 10 planning factors. Planning Factor 10 is a requirement to "enhance travel and tourism." This factor was not required at the time of CLMPO's 2040 Regional Transportation Plan (RTP) adoption.

The purpose of this white paper is to review, evaluate, and recommend strategies to integrate Planning Factor 10: Enhance Travel and Tourism into the CLMPO 2045 RTP.

3. REGIONAL TRANSPORTATION PLANNING PEER REVIEW

A peer review of selected MPO's regional transportation plans from across the country was conducted with the intent of identifying noteworthy practices to integrate Factor 10: Enhance Travel and Tourism. The MPOs selected for review are identified in **Table 1: Table of MPOs Reviewed** and are explored further in this section.

Table 1: Table of MPOs Reviewed

MPO	2010 Population	Area (sq. mile)	Plan	Adopted
Tahoe Regional Planning Agency (TRPA), Stateline, NV	55,849	512	Linking Tahoe Regional Transportation Plan	2017
Miami-Dade Regional Transportation Planning Organization (TPO), Miami, FL	2,569,420	2,020	Federal Planning Emphasis Areas (PEAs) for Miami-Dade County	2017
Puget Sound Regional Council (PSRC), Seattle, WA	3,690,086	6,384	Puget Sound Regional Council 2040 RTP	2018
Northern Middlesex Metropolitan Planning Organization (NMMPO), Lowell, MA	286,951	196	Northern Middlesex Regional Transportation Plan FFY 2020-2040	2019
Denver Regional Council of	2,877,082	2,605	2040 Metro Vision Regional Transportation Plan	2019

Governments (DROG), Denver, CO				
Atlanta Regional Commission (ARC), Atlanta, GA	4,818,052	4,550	The Atlanta Region's Plan Transportation Element	2020
Maricopa Association of Governments (MAG), Phoenix, AZ	4,055,281	10,659	2040 Regional Transportation Plan Update	2019

Linking Tahoe Regional Transportation Plan

Tahoe Regional Planning Agency (TRPA), Stateline, Nevada

About the MPO

The Lake Tahoe Regional Planning Agency was created through a Bi-State Compact between California and Nevada. The region covers 500 square miles and has about 55,000 full-time residents. Its largest population centers are the City of South Lake Tahoe and unincorporated communities of Meyers and Stateline on the South Shore, and unincorporated communities of Tahoe City, Kings Beach, and Incline Village on the North Shore.

Split by the California and Nevada borders and surrounded by natural beauty with one of the world's deepest lakes, TRPA is tasked with managing the transportation needs of a $5 billion annual economy. This economy is based on outdoor recreation and tourism that also contributes to some TRPA's largest transportation challenges and sees 10 million vehicles traveling to Lake Tahoe each year.

Addressing Planning Factor 10: Enhance Travel and Tourism

The 2017 Regional Transportation Plan vision is, "a first-class transportation system that prioritizes bicycling, walking, and transit, and serves residents and visitors while contributing to the environmental and socioeconomic health of the Region". The highest priorities of this RTP are: **Transit** (Increasing frequency to 30-minute headways, Providing free-to-the-user service, Improving recreation access), **Trails** (closing gaps in the active transportation network with a focus on shared-use paths), and **Technology** (Signal optimization, transit prioritization, real time information, vehicle electrification, and parking management). The plan organizes the travel demands and behaviors of users into three focus areas: Discover Tahoe (recreational travel), Visit Tahoe (regional entry and exit travel), and Everyday Tahoe (residential and workforce travel). TRPA applies its three major categories of transit, trails, and technology to create strategies that will spread travel over different modes, times, and destinations.

TRPA mentions that their tourism-based economy generates $5 billion each year from both summer and winter tourism and outdoor recreation. This tourism-based economy poses significant challenges to managing their transportation system since the average daily population of the area is four times the permanent population. TRPA discusses how travel needs and demands will affect their three types of users: Every Day Tahoe, Discover Tahoe and Visit Tahoe within the context of its three highest priorities through three strategies:

- Transit strategies surround promoting awareness travel options and conditions through advertising and real-time travel information. The plan also includes strategies for integrated connections between neighboring metropolitan areas that are convenient, cost effective, and easy-to-use travel options for air, rail, roadways, transit service, and park and ride locations. TRPA mentions that importance of regional collaboration and suggests a strategy to partner with agencies to create mobility hubs. This is a strategy to encourage visitors to use transit to enter and exit the Lake Tahoe area that is reliable and convenient.

- Trail strategies include projects that connect residents and commuters to schools and jobs, provide visitors recreational access, and enhance commercials centers are prioritized in this plan. For visitors, a connected trail network will allow visitors to travel from hotels to recreation car-free.
- Technology strategies are for residents, commuters, and visitors and include services that impact travel decisions include time of travel, type of mode, and use of electric or zero-emission vehicles. TRPA strategizes technological innovations that improve real time information accessibility, optimize signalization, increase data collection and transparency, proliferate electric vehicles in personal and public fleets, and improve transit safety and security. Additional improvements include weather variable speed signs, a region-wide transportation trip planning tool, and information kiosks at activity centers. Technological innovations that provide real time information can be used for all three types of users to informs them bus arrival, road conditions, parking availability, and pricing. TRPA believes that by providing real time information to recreation sites this will encourage travelers to visit locations during non-peak hours thus reducing congestion.

Federal Planning Emphasis Areas (PEAs) for Miami-Dade County

Miami-Dade Regional Transportation Planning Organization (TPO), Miami, Florida

About the MPO

The Miami-Dade Regional TPO guides the transportation process in Miami-Dade County. The TPO was created in 1977 and has 34 municipalities with a population of 2,569,420.[1] A major role of the TPO is to ensure conformance with federal regulations requiring that highways, mass transit and other transportation facilities and services are properly developed and deployed in relation to the overall plan of urban development and to approve plans for regional and state transportation network accessibility. In addition, federal guidelines require that the use of Federal Aid for transportation be consistent with TPO endorsed plans and programs. Federal, state and local transportation planning funds are utilized on an ongoing basis to insure the effectiveness of the TPO process.

Addressing Planning Factor 10: Enhance Tourism and Travel

The objective of *Federal Planning Emphasis Areas (PEAs) for Miami-Dade County* was to address new policies from the FAST Act and it includes recommendations for Miami-Dade TPO to comply with. It looks in depth at other RTPs around the county and analyzes their current RTP to address Planning Factor 10.

The 2040 LRTP was adopted in 2014 and the current 2045 Long Range Transportation Plan update is ongoing in 2020. The 2040 Plan emphasizes increasing the efficiency of the current infrastructure with

[1] Miami-Dade Transportation Planning Organization (TPO). Metropolitan Planning Organization (MPO) Database. United States Department of Transportation. https://www.planning.dot.gov/mpo/

rising construction costs; the utilization of metrics to measure the effectiveness of the plan in terms of its impact on mobility, safety, sustainability, and operation considerations; the consideration of non-motorized modes of transportation and infrastructure improvements for such modes; and freight transportation improvements to support economic growth and prosperity.

The 2040 LRTP, Goal 4 – Support Economic Vitality directly addresses Planning Factor 10. Objective 4.2 states “Enhance tourist travel and access opportunities” and the performance measures to support it are 1) Highway lane and centerline miles within .25 miles of tourist attractions, and 2) Transit service route miles within .25 miles of tourist attractions.

Additionally, in the *Addressing Compliance of 2045 LRTP Update with Requirements Final Report*[2], Miami-Dade TPO recommends to meet Planning Factor 10 by including a member or members from local travel and economic agencies to the planning process through their LRTP Steering Committee. The last recommendation is to also consider identifying connections from major hotel clusters to major tourist attractions.

Puget Sound Regional Council 2040 RTP

Puget Sound Regional Council (PSRC), Seattle, Washington

About the MPO

The Puget Sound Regional Council (PSRC) was federally designated in 1991 as the Metropolitan Planning Organization (MPO) for the Seattle, Washington four-county region of King, Kitsap, Pierce, and Snohomish counties. The PSRC is responsible for promoting the development of an interconnected, regional transportation network. This is done through: the region’s growth strategy- VISION 2040, the development of the LRTP, and the “Prosperity Partnership,” which oversees the development of the region’s economic strategy. The MPO provides a forum for collaboration on regional planning activities. The PSRC’s organizational structure consists of a General Assembly made up of elected officials from all four counties as well as the cities and towns in the planning area and a 32-member Executive Board which makes decisions on behalf of the General Assembly. It also includes an Economic Development Board, Growth Management Policy Board, Operations Committee, a Transportation Policy Board and 17 additional committees. The PSRC region is 6,384 square miles and had an estimated population of 3.7 million in 2010.[3] The region’s population is projected to grow to 5.2 million people by 2040.

Addressing Planning Factor 10: Enhance Tourism and Travel

The PSRC’s LRTP furthers VISION 2040[4], the area’s regional growth strategy. Transportation 2040: Toward a Sustainable Transportation System was adopted in May 2010 and serves as the region’s LRTP. It includes three strategies for addressing VISION 2040: (1) improving mobility, (2) protecting and enhancing the environment, and (3) identifying sustainable funding. To address mobility, projects included in the LRTP promote a strategic approach to growth along transit corridors to ease congestion.

[2] INSERT FOOTNOTE LINK
[3] Puget Sound Regional Council (PSRC). Metropolitan Planning Organization (MPO) Database. United States Department of Transportation. https://www.planning.dot.gov/mpo/
[4] VISION 2040 https://www.psrc.org/vision-2040-documents

To protect the environment, projects have been evaluated to determine potential environmental impacts to the region.

In the identification of sustainable funding sources, the LRTP acknowledges the potential change in viability of the fuel tax to be used as a source of revenue for transportation projects, due to changing technologies and inflation. The LRTP has established a framework for investments; with identifying projects that preserve and maintain the system prioritized first, followed by projects that promote safety and security, then efficiency, then those that strategically expand capacity. In May 2014, the region adopted an update report to Transportation 2040: Toward a Sustainable Transportation System, which included updates to the data and technical analysis included in the 2010 plan. The Transportation 2040: Toward a Sustainable Transportation System Update Report includes the following changes: the addition of a new Active Transportation Plan, updates to the Financial Strategy, Coordinated Transit-Human Services Plan, and Regional Transportation Demand Management Action Plan.

In PSRC's 2040 RTP, Planning Factor 10 is addressed by integrating it with the regional economic strategy, Amazing Place: Growing Jobs and Opportunity in the Central Puget Sound Region.[5] Goals and strategies that support enhance tourism and travel in Amazing Place include:

- Goal: Open economic opportunities to everyone
    - Advance economic development within small cities and rural communities
        - Residents from the core urban areas and tourists visiting the region travel to small cities to and rural communities for recreational opportunities. Transportation investments in line with growth expectations are important to keep these communities connected to the regional economy.
- Goal: Compete globally
    - Sustain and grow commercial air travel connections domestically and globally
        - Support airlines that service Sea-Tac Airport for continued success as a region.
        - Support tourism efforts which drive a substantial amount of passenger traffic through Sea-Tac Airport.
    - Support and promote international trade
        - Continue to market the region internationally and support coordinated regional branding efforts.
        - Support state tourism marketing efforts to raise the region's profile for trade relationships.
- Goal: Sustain a high quality of life
    - Improve the region's transportation system
        - Support innovation through public and private initiatives such as the University of Washington's new Mobility Innovation Center and Western Washington University's Vehicle Research Institute to stay ahead of trends in fuel economy, car sharing, and autonomous vehicles.
    - Embrace, celebrate, and promote the diversity of the region's people
        - Tourism – a growing export industry – continues to play a vital role in attracting visitors, workers, and investment to the region. International tourists – representing 7% of Seattle's total visitorship in 2016 – are known for staying

[5] Amazing Place https://www.psrc.org/sites/default/files/amazingplacestrategy.pdf

longer and spending more than domestic tourists. The region continues to experience increasing visitorship from diversifying markets, including a large increase in visitors from China.

- Preserve, enhance, and improve access to open space
  - Resource lands provide jobs in fishing, farming, forestry, material extraction, and tourism. Outdoor recreation in Washington state contributes an estimated $11.7 billion in revenue annually and supports 115,000 jobs.
  - Improve access to open space, particularly for underserved populations, including completing gaps in regional trails.
- Grow access to arts, culture, entertainment, and sports
  - Support strategies focused on expanding access and activities for arts, cultural, and educational opportunities

Northern Middlesex Regional Transportation Plan FFY 2020-2040

Northern Middlesex Metropolitan Planning Organization (NMMPO), Lowell, Massachusetts

About the MPO

The Northern Middlesex region encompasses 196 square miles in northern Middlesex County, approximately 20 miles north of Boston, Massachusetts. The member communities include the City of Lowell and the Towns of Billerica, Chelmsford, Dracut, Dunstable, Pepperell, Tewksbury, Tyngsborough, and Westford. The region is home to 286,901 persons according to the 2010 U.S. Census.[6] The NMMPO provides comprehensive transportation planning services and has 8 voting members and two ex-officio non-voting members.

Implementing Planning Factor 10: Enhance Travel and Tourism

The RTP is a planning guide that identifies and analyzes transportation infrastructure and service improvement needs in the Northern Middlesex Region through the year 2040.

Planning Factor 10 is implemented in Northern Middlesex RTP by connecting it to economic development and active transportation. Tourism in Massachusetts contributes more than $20 billion annually in direct spending alone. More than 27 million annual visitors sustain an industry that supports more than 150,000 jobs statewide.[7] The NMMPO addresses that the transportation needs of the tourism and recreational industries differ from commuter travel since tourism is generally seen as a generator of travel demand and transportation as the key to accessing tourist attractions. Transportation is a critical element in the operation of visitor attractions and in supporting activities such as national and state parks, performance venues, sporting arenas, museums, and recreational facilities. NMMPO recognizes that effective transportation planning can help balance the needs of different groups during peak tourism seasons or special events by considering the following factors:

- Alleviating traffic congestion and parking concerns near visitor attractions;

[6] Northern Middlesex MPO (NMMPO). Metropolitan Planning Organization (MPO) Database. United States Department of Transportation. https://www.planning.dot.gov/mpo/

[7] The Economic Impact of Travel on Massachusetts Counties 2018 https://www.massvacation.com/travel-trade/getting-around/stats-reports/

- Creating better access and mobility to meet the needs of those traveling to various attractions and venues;
- Improving traveler information resources;
- Linking existing, but separate tourist attractions; and
- Establishing an ongoing collaborative process between NMMPO, local communities, and organizations representing tourism interests.

NMMPO acknowledges that although transportation facilities span all modes of travel, recreation and tourist facilities can have special transportation needs that need to be met. NMMPO argues that visitors to tourism and recreation sites often need guidance on how to access those facilities and these needs can be served through information kiosks, websites, 511 traveler information[8], specialized maps, and signage.

In the NMMPO's Unified Planning Work Program (UPWP), a work task titled "Enhancing Travel and Tourism" was created. Through this task, an inventory of tourist sites and attraction were developed for the entire region that is easily accessible on the North Middlesex Council of Governments (NMCOG) website.[9] NMMCOG worked with the Greater Merrimack Valley Convention and Visitors Bureau to establish this inventory and identified the inventory by types of sites, facilitates, venues and events. To tie it back in with regional transportation plan, NMMPO staff work with the Lowell Regional Transit Authority (LRTA) to identify transit facilities near site. The interactive map indicates locations of sites or events, as well as, its proximity to nearby transit facilities, bus stops, and parking facilities.

To conclude, NMMPO staff will continue to work with its member communities to target the Opportunity Zones, Priority Development Areas, Economic Opportunity Areas, Priority Development Sites and other state and federally designated economic development areas for transportation infrastructure support. These transportation investments will provide direct connections between employment centers and employees, facilitate the delivery of goods and services, and allow businesses to efficiently transport their goods to market. NMCOG and the NMMPO staff will build upon the corridor studies previously developed and identify community development and redevelopment opportunities that enhance economic growth. Transit service in the region will continue to be examined to determine whether changes are needed to better serve the changing regional employment markets. Bicycle and pedestrian access to employment, educational, healthcare, and recreational opportunities will be improved. Residents of multi-family and affordable housing in the region will be better connected with employment and educational opportunities to improve their economic condition and quality of life.

[8] 511 traveler information is an easy-to-remember 3-digit phone number that provides current information about travel conditions, allowing travelers to make better choices – choice of time, choice of mode of transportation, choice of route.
https://ops.fhwa.dot.gov/travelinfo/about/about511.htm#:~:text=Simply%20stated%2C%20511%20is%20an,of%20transportation%2C%20choice%20of%20route.
[9] https://www.nmcog.org/enhancing-travel-and-tourism

2040 Metro Vision Regional Transportation Plan (MVRTP)

Denver Regional Council of Governments (DROG), Denver, Colorado

About the MPO

The Denver Regional Council of Governments (DRCOG) was federally designated in 1977 as the Metropolitan Planning Organization (MPO) for the greater Denver, CO region serving Adams, Arapahoe, Boulder, Clear Creek, Douglas, Jefferson, and Gilpin counties, and the City and County of Broomfield and the City and County of Denver. The region's vision is to develop connected and vibrant communities that contain housing to serve all residents, transportation services, and employment centers, in "world-class natural and built environments." The DRCOG organizational structure consists of a 60-member board of 57 voting members and 3 non-voting members, seven senior staff members, and six committees that provide input on the decision-making process of the MPO. The DRCOG region consists of 3,605 square miles and had an estimated population of 2.8 million in 2010.[10] The region projects its population will grow to over 4 million people by 2040.

Addressing Planning Factor 10: Enhance Travel and Tourism

The DRCOG seeks to provide the region with an interconnected transportation system through a strategic approach to regional growth, a vision that the region hopes to achieve through the implementation of his plan. The *Metro Vision Regional Transportation Plan (MVRTP)* was adopted in May 2019 and executes the transportation component of *Metro Vision* which outlines a strategy for the future of the region's transportation system, strategic growth, and environmental stewardship.[11]

This plan directly addresses the ten Federal Planning Factors and includes a section that identifies how each factor is implemented in the plan. For Planning Factor 10, MVRTP funds a connected network of multimodal projects, programs and services to increase travel mobility for all users. The issues of travel, mobility and accessibility are discussed throughout the plan, as is the issue of balancing increased mobility for individual users while desiring to reduce or limit increases in vehicle miles traveled, greenhouse gas emissions and single-occupant vehicle mode share to work at the regional level. MVRTP goes on to acknowledge that traffic operations and technology enhance the travelling experience from app-based notifications and wayfinding to traffic operations, resulting in smoother and more predictable travel among and between, travel modes. The 2040 MVRTP's investments in key transportation facilities and services also facilitates tourism, such as interstate highways, the Denver International Airport, and Denver Union Station. Examples include Denver Regional Transportation District's (RTD) FasTracks system[12] which includes connections to Denver International Airport, major regional tourism attractions and other important activity centers that facilitate tourism and general travel.

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[10] Denver Regional Council of Governments (DRCOG). Metropolitan Planning Organization (MPO) Database. United States Department of Transportation. https://www.planning.dot.gov/mpo/

[11] Denver Regional Council of Governments (DRCOG). Metro Vision. https://metrovision.drcog.org/

[12] FasTracks is RTD's 2004 voter-approved plan to expand transit across the Denver metro region. Since then, RTD has built 58.5 miles of light rail track and 40 miles of commuter rail track, launched a bus rapid transit service, and opened an intermodal hub at their train station in downtown Denver. https://www.rtd-denver.com/reports-and-policies/facts-figures/fastracks

The Atlanta Region's Plan Transportation Element

Atlanta Regional Commission (ARC), Atlanta, Georgia

About the MPO

The Atlanta Regional Commission (ARC) was federally designated in 1971 as the Metropolitan Planning Organization (MPO) for the Atlanta Region, and serves multiple jurisdictions based on its planning role. The ARC serves as the Regional Commission to 10 counties: Cherokee, Clayton, Cobb, DeKalb, Douglas, Fayette, Fulton, Gwinnett, Henry and Rockdale, and the city of Atlanta. As the Regional Commission, the ARC assists local jurisdictions in the development and implementation of comprehensive plans. The ARC also serves as the federally designated Metropolitan Planning Organization (MPO) for an additional 10 counties in the Atlanta Region: Forsyth, Coweta, Paulding, and parts of Barrow, Walton, Newton, Spalding, Carroll, Dawson, and Pike. The MPO's function is to develop a coordinated transportation plan that serves the jurisdictions within the 20-county planning area to create a connected, intermodal transportation system. The ARC is also responsible for:

- Air Quality Planning - 23 counties
- Water Resources Planning - 15 counties
- Aging Community Planning - 7 counties
- Workforce Planning - 10 counties
- Security and Recovery Planning - 5 counties

The ARC provides comprehensive planning services to the region it serves. Because of the size and complexity of its planning areas, it must coordinate extensively with its member governments. The ARC is governed by a 39-member board made up of county commissioners, mayors, council members, citizens, and a representative from the Georgia Department of Community Affairs. The ARC region consists of 4,550 square miles and had a population of 4.8 million in 2010.[13] The region expects its population to grow to over 8 million people by 2040.

Implementing Planning Factor 10: Enhance Travel and Tourism

The ARC's mission is to "Win the Future" through the development of a comprehensive plan that will provide an overarching vision for the region that consists of creating healthy livable communities, a competitive economy, and world class infrastructure. The Atlanta Region's Plan was adopted in May 2017 and serves as the region's comprehensive plan. It aims to incorporate all the ARC's broad planning responsibilities: transportation, community development, water resources, aging & health services, and workforce development. The Atlanta Region's Plan includes six goals to achieve its long-term vision: 1) Building the Region as a globally recognized hub of innovation and prosperity; 2) Developing a highly educated and skilled workforce able to meet the needs of 21st century employers; 3) Ensuring a comprehensive transportation network incorporating regional transit and 21st century technology; 4) Secured, long-term water supply; 5) Developing additional walkable, vibrant centers that support people of all ages and abilities; and 6) Promoting health, arts and other aspects of a high quality of life. The vision and six goals form the Policy Framework of the Plan. The Atlanta Region's Plan Transportation Element is one component of the Atlanta Region's Plan. This component serves as the region's LRTP and

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[13] Atlanta Regional Commission (ARC). Metropolitan Planning Organization (MPO) Database. United States Department of Transportation. https://www.planning.dot.gov/mpo/

is an update to the Plan 2040 Regional Transportation Plan adopted in 2014, and builds on the data and analysis included within it. The Atlanta Region's Plan Transportation Element focuses on goal number three. It serves a key role in furthering the comprehensive plan's vision, and where possible, projects and programs are linked back to the vision to show how the role of each project in furthering each component of the vision. Goal number three is supported by seven objectives and 23 policies in the Atlanta Region's Plan Transportation Element.

In in the Atlanta Region's Plan Transportation Element, Planning Factor 10 is direct addressed by mentioning tourism as a contributor to the economy of the region. The plan includes strategies to reduce congestion, which will provide various benefits to the economy, including the tourism industry. Additional strategies include investments in Transportation System Management and Operations (TSM&O)[14] technologies such as Georgia's NaviGAtor Advanced Traffic Management System (ATMS)[15], which consists of additional freeway cameras, speed detection, and on-ramp metering; and Highway Emergency Response Operators (HERO)[16] which aids in the response and clearance of traffic incidents and other emergency situations.

2040 Regional Transportation Plan (RTP) Update

Maricopa Association of Governments (MAG), Phoenix, Arizona

About the MPO

The Maricopa Association of Governments (MAG) was formed in 1967 as the designated MPO for the Phoenix metropolitan area. MAG member agencies include 27 incorporated cities and towns, Maricopa County, Pinal County, the Gila River Indian Community, the Fort McDowell Yavapai Nation, the Salt River Prima-Maricopa Indian Community, and the Arizona Department of Transportation. In addition to transportation planning, MAG is designated by the Governor of Arizona to serve as the principal agency for air quality, water quality, and solid waste management. MAG also develops population estimates and projects for the region and conduct human services planning.

Addressing Planning Factor 10: Enhance Travel and Tourism

The Maricopa Association of Governments incorporates Factor 10: Enhance Travel and Tourism by its relationship to economic development. In 2010 MAG formed the Economic Development Committee (EDC) to be consistent with federal requirements to tie economic development into the transportation planning process.

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[14] TSMO is a set of strategies that focus on operational improvements that can maintain and even restore the performance of the existing transportation system before extra capacity is needed. https://ops.fhwa.dot.gov/tsmo/#q1

[15] Georgia NaviGATor is a type of Intelligent Transportation System (ITS). This is operated by the Georgia Department of Transportation and is a traffic management and traveler information system. http://www.511ga.org/

[16] Highway Emergency Response Operators (HERO) program is critical to enhancing safety in metro Atlanta for the traveling public and emergency responders. HERO is also part of the Department's statewide safety patrol program—the first in the nation—with the Coordinated Highway Assistance & Maintenance Program (CHAMP) that covers interstates outside metro Atlanta. HEROs patrol 24 hours with the primary duty to clear roads and restore normal traffic flow due to an incident

The EDC is made up of 35 members appointed by the MAG Regional Council, including 19 elected officials from member agencies, one from Arizona Department of Transportation, and 15 business representatives. The goal of the EDC is focus on creating job opportunities, strengthening Arizona's ability to compete in the global economy, and planning for the development and improvement of Arizona's infrastructure to make the region more economically competitive.

MAG also continues outreach with other countries to enhance relationships, improve global competitiveness and engage in international trade missions. MAG made a delegation trip to Calgary, Canada with the intent of expanding bi-lateral trade relationships, business, and tourism opportunities. MAG met with the City of Calgary and the U.S. Consul in Calgary which led to stronger economic and tourism ties with Calgary. Additionally, MAG led the region's largest delegation to Montreal to celebrate Air Canada's first nonstop flight between Phoenix and Montreal.

Through the Economic Development program, MAG also engages with the Ari-Son Megaregion Council[17] to build a globally competitive "megaregion" with Mexico. At the annual Arizona League of Cities and Towns conference, MAG staff collaborates with representatives from Sonora's Secretary of the Economy and Sonora Arizona Commission to invited elected officials, economic development directors, and representatives from 20 sister cities located in Arizona and Sonora. Events include meetings, workshop discussions around transportation and tourism. As a border state to Mexico, MAG supports the Tourism and Shopping Initiative and study conducted by the University of Arizona found that expanding a zone for tourism and shopping statewide could generate up $181 million in annual spending (2016), bringing the total projected spending of Mexican visitors in Arizona to nearly $3.1 billion and a total jobs impact of 31,799.[18] By supporting an extended Tourism and Shopping Initiative for the entire state of Arizona, improving border crossings, traffic flow, and rail crossings it will lead to enhance travel and tourism and economic growth for both Arizona and Mexico. MAG successfully connected their regional transportation plan with their regional economic plan.

4. CENTRAL LANE METROPOLITAN PLANNING ORGANIZATION PLANNING FACTOR 10 OPPORTUNITIES, PLANS, AND POLICY REVIEW

This next section will examine existing local resources that the CLMPO can connect with to support implementing Planning Factor 10 in the 2045 CLMPO RTP. This section includes local plans and policies, as well as organizations and projects that are directly related to supporting travel and tourism in this region.

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[17] The Ari-Son Megaregion Council is a binational council of local elected official from Arizona and Sonora, Mexico who work with stakeholders from all levels of government and the business community to increase dialogue and strengthen strategic cross -border economic development efforts. This was created by an agreement signed between mayors in Sonora and Arizona in 2014. https://azmag.gov/Programs/Economic-Development/Ari-Son-Megaregion

[18] http://azmag.gov/Portals/0/Documents/ECONDEV_Border-Fact-Sheet.pdf

Transportation Options Opportunities

Travel Lane County

Travel Lane County markets Lane County as "Eugene, Cascades & Coast" and their mission statement is "to increase overnight stays within the county". They are partners with business, civic, government and community groups, including 600+ members. Overall, Travel Lane County provides visitors with extensive services and resources to ensure a quality visitor experience within Lane County, and specifically, the CLMPO region.

Each year, Travel Lane County produces an Annual Report that highlights amount of direct visitor spending, industry earnings, number of industry jobs, and transient room tax. In this report there is also a transportation section that highlights a given year's transportation milestones.

Oregon Scenic Bikeways: Willamette Valley Scenic Bikeway

In 2009, Oregon became the first state to develop a statewide Scenic Bikeway program. Ten years later there are now 17 designated bicycle routes that showcase Oregon. These routes are promoted by Travel Oregon and are for tourists and bicyclist of all levels. Scenic Bikeways are nominated and then selected by a statewide advisory committee made up of cyclists, regional tourism providers, and regional partners.

The original scenic bikeway, the Willamette Valley Scenic Bikeway, starts and ends in the CLMPO area. This route follows the Willamette Valley for 134 miles and connects Salem, Corvallis, Albany, and Coburg and Eugene in the CLMPO.

Picture 1: Willamette Scenic Bikeway Map

[TransAmerica Trail]

The TransAmerica Bicycle Trail began in 1973 and spans 4,216 miles from Astoria, Oregon to Yorktown, Virginia. The CLMPO area is along this route where riders bicycle through Eugene or Coburg and camp at Armitage Park for the night.

[PeaceHealth Rides Bike Share]

PeaceHealth Rides is a network of bike share stations, where users can pick up and drop off publicly available bicycles for one-way trips across the city. The bicycles have GPS tracking and built-in safety features.

PeaceHealth Rides is a partnership between the City of Eugene, University of Oregon, and Lane Transit District is sponsored by PeaceHealth.

In Travel Lane County's 2019 Annual Report, PeaceHealth Rides was celebrated its first anniversary. In its first year it was used by over 13,000 locals and visitors who logged more than 210,000 miles.[19]

Lane Transit District

Lane Transit District (LTD) operates transit services in the Eugene-Springfield Metropolitan Area, Creswell, Cottage Grove, Junction City, Veneta, Oakridge, Florence, and along the McKenzie River to the McKenzie Ranger station. LTD operates fixed-route services, including one Bus Rapid Transit (BRT), two Mobility on Demand pilots, and RideSource.[20]

Amtrak

Amtrak is located in downtown Eugene and has two daily round trips between Eugene and Portland. This specific Amtrak service is branded as Amtrak Cascades and can transport riders north from Eugene to Vancouver, British Columbia.

Picture 2: Amtrak Cascades Stop Locations

Source: Amtrak Cascades

[19] Travel Lane County 2019 Annual Report. https://assets.simpleviewinc.com/simpleview/image/upload/v1/clients/lanecounty/Annual_Report_2019_303da9d6-b3e1-4945-95b1-e0652c4fa673.pdf

[20] For more information about LTD's RideSource visit: https://www.ltd.org/ridesource/

Link Lane

Link Lane is a fixed-route bus service provided by the Lane Council of Governments (LCOG) in partnership with the Confederated Tribes of Coos and Lower Umpqua and Siuslaw Indians. Link Lane operates two intercity routes: the Eugene-Florence and the Florence-Yachats Connector. This transit service started in February 2020.

Outdoor Recreation Plans and Policies

Eugene Parks and Recreation System Plan, 2018

The Parks and Recreation System Plan is described as a "*greenprint* for how we care for the system we currently have and how we improve and expand it for a growing population with evolving priorities and needs." Included in this plan is both a 30-year vision and a 10-year implementation plan. Both are grounded in four guiding principles that reflect the needs and values of the community:

- Care for and make the most of what we have: Provide safe, clean and fun parks and recreation facilities, and enhance their value for the community to enjoy;
- Serve the entire community: Provide equitable and welcoming access to parks and recreation facilities, regardless of neighborhood, race, ability or income;
- Create more connections: Build on Eugene's strong foundation of connected open spaces and trail networks by completing and making new connections at the regional, city and neighborhood levels; and
- Build better partnerships: Forge new relationships and reinvent or strengthen old partnerships that maximize resources and enhance services.

Overall, the Eugene Parks and Recreation System includes 20 developed parks, 31 miles of rivers and streams, and has about 9.3 million park visits per year.

Willamalane, Park and Recreation Comprehensive Plan, 2012

Willamalane Park and Recreation District is designated in the Eugene-Springfield Metropolitan Area General Plan as the park and recreation service provider for Springfield and its urbanizable area, including Glenwood. Willamalane owns and operates approximately 783 acres of land encompassing 37 parks, seven community recreation and support facilities, and three undeveloped properties in the greater Springfield area. Willamalane's parks, recreation facilities and services are important community resources. Recreation services include adult and youth programs, aquatics, community athletics, special events, adaptive recreation and senior programs. The population within Willamalane's planning area is expected to grow by almost 16,000 people in the next 20 years. More residents mean more demand for parks, facilities and services. To more specifically identify future needs, and identify prioritized strategies and actions to help meet those needs, Willamalane began a comprehensive planning process in June 2010, with input from over 2,000 participants. This comprehensive planning process includes three phases: Determining needs, plan development, and plan adoption.

Strategies related to Planning Factor 10 include:

- Goal: Support community economic development
    - Community health and vitality are essential to attract and retain employees and businesses and to fuel the local economy. Diverse cultural and recreational

opportunities appeal to employers and employees. Willamalane Park and Recreation District will provide attractive parks, facilities and programs to enhance quality of life in Springfield.

- Strategy F8. Continue collaboration with the city and other agencies in implementing communitywide objectives, such as downtown and Glenwood redevelopment, planning for new development, neighborhood refinement planning, and citywide planning for tourism, open space, wetlands, stormwater, trails and bikeways, and other efforts focused on improving quality of life.

Planning for Oregon 2022

In 2022 Eugene will host the International Association of Athletics Federations (IAAF) World Championship, an event that will be held in the United States for the first time. The IAAF is the international governing body for track and field and has 214 member federations. A Register Guard article reports that, "[this event] will draw an expected 2,000 athletes from as many as 214 countries, upwards of 50,000 daily visitors and potentially more than 3,000 media members and 4,000 volunteers to the area over the course of about 10 days".

A 2015 report from ECONorthwest estimates that this event will bring in $205 million to the area.

The City of Eugene has set up a World Athletics Championships Oregon 2022 webpage that details information about the event and lays out projects in preparation for the event. The City of Eugene's goal is, "to maximize results from existing plans and policies that support the event, engage the community, and inspire the world". Projects include 20x21 Murals Project, Revitalizing Downtown Eugene, Planting 2,021 Giant Sequoias, Downtown Riverfront, New Downtown Riverfront Park, and Creating Responsible Events.

Capitalizing on Oregon22: Options for Car Free Access to Outdoor Recreation Destinations Action Plan, 2020

This report was finalized in March 2020 by the Institute for Policy Research and Engagement (IRPE), a research center affiliated with the School of Planning, Public Policy, and Management at the University of Oregon. This report builds off the information presented in the previous section.

The Oregon22 event is an opportunity to showcase the Eugene-Springfield Metropolitan area to the world. The purpose of this study is to assess the opportunities and barriers to providing car-free access to outdoor recreation in Oregon. The Oregon22 event is the key motivator, but this study considers car-free recreation access in the longer term.

The study's action plan lists the top seven priorities for Oregon22 Car-free:

- Action 1.2: Review existing Travel Oregon car-free itineraries and update or develop 1-2 additional car-free itineraries based on activities and key outdoor recreation destinations for expected visitor profiles.
- Action 2.3 Work with PeaceHealth and the Oregon22 legacy group to integrate car-free access to outdoor recreation within the proposed Blue Zones project.
- Action 2.4 Provide hospitality businesses (hotels, airports, restaurants, etc.) information (e.g., brochures) to promote car-free outdoor recreation destination information.

- Action 2.5 Market ADA accessible recreation opportunities and other recreation opportunities for underrepresented communities.
- Action 2.6 Link to Oregon22 website (mobile accessible) and create car-free travel content. Create associated landing pages on Travel Oregon, DMO/RDMO websites.
- Action 3.3 Locate outreach "pop-up" booths that include transportation and key outdoor recreation destination resources at the event site, festival area, other key areas within Eugene/Springfield, and to front line staff in hub cities.
- Action 3.4 Educate Oregon22 "envoys" (University of Oregon) and Downtown Ambassadors about transportation options and key outdoor recreation destinations.

Local Plans and Policies

University of Oregon

The University of Oregon (UO) is located in Eugene, Oregon and serves over 22,000 students and employs over 6,000 employees. In Fiscal Year 2016, the UO generated $2.2 billion in economic return to Oregon.[21] The UO also offers more than 300 undergraduate programs and more than 80 graduate subject areas. Additionally, the UO is a member of the Association of American Universities (AAU) indicating that they are one of the top 34 public research universities in the nation.

Additionally, the UO has 19 National Collegiate Athletic Association (NCAA) sports in the Pac-12 Conference which generates tourism from around the state. Popular UO sport facilities include Autzen Stadium, Matthew Knight Arena, Jane Sanders Stadium, PK Park, and Hayward Field.

In the University of Oregon 2020 Campus Plan, Principle 9: Transportation states, "The university acknowledges it has assumed responsibility to provide a reasonable level of affordable parking for students, faculty, staff, and visitors while preserving the quality of the campus and adjacent neighborhood environments and encouraging the use of alternative modes of transportation. Thus, the university will continue to pursue programs and projects that both meet the need for affordable automobile parking and encourage alternative forms of transportation, thereby reducing the demand for automobile parking." As one of the biggest employers and tourist destinations in the region, it is important for UO to be committed to enhancing travel and tourism for its employees, students, and visitors.

Regional Prosperity Economic Development Plan, 2010

This was a regional shared economic vision for Eugene, Springfield, and Lane County during the aftermath of the 2008 Market Crash. Relevant goals and tactics to Planning Factor 10 of this plan include:

- Goal 5: Identify as a place to thrive
    - Tactic 5.4: Promote the region's natural and cultural resources to enhance cultural tourism.

[21] https://www.uoregon.edu/about?utm_source=banner-module&utm_campaign=banner

Springfield Comprehensive Plan, 2019

The Springfield 2030 Comprehensive Plan serves as a framework for decision-making at the local level for Springfield's resources with a focus on: 1) Residential Lane Use & Housing; 2) Economic Development; 3) Recreation; 4) Transportation; and 5) Urbanization.

Relevant goals and policies to Planning Factor 10 include:

- Goal EG-2: Support attainment of the Regional Prosperity Economic Plan goals for creating new metropolitan area jobs in the chosen economic opportunity areas, increasing the average annual wage and reducing unemployment.
    - Policy E.12: Recruit or support businesses that pay higher than average wages for the region (as reported by the Oregon Employment Department) to diversify and expand Springfield's economy.
        - Implementation Strategy 12.6: Support development of convention- and tourism-related economic activities
- Goal EG-5c: Emphasize regional identity by creating a stronger economic personality that celebrates the region's attributes and values.
    - Policy E.32: Support community partnerships and initiatives that seek to grow the creative economy including but not limited to: cultural industry clusters and art districts; cultural tourism; jobs in film, television, publishing, news media, music, video games, social media., design advertising, performing and visual arts; and update land use planning and codes to ensure that Springfield has land appropriately zoned to encourage these opportunities.
    - Policy E.35: Increase the potential for convention- and tourist-related economic activities to generate economic activity, especially in the service industries like retail, food services, and accommodations.
        - Implementation Strategy 36.1: Promote Springfield's and the region's natural and cultural resources to enhance the cultural tourism within the region.
- Goal EG-5d: Be prepared – Contribute to development of the region's physical, social, educational, and workforce infrastructure to meet the needs of tomorrow.
    - Policy E.38: Strengthen the coordination between infrastructure, planning and investments, land use, and economic development goals to prepare land and physical infrastructure, in a timely fashion, that is necessary to support business development and stimulate quality job creation.
    - Policy E.39: Provide the services, infrastructure, and land needed to attract the identified industry clusters, especially where they can increase economic connectivity among businesses.

Glenwood Refinement Plan, 2014

The Glenwood Refinement Plan (GFP) is a neighborhood-specific plan to provide background and policy direction for decisions that affect the growth and development of the Glenwood area. Glenwood is approximately one square mile area abutted by I-5 on wrest and south and the Willamette River on the area and north that lies between the Cities of Eugene and Springfield. In 2008, the Springfield City

Council initiated a phased project to update the GRP to support and facilitate the development of Glenwood into an attractive place to live, work, and visit.

Relevant goals and policies related to Planning Factor 10 include:

- Establish a linear park with a multi-use path along the Willamette River in the Glenwood Riverfront that is sensitive to riparian areas, wetlands, and scenic values and appropriate in size and type for the surrounding urban environment in order to: bring people and activity to the riverfront; augment the existing natural and recreational Willamette River open space corridor in the region; promote tourism; and enable recreational/educational appreciation of Glenwood's natural resources and open space/scenic areas

Envision Eugene Comprehensive Plan, 2017

The City of Eugene's vision is built around seven pillars, strategies, and actions:

1. Provide ample economic opportunities for all community members
2. Provide housing affordable to all income levels
3. Plan for climate change and energy resiliency
4. Promote compact urban development and efficient transportation options
5. Protect, repair, and enhance neighborhood livability
6. Protect, restore, and enhance natural resources
7. Provide for adaptable, flexible, and collaborative implementation

The Envision Eugene Comprehensive Plan pursues this vision by guiding the City in its land use planning for future growth within Eugene's urban growth boundary. It is intended to address the needs and desires of Eugene's residents, as well as the requirements of Oregon's Statewide Planning Goals. It is a state-mandated land use plan, adopted by the City to serve as Eugene's city-specific comprehensive land use plan.

Relevant goals and policies to Planning Factor 10 include:

- Goal 3 Community Vitality: Provide appropriate support for the variety of distinct economic activity centers in the community, including downtown Eugene, key corridors and core commercial areas, neighborhood business districts, and the region as a multijurisdictional entity.
  - Policy 3.2: Economic advantages. Strengthen and capitalize on Eugene's comparative economic advantages, including (listing only relevant items):
    - Growing national presence in the specialty food and beverage, software, heavy machinery, advanced materials, and wood products industries.
    - Access to natural resources and open spaces
  - Policy 3.3: Expanding Eugene's assets. Recognize and enhance special areas of strength and local assets that attract sectors such as tourism, hospitality, and retirement living. These include:
    - A healthy, outdoor-oriented lifestyle and Track Town USA branding
    - Easy access to outdoor recreation opportunities and agricultural tourism
    - Local food and beverage manufacturing and restaurants
    - Walkable and livable neighborhoods served by transit
    - City and University sponsored arts, cultural and athletic events

5. RELEVANT PERFORMANCE MEASURES, GOALS, OBJECTIVES, AND POLICIES FROM CLMPO 2040 RTP

Overview

The RTP policy element guides transportation system planning and investment in the Eugene-Springfield metropolitan area and Coburg and is implemented through local level Transportation System Plans (TSPs). A basic assumption in the development of the RTP policy element is that transportation systems do more than meet travel demand; they have a significant effect on the physical and socioeconomic characteristics of the area they serve. Transportation planning must be viewed in terms of regional and community goals and values such as protection of the environment, impact on the regional economy, and maintaining the quality of life that area residents enjoy.

The policy elements consist of the following components:

- Goals,
- Objectives, and
- Policies

Below are the CLMPO 2040 Regional Transportation Plan's[22] current goals, objectives, and policies. The purpose of this section is to analyze current goals, objectives, and policies to see which already address Planning Factor 10.

Goals

Goal #1: Integrated Transportation System and Land Use System

Integrate transportation and land use to support transportation choices, promote all modes of transportation, reduce our reliance on single mode of travel, and enhance community livability.

How this relates to Planning Factor 10: The goal recognizes the need for enhance travel and tourism through enhancing community livability, providing transportation choices, promoting all modes of transportation.

Goal #2: Sustainability and Transportation

Support regional sustainability by providing a transportation system that considers economic vitality, environmental health, and social equity.

How this relates to Planning Factor 10: The purpose of this goal is to reflect the region's commitment to considering the three tenants of sustainability in planning a regional transportation system. The economic piece is related to enhancing tourism.

Objectives

Objective 1: Safety

Improve safety for users of all transportation modes through design, operations, maintenance, improvements, public information, and law enforcement.

[22] https://www.lcog.org/DocumentCenter/View/5430/Chapters1to4_2040-RTP?bidId=

How this relates to Planning Factor 10: The original definition/intent states, "… people feel confident, safe and secure taking their travel mode of choice". By enhancing travel through technological investments such as a real-time traffic or weather information, this would lead to more safety and security when using a transportation mode.

Objective 2: Connectivity

Support an interconnected multi-modal transportation system that provides residents with access to a range of transportation choices.

How this relates to Planning Factor 10: This is related to enhancing travel in general by providing more transportation options.

Objective 3: Accessibility and Mobility

Provide adequate levels of accessibility and mobility for the efficient and reliable movement of people, goods, and services within the region.

How this relates to Planning Factor 10: The original definition/intent states, "The objective supports the needs for multimodal accessibility to employment, shopping, other commerce, medical care, housing, and leisure… this objective also supports the need for improved access for tourists to destinations." This already supports Planning Factor 10.

Objective 4: Environment

Provide a transportation system that reflects our commitment to environmental quality.

How this relates to Planning Factor 10: The original definition/intent states, "the region's desire to reduce transportation-related energy consumptions can be met through increased use of transit, telecommuting, zero-emissions vehicles, ridesharing, biking and walking…" In other RTPs, MPOs defined enhance travel through technological advancements such as zero-emissions vehicles aka promoting the use of electric vehicles.

Objective 5: Economic Vitality

Support transportation strategies that improve the economic vitality of the region, enhance economic opportunity, and increase the reliability and efficiency of our freight system.

How this relates to Planning Factor 10: Enhancing travel and tourism directly benefits improving economic vitality.

Objective 11: Coordination/Efficiency

Coordination among agencies to facilitate efficient planning, design, operation, and maintenance of transportation facilities and programs.

How this relates to Planning Factor 10: Original definition/intent states, "The primary intent of this objective is to ensure that public agencies involved with the region's transportation system coordinate to meet the need for efficiency. A second aspect of this objective is to support opportunities for coordination between the public and private sectors, which results in transportation efficiencies. Although the roadway infrastructure for the transportation system of the 21st century is largely in place, the system must be managed more efficiently as it is used more intensively. This objective supports the research, evaluation, and implementation of innovative management practices, land use patterns, and new technologies." Planning factor 10 is related to this objective by enhancing travel through new technology innovations.

Additionally, there is a new federal requirement that states, "The Secretary shall encourage each MPO to consult with officials responsible for other types of planning activities that are affected by transportation in the area (including State and local planned growth, economic development, tourism, natural disaster risk reduction, environmental protection, airport operations, and freight movements) or to coordinate its planning process, to the maximum extent practicable, with such planning activities." [49 USC 5303(g)(3)][23]

It is now a requirement under the FAST Act for MPOs to include officials responsible for tourism in RTP process. This can be met by including a representative from Travel Lane County to the RTP process.

Policies

Lane Use Policy #4: Multi-Modal Improvements in New Development

Require improvements that encourage transit, bicycles, and pedestrians in new commercial, public, mixed-use, and multi-unit residential development.

How this relates to Planning Factor 10: This policy support efforts to improve the convenience of using transit, biking, or walking to travel, from, and newly developed and redeveloped areas. This directly addresses enhancing travel.

TDM Policy #3: Congestion Management

Implement TDM strategies to manage demand at congested locations.

How this relates to Planning Factor 10: Strategies to manage traffic congestion are directly related to enhancing travel.

TSI System-Wide Policy#2: Intermodal Connectivity

Develop or promote intermodal linkages for connectivity and ease of transfer among all transportation modes.

How this relates to Planning Factor 10: The CLMPO 2040 RTP defines an intermodal transportation system as, "a system that includes all forms of transportation in a unified, connected manner", and defines intermodal trip as, "one that involves two or more modes between the trip origin and destination". This policy relates to Planning Factor 10 because creating an intermodal transportation system will create a more efficient and easy-to-use transportation system. This will also promote car-free tourism in the region.

TSI Roadway Policy #3: Coordinated Road Network

In conjunction with the overall transportation system, recognizing the needs of other transportation modes, promote or develop a regional roadway system that meets combined needs for travel through, within, and outside the region.

How this relates to Planning Factor 10: A regional roadway system that meets the travel needs of motorists, transit users, bicyclists, pedestrians, and commercial vehicles directly addresses enhancing travel and tourism in and outside of the MPO region.

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[23] [49 USC 5303(g)(3)] https://uscode.house.gov/view.xhtml?req=(title:49%20section:5303%20edition:prelim)

TSI Transit Policy #1: Transit Improvements

Improve transit service and facilities to increase the system's accessibility, attractiveness, and convenience for all users, including the transportation disadvantaged population

How this relates to Planning Factor 10: Other RTP's discussed in Section 2 have used real time transit information as way to address this planning factor.

TSI Other Modes Policy #1: Eugene Airport

Support public investment in the Eugene Airport as a regional facility and provide land use controls that limit incompatible development within the airport environs. Continue to use the Eugene Airport Master Plan as the guide for improvements of facilities and services at the airport.

How this relates to Planning Factor 10: The Eugene Airport/Mahlon Sweet Field is the major airport in the region that provides commercial passenger, cargo, mail, and general aviation services to the metropolitan area. By continuing to support public investment to the Eugene Airport, this directly addresses and supports Planning Factor 10.

TSI Other Modes Policy #2: High Speed Rail Corridor

Support provision of rail-related infrastructure improvements as part of the Cascadia High Speed Rail Corridor project.

How this relates to Planning Factor 10: In the 2040 CLMPO RTP this policy emphasizes that Cascadia High Speed Rail is a cooperative effort that involves the states of Oregon and Washington, the Province of British Columbia, and Burlington Northern Railroad, Southern Pacific Railroad, and Amtrak. The definition also indicates that the CLMPO area is the corridor's southern terminus. By supporting and investing in high speed rail, this will directly support Planning Factor 10. This is an opportunity to enhance travel and tourism via rail and provides another transportation options for residents and visitors.

TSI Other Modes Policy #3: Passenger Rail and Bus Facilities

Support improvements to the passenger rail station and inter-city bus terminals that enhance usability, convenience, and intermodal trips

How this relates to Planning Factor 10: This policy promotes the growth of inter-city bus and passenger rail facilities. By enhancing intermodal connections and trips, this supports Planning Factor 10.

6. RECOMMENDATIONS FOR THE CLMPO 2045 REGIONAL TRANSPORTATION PLAN

This paper has provided an overview of Planning Factor 10, explored how MPOs across the country are implementing Planning Factor 10, and has examined local plans and policies that support and provide opportunities to implement the Planning Factor 10: Enhance Travel and Tourism in the CLMPO 2045 RTP. This section recommends how Planning Factor 10 can best be implemented in the CLMPO 2045 RTP update.

The CLMPO can best implement Planning Factor 10 into 3 categories: Economic Vitality, Transportation Options and Connectivity, and Technological Innovations.

Economic Vitality

Economic vitality is tied to enhancing travel and tourism because it sustains local and state economies while also supporting current and future jobs. In Fiscal Year 2018-19, Travel Lane County reported that direct visitor spending in Lane County topped $762 million with an additional $259 million that was spent by county residents travelling in and out of the region resulting in total visitor spending for over $1 billion in 2018.[24] Table 2: FY2018-19 Direct Visitor Spending in Lane County breaks down where money was mostly spent by visitors.

Table 2: FY2018-19 Direct Visitor Spending in Lane County

Industry	Amount
Transportation	$133 million
Arts, Entertainment & Recreation	$94 million
Food & Beverage	$293 million
Accommodations	$141 million
Retail	$101 million
Total	$762 million

Source: Dean Runyan Associates, LaneCo2018p

Additional information includes $297 million industry earnings, 11,030 industry jobs and $12.3 million in Transit Room Taxes.[25] The CLMPO is full of tourist destinations such as the University of Oregon, Eugene Parks and Recreation, and Willamalane parks. The region is also home to large music and sporting event venues such as Hayward Field, Autzen Stadium, and Matthew Knight Arena on the University of Oregon campus. Large sporting events occur yearly, but with the World Athletics Championships coming to the region in 2022, this poses a great opportunity the region's economy and tourism.

The CLMPO should look at North Middlesex MPO's (NMMPO) interactive regional travel and tourism map.[26] This is an online interactive map that shows where local tourist attractions are in relation to transportation amenities such as bike lanes and transit stops. The CLMPO can partner with Travel Lane County to identify major tourist and recreational landmarks throughout the region. Once this is established, CLMPO can use this interactive map to visualize where there are transit gaps or projects that need to be prioritized and are relatively close to tourist destinations. The purpose of this would be to determine transportation improvement needs for visitors and residents in CLMPO. This also would be a resource for those residents in the MPO and tourists to travel car-free in the region.

Other MPOs like MAG and PSRC addressed planning factor 10 by aligning it with economic plans in their regions. The CLMPO can take a similar approach by aligning goals and policies from already established economic policies from the Regional Economic Prosperity Plan, Envision Eugene Comprehensive Plan, and Springfield Comprehensive Plan with the RTP.

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[24] Lane County Annual Report FY 2018-19 https://assets.simpleviewinc.com/simpleview/image/upload/v1/clients/lanecounty/Annual_Report_2019_303da9d6-b3e1-4945-95b1-e0652c4fa673.pdf

[25] The City of Eugene serves as the transient room tax administrator for Springfield, Florence, Cottage Grove, and Lane County. It is a 4.5% tax charged on all overnight stays including hotels, motels, campgrounds, retreat centers, RV parks, bed and breakfasts, vacation rentals, and short-term rentals. https://www.eugene-or.gov/1155/Transient-Room-Tax-TRT

[26] https://www.nmcog.org/enhancing-travel-and-tourism

Transportation Options and Connectivity

Next, investment in marketing transportation options and its infrastructure is related to enhancing travel and tourism. Transportation options includes the promotion of walking, biking, transit, ridesharing, and telecommuting[27] instead of using a private, single-occupancy vehicle.

A study conducted by Dean Runyan Associates in 2015 found that bicycle-related tourism in Oregon attracts many visitors from both within and outside of the state. The study found that in 2012 1.2 million bike trips for recreation were taken in Oregon. Of the 1.2 million trips, nearly a quarter of the trips were taken in Willamette Valley area. Travel expenditures on these trips totaled roughly $400 million and supported 4,600 jobs that provided $102 million in earnings.[28] The region already has hundreds of miles of multi-use paths and dedicated bike lanes. By continuing to market intercity bicycle routes such as the Willamette Scenic Bikeway and TransAmerica Trail, this will bring in more bicycle riders that are looking to travel car-free to or through the region.

There is an opportunity to partner transportation agencies with Travel Lane County, Travel Oregon, and the Eugene and Springfield Chamber of Commerce. Other MPOs addressed in the early section have created new advisory committees to specifically link transportation and economic vitality. This would be beneficial public-private partnership where tourism and businesses in the region can be marketed while also promoting transportation options to these places.

PeaceHealth Rides bike share in Eugene has proven to be a community asset that provides last mile connections to key destinations like the University of Oregon, downtown Eugene, Eugene Amtrak, and Riverbend Hospital. Although it serves these key destinations in Eugene, it fails to connect to downtown Springfield and downtown Coburg which are both key destinations in the CLMPO area. The CLMPO should work with its partners to assess the feasibility to provide bike share to areas in the region that are not being served.

Lastly, the Eugene Airport is the major airport in the CLMPO area and the region, however, there is not a reliable way to travel from the airport to downtown Eugene or downtown Springfield car-free. Currently, the only way to get to the Eugene Airport car-free is through airport shuttles from local hotels or by using Uber or Lyft or taxis. The CLMPO should prioritize a car-free transportation service for residents and tourists that want to visit the area without a car. The Oregon22 event will bring a large number of visitors to the region and this would be an opportunity to provide a service for this large population visiting the region.

Technological Innovations

Lastly, other RTPs addressed Planning Factor 10 through technological innovations such as real-time information, weather information, seamless transition between different travel options, electric vehicles, and fare-free travel.

The region has demonstrated this enhancement of travel and tourism through Lane Transit District's transition to TouchPass and seamless transportation, the addition of PeaceHealth Rides bikeshare, and

[27] CLMPO Regional Transportation Options Plan (RTOP) https://www.lcog.org/657/Regional-Transportation-Options-Plan

[28] Dean Runyan Associates. 2013. *The Economic Significance of Bicycle-Related Travel in Oregon: Detailed State and Travel Region Estimates, 2012*. Prepared for Travel Oregon.

mobility-on-demand projects such as EmGo. The Oregon Department of Transportation's (ODOT) TripCheck is another example of existing real-time travel information that is used for travel and congestion mitigation.

The CLMPO should continue to invest in technological innovations that benefit travel in the region and should also continue to research new and upcoming technological innovations to stay ahead of the curve. On days when the University of Oregon has a sporting event, the area sees more congestion and visitors from outside of the region to attend an event. The CLMPO can partner with ODOT's TripCheck service to inform the community where traffic is occurring. Also, the addition of an online travel tool that shows tourist destinations and transportation amenities can be beneficial for events like this. Community members could look to this tool to see what their transportation options are on days when there are big events in the region.

CONCLUSION

All in all, the addition of Planning Factor 10: Enhance Travel and Tourism is still relatively new and other MPOs like the CLMPO are researching how to address it in their upcoming RTP updates. From researching MPOs that have addressed this planning factor, it was clear that there was not one way to directly address it, but instead, it was up to each MPOs to interpret it.

The biggest themes from my research were that Planning Factor 10 was connected to economic vitality, transportation options and connectivity, and technological innovations. Examples include investing in infrastructure near tourist destinations and jobs, providing more transportation options to mitigate travel for residents and tourists, providing car-free access to outdoor recreation, and investing in technological innovations to provide users with real time information.

The CLMPO currently has all the tools to become one of the leading MPOs that implements Planning Factor 10. With the CLMPO's robust bicycle and transit network, transportation options program, attractive tourist destinations, and community partners like Travel Lane County, the CLMPO is in a great a position. The CLMPO can continue to strive to be at the forefront of enhancing travel and tourism by continuing to invest in and expand its current programs and infrastructure, and by researching programs that are not already in this region.

This MPO region is home to travel and tourist destinations that will only get better with more coordination between community organizations and by investing in more transportation options for both its residents and tourists.

Appendix E:

Public Involvement Plan for the Central Lane Metropolitan Planning Organization 2045 Regional Transportation Plan, Intelligent Transportation System Architecture, Operations and Implementation Plan, and Congestion Management Process

The Central Lane Metropolitan Planning Organization (CLMPO) 2045 Regional Transportation Plan (RTP), Intelligent Transportation System (ITS) Architecture, Operations and Implementation Plan, and Congestion Management Process (CMP)

Public Involvement Plan

Drafted by JLA Public Involvement, March 2020

Project Overview

Lane Council of Governments (LCOG) is underway with a regional planning effort to integrate their Intelligent Transportation System (ITS) plan with updates to the Regional Transportation Plan (RTP) and Congestion Management Process (CMP). LCOG and the regional partners recognize that now is the time to mainstream transportation system management and operations (TSMO) and have structured this project to deliver the RTP, CMP, and ITS plan as part of one cohesive effort. This new approach to regional planning incorporates system operations in parallel with other strategies, which provides the basis for applying emerging technologies to better operate and manage a transportation system.

Ultimately, this project will:

- Create common regional transportation goals, objectives, and performance measures that can be used for the RTP, CMP, and ITS plan.
- Ensure future transportation investment decisions consider the full range of tools to meet community needs and the region's goals and objectives.
- Outline long range and day-to-day transportation operations needs and produce strategies and projects that consider the full range of transportation options.

This integrated regional planning effort will set a new standard for other agency planning efforts in Oregon.

Study Area

LCOG is the Metropolitan Planning Organization (MPO) for the central Lane County area that includes the Eugene-Springfield metropolitan area and Coburg. The MPO is the lead agency for regional transportation planning and distributing federal transportation dollars for the Central Lane County area.

The MPO works cooperatively with local governments and transit providers to set priorities for transportation needs.

The MPO Planning Area covers the area within the urban growth boundaries of Eugene, Springfield, and Coburg, and a small area of Lane County adjacent to these urban areas. Partners in the MPO are:

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

Purpose and Goals of the Public Involvement Plan

The purpose of the public involvement program is to share information and gather input from the community related to transportation needs and desires that might inform the development of the RTP, CMP and ITS. This Public Involvement Plan will remain consistent with the CLMPO Public Participation Plan (adopted October 2015).

The public involvement goals are to:

- Communicate complete, accurate, understandable and timely information to the public and stakeholders throughout the project.
- Actively seek public input at project milestones to understand the transportation needs and desires of the community, engaging a broad, diverse audience.
- Provide meaningful public involvement opportunities and demonstrate how input has influenced the process.
- Seek participation of potentially affected and/or interested stakeholder groups, individuals, neighborhoods, businesses and organizations.
- Collaborate with LCOG staff and partnering agencies to build support and consensus around plan outcomes.
- Ensure that the public involvement process is consistent with applicable state and federal laws and requirements, and is sensitive to local policies, goals and objectives.

Target Audiences & Key Stakeholders

The public involvement process will seek to engage the following types of affected and interested people and organizations in the project area, such as:

- Elected officials
- Agency partners working on related plans
- Tribes
- State Historic Preservation Office (SHPO)
- Business organizations, associations and chambers of commerce

- Bike, Pedestrian and Transit advisory boards
- Transit interests
- Environmental interests
- Accessibility groups
- Senior services
- Groups that represent English as a second language speakers
- Public health interests
- Equity interests
- Schools and colleges
- Tourism interests
- Housing and community development interests
- Emergency services providers
- Neighborhood Associations
- Local event organizers
- Large employers
- General public
- Local media

Key Messages

Key messages summarize the why, what, and how of the process, and constitute basic talking points the project team will use when communicating with external stakeholders about the project. The key messages may change and expand as the project evolves.

Overview

The LCOG RTP, CMP and ITS plans are about setting the goals, needs and priorities that will guide future transportation investments in of Eugene, Springfield, and Coburg that will better connect people to where they want to go by considering a range of transportation options.

Why do we need the plan?

To satisfy federal and state requirements for funding: Many state and federal funding sources require an established plan be in place that identifies needs and how to meet them. This regional planning effort will fulfill these requirements.

To build on previous work, toward results: This plan will build on previous work from area partners and help move us closer to realizing regional goals, action measures and projects.

Where will it apply?

The entire MPO Planning Area, which covers the area within the urban growth boundaries of Eugene, Springfield, and Coburg, and a small area of Lane County adjacent to these urban areas.

What will it accomplish?

- Create a single, regional document that outlines identified needs, goals, priorities and opportunities for improved movement of people and goods around the region.
- Identify strategies to increase access to housing and jobs through improved transportation options.
- Identify strategies to improve transportation for all people, including vulnerable and low-income populations.

- Consider and integrate a range of transportation options and technologies.
- Develop a sustainable transportation system and reduce CO2 emissions by taking cars off the road, supporting climate recovery and reduced reliance on the automobile.

What is the timeline for drafting the plan?

The overall planning effort will take approximately a year and a half, including public outreach and opportunities for public input. Outreach opportunities will occur in May and October of 2020, with the first round focused on collecting community feedback on goals, objectives and priorities and confirm what was gleaned from other local plans. The second round will focus on reviewing and responding to possible future transportation concepts included in the draft plan. The RTP is expected to be completed and adopted by the Metropolitan Policy Committee (MPC) in June 2021.

Decision-making Structure

The Metropolitan Policy Committee (MPC) is the decision-making body of the Central Lane MPO, which was created by Eugene, Springfield, and Lane County to cooperate on issues of regional importance. MPC is comprised of public officials from Springfield, Eugene, Lane County, Coburg, Lane Transit District, and the Oregon Department of Transportation.

The MPC is the project's final decision maker. The decision-making structure for this project was developed to establish broad-based support for the project. The PMT believes the best way to build support is to have an open, inclusive process that is viewed as credible by the community.

The purpose of the PMT is to coordinate and guide the project. The PMT includes LCOG staff, and the consultant team.

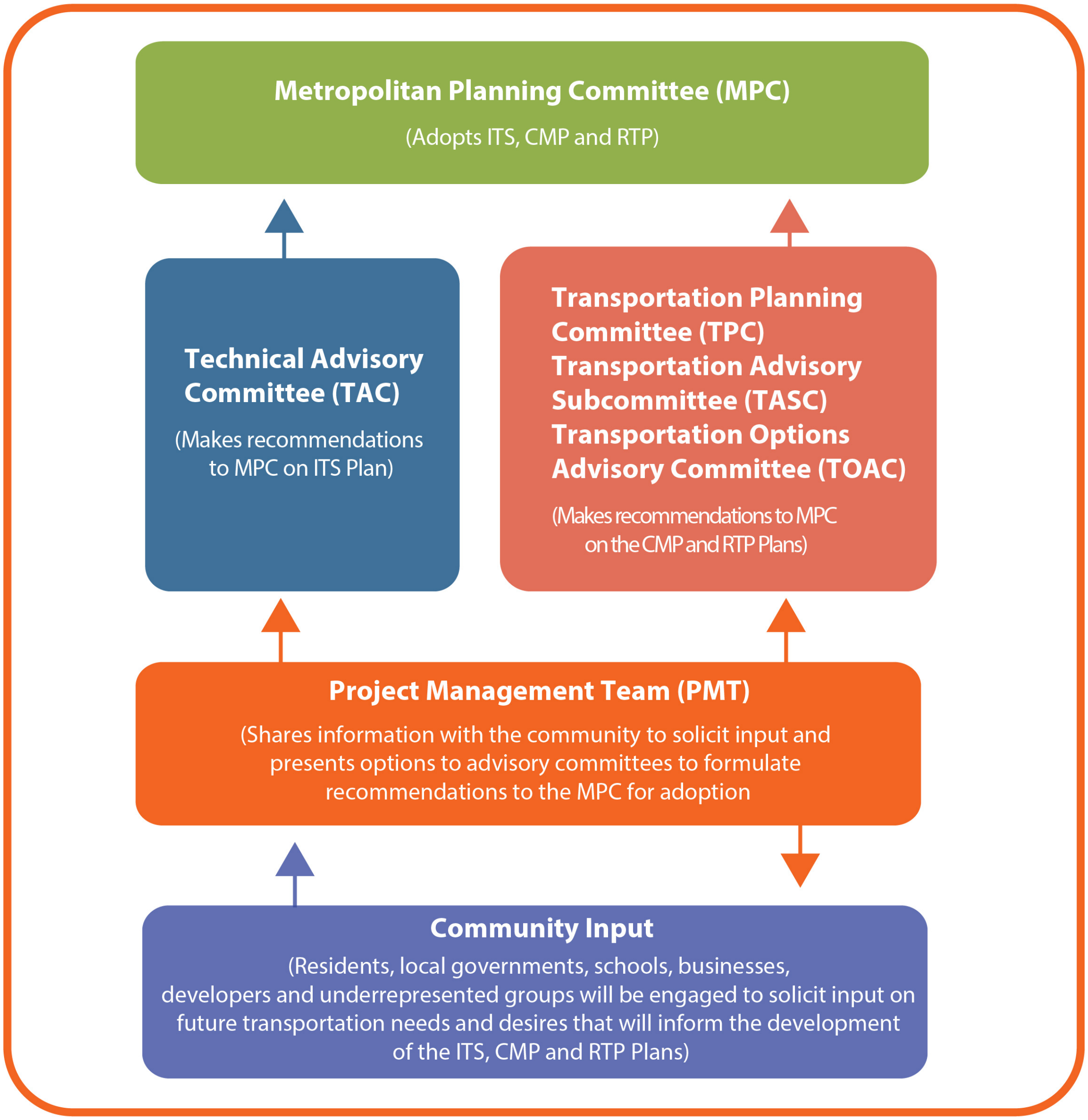
To support development of a credible decision-making process, a Technical Advisory Committee (TAC) has been formed to provide recommendations for the ITS planning efforts. The RTP and CMP development process will utilize standing committees that support the MPC and are composed of local agency staff members. These groups regularly are engaged with on-going CLMPO activities. These committees include the Transportation Planning Committee (TPC), the Transportation Advisory Subcommittee (TASC), and the Transportation Options Advisory Committee (TOAC).

The ITS TAC will review and comment on deliverables and provide technical and policy advice according to member expertise.

The TPC, TASC and TOAC will review and comment on deliverables and provide a community perspective on the process of developing the RTP and CMP. LCOG shall ensure that meetings include outreach to and opportunities for representatives of the following interests to be heard: residents-at-large, local government agencies, schools, businesses, developers, and underrepresented communities. All meetings will be open to the public and include a public comment period.

The PMT will make present options to TPC, TASC and TOAC and each advisory body will make recommendations to MPC for adoption.

Based on this information, the decision-making structure shown in the following figure was developed. More information on these groups can be found in the next section of this plan.



Communications and Outreach Tools

LCOG is committed to engaging the public and key stakeholders on this project and is employing tools to be accessible to a broad, diverse audience. Appropriate participation tools are critical to building awareness of the project and soliciting input that informs the development of the RTP, CMP and ITS. The following table includes informational tools and activities that will be used throughout the project to inform a broader public audience and solicit input related to needs and possible transportation improvement concepts.

It is recommended that project materials be translated into Spanish for targeted engagement events. According to Census information available on Lane County's website, 91.53% of Lane County residents speak only English, while 8.47% speak other languages. The non-English language spoken by the largest group is Spanish, which is spoken by 4.86% of the population. Slightly less than half of those who speak Spanish in addition to English report that they speak it less than very well.

Tool/Activity	Description	Lead	Timing
Project Website	A project website, hosted on the LCOG's website, will be used as the main repository of project information. Basic project information and documents will be hosted on this website. Important updates about engagement opportunities will be displayed prominently on the website.	JLA content; LCOG posting	Continuous
Stakeholder database	A database will be created which includes important stakeholder groups and interested parties in the project area. The database will be updated as the project progresses and will track those individuals and groups who express interest in the project. The database will be used for notification of engagement opportunities and communicating key milestones.	JLA	Continuous
Fact Sheet	The project team will create a project fact sheet to be updated as the project progresses. The fact sheet will be developed within the LCOG communications guidelines. The fact sheet may be translated into non-English languages as needed.	JLA/LCOG	April 2020 (and up to two additional updates)
Overview Video	The project team will develop one informational video to describe the goals of the project and convey the values, needs and priorities to address from other local planning efforts. The video will include Spanish subtitles.	JLA	April 2020

Tool/Activity	Description	Lead	Timing
Promotional Materials/Posters & Social Media	The project team will create up to two posters to promote the engagement events and online surveys. Posters may be distributed to community spaces and public facilities throughout the project area. Poster content may include the project purpose and need, the type of input needed and the project timeline with contact information, including the website. The project team will also develop social media content to be shared on the project partners social media platforms to promote engagement events and feedback opportunities. Promotional materials will be bi-lingual and will include information in Spanish.	JLA/LCOG	1. May 2020 *(Project Introduction; Goals & Priorities)* 2. October 2020 *(Future Transportation Concepts; draft plan)*
Tabling Events, Open Houses and Online surveys	Two rounds of outreach will be conducted to share information with the general public and to gather feedback and opinions concerning goals and priorities and to explore future transportation concepts. Materials will be created for up to 4 tabling events (two during each round of outreach to promote open houses and online surveys which will be posted to the project website). The tabling events, open houses and online surveys will occur during the following two key project milestones: • May 2020 – An open house will be held and an online survey will be developed to introduce the project; share project information and solicit feedback about goals and priorities as compiled from local plans. The open house and online survey will be promoted via social media, printed posters locations across the project area, press releases and at up to 2 tabling events at high traffic locations. • October 2020 – An open house will be held and an online survey will be developed to report out what feedback was heard during the earlier round of outreach and to share possible future transportation investment strategies or concepts included in the draft plan. The open house and online survey will be promoted via social media, printed posters locations across the project area, press releases and at up to 2 tabling events at high traffic locations. Online surveys may be translated into Spanish as needed.	JLA/DKS/LCOG	1. May 2020 *(Project Introduction; Goals & Priorities)* 2. October 2020 *(Future Transportation Concepts; draft plan)*
Press releases	Up to two press releases will be developed to inform local news media about the project to promote engagement opportunities.	JLA content; LCOG distribution	1. Press Release 1 - May 2020 2. Press Release 2 – October 2020

Tool/Activity	Description	Lead	Timing
Listening Sessions	The project team will coordinate, facilitate and document up to 4 listening sessions with key project stakeholder groups, such as ESL residents, seniors, bike/ped groups, safe routes to schools coordinators, businesses, etc. Bi-lingual staff will attend at least 2 sessions.	JLA lead DKS/LCOG to attend	May-July 2020
Presentations to elected bodies and advisory boards	The following groups and advisory boards may receive regular updates on the project at key milestones. LCOG will take the lead on engaging the following elected or advisory bodies. • City of Coburg • City of Eugene • City of Springfield • Lane County • Lane Transit District LCOG staff will attend the meetings and consultant staff will provide materials.	County/ DKS	Ongoing at key milestones
Stakeholder emails	Emails will be sent to all stakeholders to share the latest project information and engagement opportunities.	JLA/LCOG	In conjunction with other activities
Public Involvement Summary Reports	The project team will produce a summary report of outreach activities, key themes heard from the public at the culmination of each round of outreach.	JLA	June 2020 and November 2020

Project Team Roles and Responsibilities

JLA Public Involvement

- **Adrienne DeDona, Public Involvement Manager.** Adrienne will oversee all public involvement activities. She will lead the logistics of developing all public information and activities. She will manage the review process of public information.
- **Jenny Clark, Public Involvement Specialist.** Implementation of public involvement activities.

LCOG

- **Paul Thompson, Program Manager and LCOG staff.** Paul and LCOG staff will provide project oversight to ensure that the project meets the requirements and objectives of affected community members and organizations within the project area. He and staff will coordinate and attend jurisdictional briefings as needed. Paul and staff will provide input and review of public information and be a part of the PMT meetings, TAC and PAC meetings and engagement events.

DKS

- **Carl Springer, DKS.** Carl oversees the planning process for development of the RTP, ITS and CMP. He will provide input on involvement strategy and activities. Carl will be an active part of TAC and PAC meetings and engagement events. He will provide content for engagement materials, including the online surveys and review all public information.

Measuring and Monitoring Outreach Activities

At key milestones, the PMT will meet to discuss and assess how well the program is meeting the public involvement goals listed in this plan. While evaluation of these goals is necessarily subjective, the team will also consider the following more measurable objectives as the team assesses program effectiveness:

- Number of participants attending meetings or events.
- Number of website hits or downloads occurring during a specific time period.
- Number of people who have signed up for the project mailing list.
- Number of project comments received (phone, email, online).
- Whether the comments are relevant to the project (indicates project understanding).
- How project decisions have been modified as a result of public input.
- Voice and tone of any media stories about the project.

Appendix F: Outreach Summary

TABLE OF CONTENTS

INTRODUCTION

The Central Lane Metropolitan Planning Organization (CLMPO) is responsible for updating the Regional Transportation Plan every four years. An important element of this update is public outreach and engagement. As such, CLMPO conducted outreach to solicit feedback from agency partners and gather input from the public throughout the RTP development.

CLMPO also conducted targeted outreach to federal and state agency partners in fulfillment of federal requirements about interagency consultation relating to the RTP's Air Quality Conformity Determination (AQCD) and environmental analysis. CLMPO coordinated with state and local air quality planning agencies; state and local transportation agencies; the United States Environmental Protection Agency (EPA); and USDOT to develop the RTP's AQCD. Additionally, CLMPO consulted with state and local agencies responsible for land use management, natural resources, environmental protection, conservation, and historic preservation during development of the environmental analysis.

CLMPO conducted outreach between April 2020 and November 2021 to share information about the RTP with the public, solicit input about transportation needs and funding priorities, and learn how the public uses transportation in Central Lane County. Feedback received informed the RTP's goals, objectives, performance measures, projects, plans, programs, and outcomes.

INTERAGENCY CONSULTATION

AIR QUALITY CONFORMITY DETERMINATION

An AQCD for a transportation plan or program is a finding that proposed transportation activities will not impede this area from continuing to meet air quality standards and will not cause or contribute to new air quality violations. In areas that have been designated as nonattainment for National Ambient Air Quality Standards (NAAQS), including those that were redesignated to attainment in the past 20 years ("maintenance areas"), an AQCD is required whenever the Metropolitan Transportation Improvement Program (MTIP) or RTP is updated, or every 4 years, whichever comes first. The AQCD must be adopted as part of the approval process. USDOT must make the conformity determination before the plan or program can become operative.

The Eugene-Springfield area is designated a maintenance area for coarse particulate matter (PM_{10}). This area has an approved limited maintenance plan and as such is not required to satisfy regional emissions analysis; hot spot requirements for certain projects in this area are still required. The CLMPO has prepared an AQCD for PM_{10} which identifies air quality implications of each project on the 2045 RTP constrained project list to determine which projects are considered exempt with no requirement for hot spot analysis; which are non-exempt but are not of local air quality concern and therefore require qualitative hot spot analysis; and which are non-exempt that have the potential for being projects of local concern, thus requiring quantitative hot spot analysis (RTP Appendix I AQCD for 2045 RTP).

Per 40 CFR §93.105, MPOs are required to follow an interagency consultation (IAC) process involving the MPO; state and local air quality planning agencies; state and local transportation agencies; EPA; and USDOT. In accordance with this requirement, CLMPO circulated a draft of this document to the Oregon Department of Transportation (ODOT), EPA, Oregon Department of Environmental Quality (DEQ), Lane Regional Air Protection Agency (LRAPA), and USDOT (Federal Highway Administration and Federal Transit Administration) for interagency consultation. The IAC review period lasted from September 14, 2021 through October 14, 2021, and CLMPO held a remote meeting with the IAC group on September 30, 2021 to review the document. Comments received from IAC partners following this meeting are documented in **Appendix A**. All feedback has been incorporated into the final AQCD.

ENVIRONMENTAL CONSULTATION

The Fixing America's Surface Transportation (FAST) Act requires MPOs to consider how the RTP will protect and enhance the environment and discuss environmental mitigation activities and potential areas to carry out these activities. CLMPO's 2045 RTP addresses these requirements in RTP Appendix H Environmental Analysis.

Per 23 CFR §450.306(g)(10), MPOs must consult with state and local agencies responsible for land use management, natural resources, environmental protection, conservation, and historic preservation concerning the development of the transportation plan, including a comparison of transportation plans with state conservation plans or maps and a comparison of transportation plans to inventories of natural or historic resources. In accordance with this federal regulation, the CLMPO consulted with Federal, State, local, and Tribal entities responsible for land use management, natural resources, environmental protection, conservation, and historic preservation.

The agencies listed below were solicited for feedback on RTP Appendix H Environmental Analysis prior to the public comment period. CLMPO received comments from the Department of State Lands and the US Army Corps of Engineers (documented in **Appendix B**). This feedback has been incorporated into the final Environmental Analysis draft.

Category	Type	Agency (Contact Title)
Airport Operators	City	Eugene Airport (Assistant Airport Director)
Disaster Mitigation	State	Oregon Department of Transportation
	State	Oregon Department of Transportation
Environmental Protection	Federal	U.S. Environmental Protection Agency
	Federal	U.S. Army Corps of Engineers (Eugene Section Chief)
	State	Oregon Department of Transportation Environmental R2 (Environmental Manager)
	State	Oregon Department of Environmental Quality
Freight Management	State	Oregon Department of Transportation Freight (Freight Program Manager)
General	State	Oregon Department of Transportation
Historic Preservation	State	Oregon State Historic Preservation Office (Deputy State Historic Preservation Officer)
Land Use Management	State	Oregon Division of State Lands (Aquatic Resource Planner)
	State	Oregon Department of Land Conservation and Development
Natural Resources	Federal	National Marine Fisheries Service
	Federal	U.S. Fish and Wildlife Service
	State	Oregon Department of Fish and Wildlife (District Fish Biologist)
	Local	Lane Regional Air Protection Agency (Executive Director)
	Local	Lane Regional Air Protection Agency (Operations Manager)
	Local	Lane Regional Air Protection Agency (Air Monitoring and Data Quality Coordinator)
Tribes	Tribes	Confederated Tribes of the Grand Ronde Community in Oregon (Manager, Historic Preservation)
	Tribes	Confederated Tribes of Siletz Indians (Transportation Planner)
	Tribes	Confederated Tribes of Coos, Lower Umpqua, and Siuslaw Indians
	Tribes	University of Oregon Tribal Government Relations (Tribal Liaison)
	Tribes	Lane Community College Native American Student Program (Program Coordinator)

OVERALL PUBLIC PARTICIPATION AND NOTIFICATION

To gather feedback to inform the update of the RTP, the project team developed an **online open house** that included an **issues map**, a **bilingual survey**, and a **bilingual mailer** in Spanish and English that included similar questions to what were in the survey and online open house.

Participants were able to use the issues map to identify places in the Eugene-Springfield area transportation infrastructure where they have concerns, issues, or ideas for improvement.

Overall, **190 people participated**, with 125 participating in the online open house, 46 completing and sending back the mailer, and 19 completing the bilingual survey.

Community members were informed about the online open house through the following:

- Social media posts to the LCOG Facebook page
- Posts on the project website
- Media release
- Bilingual (Spanish/English) mailer
- Bilingual (Spanish/English) flyer
- Emails asking community groups to publicize and participate in the online open house
- Presentations at community group meetings

Additionally, community members were invited to submit public comment via email or verbal testimony at monthly Metropolitan Planning Committee (MPC) meetings.

PUBLIC FEEDBACK SUMMARY

OPEN HOUSE QUESTIONS AND ISSUES MAP

This section summarizes the feedback received through the online open house and issues map included in the open house.

ISSUES MAP

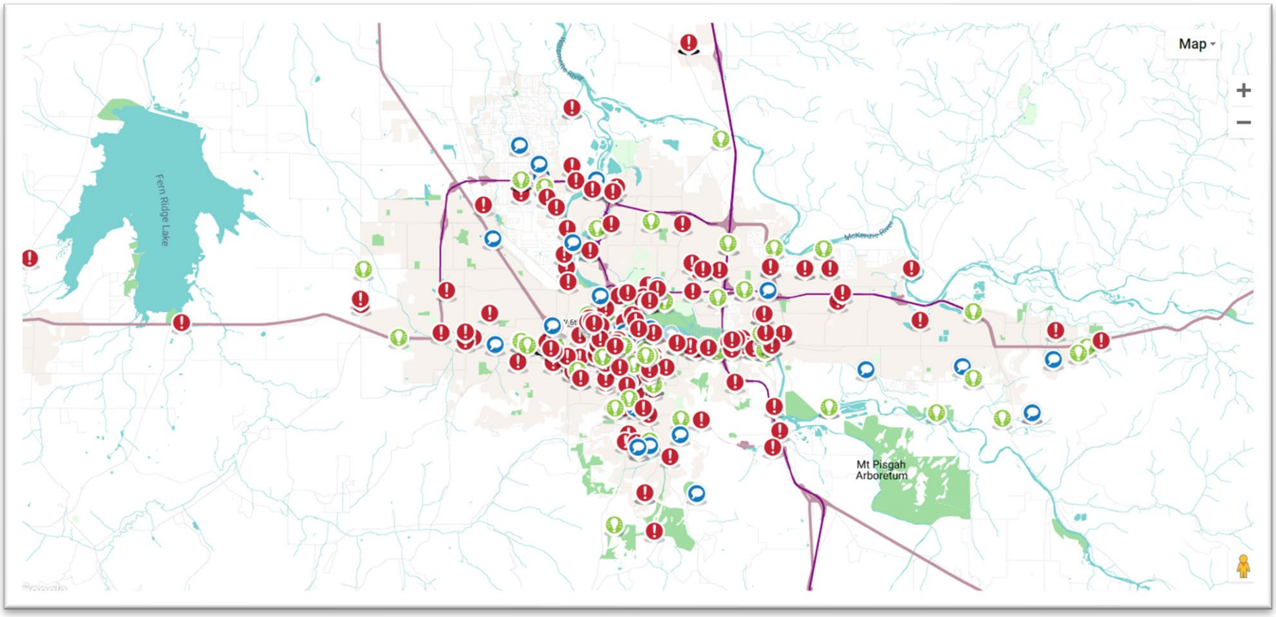
Online open house participants were given the opportunity to identify specific transportation system locations in the Eugene-Springfield area where they have concerns, issues, or ideas for improvement. **79 unique users** submitted a total of **268 comments. Each unique user submitted an average of 3 comments.**

Overall, **people were most focused on safety**, with the primary concern focused on bike/pedestrian **safety at intersections**. The next most common concern centered on bike/pedestrian safety due to **lack of bike lanes, narrow sidewalks, and/or bad signage**. The third most common theme across the comments was **connectivity and connections** between the different modes of transportation. These comments are summarized below by recurring themes found across the comments.

Please see **Appendix D** for more details about the comments as well as the specific addresses of the locations or places participants submitted comments about. It may be helpful to view the comments in context with the locations they were placed. The issues map and comments are viewable at this link: **https://maps.jla.us.com/lcog-rtp**

Respondents were given the choice of three icons:

-  (comment bubble) to denote a general comment
-  (exclamation point) to denote a problem or concern
- (green light bulb) to denote an idea



Safety

- People pointed out many places (over 20 locations) where the sidewalks are **too narrow**, sidewalks cannot be shared between bikes and pedestrians, and/or **bike and pedestrian traffic should be separated**
- There were several locations (over 15 locations) were people noted an **unsafe pedestrian or bike crossing**
- Many locations were noted as having **insufficient lighting**. River Path was mentioned a few times
- Many places were noted has having **poor signage**, poor signals, or inadequate pedestrian and bike crossing indicators
- People noted **high-speed traffic and speeding** being an issue at several locations
- Roughly 10 locations had **gaps in sidewalk, or a sidewalk is needed**
- Many locations (roughly 7 places) were marked as **unsafe to bike and/or as needing bike lanes**
- Several roads and locations were noted to have **too much traffic**
- People noted a few areas where they perceived houseless **camps to be unsafe**
- A few people noted a few locations where it is **uncomfortable to travel as pedestrian or bicyclist**
- People noted unsafe **left turns** south on Pearl, at 18th and unsafe **right turns** at Agate onto Franklin and E. 29th at Amazon Drive

Bicycling

- Bike path abruptly **ends or has gaps** / bicycle connection needed (roughly 11 locations)
- Someone said that there are too many stop signs along bikeway at 12th Ave between Jefferson St and High St
- People pointed out **opportunities for a bike route**: Laura St. through PeaceHealth and a route between Veneta and Eugene
- **Bike lanes are full of debris** along Franklin going south from the Glenwood roundabouts to LCC
- People said that **safer/smoother transitions for bicyclists** are needed at W. D Street Greenway to W. D Street and from the Path to High St at 19th & Amazon Path

Repairs or upgrades

- Roads or bike paths need to be **repaved or upgraded** (roughly 12 locations)
    - Bike path **needs to be paved** at Fern Ridge Path undercrossing at Acorn Street
- People mentioned **erosion and cracks** on bike paths west of Arthur underpass and Westbound 24th, just after Hilyard St.
- People pointed out that a few **sidewalks and trails** need to be **widened**
- Someone noted that the **decommissioned utility pole** at Chambers St. & Arthur St. northeast side needs to be removed
- Several people mentioned **flooding at Fern Ridge Path** undercrossing at Chambers and at Bertelson Rd. and on the **West Eugene Bike Path**

Access, Connections, Connectivity

- People mentioned that a connection is needed, or **connectivity needs to be improved** at several locations
- A few people mentioned wanting a **pedestrian bridge or multi-use path** to Mt Pisgah as well as a few other locations
- Several people mentioned that the **south gate at Lane County Fairgrounds is always locked** and hinders connectivity

Public Transit

- A few **bus stops** were mentioned as having **unreliable frequency** (Willamette St & E 27th Ave) or appearing **unmaintained and disused** (Eldon Schafer & E 30th next to LCC)
- Someone said that there needs to be **bus service to EWEB's Roosevelt building**
- Someone would like **EmX service on River Road**
- Several people mentioned the **#12 bus should not be eliminated**. Elimination will make it impossible for some to ride the bus because the next closest stop is a mile away
- People identified a few locations where service could be extended

- Someone suggested that the **Amazon Station should be retrofitted as a South Eugene HUB**
- Someone said that a **high-speed rail should be created downtown**, along rail tracks built in the I-5 right of way with a new station in Glenwood connected to EmX

Other concerns, issues, or ideas for improvement:

- Several locations (roughly 10) were mentioned as **needing traffic calming or traffic improvement measures**
- There were **a few anti-freeway comments** relating to the I-205, I-5/Gateway, and the planned Beltline widening.
- Many people commented about **on-street parking across Eugene**, specifically about cars parked in bike lanes
- Someone said that the **bike bridge over I-5 is their favorite** way to cross I-5.
- Someone said that **24th Street, east of Amazon Parkway is one of the best crossing intersections** for cyclists and pedestrians in Eugene.
- People would like to be able to **access trails without a car**
- Someone asked that **disabled peoples' access** paths be increased

ONLINE OPEN HOUSE RESPONSES

Online open house participants were given the opportunity to respond to a series of questions about transportation needs and funding priorities in the Central Lane County region, which includes Eugene, Springfield, and Coburg.

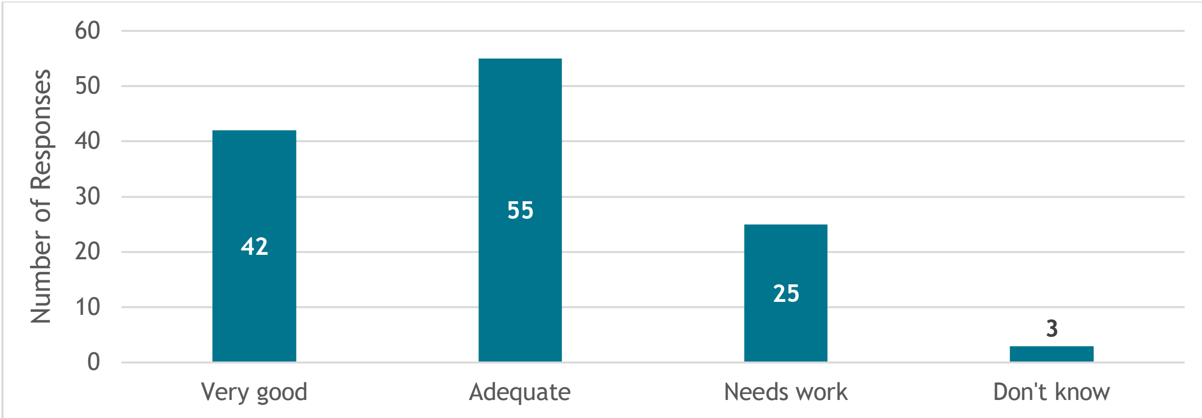
A total of **125 people participated in the online open house**. There was a total of 229 pageviews and **202 unique pageviews** of the online open house between December 16, 2020 and February 28, 2021

Feedback is summarized below.

Note: Unless otherwise stated, the percentages listed in the analysis of each question take into consideration the number of participants who responded to the question, not the total number of people who participated in the online open house.

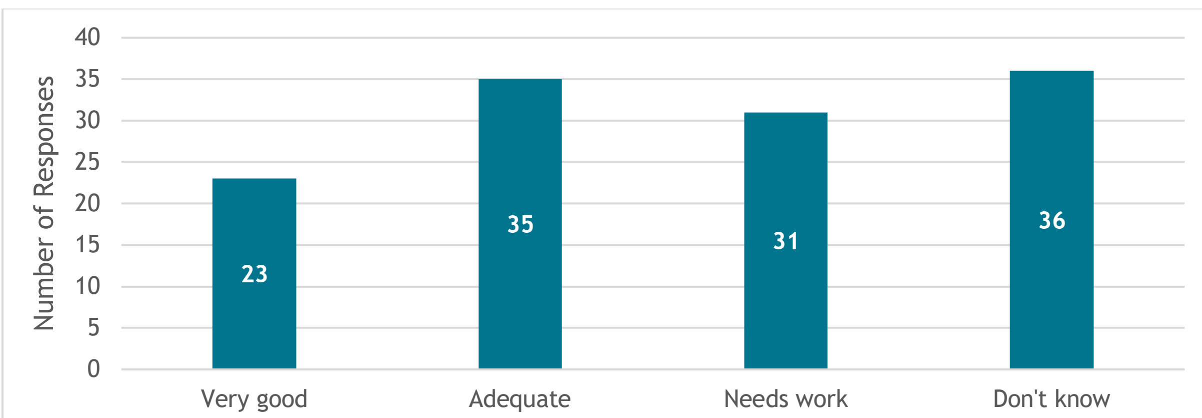
1. **How would you rate the road network for cars in the Eugene-Springfield area?**

   Overall, the majority of participants **(78%) thought that the road network for cars was either "Very good" or "Adequate,"** 44% and 34% respectively.



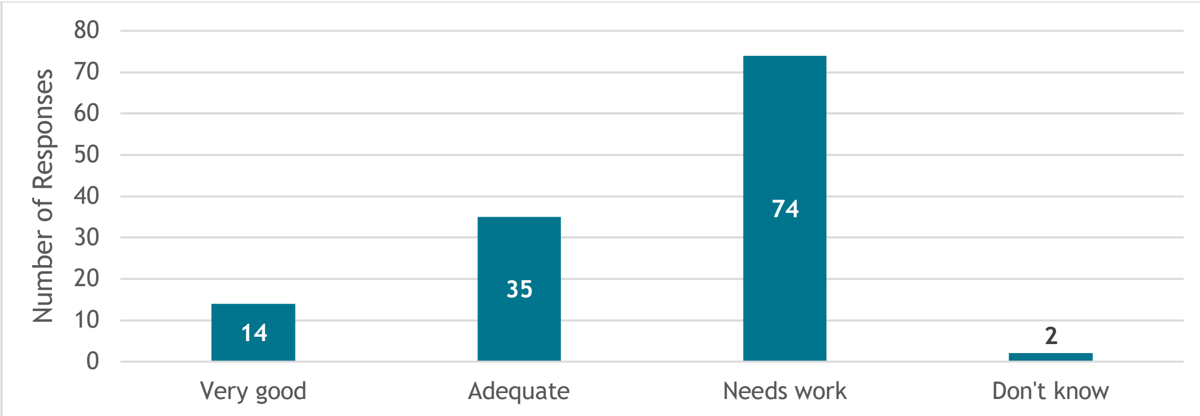
2. **How would you rate the road network for moving goods via truck/service vehicles in the Eugene-Springfield area?**

   Many participants **(29%) responded as "Don't know"** when asked to rate the road network for moving goods via truck/service vehicles (i.e., freight). A little over a quarter **(28%) thought the network was "Adequate"** and a quarter (25%) thought that it "Needs work." Eighteen percent thought that the network was "Very good."



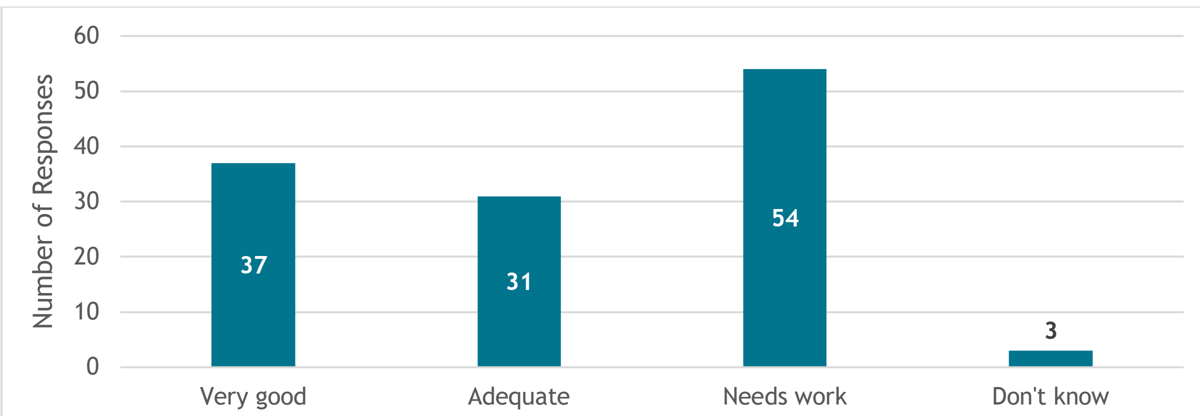
3. **How would you rate the on-street walking/rolling network (such as sidewalks and crossings) in the Eugene-Springfield area?**

   A majority of participants **(59%) thought that the on-street walking/rolling network needs work.** A little less than half **(39%) rated it as "Very good" or "Adequate."**



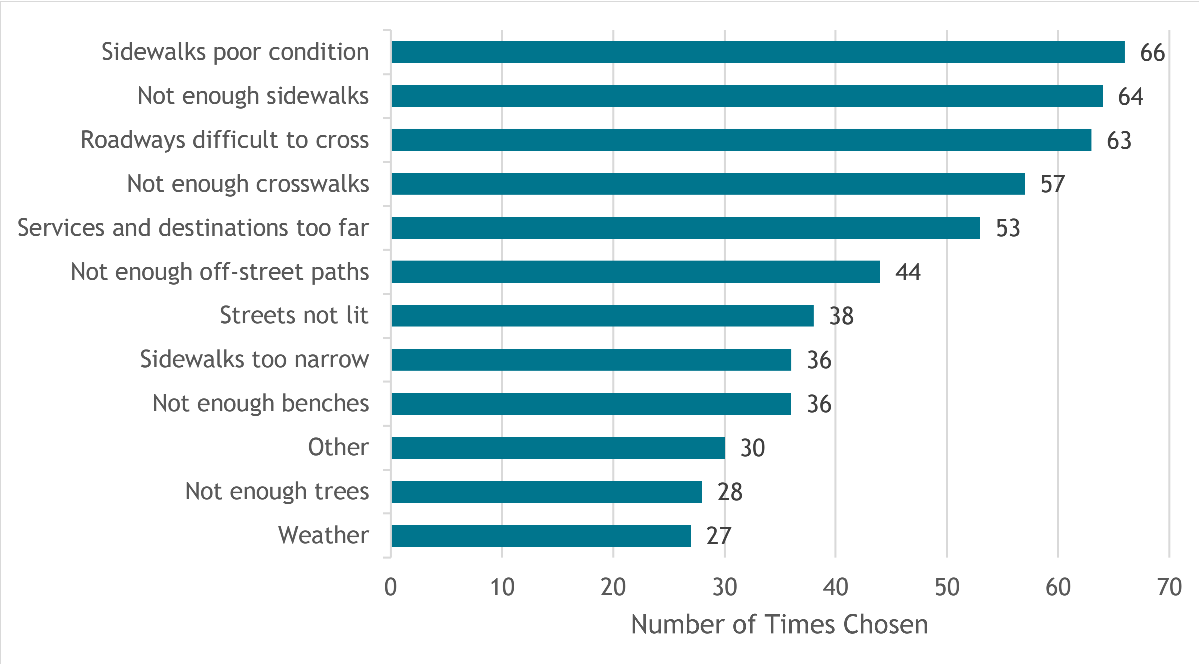
4. **How would you rate the off-street walking/rolling network (such as multi-use paths and trails) in the Eugene-Springfield area?**

While 43% of respondents felt that the off-street walking/rolling network "Needs work," over half **(55%) felt that it was either "Very good" or "Adequate."**



5. **What are the main barriers to walking in the Eugene-Springfield area? *(Check all that apply.)***

Of those who responded, a little more than half felt that the main barriers to walking in the Eugene-Springfield area are **that sidewalks are in poor condition or lack curb ramps at street crossings (54%),** there are **not enough sidewalks (52%),** or the **roadways are difficult to cross (52%).** Weather was the least checked barrier to walking in the area.

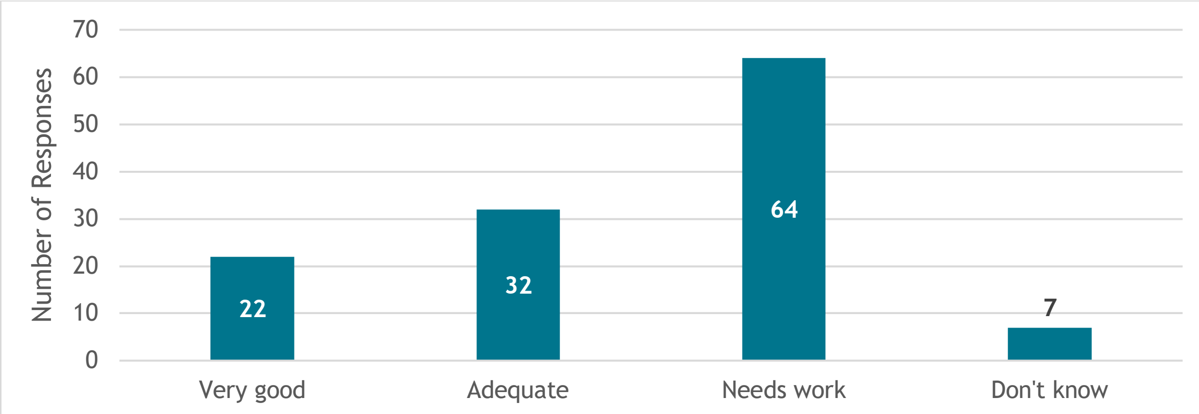


Below is a summary of the barriers people listed under "Other." Please see **Appendix C** to read the individual, unedited comments.

- **Safety**: Many people wrote about safety being their top concern. They talked about the following:
  - **Distracted and high-speed** drivers
  - Perceived danger from men, **houseless people**, and/or people living on bike paths or under bridges
  - **Traffic laws** and "every intersection is a crosswalk" needs to be enforced
  - **Unleashed dogs**
- **Lighting**:
  - Better-lit sidewalks are needed
- **Other:**
  - Some felt that **cars are prioritized** over humans/nature
  - **Sidewalks are dirty/unclean** and need to be routinely cleaned
  - **Traffic calming measures** need to be introduced
  - Major, well-connected streets have **too much noise pollution**. Walking paths that connect side streets would help.
  - **Gaps** in sidewalk network

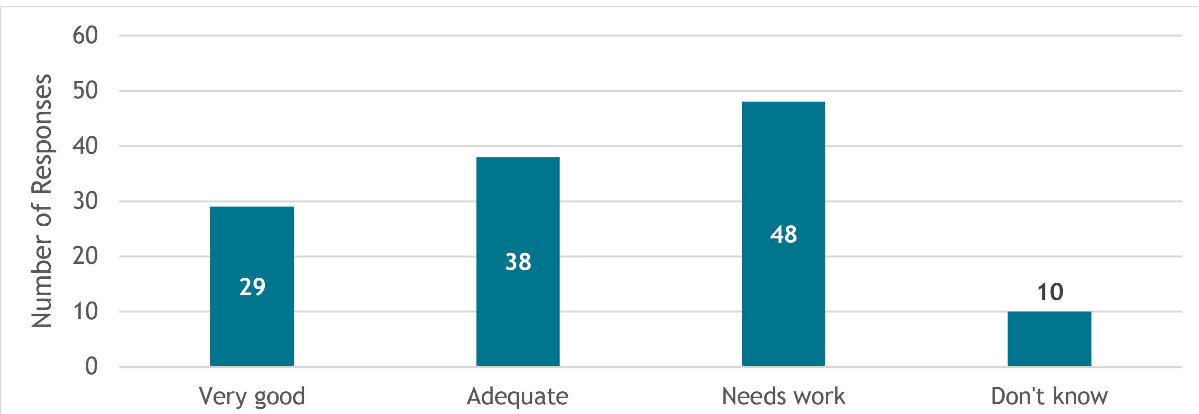
6. How would you rate the on-street biking network (such as bike lanes and bike parking) in the Eugene-Springfield area?

Half of all respondents **(51%) felt that the on-street biking network "Needs work."** Less than half (43%) feel that it is either "Very good" or "Adequate."



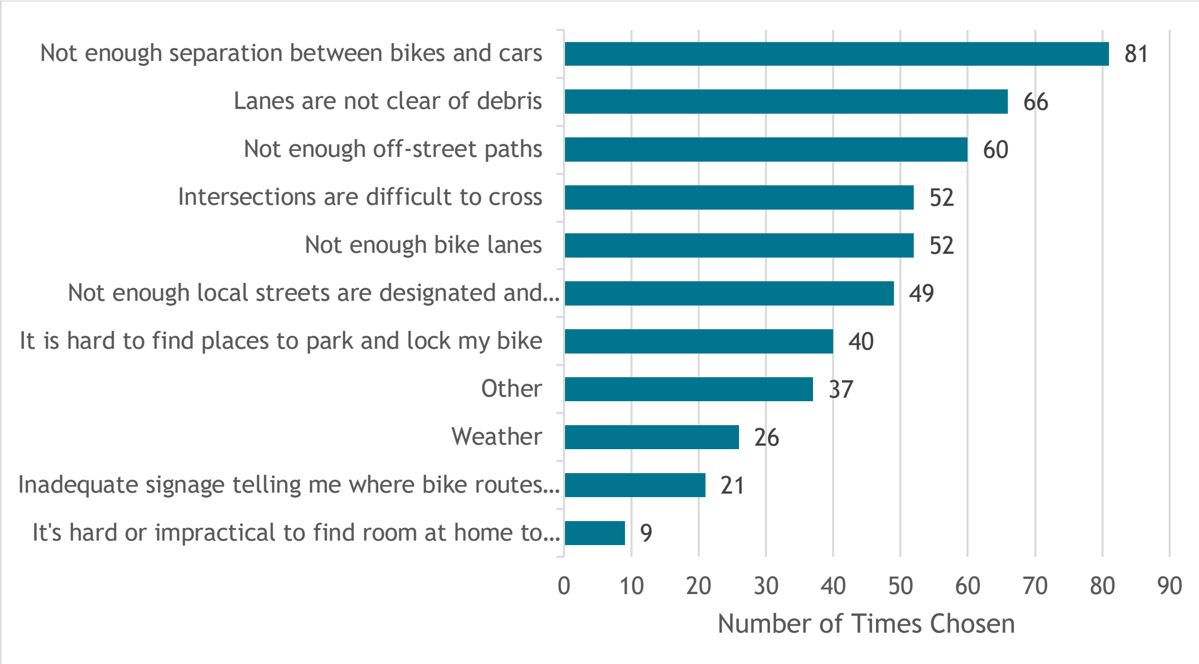
7. **How would you rate the off-street biking network (such as multi-use paths and trails) in the Eugene-Springfield area?**

   A little more than half **(54%) of people felt that the off-street biking network was "Very good" or "Adequate."** However, a little more than a third (38%) thought that they network "Needs work."



8. **What are the main barriers to biking in the Eugene-Springfield area?**

   Of those who responded, **the majority (65%) felt that the main barrier to biking in the Eugene-Springfield is due to not enough separation between bikes and cars.** This was followed by "lanes not clear of debris" (53%) and "not enough off-street paths" (48%). "It's hard or impractical to find room at home to park and lock my bike" was the least checked barrier to biking in the area.



Below is a summary of the barriers people listed under "Other." Please see **Appendix C** to read the individual, unedited comments.

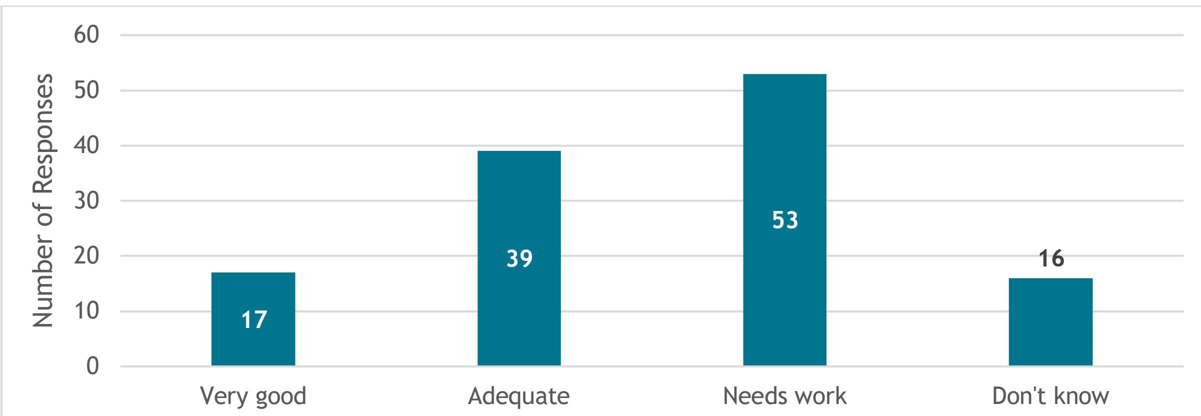
- **Safety:** Many people wrote about safety being their top concern. They talked about the following:
  - Aggressive and/or **distracted drivers** and **high-speed** drivers
  - Distracted cyclists
  - Perceived danger and/or **public safety risk from houseless people**
  - Bike **theft**
  - E-Bikes and scooters go to fast
- **Lighting:**
  - While one person wrote that they liked the lighting on bike/pedestrian paths, many wrote that most **bike paths lack adequate lighting**, especially at night.
  - One person wrote that **off-street lighting is blinding** when cycling.
- **Connectivity:**
  - Bike lanes and trails are **not well connected throughout the county**. One person listed Veneta being particularly hard to get to. Someone said that it is hard to bike from Eugene to Springfield.
  - Someone suggested that **small, targeted, connections** could help.
- **Bike facilities and infrastructure:**
  - Some noted that bike paths are **too narrow, forcing bicyclists into the street** (specifically during the COVID-19 pandemic), while others said that some **bike facilities direct cyclists onto the sidewalk.**
  - Center **rumble strips** discourage safe passing of bicyclists.

- ○ **Signage** on River Road is inadequate.
- ○ Need for a **broader network of separated facilities** for pedestrians and bicyclists and **protected bike infrastructure** (cycle tracks, buffered lanes).
- ○ **Traffic signals** should prioritize bicyclists.
- ○ One person wrote that the **bike path** to businesses on Coburg Road is **scary and confusing**.

- **Interaction with other users:**
  - ○ Some wrote that **pedestrians do not yield/share the path** and that some **bicyclists do not signal** when they are turning.

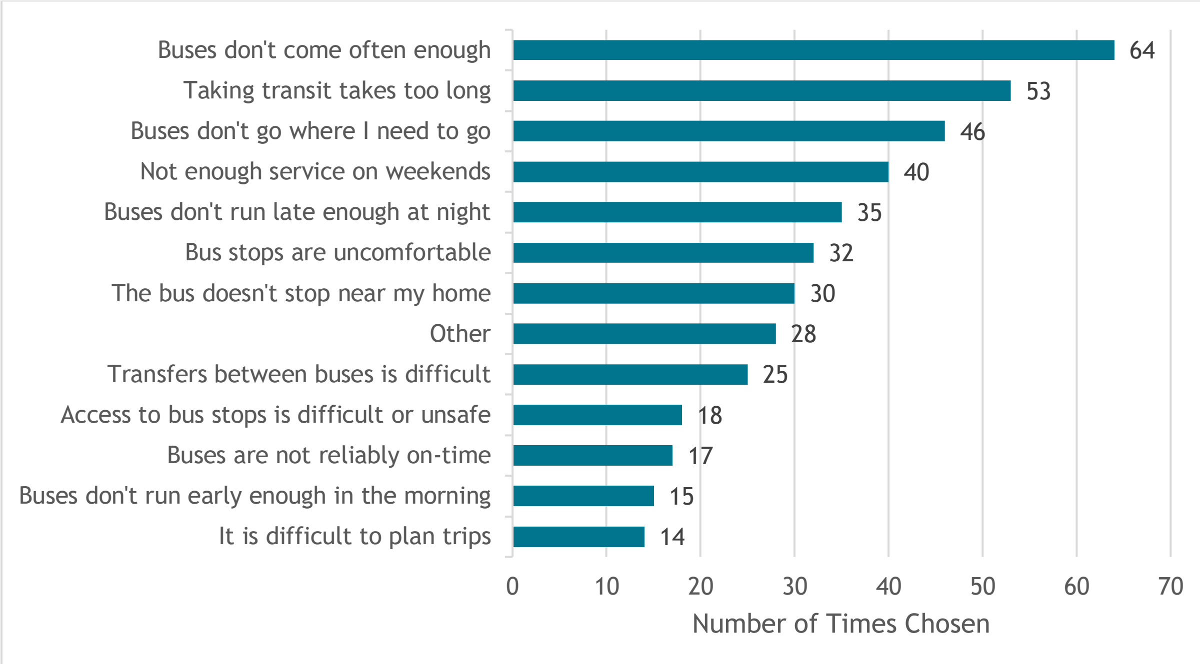
9. How would you rate the bus (transit) system in the Eugene-Springfield area?

Most people **(42%) felt that the bus (transit) system "Needs work."** However, 45% felt that that the transit system was either "Adequate" (31%) or "Very good" (14%).



10. What are the main barriers to taking transit in the Eugene-Springfield area?

Of those who responded, **the majority (55%) felt that the main barrier to taking transit in the Eugene-Springfield is due to buses not coming often enough.** This was followed by "taking transit takes too long" (46%) and buses not going where people need to go (40%). "It is difficult to plan trips" was the least checked barrier to taking transit.



Below is a summary of the barriers people listed under "Other." Please see **Appendix C** to read the individual, unedited comments.

- **Safety**
  - Many listed that the bus **does not feel clean, healthy, or safe**. Of those that wrote about cleanliness or safety, many listed **COVID-19** as the reason they are not currently taking the bus.
  - **Bus drivers are compromise comfort and safety** to keep to their route schedule
- **Infrastructure and facilities**:
  - Bus stops do not provide **weather protection**
  - **No parking** for car at most stops
  - A **phone app** for bus arrivals and schedule would be helpful
- **Connectivity**
  - Many noted that **there need to be more bus routes and that the bus needs to come more often.** Specifically, bus routes that don't connect through downtown are needed.
  - While some routes can get riders to work morning, riders are not able to find a bus back home at night.
  - A few people mentioned that **EmX is better than the bus** and that they would like to see it expanded.
  - Several people noted that **bus stops are being removed** (or will be removed) **near their home**.
- **Other**

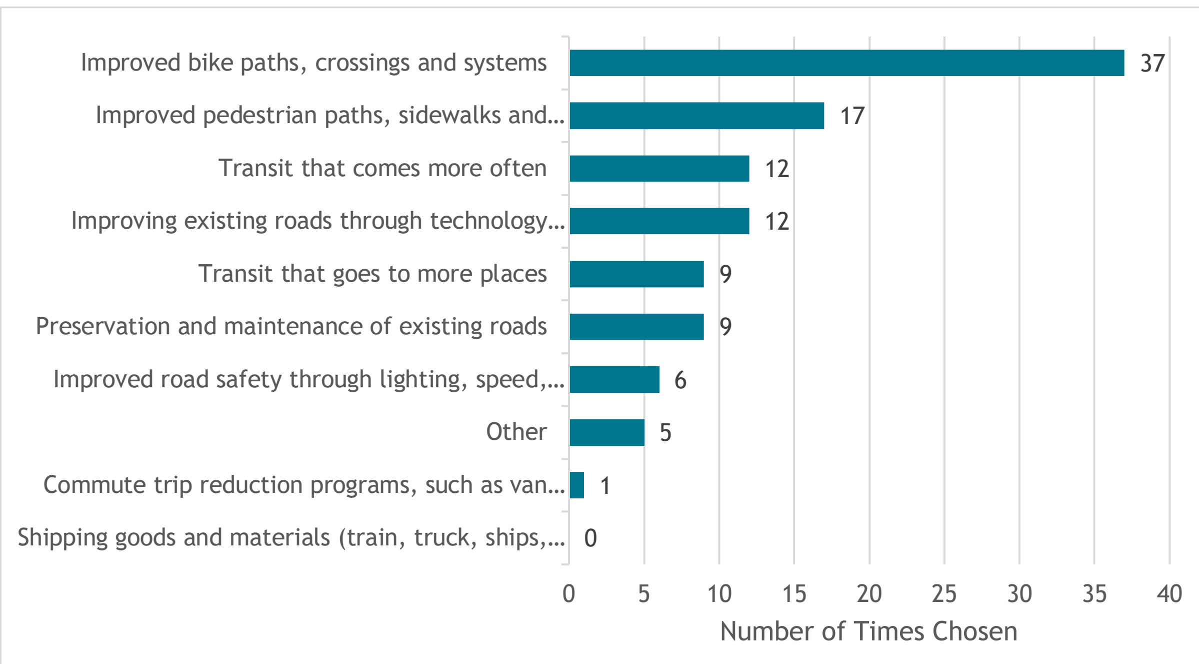
- Some said that the **bus is not pleasant**, mainly due to the people they share the bus with
- Two people said that they would **like the buses to be free**
- Someone wrote that **bus outreach is not always done well**, leaving the public out of the loop.
- Some noted that **it is quicker to bike or walk** to destinations

11. If you had to pick just one transportation project to fund, what would it be?

Participants were asked to choose one of the following nine transportation projects to fund:

1. Preservation and maintenance of existing roads
2. Improving existing roads through technology (signal timing, traffic management, etc.)
3. Transit that comes more often
4. Transit that goes to more places
5. Improved bike paths, crossings and systems
6. Improved pedestrian paths, sidewalks and crosswalks
7. Shipping goods and materials (train, truck, ships, planes)
8. Commute trip reduction programs, such as van pools, park and rides, teleworking, etc.
9. Improved road safety through lighting, speed, design, etc.

Of these, **people chose "Improved bike paths, crossings and systems" most often** (37 times). No respondents chose "Shipping goods and materials (train, truck, ships, planes)."



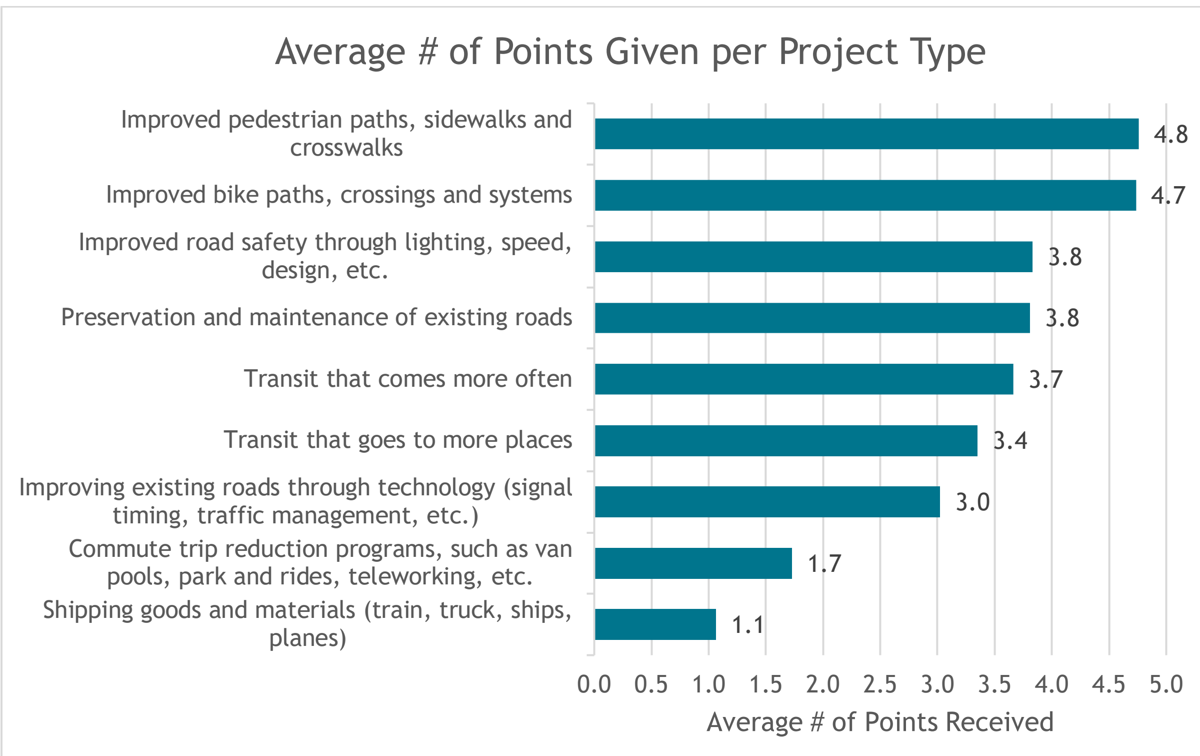
Five (5) people responded with "Other," below are themes from their answers. Please see **Appendix C** to read the individual, unedited comments.

- Free buses
- Passenger commuter rail
- Addition or expansion of highways or freeways
- Upgraded roads between cities and towns on key cycling corridors
- Maintain pre-pandemic bus routes

12. How much would you spend on each of these types of projects?

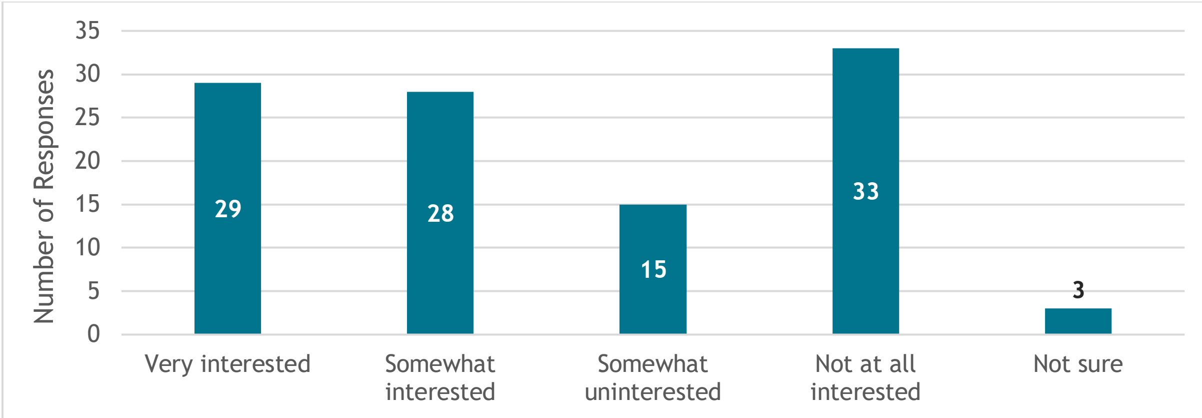
For this question, participants were given 36 points to allocate between the nine types of transportation projects presented in the previous question. They could assign up to 8 points per project.

On average, respondents gave **"Improved pedestrian paths, sidewalks and crosswalks" (4.8 points)** and **"Improved bike paths, crossings and systems" (4.7 points) the most points.** "Shipping goods and materials (train, truck, ships, planes)" received the lowest average number of points (1.1 points).



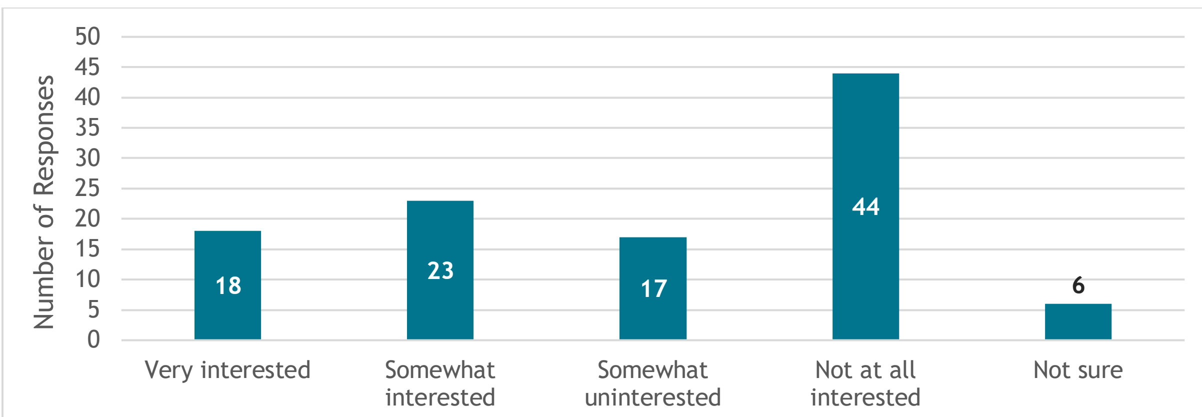
13. When it comes to alternative transportation options, are you very interested, somewhat interested, somewhat uninterested, or not at all interested in bike share programs or programs to allow you to try out electric assist bikes?

About a third **(31%) of respondents were "Not at all interested" in *bike share* programs or programs to allow you to try out *electric assist bikes***; however, more than half (53%) were either "Somewhat interested" (26%) or "Very interested" (27%).



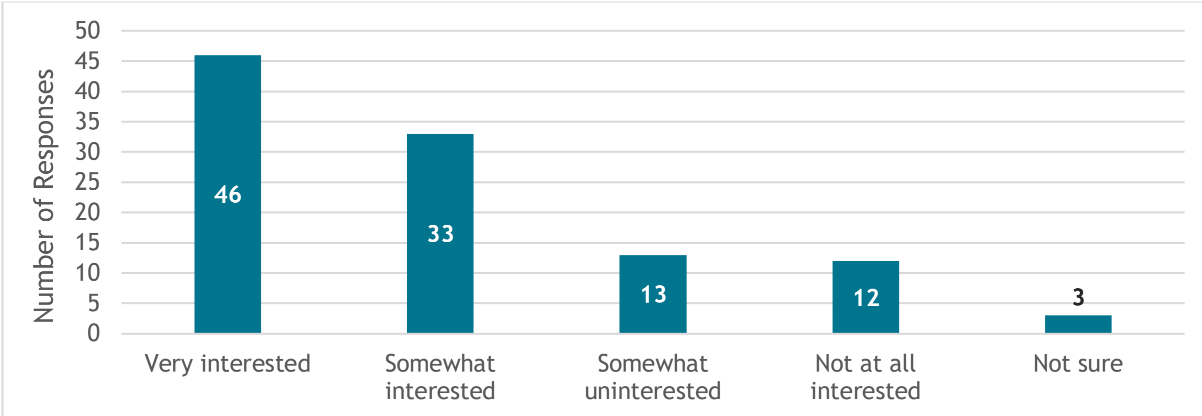
14. When it comes to alternative transportation options, are you very interested, somewhat interested, somewhat uninterested, or not at all interested in programs to encourage the use of *electric scooters*?

Most **(41%) of respondents were "Not at all interested" in programs to encourage the use of electric scooters**, with a less than a quarter (21%) "Somewhat interested."



15. When it comes to alternative transportation options, are you very interested, somewhat interested, somewhat uninterested, or not at all interested in programs that would make *electric vehicles more convenient to use*, such as more EV charging stations?

Most respondents **(43%) were "Very interested" in programs that would make electric vehicles more convenient to use**, with about a third (31%) being "Somewhat interested."



16. Do you have any other thoughts or comments you'd like to share with us?

A little under half **(46%) of all respondents submitted a total of 57 comments**. Below is a summary of the comments. Please see Appendix C to read the individual, unedited comments.

What CLMPO should prioritize:

- A few believe that the **order or prioritization of transportation modes** should be as follows: Walking, transit, biking, car share/taxis, individual car ownership/use
- CLMPO should **focus on the problems** (speeding, DUII, distracted driving)
- Prioritize **pedestrian access and safety**
- Currently **focus too much on automobile infrastructure** (like parking) and prioritize **people who live downtown or by the UO campus**
- Some would like **e-bikes to be prioritized** over electric vehicles. These comments are at odds with the feedback in questions 13-16; where respondents indicated more interested in electric vehicles overall

Several people related the RTP to more broad issues:

- One person said that **increasing density will improve transportation for the community.** Related to this, people believe that increased density is needed where good rapid transit lines are installed
- Someone said that the city (possibly Eugene) needs to **greatly enhance density of retail options in non-downtown areas** to reduce “drive everywhere habits”
- One person asked that CLMPO **not view this as just a transportation plan** and that **transportation must be seen as part of a larger strategy** to address climate change, housing affordability, equity, and health and economic opportunities

Car / Driving network

- Concerns:
  - A few respondents felt that there was a **lack of freeway/highway systems** in the Eugene/Springfield area
  - Some people said they **do not like curb bump-outs**
  - **Traffic lights used to be synced**, but now EmX interferes with that
  - Downtown lacks convenient parking

  - Several respondents mentioned that there is an **overabundance of on-street parking,** which negatively impacts bike/pedestrian safety and encourages more driving
  - Transportation planning must still acknowledge that **systems to support single occupancy vehicles are unsustainable,** even as we shift to electric vehicles
  - Someone said that they are **not in favor of speed bumps** or **attempts to reduce the use of cars**
- Ideas / Suggestions:
  - **Commercial vehicles** (trucks, etc.) **should bear a larger percentage of maintenance costs** since they cause a majority of damage to roadways
  - Off-ramps should be extended.
  - **Current infrastructure is not maintained and should be fixed** before investing in modifications or improvements
  - **Eliminate parking on Broadway** and turn it back into a pedestrian/bike/scooter/skate right of way with space for outdoor dining
  - Ability to **pay for parking with a smart phone app** (in reference to downtown parking meters)

Electronic Vehicles

- Many thought that **EV charging infrastructure needs to be expanded** to prepare for what is perceived to be an inevitable shift to electronic vehicles. Someone mentioned that programs to **encourage employers to install workplace electric vehicle charging** should be created
- Someone mentioned **"electric micromobility"** and that the county should plan for this
- One person said that **electric cars should not be prioritized** because they **do not address inequities in our transportation system**

Biking network and infrastructure

- Concerns / Comments
  - Like the new **bike lanes that are more separate** from car traffic
  - **Center-line rumble strips** sometimes cause unsafe passing of bikes by motorists
  - Someone expressed concern about **River Road northbound when nearing Beltline** as being extremely dangerous for bicycles and said that the **area along Roosevelt at 99W** is very dangerous
- Ideas / Suggestions
  - Better program to keep the streets free of leaves and other debris
  - More options for bike paths in Santa Clara area
  - Better lighting near WWTP bike path
  - **"Bikes May Use Full Lane" signs** need to be put up to educate motorists and encourage them to be less aggressive towards bicyclists

E-bikes and bike share programs

- Concerns / Comments
  - Some expressed concern about electric scooters and e-bikes **sharing cycling infrastructure** given their greater speed and the perception that users tend to not signal
  - Electric bikes, etc. are **not compatible with existing infrastructure**
- Ideas / Suggestions

    - Respondents said that **e-bikes should be made accessible to all** and that there should be **infrastructure to help people feel safe** using them
    - Programs to **subsidize e-bike purchases**
    - Expansion in **lower income areas should be prioritized**

Transit network and infrastructure

- Concerns / Comments
    - Bus system is **too expensive**
    - Bus shelters **don't protect people from weather**
    - **Lighting is too bright/harsh**
    - Perception that **people are not interested** in riding the bus
- Ideas / Suggestions
    - Use **smaller electric buses** to go more places
    - Existing bus routes should **have more frequent service**, but not at the expense of cutting routes
    - A **higher, regional-level public transportation planning** is needed to create more better, and faster rail connections to larger and more distant population centers
    - **Expand EmX** to places like Veneta, Coburg, Creswell, Junction City
    - Change zoning so that there are more places to go nearby people's homes

Walking network

- Concerns / Comments:
    - Someone mentioned that **most of their neighborhood** (1 block west of Hwy 99 near Royal) **has no sidewalks and is poorly lit,** making the neighborhood feel unsafe
- Ideas / Suggestions:
    - Many respondents said that they would like **a system where the majority of people can easily walk and use transit for most of their daily needs**
    - **Density of housing or development** could encourage more walking and biking
    - **Pedestrian/bicyclist only spaces**
    - Someone listed **several ways walking could be made more accessible**, such as mandating sidewalk infill when properties sell, upgrading neighborhood collectors to have at least one sidewalk/multi-use path, educating residents on their responsibilities to keep sidewalks free of debris and vegetation trimmed, etc. (please see individual comments in the appendix)
    - A program to **assist low income homeowners to repair sidewalks**
    - **Additional law enforcement** to increase traffic safety and the safety of pedestrians

Climate Change and Sustainability

- Many respondents agreed that **driving gasoline-powered cars needs to be disincentivized** and reduced, largely to combat climate change and pollution.
- Someone thought that the **gasoline tax should be raised** to disincentivize people from using gasoline-powered vehicles

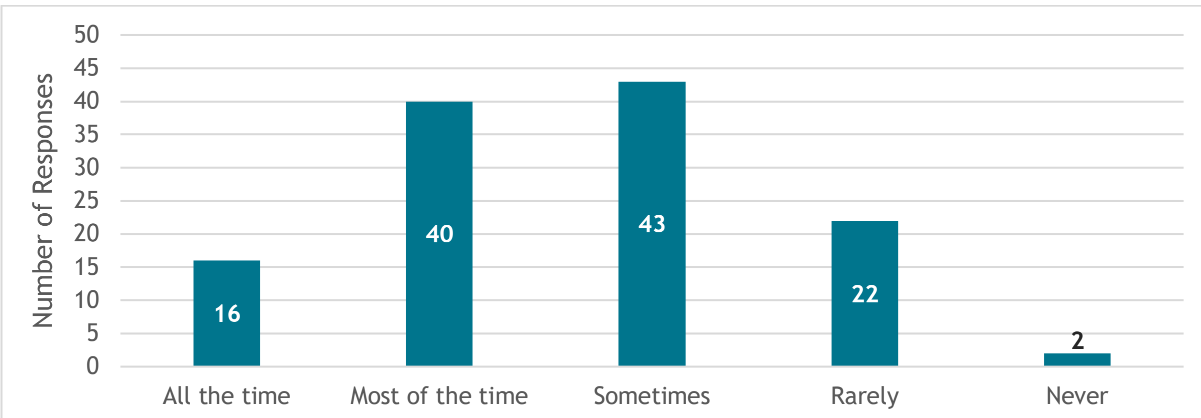
Other

- Someone mentioned that the **"Twenty is Plenty"** is a welcome program in Eugene

- **Ideas for technological improvements:** Automatic traffic controls/enforcement, automatic photo tickets, auto traffic metering to minimize traffic at peak hours.
- There was the perception that **LCOG is not working in the best interests of Coburg** or the rural areas of Lane County

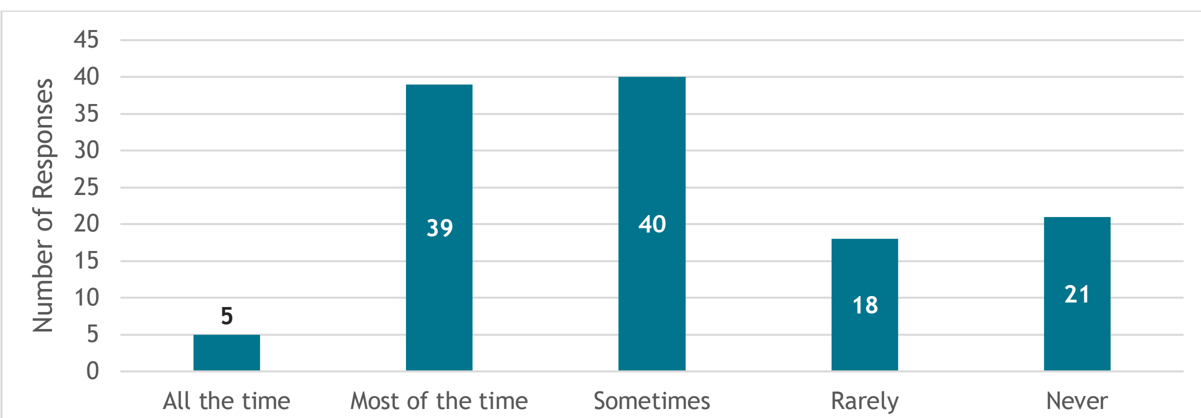
17. How do you usually get from one place to another by driving or riding in a car or other motor vehicle?

Of those who responded, **most respondents (35%) said that they "Sometimes" travel by driving or riding in a car or other motor vehicle**. While almost half (46%) said that they get from one place to another by car or motor vehicle "All the time" or "Most of the time."



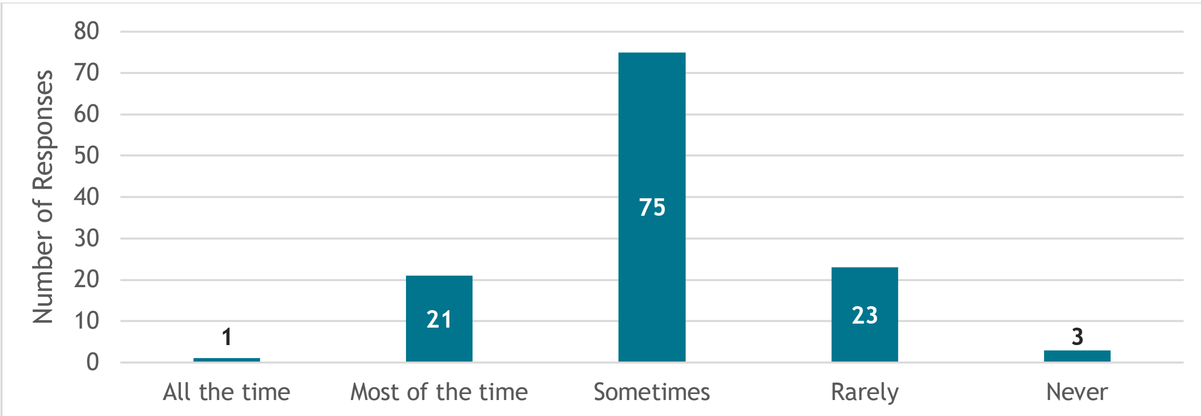
18. How do you usually get from one place to another by riding a bike?

The **majority of respondents (65%) said that they either "Sometimes" travel by bike (33%) or travel by bike "Most of the time" (32%).** Only 4% of respondents said that they usually get from one place to another by bike "All of the time."



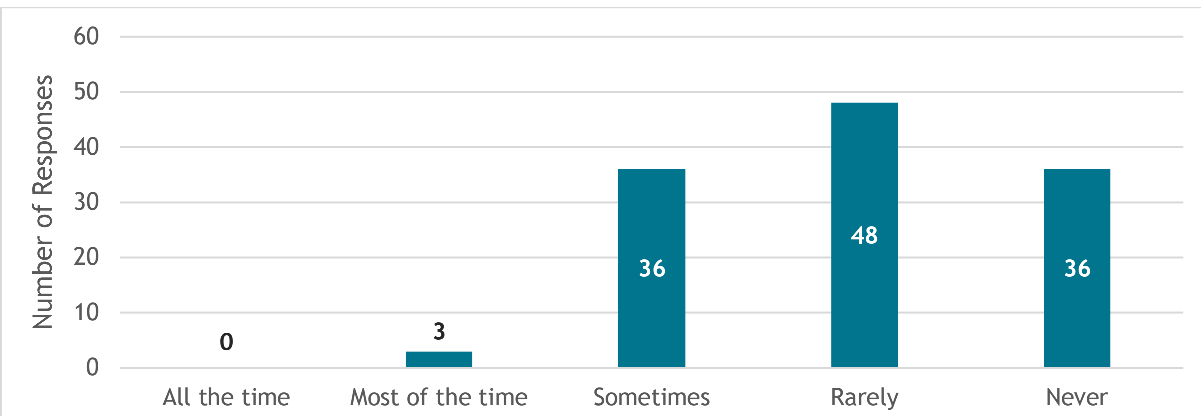
19. How do you usually get from one place to another by walking?

The **majority of respondents (61%) said that they usually get from one place to another by walking "Sometimes."** Only one person said that they get to places by walking "All of the time."



20. How do you usually get from one place to another by taking the bus?

The **majority of respondents (39%) "Rarely" take the bus.** An equal amount either "Never" take the bus or "Sometimes" take the bus to get from one place to another (29% for each). None of the participants said that they travel by bus all of the time.



21. How do you usually get from one place to another using other means of transportation?

Sixteen (16) people said that they usually travel by another means of transportation. Below is a summary of the responses. Please see Appendix C to read the individual, unedited comments.

- One person said they are thinking about getting an **electric bike because of big hills**

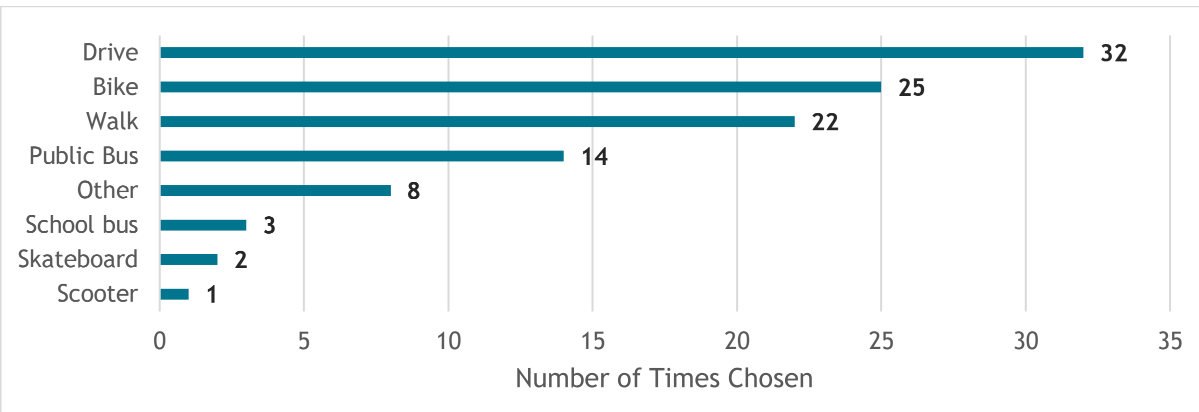
- Many people mentioned their **transportation habits have changed significantly due to COVID**. Pre-COVID, people biked and took transit; now, many people work from home and don't commute anymore
- Many said they have been **avoiding buses during COVID** but **will resume taking the bus once they are vaccinated**
- One person mentioned that **bike paths flood** and **sidewalks are broken and nonexistent**, and that "car rams" on slippery sidewalks are hazardous
- A major shortcoming is a **lack of coordination between the cities and the county** and referenced the stretch of Highway 99 between Dillard Rd. and Creswell, which they said is very dangerous for cyclists
- One person said that they **would take the bus more often if the bus was timely** and if they **didn't have too walk far**

22. Do you or a member of your family travel to and from school on any given day?

The majority of respondents **(69%) said that they or a family member does not travel to and from school.**

23. If yes, please select the most common travel method(s) that you use? *(Check all that apply.)*

Of those who said that they or a family member travel to and from school, **about a quarter (26%) said that they drive** to and from school, followed by **21% saying that they bike** to and from school.



Below is a summary of the responses. Please see **Appendix C** to read the individual, unedited comments.

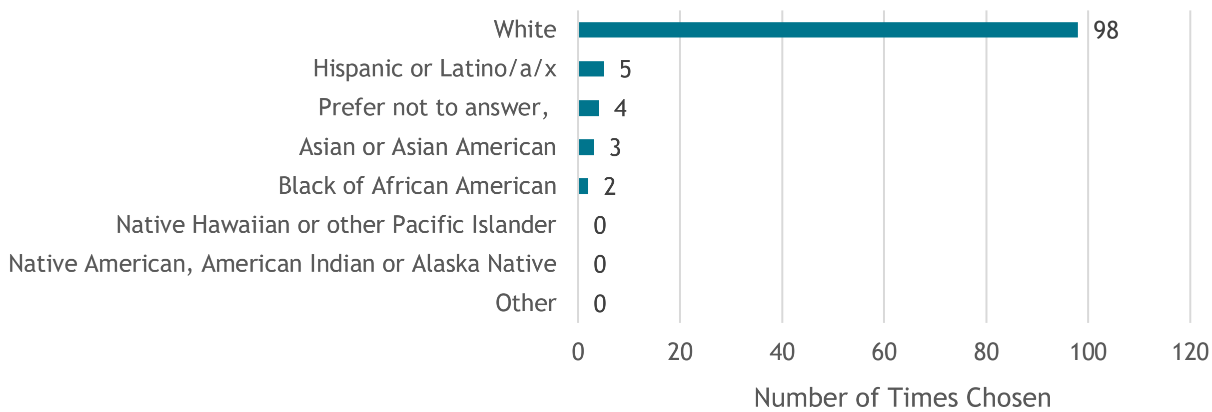
- If **"Transit Tomorrow"** removes the bus stops near the respondent's house, they may no longer use the public bus to get to school and the student may drive
- Someone responded that they **drive an electric vehicle**
- Someone said that they would love to bike if there were a safe connection

DEMOGRAPHIC INFORMATION

Participants from the online open house were asked a series of optional demographic questions. This information is useful to compare with the county's current demographics.

Racial or Ethnic Identity

The majority of participants identify as white (88%), higher than the percent of the Lane County population that identifies as white (81.2%). Three (3) respondents identified two racial or ethnic identities. The second largest group of participants selected Hispanic or Latino/a/x (4%).

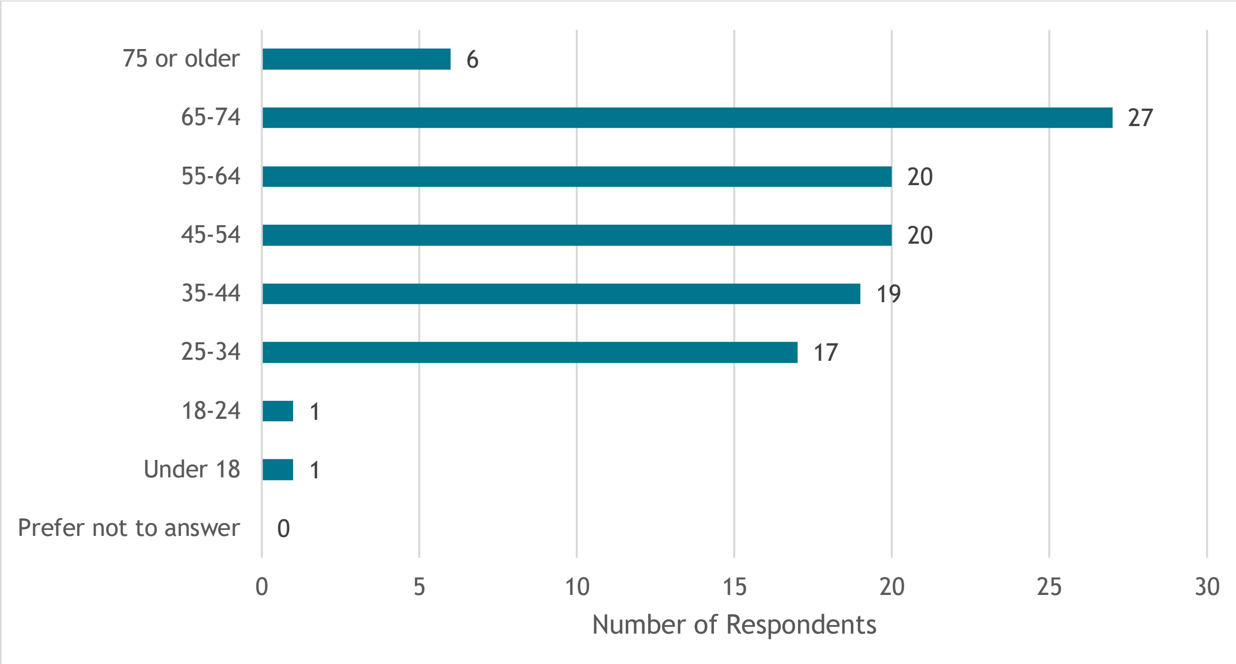


Language (other than English)

Participants were asked if they spoke a language other than English at home. **The majority of respondents (99%) speak primarily English at home**, which is above the percent who speak only English at home in Lane County (91.5%). Six (6) responded that they speak Spanish and one (1) said they speak Japanese at home.

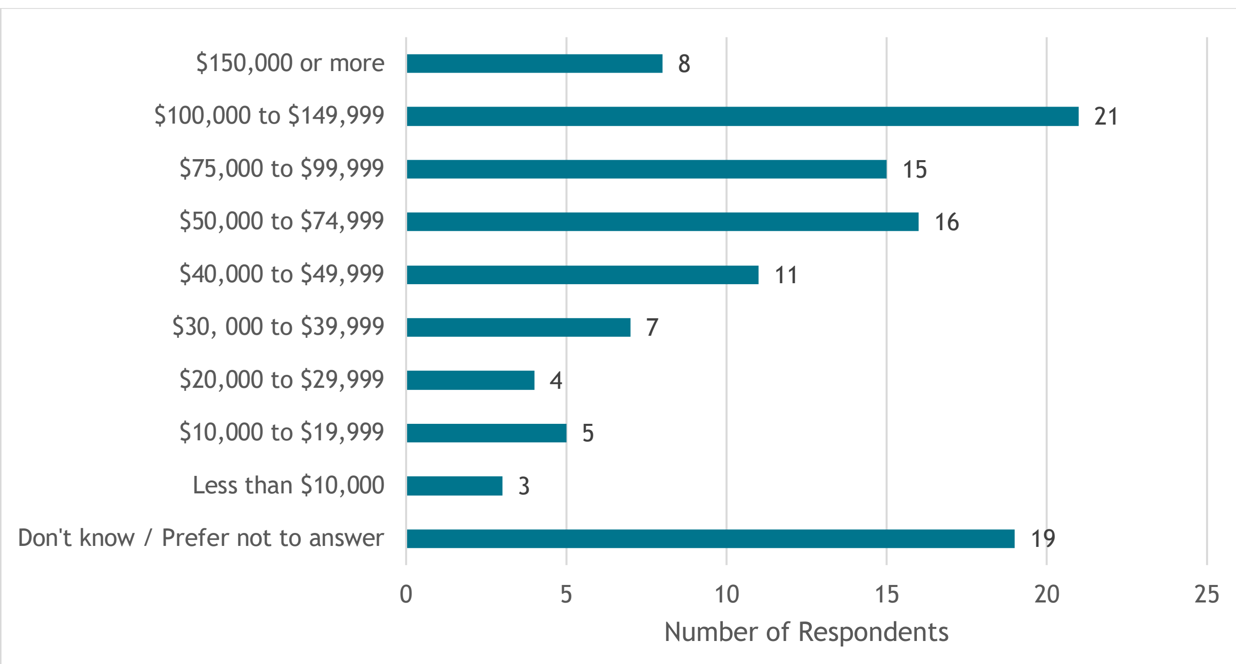
Age

Overall, the age of participants was higher than the median age of community members in Lane County (39.5 years old). Of those that responded, the **largest group of participants were between the ages of 65 – 74 (24%).** The second largest groups were between the ages of 45 – 54 (18%) and 55-64 (18%)



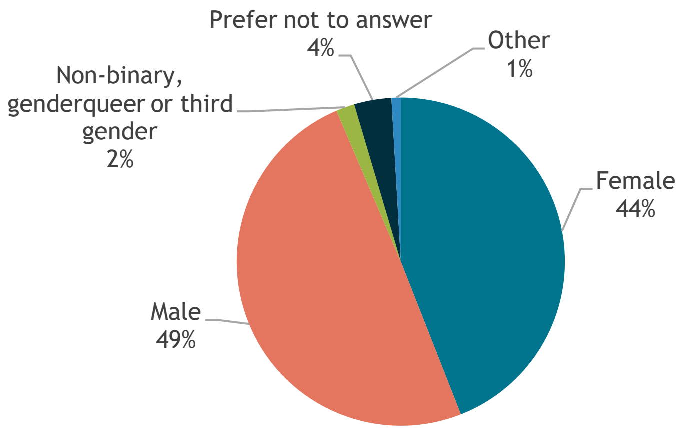
Annual Household Income Before Taxes

The **majority of the respondents have a household income between $100,000 to $149,999** a year, which was more than double the median household income in Lane County ($49,958).



Gender

The majority of participants (49%) were male, while 44% were female, with 4% of respondents preferring not to answer and 3% indicating they identified as non-binary, genderqueer, third gender, or other. This somewhat aligns with the distribution seen in Lane County, where 49% of the population is male and 51% is female.



Zip Code of Primary Residence

Of those who responded, the most common zip codes were 97405 (28%), followed by 97402 (18%) and 97401 (16%). More detailed information can be found in Appendix E.

BILINGUAL SURVEY

A Spanish language survey was developed as an alternative to the online open house, which was offered in English. There were no initial responses to the survey; therefore, the survey was translated into English to be bilingual and was shared with students of Downtown Languages, a nonprofit in the Eugene area that provides language, literacy, and other educational programs.

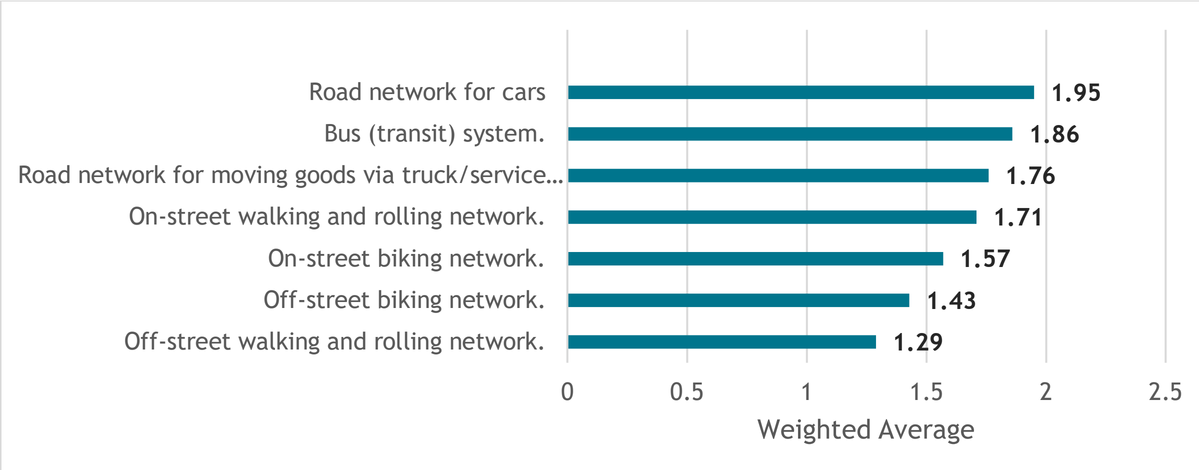
Students from Downtown Languages who completed the survey between May 1-31, and who provided their contact information, were provided with a $20 Visa gift card. While there **a total of 22 responses, 19 people completed the survey** and left their contact information.

Note: Unless otherwise stated, the averages listed in the analysis of each question take into consideration the number of participants who responded to that question, not the total number of people who participated in the survey.

1. **How would you classify the following modes of transportation in the Eugene-Springfield area? *(Where 3 is "Very good" and 1 is "Needs work.")***

   Overall, the **road network for cars received the highest average score** of 1.95, while the **off-street walking and rolling network had the lowest score** (1.29), meaning that it needs the most work out of all the modes of transportation presented.

   This feedback was consistent with the online open house and mailer.



2. What are the main barriers to walking, biking, and taking public transportation (the bus) in the Eugene-Springfield area?

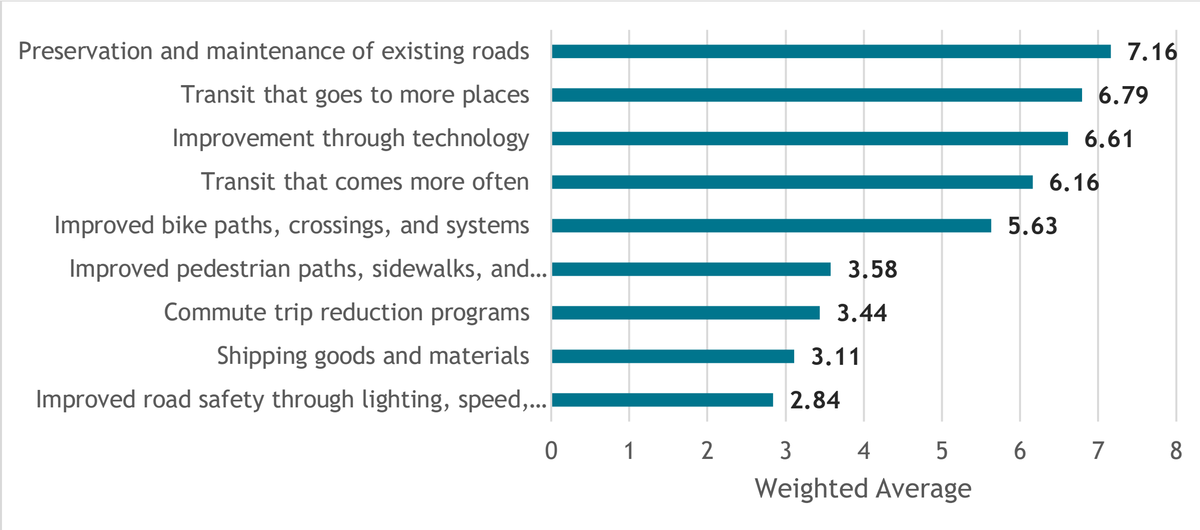
Below is a summary of the responses. Please see Appendix G to read the individual, unedited comments.

- Lack of **consistent and adequate transit service**
- **Signal timing** does not support active transportation efficiency or safety
- **Lack of pedestrian infrastructure**
- There is **limited space on public transit for riders**
- Main streets are not built to **support active transportation and public transit users**
- **Communication limitations** with drivers makes traveling by public transit difficult.
- Sidewalks and pedestrian infrastructure **are not ADA accessible**
- **Lack of bike facilities**, including bike service areas (pumps, etc.)
- **Road maintenance issues** create mode conflicts

3. Prioritize these transportation projects from most important to least important. *(Where 9 is most important and 1 is least important)*

Of the nine transportation projects presented**, "Preservation, maintenance of existing roads" scored the highest.** This was followed by "Transit that goes to more places." "Improve road safety" scored the lowest.

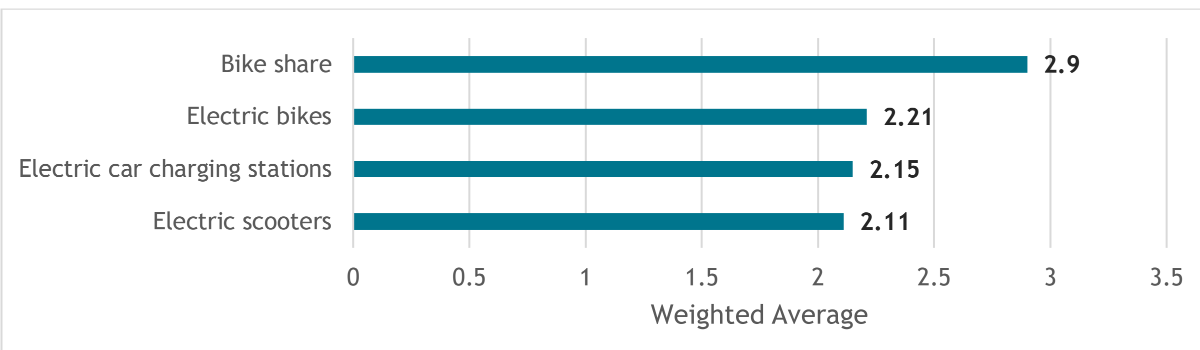
While respondents to the online open house and mailer also ranked "Preservation, maintenance of existing roads" high, they gave "Improved road safety" a higher priority than survey respondents.



4. **Please share your level of interest in each of the following future programs. *(Where 4 is "Very interested" and 1 is "Not interested")***

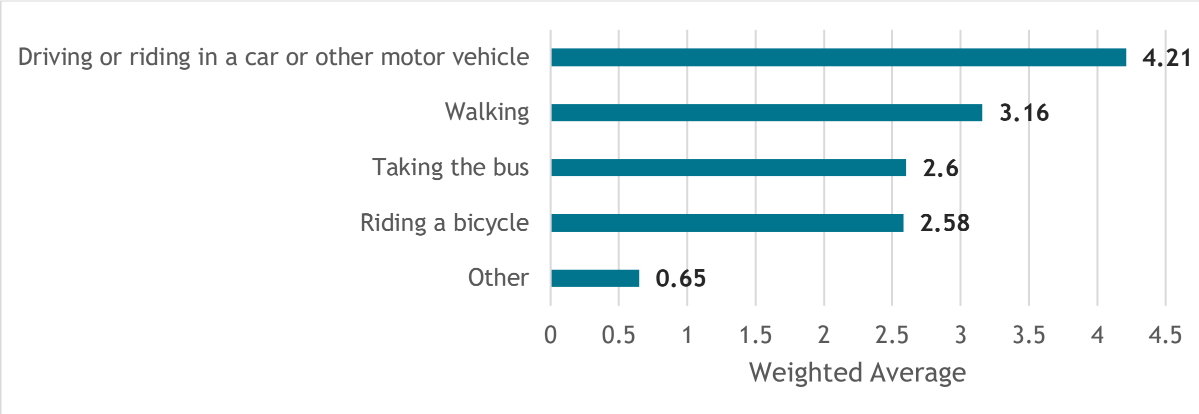
   Overall, **more people were interested in programs for bike sharing.** People were least interested in programs for electric scooters.

   Unlike survey respondents, respondents to the online open house and mailer expressed more interest in programs that would make electric vehicles more convenient to use over the other programs over the other programs.



5. **How often do you use the following modes of transportation? *(Where 5 is "All the time" and 1 is "Never")***

   Overall, **people get from place to place by driving or riding in a car or other motor vehicle most of the time.** On average, people use bikes least often. This feedback was consistent with the online open house and bilingual mailer

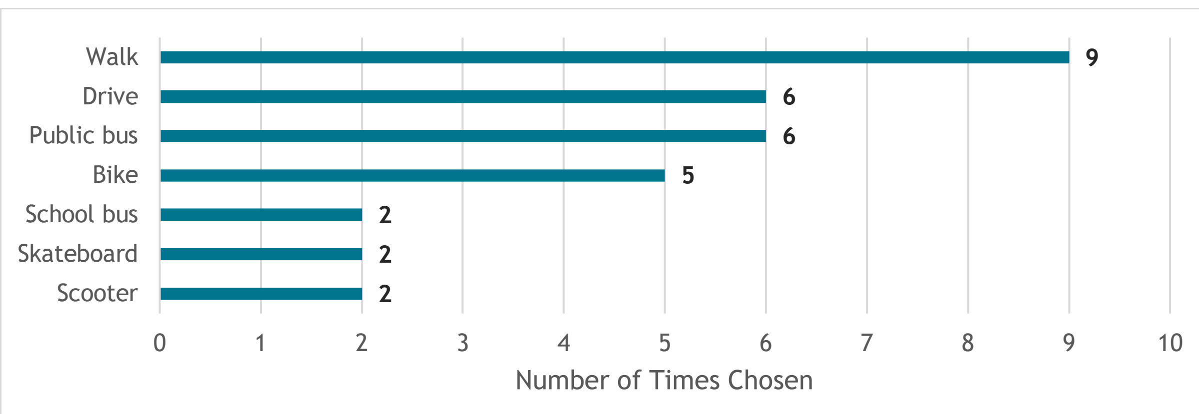


6. **Do you or a family member regularly travel to and from school? *(Check one)***

   Of those that responded to this question, **a majority (14) responded that they or a family member regularly travel to and from school**. Only six people indicated that neither they, nor a family member, regularly travel from school or work.

7. **If your answer is yes, please select the most common travel method(s) you use. (Check all that apply)**

   Of those who regularly travel to and from school, **most walk or bike**. Online open house and mailer respondents were most like to say that they drove to school .



8. **Do you have any other ideas or comments you want to share with us? *(Open text)***

   Below is a summary of the responses. Please see **Appendix G** to read the individual, unedited comments.

   - Maintain/increase existing public transit routes
   - Provide additional bus routes in the area
   - Support electric scooter program implementation
   - Improve maintenance of the street

BILINGUAL MAILER AND COMPARISON TO ONLINE OPEN HOUSE RESPONSES

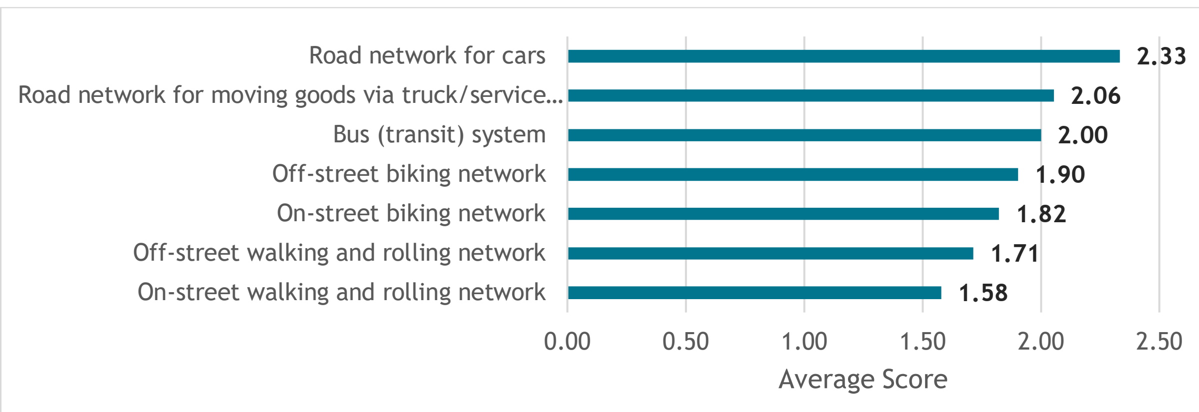
This section summarizes the feedback received from the bilingual mailer that was sent to roughly 3,000 people in Eugene, Springfield, and Coburg. **46 people sent back completed the mailers.** All were returned with responses given in English.

Note: Unless otherwise stated, the averages listed in the analysis of each question take into consideration the number of participants who responded to that question, not the total number of people who sent back a mailer.

1. **Rate the following modes of transportation in the Eugene-Springfield area. *(On a scale of 1-3, where 3 is "Very good" and 1 is "Needs work")***

   Overall, the **road network for cars received the highest average score** of 2.33, while the on-street walking and rolling network had the lowest score (1.58), meaning that it needs the most work out of all the modes of transportation presented.

   Comparison with online open house: This was consistent with the responses to the online open house where the majority of people felt that the road network for cars was either "Very good" or "Adequate," and that on-street and off-street walking networks need work, as well as the on-street biking network. However, people who mailed in their responses were more likely to think that the bus system was adequate, whereas open house participants were more likely to think it needed work.



2. **What are the main barriers to walking, biking, and taking public transit (bus)? *(Open text)***

   Overall people felt that the **condition of the sidewalks or bike paths was a barrier** to walking or biking. **Safety was a common** theme throughout, with reckless drivers, inadequate signage or lighting, not enough safe cross walks, and houseless people being the primary reasons people felt unsafe walking, biking, or taking public transit in Central Lane County.

People also noted that **Bethel is isolated from the rest of Eugene,** and it is hard to get places in that area.

Comparison with online open house: Feedback was consistent with the online open house—pedestrian paths, sidewalks and crosswalks and bike paths, crossings and systems need to be improved.

Below is a summary of the common themes found in the responses by transportation type. Please see **Appendix F** to read the individual, unedited comments.

Walking

- Distance (too far to walk)
- Gaps in sidewalk
- Hostile drivers
- Inadequate signage, lighting
- Poorly maintained sidewalks and inadequate lighting
- Not enough safe crosswalks
- Very dangerous intersections
- Wheelchair and walker unfriendly

Biking

- Bike paths that are not continuous nor interconnected
- Do not feel safe (because of too many cars or people)
- More access for 3 wheel bikes
- Noise and pollution
- Not enough off-street biking networks or designated bike lanes
- On-street biking network in Eugene is very good but the system in Bethel needs work
- Poor lighting
- Poorly maintained bike lanes

Taking public transit (bus)

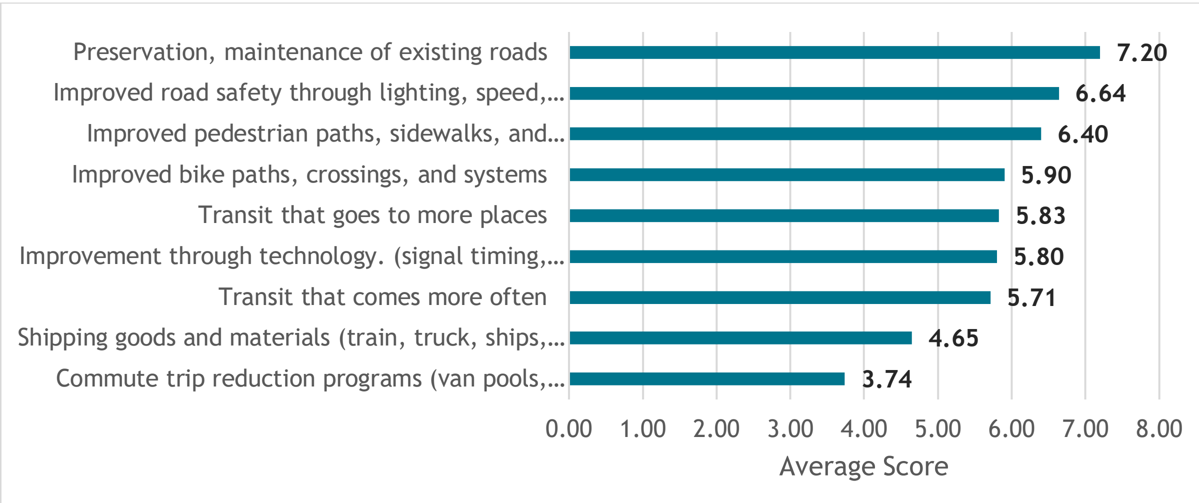
- Benches for the elderly to sit while waiting for the bus
- Bus infrequency, duration
- Bus routes disappearing
- Bus stops are too far
- Bus system in Eugene is very good but the system in Bethel needs work
- Desire for the old style bus pass
- Not enough people ride the bus
- Perception that only druggies and homeless people take the bus

3. **Prioritize these transportation projects from 9 (Most important) – 1 (Least important):**

   Of the nine transportation projects presented**, "Preservation, maintenance of existing roads" scored the highest.** This was followed by "Improved road safety through lighting, speed, design, etc." and "Improved pedestrian paths, sidewalks, and crosswalks."

   "Commute trip reduction programs (van pools, park and rides, etc.)" scored the lowest.

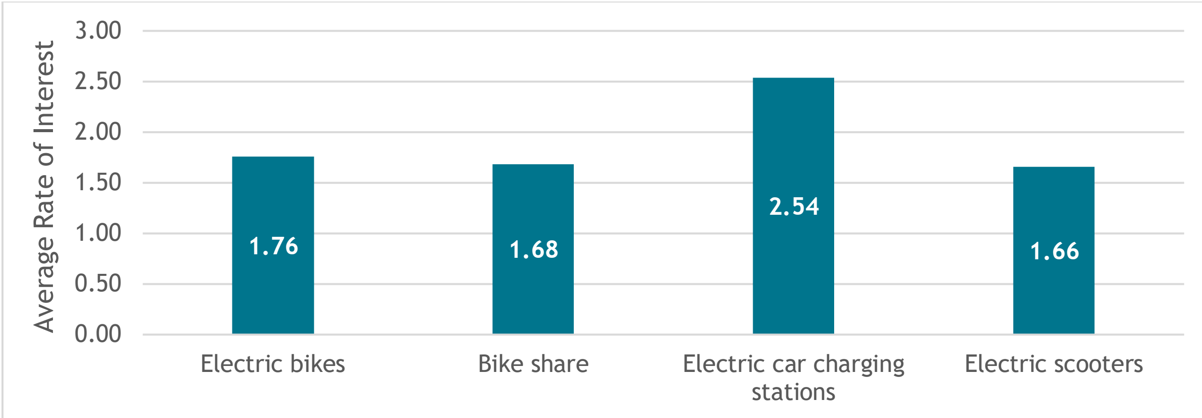
   Comparison with online open house: People who responded to the open house were more likely to choose "Improved bike paths, crossings and systems" or "Improved pedestrian paths, sidewalks and crosswalks" as their top transportation project. These were also the projects that people awarded the most points to in question twelve of the open house.



4. **Which of the following programs are you interested in?** ***(On a scale of 1-4, where 4 is "Very interested" and 1 is "Not interested")***

   Overall, **more people were interested in programs for electric car charging stations.** People were least interested in programs for electric scooters.

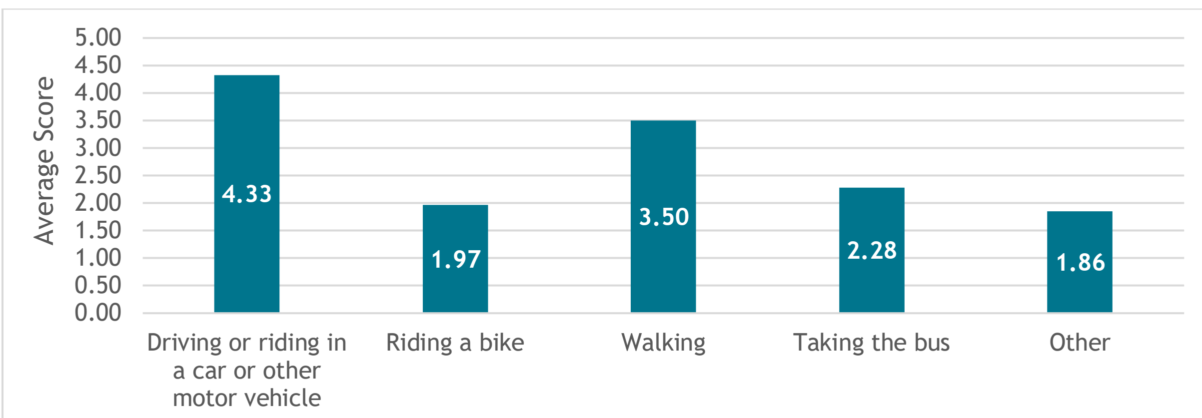
   Comparison with online open house: Feedback was consistent with the online open house, where a larger percentage of respondents said that they were somewhat or very interested in programs that would make electric vehicles more convenient to use over the other programs.



5. **How often do you use the following modes of transportation?** ***(On a scale of 1-5, where 5 is "All the time" and 1 is "Never")***

Overall, **people get from place to place by driving or riding in a car or other motor vehicle most of the time.** On average, people use bikes least often.

Comparison with online open house: Feedback was consistent with the online open house where a larger percentage of people said that they drive or ride in a car more than the other modes of transportation.



6. **Do you or a family member regularly travel to and from school?**

Of those who answered, only **three (3) people said that they or a family member regularly travels to and from school**. Of those who said yes, most drive, walk, or take public transit. Two (2) people said that they bike, and one (1) person said they take the school bus.

Comparison with online open house: This was consistent with the feedback received through the online open house.

7. Do you have other comments or questions? *(Open text)*

Below is a summary of the responses by transportation type. Please see **Appendix F** to read the individual, unedited comments.

Public Transit

- Bus stop is too far from home and grocery store
- Desire for more busses going further outside the county
- Smaller, circular bus routes

Walking / Sidewalks

- Improve signal timing for pedestrians
- Sidewalks need to be repaired

Biking

- Bike paths need to be safer

Driving

- The highways are well maintained
- Neighborhood streets need to be repaired
- Traffic hours are too crowded

Other

- Several respondents said that Lane County does a very good job with its transportation network
- People do not know how to use round abouts and crosswalks
- Someone living in Bethel said that they need a car to get everywhere
- Desire for RTD service to the beach and back
- Ride-share and taxis are expensive
- Desire for signal timing and lighting and speed safety measures.
- Someone said that trucks need to be re-routed and use Beltline Rd to West Eugene
- Someone found the questionnaire confusing

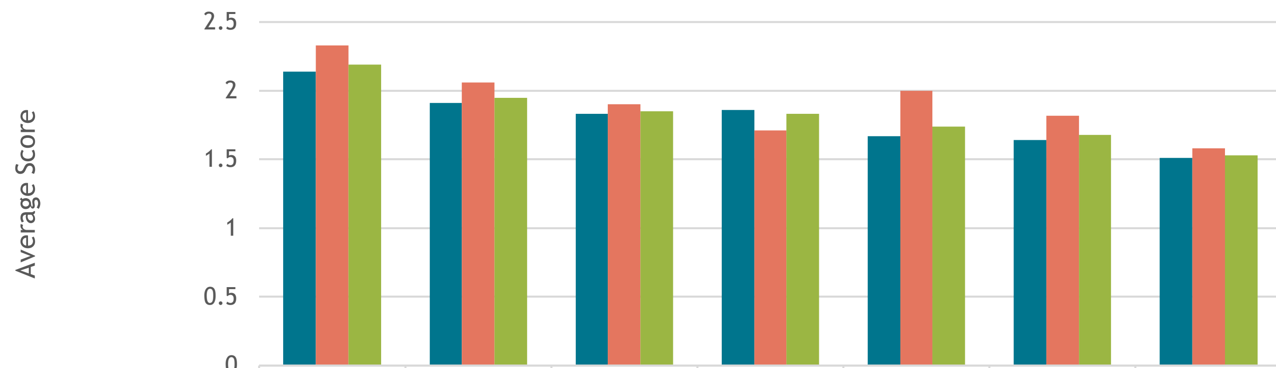
BILINGUAL MAILER AND ONLINE OPEN HOUSE RESPONSES AGGREGATED FOR RELEVANT QUESTIONS

Below are the following questions that were in posed in such a way in both the bilingual mailer and online open house that they were able to be compared.

Rate the following modes of transportation in the Eugene-Springfield area.

Below is a comparison chart between data from the online open house and data from the bilingual mailer for how people rate various modes of transportation. The data from the online open house has been converted from qualitative data to quantitative data where “Very Good” equates to 3, “Adequate” to 2, and “Needs work” to 1, which aligns with the rating scale used in the mailer. “Don’t Know” was excluded from the data set.

When taken as aggregate, the **road network for cars remains the most highly rated mode of transportation** with a score of 2.19. The on-street walking and rolling network remains the mode of transportation that needs the most work.

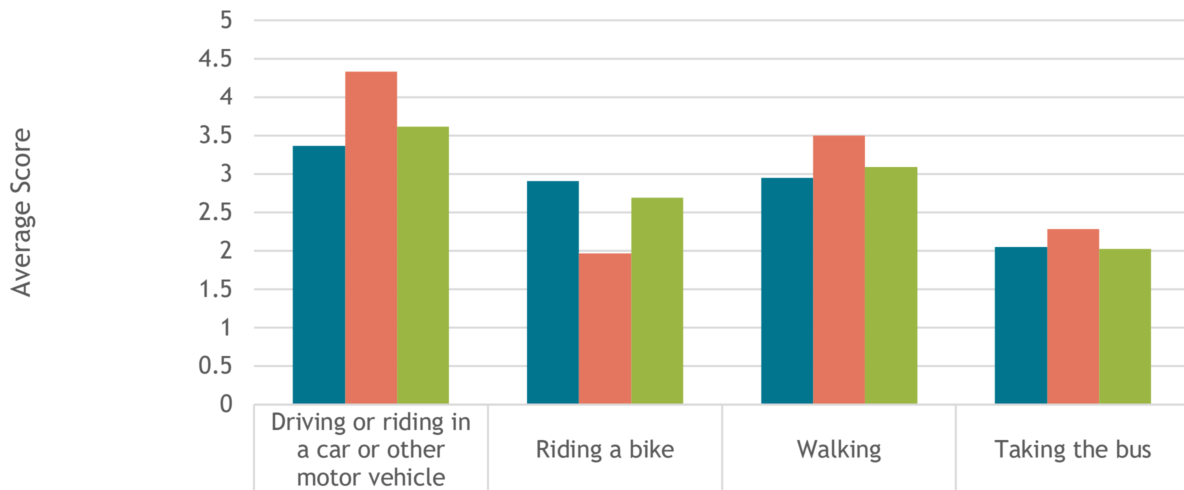


	Road network for cars	Road network for moving goods via truck/service vehicles	Off-street biking network	Off-street walking and rolling network	Bus (transit) system	On-street biking network	On-street walking and rolling network
Online Open House	2.14	1.91	1.83	1.86	1.67	1.64	1.51
Bilingual Mailer	2.33	2.06	1.90	1.71	2.00	1.82	1.58
Combined	2.19	1.95	1.85	1.83	1.74	1.68	1.53

How often do you use the following modes of transportation?

Below is a comparison chart between data from the online open house and data from the bilingual mailer for how often people us various modes of transportation. The data from the online open house has been converted from qualitative data to quantitative data where “All the time” equates to 5, “Most of the time” to 4, “Sometimes” to 3, “Rarely” to 2, and “Never” to 1, which aligns with the rating scale used in the mailer.

When taken as aggregate, **driving or riding in a car or other vehicle** remained the most used mode of transportation.

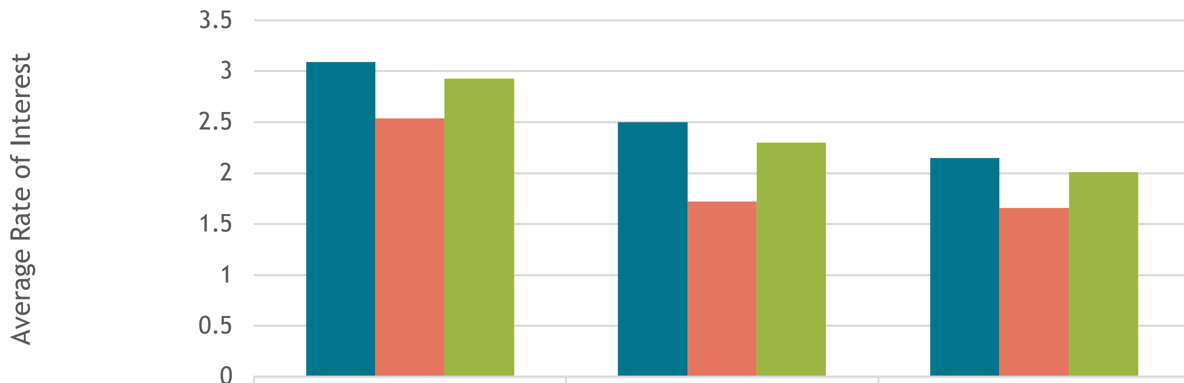


	Driving or riding in a car or other motor vehicle	Riding a bike	Walking	Taking the bus
Online Open House	3.37	2.91	2.95	2.05
Bilingual Mailer	4.33	1.97	3.50	2.28
Combined	3.62	2.69	3.09	2.03

Which of the following programs are you interested in?

Below is a comparison chart between data from the online open house and data from the bilingual mailer for how interested people were in various e-bike, bike share, scooter, and electric vehicle programs. The data from the online open house has been converted from qualitative data to quantitative data where “Very interested” equates to 4, “Somewhat interested” to 3, “Somewhat uninterested” to 2, and “Not at all interested” to 1, which aligns with the rating scale used in the mailer.

When taken as aggregate, **programs that would make electric vehicles more convenient to use** remained the most popular, while electric scooters remained the most unpopular.



	Programs that would make electric vehicles more convenient to use	Bike share programs or programs to allow you to try out electric assist bikes	Programs to encourage the use of electric scooters
Online Open House	3.09	2.50	2.15
Bilingual Mailer	2.54	1.72	1.66
Combined	2.93	2.30	2.01

NEXT STEPS

Below are some recommended next steps:

- Consider conducting targeted outreach, possibly reopening the online open house and Spanish language survey and/or conduct listening session meetings, to solicit additional feedback from groups that were underrepresented in the initial outreach period.
- Categorize the comments and recommendations received from the public according to the project or program they fall under in the RTP. Recommendations or comments that do not fall under one of these projects or programs will be shared with the City and County to be incorporated into planning and funding ideas.

APPENDIX A: AQCD INTERAGENCY CONSULTATION COMMENTS RECEIVED

From:	Clark, Adam
To:	CLARKE Kelly A; max hueftle; Steve Dietrich; morgan.schafer@deq.state.or.us; Pepple, Karl; jasmine.harris@dot.gov; TUPICA RACHAEL (LCOG List); emily.cline@dot.gov; BORREGO JEREMY (LCOG List); Ned.Conroy@fta.dot.gov; JOHNSTON BILL (LCOG List); MAHER John D; THOMPSON Paul E; CALLISTER Dan; CURRIER Ellen; DORFMAN Rachel M; GILES Lance (SMTP)
Subject:	RE: Conformity Meeting: Central Lane MPO Regional Transportation Plan AQCD
Date:	Thursday, September 30, 2021 11:53:53 AM

Hi all; here is the recommended edit I mentioned on this morning's call for pg 6, paragraph 3 of the AQCD, with additions in green (go Ducks?);

"In ~~certain~~ areas that have been designated as nonattainment for a ~~where air quality emissions have exceeded the~~ National Ambient Air Quality Standards (NAAQS), including those that were redesignated to attainment in the past 20 years ("maintenance areas"), an AQCD is required whenever the Metropolitan Transportation Improvement Program (MTIP) or MPO's Metropolitan Plan (RTP) is updated, or every 4 years, whichever comes first."

Thanks for a great call!

Adam Clark
Air Planning Section
Air and Radiation Division
EPA Region 10
206-553-1495

From:	Borrego, Jeremy (FTA)
To:	CLARKE Kelly A; Max Hueftle; SteveDietrich@lrapa.org; morgan.schafer@deq.state.or.us; clark.adam@epa.gov; pepple.karl@epa.gov; Harris, Jasmine (FHWA); TUPICA RACHAEL (LCOG List); Conroy, Ned (FTA); JOHNSTON BILL (LCOG List); MAHER John D; THOMPSON Paul E; CALLISTER Dan; CURRIER Ellen; DORFMAN Rachel M; GILES Lance (SMTP); Cline, Emily (FHWA)
Subject:	RE: Conformity Meeting: Central Lane MPO Regional Transportation Plan AQCD
Date:	Thursday, September 30, 2021 11:35:40 AM
Attachments:	AQCD for CLMPO 2045 RTP Draft 20210914 JB.pdf

Hey all,

Thanks for the informative meeting and great discussion. Attached are my comments on the RTP AQCD. If you have any questions, please let me know.

Thanks again,

Jeremy Borrego, AICP
Transportation Program Specialist
Federal Transit Administration
Region 10 - Seattle, WA
Phone: 206.220.7956

From:	Harris, Jasmine (FHWA)
To:	CLARKE Kelly A; Clark, Adam; max hueftle; Steve Dietrich; morgan.schafer@deq.state.or.us; Pepple, Karl; TUPICA RACHAEL (LCOG List); Cline, Emily (FHWA); BORREGO JEREMY (LCOG List); Conroy, Ned (FTA); JOHNSTON BILL (LCOG List); MAHER John D; THOMPSON Paul E; CALLISTER Dan; CURRIER Ellen; DORFMAN Rachel M; GILES Lance (SMTP)
Subject:	RE: Conformity Meeting: Central Lane MPO Regional Transportation Plan AQCD
Date:	Thursday, September 30, 2021 3:15:44 PM
Attachments:	image001.png FHWA - AQCD for CLMPO 2045 RTP Draft 20210914.pdf

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Thank you Kelly, attached are FHWA's comments!

Jasmine Harris
Transportation Planner
Federal Highway Administration- FHWA | Oregon Division
530 Center St NE, Suite 420 | Salem | OR | 97301
O 503.316.2561| F 503.399.5838
Jasmine. Harris@dot.gov

From: GILES Lance (SMTP)
To: CLARKE Kelly A
Cc: Max Hueftle
Subject: RE: LMP design value wildfire data exclusion
Date: Thursday, September 30, 2021 2:36:01 PM

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Hi Kelly,

I think that should be of no concern as far as the AQCD is concerned.

It means that the PM10 data is still on record and included in AQS (the EPA database), unless an official request is made for and Exceptional Event and is concurred with by the EPA.

However, the PM10 wildfire data that would contribute to a violation of the NAAQS is allowed to be excluded from the DV calculation when qualifying for the LMP without the EPA EE concurrence.

-Lance

From: CLARKE Kelly A <KCLARKE@Lcog.org>
Sent: Thursday, September 30, 2021 2:25 PM
To: Lance Giles <lance@lrapa.org>
Cc: Max Hueftle <max@lrapa.org>
Subject: RE: LMP design value wildfire data exclusion

Hi Lance,

Thank you for this. I will address it in the AQCD.

I am not clear, though, on what this means: Such data are not eligible to receive a concurrence flag in AQS and are not excluded from AQS or other design value calculations performed in AQS

Is that anything of concern or note?

Kelly

From: Lance Giles <lance@lrapa.org>
Sent: Thursday, September 30, 2021 2:14 PM
To: CLARKE Kelly A <KCLARKE@Lcog.org>
Cc: Max Hueftle <max@lrapa.org>
Subject: FW: LMP design value wildfire data exclusion

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Kelly,

Below is the response from EPA that includes the attached documentation. Hopefully a little extra language in the AQCD and a link to the attached document will satisfy Adam Clark's request for clarification on the removal of wildfire data.

-Lance

From: Duboiski, Christi <duboiski.christi@epa.gov>
Sent: Thursday, September 30, 2021 12:32 PM
To: Lance Giles <lance@lrapa.org>
Cc: Vaupel, Claudia <Vaupel.Claudia@epa.gov>; Clark, Adam <Clark.Adam@epa.gov>
Subject: RE: LMP design value wildfire data exclusion

Hi Lance. Thanks for the clarification. I'll give you my initial response and then Claudia and Adam can weigh in with additional information or corrections, if necessary.

I understand that part of the regional Air Quality Conformity Determination (AQCD) for traffic planning contains PM10 trend data for Oakridge, and the FTA is asking LRAPA to reference the documentation or agreement that shows that removal of the wildfire data is allowed for DV calculations for LMPs.

I've attached the FAQ document for Exceptional Events (2016 Revisions to the Exceptional Events Rule: Update to Frequently Asked Questions – updated 2020) that answers your question. This guidance (See section E.13) states that "for purposes of developing a PM10 Limited Maintenance Plan, air quality monitoring data that area not exceedances or contributions to violation of the NAAQS may be treated in a manner " analogous" to the treatment of exceedance data under the Exceptional Events Rule, provided the impacted data otherwise satisfy the federal definition and criteria for exceptional events. Such data are not eligible to receive a concurrence flag in AQS and are not excluded from AQS or other design value calculations performed in AQS."

So, the removal of wildfire data when calculating the average DV for the most recent 5 years of data to show that the area qualifies for the LMP is allowed, but the data will not receive concurrence flags or be excluded from AQS DV calc.

See specifically Section E.13 - **Question:** Can an air agency request to exclude data by preparing a demonstration that meets the requirements of the Exceptional Events Rule for purposes of PM_{10} Limited Maintenance Plan eligibility?

Hope this helps

APPENDIX B: ENVIRONMENTAL CONSULTATION COMMENTS RECEIVED

From: CURRIER Ellen
To: CLARKE Kelly A; DORFMAN Rachel M
Subject: Fwd: Environmental Coordination for Central Lane Metropolitan Planning Organization Region Transportation Plan
Date: Wednesday, September 29, 2021 3:41:03 PM
Attachments: image001.jpg
20210929 Corps to LCOG Ltr_CLMPO RTP.pdf

FYI.

From: Griffith, Daniel C NWP <Daniel.C.Griffith@usace.army.mil>
Sent: Wednesday, September 29, 2021 3:15:02 PM
To: CURRIER Ellen <ecurrier@lcog.org>
Subject: Environmental Coordination for Central Lane Metropolitan Planning Organization Region Transportation Plan

You don't often get email from daniel.c.griffith@usace.army.mil. Learn why this is important

CAUTION: This email originated from outside the organization. DO NOT CLICK links or attachments unless you recognize the sender and know the content is safe.

Hi Ellen,

Please see attached for the USACE response to the request for comments on the above referenced project. Please feel free to contact me if you have any questions or require further information.

Thanks,

Danny

Daniel C. "Danny" Griffith
Regulatory Project Manager
U.S. Army Corps of Engineers
Portland District, Eugene Regulatory Field Office
211 East 7th Avenue, Suite 105
Eugene, Oregon 97401-2763
541-465-6878
daniel.c.griffith@usace.army.mil

DEPARTMENT OF THE ARMY
U.S. ARMY CORPS OF ENGINEERS, PORTLAND DISTRICT
211 EAST 7TH AVENUE, SUITE 105
EUGENE, OR 97401-2763

September 29, 2021

Regulatory Branch
Corps No.: NWP-2021-468

Ms. Ellen Currier
Lane Council of Governments
859 Willamette Street, Suite 500
Eugene, OR 97401
ecurrier@lcog.org

Dear Ms. Currier:

We received a request via email on September 14, 2021 from the Lane Council of Governments (LCOG) requesting the U.S. Army Corps of Engineers (Corps) review the Central Lane Metropolitan Planning Organization (CLMPO) draft long-range Regional Transportation Plan (RTP) located in Lane County, Oregon. Specifically, the CLMPO requested that we review Appendix D of the RTP and provide comments.

The Draft Appendix D describes the RTP as multiple efforts to be completed over several years across a large geographic area. It does not disclose the details of specific projects, but instead proposes to tier to site-specific project evaluations as they occur. As a result, we are providing general comments regarding Corps jurisdiction and authority.

We have reviewed the Draft Appendix D pursuant to Section 404 of the Clean Water Act (CWA) and Section 10 of the Rivers and Harbors Act of 1899 (RHA). Under Section 10 of the RHA, a Department of the Army (DA) permit is generally required to construct structures or perform work in or affecting navigable waters of the U.S. Portions of the Willamette River and McKenzie River within Lane County, as well as some waters along the Oregon coast in Lane County, are regulated under Section 10 of the RHA. Therefore, based on the maps included in the Draft Appendix D, it appears a Section 10 DA permit may be required for one or more individual projects within the RTP.

Under Section 404 of the CWA, a DA permit is generally required for the discharge of dredged or fill material (e.g., fill, or mechanized land clearing) into waters of the U.S., including wetlands. Discharges of dredged or fill material in waters of the U.S. that may result from certain activities can be exempt from regulation under Section 404. Based on the maps included in the Draft Appendix D, it appears a Section 404 DA permit may be required for one or more individual projects within the RTP.

- 2 -

Section 14 of the Rivers and Harbors Act of 1899 and codified in 33 U.S.C. § 408 (referred to as "Section 408") authorizes the Secretary of the Army, on the recommendation of the Chief of Engineers, to grant permission for the alteration or occupation or use of a Corps federally authorized project if the Secretary determines that the activity will not be injurious to the public interest and will not impair the usefulness of the project. An alteration is defined as any action that builds upon, alters, improves, moves, occupies, or otherwise affects the usefulness, or the structural or ecological integrity of a Corps federally authorized project. Several federally authorized projects, such as the Amazon Creek Diversion Canal, are present with the geographic boundary of the RTP and thus may require Section 408 review for one or more individual projects with the RTP. You can find more information on Section 408 review at: https://www.nwp.usace.army.mil/408/.

Additionally, the Corps must evaluate whether the RTP may impact any real estate interest held by the Corps. Given the large geographic area of the RTP as described in the Draft Appendix D, one or more individual projects within the RTP may require review by the Corps Real Estate Division. You can find more information on the Corps' Real Estate Office at: https://www.nwp.usace.army.mil/Library/Aerial-photos/.

The Draft Appendix D states that coordination and consultation with the Corps and other agencies would occur during individual project development, design, and permitting. I encourage this coordination with my staff regarding the applicability of the Corps jurisdiction and authority for projects included in the RTP. If you have any questions, please contact Mr. Danny Griffith by telephone at (541) 465-6878 or e-mail at daniel.c.griffith@usace.army.mil.

Sincerely,

William D. Abadie

William D. Abadie
Chief, Regulatory Branch

From: CURRIER Ellen
To: CLARKE Kelly A; DORFMAN Rachel M
Subject: Fwd: Environmental Coordination for the Central Lane Metropolitan Planning Organization''s Regional Transportation Plan
Date: Friday, September 17, 2021 8:17:22 AM

From: BROWN Jevra * DSL <jevra.brown@dsl.state.or.us>
Sent: Thursday, September 16, 2021 3:13:36 PM
To: CURRIER Ellen <ecurrier@lcog.org>
Subject: RE: Environmental Coordination for the Central Lane Metropolitan Planning Organization's Regional Transportation Plan

CAUTION: This email originated from outside the organization. DO NOT CLICK links or attachments unless you recognize the sender and know the content is safe.

Ellen,

Thank you for the opportunity to review the draft Regional Transportation Plan. I have mostly restricted my review to the Waters section of the document with some attention to areas that may have implications on DSL" Removal-Fill program. I have forwarded your request to our Proprietary program as we may have land and waterway ownership interests within the study area.

Page 23, Wetlands: The inventories appropriate for planning in Oregon and within the plan study area are those included within the Statewide Wetlands Inventory for which there is an online web map, find the link to the web page in my signature line for details, scroll down to the map link. The SWI includes the NWI as delivered from the USFWS and also includes a subset of the USGS NHD for waters mapping and subsets of the USDA NRCS soil survey SSURGO/STATSGO combined dataset for Oregon to flag areas with greater likelihood of containing unmapped wetlands or waterways. The SWI should be used outside of the study areas of Local Wetlands Inventories (LWIs).

Technically the SWI also includes approved LWIs and approved wetland delineations and determinations. This mapping has not yet been incorporated into the SWI web map. The mapping associated with these documents supersede the previously mentioned SWI datasets within their respective study areas. There are several approved LWIs within the plan study area, reports, maps and GIS are available from this web page: https://www.oregon.gov/dsl/WW/Pages/Inventories.aspx See the two Eugene, two Springfield and the Coburg approved LWIs. It sounds like you may have accessed these already. Eugene has four study areas that have not been approved for use. Springfield has an LWI in review. These may be approved for use for future project-specific planning.

Delineations and determinations are not available in GIS format and are usually reviewed more on a project-specific level. This approved delineation mapping or determination decision may be obtained through public records requests: https://www.oregon.gov/DSL/Pages/PRR.aspx

Because this planning effort begins to estimate the number of projects that may include wetlands and waters impacts we may anticipate that wetland and waters mitigation may be required to offset those impacts. We appreciate that the mitigation strategies beginning on page 35 do emphasize the first steps in mitigation which are to avoid and minimize impacts to the greatest extent practicable. When these steps have been taken and impacts are necessary, there are a number of mitigation banks that serve this plan area. A map of mitigation bank service areas can be found here: https://www.oregon.gov/dsl/WW/Pages/MitigationMap.aspx The jurisdictions within this plan area may also consider if there are locations where wetland and waters mitigation projects may serve double duty to also protect from flood hazards by for example providing additional flood storage and delay, or may serve to improve water quality. Long range planning at the scale of this plan area may begin to identify appropriate mitigation project locations. If such locations might serve multiple transportation projects please work with the DSL mitigation specialists for appropriate mitigation planning: https://www.oregon.gov/dsl/WW/Pages/Mitigation.aspx

Scanning the document it looks like you included most of the concepts and I am only refining what is written. Let me know if there is anything else we can do.

Thank you for the opportunity to review the draft.

Jevra Brown, Aquatic Resource Planner
Department of State Lands
Cell 503-580-3172
Checking for wetlands and waters? – Use the STATEWIDE WETLANDS INVENTORY

To help prevent the spread of COVID-19 many of the DSL staff are telecommuting.

APPENDIX C: ONLINE OPEN HOUSE OPEN TEXT QUESTIONS

Below are the unedited comments that respondents submitted for the open text questions in the open house.

QUESTION 5: What are the main barriers to walking in the Eugene-Springfield area? *(Check all that apply.)*

Those who chose "Other," wrote the following in the open text box:

- I'd like sidewalks to be better lit-- but not in a way that's disturbing to residents like street lamps are
- Drivers are distracted or in too great a hurry for ped and bike safety
- dangerous men
- Too much car parking, too many cars going too fast, buildings are often oriented to parking lots, doors are difficult to access on foot
- Auto traffic moving too fast
- Security - too many scary people camping under bridges and in parks along paths
- I'd prefer to bike!
- Too many people living on bike paths/sidewalks/parking strips to be safe. Also, off-street lighting is blinding when cycling, so it makes it LESS safe. Lastly, how about some traffic law enforcement?
- Roadways are designed to encourage high speed driving.
- Bums/thieves/druggies
- Safety inadequate nearly everywhere.
- It would be helpful if the sidewalks were routinely cleaned of trash, leaves and other debris.
- Due to insufficient resources for the houseless, public safety concerns are an unfortunate, unintended, risk to pedestrians
- Too many streets (e.g., Jefferson St.)were designed as easy ways to move TRAFFIC to and from downtown. Springfield Main Street is even worse! We need more traffic calming measures on many streets in this area...OR better traffic law enforcement.
- Only major streets with incredible noise pollution connect all the way through town; there are lots of quiet neighborhood streets that dead-end. Having walking paths that connect side streets would help.
- Safety issues
- sidewalks abut streets where traffic is going too fast
- Danger from homeless population and city is too spread out

- Illegal camping, unsanitary conditions, and unleashed dogs create unsafe conditions that make use of a car more preferable.
- There are no safe and pleasant ways to walk from Eugene to Springfield
- Cars prioritized over humans/nature
- Gaps in sidewalk network
- The law that "every intersection is a crosswalk" is not known or enforced at all. If this law were actually used, the walking environment would improve vastly.
- Some places unsafe to walk due to unhoused camping
- Drivers of vehicles are behaving dangerously and putting people walking and cycling at risk of injury or death.
- Lack of crosswalk enforcement and related driver education
- ill mannered bicycle and skateboard riders
- don't feel safe
- arthritis
- Cars and drivers

QUESTION 8: What are the main barriers to biking in the Eugene - Springfield area? *(Check all the apply)*

Those who chose “Other,” wrote the following in the open text box:

- Aggressive auto drivers and careless cyclists
- Drivers are distracted or in too great a hurry for bike and ped safety
- Not enough streets made difficult to access for cars, like Alder from 19th to 24th
- The bike lanes that are there often don't connect to each other, bike lanes often disappear at intersections, there are too many cars going too fast, there is conflict built into off-street bike facilities (e.g. intersections lacking clear right-of-way), bike facilities often are less direct methods, too many bike facilities direct cyclists onto the sidewalk
- Drivers are getting meaner, too many door zone bike lanes, bike paths lack adequate lighting, poor bike infrastructure near commercial destinations, using park space for transportation introduces conflict
- Security - too many scary people along the river paths
- Motorists refuse to obey the law and enforcement is nonexistent. Add in the ever-expanding size of their largely unguided missiles, and it fails. Lastly, stop with the center rumble strips; they discourage safe passing of people on bikes.
- Connection to and bike path to businesses on Coburg Road - scary and confusing around hwy
- Too many breaks in the system; bike paths too narrow during COVID so forced onto streets, which is not terrible but has its own drawbacks; almost no one gives warnings

upon passing, which is even worse for ebikes/scooters given their greater speed; pedestrians do not yield/share the path
- Bike Theft, people hanging out along paths/underpasses
- Roadways are designed to encourage high speed driving.
- Connections within Eugene-Springfield are generally good but it's hard to get to Veneta
- Druggies/bums/thieves
- Signage on River Road inadequate to know which streets have a path to the West Bank Trail. Love lighting on bike/ped paths.
- Connectivity - many bike paths are not connected at key intersections. Small, targeted, connections could have huge impacts
- I donâ€™t need to ride a bike
- We need reduced design speeds for anywhere people biking and walking share space with people driving, and we need a broader network of separated facilities for those who don't feel safe sharing space. Both of these things should be prioritized so that a rapid rollout of a bike/ped network can happen in advance of the major population growth on the way.
- Danger from homeless camps and garbage
- Steps to discourage bicycle theft are infrequent. Thieves are permitted to operate with little effort to dissuade them.
- There are not enough ways to bike from Eugene to Springfield--especially at night when the river path is not lit.
- No safe bike parking â€” afraid of theft
- Fast cars prioritized over human safety/livability/environment
- Not enough protected bike infrastructure (cycle tracks, buffered lanes)
- I think the area is doing pretty well, but improvements are needed! We need to steadily increase bike riders and walkers and do everything possible to facilitate this growth.
- Not enough protect or Class 1 bike lanes
- Traffic signals should prioritize bicycler. Lack of lighting along the Amazon park and Willamette river trails make it scary for riding at night.
- Bike theft
- Major bikeways (e.g., 13th) force bikes to catch every red light, no coordination
- Roads are in a horrible state of disrepair
- Drivers of vehicles are behaving dangerously and putting people walking and cycling at risk of injury or death.
- Bike theft
- bike lanes and trails are not interconnected enough
- bikes stolen

- Basically, cars are the problem. (I have one, so don't' @ me.) Also, there's no safe route to the (wonderful) river bike path from anywhere south of Fifth Ave., especially with construction at the former EWEB site messing up access via High Street.
- don't feel safe - too many beggars
- arthritis
- Cars and drivers

QUESTION 10: What are the main barriers to taking transit in the Eugene - Springfield area? *(Check all the apply)*

Those who chose "Other," wrote the following in the open text box:

- Bus stops are terrible. Especially the costly new ones. No weather protection and foolish expenditure on custom metal fabrication and trite art
- Bus doesn't stop near my workplace; also the area needs more density of development to support transit
- Transit Tomorrow proposal to remove bus stops near my home
- Doesn't feel clean, healthy, or safe.
- I don't feel safe while I'm on the bus, and it is far from pleasant. There is always a deranged person trying to engage me in conversation, or someone yelling at their child, or someone having a conversation about having sex or taking drugs. I'm not actually an old fuddy-duddy, it's just that being on the bus should be more pleasant than driving, not less.
- Drivers are too focused on keeping to schedule, compromising comfort and safety.
- I can take the bus from Eugene to Veneta in the AM but there is no bus back home
- Not interested, waste of money
- not enough diversity in bus service
- It is difficult to assess bus service with the pandemic. I am really looking forward to EmX bus services on River Road--when the pandemic is over. That would provide sufficient frequency that I won't worry if the bus is not 'on time.' Bus service to downtown is quick for me, once I am on the bus.
- Make them free like Corvallis!!!
- Bus stops that include trash cans need more routine attention.
- closures/cut backs on lesser used routes severely inconveniences residents (elderly, handicapped) who need buses to get to stores and services.
- The hub/spoke system means that trips other than downtown take a very long time. If I want to head straight south or north, for example, it doesn't make sense to have to go downtown first.
- No parking for car at most stops
- I lost my easy acces to the bus from my home several years ago.

- The bus network is great for a metro area of our size. I mostly use the EmX which is excellent. Would love to see that expanded up Coburg or River Road.
- Public Transit is lower priority than private cars
- The bus system is okay for an area of this population but again, we need to make steady improvements to get more people using our bus system. It needs to be super convenient and easy to use. More bus routes, more often, reaching more places. A free bus system, like they have in Corvallis, would be best.
- A phone app for clearly and easily getting bus arrival times a bus stops would be nice.
- Due to COVID, Iâ€™m not using the bus.
- Bus outreach is not always done well, leaving the public out of the loop and sometimes frustrated.
- EMX is better than the bus, transit should replicate that schedule
- Congestion makes transit travel slower than SOV
- Right now, it's just COVID. Too scary. Hopefully this will change.
- LTD considering stopping service to my area
- Quicker to bike/walk to destinations
- need more not less bus routes

QUESTION 11: If you had to pick just one transportation project to fund, what would it be?

Those who responded “Other,” wrote the following in the open text box:

- free buses like Corvallis
- Passenger commuter rail
- The addition or expansion of highways or freeways
- Upgrading roads between cities and towns on key cycling corridors to accommodate cyclists and motorists. For example, economic and recreational activity between Eugene and Creswell is suppressed by the dangerous stretch of Highway 99 beyond Dillard Road. Everyone loses and safety is compromised.
- maintain pre-pandemic bus routes based on providing access for all (elderly, disabled, students, & people who chose to travel by bus in the neighborhoods

QUESTION 16: Do you have any other thoughts or comments you'd like to share with us?

- install touchless walk signals during pandemic.
- ev charging infrastructure needs to be greatly expanded
- More transit, fewer single user auto traffic.
- I think the intersection between zoning and transportation is an important issue. Where good rapid transit lines are installed, increased density is in order. This also requires a

larger regional view than the area of this public transportation planning. That bigger picture includes more, better, faster rail connections to larger and more distant population centers and expansion of good transportation services such as EMX to places like Vineta, Coburg, Creswell, Junction City. Perhaps those ""exurbs"" need to be encouraged to limit their urban growth boundaries in exchange for better public transportation connections that limit or reduce job to home and home to shopping area car trips.

- Dedicated bus lanes with frequent service MUST be a top priority if we are to move toward sustainability; Commit publicly and bring policies and budget into alignment with a prioritization of modes as follows--- 1. walking> 2. transit> 3. biking> 4. car share/taxis> 5. individual car ownership/use; Change zoning so that there are more places to go nearby people's homes; make e-bikes accessible to all and create the infrastructure that will support people in feeling safe using them;
- Used to bike commute (now retired)
- The bus system is too expensive. $9Million each for huge hybrid buses that don't ever use the electric option. NOW spending $10mil each for huge electric buses. Use smaller electric buses to go more places. The bus shelters are a joke. They don't protect people from wind or rain. Better bus shelters, less art work. I think the lighting is too bright/harsh as it is. Choose softer looking, directional LEDs to reduce night pollution...we live on this planet with other creatures.
- Fix 30th ave biking
- Parking is not expensive enough. We really need more Donald Shoup-inspired parking pricing in Eugene! When parking spaces are full for blocks and blocks, you have to raise the prices! Also, I know this is a transportation survey, but increasing density of development, especially within a mile of the downtown cores and along major corridors, will be the best investment our community can make in improving transportation for our community.
- Try out? How about programs to subsidize ebike purchase? All evidence so far says they reduce VMT
- Our priority should be to build out a system where 95% of people can easily walk and use transit for 95% of their daily needs. Add bicycle and other active infrastructure to address needs beyond that, and then auto use last.
- I'm glad for the new bike lanes that are more separate from car traffic. I have always hated, say, Pearl St. where bikes were supposed to ride to the left of center, a very dangerous feeling place. Likewise the bike lane on 11th downtown. I hate it.
- Electric micromobility is likely coming whether encouraged or not. It would be to the advantage of the area if this revolution is planned for -- both to avoid conflicts with existing non-motorized users, but also to maximize use of micromobility over passenger cars. Eugene-Springfield has the opportunity to be a model here. Also, we absolutely

need to have programs encouraging employers to install workplace electric vehicle charging and programs to incentivize charging network operators to install DC fast chargers for EVs.

- Multi use paths are a thing of the past with electric scooters, skate boards and bikes competing with bikes, roller blades, skate boards, joggers, baby carriages and walkers.
- Overabundance of on-street parking, and a near-complete lack of enforcement of the few restrictions, destroys bike/ped safety and induces more driving. Time to put that acreage to better uses than storing people's private property. Also, I understand Lane County leads the state in roadway deaths and drunk drivers are a big part of that. However, putting in center-line rumble strips on roads that don't have truly rideable shoulders causes unsafe, and illegal, passing of bikes by motorists. In the interest of safety, we're making our county roads less safe for the most vulnerable users AND discouraging a means of transportation that adds years to people's lives. (People who ride bicycles live, on average, about 3 years longer than those who don't.) Let's focus on the problems (speeding, DUII, distracted driving) rather than assuming no one will travel between cities by bike. That assumption becomes self-fulfilling when things like rumble strips are cut in. Lastly, but probably most important, we really need to put up ""Bikes May Use Full Lane"" signs. It educates motorists and causes them to be less aggressive towards the people they encounter who are on bikes. While we're at it, put up educational signs about ORS 811.065, safe passing of bicyclists. The map failed me, but the southbound bike lane on Coburg Rd as it approaches Eugene north of Crescent simply disappears. Imagine encountering this on arrival from the Willamette Valley Scenic Bikeway while trying to get to one's Hotel. That hazard is a terrible look for us.
- I'm concerned about electric scooters and e-bikes sharing cycling infrastructure given their greater speed and indication so far that the users of the former are at least as likely to ignore proper warning protocol when passing as are cyclists. City also needs to greatly enhance density of retail/etc. options in non-downtown areas to reduce auto trip lengths drastically Few areas in area offer 20-minute neighborhoods, city has done little to advance medium density housing with setbacks that will reassure opponents so that outlying neighborhoods will get out of their drive-everywhere habits
- Please don't view this as just a transportation plan--transportation must be seen in context, as part of our strategy for climate change, housing affordability, equity, and health and economic opportunity.
- Electric cars are a waste. They do not address inequities in our transportation system or land use policies that support cars over people. Stop pouring money into it.
- I'd be much more interested in getting more people on electric bikes than in electric cars, which still use virtually 100% of their power to move the vehicle, not the passenger. And they still need parking spaces.

- Obviously people in this area are not interested in riding a bus. LCOG is not working in the best interests of Coburg or the rural areas of lane county. Continued growth is slowly destroying this once peaceful, safe area. The root cause of the problems in this area and the entire world is over population. We should be putting our focus on that and not a bandage over the problem.
- We all need to move to EV use, sooner or later. Vehicles and charging stations need to move ahead together.
- EV and autonomous vehicles are very soon going to be the predominant mode of transit. We should be planning for this shift in vehicle ownership and type. Charging, pick-up/drop-off regulations in downtown, smart intersections, autonomous truck delivery.
- Most interested in how funding will support reduction in ghg emissions
- I would ride my bike more often in the winter if there were a better program to keep the streets free of leaves and other debris. Wet leaves can be dangerous for bikers and walkers.
- Hi... Concerning the plans you are creating, please note that I'm not in favor of more speed bumps or attempts to reduce the use of private automobiles. Folks should be able to use and enjoy different types of transportation options that work best for them and that they can afford without impediments. Thank you to each of you who are working on these plans and for your help in making our community a better place to live! :-)
- How will you assess these data statistically? What are your hypothesized outcomes, and how did you plan to test these? Are there conceptual, theoretical, or operational methodologies that are used to support your findings as both valid and reliable? How do you hope to gauge the importance of the risk-benefit spatial attributes you requested participants to place on the map? I have developed a very similar methodology to this over the past few years; the application, for the purposes of a doctoral dissertation, is on brownfield land uses. However, I can suggest statistical tests and methodologies to strengthen your results. I would also be very excited to talk after the survey closes to learn more about the roadblocks you have encountered, which can help me as I move forward in my research. This is an awesome collaborative tool!
- (I wasn't able to make a mark on the map using my phone) Most of my neighborhood (1 block west of Hwy 99 near Royal) has no sidewalks & is poorly lit. We like to walk our dog to Peterson barn, but when its dark early most of the year, it doesn't feel safe to do so early in the morning or after work since it is so dark & we have to walk in the street.
- We need to address the lack of freeway/highway systems in the Eugene/Springfield area. Technology and improved sidewalk/bike lanes will not make up for the lack of extra roadways that are needed.
- More walking and biking through density, reduced car use, ped/bike only spaces among others are great ways to attract young professionals to our community and to make it thrive. I hope that the city will start to implement these things and more.

- As the population ages, active transportation will more likely feature walking versus bicycling, scooters. Making it more accessible should be a priority, e.g., mandate sidewalk infill when properties sell; upgrade neighborhood collectors to have at least one sidewalk/multi-use path; educate residents on their responsibilities to keep sidewalks free of debris and vegetation trimmed; set traffic lights so there's a time when every traffic lane is red so that when the light turns green and the pedestrian gets the go-ahead to walk, they aren't endangered by those running red lights; ensure cleaning up sidewalks is part of contracts to do work in the right-of-way (gas line installs, tree trimming for utilites); schedule clean-up of major walking routes abutting roads after gravel is used for ice/snow (as it gets kicked up on the sidewalk and makes it very slippery); use more HAWK pedestrian crossings versus the flashing beacons.
- Free EV charging at Parcade is GREAT! Blinking yellow light pedestrian crossings are good. Traffic light patterns and signage is good. Cyclists & boarders should wear bright neon reflective clothing.
- One area not addressed here is additional law enforcement to increase traffic safety and the safety of pedestrians and visitors in some areas of the metro area, such as downtown Eugene.
- I primarily use bike for transport, occasionally using my own vehicle and car share. I walk for leisure in y neighborhood. Sidewalks in my older neighborhood need repair but some home owner neighbors cannot afford to replace. Would like a program to assist low income home owners upgrade sidewalks in front of our homes. If there is a program would like to know.
- Shifting to electric vehicles is long overdue. The gasoline tax should be raised such that the price of gasoline does not fall below a certain price. This would ensure steady movement away from gasoline-powered vehicles.
- I have an electric bike but I am wary of using it for errands because I believe it will be stolen when parked in front of businesses. I believe the concept of public transit being a more frequent or going more places is somewhat misleading in terms of how LTD interpreted this question a few years ago existing bus routes should be improved to increase speed and efficiency and but not at the expense of cutting out routes completely. In an ideal world we’d like to see frequent service everywhere, but not if what is meant is at the expense of any access at all.
- Planning for an electric vehicle future should not come at the expense of the transportation issue surrounding SOV use. With the climate driver reduced or eliminated by EVs, transportation planning must still acknowledge that systems to support SOV use are unsustainable.
- Thanks for working on this! Transportation reform is crucial to reduce global warming. Most local climate pollution comes from cars, a fact too often ignored by people claiming to care about climate change.

- ITS has best GHG bang per buck. Would love to see small barriers in connections improved for active modes.
- I'm not sure if EVs should count as ""multi-modal."" They are still cars and still take up more than their fair share of road space and parking space. Make sure to invest in e-bikes as much or more as you are investing in EVs.
- I think electric vehicles are a part of the solution to our climate crisis, but they don't make cities more beautiful, safe or pleasant. This technology will happen without a boost from us. Pedestrians are our most vulnerable users; start with pedestrian access and safety for the biggest bang for our buck. Investment here will have a trickle up effect, and will have a positive effect on biking and transit.
- I can't go back to the map but I was not thinking of bike share when putting comments on the map. If you use/expand bike share, it needs to be expanded to lower income areas (ie- West Eugene).
- Your map doesn't work. Extremely dangerous for bicycles along River Road northbound when nearing Beltline. Cars turning right across bike lane to take shortcut through parking lot to River Ave, to turn right onto River Ave, to turn right onto Beltline, and to turn right onto Division! Holy cow! Who designed this area?! Dangerous area along Roosevelt at 99W. Vehicles leaving and entering new gas station (two access/exit points) most drivers don't stop before the sidewalk that cyclists appear to need ride both directions. And this is, just past the turn lane from 99 southbound to Roosevelt westbound, where drivers often don't stop. Vehicles exiting ew gas station are often turning eastbound AND crossing the eastbound bike lane. There are so many issues in this area - between the angled railroad crossing and the intersection with the neighborhood to the north and industrial area to the south (seems a lot of FedEx trucks go in and out of there). And NOW a 7-11 is going in at 99 and Roosevelt! VERY bad planning and design in these two areas.
- I'm a fan of bike share programs, but Eugene's doesn't really serve anyone who doesn't live downtown or by campus. The state of bike infrastructure (at least in Eugene) is decent (for a city in the united states), but it's intimidating for someone who isn't used to riding bikes which makes a lot of people not consider using it. If the paths were more common and less intimidating, and the bike share radius larger, it would be useful to far more people.
- Stop with the curb bump-outs, all they do is decrease situational awareness because I’m concerned about watching for new curbs so I don’t wreck my sidewalls. Also, I don’t like large EV batteries, hydrogen paste exchange stations are way better from a mining standpoint.
- The city will need to build infill housing and climate goals and space concerns can't sustain more automobile infrastructure. Concern for automobile infrastructure (like parking) already limits the scope of projects that we consider acceptable. We need to

strive for a future Eugene with intra-city travel dominated by public transit and bike-like options.

- Residential EV plug in option for people with no off street parking
- Complete the sidewalks on College Hill. Put overhead lines underground. Redesign streets to make them pedestrian friendly. Build more housing spent. Stop sprawl.
- hard to ride bikes on River Road with heavy traffic need more options for bike paths in Santa Clara area need better lighting near WWTP bike path -- very unsafe early in morning for commuters
- Roadways through-out the city are in horrible disrepair. Commercial vehicles (trucks, etc) should bear a larger % of maintenance costs since such vehicle cause a majority of damage. Increase traffic police patrol...running red lights/stops signs, cell phone use and general dangerous driving has become commonplace.
- Need to have automatic traffic controls/enforcement on Harlow Road and Coburg Road. No cops; automatic photo ticket writers. Also, auto traffic metering, minimizing traffic at peak hours, on same roads. Twenty is Plenty is a welcome program in Eugene!
- I'd probably be more interested if I had an ev.
- Bicycling is not practical in Eugene for much of the year. Scooters and skateboards should not be used on sidewalks. Ever.
- Make sure bike share programs, electric assist or not, are accessible - and don't make getting trikes or other accessible bikes a mysterious process (*cough PeaceHealth cough*). I am personally uninterested in scooters, but I do know they can cut down on car traffic and be useful especially in downtown. Honestly, I'd eliminate parking on Broadway and turn it back into a pedestrian/bike/scooter/skate right of way with a lot of space for restaurants to have tables outside. The Streatery was awesome. Let's keep it up all year.
- It doesn't take a computer simulation to figure out the traffic issues in the Eugene Springfield area, just drive and pay attention as traveling westbound on beltline over the river is an excellent example. Traffic lights on sixth & seventh Street used to be synced if you maintained a single speed, but now we have the EMX. Franklin at U of O, forget it. it is a lot of stop-and-go. Off ramps (if you want to spend money on anything) should be extended because, for some silly reason, people in this region feel that they have to slow down about a mile before them thus creating a bottleneck. Downtown I avoid it whenever possible because I don't feel safe also lack of convenient parking and having to race the parking meter. On the meters, it would really be great if you put in your debit card and it charges you for the time that you are there so you can take time to actually shop. I like the one parking option where I pay with my smartphone and if I need more time, I just go to my phone and add more time. And finally, you have a history of not maintaining the current infrastructure and I would fix that before thinking about any modifications or

improvements. Poorly maintained roads cost people hundreds of dollars per year in vehicle damage and delays.

- Electric bikes, etc. are NOT compatible with our existing pedestrian/cycling infrastructure. If they are allowed (which it appears is inevitable) we need more space to allow safe use for all users. Speeds are much faster using these modes and from my experience the users of these technologies are not aware of courteous passing and signaling. My preference is to ban the use of these on pedestrian/cycling paths. Put them in the auto lanes and have those users deal with them. If ""20 is plenty"" electric modes of transportation have sufficient capability to use the auto lanes w/o impeding traffic flow.
- Adding alternative transportation is good for the environment & interested able bodied people, however, it should be a supplement, not a replacement for buses as transportation.
- Amazon Station, Santa Clara, and other neighborhood hubs

QUESTION 21: How do you usually get from one place to another using other means of transportation?

Of those who said that they usually travel by another means of transportation, they wrote the following in the open text box:

- tempted to get an electric bike version for some of the big hills around here...
- I have been avoiding the buses somewhat during COVID, look forward to when I can get vaccinated.
- I've spent most of the past two years on crutches. It's a nightmare here. Bike paths flood (very dangerous to traverse standing water on crutches). Sidewalks are broken and nonexistent. Car rams on slippery sidewalks are hazardous. Just horrid!
- My husband rides his bike quite regularly for recreation in the summer and in the neighborhood for errands. A friend and I used to go out to lunch once a month, and in nice weather, we took the bus for an adventure.
- COVID has decreased my biking as I now work from home and no longer bike commute.
- Link trips; have multiple choices that favor biking and walking
- I suspect that I am not the only community members whose transporation mix has adjusted due to the risk-based perception of COVID. This should be taken into account. My answers to the questions above, pre-COVID, would have been subtantially different. For example, the relationship between my walking and bus behavior would have been the reciprocal of what I reported here.
- In vehicle with other
- A major shortcoming is a lack of coordination between the cities and the county. For example, the stretch of Highway 99 between Dillard Rd. and Creswell is very dangerous

for cyclists. Roads should be designed so cyclists can travel between towns. This is now completely overlooked to the peril of cyclists and annoyance of drivers.

- My habits have changed significantly due to COVID. Pre COVID I mostly walked, bikes, and took transit. Now, I work from home and don't have a commute.
- Things have changed during the pandemic. Weâ€™ve been told that public transport is not recommended, but weâ€™d like to return to it after, if our routes are still intact.
- I used to ride bus more. Looking forward to riding again after COVID-19.
- Biking is usually weather-dependent
- Won't ride Public Transit during Covid-19 (Age-66)
- My son uses the bus all the time as he choses not to drive. With physical limitations, I drive most of the time, but if I can take the bus in a timely manner, & not have to walk very far, I would take the bus more often. When I can no longer drive, we bought our house partly to be near a bus stop for the future.
- These questions make no sense during the pandemic

QUESTION 23: If yes, please select the most common travel method(s) that you use.

For those who said that they or a family member travel to and from school and selected “other” as their most common travel method, they wrote the following in the open text box:

- But we would LOVE to bike if there were a safe connection. It's only 2 miles.
- This will change if Transit Tomorrow removes the bus stops near our house. Not sure how our student will get to school then; she is now old enough to drive so we may add a passenger car to the road.
- By herself
- well, when you actually *went* to school
- My partner drives every day as an essential retial worker
- Mostly walk. Rarely drive.
- Ev
- This should be allowed only for people who respond yes to the previous question. Also, what is school? K-12, college? university? What if that is where we work?

APPENDIX D: ISSUES MAP COMMENTS

Below are the unedited comments that respondents submitted in the issues map, grouped by address. Respondents wrote in the location name.

Location Name	Comment	Address

River Road & Division Ave	Way too much traffic at this intersection	1 Division Ave, Eugene, OR 97404, USA
37th at Willamette intersection	Inadequate marked pedestrian crossings in this area	10 W 37th Ave, Eugene, OR 97405, USA
Delta/Green Acres Intersection	Bike path abruptly ends at a very high traffic intersection. It is impractical for anyone who is not a very confident cyclist to access the businesses on Green Acres.	1005 N Delta Rd, Eugene, OR 97408, USA
where eastbound bike path meets N Delta Hwy	the bike path ends at a large and busy intersection. I've complained about it before. Solution would be a signal for all vehicle traffic to stop to allow peds and bikes to cross over to the south side of Crescent to access JoAnn's, Goodwill, MOC, etc.	1005 N Delta Rd, Eugene, OR 97408, USA
Fern Ridge Path undercrossing at Bertelson Rd	The Fern Ridge Path undercrossing at Bertelson Rd floods often, forcing people to cross the high-speed and poorly signed and marked Bertelson Rd. About a year ago, a person on bike had to make this detour, and a reckless driver crashed into them, causing serious injury to the person on bike.	1011 S Bertelsen Rd, Eugene, OR 97402, USA
Prescott Ln	Pavement here is very rough, degraded, and several sunken strips where it has been dug up.	1055 Prescott Ln, Springfield, OR 97477, USA
6th Ave	There are too many lanes to cross safely. The sidewalks are too narrow. The wide street and many lanes encourage people to drive too fast here (in my experience, typically 10-15 mph over the speed limit). This is an extremely hostile environment for biking and walking and divides the neighborhood. I have lived along highways of 100k-200k AADT that were less divisive than this street.	1070 OR-99, Eugene, OR 97402, USA
Bike Lane / Connections on Coburg	This area is so confusing on a bike! Crossing under the highway (both directions) is unclear and feels very unsafe with the number of car-traffic	1075 Ruth Bascom Bike Path, Eugene, OR 97401, USA

	directions and lack of driver awareness of crossing bikes.	
Coburg-MLK-Club Rd-I 105	These intersections are very confusing, convoluted, and don't seem to work well for any mode. Maybe a less convoluted design would work better?	11 Coburg Rd, Eugene, OR 97401, USA
4th Ave and Blair Blvd	Drivers of vehicles do not adhere to painted crosswalks, and it is also difficult to see around the sharp angle of Blair Blvd, leaving people crossing in this area in a difficult and dangerous situation. This problem becomes increasingly noticeable with the amount of foot traffic due to walkable businesses in the area and the walkable nature of the Whiteaker (Whiteaker Community Market, Red Barn Natural Foods, Slice Pizza, etc.), and two bus stops on either side of the street, resulting in people crossing the street frequently. A stop sign on Blair Blvd would greatly improve this intersection.	1100 W 4th Ave, Eugene, OR 97402, USA
Acorn underpass on Fern Ridge Bike path.	Repave the path surface from rough and jarring asphalt to either 1)much smoother (and wider?) asphalt or 2) concrete as in the remainder of the path.	1130 Acorn Park St, Eugene, OR 97402, USA
Fern Ridge Path undercrossing at Acorn Street	The Fern Ridge Path undercrossing at Acorn Street is extremely rough and narrow. It is not fun to ride a bike on it.	1130 Acorn Park St, Eugene, OR 97402, USA
delta ponds	A bridge connecting the gravel paths into a loop	1150 Darlene Ln, Eugene, OR 97401, USA
West 11th Underpass	Security concern with loitering people under this bridge. Also, a common area where bicyclists get flats. I have had 2 under this brindle in the last year.	1165 Sam Reynolds St, Eugene, OR 97402, USA
Bike Path too narrow	Bike path pavement is too narrow on NE side of intersection, users frequently misjudge the turn and fall off the pavement into the dirt. Pave an	1190 City View St, Eugene, OR 97402, USA

	additional 2-3 ft to accommodate turning radius at this intersection.	
Access path from West 12th Avenue to Fern Ridge Path near City View St	The path that connects West 12th Avenue to Fern Ridge Path near City View St has failed pavement, is narrow, and extremely difficult to navigate safely. It needs to be repaved and signage improved.	1195 City View St, Eugene, OR 97402, USA
University / 19th Intersection	Cars frequently blow through stop sign, barely slowing down	1208 E 19th Ave, Eugene, OR 97403, USA
North side Willamette River bike trail	Add lights. Does not feel safe due to being too dark at night.	1218 Aspen St, Springfield, OR 97477, USA
Commons Drive roundabout	More roundabouts like this would be great.	123 S Garden Way, Eugene, OR 97401, USA
bike infrastructure on Coburg	I would love to ride my bike to Trader Joe's more often, but the bike path abruptly ends and you have to navigate a busy parking lot or ride on a narrow sidewalk	124 Coburg Rd, Eugene, OR 97401, USA
Fern Ridge Path crossing at Polk St	It is hazardous for people crossing Polk Street. Cars drive too fast and fail to stop for people crossing the street. This is also a Safe Routes to School route. It is not clear where people should cross Polk Street and Amazon Creek.	1249 W 16th Ave, Eugene, OR 97402, USA
West Eugene Bike Path	The path regularly floods throughout the winter, which cuts off essential access as a commuting route for bicyclists and walkers to employment centers and essential services both to West Eugene and center city. This also cuts off all forms of recreational access	1250 Bailey Hill Rd, Eugene, OR 97402, USA
Narrow Sidewalk for Amt of Foot/Bike Traffic	There is a very narrow sidewalk between the community garden and Lincoln School building for the amount of foot and bike traffic that use it to get	1259 Monroe St, Eugene, OR 97402, USA

	to the Fern Ridge Path, the dog park, and north of 18th.	
E 13th Ave bike lane to/from campus	Light coordination is poor making this a really slow biking route. Bikes have to stop at every intersection.	1290 Patterson St, Eugene, OR 97401, USA
13th and Lincoln	Raised pedestrian crosswalk across West 13th avenue is too high, like a speed bump on steroids.	1293 Lincoln St, Eugene, OR 97401, USA
13th and Lincoln	The raised sidewalk is too high.	1293 Lincoln St, Eugene, OR 97401, USA
Raised Crossing	This new raised crossing is WONDERFUL!! The problem is that people driving don't have a lot of notice and are often speeding when they hit it. Add some signage or other notice, so people don't hit it going so fast. If folks were actually going the speed limit, it wouldn't be a problem. I'd like to see MANY more of these around the city, so let's get this right.	1293 Lincoln St, Eugene, OR 97401, USA
Garfield and 13th	Major E-W traffic is routed through residential neighborhoods (from 11th to 13th,18th) causing frequent accidents. Instead extend E-W traffic on 11th to Chambers.	1295 Garfield St, Eugene, OR 97402, USA
Polk Street	The entire length of Polk Street has failing pavement and no safe space to ride a bike. Its design encourages drivers to speed. Please remove on-street parking of private vehicles from the public right of way and reallocate the space for people to move about safely.	1295 W 18th Ave, Eugene, OR 97402, USA
Street bike sensing needed and Pedestrian flashing signage at Polk and 22nd.	1) add a bike activated street induction diamond to alert cars of approaching bikes 2) integrate the bike activation circuit with pedestrian activated solar crossing flashing warning signs	1295 W 22nd Ave, Eugene, OR 97405, USA

bike path at City View	Mark all cross-streets on the Amazon path. Just stencil on the overpass (both ways) or create a signpost so we know where we are & can describe it to others.	1304 City View St, Eugene, OR 97402, USA
West Bank Path	The entire length of asphalt path needs has multiple potholes and bumps. It needs to be replaced and widened.	131 Arbor Dr, Eugene, OR 97404, USA
13th avenue bike path	The 13th avenue bike path is a terrible experience for cyclists -- stopping every block, forced to stop on a green light, despite wanting to go straight (consider a cyclist going eastbound on 13th having to stop at pearl -- it's nonsensical), etc, etc. Attempting to cross 13th via a N/S street is also now a terrible experience. I can't think of a single thing that was not made worse due to the 13th avenue bike lane.	1313 Pearl St, Eugene, OR 97401, USA
Fern Ridge path at Oak Patch	The passive signage here seems somewhat dangerous. What about adding a solar activated warning signal for cross car traffic?	1333 Oak Patch Rd, Eugene, OR 97402, USA
West bank bike path	The asphalt portions of this bike path are in need of consideration for upgrades to the wider and friendlier concrete version.	135 Oakleigh Ln, Eugene, OR 97404, USA
West Bank Trail	I am looking forward to the rehabilitation of the West Bank Trail, delighted for the lighting. It will be a real asset to recreational biking and walking and for commuter travel.	135 Oakleigh Ln, Eugene, OR 97404, USA
Bike Path west of Arthur underpass	This location has serious creekbank slumping and path erosion. Large cracks are filled with tar but the creek clearly needs some additional rock work improvements and the path needs to be placed on a more stable underpad and concrete redone.	1398 Arthur St, Eugene, OR 97402, USA
W 19th	This whole stretch needs traffic calming like E 19th got, if not diverters. Way too much	141 W 19th Ave, Eugene, OR 97401, USA

	aggressive driving. Get the through traffic onto 18th where they belong	
Alton Baker Eastgate Woodlands	End the oasis of darkness, itâ€™s too dark for most to feel safe, requires buying expensive lights and ultimately generates more VMT, causing greenhouse emissions that will harm the wildlife	1451 Walnut Rd, Springfield, OR 97477, USA
River Path between D St and I-5	The lack of lighting here is extremely dangerous.	1451 Walnut Rd, Springfield, OR 97477, USA
South end of Knickerbocker/offramp	Need bike and ped access to southbank trail here. a signaled crossing here and a ramp and at grade crossing of the racks would connect this whole neighborhood- Laurel Hill Valley to the network.	1452 Sylvan St, Eugene, OR 97403, USA
Maxwell Rd	This is one of the only ways to get between River Rd and Barger. The alternatives are going south to Roosevelt, or north to Irving and going south on 99. The bridge has a narrow sidewalk on one side, and no bike lane. Given how important it is for cyclists and pedestrians, improving this is fairly important.	1475 Maxwell Rd, Eugene, OR 97402, USA
Bike path connection	A connection here or at the end of manor drive to the existing path behind RiverBend would create great access for local residents and allow bikes to avoid the dangerous section of MLK	15 Kathleen Ct, Springfield, OR 97477, USA
Washington-Jefferson Viaduct	This viaduct is extremely impactful to air quality, noise levels, transportation connectivity, and levels of car traffic in the neighborhood. It would serve car traffic better and be less impactful to the neighborhood if it terminated at 1st Ave instead of 7th Ave.	150 N Jefferson St, Eugene, OR 97402, USA
Clearwater Park	Pedestrian bridge to Mt Pisgah. Would also open up creating a path on the south side of the river as well.	1502 Clearwater Ln, Springfield, OR 97478, USA

Mohawk Blvd near Olympic	Uncomfortable area to bike through due to vehicular traffic and little recognition of the bike paths	1520 18th St, Springfield, OR 97477, USA
Patterson between Franklin and 24th	Crossing Patterson east-west on foot is too difficult. Paint east-west crosswalks at every intersection.	1547 Patterson St, Eugene, OR 97401, USA
Hilyard from Franklin to 24th	Crossing Hilyard east-west on foot is too difficult and is a major route for students. Paint east-west crosswalks at every intersection.	1553 Hilyard St, Eugene, OR 97401, USA
Between 27th and 24th on Amazon	Lots of foot traffic with no clear or lit crossing in this area	157 E 27th Ave, Eugene, OR 97405, USA
Two-way bike lane on Alder along campus	Two-way bike traffic along the one-way road is confusing for cars crossing Alder. Drivers may not know to look both ways for bikes, especially if new to the area.	1584 Alder St, Eugene, OR 97401, USA
Fern Ridge Path undercrossing at Chambers	Frequent flooding makes it impassible, requiring users to cross Chambers at surface	1600 Chambers St, Eugene, OR 97402, USA
99	I work off of 99 and live in the Whitaker. Buses take over an hour to travel that short distance and cycling conditions are not safe.	1601 State Hwy 99 N, Eugene, OR 97402, USA
River Loop	This road has a fairly high speed limit 45?) and no shoulder/lights, but it has a lot of foot and bicycle traffic. Given the increasingly residential nature of the area, it seems like it should be lowered.	1625 River Loop 1, Eugene, OR 97404, USA
18th Overpass	Safety and lighting has been a concern. Also, lots of trash and debris left by the house-less camps nearby	1665 W 18th Ave, Eugene, OR 97402, USA
Chambers St. & Arthur St. northeast side	Remove the decommissioned utility pole that is on the northeast corner. It is unnecessary and blocks vehicular views of pedestrians, especially if you're on Chambers making a right turn onto Arthur. The pole reduces pedestrian visibility and makes this intersection more unsafe.	1775 Arthur St, Eugene, OR 97402, USA

ECCO Apartment/DariMart	The recent death of Tony Lockhart as he crossed River Road is a strong indicator that a signalized crossing is needed at this location. With the addition of 53 units at Iris Place across the street, even more pedestrians and vehicles will be accessing River Road. Please prioritize safety measures in this and similar locations.	178 Norman Ave, Eugene, OR 97404, USA
Intersection of E 30th Ave and Agate	Install a stop light so that people can safely turn left from Agate onto 30th Ave. Less expensive, but not as safe, improvement is to slow traffic on 30th. Don't let speed go up to 45mph until after Spring Blvd.	1781 E 30th Ave, Eugene, OR 97405, USA
Coburg Road	Car drive very fast and biking does not feel safe	1785 Adkins St, Eugene, OR 97401, USA
18th & Hilyard Intersection	New light is inadequate to protect crossing cyclists from turning cars	1788 Hilyard St, Eugene, OR 97401, USA
Buck Street North	Needs a pedestrian crosswalk between Oak Patch and Brittany	1790 Buck St, Eugene, OR 97402, USA
Hwy 126	This is the only way to get to many towns to the east, but since it's a very high traffic road, the lack of shoulder means it's not a safe road to bike down.	180 S 79th St, Springfield, OR 97478, USA
Intersection 18th & Jefferson	Bike flow north/south is difficult due to parking; narrow travel between parked and moving traffic	1805 Jefferson St, Eugene, OR 97402, USA
Mohawk Blvd bridge over 126	Crossing the bridge isn't easy due to vehicle traffic and slope	1871 Mohawk Blvd, Springfield, OR 97477, USA
Goodpasture Island Rd and Ridgeway Dr/Happy Ln	Crossing Goodpasture on foot or bicycle is dangerous. There is a blind curve making it difficult to see if westbound traffic is coming. Traffic in both directions drive way too fast,	1878 Happy Ln, Eugene, OR 97401, USA

	especially eastbound traffic exiting from Delta Hwy.	
Laura St	This could make a great bike route to safely access the PeaceHealth campus from Downtown Springfield. Right now itâ€™s just another fast street for drivers who for some reason prefer not to use the fast street a couple hundred feet to the East.	1887 Laura St, Springfield, OR 97477, USA
Grove St.	This is a main throughfare in a residential zone (25MPH), but people regularly speed through here up to 40 MPH at the center between Silver and Maxwell. Need low speedhumps to slow traffic since there's no sidewalks and this is travelled by students as a main corridor for schools.	1909 Grove St, Eugene, OR 97404, USA
Intersection at Franklin and Villard	Takes forever to cross Franklin as a pedestrian, here and at other intersections. When you do get to cross, I can barely make it across before the countdown ends.	1917 Franklin Blvd, Eugene, OR 97403, USA
Bike ped bridge over 126	Connect Springfieldâ€™s Ward 1 to the bike path network along the Willamette with a bridge to the by-gully path here	1951 Don St, Springfield, OR 97477, USA
Gilham Road	Protected Bike lanes would be helpful here as there are three schools on the road and children to often not feel safe with no separation between them and cars. Protected bike lanes would also give more separation for people walking.	1958 Gilham Rd, Eugene, OR 97401, USA
Hilyard north of 23rd	The on-street parking, narrow travel lanes, and frequent pedestrian crossings on this section of road combine to make a hazard. Most nerve-wracking place for me to drive in Eugene	1961 Hilyard St, Eugene, OR 97405, USA
Westmoreland Park	The lighting in this park is so bad that we can't bike or walk through here at night safely.	1965 Fillmore St, Eugene, OR 97405, USA

Garfield, between 8th and 6th	This section of Garfield does not have bike lanes and it is too dangerous to ride on the street, even for experienced riders. Traveling here by bike is on sidewalks and involves crossing from one side of the street to the other. It's pretty bad.	1975 W 8th Ave, Eugene, OR 97402, USA
Multi-use path in Westmoreland Park	The pavement is crumbling and failing in several locations between the Boys and Girls club and the bridge over 18th Avenue. I assume it has received no care since the bridge was installed. It needs to be replaced.	1985 Fillmore St, Eugene, OR 97405, USA
All along Jefferson	Drivers go too darn fast all along Jefferson	1993 Jefferson St, Eugene, OR 97405, USA
24th Street, east of Amazon Parkway	This is one of the best crossing intersections for cyclists and pedestrians in Eugene! Cars stop on 24th for this crossing pretty reliably (like, 90-95% of the time?). Can we mark and sign more intersections like this at key crossings in the area (e.g. 24th and Alder)?	1995 Amazon Pkwy Ct, Eugene, OR 97405, USA
Taylor and W. 20th curb access to pedestrian path	Increase disabled access to pedestrian bark mulch path by restricting on street parking for a curb replacement with a graded access point to the path and portable toilet from the street. (this idea may require coordination with City Parks and Open Spaces planning....)	1995 Taylor St, Eugene, OR 97405, USA
Westmoreland Pickleball Courts and related parking and resident problems	Residential parking, disturbances, and traffic/parked car safety risk interactions on Polk is affected by the high volume use of pickleball courts at this location. My idea is to relocate the pickleball courts to the present site of the now abandoned Kidsports building and make use of the off-street parking for the courts. The base problem with the present courts is that they were constructed in a wetland and have cracks from artesian water pressure that makes their use during much of the rainier months compromised. I realize that this idea probably needs to also be	1995 Taylor St, Eugene, OR 97405, USA

	coordinated with Eugene Parks and Open Spaces.	
13th Street Bikeway	This bikeway is a really great idea that continues to be a complete failure. There at least used to be a bike lane that would allow you to go east from Jefferson to Campus only stopping twice or so. Now all users need to stop almost every block through the downtown area. Hopefully a change in the traffic lights can be made so this will become a functioning route again.	20 E 13th Ave, Eugene, OR 97401, USA
Bike bridge to Glenwood	Make it happen!	200 B St, Springfield, OR 97477, USA
Fairway Loop	Traffic diverter on Fairway Loop was misplaced and required a second one placed to the north of the first to keep traffic out. City removed this diverter without comment. How do we get it restored? New developments allowing cut through traffic around the diverter are going in and we'll end up with the original problem of too much traffic cutting through the neighborhood here.	2004 Eastwood Ln, Eugene, OR 97401, USA
Pearl and 18th	When I travel by bike south on Pearl, at 18th I have had several occasions when cars turn left from Pearl to 18th in front of me in the bike lane.	205 E 18th Ave, Eugene, OR 97401, USA
road on NE corner of Pearl and 19th.	You have to press a crossing button to cross the road and the pavement to get to the button is cracked and has standing water on rainy days.	205 E 18th Ave, Eugene, OR 97401, USA
Garfield & 7th Ave	Trnfer from south or east of this intersection to the bike path over to Roosevel Blvd is awkward. There is no direct connection from W 11th, there is no bike lane/path via Garfield, which has heavy and speedy traffic, so this is a dangerous transition from neighborhoods to get over to Hwy 99 and spots north	2060 W 7th Pl, Eugene, OR 97402, USA
Pioneer Parkway	Way too scary to cross on foot or by bike, restore two way second & third, add a stop sign here. This highway infrastructure hurts business and	207 D St, Springfield, OR 97477, USA

	property values in Downtown Springfield and is antithetical to our home town feel.	
Hilyard and Patterson	East-West pedestrian crossings on Hilyard and Patterson are impossible. Cars never stop at so-called "unmarked crosswalks". Painted crosswalks are needed at every east-west crossing between Franklin and 24th.	2091 Hilyard St, Eugene, OR 97405, USA
Charnelton & 11th Ave	This problem has been corrected very recently with a barrier. I experienced a hit and run, while on a bike. A car turned right, into my lane. I swerved, braked hard, and hit the side of their car, then leaping forward over the bike as they sped off. These types of intersections can be identified with a high degree of accuracy and predictability using geospatial analytics -- in addition to the perceived risk-benefit attributes that you are requesting from local participants.	211 W 11th Ave, Eugene, OR 97401, USA
Connect South Bank Trail	Connect the south bank bike trail from the Autzen to Knickerbocker bike bridges. This is a big missing link that will become very important as Glenwood redevelops and builds its riverfront trail. Thereâ€™s enough room between the tracks and the river for a trail and frequent usage will cut down on transient camping problems in this secluded area.	2133 Franklin Blvd, Eugene, OR 97403, USA
The scary tunnel	The scary tunnel is scary, the path nearby floods, come on, make a real connection between campus and glenwood. Maybe letâ€™s replicate what it feels like to ride through here at night for drivers on Franklin by converting the bridge over the tracks for drivers into a rickety rope suspension bridge.	2133 Franklin Blvd, Eugene, OR 97403, USA
30th Avenue	There's no good way to ride a bike to LCC. 30th Avenue has no shoulder on the west side, and the on/off ramps, while convenient for cars, are dangerous for bicycles. A bike path paralleling the road would make this route much safer.	2135 Spring Terrace Dr, Eugene, OR 97405, USA

Fern Ridge Bike Path Chambers to Danebo	I would like my daughter to have been able to walk or bike to Churchill HS, but it really has not been safe enough for years. Between homeless camps blocking road underpasses or groups of men smoking pot and yelling obscenities, the path is not safe for any child to walk or bike along it.	2139 W 15th Ct, Eugene, OR 97402, USA
Multi-use path connector on west side of Club Road	The connector from the north bank river path to the intersection of Club Road and I-105 has serious tree root uplifting and failures. Drivers exit the driveways across the path without looking for people on foot or bikes.	22 Club Rd, Eugene, OR 97401, USA
Bike and Pedestrian (School) crossing at Polk	1) Street to bike path access for bikes is not integrated with signage 2) Pedestrian crossing remains dangerous for school groups traveling from Adams to ATA track, Boys and Girls Club, etc. 3; minor) Map showing path to sidewalk alignment is inadequate unless satellite view.	2205 Polk St, Eugene, OR 97405, USA
Intersection of 22nd Ave and Jefferson St., Eugene.	Even with PED-activated crossing signal, plus zebra striped crossings on north and south sides of intersection, cars STILL speed through. This continues to be a very dangerous intersection. The intersection is on a "safe walk to school" route and many young children cross (i.e., at least they did before Covid restrictions)	2235 Jefferson St, Eugene, OR 97405, USA
12th Ave	12th Ave has a stop sign every block between Jefferson St and High St, but is a designated bikeway and a popular alternative to car-dominated 11th Ave. There should be a regional standard for bikeways that doesn't allow as many stop signs as are located here.	228 W 12th Ave, Eugene, OR 97401, USA
Beaver St & Division Ave	This is a very dangerous corner for bike riders. Cars exiting the Beltline are not required to stop before turning right onto Beaver St. There is no "runway" or buffer for cyclists to get start riding as cars quickly turn. Also returning the opposite direction also has limited space and timing to	2310 Beaver St, Eugene, OR 97404, USA

	transition back to the path along side Delta Sand & Gravel.	
Intersection 23rd Ave. & Jefferson St. Eugene	This continues to be a very dangerous intersection. 23rd Ave.'s east-West traffic to/from College Hill PLUS speeding north-south traffic on Jefferson St. PLUS a lack of sidewalks on 23rd Av.---all this adds up to a dangerous intersection for pedestrians, bicyclists AND automobile drivers.	2320 Jefferson St, Eugene, OR 97405, USA
Willamette Street	Hoping that the Willamette Street project will eliminate the poles in the sidewalks and combine driveways for improved pedestrian safety.	2330 Willamette St, Eugene, OR 97405, USA
Alder St. and 24th Ave.	Make this intersection a crosswalk for bicycles like the one on 24th & Amazon bike way.	2388 Alder St, Eugene, OR 97405, USA
Crossing both Pioneers on D	D Street is the bikeway but crossing both Pioneers is scary--why is there no designated crossing here? Cars have straightaway with no traffic signals from Centennial to Main Street-- almost a full mile.	239 D St, Springfield, OR 97477, USA
23rd and 24th west of Amazon	The sidewalk network has major gaps in this key pedestrian connection between College Hill and Roosevelt/SEHS.	2405 Portland St, Eugene, OR 97405, USA
24th and Alder	Add bike prioritization to this intersection. Cyclists can wait a long time during commute hours to cross at this intersection. Auto drivers do not know how to respond and sometimes will stop when they have the right of way placing unsuspecting cyclists at risk if they attempt to cross. Suggest and intersection such as the crossing at 24th and Amazon or 19th and Alder.	2407 Alder St, Eugene, OR 97405, USA
Alder St, crossing at 24th	Alder street is a designated bikeway, but this intersection at 24th really interrupts the flow of the bikeway. Could the entire intersection be marked/striped/signed as a bike and pedestrian crossing (similar to the effective crosswalk on 24th, just east of Amazon Parkway)?	2412 Alder St, Eugene, OR 97405, USA

Alder St. and 24th Ave.	Make this intersection a crosswalk like the one at 24th and Amazon bike trail where bikes have right of way.	2412 Alder St, Eugene, OR 97405, USA
Springfield in General	Inadequate lighting in most area of the city.	2414 15th St, Springfield, OR 97477, USA
Exit of Laurel Hill valley	No safe way for peds or bikes to get to Glenwood	2415 Laurel Hill Dr, Eugene, OR 97403, USA
19th & Amazon Path	There needs to be a smoother transition from the Path to High St to accommodate all users especially those less experienced bike riders. Currently riders need to watch for traffic coming from the West and East while attempting to connect to High St safely.	245 E 19th Ave, Eugene, OR 97401, USA
road on NE corner of Pearl and 19th.	On a bike, pushing a button to cross is required and the pavement to access the button is cracked and filled with water. It would be better if the sensor would pick up bikes but it doesn't.	245 E 19th Ave, Eugene, OR 97401, USA
4th st bike lane	This door zone bike lane sucks in general, but also specifically gets too narrow to actually fit through at the curve here	245 E 4th Ave, Eugene, OR 97401, USA
South River Path between I-105 & Ferry St Bridge	There is too much traffic on this path segment for it to be shared between bikes & pedestrians. There should be a regional standard that requires bike & pedestrian traffic be separated unless there is a reason (other than cost) not to do so (e.g. space constraint).	248 Cheshire Ave, Eugene, OR 97401, USA
E. 29th from Amazon Pkwy to Willamette St.	Protected bike facilities on E.29th from Amazon Pkwy to Willamette St. would help with safety and reduce stress for many cyclists wanting to connect from the multi-use path to Woodfield station on 29th.	249 E 29th Ave, Eugene, OR 97405, USA
25th and Alder	Curb bump-outs are too large to accommodate turning full size cars	2505 Alder St, Eugene, OR 97405, USA

End of Amazon Multi-Use Path	It would be nice to have a separated bike facility from here to Downtown, Fern Ridge Path, and the Riverfront Path (the latter of which is coming on High Street, I believe).	255 E 18th Ave, Eugene, OR 97401, USA
Bike lane along MLK	Drivers go highway speeds along this stretch of road. Sound wall creates no way to get away from traffic. No sidewalk so pedestrians walk against traffic in bike lane	2550 Wayside Ln, Springfield, OR 97477, USA
Amazon bikeway from 24th Ave. south	Needs lights. Feels unsafe at night because there are no lights.	2596 High St, Eugene, OR 97405, USA
Hunsaker Rd	Hunsaker is built like a small residential street, but it's functionally a highway offramp. Either traffic needs to be redirected down Division, or it needs bike lanes/sidewalks.	2645 Janelle Way, Eugene, OR 97404, USA
Santa Clara Transit Station	I am looking forward to the opening of the SC Transit Station. It has been a long time in the works. When the pandemic has receded, I am hoping EmX services will be provided on River Road.	2649 River Rd, Eugene, OR 97404, USA
Bike route between Veneta and Eugene	In spite of multiple repaving projects over the years, there still is no safe and direct bike route between Veneta and Eugene. It would be easy to add a 6 ft bike lane on Hwy 126 with a rumble strip to protect bikers, but for no reason this has not been done.	27000 Rte F, Eugene, OR 97402, USA
Sidewalk crossing of Amazon Drive from E. 29th	Waiting car drivers on E. 29th at the light get anxious or confused and attempt to make right turns onto Amazon Drive after stopping at the same time (or just prior to) the Pedestrian Crossing light coming on. The lights there need an accompanying sign saying "No right turn when pedestrians are present". Since bikes are forced to either merge into car lanes or mount the sidewalk at Ferry Street, they essentially become part of the pedestrian crossing traffic to access bike paths in Amazon Park. I've had numerous	2901 Ferry St, Eugene, OR 97405, USA

	near misses from turning cars (drivers had to jam on their brakes and were obviously startled!) at this crossing both when crossing with children and on my bike.	
Bike and Pedestrian crossing of 29th at Lincoln	Replace the outdated pedestrian crossing activators and add a street induction bike activator at this intersection, especially for southbound bikes on Lincoln trying to access the street path eastbound on 29th as well as for children negotiating traffic to access the newly planted modular elementary school. The way the Lincoln Street is offset at this intersection presents problems both with long waits and confusion from turning cars for crossing pedestrians. Now that the diagonal sidewalk across the field is now a modular school and no longer present, this intersection becomes a serious safety concern.	2913 Lincoln St, Eugene, OR 97405, USA
Ferndale Dr	Very few of these residential streets have sidewalks, and many of the older sidewalks are in poor condition, or lack ramps at intersections.	295 Ferndale Dr, Eugene, OR 97404, USA
Harvest Landing	A bike path from here, along the back edge of RiverBend, up to Armitage park would be a great recreation and transportation resource.	2971 14th St, Springfield, OR 97477, USA
Intersection Silver Ln and River Rd.	A dedicated turn lane from River Rd. (SB)to Silver Ln (WB) would be really helpful. This intersection regularly backs up due to people preparing to turn due to the increased population density, and schools.	3 River Ave, Eugene, OR 97404, USA
Delta Hwy between Green Acres and Ayers	The bike lane here could use protection from large trucks that come extremely close to bike riders. Maybe remove center median or widened the street?	3011 N Delta Rd, Eugene, OR 97408, USA
Bike bridge over I-5	This bridge is gorgeous and my favorite way to get across I-5. It would be great if the approaches could be protected better from too-fast motor vehicles, especially to the east.	3022 Gateway Loop, Springfield, OR 97477, USA

Bike infrastructure at Gateway Mall	I love the I5 bike path, but once you get to Gateway it's very difficult to navigate the giant parking lots on a bike. I hate riding on the sidewalk but that's the only safe way to get from the path to the stores at the other end of the mall.	3022 Gateway Loop, Springfield, OR 97477, USA
Amazon bike path underpass	Needs to be lit, as well as surrounding area	3035 Hummingbird Ln, Eugene, OR 97405, USA
Tugman park bike extension to E 39th street	It would be great to see the asphalt portion of this path converted to the wider and friendlier concrete style of path.	305 E 39th Ave, Eugene, OR 97405, USA
I-105 between Coburg & I-105	I-105 really reduces connectivity between MLK and the neighborhoods around Harlow Road. I-105 carries very little traffic for a limited access facility. Maybe the transportation system in this area would work better if there was an at-grade intersection at Garden Way and the signals at the interchange with Coburg Road were moved from Coburg to I-105?	3050 Country Ln, Eugene, OR 97401, USA
east end of River Path	The bike path, with it's issues, is really pretty good. And then across from Lane Forest Products, it just... ends? Perhaps a better transition could be put in place so people will start thinking about biking to Glenwood.	3111 Franklin Blvd, Eugene, OR 97403, USA
spencer butte trailhead	extend bus route to spencer butte trailhead & neighborhoods farther up south Willamette St.	31728 Owl Rd, Eugene, OR 97405, USA
Walk/Bike route between Churchill area and Bethel Neighborhood	In spite of people asking for it for at least 209 years, there still is no functioning walk or bike route between the Churchill Area (southwest of 13th & Chambers) and the Bethel Neighborhood.	320 Cap Ct, Eugene, OR 97402, USA
Harlow Road	35 mph Speed Limit constantly exceeded. No limit enforcement like photo ticket-writing auto-penalties.	3210 Harlow Rd, Eugene, OR 97401, USA

Ridgeline trail crossing	Really needs some more markings, at least a crosswalk	32275 Fox Hollow Rd, Eugene, OR 97405, USA
Get rid of one-way streets	Get rid of almost all the one-way streets. These waste gas in long detours and are not bike and pedestrian friendly or safe and hurt city livability. They are relics of a bygone age when car speed was the top priority.	325 E 11th Alley, Eugene, OR 97401, USA
Mt Baldy Summer	Improve a trail from Mt Baldy to Arlie Park. Improve it wide enough to allow bikes and pedestrians.	32543 Mt Baldy Ln, Eugene, OR 97405, USA
River Rd at Fir Lane	This is a great place to access the trails along the river, but it's an unpleasant crossing on a bike, especially turning left (south) from Fir onto River Rd.	330 River Rd, Eugene, OR 97404, USA
Beltline Bridge	This is a bottleneck and needs to be expanded to 6 lanes (or put in a couple more bridges across the Willamette). River Rd/Santa Clara is becoming more dense, and existing roads cannot handle the volume.	3355 Riverplace Dr, Eugene, OR 97401, USA
Owosso Bridge	People camp under and near bridges can be aggressive and scary. I won't walk alone anymore and I used to walk 4 miles route a few times per week.	3355 Riverplace Dr, Eugene, OR 97401, USA
Stop freeway waste	Stop building crazy freeway projects like the I-5/Gateway road spaghetti and the planned Beltline widening. If we were really serious about global warming and increasing alternative modes would we actually be investing a billion dollars on these huge L.A.-like projects that will do nothing but promote sprawl, choke with traffic and suck the life out of downtown? Get real, 95% of the money in the TSP is going to vastly increasing Eugeneâ€™s carbon footprint and reducing its livability.	3355 Riverplace Dr, Eugene, OR 97401, USA

Willamette river	Anyway that's been here for two weeks revises that this is the major bottleneck on this freeway and looking at the animation and plans for the new construction it's taking place in this area is not going to address this issue in fact, even your own animation shows is not feasible.	3355 Riverplace Dr, Eugene, OR 97401, USA
Harlow Road	The #12 bus that goes through Harlow is excellent, and its frequent route between downtown and Gateway was a key factor in my choice to make my home in this area. I am concerned that LTD had a proposal to eliminate the #12. Please keep service as is. It is the only bus north of MLK that serves the area between Coburg Rd and Springfield.	3393 Harlow Rd, Eugene, OR 97401, USA
Intersection at VanDuyn and Harlow	Difficult for transit users to cross Harlow to stops on N and S sides of the street. Generally dangerous intersection for those walking and biking.	3393 Harlow Rd, Eugene, OR 97401, USA
On Harlow Road, between Van Duyn and Waverly	Pre pandemic, LTD was going to eliminate their #12 bus that runs on Harlow Road between Coburg Road and Gateway Street. My wife and I are senior citizens who take the #12 bus frequently. Eliminating the #12 bus will present a hardship for us as it will make it impossible for us to ride the bus. In order to ride a bus, we would have to walk a mile to Coburg Road or a mile to the bus station on Gateway Street in order to catch a bus. LTD needs to provide some type of transportation along Harlow Road to make it easier to catch other buses.	3393 Harlow Rd, Eugene, OR 97401, USA
bike lane near Beltline onramp	cars like to turn in front of bikes or don't see bikes in bike lane	35 Silver Ln, Eugene, OR 97402, USA
35th, Glen Oak, & Knob Hill	Needs more stop signs or â€œcross traffic does not stopâ€ signs	3515 Glen Oak Dr, Eugene, OR 97405, USA

Agate Street from E.31st to Vine Maple.	A sidewalk is needed on Agate Street from E.31st to Vine Maple Street. It is quite dangerous for people to walk on Agate Street and the only pedestrian connections from Spring Blvd. hill down to Hilyard Street area are miles apart.	3581 Agate St, Eugene, OR 97405, USA
Connector Path	Bike path connector from Clearwater Park to south side of Thurston Hills	36193 OR-222, Springfield, OR 97478, USA
Franklin Blv	The bike land just ENDS in the middle of Franklin with no safe path for bikes. It's uncomfortable, cars speed, it's dark, etc	3627 Franklin Blvd, Eugene, OR 97403, USA
37th & Donald intersection	Extremely low all-way stop compliance rate	3701 Donald St, Eugene, OR 97405, USA
New Bikeway Light Timing	Please prioritize bike traffic on the new bikeway	37w W 13th Ave, Eugene, OR 97401, USA
29th Street, west of Lincoln.	This section of the street does not have sidewalks on either side of 29th. It is very dangerous, muddy, inconvenient for pedestrians. Please put in sidewalks.	38 Lorane Hwy, Eugene, OR 97405, USA
East Side of Hilyard	A wide sidewalk on the east side of Hilyard would reduce the number of people having to cross Hilyard Street multiple times if they are coming from the east side of Hilyard and accessing a business or location on the east side. This would reduce potential conflicts.	3851 Hilyard St, Eugene, OR 97405, USA
Biking along Franklin in Glenwood	If you are going to go into Glenwood on bike, you'll need to travel along Franklin, and riding on the sidewalk clearly isn't an option due to the condition of the sidewalks. Biking in the street has gotten better in the last few years, but a serious effort to improve safety for bicyclists should be made.	3855 Franklin Blvd, Eugene, OR 97403, USA

Marcola Rd, 42 St & Hayden Bridge Rd	Cyclists find it difficult making the transition along Marcola Rd from either 42 St or Hayden Bridge Rd as the traffic is fast and many large trucks. Maybe add a flashing signal for cyclists to cross near Hayden Bridge Rd and/or use a round-about to slow traffic.	3950 Marcola Rd, Springfield, OR 97477, USA
Fox Hollow/Potter intersection w West Amazon/East Amazon	The Active Transportation Corridor made E Amazon driving lanes smaller, and the new bike lanes bring more bicycle and foot traffic through this intersection.	4001 Potter St, Eugene, OR 97405, USA
4th Ave	There should be a more direct path connecting the two segments of 4th Ave. This path should have curb cuts at Washington and Jefferson Sts so cyclists can use it.	404 Washington St, Eugene, OR 97401, USA
8th Ave at Ferry Street Bridge viaduct	There appears to be no valid reason why the northerly crosswalk of this intersection is closed to pedestrians.	409 E 8th Ave, Eugene, OR 97401, USA
EWEB at Roosevelt	There is no reasonable bus service to EWEB's Roosevelt building, workplace of 400+ people.	4200 Roosevelt Blvd, Eugene, OR 97402, USA
western roundabout in Glenwood	Having two roundabouts in Glenwood was an unexpected surprise after construction was done. It is clear that only one is needed, and having two is bewildering to less-skilled drivers like my wife. Perhaps next time any construction is done here, the western traffic circle could be removed.	4245 OR-126 BUS, Eugene, OR 97403, USA
Franklin Boulevard at Glenwood	This location was given the nickname "crazy eights" roundabouts in general are hazardous but when you come up with a crazy design like this one, it makes it even more dangerous. I cite Harlow Road as an example where you have too many lanes going into the roundabout, you're focusing on navigation, merging traffic and then throw pedestrian crossings on top of that plus if it's dark and rainy even makes it more dangerous.	4250 Franklin Blvd, Eugene, OR 97403, USA

	Understandably roundabouts are a fad, they look great in the animations, but the only work in large areas like in London not on general streets with lots of traffic. Stick with a traffic light.	
E. 39th Ave.	A sidewalk on the north side of E.39th from Hilyard to Donald would help the safety of pedestrians. I have experienced many near misses due to the blind corner, especially at night.	434 E 39th Ave, Eugene, OR 97405, USA
West D Street	The segment of West D Street from the North Bank Path to Mill Street is a critical between Eugene and Springfield for people on foot and bike. There is no safe off-street connector, but this is the best candidate for such a critter. Unfortunately the public right of way is dedicated to underused on street parking and encourages drivers to speed. Please create a safe and separated space for people to ride bikes on this segment.	443 W D St, Springfield, OR 97477, USA
Wallace Ln	Scary place to walk, no sidewalks, challenge for walking to school	444 Wallace Ln, Springfield, OR 97477, USA
Eliminate RR through downtown	Eliminate the rail tracks through downtown. Replace them with a new high-speed rail built in the I-5 right of way with a new station in Glenwood connected to EmX. This would have huge benefits: - It would allow for the removal of the downtown freeway viaducts at Washington-Jefferson and leading to the Ferry Street Bridge. These ugly, noisy viaducts destroyed much of downtown, removing them would dramatically increase livability and property values. - Eliminate delays at rail crossings. - Eliminate noisy trains and noise thorugh town. - Save numerous lives of people hit by trains. - Remove the biggest thing blocking Eugene from connecting to the river.	450 W 3rd Ave, Eugene, OR 97401, USA

	- Free up vast amounts of high-value land for parks, rails to trails and redevelopment downtown and at the big railyards along the Northwest Expressway. Besides the huge economic boom from these improvments and redevelopment, the city could be saved from a real boom. Imagine a Mosier-like fiery derailment at 5th Street Market. Imagine if instead it was a train full of deadly chlorine. This is a far more likely disaster scenario for Eugene than any earthquake.	
West D	Lacks infrastructure to support volume of people on bikes, leading to driver harassment and intimidation	453 W D St, Springfield, OR 97477, USA
Beltline between 11th and Roosevelt	Missing link in bike network between LTD EmX station at Walmart and Roosevelt Ave, parallel to Beltline	4626 W 11th Ave, Eugene, OR 97402, USA
Blair Blvd North of 6th Ave	Poor bicycling infrastructure here. No safety for cyclists.	488 Blair Blvd, Eugene, OR 97402, USA
Booth Kelly Road	There's a useful cycle/pedestrian path here, but it's in awful shape. It would be great if this could be resurfaced, and a multi use path added along the railroad tracks to connect with 42nd.	4961 Forsythia St, Springfield, OR 97478, USA
parked delivery/moving vehicles	Too many delivery vehicles and parked cars in the cycle track in this area. Enforce existing laws. In general too many vehicles park (attended or unattended) in bike lanes throughout Eugene/Springfield forcing cyclist to attempt to merge with traffic and sometimes to stop movement to wait for the vehicle to move.	5 Alder St, Eugene, OR 97401, USA
Intersection Kourt Dr and River Rd.	This intersection is hazardous for pedestrians at night. The lighting is poor. It needs a street lamp on the west side of River Rd to light up the crosswalk across Kourt Dr.	50 Kourt Dr, Eugene, OR 97404, USA

Amazon bikeway from 24th Ave. south	Needs lights at night to feel safe riding.	500 E 24th Ave, Eugene, OR 97405, USA
River Path	There NEEDS to be light here. As a young woman, I do not feel safe riding alone here at night and it's the only safe way to ride from Eugene to Springfield. This is a huge barrier when there is no other option.	510 Walnut Pl, Springfield, OR 97477, USA
downhill bike lane on Fox Hollow	It would be great if the downhill bike lane could be paved smoothly and maintained to be branch- and garbage can-free. Most people I see do not use it because it is not safe.	5112 Mahalo Dr, Eugene, OR 97405, USA
W. D Street Greenway to W. D Street	Safer/smoother transition for bicyclists needed	512 W D St, Springfield, OR 97477, USA
Clearwater to Jasper	I would love to see a better connection between the Clearwater Trail, Jasper Road and then the Weyerhauser Road- a popular place for cyclists to ride to get out of town toward the east.	5162 OR-222, Springfield, OR 97478, USA
126 at 52nd	This needs official offramp markings to exit the freeway in both directions. This can be done by simply adding striping. Traffic already does it and it works great and it's safe as you're not slowing down traffic behind you (and you don't need any fancy computer animation to figure this out, just watch the traffic) and it does not require any additional construction. Simple easy. However, I read somewhere that there are plans to put an overpass at this location which is a really stupid idea and unnecessary.	5233 Highbanks Rd, Springfield, OR 97478, USA
High St north of 6th Ave	The High St bike lane terminates a block south of a major bike connection to 5th Ave, 2 blocks south of a major bike connection to 4th Ave (and the river paths east), and 4 blocks south of a major bike connection to the river paths west and north. There should be a regional standard requiring connections to existing facilities when a bikeway is	525 High St, Eugene, OR 97401, USA

	added or a mechanism, including public comment opportunity, for why the connection wasn't made.	
W 11th / Hwy 126 between Terry and Crow Road	There should be a bicycle connection between Terry and Crow Rd. It would be easy to do a two-way separated bike path on the South side of Hwy 126 between Terry and Crow Rd, allowing riders to bypass the extra mile on Green Hill with no shoulder and high speed traffic. This 2,000' connection would greatly improve riding conditions between Veneta and Eugene, allowing people to use Cantrell Road and avoid Hwy 126 entirely.	5300 W 11th Ave, Eugene, OR 97402, USA
Racists	Police supported racism makes this neighborhood unsafe.	544 Cascade Dr, Springfield, OR 97478, USA
Bike underpass below MLK Blvd	This continues to be infested with people and dogs blocking through-going ped/bike traffic, and leaving behind a startling amount of human waste.	550 Ruth Bascom Bike Path, Eugene, OR 97401, USA
Franklin Boulevard running between Glenwood roundabouts and LCC	Biking along Franklin going south from the Glenwood roundabouts to LCC feels incredibly dangerous. The bike lanes are always full of debris and cars drive ridiculously fast there. The intersections around I-5 also feel unsafe to bike across due to lack of bike signaling. A separate walk/bike path would increase access greatly.	5510 Franklin Blvd, Eugene, OR 97403, USA
I-105	This highway carries very little traffic for a limited-access highway, and it is extremely impactful due to its location directly adjacent to the river bank. It should be replaced with a narrower facility, perhaps a widened Country Club Rd could handle the traffic that currently uses I-105.	560 Country Club Pkwy, Eugene, OR 97401, USA
Remove I-105	Remove I-105 along the north bank of the Willamette. Waterfront freeways are a planning mistake that cities all over the country and world are correcting. I-105 destroys one of the best assets Eugene has, its scenic riverfront. Replace the freeway with a park, a boulevard and then	560 Country Club Pkwy, Eugene, OR 97401, USA

	high-value park front redevelopment. Think McCall waterfront park in downtown Portland.	
West D	Replace through traffic here with a parking lot for the river path and swimming hole. Too many drivers are just trying to avoid hitting lights on Centennial	560 W D St, Springfield, OR 97477, USA
Blair Blvd	Parked cars make Blair Blvd uncomfortable to cycle on and reduce sight lines for the frequent driveway intrusions on this street. Sidewalks here are dangerously narrow.	565 Blair Blvd, Eugene, OR 97402, USA
East side of the road	missing sidewalk	573 68th Pl, Springfield, OR 97478, USA
River Road	River Road has many places where the lighting is insufficient. People cross all along the corridor, but there are patches of darkness all along the street.	585 River Rd, Eugene, OR 97404, USA
All of Patterson	Add bike infrastructure	612 E 14th Ave, Eugene, OR 97401, USA
Fern Ridge path	Actually connect the Fern Ridge path to Fern Ridge. The cars on Royal are particularly aggressive	6191 Royal Ave, Eugene, OR 97402, USA
intersection southwood and country club	Difficult bike crossing here to get to and from the river paths.	619A Country Club Rd, Eugene, OR 97401, USA
6th & 7th	Pedestrian crossing of 6th and 7th should be easier. Install touchless walk signals during and after pandemic.	645 Blair Blvd, Eugene, OR 97402, USA
Gravel bike access south of City Park dog off leash area	Pave this path and connect it with an off street path along the east edge of the dog park. Also add a bike security lock option for stops at the dog off leash area. Some problems are 1) puddles develop during rainy days 2) access to sidewalk on east edge is interrupted. 3) direct crossing of Jeffereson Street east one block at 16th Street is	645 W 16th Ave, Eugene, OR 97402, USA

	more appealing than turning north to access bike traffic crossing at 15th Street.	
Lane County Fairgrounds southeast bridge over Amazon Creek	The pavement has a huge drop and lip abutting the Lane County Fairgrounds southeast bridge over Amazon Creek. Some asphalt was hastily slopped in to fill the sagging approaches, but it is rough and hazardous if you do not approach it perfectly perpendicularly.	655 W 15th Ave, Eugene, OR 97402, USA
Bike tunnel under I-105 eastbound on-ramp at Coburg Road	People often camp or loiter, or leave their belongings and trash, in the dark tunnel, obstructing people who wish to pass through safely	66 Centennial Loop, Eugene, OR 97401, USA
Bike path access to streets south of the Rose Garden	The actual path surface and marking becomes both rough and obscure where it passes the 4J parking and service roads. Better surface and better marking are in order here.	687 Cheshire Ave, Eugene, OR 97402, USA
Crossing 7th going north on east side of intersection	Need a dedicated light for pedestrians. Currently, the right turn from High to 7th and the crosswalk can go at the same time.	699 High St, Eugene, OR 97401, USA
Hayden Bridge Way/Pioneer Pkwy roundabout	With just a few changes, the roundabout could be made safe and reasonable to use by pads and bikes. Right now, it's a nightmare. This was along a very popular bike route - not so much now.	7 N 3rd St, Springfield, OR 97477, USA
The damn roundabout	This bike path has no reason to exist because the roundabout is not safe enough to cross on foot or by bike. At the exits, even if a driver in one lane stops, the person in the crosswalk isnâ€™t visible to the driver in the other lane. Alternate north south walk/roll routes are a necessity. Nice level of service for drivers through, so thatâ€™s, uh, something.	7 N 3rd St, Springfield, OR 97477, USA
Market of Choice plaza on 29th Ave	Lots of traffic into and out of the plaza is dangerous for cyclists. It's hard to find safe biking routes to these shops.	70 W 29th Ave, Eugene, OR 97405, USA

Crosswalk to Part	Improved pedestrian crossing from neighborhoods into Tugman Park.	700 E 37th Ave, Eugene, OR 97405, USA
Crossing at 11th and Madison	Traffic moves WAY too fast and the crossing is not safe for the many residents who use this route on foot/bike to get to the dog park, Fern Ridge Path, and north of 18th.	700 W 11th Ave, Eugene, OR 97402, USA
Beltline bike/ped crossing	We need a bike/ped bridge over the Beltline to connect Santa Clara and River Road neighborhoods and to provide safe passage for students and others moving between the two.	701 Skipper Ave, Eugene, OR 97404, USA
Madison at 6th	No comfortable place for cyclists to wait at this intersection. The intersection often doesn't change for cyclists despite the sign. There doesn't appear to be a valid engineering reason to close the easterly crosswalks to pedestrians, since this intersection is not on recall and there is plenty of queuing space for cars on 6th Ave and the off-ramp.	710 OR-99, Eugene, OR 97402, USA
Intersection at Hilyard and 24th	Protected bicycle lanes throughout the intersection. This would mean installing protected bike lanes on 24th and Hilyard, as well as a "Dutch" style intersection. This intersection sees a lot of foot traffic and bike traffic considering there is extremely poor bike/ped infrastructure here. I believe the buisnesses here on Karma Corner would see immediate increases in revenue if this intersection is able to support the movement of bikes and peds	711 E 24th Ave, Eugene, OR 97405, USA
Westbound 24th, just after Hilyard	There is a crack in the road surface here that will certainly kill a cyclist one day. It's parallel to the direction of travel, forcing cyclists to either anticipate it, or ride it until the very end when they simply hit a bump. If you were to swerve at all while riding next to the crack, you'd crash in to traffic. It's been this way for years.	711 E 24th Ave, Eugene, OR 97405, USA

Sharrows throughout downtown	Sharrows are not a form of bike infrastructure. Several cities, such as LA, have already moved away from using sharrows and building better, more protected facilities. I'd like to see our region do the same. I did my thesis work looking at the bike network via GIS and income disparity. I included sharrows in the analysis but if I hadn't, there is much more stark differences between high vs. low income census tracts and bike infrastructure	725 Olive St, Eugene, OR 97401, USA
7th Ave	Too many lanes to cross safely	730 Madison St, Eugene, OR 97402, USA
Bike route to Thurston Hills natural area	Would be great if you didnâ€™t need a car to access the new trails	7390 McKenzie Hwy, Springfield, OR 97478, USA
Connection	Does not feel like a safe location on bike transitioning from Alder Street bike facility to the riverfront path at this location.	755 E Broadway, Eugene, OR 97401, USA
Thurston Hills	Skills park and pump track adjacent to the parking lot	7575 McKenzie Hwy, Springfield, OR 97478, USA
Mill Race bike path	It's a little hard to get to the mill race bike path from the middle of Springfield. Access down 28th is terrible (trucks & dirt road & no shoulder) and I'm not sure where else I can cross the tracks to join with the bike path, apart from going all the way down to 8th	790 S 28th St, Springfield, OR 97477, USA
Blair & Monroe	The lighting in this crosswalk is bad, people driving are often confused by the intersection and fail to yield right-of-way to pedestrians.	791 W 8th Ave, Eugene, OR 97402, USA
Monroe at 7th Ave	No place for bikes to wait for intersection. Traffic turning onto 7th often fails to look for pedestrians.	792 W 7th Ave, Eugene, OR 97402, USA

Crossing at 13th and Monroe	The western bike path goes through the fairgrounds parking lot and leaves you here at this crossing, but there is no traffic light for going north, so bikes have to get off and use the pedestrian crossing. Also, going south at this crossing, the light can't "read" a bike, so again we have to go onto the sidewalk to push the pedestrian light.	795 W 13th Ave, Eugene, OR 97402, USA
Monroe at 13th Ave	Cars attempting to turn left often look right and turn without checking crosswalk. Cyclists often go straight here but have to go onto the sidewalk to call the signal. Cars stop in the crosswalk when turning left on red.	795 W 13th Ave, Eugene, OR 97402, USA
Closed Crossing	This is the most direct crossing for neighborhood traffic on foot and bike coming going from the safe crossing on Monroe (and the Monroe Greenway for bikes) to the Fern Ridge Path, the Dog Park, and north of 18th, but the gate is nearly always locked, forcing travelers to backtrack around the Event Center on the Madison side. Or, for those in the know, to use the Madison crossing altogether when there is no crosswalk or bike infrastructure on either side.	796 W 13th Ave, Eugene, OR 97402, USA
South gate at Lane County Fairgrounds	This gate is almost always locked. It blocks the only direct safe off-street connection between Friendly Street and Monroe Street. Please remove this unnecessary barrier to mobility.	796 W 13th Ave, Eugene, OR 97402, USA
Monroe at 6th Ave	No comfortable place for cyclists to wait at this intersection. The intersection often doesn't change for cyclists despite the sign.	799 W 6th Ave, Eugene, OR 97402, USA
Connection	Tough transition for a bike crossing Franklin to take a 90 degree turn to get on the wide sidewalk.	800 Alder St, Eugene, OR 97401, USA
E Broadway sidewalk bikeway	Alder St bikeway traffic is routed onto a sidewalk here, but the sidewalk is far too narrow to be shared between bikes & pedestrians.	800 Alder St, Eugene, OR 97401, USA

Murdock Rd south of Fox Hollow	Open up this road, easement, etc. for cyclists/pedestrians to connect to South Lane County (Creswell, etc.). There are not great routes south of town, this would be a great option. The road appears to connect. Potentially request that the land owner(s) allow pass though access for cyclists/pedestrians. Post signage indicating as much.	84249 Murdock Rd, Eugene, OR 97405, USA
Territorial Road	No shoulder for longer bike rides. Fast moving and sometimes disrespectful traffic on this section in particular. It is a great part of a loop for a longer bike ride but also comes at a pretty high cost with blind hills and no shoulder.	84298 Territorial Hwy, Eugene, OR 97405, USA
Franklin Blvd	This is one of the two main roads to LCC, neither of which are bike friendly. An actual bike lane, or separated path, would make bicycling to LCC much safer for students.	86720 Franklin Blvd, Eugene, OR 97405, USA
42 St near International Paper	The path along 42 St runs from Marcola Rd to International Paper then stops. For cyclists headed South, this is a hazard crossing. Suggest putting in a light for crossing at the end of the path.	880 N 42nd St, Springfield, OR 97478, USA
Hayden Bridge	Speeds greatly in excess of posted, which is already too high for the volume. Some of us in the neighborhood have taken to driving Haydern Bridge at 25 mph during rush hours to force traffic to slow down or we'll stand at Harvest Ln and repeatedly push the pedestrian signal to stop traffic. Additionally, they turn off Hayden and drive through the neighborhood like it was Hayden. We've taken tp parking our cars on the street in a legal manner but turning our street into a one-lane road.	885 Old Orchard Ln, Springfield, OR 97477, USA
Hayden Bridge area	No sidewalks outside city limits, limited streetlights and drivers frequently exceed the speed limits in this residential & school area.	885 Old Orchard Ln, Springfield, OR 97477, USA

Green Hill Rd	Fern Ridge Trail is nice to get one out of town but Greenhill Road has no shoulder for bike riders heading out toward crow or Veneta for a longer ride	88505 Green Hill Rd, Eugene, OR 97402, USA
Greenhill Road	The Fern Ridge Path is great, but riding a bike on Green Hill Road is not. High speed traffic and no shoulder for a mile to get to Crow Road and popular rides to the south and west (and riding to/from Veneta).	88535 Green Hill Rd, Eugene, OR 97402, USA
Territorial Road North of Veneta	This part of Territorial Road is so dangerous for bikes that you have to choose between life and death if it is the wrong time of day. There are few other roads that connect quieter roads north of Veneta in this area and is often a connector bike clubs used to get back to Fern Ridge Trail or got down to Central and Vaughn Roads south of 126. I hate riding a bike on this road solo.	88990 Territorial Hwy, Elmira, OR 97437, USA
Classic Place	Asphalt pavement degraded to the point of ruts and debris- a physical danger to cyclists using street surface.	899 Classic Pl, Eugene, OR 97401, USA
6th and 7th	Put 6th and 7th on a road diet. The eight lane freeway couplet that dices and deadens downtown needs reform. Downtown should be a destination, not something designed to pump cars through. Remove one lane from each and add bike lanes and wider sidewalks, street trees, crossing islands and a turn laneâ€”south Willamette proves this works great. Convert 6th and 7th to two-way streets. Two way streets reduce deadly vehicle speeds, make crossing easier for pedestrians (no one car stops while the other passes and kills), reduce pollution due to shorter traveling distances, increase livability, etc. The Hult Center was supposed to enliven downtown but instead sits on an island in a freeway river of traffic.	9 OR-99, Eugene, OR 97401, USA

Blair at 7th	No safe place for cyclists to wait at this intersection.	900 W 7th Ave, Eugene, OR 97402, USA
Coburg to Eugene Corridor	It would be nice to have a multi use path between Coburg and Eugene as Coburg road is very unsafe and dangerous.	90064 Coburg Rd, Eugene, OR 97408, USA
Amazon Parkway, between 24th and 19th Ave.	There is a partial sidewalk on the east side of Amazon Pkwy that abruptly ends. No sidewalk on the west side. Let's make this road walkable, so we don't have to walk way out of our way to access this otherwise highly walkable area.	91 E 23rd Ave, Eugene, OR 97405, USA
Downtown Eugene is Scary	A place I avoid due to homeless, transients, travelers. It could be so much better. I can get all I need in other parts of the metro area.	910 Willamette St, Eugene, OR 97401, USA
n skinner	street is too narrow for 2 way traffic especially with new development underway	91193 N Skinner St, Eugene, OR 97408, USA
5 way intersection of Coburg& Oakway	This intersection is nearly impossible for bikes/peds to cross safely. If it can't be redesigned with safety in mind, some better physical or social engineering needs to happen to prevent cars from turning on red lights.	946a Southwood Ln, Eugene, OR 97401, USA
Coburg Road at Oakway	A bike box at the stoplight on Coburg would enable cyclists to move from the bike lane on southbound Coburg onto the path just east of Southwood without having to interact with the cars swooping at a rapid speed off of Coburg.	946a Southwood Ln, Eugene, OR 97401, USA
Monroe St	There should be a sidewalk on the westerly side of Monroe St so pedestrians don't need to go out of their way by using the winding path through the park. Also there are sometimes people exhibiting unsafe behaviors in the park and it would be safer for pedestrians to be able to use a route in a more visible location.	950 Monroe St, Eugene, OR 97402, USA

8th Ave	Road surface is in poor/unsafe condition. Needs "traffic calming" strategy. Current behaviors of drivers make for hazardous conditions	959 W 8th Ave, Eugene, OR 97402, USA
Polk Ave	HORRIBLE ROAD SURFACE!	975 Polk St, Eugene, OR 97402, USA
7th Ave	There are too many lanes to cross safely. The sidewalks are too narrow. The wide street and many lanes encourage people to drive too fast here (in my experience, typically 10-15 mph over the speed limit). This is an extremely hostile environment for biking and walking and divides the neighborhood. I have lived along highways of 100k-200k AADT that were less divisive than this street.	990 W 7th Ave, Eugene, OR 97402, USA
Extend riverfront path system	Make it a top priority to plan and secure land for extending Eugeneâ€™s riverfront system of parks, bike paths and bridges to the north along both sides of the Willamette and McKenzie Rivers. Past generations preserved Eugeneâ€™s riverfront gems, its time we do it for our kids. It will be far easier and cheaper now than in the future. Construction should begin soon.	999 Division Ave, Eugene, OR 97404, USA
Amazon Station	Retrofit Amazon Station as a South Eugene HUB. Buses from many South Eugene & Friendly area neighborhood routes could use the HUB as a transfer station. Also, adding electric recharging, bike rental etc. at the Amazon Station would further utilize this already existing well located underused structure.	Amazon Station, Eugene, OR 97405, USA
Bertelson biking and walking	Fast cars, small bike lane often with debris in it. Not complete sidewalk. Something like the separated bike line on Amazon would be great here!	E/S of Bertelsen S of 11th, Eugene, OR 97402, USA
Crosswalk between bike path and Delta Bridge	I echo Rob - this is a dangerous crosswalk for bikes and peds. Deserves a flashing light for	E/S of Goodpasture Island Rd S of Delta

	crossers or enforcement for cars to slow the heck down.	Ponds Xing, Eugene, OR 97401, USA
Goodpasture Island Rd. bike/ped crossing to Delta Ponds Bridge	Cars often do not stop here for bikes or pedestrians. Enforcement and/or activated flashing crossing signal would help	E/S of Goodpasture Island Rd S of Delta Ponds Xing, Eugene, OR 97401, USA
Crosswalk across Franklin	Right turning traffic from Agate onto Franklin. I've almost been hit here multiple times on foot and bike from cars who don't see me when I'm crossing.	EmX Agate Station Inbound, Eugene, OR 97403, USA
Franklin Blvd, adjacent to campus	Franklin Blvd is uncomfortable to travel along as a pedestrian and lacks support for bicyclists on much of the important stretch between campus and Springfield. Crossings are far apart and the width of the street means that it takes a long time to cross. Recent fatalities show that this is a dangerous road that needs fixing.	EmX Agate Station Inbound, Eugene, OR 97403, USA
Walnut at Franklin Blvd	Hazardous crossing, even with stoplight. For bicyclists, the signal can change when I'm only halfway across the street.	EmX Walnut Station Inbound, Eugene, OR 97403, USA
Walnut Street at Franklin Boulevard	Pre-pandemic, riding my bicycle at the end of the school / work day. I had to wait three traffic signal cycles before I was able to safely cross from south to north with the traffic signal. Car traffic from both north and south did not wait for me as they turned onto Franklin Boulevard eastbound. Additionally, a young woman was killed at this location, I believe running across the street from the EmX Station, although I don't know the details of the incident.	EmX Walnut Station Inbound, Eugene, OR 97403, USA
Lane County Fairgrounds remote parking lot	The parking lot is a de facto bike and foot path for people to cross at the only unlocked crossing of Amazon Creek between Jefferson Street and Polk Street (and those streets are also hazardous for people on bikes). Its pavement has dozens of	Fern Ridge Trail, Eugene, OR 97402, USA

	potholes, is extremely rough, and is failing is many spots. It needs to be repaved.	
Middle Fork Path	It would be wonderful to have a multi use bridge, so that people could easily walk/ride to Mt Pisgah.	Middle Fork Path, Springfield, OR 97477, USA
Running/Biking route to/from Pisgah needs improvement	I know lots of folks who run/bike to/from mt pisgah. There is currently no enjoyable way to connect w/o running along high speed roads. Creating a connection from Ridgeline to LCC is a start, but also need a safe way to get from LCC to Pisgah. To connect the loop to Springfield (and the other Buttes, Kelly & Skinners) could use a bridge over the river to Dorris Ranch. It may appear that it is a niche user of trails that would take advantage of this route, but there easily are hundreds of ultra runners in town that would take advantage of the route and lots of other users that would use part of the route. Particularly from Springfield to Pisgah.	Middle Fork Path, Springfield, OR 97477, USA
Downtown - West and East	Could we continue to make more streets 2 way that are currently 1 way without widening the street or removing street trees? It makes getting around easier. Fewer trips out of the way to get to a street that is going in the correct direction...driving or biking.	N/S of 11th W of Monroe, Eugene, OR 97402, USA
Intersection of Eldon Schafer Dr. & E 30th	The "bus stop" near the intersection of Eldon Schafer & E 30th next to LCC is ridiculous -- it appears unmaintained and disused, so every time I have waited for a bus (headed east), I always wonder if the bus stop is still in use and if a bus is going to stop for me. Transit riders who disembark from the westbound stop and who want to go to LCC have to run across 30th. There is no sidewalk up Eldon Schafer to reach LCC; LCC's walking path is right there, but there is a ditch and/or a fence to cross to reach the path.	N/S of 30th E of Eldon Schafer, Oregon 97405, USA

Franklin Road Diet	Put Franklin on a road diet. Nine lanes of high-speed traffic slicing through the UO and downtown is ridiculous. Have a pizza at Tracktown and then try crossing the street without becoming road pizza yourself or walking a mile to a still scary crosswalk. This is terrible urban design. The street could easily lose two or more lanes of traffic. The current plan for roundabouts is an absurd, carbon coughing, wasteful suburban design that prioritizes fast cars over short, safe walking and biking distances and compact, livable and efficient urban form. This is the heart of Eugene, not a suburban office park. Eliminate car lanes to redesign with cycle tracks, trees, wide sidewalks, on-street parking and slower/safer, not faster cars. With the huge UO population, Franklin should be one of the most walker, transit and bike friendly places in Oregon, not another swirling car sewer.	N/S of Franklin Blvd W of Agate, Eugene, OR 97403, USA
13th Ave	Wrong-way bike traffic and sidewalk riding is extremely common on 13th Ave, especially west of Madison (because there is no separated westbound bikeway).	S/S of 13th E of Monroe, Eugene, OR 97402, USA
Harlow just east of North Garden Way	It's often very tricky for a bicyclist heading east on Harlow to merge across Harlow to get onto the bike path along I-5--and similarly hard for a bicyclist heading west on Harlow over I-5 to make the left turn onto Garden Way	S/S of Harlow E of Garden Way, Eugene, OR 97401, USA
Crossing MLK by Leo Harris PKWY	Please widen the northern bike ped trail and put a proper crossing with ped/bike signal activation. Incredibly dangerous crossing with or without a big game.	S/S of MLK Blvd E of Centennial Lp, Eugene, OR 97401, USA
17th & Alder	Need flashing crosswalk signs, difficult to read pedestrian intent at this crossing	W/S of Alder N of 17th, Eugene, OR 97401, USA
Two way bike route on Alder along campus	Two way bike traffic on this one way road is confusing for car traffic. Drivers may not look both	W/S of Alder N of 17th, Eugene, OR 97401, USA

	ways to check for bicycles, especially those unfamiliar with the area.	
Double Crossing between West 7th Place and West 7th	The long delays for pedestrian and bike crossing both of these streets tempts defiance of the signal requirements for folks traveling from the shopping area to access south Garfield. I hope that the pedestrian access can be improved by having one time for peds and bikes to cross both W. 7th place and W. 7th.	W/S of Hwy 99 N of 7th, Eugene, OR 97402, USA
Eastwood Ln/Coburg	Back up traffic from the coburg light backs it very difficult to exit/enter Eastwood, especially during high traffic times.	W/S of Oakway S of Eastwood, Eugene, OR 97401, USA
River Rd. at Park Ave.	Westbound bike traffic using the connector from Stephens arrives at River Rd. at the south side of the Park Ave. intersection. When continuing westbound onto Park Ave, bike traffic must cross the intersection diagonally, which causes conflicts with any traffic from Park Ave. turning left onto River Rd. to go northbound. Installing a red left turn arrow that stays red when the crossing button is pushed could solve this.	W/S of River Rd S of Park, Eugene, OR 97404, USA
Thurston Hills	The gravel on the south side needs to be of the same quality as the north side. Dedicated downhill trail for MTB's on the southside needed as well	Weyerhauser Rd, Springfield, OR 97478, USA
Locked gates	Having a bike route through the Fairgrounds was great for north-south bike/ped transportation, but now the gates are inexplicably locked. They should be reopened.	Wheeler Pavillion, Eugene, OR 97402, USA
Bus Timing/Waiting	There is a lot of neighbors nearby who could easily catch a bus to downtown from here if the bus timing was reliable, more frequent, and there was some rain cover and seating for folks.	Willamette St & E 27th Ave, Eugene, OR 97405, USA

APPENDIX E: DEMOGRAPHIC DATA: ZIP CODES

Below are the zip codes gathered from participants in the online open house.

Zip Code	Count
97401	16
97402	19
97404	13
97405	29
97408	4
97455	1
97477	11
97478	5
97403	5

APPENDIX F: BILINGUAL MAILER OPEN TEXT QUESTIONS

Below are the unedited comments that respondents submitted for the open text questions in the bilingual mailer.

QUESTION 2: What are the main barriers to walking, biking, and taking public transit (bus)?

- Convenience
- Distance/timing/freedom
- Distance from home to bus stops- pooorly maintaining sidewalks in adequate lighting
- Fewer bus routes in Bethel- since EMX to west Eugene
- I walked and bussed for 3 years after moving to Eugene from a big PNW city. I finally gave up and bought a car. Controlled crossings (big buttons) and motorist hostility make walking very hard. A car town sure.
- perception that only druggies and homeless people take bus. (I know that's not true but that's the perception)
- Rough walks and clean Buses
- Safety- extended routes outside county lines more access for 3 wheel bikes
- Areas on sidewalks need work
- benches for the elderly to sit while waiting for the bus. At all stops.
- Bethel isolation - hard to go anywhere but Bethel
- Bike paths that are not continuous nor interconnect: suddenly end. Poorly maintained bike lanes
- Bike: Not enough off-street networks. Walk: too far from work/shopping
- Cars/computerize system - need old style bus pass
- Cross walk safety

- Designated lanes, crosswalks, signage, lighting
- Education! Pay attention. People need to walk with extra 5 or so feet to safely walk across street to a crosswalk
- I don't feel safe on my bike with cars. More bike lanes
- I use a rolling walker - sidewalks are VERY rough
- Inexperienced drivers
- Lack of safety from people and autos
- lighting
- Poor lighting. Poor surface, cracks, holes
- Safety of biking
- Some neighborhoods are still connected to bike network path
- time
- Too many cars, noise + pollution + joy rides! Walking: sidewalks, no ramps, bikers, dog poop, cracks, no side-walks, homeless tents and messes, very dangerous intersections, free right turns, watch out for left turners, wheelchair unfriendly
- traffic. We need a east/west bike path through town without cars
- time and place of bus stops
- Designated lanes, crosswalks, signage, lighting
- Bus routes disappearing because of MAX system which is not faster or more efficient a waste
- Bus infrequency, duration.
- benches for the elderly to sit while waiting for the bus. At all stops.
- 3s for bus in Eugene, 1 in Bethel. Same for on-street biking network
- not enough people ride the bus

QUESTION 7: Do you have other comments or questions?

- #17 LTD Springfield run B St to 14th St. #18 connect with #13 Centennial. More Lowell and Cottage Grove busses.
- Both residents here are in our 8s, and health conditions limit our mode of transportation
- For its size I think Lane county dose a very good job! Thanks.
- I am 8 years old and still drive a car in Eugene. Prior years I either walked or drived-never took the bus. I know a lot of energy was put into doing this survey. I hope it was worth the time.
- Improve signal timing for pedestrians. The bus takes longer because the "last mile" takes so long. Walking a mile in Eugene when you are in a hurry. You'll go nuts.
- In S. Eugene I commuted primarily by bike and bus - in Bethel I need a car. I feel very isolated in Bethel - the tracks make it unsafe to go by bicycle to town or the university

and buses take forever to go anywhere - it would have taken close to 2 hours to commute from my home

- "Interested in signal timing and lighting, and speed safety measures.
- The highways are kept up very well. The surface … badly neglected; i.e., echo hollow and B… as 2 examples (text is cut off)"
- It is difficult for me to use the bus as the nearest stop is blocks away from my home and grocery store. Shopping becomes impossible. Sidewalks are full of cracks, holes and low visibility. I live in fear of falling and don't own a cell phone so calling for hlp is not possible. Ride share and taxi's are expensive.
- More access for 3 wheel bikes. Safety on the bike. Safety on the bike path!!! More busses going further outside County.
- Overall, LTD is extremely easy to use and can get you almost anywhere you need to go.
- People need education. Taught how to use these new and old transportation services such as round abouts and crosswalks. Motorists and pedestrians… don't get in the mind set you have the right of way.
- Please please make it possible to access RTD services to beach (and back) routes… we would so enjoy this; the beach is here for everyone…as is the bus
- Please repair neighborhood streets!!
- Prioritize patching/repairing Willamette Street
- Smaller, circular bus routes
- Supporting climate reduction seems like a progressive/liberal catch all phrase -- I already feel good about myself
- Survey poorly designed and laid out. Vague and confusing
- Thank you for what you have already done just do more too!
- This is all too confusing - I walk or ride the bus. Bus service is great sidewalk do need repairing
- Traffic hours are too crowded
- Trucks need to be re-routed vs 6th and 7th ave. Trucks use Beltline Rd to West Eugene
- Wife uses public bus every day (#11). I drive between cities (No Franklen cloverleafs - maintain 2 lane road service)
- I so appreciate the lights for pedestrians crossing that have been installed on Main St.

APPENDIX G: BILINGUAL SURVEY OPEN TEXT QUESTIONS

Below are the unedited comments that respondents submitted for the open text questions in the bilingual survey.

QUESTION 2: What are the main barriers to walking, biking, and taking public transit (bus)?

- Service hours for public transport. There are routs in which the frequency of buses is not adequate.
- Pobre comunicacion y espacios reducidos...
- Traffic lights are optimized for the drivers and takes forever to cross the street. With public transport the main problem that the driver never has change and almost every time one bus it's not enough to come from one place to other place"
- Por las calles principal
- Traffic lights are optimized for the drivers and takes forever to cross the street. With public transport the main problem that the driver never has change and almost every time one bus it's not enough to come from one place to other place"
- El espacio es muy reducido
- No hay muchas banquetas apropiadas para descapacitados
- Need to install bike pumps
- La calle muy dañada y mal pintada la línea de donde puede andar la bicicleta y el carro
- Los carriles y vias peatonales
- Los carriles y vias peatonales
- Tomar el autobús

QUESTION 8: Do you have any other ideas or comments you want to share with us?

- Please don't cut routes and public transport system. It is critical for developing a eco friendly and socially responsible city.
- Mas servicio de transporte público...
- Por ahora no
- No
- SI SE PUDIERA AGREGAR MAS TRANSPORTE O MAS FRECUENTE A LA RUTA 17 Y 18 SON LAS QUE USO FRECUENTE Y TARDAN MUCHO
- Que haya más rutas
- No
- Electic scooters will be helpful because not all people can bike on hills.
- Mejorar las calles
- No

APPENDIX H: METROPOLITAN PLANNING COMMITTEE SUBMITTED COMMENTS VIA EMAIL

Below are unedited public comments submitted via email by community members.

Date	Email Subject Line	Comment
09/15/2020	Route between Eugene and Coburg	Hello, Would the city ever consider implementing a bike/ped path between the cities of Eugene and Coburg? I bike to Coburg often and regularly see other bicyclists going to and from the cities. So there is a demand, and I'm sure that if it were to be opened to pedestrians that they would use it as well. The current route to get between the cities it very unsafe. There is a quarry off of Coburg Rd and as such large gravel trucks often go by, as well as semi trucks and farm equipment. The distance between the cities is also not that long, meaning that it would be feasible for many people to bike. This would clearly have to be coordinated with the city of Coburg as well, so if there is any relevant information that they have that you know about, that would be very helpful.
09/27/2020	2045 Regional Transportation Plan	Dear MPC members: Given the horrific fires our County will be reeling from for years to come, is there any doubt left that the 2045 RTP under development must have a clear goal to greatly curb greenhouse gas emissions? I urge you to ensure that a goal is put in place now. Our lives may depend on it.
09/29/2020	Please add an explicit goal to reduce greenhouse gas (GHG) emissions to the 2045 Regional Transportati	Addressing transportation related GHG emissions cannot be done on an individual level. Instead, it is imperative to have defined goals and supporting plans to provide more safe, equitable, and sustainable transportation options. I urge you to address climate change in the next regional transportation plan, our lives depend on it. Thank you.

	on Plan (RTP)	
09/29/2020	2045 RTP Needs to Reduce Greenhouse Gases	Dear Metropolitan Policy Committee, There's nothing like 10 days of smoke to help you see clearly. I'm writing to urge you to get serious about climate change by adding a specific goal to reduce greenhouse gas emissions in the 2045 Regional Transportation Plan. September's fires, and the devastation they brought to the hundreds who lost their homes, as well as the deep sadness for all of us who cherish the McKenzie Watershed, make it clear that climate change is real, and we need to take action. Transportation is our largest source of greenhouse gases, and any transportation plan for the coming years must identify explicit goals and strategies for reducing the greenhouse gases that are promoting these destructive wildfires. Reducing greenhouse gas emissions would be good policy even if there were no concern about climate change. The actions we take to reduce emissions will also save lives on the streets, offer better transportation choices, be more equitable, and promote healthy, active living. Our future needs a greener transportation system. If we don't have a specific goal for GHG emissions, we will not achieve reductions. Please take the first step toward a more sustainable transportation system by adopting an explicit goal for reducing greenhouse gas emissions. Thank you for your attention.
09/30/2020	Greenhouse gas pollution reduction should be a regional goal	Dear Members of the Metropolitan Policy Committee: Climate change is happening now, and affecting our lives now. Our failure to take action to mitigate this in the past has led us down a dangerous, expensive path, in which extreme weather threatens our economy, our communities, and our future. We know that well-coordinated land use and transportation planning

		is essential to reducing greenhouse gas pollution. Lastly, we know that there are enormous co-benefits to our economies, health and safety, housing affordability, and access to opportunity that come along with this kind of planning. Please act now to identify the reduction of greenhouse gas emissions as a goal in the 2045 Regional Transportation Plan.
09/30/2020	Please add a specific goal to reduce greenhouse gas emissions in the 2045 Regional Transportation Plan	Hello Metropolitan Policy Committee, My name is Claire Roth. Thank you for all of the hard work you have put into developing the 2045 Regional Transportation Plan thus far. I am here virtually today to ask that you add a specific goal to reduce greenhouse gas emissions in the aforementioned plan. Our world is way past due for the kind of climate attention that it deserves, seeing as there is no Planet B. Transportation accounts for about 28% of greenhouse gas emissions in the United States, the biggest slice of the greenhouse gas pie (which personally, doesn't sound like an appetizing dish). Talking about transportation without talking about greenhouse gas emissions is like trying to drive a car without wheels; it's an incomplete concept and won't get you where you need to go. Unfortunately, in many respects, it's too late to reverse the devastating effects climate change has already brought upon the flora and fauna of this earth. It's no longer a question of what we will lose, but a question of how much more we will lose, unless we stand up and make goals, which later blossom into commitments and standing change. A healthy, sustainable, and prosperous future is possible, but it won't be easy. Adding a tangible goal to reduce greenhouse gas emissions into the 2045 Regional Transportation Plan is a step in the right direction of this better future, if but a small one. We can do this, we must do this, and the time is now. Thank you for your time.

10/01/2020	Lane Co. attitudes about climate and MPC goals	MPC Members, Thank you for accepting public testimony as part of your work. As you begin initial stages of updating the Regional Transportation Plan, I hope you will incorporate an explicit goal to reduce greenhouse gas emissions. This plan should reflect the values of the residents in our region, the vast majority of whom understand the risks posed by climate change and understand our transportation system needs to change in order to reduce emissions. According to the most recent (2020) survey done by Yale, 63 percent of adults in Lane County are worried about global warming, and 54% agree their "local officials should do more to address global warming" This long term regional plan sets the stage for millions of dollars of transportation investments that will last for decades. It's important that these long-term community investments reflect both the realities of today and our goals for tomorrow. I hope you will take this opportunity to confidently incorporate the goal of reducing greenhouse gas emissions within the updated RTP. Thank you.
02/03/2021	Public Testimoney: MPC, Feb. 4 on RTP	Dear MPC Leaders, I'm pleased to see multiple references in the draft Regional Transportation Plan to the Vision Zero goal of eliminating traffic-related deaths and serious injuries. I'm concerned, however, at the lack of adequate means to measure progress toward this goal. Performance measures are how citizens can gauge progress toward the adopted goals. If the only measures of safety are deaths and serious injuries, as proposed in the draft, we will only know, after the fact, when the

		plan has failed. We need additional performance criteria to evaluate our progress in creating a transportation system that is safe for all users. We know that creating infrastructure that reduces or eliminates conflict between autos, pedestrians and bicyclists can save lives, and we have included many such infrastructure projects in our transportation plans. To measure progress toward transportation safety, we need such criteria: as: *Total miles and percentage of regional pedestrian and bicycle networks completed *Average Distance between safe pedestrian crossing infrastructure on such high volume roads as River Road, Coburg Road, Franklin Boulevard, Main Street and West 11th (low numbers are good!) *Percentage of funds spent on safety infrastructure close to high-need schools (a proxy for underserved/disadvantaged populations) With transportation funding always limited, it is important to have safety criteria to establish the value, in human lives, of the projects we build and seek funding for. Including these and similar performance measures will help to obtain funding to enhance safety and equity, and to ensure that such funding is used effectively. Thank you for your consideration.
02/03/2021	350 Eugene Testimony for MPC meeting Thursday, February 4	To the members of the Metropolitan Policy Committee of Lane Council of Governments: My name is Patty Hine and I am a volunteer and am a leader with the grassroots climate justice organization, 350 Eugene. We have over 2,000 supporters and have been advocating for strong climate policy in this community and region for seven years. Local city and county climate action plans set strong emission reduction targets and are key to addressing the big changes we

		need to make to reduce personal and community-wide greenhouse gas emissions (GHGs). Decision-makers at every level must step up to set ambitious, measurable goals to ensure we take the boldest possible actions. We urge you, in the strongest possible terms, in your work to update the regional transportation plan (RTP) for the Central Lane (Eugene-Springfield-Coburg) metropolitan area, to include a performance measure that explicitly measures greenhouse gas (GHG) emissions from motor vehicles. It's clear that the metrics we design to judge our success will drive the needed progress. Anything less would show a lack of commitment to our goals. Thank you for considering my public comment on behalf of 350 Eugene.
02/03/2021	Comment on Performance measures for RTP and CMT	To the members of the Metropolitan Policy Committee of Lane Council of Governments: Thank you for the opportunity to comment on an issue of great importance to me, and to the wellbeing of our community. I am a retired, longtime, Lane County resident deeply concerned about the impacts of climate change. I am a volunteer member of the City of Eugene Active Transportation Committee, but I am writing here as a private citizen. Prior to retirement I was Executive Director of BRING Recycling. Since transportation has such an outsized impact on greenhouse gas emissions, I believe it is a critical first step to include measurement of GHG emissions from motor vehicles in the updated Regional Transportation Plan for the Central Lane Metropolitan area. The City of Eugene has set strong, necessary, GHG reduction targets, but without a means to quantify the impact of vehicle travel we are making it more difficult to achieve them. Goals have also been set to greatly increase the number of trips made by bus, foot, bike or other "active transportation", but unless we understand the full impact

		of vehicle travel, we will continue to "talk the talk" without the data to spur the essential investments that help us "walk the walk". In business it is often said that "what you count is what counts". I found this to be true in the non-profit world as well. It is high time to start counting vehicle GHG emissions. I urge you, as you work to update the Regional Transportation Plan, to include performance measures that include specific measures of greenhouse gas emissions from motor vehicles. If we do not count something as impactful as vehicle emissions, we are in effect saying that their impact is not important. Does anyone actually still believe that?
02/04/2021	MPO Public Comment re: GHG Measure(s) within the RTP	I'm writing to encourage the Metropolitan Policy Committee (MPC) to include a performance measure for greenhouse gas (GHG) emissions from motor vehicles in the updated regional transportation plan (RTP). The transportation sector makes a significant contribution to GHG emissions. Without a means for measuring vehicle emissions it seems unlikely that reductions through mitigating actions will be able to reveal success or failure. The MPO should be a leader and not lag behind in this regard.
02/04/2021	GHG emissions in Lane County	To the members of the Metropolitan Policy Committee of Lane Council of Governments: Measure what matters. Please include a performance measure for greenhouse gas (GHG) emissions from motor vehicles in the updated regional transportation plan (RTP) for the Central Lane (Eugene-Springfield-Coburg) metropolitan area.
02/04/2021	MPC meeting Thursday, February 4 – action on GHG metric	To the members of the Metropolitan Policy Committee of Lane Council of Governments: I am urging you in your work to update the Regional Transportation Plan (RTP) for the central Lane (Eugene-Springfield-Coburg) metropolitan area to include an explicit performance measure that quantifies greenhouse gas (GHG) emissions attributed to motor vehicles, and more importantly,

		ensure that this metric is used to reduce and reverse the growing GHG emissions from our metropolitan area. I am a volunteer chair of my neighborhood transportation team, striving to make things better at the neighborhood level. This past year, our team adopted four transportation pillars to guide our efforts: Health, Safety, and Sustainability. We recognize the negative consequences of unchecked GHG emissions and other pollutants, as well as noise and threat to life and property, that our current transportation system promotes. These are not good outcomes for our neighborhoods, our metropolitan area, Oregon, and the global community. I have been volunteering my time and energy for 20 years in my neighborhood, and without strong leadership and direction from all levels of government, we are hamstrung in making the most meaningful impacts. As a professional, I work daily on environmental management supporting our local cities and government agencies. In my job, I strive to improve water quality, protect our watersheds, and make the most effective and efficient use of public resources I can - including opportunities to reduce GHG output and to sequester carbon. We also are steeling ourselves for the irreversible impacts of climate change underway, and we are not yet prepared to be fully resilient to hotter, drier summers, heavier winter storm events, and threats to our iconic Oregon ecology - including native salmon. Without reducing GHG emissions now, we are only exacerbating these problems and inflating the costs yet to be borne out. The important research conducted in the Pacific Northwest this past year identified car tire chemicals as the culprit for coho salmon die-offs in the Puget Sound area. We know and understand that GHG reductions alone are not the only solution to protect our health and environment, but an improved transportation system overall is required to remedy these unfortunate consequences of the ever-expanding use of automobiles as our prevalent means of commuting.

		Thank you. I trust you will do the right thing in adopting a meaningful transportation GHG metric in the RTP.
02/04/2021	MPC Testimony – Vision Zero	What can be said about transportation safety that hasn't already been said? Our River Road/Santa Clara area seems to take the brunt of pedestrian and bicycle injuries and deaths. Our neighbor Irene Ferguson was killed just 2 years ago, with a commemoration of her quest for transportation safety to be a feature at the new Santa Clara Transit Station opening on February 7. And now another neighbor, Tony Lockhart died on January 1 on River Road as he crossed the street. We can't just keep memorializing people after they have died. The updating of the Regional Transportation plan offers us an opportunity to determine exactly what is needed to make our streets safe for people. Identify specific projects and how much would it cost to engineer safe streets. Everyone laments about the cost of putting in a signal light or just more street lights, but the cost of even one death would pay for that stutter light. Just think of the savings to not have to call out police and ambulance. Think of the emotional and financial costs to the family and the larger community with a parent, worker, or child lost. How many new protected bikeways could we build with those emergency expenditures? How many sidewalks could be built or improved? Vision Zero sets forth a goal to guide us. The draft plan for the RTP contains good safety goals and objectives. We need to focus to make sure safety measures are actually planned and implemented. We need to develop a collective culture of friendship and concern for others, caring about one another's safety before our own self-interest of getting somewhere faster. Now, if we could only get people to make rational decisions, choose to be good

		citizens, obey speed limits, cross at crosswalks, and wear a mask, then everyone would be much safer.
02/04/2021	Diagram attachment for verbal testimony	https://www.khi.org/assets/uploads/news/13324/medical_marijuna_-_pathway_diagram_attachment_1_2.pdf

APPENDIX I: METROPOLITAN PLANNING COMMITTEE SUBMITTED COMMENTS VIA VERBAL TESTIMONY

Below are meeting minutes from Metropolitan Planning Committee (MPC) meetings when the RTP was discussed.

Below are meeting minutes from Metropolitan Planning Committee (MPC) meetings when the RTP was discussed and public testimony related to the RTP.

MPC MEETING MINUTES FROM 03-05-2020

Regional Transportation Plan (RTP)

Mr. Thompson introduced Carl Springer and Dennis Mitchell with DKS Associates, the consultant team that would be working on updates to the RTP, Congestion Management Plan (CMP), and the Intelligent Transportation System Plan (ITSP).

Mr. Mitchell said the project team was composed of DKS Associates, with JLA as the subconsultants for public engagement; the project team would also work directly with LCOG staff during the process. He said he would be the lead for the ITSP update and Mr. Springer would lead the RTP and CMP updates.

Mr. Springer stated it was the first time all three plans would be simultaneously updated, with emerging technologies used to make best use of the efficiency and safety of the system. He said the objectives of the update process were:

- develop a unified voice for regional investments
- extend the planning horizon to 2045
- address federal corrective actions form the certification process
- create a performance-based planning framework
- integrate long-range planning

Mr. Springer reviewed the long-range planning process and identified opportunities to integrate planning among plans. He said the MPC's role was to provide guidance and policy direction. He reviewed the timeline of approximately 18 months and identified the points of consultation with the MPC during the process. He said key questions to be addressed were:

- reflect the regional voice
- flexibility
- effective performance and benefit measures
- tracking the appropriate data

Mr. Berney said the national perspective of DKS would benefit the MPO in terms of best practices, particularly on climate issues. Mr. Springer agreed that information would be useful to the extent it reflected local community values.

Mr. Berney asked if DKS worked with communities where maintaining or creating jobs was a guiding value. Mr. Springer said his experience was less in the area of creating jobs and more about economic robustness at a broader level involving issues such as mobility, reliable travel time and minimal transfer between modes.

Mr. Sorenson asked to what extent the plans would relate to recent community goals of increased availability of housing and decreased carbon emissions. Mr. Thompson said the plans would reflect and support those goals to the extent the MPC desired. He said federal regulations required the MPO plans to be consistent with all local and state adopted plans and policies. How much further that went would be up to the MPC.

Ms. Brindle said there were several alternate routes for moving around the region, which was important for resiliency. She it would be valuable to make those other routes and transportation modes more operationally efficient.

Mr. Thompson said there were recent state performance measures related to safety and system performance that the MPC had supported and this was the first opportunity to provide that support in the long-range planning process. The CMP would look specifically at issues related to operation of the system.

Ms. Lundberg said there were discussions at the state level among local elected officials about how to deal with natural disasters. She said routes from the coast and to central Oregon would be crucial and interconnection of the system to assure critical routes were still operational should be considered during the planning process. Another issue to consider was freight traffic and what new technologies for moving goods might be available.

Mr. Smith said resiliency was a concern for the City of Coburg because of physical barriers, such as the river, that isolated it from the western part of the county and the metropolitan area. He said communities to the north of Coburg were outside of the county, but had a major impact because of the very large amount of commuter traffic that passed through the city.

Mr. Berney reported that at a recent National Association of Counties legislative conference discussions of resiliency included the role of retrofitting existing structures in communities to make them safe sites for people to gather in the event of a natural disaster.

MPC MEETING MINUTES FROM 09-03-2020

2045 Regional Transportation Plan (RTP) Federal Requirements

Mr. Thompson said the MPO was in the midst of updating the 2045 RTP. The first stage was to update the policies to address new federal regulations, align with state-level planning guidelines and priorities, and reflect the priorities of local communities.

Mr. Thompson introduced Mr. Springer, DKS Consulting, who gave a powerpoint presentation entitled *Regional Transportation Plan Federal Priorities*. Mr. Springer reviewed the new topics required by the federal MAP-21/FAST Act, including security, preservation, resilience, reliability, stormwater impacts, and travel & tourism. Discussing state and local emerging trends, Mr. Springer cited climate change, equity, technology efficiency, and preservation. The federal regulations required the RTP to include performance-based outcome measures to help inform investment decisions. The consultants also planned to develop additional measures, as well as their targets.

Ms. Vinis described the RTP as an opportunity to apply a climate lens to the priorities. She suggested it be specifically called out as a priority, e.g., add greenhouse gas reduction as an outcome measure.

Mr. Berney questioned the state's approach to preparing for emergencies by retrofitting existing infrastructure. He thought it was a very expensive approach and a better strategy was to establish self-sufficient local community emergency facilities.

Ms. Brindle described construction process changes that contributed to sustainability and greenhouse gas reduction, for example re-using building materials or upgrading a bridge without building a detour bridge.

Mr. VanGordon encouraged MPO members not to focus too much on specific solutions that preclude them from using yet-to-be-invented technology.

Mr. Berney advocated for a balance between generalities and specificities. He described a climate change/community reinvestment template currently being developed by County staff to use when making purchasing decisions as an example. Mr. Berney offered to share the template with other jurisdictions once it had been adopted by the Board of County Commissioners.

Mr. Thompson noted greenhouse gas emission reductions had been withdrawn from the federal requirements in the MAP-21/FAST act legislation. At the state level, ODOT staff had not yet determined how they were going to integrate climate change into their decision-making and the LCDC would soon undertake their own rule-making on greenhouse gas emissions reduction. Mr. Thompson noted neither may be decided by May 2021, which was the deadline for the RTP update.

MPC MEETING MINUTES FROM 10-01-2020

COMMENTS FROM THE AUDIENCE

Mr. Pishioneri explained the procedures for providing testimony.

Matt McRae, Eugene, asked that the MPC consider incorporating an explicit goal to reduce greenhouse gas emissions in the updated Regional Transportation Plan (RTP). He said the plan should reflect the values of the region's residents, a majority of whom understood the risks of climate change and need to change the transportation system. He cited recent surveys of Lane County residents indicated that level of concern. He hoped the millions of dollars of transportation investments would reflect both the realities of today and the goals of tomorrow.

Claire Roth asked that a specific goal related to reduction of greenhouse gas emissions to the RTP. It was past due for the type of climate attention the world deserved. Transportation accounted for about 28 percent of greenhouse gas emissions in the United States. She said greenhouse gas emissions must be included in discussions about transportation. In many respects it was too late to reverse the devastating effects of climate change; it was a question of how much more would be lost. Adding a tangible goal of greenhouse gas emissions reduction into the 2045 RTP was a step in the right direction.

Kelsey Zlevor, Eugene, former chair of the Eugene Sustainability Commission, she said it was imperative the 2045 RTP include the goal to reduce greenhouse gas emissions. She said recent wildfires were fueled in part by climate change which was tied to greenhouse gas emissions. Not including a greenhouse gas emissions goal in the plan would be disrespectful to the victims of the fires, the wildfire crisis and young adults of the future. She strongly encouraged including a greenhouse gas emissions goal in the plan.

Terry Parker, Eugene, spoke as a representative of 350 Eugene. She encouraged the MPC to fully acknowledge the climate crisis and the significant role that transportation planning and policy changes could make in reducing greenhouse gas emissions. She asked that greenhouse gas goals and objectives that supported and aligned with other local plan be adopted. It was critical to work together to make significant changes. The MPC had an obligation to apply both the science of climate change and social equity in its important work.

Corey Parrish asked the MPC to consider adding an explicit goal to reduce greenhouse gas emissions in the 2045 RTP being developed. Within an explicit climate change goal the other two goals listed in the plan could not be achieved. The first was an integrated transportation and land use system. Transportation was the primary polluter in greenhouse gas emissions and that fact had to be addressed. The second goal was sustainability of transportation and sustainability was built on the premise of climate change; without a greenhouse gas emissions goal sustainability could not be achieved. Without addressing explicit goals for climate change other objectives in the plan were not being addressed, including an environmental commitment, economic vitality and equity and public health.

2045 Regional Transportation Plan (RTP) Draft Goals

Mr. Thompson suggested that as time was limited, he would provide a brief overview of the topic and an in depth discussion could be scheduled at the next MPC meeting.

Mr. Pishioneri determined there were no objections to Mr. Thompson's suggestion.

Mr. Thompson noted that the agenda materials included seven draft goals recommended by staff that would meet the federal requirements of the MPO's long-range plan and invited comments and feedback on the goals. He said two options for addressing greenhouse gas emissions had also been proposed within the long-range plan and asked for direction on whether to have a specific greenhouse gas emissions goal as part of the RTP. Another option was to include greenhouse gas objectives under one or more of the other seven goals. He invited questions and comments from the MPC to inform the next meeting's discussion.

Ms. Vinis said the MPO should be aligned with the state's goals for greenhouse gas emissions in order to be well positioned for state funding. She advocated for having an additional goal related to emissions. She said if a specific goal and metric was not established the issue tended to get lost in the larger context of the plan.

Mr. Yeh concurred with Ms. Vinis. He said Lane Transit District (LTD) had established some very specific greenhouse gas emissions goals in June 2020, with 75 percent reduction in emissions by 2030 and converting the fleet from fossil to alternative fuels. He supported the inclusion of a greenhouse gas emissions goal in the MPO's plan and felt the public also supported that.

Mr. Sorenson favored including a goal to reduce greenhouse gas emissions that contributed to climate change in the RTP. It was important to have support from the various jurisdictions. Lane County had recently begun work on a climate plan. The RTP should be clear as 40 percent of emissions came from transportation and facilitating transportation within the metro area was the business of the MPC.

Mr. Berney suggested a goal of "reduce greenhouse gas emissions." He said climate change did not have to be added as it was inherent in the statement. The greatest driver in creating new jobs and new markets and access to them was responding to clean energy opportunity.

Mr. Berney left the meeting at 1:15 p.m.

Mr. VanGordon said the question was how to incorporate the issue of greenhouse gas emissions in the RTP. His preference was to have an objective because there was state rule-making under way that would impact MPC jurisdictions and he did not want to get out ahead of that effort. He was not opposed to discussions of a metric, but wanted to protect jurisdictions' right to prioritize their transportation dollars and questions about sustainability and greenhouse gas reductions needed to happen at the local jurisdictions.

Mr. Yeh reported that LTD was making progress on its goals and had secured the necessary funding for electric buses. Some electric buses were already in service and more were being added. He agreed with Mr. Berney and Mr. VanGordon's comments, but hoped to see a more concrete goal to achieve in the form of a metric. He said the issue was climate change, but also about giving proper incentives for people to make a change for the right reasons.

Mr. Pishioneri echoed Mr. VanGordon's comments. He agreed the issue was important, as were the method of how to achieve goals and protection of local interests.

Mr. Smith also expressed concern about establishing a specific measurement before the state concluded its work. He agreed there should be a statement about the reduction of greenhouse gases, but did not want the MPC to identify specific goals and objectives only to discover the state was using different metrics.

Ms. Vinis said the intent was to provide some direction to Lane Council of Governments (LCOG) and local staff about the inclusion of a broader goal. There were ways to highlight reduction of greenhouse gas as a key goal and those could be determined at a future point when more information from the state became available.

In response to a question from Mr. VanGordon, Ms. Vinis said she was suggesting an eighth goal related to greenhouse gas reduction rather than incorporating emissions reduction objectives in the other goals.

Mr. VanGordon said he preferred objectives and that could be part of the next discussion.

Mr. Thompson determined there was consensus to have staff provide examples of greenhouse gas goals and objectives for the next meeting's discussion.

Mr. Pishioneri asked that the agenda for the November meeting include sufficient time for an in depth discussion of the topic.

MPC MEETING MINUTES FROM 11-05-2020

COMMENTS FROM THE AUDIENCE

Rob Zako, executive director for Better Eugene-Springfield Transportation (BEST), stressed that the actions MPC could take to address climate change were also actions that improved the local community. He thought climate change goals were imbedded in the proposed 2045 Regional Transportation Plan (RTP) draft goals. However, to be more explicit, Mr. Zako proposed an amendment to the Healthy People and Environment goal, adding the language: "greenhouse gas emissions are reduced." Mr. Zako also expressed interest in working with MPC to identify the performance measures and targets used to judge the progress made in achieving the adopted goals.

2045 Regional Transportation Plan (RTP) Greenhouse Gas (GHG) Emissions Goal

Mr. Thompson noted the agenda item was a continuation of the discussion from the October meeting. MPC members had asked staff to present examples of addressing GHG emissions as a separate goal or adding GHG objectives to support other goals, e.g., the Transportation Options and Healthy People and Environment goals. He reviewed the examples of possible goals and objectives in the agenda memo. Mr. Thompson requested direction regarding which approach MPC members preferred.

Ms. Vinis preferred the alternatives that referenced state statutes or goals.

Mr. Smith advocated for having an overall goal regarding GHG emissions reductions. Regarding the objectives presented, he supported the one taken from the Springfield Transportation System Plan (TSP).

Mr. VanGordon thought it was important to keep in mind that the RTP goals were not ranked. He said the State of Oregon was moving quickly to set their own objectives regarding GHG emissions reductions and it might be wise to adopt a placeholder objective in the RTP until the State completed their work. In general, he supported the approach of adding GHG objectives to support other goals. Mr. VanGordon also raised concerns about the "Reduced vehicle miles traveled per capita" objective as it did not account for technology efficiencies.

Mr. Berney concurred with Mr. Smith in that GHG emissions reductions should be a goal. He proposed the following language: "A job-creating, carbon neutral transportation plan." Mr. Berney added it was important for the MPO to set goals and then give individual jurisdictions maximum flexibility to determine how to meet the goals.

Mr. Pishioneri agreed with Mr. VanGordon's observations about treating all the RTP Goals equally and not having a specific objective regarding vehicle miles traveled.

Ms. Vinis proposed the RTP incorporate the language from the first proposed goal "Greenhouse Gas Emissions Reduction: the region reduces emissions of transportation related greenhouse gas" and add the objective taken from the Springfield TSP.

Mr. Smith reiterated his support for the Springfield TSP objective. He raised concerns about objectives that were tied to specific Oregon statutes as they could change.

Mr. Pishioneri expressed interest in Mr. Zako's suggestion regarding an amendment to third goal (Healthy People and Environment).

When Mr. Berney suggested the Goal have a specific target, Mr. Thompson clarified the performance targets were tied to the objectives, both of which would be developed before the RTP was adopted.

Mr. VanGordon also liked the Springfield TSP objective. If there were a separate GHG goal adopted, he supported one that was tied to the State's actions.

Mr. Thompson suggested the amendment Mr. Zako proposed during the public comment period be changed to **"transportation** greenhouse gas emissions are reduced". Ms. Vinis, Mr. Pishioneri, and Mr. Smith concurred.

Mr. Sorenson asked if, 2020 notwithstanding, transportation greenhouse gas emissions were increasing. If so, he observed using language that the goal was to reduce them was a substantial change to the current trend. LCOG staff offered to report on the data (for the MPO region, the state, the nation, ang globally) at a future meeting.

Mr. Berney shared that globally, 2.57 million pounds of carbon were emitted into the atmosphere every second. He stressed the importance of having baseline data in order to measure progress towards the goal.

Mr. Thompson summarized the discussion. He assured MPC members the plan would explicitly state that all the goals were on equal standing, not prioritized. He repeated the amendment to the Healthy People and Environment goal which explicitly stated "transportation greenhouse gas emissions are reduced". Mr. Thompson also noted general support for the Springfield TSP language to be added as an objective.

2045 Regional Transportation Plan (RTP) Draft Goals

Mr. Thompson referenced the agenda item memo in the packet, noting LCOG staff was asking for review, discussion, and feedback on the other draft goals.

Ms. Clarke described how the draft goals had been developed and listed them: Transportation Choices; Safety, Security, and Resiliency; Healthy People and Environment (as amended in the previous agenda item); Equity; Economic Vitality; Reliability and Efficiency; and System Asset Preservation.

When no MPC members raised any issues or concerns with the proposed draft goals, Mr. Pishioneri viewed that as a sign of approval and directed staff to proceed.

MPC MEETING MINUTES FROM 12-03-2020

COMMENTS FROM THE AUDIENCE

Mr. Pishioneri explained the procedures for providing testimony.

Rob Zako, Eugene, representing Better Eugene-Springfield Transportation (BEST), thank the MPC for its discussion of Regional Transportation Plan (RTP) goals at its November meeting and the addition of language related to climate change. He supported the plan's draft objectives that would be discussed later in the meeting and pointed out that there was new language addressing equity, safety, climate change and options. He encouraged the MPC to discuss a proposal for future funding that identified important priorities for the region. He expected that as language in the plan was finalized there would be opportunities for public comment.

John Faville, Eugene, a member of Northeast Neighbors, spoke to construction of a path along the east side of North Delta Highway. He explained the importance of the path to bicycle safety as high and low density residential development in the area increased. He said Northeast Neighbors supported the project and urged the MPC to endorse it.

2045 Regional Transportation Plan (RTP) Draft Objectives

Ms. Clarke reviewed the draft objectives provided in the agenda materials. She said they had been developed to support the following goals the MPC agreed upon at its November 2020 meeting: 1. Transportation Choices, 2. Safety, Security and Resiliency, 3. Healthy People and Environment, 4. Equity, 5. Economic Vitality, 6. Reliability and Efficiency, and 7. System Asset Preservation. The objectives were intermediate points to help fulfill those goals, providing strategies and tools to be utilized over the plan's horizon. She noted that many of the objectives supported more than one goal. The goals and objectives were not prioritized and that would remain so in the final version of the plan. She said staff was developing public outreach strategies and an online open house would be launched in the following week, and meetings were being scheduled with key partners and community groups. She invited feedback from the MPC.

Ms. Vinis asked why goals and objectives were not being prioritized. Ms. Clarke said the MPC had indicated each of the goals was equally important and since the objectives were complementary to fulfilling many of the goals staff had taken that same approach. Mr. Thompson added that the plan had a 24-year horizon and objectives provided a toolbox that could be used at any point during that time depending upon funding availability, as well as changing federal requirements and local priorities. He said the RTP was updated every four to five years and new objectives could be added at those points.

Mr. Yeh commented that the objectives were excellent, coincided with many of the issues LTD was addressing and would likely be incorporated in the District's strategic planning efforts.

Mr. Smith said he supported the goals and objectives, which were well done and identified the issues that should be addressed in the future.

Mr. Thompson said there had been considerable public input on the draft goals discussion began in July 2020. He pointed out that the goals and objectives were only drafts developed with the MPC's input in order to begin the extensive public outreach campaign process.

Amendment to Regional Transportation Plan (RTP)

Mr. Thompson said the City of Eugene was proposing an amendment to the current adopted RTP to add the North Delta Highway path project to the RTP's financially constrained bicycle/pedestrian project lists. Details were provided in the agenda materials. He said the purpose of adding the project was to provide support for a grant the city was applying for to fund construction of the path. He asked that a public hearing be held. He said the public comment period was open and a proposed action on the amendment would be presented to the MPC at its January 2021 meeting.

Mr. Pishioneri opened the public hearing. There was no one wishing to speak and Mr. Pishioneri closed the hearing and invited comments from the MPC.

Mr. Yeh, speaking as a cyclist, said he supported any extension of bike paths in the region. He said it made the area a desirable destination and improved connectivity among transportation modes around the city.

Ms. Vinis said a large amount of residential development was projected for that area of the city and the path would connect those housing units to shopping and provide a safe place for residents to walk.

Mr. Pishioneri noted that he and other MPC members were also indicating their support for the amendment.

MPC MEETING MINUTES FROM 1-07-2021

Amendment to Regional Transportation Plan (RTP)

Mr. Thompson said the City of Eugene was requesting an amendment to the Central Lane MPO's Regional Transportation Plan (RTP) for the North Delta Path project. The City wished to amend the RTP to place the project on the Plan's fiscally constrained project list. The City was applying for grant funding for construction of the project, and listing the project in the MPO's regional transportation plan would support the grant application. He said the MPC had held a public hearing on the request at its December 2020 meeting. He said written comments were also submitted during that meeting and no additional testimony had been received during the subsequent 30-day public comment period. Staff was requesting approval of Resolution 2021-01

> Mr. Yeh, seconded by Mr. Moe, moved approval of Resolution 2021-01. The motion passed unanimously, 9:0.

MPC MEETING MINUTES FROM 02-04-2021

COMMENTS FROM THE AUDIENCE

Rob Zako, Eugene, Better Eugene-Springfield Transportation (BEST), shared a diagram of factors related to legalization of medical marijuana that influenced health. He spoke to performance measures, noting that the Central Lane MPO had adopted local transportation goals and objectives for the Regional Transportation Plan (RTP) beyond what was federally mandated. He reviewed the diagram and its depiction of upstream and downstream factors and how those should be considered in performance measures. He used climate change actions to illustrate his point about creating a plan that achieved the desired goals and objectives.

Sarah Mazze, 4J School District Safe Routes to Schools Coordinator, echoed Mr. Zako's comments regarding the RTP goals and objectives. She said that all biking and walking facilities were not equal in terms of providing access to employment and key destinations. She related a parent's concern about his child's access to a school via biking on River Road. She said historically marginalized communities often had to make difficult choices about active transportation related to time and safety. She urged consideration of those factors in the transportation planning process, such as an upstream factor that measured the distance between crossings and lighting on high volume, high speed streets.

Carleen Riley, Eugene, (River Road Community), said the River Road/Santa Clara area seemed to take the brunt of pedestrian and bicycle injuries and deaths. She noted two recent pedestrian deaths and said the RTP update presented an opportunity to determine exactly what was needed to make streets safe for people by identifying specific projects and the cost to engineer safe streets. She said the cost of signal lights and more street lights was lamented, but the cost of even one death in terms of emergency response and the emotional cost to family, friends and the larger community should be weighed. Vision Zero provided a guiding goal and the draft RTP should contain good safety goals and objectives. It was also important to build a collective culture of friendship and concern for others that put the safety of others before reaching a destination faster.

Steve Piercy, Eugene, observed that there were many dangerous travel areas in Lane County and one of the challenges was obtaining valid data in a timely manner. The only data available current was months after the fact and consisted of injuries and fatalities information collected by law enforcement officers. He said it was important for Lane County to do what other municipalities had done, which was crowd source data. He said the City of Eugene had a crowd sourcing map for its Vision Zero effort, bikemaps.org. He said it was an international map where individuals could indicate collisions, near collisions, hazards and other dangers that could exist while traveling on roadways. That helped identify locations where collisions and serious injuries were likely to happen before they occurred. He encouraged the expansion of data collection.

Draft Regional Transportation Plan (RTP) and Congestion Management Process (CMP) Performance Measures (PMs)

Mr. Thompson stated that the materials in the agenda packet represented the first phase of development of performance measures for the RTP and CMP. To keep the process moving forward to meet federal timelines they were presented to show the minimum measures necessary to fulfill current federal requirements. He asked for feedback from MPC members on the measures and noted that consultants and staff were continuing to work on data and other information necessary to propose specific targets for the measures. Proposed draft targets would be provided at a future meeting. Potential additional measures were also being discussed for inclusion in the RTP and/or CMP beyond the minimum set needed to meet federal requirements. Public comments received to date on the draft measures had been provided to the MPC electronically.

Ms. Clarke reviewed the following performance measures in Table 1: Miles Traveled, Travel Time, Congested Miles of Travel, Vehicle Hours of Delay, Congestion, Mode Share, System Completeness, Access to Jobs, Access to Services, Access to Transit and Safety.

In response to a question from Mr. Moe, Ms. Clarke said the data used for the travel model was pre-COVID-19, but moving forward data reflecting current conditions would be available and both sets of data could be evaluated. She said this was the first time the criteria had been evaluated and baseline conditions established.

Ms. Clarke said Table 2 demonstrated how the performance measures connected to the MPC's goals as well as federal, state and local guidance. Attachment 1 highlighted federal performance measures in which the MPO was already participating and state performance targets. Attachment 2 contained the draft RTP goals and objectives.

Ms. Vinis expressed support for going beyond the minimum requirements, particularly with respect to greenhouse gas emissions, and appreciated the comments provided during comments from the audience.

Mr. Smith stressed the importance of mode share safety and hoped that significant data was available to measure bicycle use and the challenges of navigating hazardous areas. A solid and safe bicycle system was an essential element of future transportation.

Mr. Yeh concurred with Ms. Vinis regarding performance measures related to greenhouse gas emissions. He also agreed with the importance of a safe bicycle system to allow people to move about the community without cars. He suggested two additional measures related to the quality of transit. The first measure would be the number of people with access to frequent or useful transit, which was defined as 15 minute vehicle arrival times. The second related to historical access to any transit and pedestrian/bicycle access and expansion of that access to improve quality of life for other areas of the community.

Mr. Groves supported the recommendations from other MPC members. He said any efforts to provide separation between vehicles and bike lanes and sidewalks created a margin of safety. Too many injuries and fatalities were caused by well-intended street design that he felt did not provide an adequate safety margin for people on bikes or walking.

In response to a question from Mr. VanGordon, Mr. Thompson said there was enough time available to address comments from the public and suggestions from MPC members about performance measures. He said the initial deadline for adopting and submitting the RTP was May 2021, but staff would be meeting with federal representatives and he did not feel there would be any negative consequences to moving that deadline into the fall of 2021. Federal regulations provided for a once year grace period following the May 2021 date. He expected a federal transportation bill from the new Congress and administration within a year or two and it was likely to address new areas not in the current legislation, such as greenhouse gas. He noted that a greenhouse gas goal was included in the new RTP and a rule-making committee was not likely to complete it work before the end of 2021. As currently drafted, it appeared that the MPO would be required to conduct full performance analysis and scenario planning around greenhouse gas emissions and adopt local performance measures within the next two or three years.

Ms. Vinis reaffirmed that the MPO should not defer establishing its own greenhouse gas measures because of pending activity at the state and federal levels. She asked staff to share information about potential state and federal measure as it became available.

Mr. Berney observed that performance measures tended to de facto define the priorities of a program.

MPC MEETING MINUTES FROM 04-01-2021

COMMENTS FROM THE AUDIENCE

Rob Zako, Eugene, representing Better Eugene-Springfield Transportation (BEST), spoke to Regional Transportation Plan (RTP) performance measures. He was generally pleased with staff's recommendations for greenhouse gas emissions. He noted the measure should reference per capita rather than an absolute number. He felt the access to transit measure was also good, but suggested a better measure of transit usefulness might be access to jobs. Regarding health and safety, BEST welcomed staff's suggestion of doing more work to develop upstream measures of actions to assure the transportation system was safety and healthy. He said those measures reflected a very different transportation system than in the past and would require hard work. The proposed federal infrastructure legislation would support many of those initiatives.

Claire Roth, Eugene, representing BEST, spoke to the recent release of a Dangerous By Design report by Smart Growth America, examining motor vehicle traffic-related deaths across the country. She said the report identified a repeating trend of death on streets. Locally that trend was repeated as a result of lack of infrastructure for people walking and biking. She would forward the report and associated materials to MPC members.

Kevin Schaffer, Springfield, shared information from Labor Secretary Pete Buttigieg regarding the need for a world class transportation system and a full range of transportation mode choices for Americans. It was time to break the false choices of climate versus jobs and to create jobs through climate action. It should not be necessary to own a car in order to prosper. American communities could be as good or better than anywhere else in the world; it was just necessary to make that choice.

Regional Transportation Plan (RTP) Performance Measures Update

Ms. Clarke stated that draft performance measures for the RTP were presented at the MPC's February 2021 meeting. The MPC supported those measures and baseline conditions for each of those measures would be presented at the May 2021 meeting. Additionally, the MPC directed staff to explore and address the following measures:

- A transportation related greenhouse gas (GHG) emissions performance measure
- A performance measure specific to the number of people with access to frequent or useful transit
- Safety and health related performance measures with an upstream perspective on measuring efforts the MPO and partner agencies can control

Ms. Clarke reviewed the measures being proposed in accordance with MPC direction:

- Transportation Related Greenhouse Gas Emissions - A 20% reduction in greenhouse gases by 2040 from light vehicles consistent with the state goal to, by 2050, achieve greenhouse gas levels that are at least 75 percent below 1990 levels.
- Access to Transit - Number and percent of households within ¼ mile of frequent transit (for the entire region, within equity-focused area, and in non-equity focused areas)
- Upstream and Downstream Health and Safety Measures - Staff proposed an RTP project or strategy to address the upstream and downstream measures related to public health and safety.

Ms. Clarke pointed out the RTP included a performance measure related to jobs access. She said the third proposal was a project related to developing upstream and downstream health and safety measures, which were more qualitative and nuanced in nature. She said the Transportation Planning Committee (TPC) reviewed and supported the three proposals at its March17, 2021, meeting.

Ms. Vargas thanked staff for including a measure related to high frequency transit access as it was an important quality of life component by providing access to employment, education and services.

Ms. Vinis also appreciated the proposals, particularly the health and safety performance measures, as the increase in fatalities and injuries was a significant issue.

Mr. Skov concurred with Ms. Vargas regarding transit-related measures. He served on the rule-making advisory committee for the Department of Land Conservation and Development's Climate Friendly and Equitable Communities initiative and emphasized the effort to integrate equity with reduction of greenhouse gas emissions. He expected there would be performance measures and goals related to emissions reductions and to equity outcomes at the local level. The MPC was a good forum for those conversations.

Mr. Hurley asked how the 20 percent reduction in greenhouse gases would be measured and how traffic on Interstate 5 traffic would be separated from local community traffic. Ms. Clarke said the state was examining different factors to evaluate greenhouse gas emissions and staff was relying on that currently as there was no local level to measure.

Mr. Thompson said, with regard to proposed work on the health-related performance measure, that staff recently participated in a national workshop on integrating public health into public land considerations. One direction that could emerge was development of health-related performance measures for transportation and he said that could be reflected in the new federal transportation legislation.

Mr. Berney said Lane County had a climate action initiative and there were many different groups in the county that responded to different measures for different timeframes, all ultimately dealing with carbon emissions, with a goal of net zero for Lane County at some point in the future. He asked how all of those efforts could be coordinated with respect to measures so policy makers could get a sense of progress. Ms. Clarke said those working on the RTP hoped to see documentation of the different measures that were in place in the region, but she was not aware of efforts to make that coordination happen.

Ms. Newman noted that a meeting was being organized by Lane County staff to bring partners together to discuss those types of coordination issues.

APPENDIX J: ORGANIZATIONS ENGAGED DURING PUBLIC OUTREACH

Below are the local organizations engaged during the public outreach period.

Organization	Date
350 Eugene	01/04/2021
Eugene InMotion	January Newsletter
League of Women Voters	01/04/2021
Confederated Tribes of the Coos, Lower Umpqua and Siuslaw Indians	01/04/2021
Confederated Tribes of the Siletz Indians	01/05/2021
Lane Independent Living Alliance	01/05/2021
Our Children's Trust	01/05/2021
Asian Pacific Island Community Action Team	01/07/2021
Centro Latino Americano	02/01/2021
Active Bethel Citizens	02/01/2021
4J Safe Routes to School	02/01/2021
Springfield Safe Routes to School	02/01/2021
Bethel Safe Routes to School	02/01/2021
Springfield Alliance for Equality and Respect	02/01/2021
Catholic Community Services of Lane County	02/01/2021
Springfield Planning Commission	02/01/2021
Lane Kids	02/01/2021
Equity and Community Consortium	02/01/2021
Grupo Latino de Accion Directa of Lane County	02/01/2021
Lane County Equity and Access Advisory Board	02/01/2021
University of Oregon LiveMove	02/01/2021
Better Eugene Springfield Transportation	02/01/2021

Lane Community College, Native American Student Program	02/01/2021
University of Oregon Tribal Government Relations	02/01/2021
Amazon Neighbors	02/17/2021
Cal Young Neighbors	02/17/2021
Churchill Neighbors	02/17/2021
Downtown Neighborhood Association	02/17/2021
Fairmount Neighbors	02/17/2021
Far West Neighbors	02/17/2021
Friendly Area Neighbors	02/17/2021
Goodpasture Island Neighbors	02/17/2021
Harlow Neighbors	02/17/2021
Industrial Corridor	02/17/2021
Jefferson Westside Neighbors	02/17/2021
Laurel Hill Valley Citizens	02/17/2021
Northeast Neighbors	02/17/2021
River Road Community Organization	02/17/2021
Santa Clara Community Organization	02/17/2021
South University Neighborhood Association	02/17/2021
Southeast Neighbors	02/17/2021
Southwest Hills Neighborhood Association	02/17/2021
Whitaker Community Council	02/17/2021
Neighborhood Leaders Council	02/17/2021
City of Eugene’s Community Bulletin	February Newsletter

Appendix G: Travel Barriers and Benefits Survey Report

Central Lane Metropolitan Planning Organization Travel Barriers and Benefits Survey

July 2020

1. INTRODUCTION AND METHODOLOGY

Introduction: The Central Lane Metropolitan Planning Organization commissioned DHM research to conduct a travel behavior survey to gain public insights into regional perceptions towards travel. From June 25 to July 10, 2020 DHM Research conducted a survey of residents in the Central Lane Transportation Management Area (TMA), which encompasses the cities of Eugene, Springfield, Coburg, and surrounding urban area. The purpose of the survey was to assess perceptions of the transportation system and to obtain a better understanding of travel priorities and behavior. This survey is a follow-up to a similar survey DHM conducted in 2014: the 2014 Eugene-Springfield Metropolitan Area Travel Barriers and Benefits Survey.

Research Methodology: This hybrid (telephone and text-to-online) survey consisted of 502 residents and took approximately 21 minutes to complete. This is a sufficient sample size to assess opinions generally and to review findings by multiple subgroups, including age, gender, area, and party affiliation.

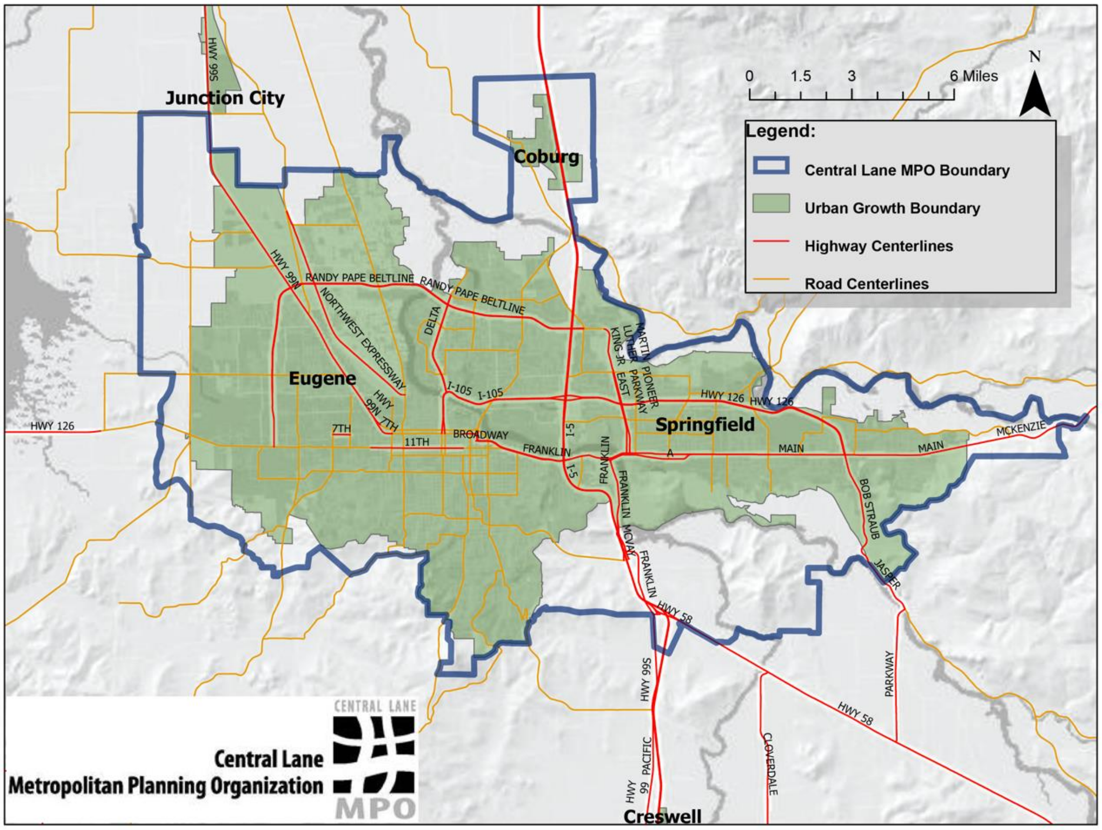
Respondents were contacted from multiple lists: a list of registered voters; a landline household list compiled from public records and consumer lists; and a cellular consumer list developed from cell and cable consumer information matched to publicly available address information. Telephone respondents were contacted by a live interviewer and text-to-online respondents received a text invitation directing them to an online survey. Text-to-online respondents were offered a $5 incentive for their participation. In gathering responses, a variety of quality control measures were employed, including questionnaire pre-testing and validation. Quotas were set by age, gender, area, and party affiliation to ensure a representative sample.

For the purposes of analytic continuity, to a large extent, questions in this survey matched questions asked in the 2014 Eugene-Springfield Metropolitan Area Travel Barriers and Benefits Survey, enabling comparisons across time. New questions added to this survey are indicated with asterisks and were added in recognition of evolutions to travel since the 2014 survey. It should be noted that the geographic scope of the 2014 survey differed slightly from the 2020 survey: the 2014 survey was specific to the Eugene and Springfield City Limits while the 2020 survey encompassed the entire Central Lane TMA.

The 2020 Central Lane Metropolitan Planning Organization Travel Barriers and Benefits Survey was conducted amidst the COVID-19 global pandemic and the resulting Stay at Home Orders, which have had profound impacts on travel behaviors in the TMA. Respondents were asked to report on their own travel behavior prior to COVID-19 and the Stay at Home orders in Oregon.

Statement of Limitations: Any sampling of opinions or attitudes is subject to a margin of error. The margin of error is a standard statistical calculation that represents differences between the sample and total population at a confidence interval, or probability, calculated to be 95%. This means that there is a 95% probability that the sample taken for this study would fall within the stated margin of error if compared with the results achieved from surveying the entire population. The margin of error for this survey is +/- 4.9%.

DHM Research Background: DHM Research has been providing opinion research and consultation throughout the Pacific Northwest and other regions of the United States for over 40 years. The firm is nonpartisan and independent and specializes in research projects to support public policy making.



2. SUMMARY OF OBSERVATIONS

Expanding bus transportation, reducing traffic congestion, and improving road conditions are the top transportation issues for residents of the Central Lane Transportation Management Area.

- When it comes to the combined areas of Eugene and Springfield only, expanding bus transportation and reducing traffic congestion have grown as priorities since 2014, while improving road conditions has remained a steady concern.
- 31% of residents in the TMA prioritized expanding bus transportation.
- 19% of residents in the TMA prioritized reducing traffic congestion.
- 18% of residents in the TMA prioritized improving road conditions.

Driving alone is the most frequently used mode of transportation followed by driving with others in the household and walking.

- Among those who drive alone, freedom (44%) and need (39%) are the primary motives.
- Information about health and environmental benefits (47%), along with difficulty parking (46%), are the most influential factors in getting people to use alternatives to driving alone.

The top reasons people bike and walk for transportation are for enjoyment and for health benefits.

- Shopping (83%) and visiting friends (30%) are the most common reasons for non-recreational biking, while shopping (80%) and eating out (30%) are the most common reasons for walking.
- Among those who bike or walk monthly or less often, approximately half would like to bike and walk more often.

There is a desire among some residents to bike or walk more often for transportation purposes.

- Those who would like to bike more often say they would do so if:
  - Quality bike parking were available (77%)
  - Bike lanes were available or more connected (76%)
  - Stores and services were closer to where they lived (72%)
  - They felt safer on the roads (72%)
  - They knew more about local bike routes (58%)
  - They had access to an e-bike (48%)
- Those who would like to walk more often say they would do so if:
  - Stores and services were closer to where they lived (85%)
  - Sidewalks in their area were better connected (67%)
  - They felt safer walking along and crossing the street (63%)
  - There were fewer hills in their neighborhood (26%)

The top reasons people ride the bus are limited car access, financial considerations, and enjoyment.

- Shopping (70%) and entertainment (46%) are the most common destinations for bus riders
- Among those who ride the bus monthly or less often, approximately one in three would like to bus more often.

There is a desire among some residents to ride the bus more often for transportation purposes.

- Those who would like to bus more often say they would do so if:
  - Buses came more frequently (92%)
  - There were better connections to and from transit stops (92%)
  - They could rely on buses to be on time (82%)
  - They knew it would cost less than driving (78%)
  - There were a county-wide bus service for longer commutes (77%)
  - They felt personally safer (77%)
  - Buses were more comfortable (61%)
- Among Eugene and Springfield residents who would like to bus more often, Eugene residents (81%) are more likely than Springfield residents (68%) to say a county-wide bus service would be a motivator.

Some residents are interested in programs that promote multimodal transportation options.

- Approximately half of residents are interested in programs to promote: electric vehicle use (54%), bike sharing and electric-assist bikes (49%), and electric scooters (44%).

Nearly half of residents believe telecommuting for work and school are more likely in the future.

- Of residents (46%) who believe telecommuting will be more likely in the future, the belief is higher among students (83%), residents age 35-54 (61%), and those with children in the household (59%).
- Approximately half (48%) would prefer to telecommute, with a stronger preference among adult students (78%) and residents under age 55 (60%).
- Among those who prefer telecommuting, more than eight in ten (82%) would like to do so several times a week or more.

3. KEY FINDINGS

3.1. Transportation Priorities

Respondents were asked, unprompted, what they felt were the most important issues in the Eugene-Springfield area that they would like their local government leaders to address (Q1).

Table 1
Most Important Transportation Issues

Response Category	Eugene N=361	Springfield N=115	Rest of Area N=25	Central Lane TMA N=502
Expand bus transportation system	34%	22%	38%	31%
Improve traffic congestion	20%	19%	14%	19%
Improve road conditions	16%	25%	17%	18%
Increase bike accessible areas / bike lanes	9%	7%	5%	8%
Improve Beltline	7%	4%	7%	7%
Improve road safety	5%	12%	6%	6%
Safety on buses / terminals	6%	4%	4%	6%
Don't see any problems / issues	4%	5%	7%	4%
More affordable / free buses	4%	6%	4%	4%
Better sidewalks / pedestrian paths	4%	5%	3%	4%
Bicycle safety	3%	3%	1%	3%
Reduce pollution / alternative fuels	1%	2%	3%	1%
More parking	1%	1%	1%	1%
Bike, e-bike, e-scooter share	1%	-	-	1%
Carpool options	*	-	1%	*
None / Nothing	7%	9%	10%	8%
All other responses	-	-	-	-
Don't know	2%	3%	2%	2%

Source: DHM Research (July 2020) and LCOG
Note: Percentage less than 0.5 printed as *

In the Central Lane TMA, **expanding bus transportation** (31%) was the number one reported transportation issue. Overall, other top mentions included **improving traffic congestion** (19%), **improving road conditions** (18%), and **increasing bike accessible areas / bike lanes** (8%).

By Area:
Eugene and Springfield residents share the same top transportation priorities, but they rank them differently. Eugene's residents prioritized **expanding bus transportation** (34%), **reducing traffic congestion** (20%), and **improving road conditions**. Springfield's residents prioritized **improving road conditions** (25%), **expanding bus transportation** (22%), and **reducing traffic congestion** (19%).

Demographic Differences:
Residents with incomes less than $50K (40%) were more likely to prioritize **expanding bus transportation** than those making over $100K (18%), while those in higher income brackets were more likely to prioritize **improving road conditions** than those making less than $50K. Residents aged 35-54 were more likely than

residents over 55 to prioritize **increasing bike accessible areas / bike lanes** and **better sidewalks / pedestrian lanes**, as were residents with incomes over $100K compared with those making under $100K.

3.2. Proximity to Work and School

Respondents were asked how frequently they commute to work or school between urban and rural areas within Lane County (Q2).

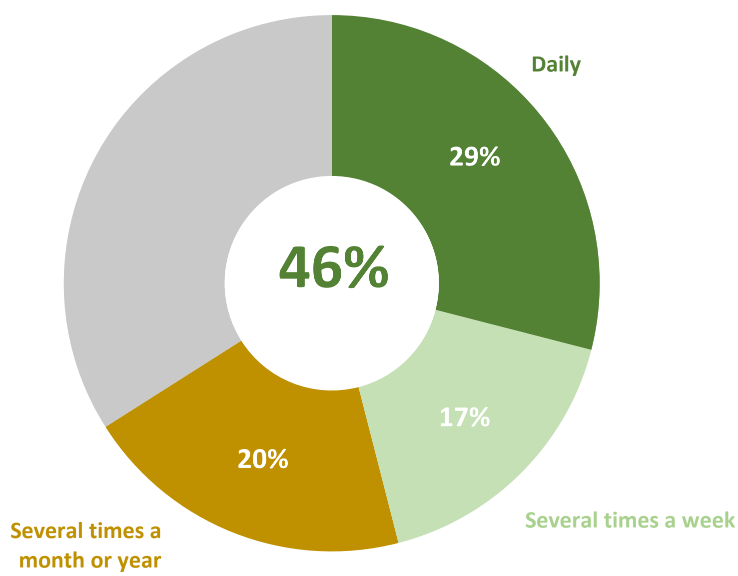
Table 2
Frequency of Commute Between Urban and Rural Areas

Response Category	Eugene N=361	Springfield N=115	Rest of Area N=25	Central Lane TMA N=502
Daily	28%	30%	23%	29%
Several times a week but not every day	16%	18%	21%	17%
Several times a month	11%	4%	6%	9%
A few times a year	10%	13%	5%	11%
Never	32%	31%	43%	32%
Don't know	2%	3%	1%	2%

Source: DHM Research (July 2020) and Lane Council of Governments (LCOG)

Almost half of residents (46%) say they are traveling to work or school between urban and rural areas at least several times a week.

Chart 1
Frequency of Commute Between Urban and Rural Areas



Source: DHM Research (July 2020) and LCOG

Respondents were then asked if they would live closer to their workplace if they were able to find an affordable place to live (Q3).

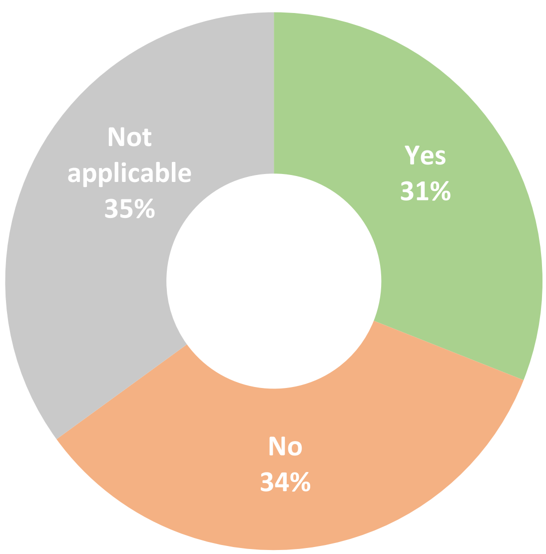
Table 3
Desire to Live Closer to Work

Response Category	Eugene N=361	Springfield N=115	Rest of Area N=25	Central Lane TMA N=502
Yes	32%	28%	26%	31%
No	34%	39%	40%	35%
Not applicable	33%	31%	33%	33%

Source: DHM Research (July 2020) and LCOG

About one third of residents (31%) would prefer to live closer to their workplace if they could find an affordable place to live.

Chart 2
Desire to Live Closer to Work



Source: DHM Research (July 2020) and LCOG

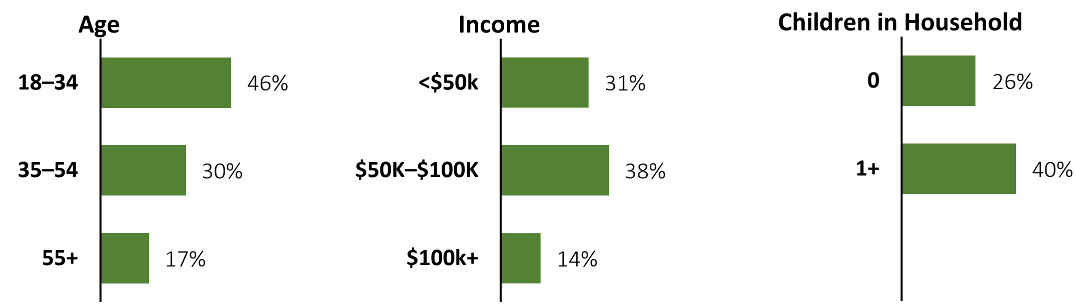
By Area:
No statistically significant differences by area exist.

Demographic Differences:

Overall, young residents, residents with families, and residents in households earning $50-$100,000 are more likely to want to live closer to their workplaces.

Chart 3

Desire to Live Closer to Work by Age, Income, and Children in Household



Source: DHM Research (July 2020) and LCOG

3.3. Travel Behavior

Respondents were asked how often they used various modes of travel for transportation purposes (Q4-Q10).

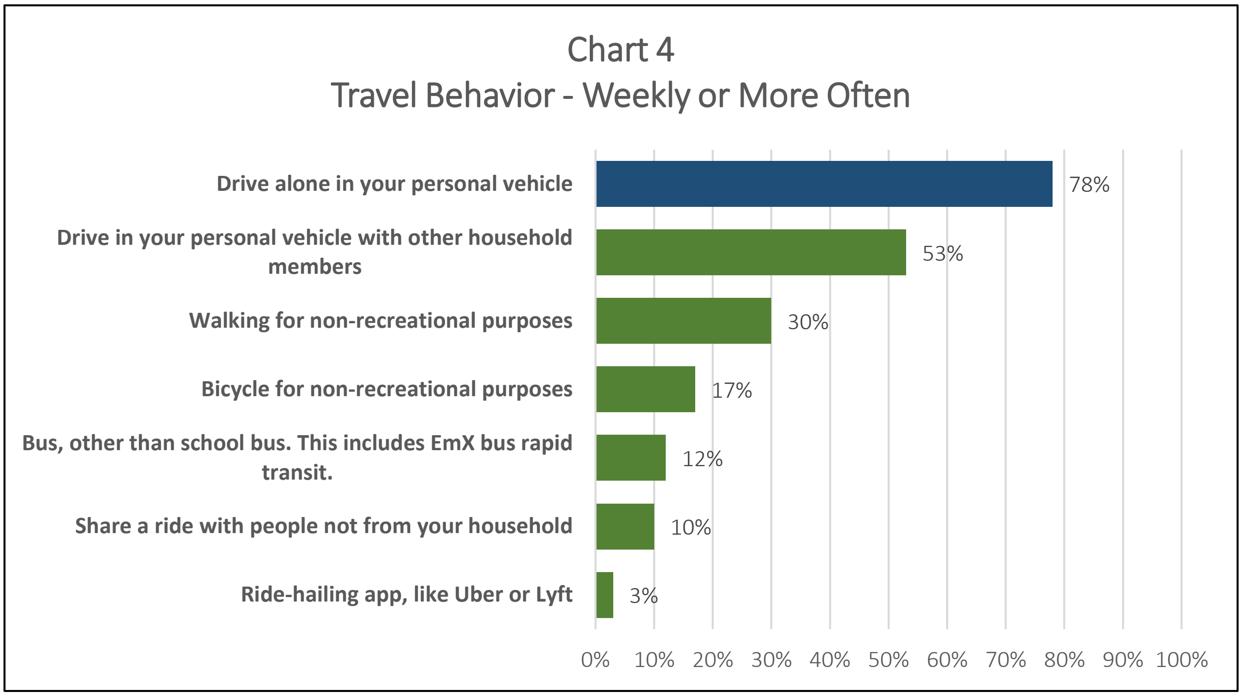
Table 4

Travel Behavior in the Central Lane TMA

Response Category	Daily	Several times a week but not every day	Several times a month	A few times a year	Never	Don't know
Drive alone in your personal vehicle	48%	30%	9%	4%	10%	<1%
Drive in your personal vehicle with other household members	18%	35%	19%	6%	22%	0%
Share a ride with people not from your household (example: Carpool or Vanpool)	3%	7%	18%	24%	47%	1%
Ride hailing app, such as Uber or Lyft (2014 Carsharing service: Flex car, Zipcar, Car2Go)	2%	1%	9%	29%	58%	1%
Bus, other than school bus. This includes EmX bus rapid transit	4%	8%	11%	24%	53%	<1%
Bicycle for non-recreational purposes such as to work, school, shopping, errands, etc.	9%	8%	10%	18%	54%	2%
Walking for non-recreational purposes such as to work, shopping, errands, etc.	12%	18%	19%	20%	31%	<1%

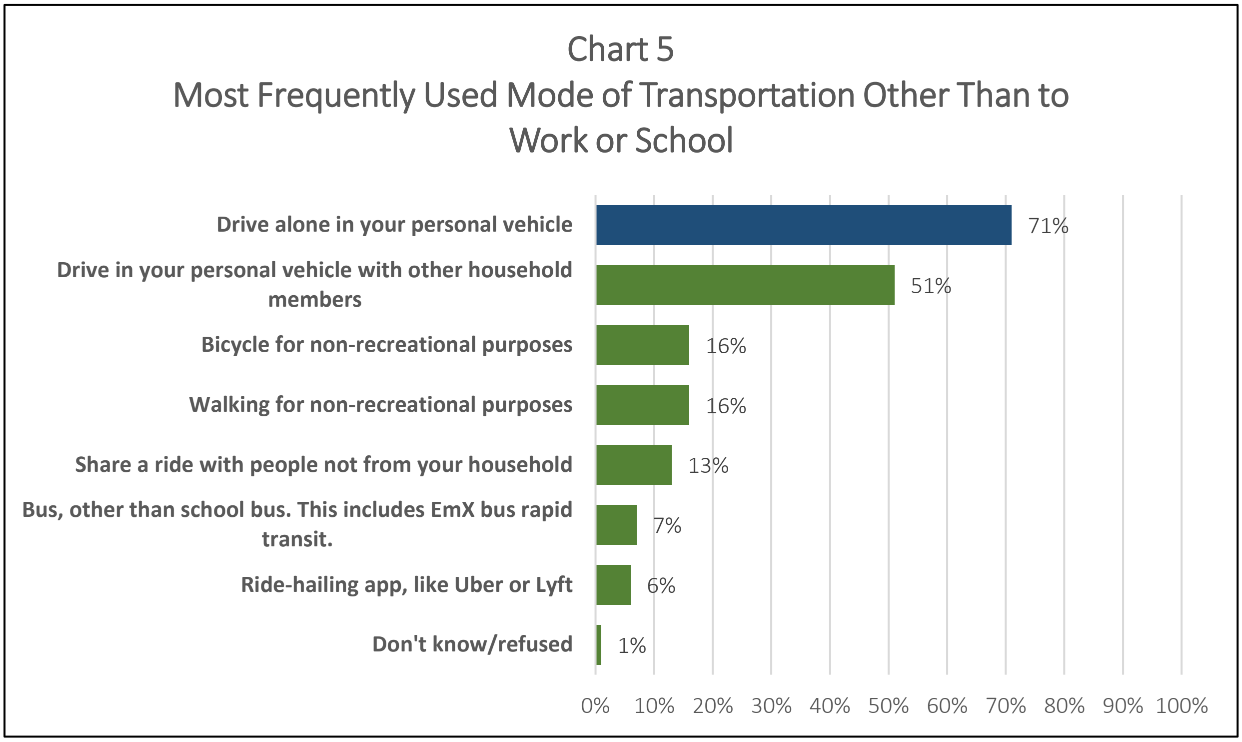
Source: DHM Research (July 2020) and LCOG

Overall, three in four (78%) Central Lane TMA residents **drive alone in their personal vehicle** weekly or more often, with half (48%) doing so on a daily basis. This was followed by **driving in a personal vehicle with other household members** (53%). **Walking** (30%), **biking** (17%), **taking the bus** (12%), and **sharing a ride with others outside of their household** (10%) distantly followed.



Source: DHM Research (July 2020) and LCOG

Next, respondents were asked to think about trips that they take, other than to work or school, and indicate the mode of transportation they most frequently use. They could indicate up to three modes (Q11).



Source: DHM Research (July 2020) and LCOG

Overall, six in ten (71%) **drive alone in their personal vehicle** most frequently for trips other than work and school. This is followed by **driving in personal vehicle with other household members** (51%). **Walking** (16%), **biking** (16%), **sharing a ride with others outside of their household** (13%), and **taking the bus** (7%), distantly followed.

By Area:

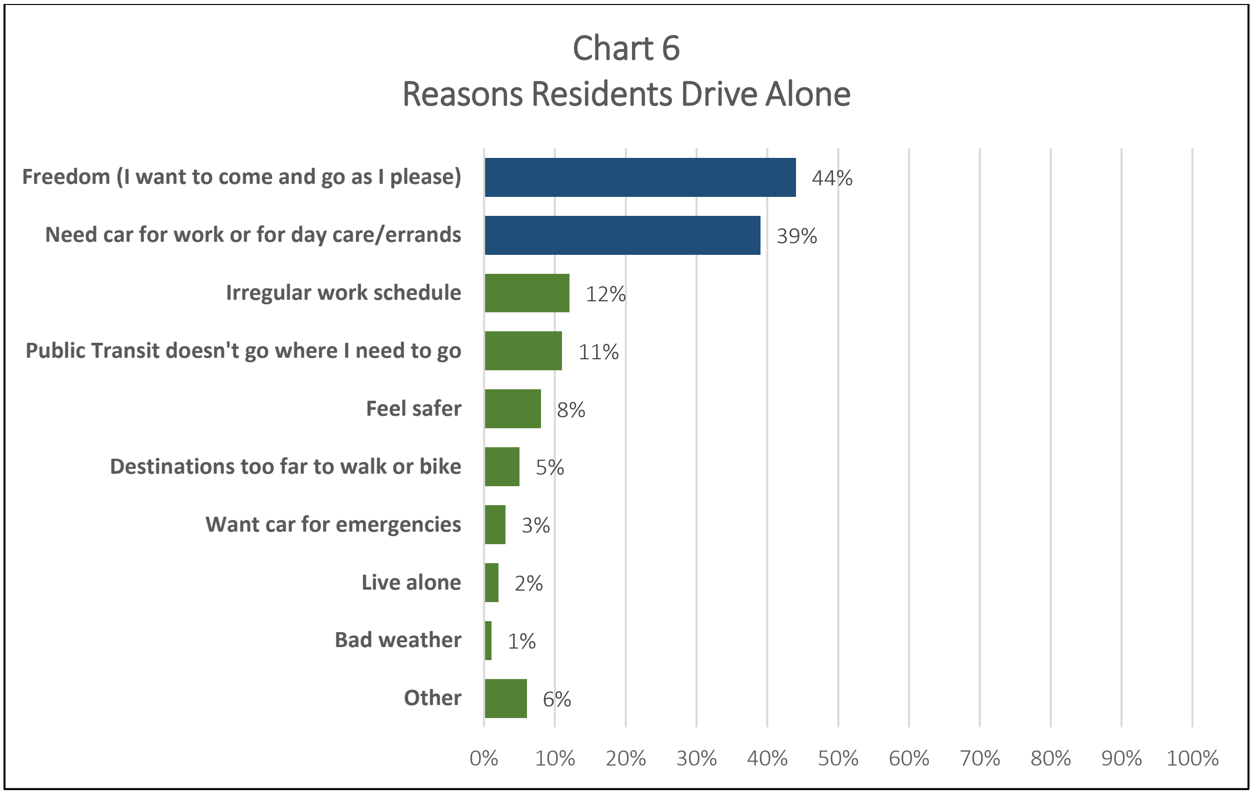
Eugene residents (16%) were more likely than those from Springfield (6%) to **share a ride with people not from their household**. Eugene residents were more likely than those in the TMA who live in neither Eugene nor Springfield to **walk** (19% vs, 5%) as a form of transportation; Eugene residents more likely than those in Springfield to **bicycle** (19% vs. 7%) as a form of transportation.

Demographic Differences:

Respondents under 55 are more likely than those 55 and older to **drive in their personal vehicle with other household members** (18-34: 59%; 35-54: 61%; 55+: 67%). Respondents ages 18-34 are also more likely than those 55 and older to use a **ride-hailing app, like Uber or Lyft** (18-34: 10%, 35-54: 6%, 55+: 2%).

Respondents from households making $50K or less were more likely than those from higher income households to use the **bus** (<$50K: 11%; $$50K-$100K: 5%; $100K+: 1%) and less likely to **drive alone** (<$50K: 57%; $$50K-$100K: 82%; $100K+: 77%) or **drive with other household members** (<$50K: 38%; $$50K-$100K: 61%; $100K+: 65%).

Respondents who drive alone as a form of transportation were asked, unprompted, for the reasons they drive alone (Q12).



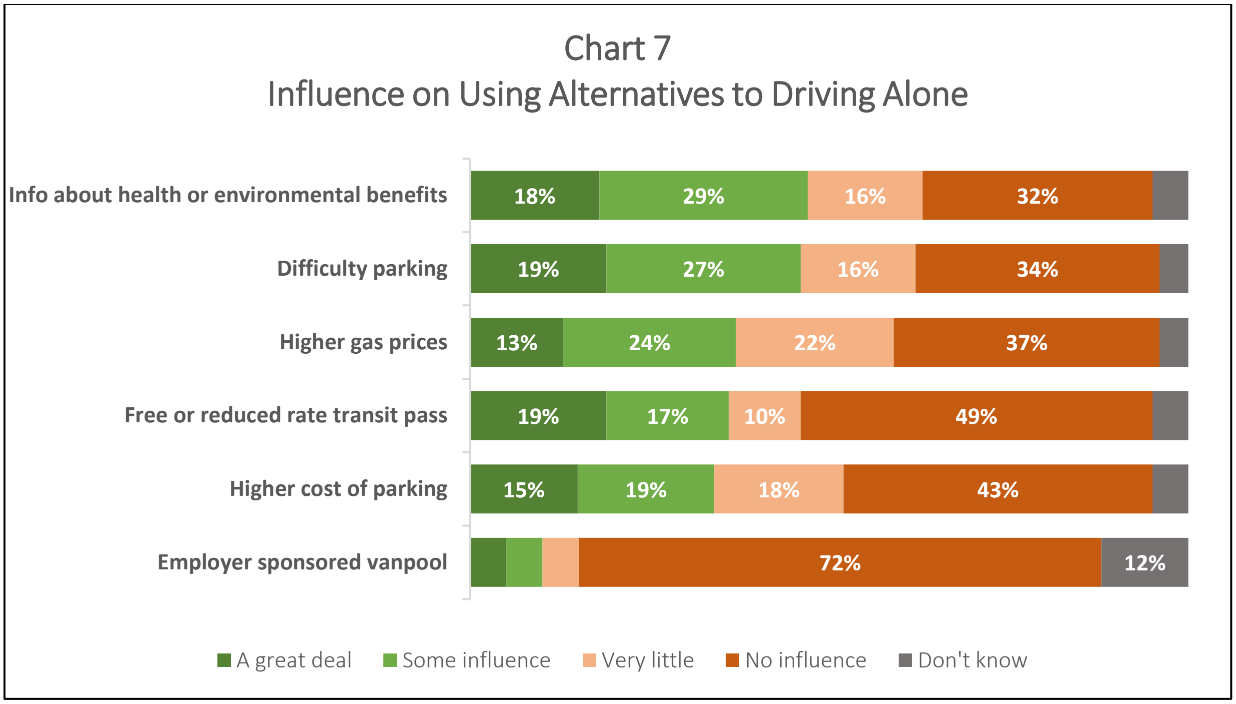
Source: DHM Research (July 2020) and LCOG

Top reasons for why respondents drive alone included **freedom** (44%) and **needing a car for work, day care, or errands** (39%). One in ten residents also mentioned an **irregular work schedule** (12%) or **public transit doesn't go where they need it to go** (11%) as reasons they drive alone.

By Area:
No statistically significant differences by area exist.

Demographic Differences:
Respondents 55 and older were more likely than those who are younger to cite an **wanting a car for emergencies** (18-34: 0%; 35-54: 1%; 55+: 7%) or **living alone** (18-34: 0%; 35-54: 0%; 55+: 6%) as reasons they drive alone. No other statistically significant demographic differences exist.

Respondents who use transportation options other than driving alone monthly or more frequently were asked how much influence various factors had on their decision (Q13-Q19).



Source: DHM Research (July 2020) and LCOG

Information about health and environmental benefits, as well as difficulty parking, are the biggest motivators when choosing alternatives to driving alone. Almost half (47%) reported that **information about health or environmental benefits** had a great deal (18%) or some (29%) influence on their decision to use alternatives to driving alone. Almost half (46%) also reported that **difficulty parking** had a great deal (19%) or some (27%) influence on their decision to use alternatives to driving alone. The second tier of influencers included **higher gas prices** (37%), **free or reduced rate transit passes** (36%), and **higher cost of parking** (34%). The **employer sponsored vanpool** was the least influential with 72% reporting it had no influence on their decision to use alternatives to driving alone. Other items that influenced decisions mentioned by respondents included **convenience, lack of a vehicle,** and **health benefits.**

By Area:

All influencers were consistent by area with the exception of **higher gas prices** and **information about health or environmental benefits.** Respondents in Eugene (63%) were more likely than those in Springfield (48%) to say **higher gas prices** had a little or no influence on their decision, while those living in Springfield (50%) as well as those living outside of Eugene or Springfield (49%) were more likely than respondents in Eugene (33%) to say this had a great deal or some influence. Respondents in Eugene (51%) were more likely than those in Springfield (36%) to cite **information about health or environmental benefits** as having a great deal or some influence, while respondents in Springfield (61%) were more likely than those in Eugene (44%) to say that this had little or no influence on their decision.

Demographic Differences:

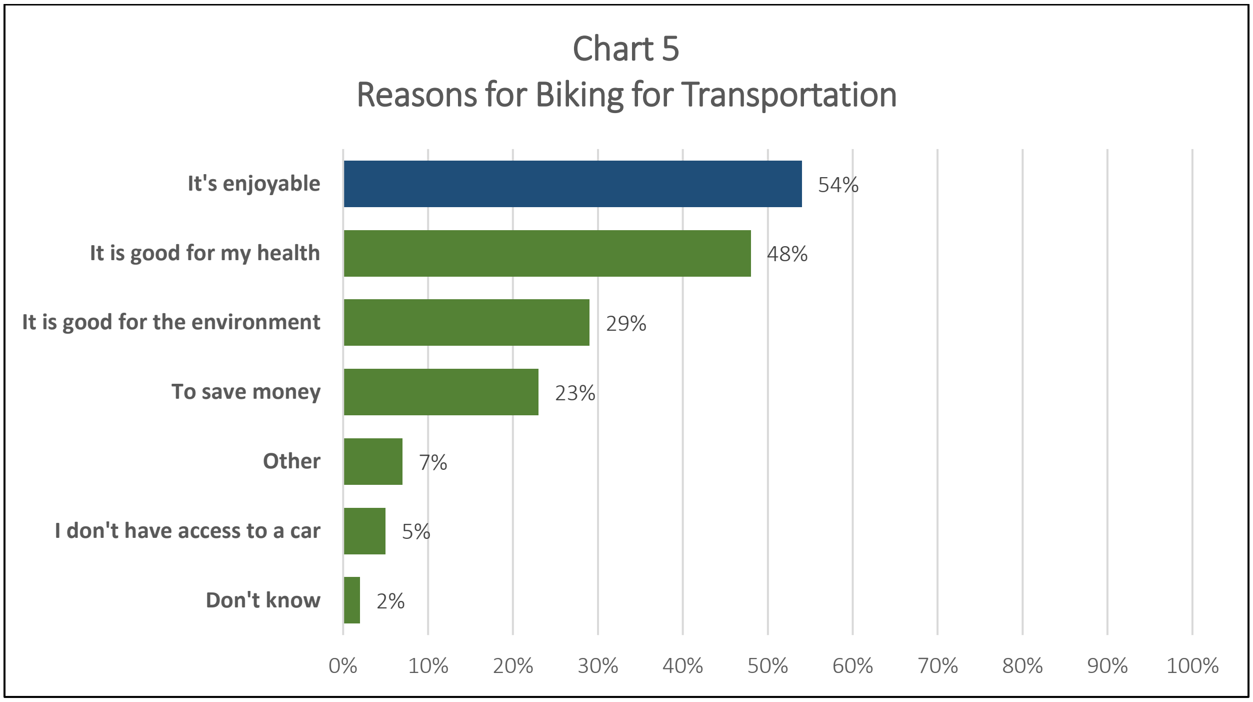
Those under age 55 were more likely to say that **difficulty parking** had a great deal or some influence (18-24: 55%, 35-54: 51%, 55+: 35%), while those 55 and older were more likely to say this had little or no influence (18-24: 41%, 35-54: 48%, 55+: 62%). Younger respondents, ages 18-34, were also more likely than those 55 and older to say that **higher cost of parking** had a great deal or some influence (18-24: 45%, 35-54: 32%, 55+: 26%), while those over 55 cited that this had little or no influence (18-24: 50%, 35-54: 64%, 55+: 72%).

Not surprisingly, those who bike (69%) or walk (66%) are more likely than those who drive alone (43%) or with others in their household (43%) to say that **information about health or environmental benefits** has a great deal or some influence. Those who drive alone (25%) or with others in their household (25%) are more likely than those who take the bus (3%) to say that **higher gas prices** have very little influence. Respondents who use raid-hail (46%) are also more likely than those who drive alone (46%), those who drive with others in their household (14%), those who bike (13%), and those who walk (10%) to say that **higher cost of parking** has a great deal of influence.

Respondents who ride the bus (79%) were more likely than those who use other modes (31-51%) to have been influenced by **free or reduced rate transit pass**. Respondents from households making less than $50K a year (49%) were more likely than those who make $100K or more (29%) to be influenced by **free or reduced rate transit pass**.

3.4. Biking

Respondents who bike monthly or more often were asked, open-ended, why (Q20).



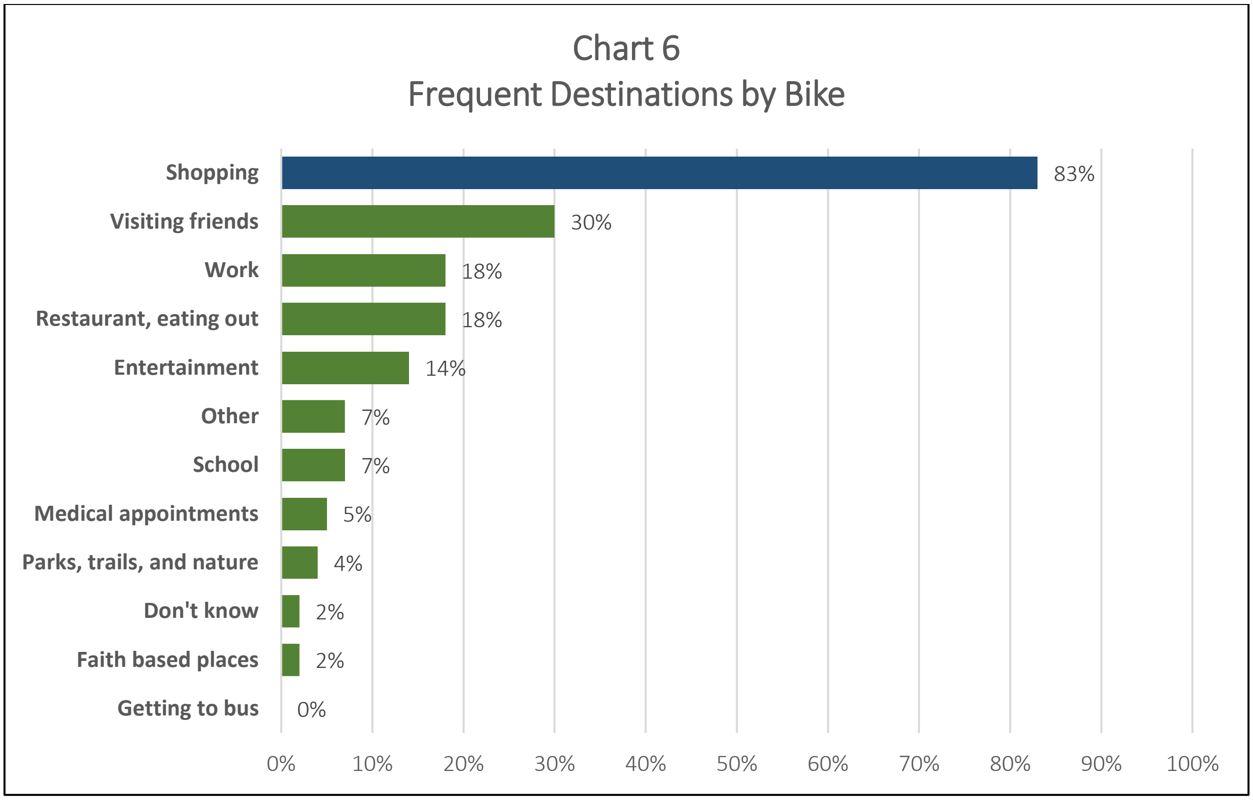
Source: DHM Research (July 2020) and LCOG

The top reason respondents gave for biking as a form of transportation was that **it's enjoyable** (54%). Nearly five out of ten (48%) bike because **it is good for their health**. Other reasons respondents bike as a form of transportation included **environmental benefits** (29%) and **to save money** (23%). All other reasons were mentioned by less than 10% of respondents.

By Area: Due to reduced sample size (Eugene, N=109; Springfield, N=15), there were no significant differences by area.

Demographic Differences: Women (55%) were more likely than men (44%) to bike because **it was good for their health**. Reasons respondents bicycle as a form of transportation showed no other significant differences among demographic subgroups.

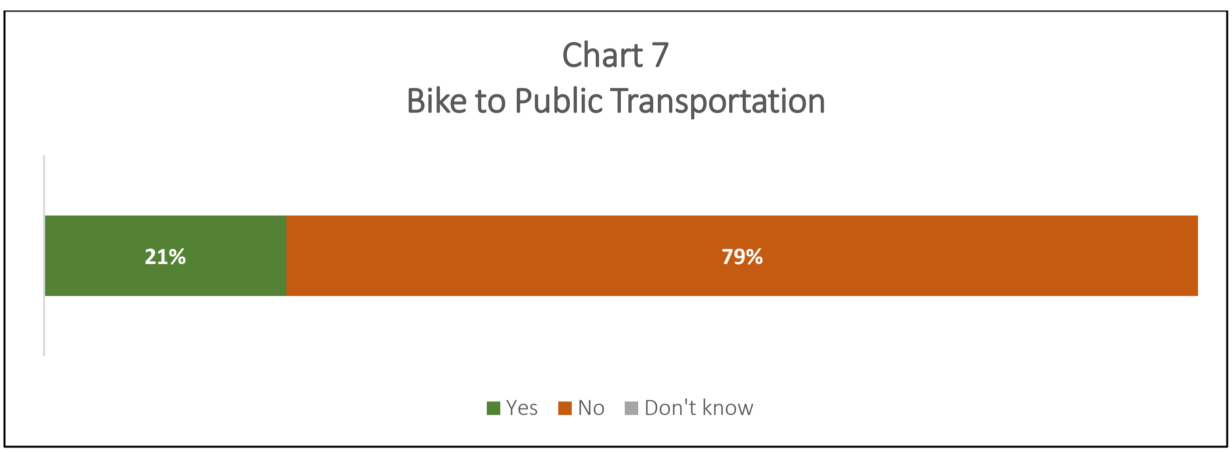
Respondents who used a bike most frequently as a form of transportation were asked where they typically go most often (Q21). Due to small sample size (N=132), analysis by area and demographic subgroups are not presented for this question.



Source: DHM Research (July 2020) and LCOG

The most frequent destinations for the majority of respondents (83%) was to go **shopping**. This was followed most closely by **visiting friends** (30%), **restaurants** (18%), **work** (18%), and **entertainment** (14%). All other destinations were frequented by less than 10% of participants.

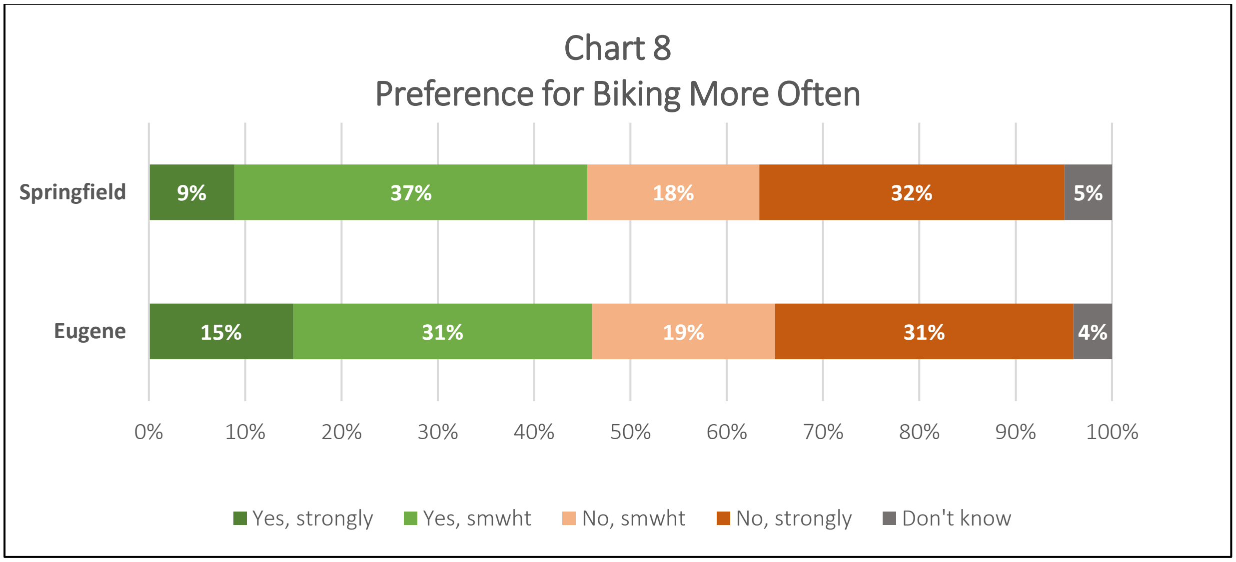
Respondents who used a bike most frequently as a form of transportation were asked if they ride their bike to or from public transportation (Q22). Due to small sample size (N=81) analysis by area and demographic subgroups are not presented for this question.



Source: DHM Research (July 2020) and LCOG

Most respondents have not biked to or from public transportation. Overall, 21% have biked to or from public transportation while nearly eight in ten (79%) have not.

Respondents who biked monthly or less often were asked if they would prefer to bike more often for transportation purposes (Q23).



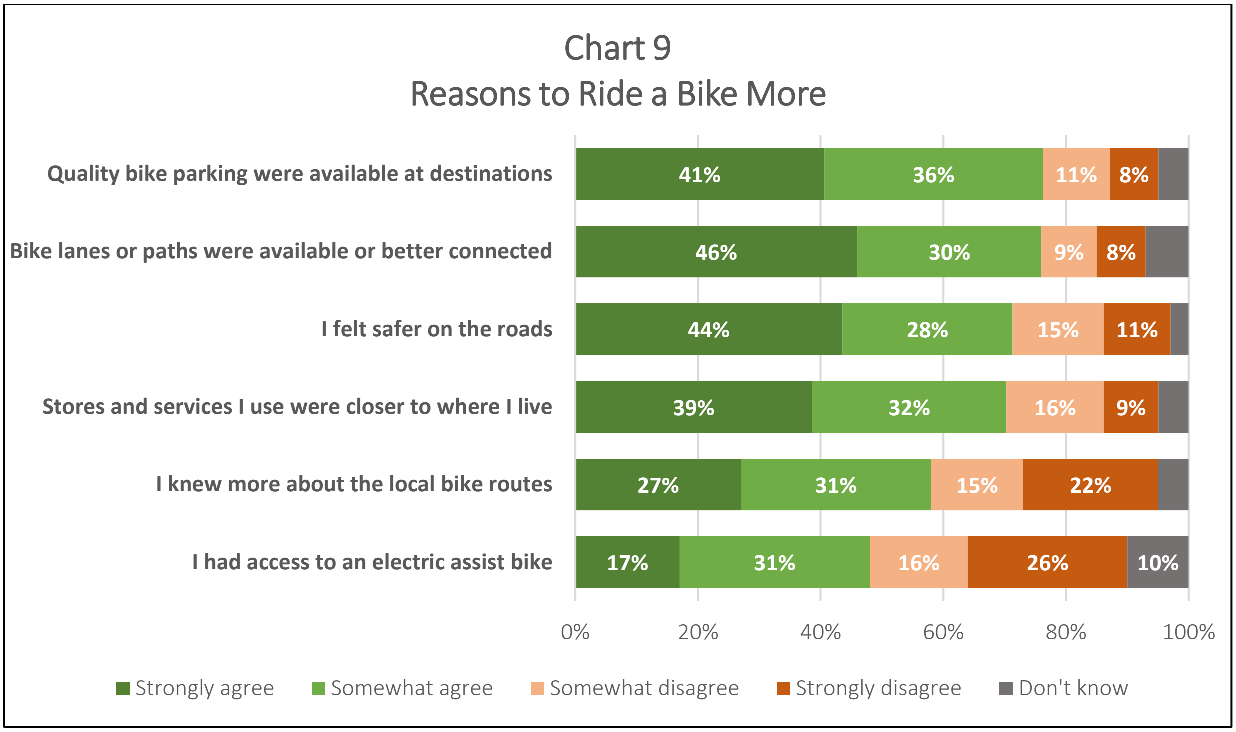
Source: DHM Research (July 2020) and LCOG

Overall, nearly five in ten (46%) would prefer to bike more often for transportation purposes, with 14% who felt this way strongly. Half of the respondents (50%) have little or no desire to bike more often.

By Area: No significant differences in preference to bike more often exist by area.

Demographic Difference: Respondents under the age of 55 are more likely to have a desire to bike more often than those who are older (18-34: 58%, 35-54: 51%, 55+ 32%). Respondents who live in households making more than $50K per year are more likely to have a desire to bike more often than those making less than $50K per year (<$50K: 40%, $50K-$100K: 49%, >$100K: 56%).

Those who would like to bike more for transportation purposes were read a list of reasons why people may bike more. They were asked to rate their agreement with each of the following statements (Q24-Q29).



Source: DHM Research (July 2020) and LCOG

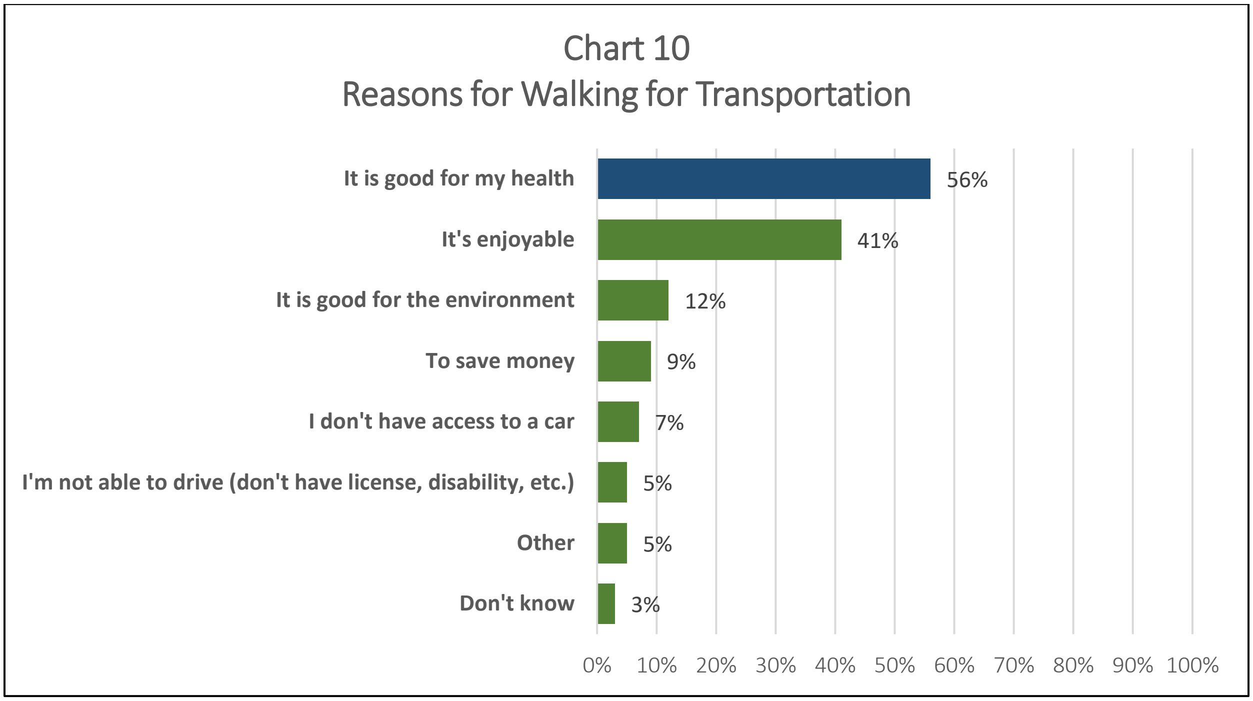
Quality bike parking were available at destinations (77% strongly agree or somewhat agree), and **Bike lanes paths were available or better connected** (76%) are the number one deterrents to riding a bike for transportation. This is followed closely by **I felt safer on the roads** (72%), and **Stores and services I use were close to where I live** (71%). Less important items include **I knew more about the local bike routes** (58%), and **I had access to an electric assist bike** (48%).

By Area: Due to small sample sizes within the regions in Eugene and Springfield, analysis by area is not presented.

Demographic Differences: Variables that would encourage respondents to bike more often were consistent across demographic subgroups.

3.5. Walking

Respondents who walk monthly or more often were asked, unprompted, why (Q31).



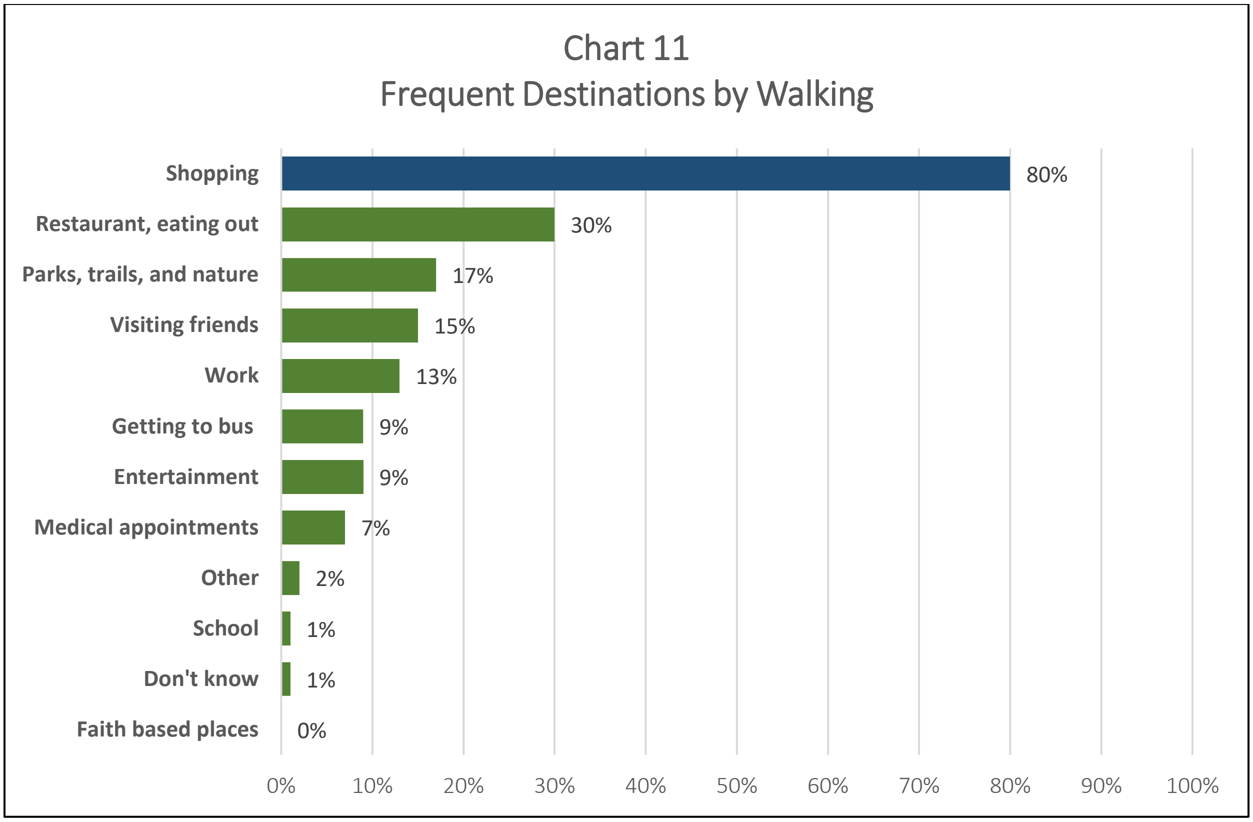
Source: DHM Research (July 2020) and LCOG

The top reason for walking for transportation was for **health benefits** (56%). The next biggest reasons were **it's enjoyable** (41%), **it is a good for the environment** (12%), and **to save money** (9%).

By Area: Results are similar by area with the exceptions of **health benefits** and **saving money**. For **health benefits,** respondents from Springfield (65%) were more likely than those from Eugene (53%). Respondents from Eugene (11%) were more likely than those from Springfield (0%) to walk as a form of transportation to **save money**. No other differences by area exist.

Demographic Differences: Reasons respondents walk for transportation were consistent across demographic subgroups.

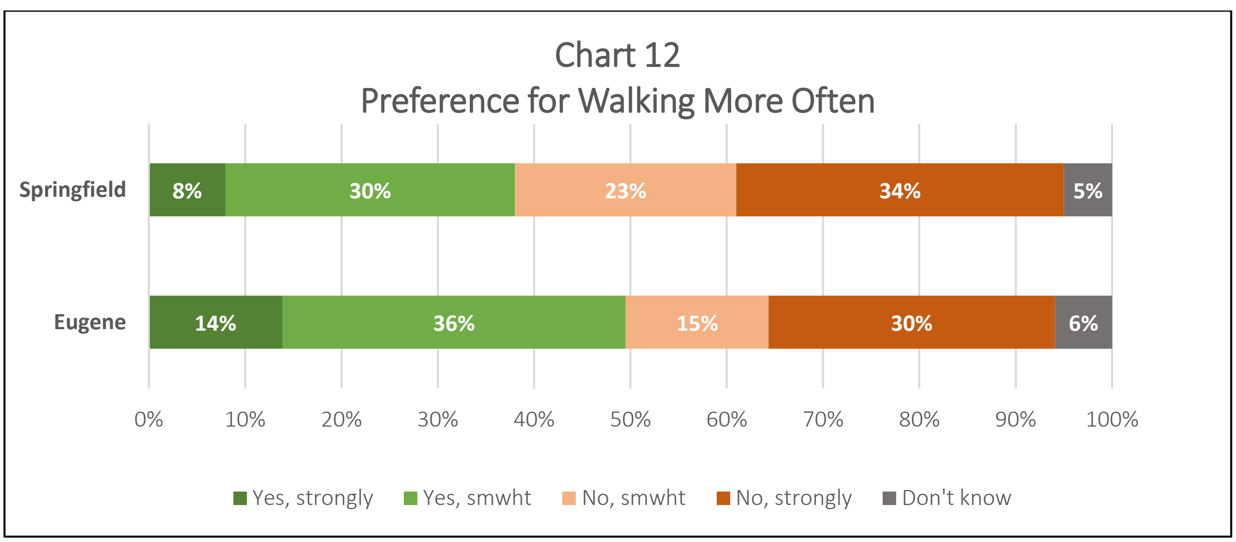
Respondents who walk most frequently as a form of transportation were asked where they typically go most often (Q32). Due to small sample size (N=82), analysis by area and demographic subgroups are not presented for this question.



Source: DHM Research (July 2020) and LCOG

Similar to those who bike for transportation, the most frequent destination for those who walk was **shopping** (80%). This was distantly followed by **restaurants** (30%), **parks, trails, and nature** (17%), **visiting friends** (15%), and **work** (13%). All other destinations were frequented by less than 10% of respondents.

Respondents who walked monthly or less often were asked if they would prefer to walk more often for transportation purposes (Q33).



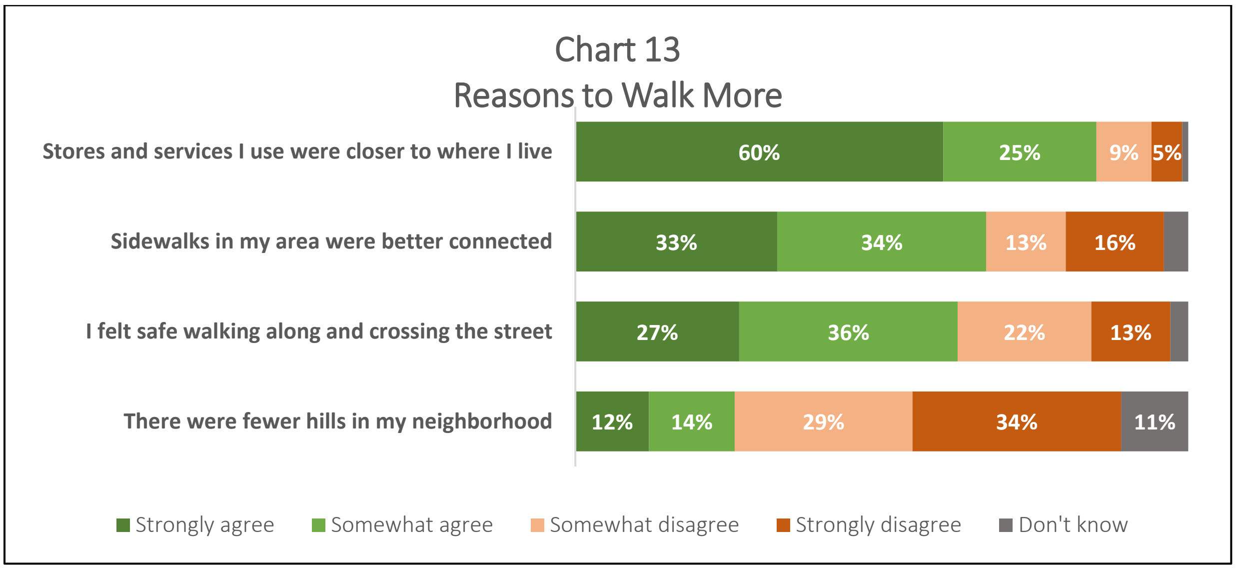
Source: DHM Research (July 2020) and LCOG

Overall, nearly half of respondents (47%) would prefer to walk more often for transportation purposes, with 13% who felt this way strongly. Nearly half of respondents (48%) do not have a desire to walk more often for transportation purposes.

By Area: Respondents from Springfield (56%) had a higher desire to not walk more often for transportation purposes compared to respondents from Eugene (45%).

Demographic Differences: Respondents ages 18-34 (59%) are more likely than ages 35-54 (47%) and 55+ (37%) to express a desire to walk more for transportation purposes. Respondents that make $100K or more (60%) are more likely than those making $50K-$100K (48%) and less than $50K (39%) to express a desire to walk more for transportation purposes. No other demographic differences exist.

Those who would like to walk more for transportation services were read a list of reasons why people may walk more. They were asked to rate their agreement with each of the following statements (Q34-Q37).



Source: DHM Research (July 2020) and LCOG

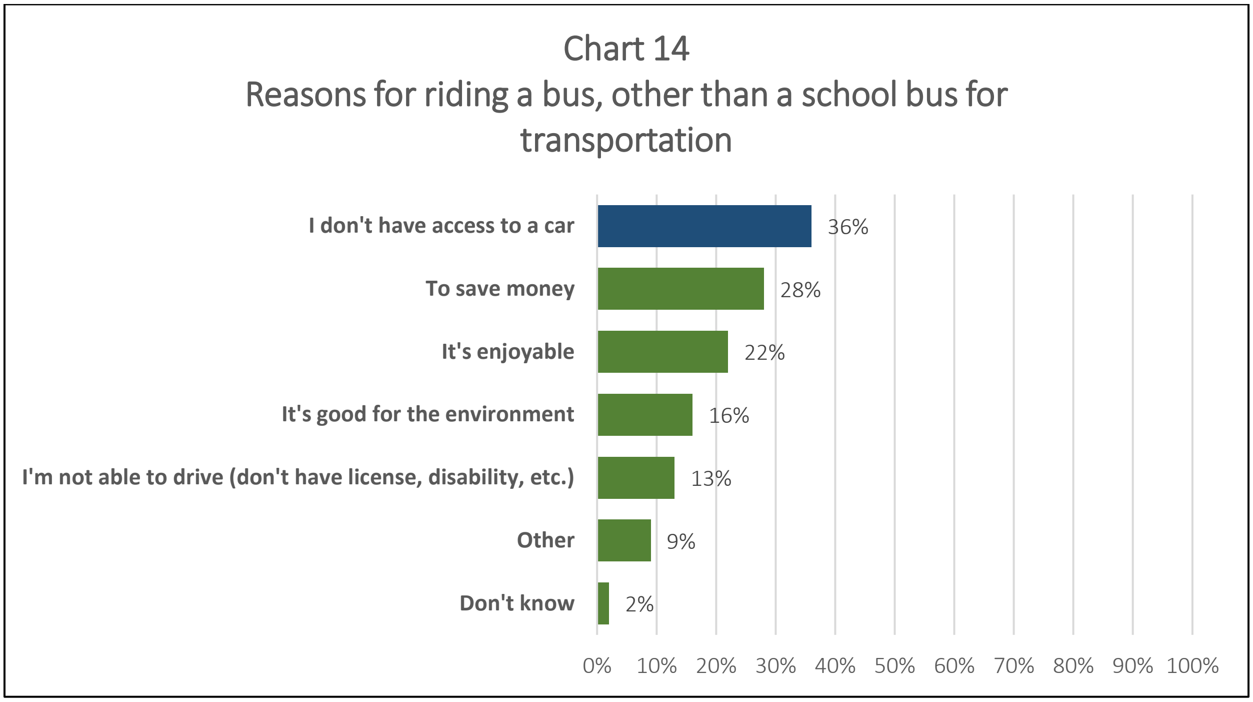
Respondents were more likely to walk more if **stores and services they use were closer to where they live** (85%). Other barriers to walking more often include **sidewalk connectivity** (67%) and **felt safe walking along and crossing the street** (63%). The barrier that had the lowest impact were **hills in their neighborhood** (26%).

By Area: Due to small sample sizes within the regions in Eugene and Springfield, analysis by area is not presented.

Demographic Differences: Variables that would encourage respondents to walk more often were fairly consistent across demographic subgroups.

3.6 Bus Ridership

Respondents who walk monthly or more often were asked, unprompted, why (Q39)

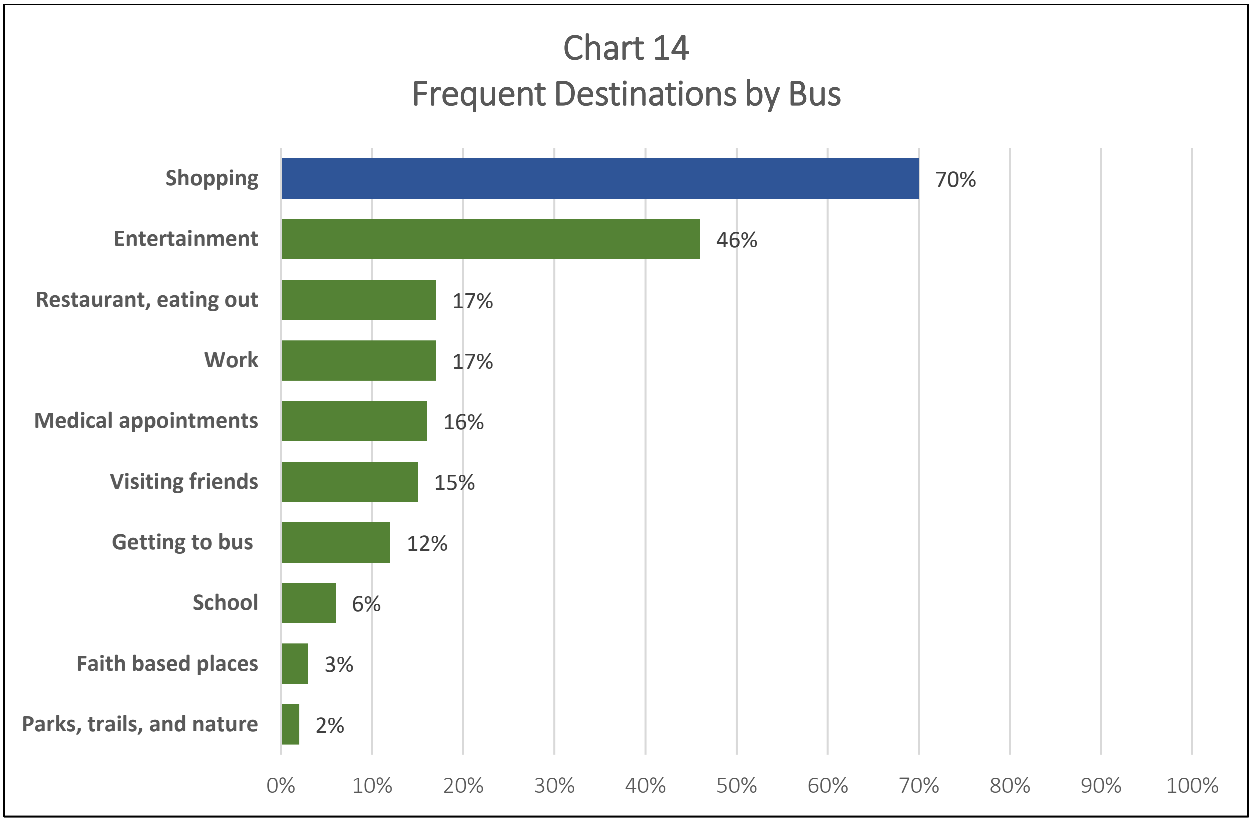


Source: DHM Research (July 2020) and LCOG

The top reason why respondents ride a bus, other than a school bus for transportation is because **they do not have access to a car** (36%). Other reasons include **to save money** (28%), **it's enjoyable** (22%), **environmental benefits** (16%), and **they are not able to drive** (13%).

Demographic Differences:

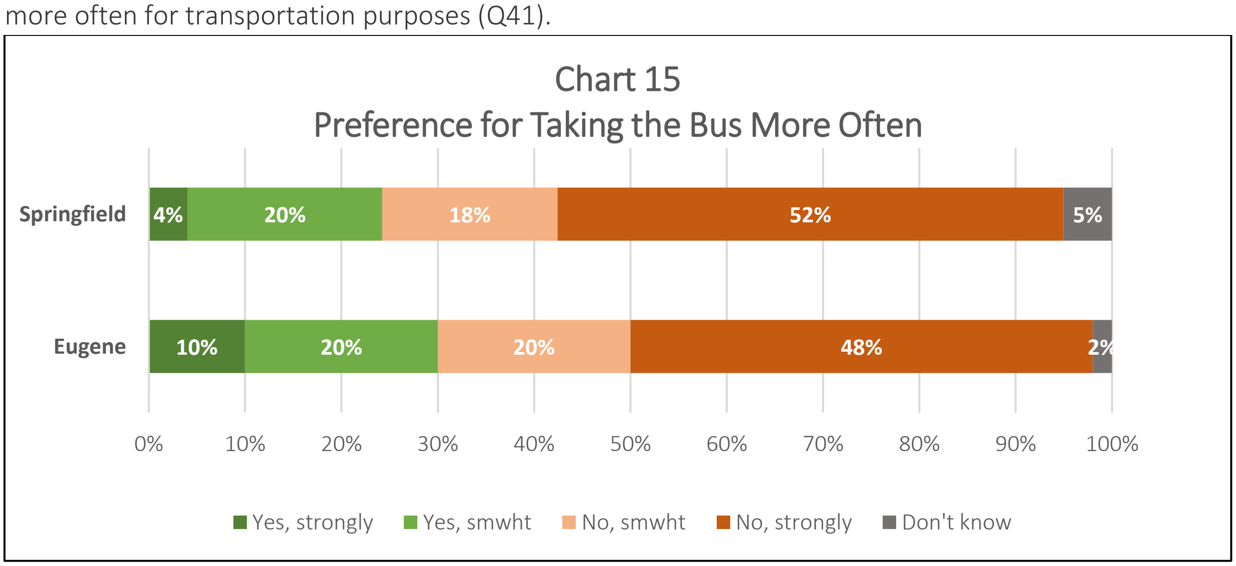
Respondents who frequently use the bus as a form of transportation were asked where they typically go most often (Q40).



Source: DHM Research (July 2020) and LCOG

Seven out of ten respondents that frequently use the bus a form of transportation use it for **shopping** (70%). This is followed by **entertainment** (46%), **restaurants** (17%), **work** (17%), **medical appointments** (16%), **visiting friends** (15%), and **getting to the bus** (12%).

Respondents who take the bus monthly or less often were asked if they would prefer to take the bus more often for transportation purposes (Q41).



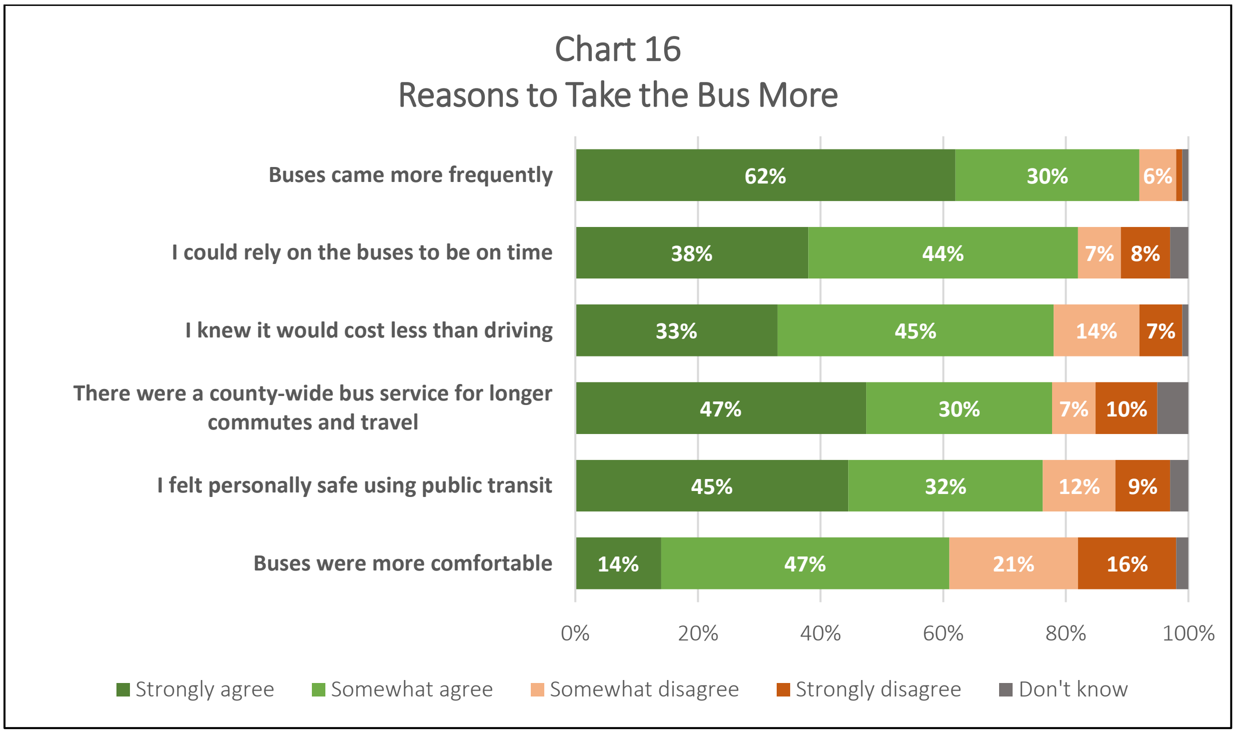
Source: DHM Research (July 2020) and LCOG

Overall, 69% of respondents would prefer to not take the bus more often as a form of transportation while a third (29%) of respondents would prefer to take the bus more often.

By Area: Respondents in Springfield (70%) and in Eugene (68%) had the same preferences to not take the bus more as a form of transportation. However, 10% of respondents from Eugene felt strongly about using the bus more as a form of transportation compared to 4% in Springfield that felt strongly about it.

Demographic Differences: Those with no children in their households (32%) are more likely than those with children in their households (20%) are more likely to want to ride the bus more.

Those who would like to take the bus more for transportation purposes were read a list of reasons why people may take the bus more. They were asked to rate their agreement with each of the following statements (Q42-Q48).



Source: DHM Research (July 2020) and LCOG

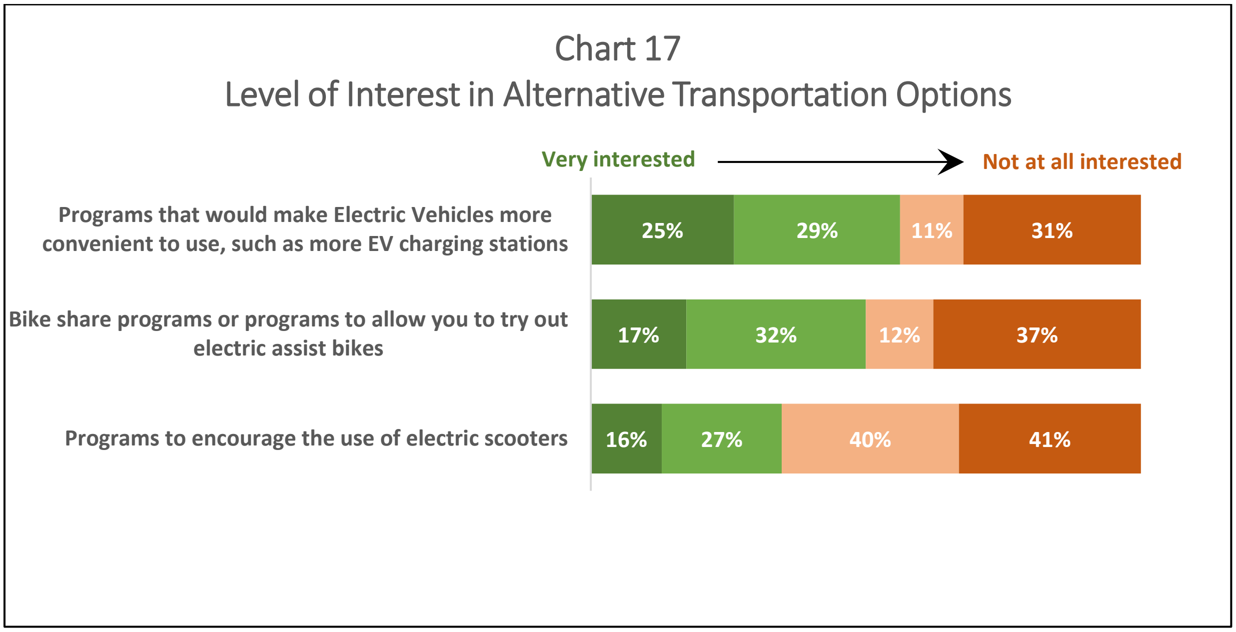
Buses came more frequently (92% strongly agree or somewhat agree) is the number one deterrent for why respondents do not use the bus. This is followed by **I could rely on the bus being on time** (82%), **I knew it would cost less than driving** (78%), **there were a county-wide bus service for longer commutes and travel** (77%), and **I felt safe using public transit** (77%). The least important factor was **buses were more comfortable** (61%).

By Area: No statistically significant differences by area exist.

Demographic Differences: Older residents age 55+ (84%) are more likely to ride the bus if they felt more personally safe than younger residents age 18-24 (78%) and age 35-54 (65%).

3.7 Multimodal Transportation

Respondents were asked about their level of interest in three alternative transportation options (Q50-Q51).



Source: DHM Research (July 2020) and LCOG

Roughly half of residents are interested in programs to support Electric Vehicles (EVs), bike sharing, and electric scooters. Fifty-four percent of respondents are interested in **programs that would make EVs more convenient to use**, 49% are interested in **bike share programs**, and 43% are interested in **programs to encourage the use of electric scooters**.

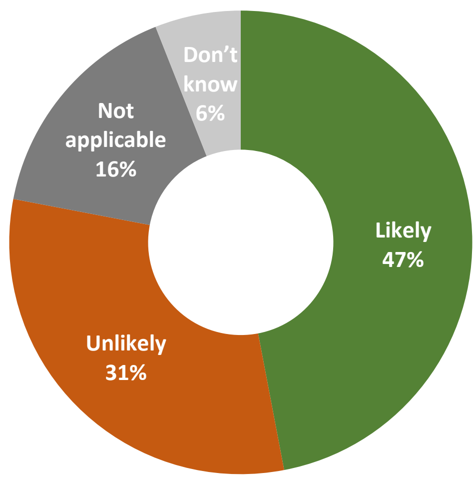
By Area:
No statistically significant differences by area exist.

Demographic Differences:
Not surprisingly, residents under 55 were more likely to show an interest than residents over 55 in **bike share programs** (18-34: 58%, 35-54: 52%, 55+: 38%) and **electric scooters** (18-34: 52%, 35-54: 48%, 55+: 31%). Residents who primarily bike (74%) and walk (71%) were more likely than those who drive alone (47%), drive with others in their household (53%), or take the bus (40%) to express interest in **bike share programs**, as were those who prefer to telecommute (60% vs. 44% among those who do not prefer to telecommute). Men (60%) were more likely than women (47%) to express interest in **electric vehicles**.

3.8 Telecommuting

Residents were asked if they thought the recent experience with COVID-19 and the state stay at home orders will make it more likely that telecommuting will be part of their future (Q53).

Chart 18
Future Telecommuting Likelihood



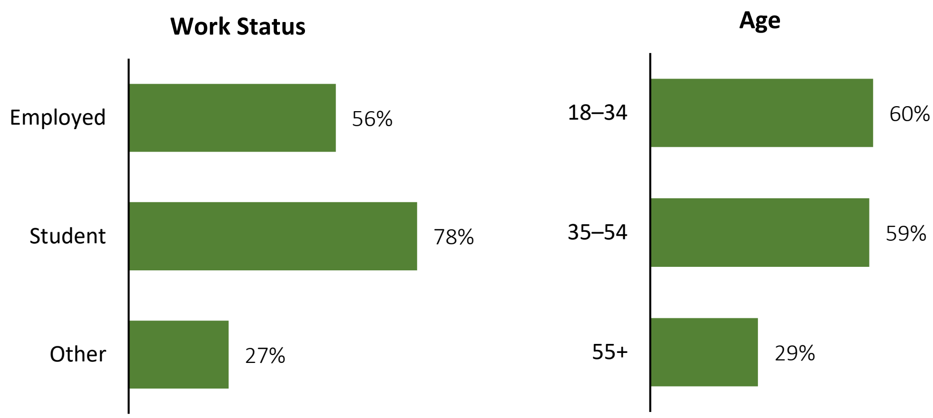
Source: DHM Research (July 2020) and LCOG

Nearly half (47%) of residents believe the recent experience with COVID-19 will make telecommuting for work and school more likely in the future.

Next, residents were asked if they would prefer to telecommute to work or school in the future at least some of the time, if given the option (Q54).

Chart 19

Telecommuting Preference

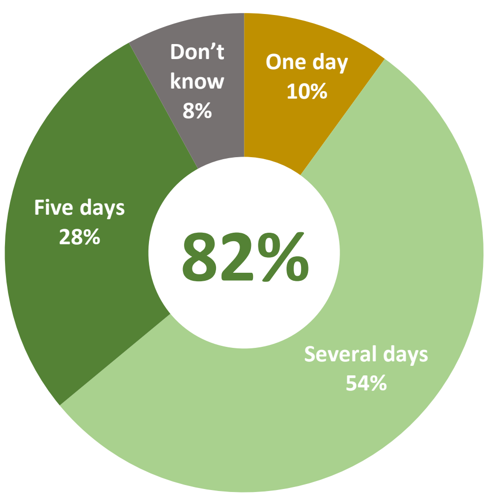


Source: DHM Research (July 2020) and LCOG

Residents who were currently employed (56%) or in school (78%) were more likely to prefer telecommuting, as were residents under age 55.

Those who preferred telecommuting were then asked how many days in a normal five-day work week they would prefer to telecommute to work or school (Q55).

Chart 20
Preferred Number of Days Telecommuting



Source: DHM Research (July 2020) and LCOG

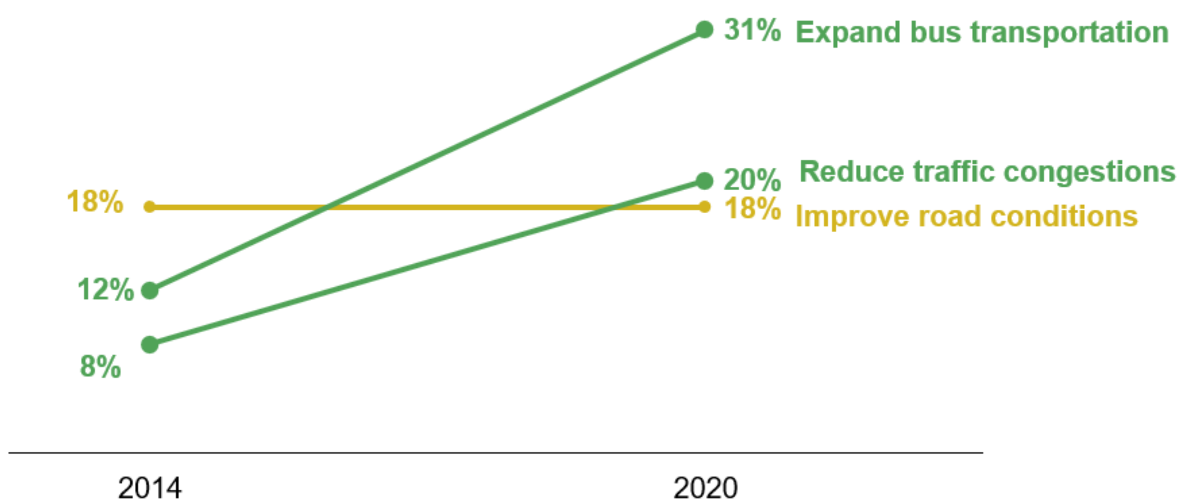
Among those who prefer telecommuting, about eight in ten would prefer doing so at least several days a week.

4. 2014-2020 COMPARISON

Among Eugene and Springfield residents, expanding bus transportation and reducing traffic congestion have grown as priorities since 2014.

Chart 21

Change Over Time in Priorities for Eugene and Springfield



Source: DHM Research (July 2020) and LCOG

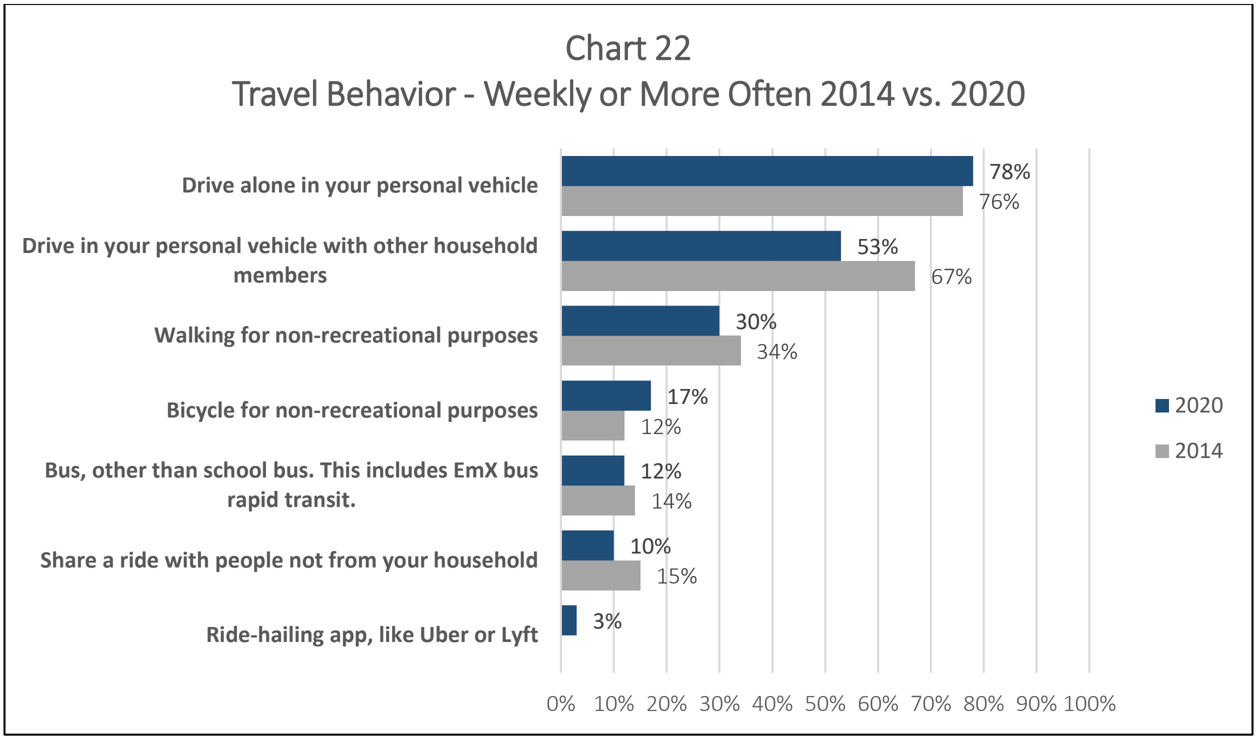


Chart 22
Travel Behavior - Weekly or More Often 2014 vs. 2020
Drive alone in your personal vehicle
78%
76%
Drive in your personal vehicle with other household members
53%
67%
Walking for non-recreational purposes
30%
34%
Bicycle for non-recreational purposes
17%
12%
Bus, other than school bus. This includes EmX bus rapid transit.
12%
14%
Share a ride with people not from your household
10%
15%
Ride-hailing app, like Uber or Lyft
3%
0% 10% 20% 30% 40% 50% 60% 70% 80% 90% 100%
2020
2014

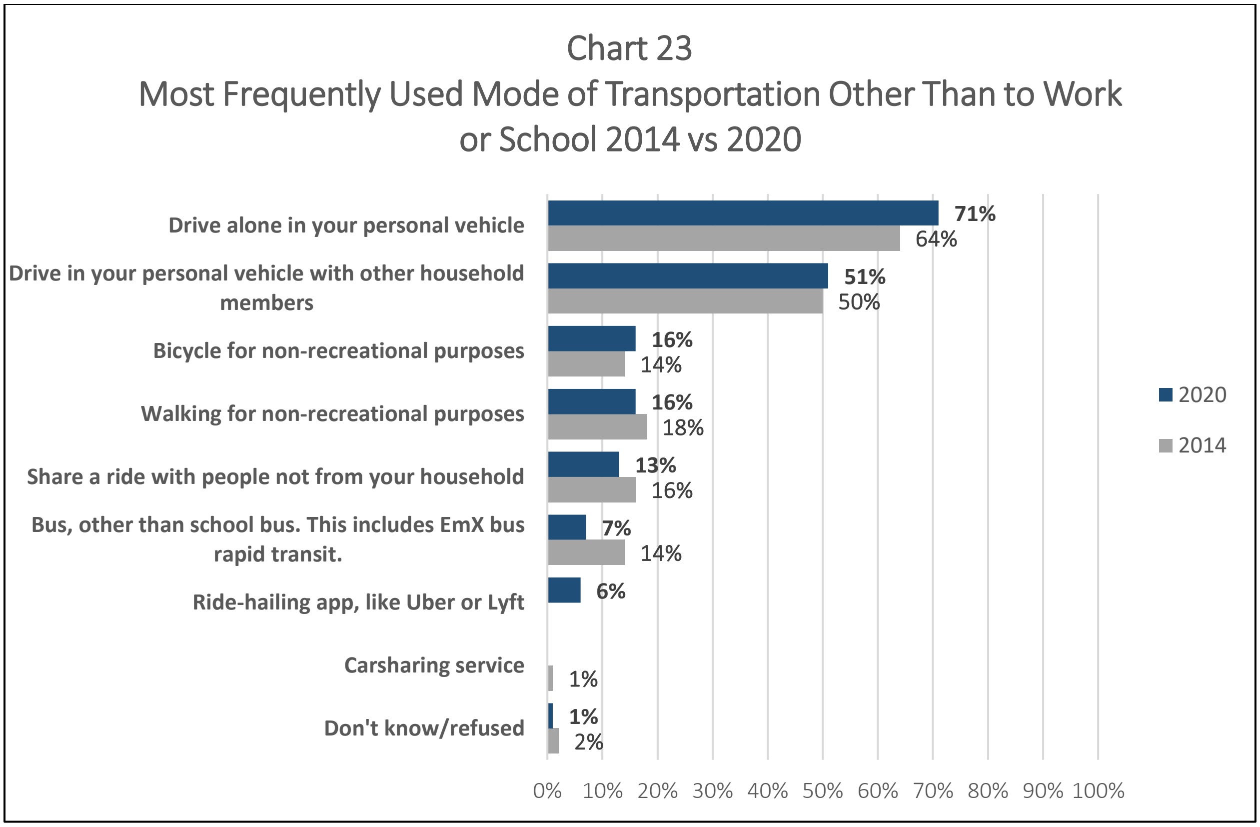


Chart 23
Most Frequently Used Mode of Transportation Other Than to Work or School 2014 vs 2020
Drive alone in your personal vehicle
71%
64%
Drive in your personal vehicle with other household members
51%
50%
Bicycle for non-recreational purposes
16%
14%
Walking for non-recreational purposes
16%
18%
Share a ride with people not from your household
13%
16%
Bus, other than school bus. This includes EmX bus rapid transit.
7%
14%
Ride-hailing app, like Uber or Lyft
6%
Carsharing service
1%
Don't know/refused
1%
2%
0% 10% 20% 30% 40% 50% 60% 70% 80% 90% 100%
2020
2014

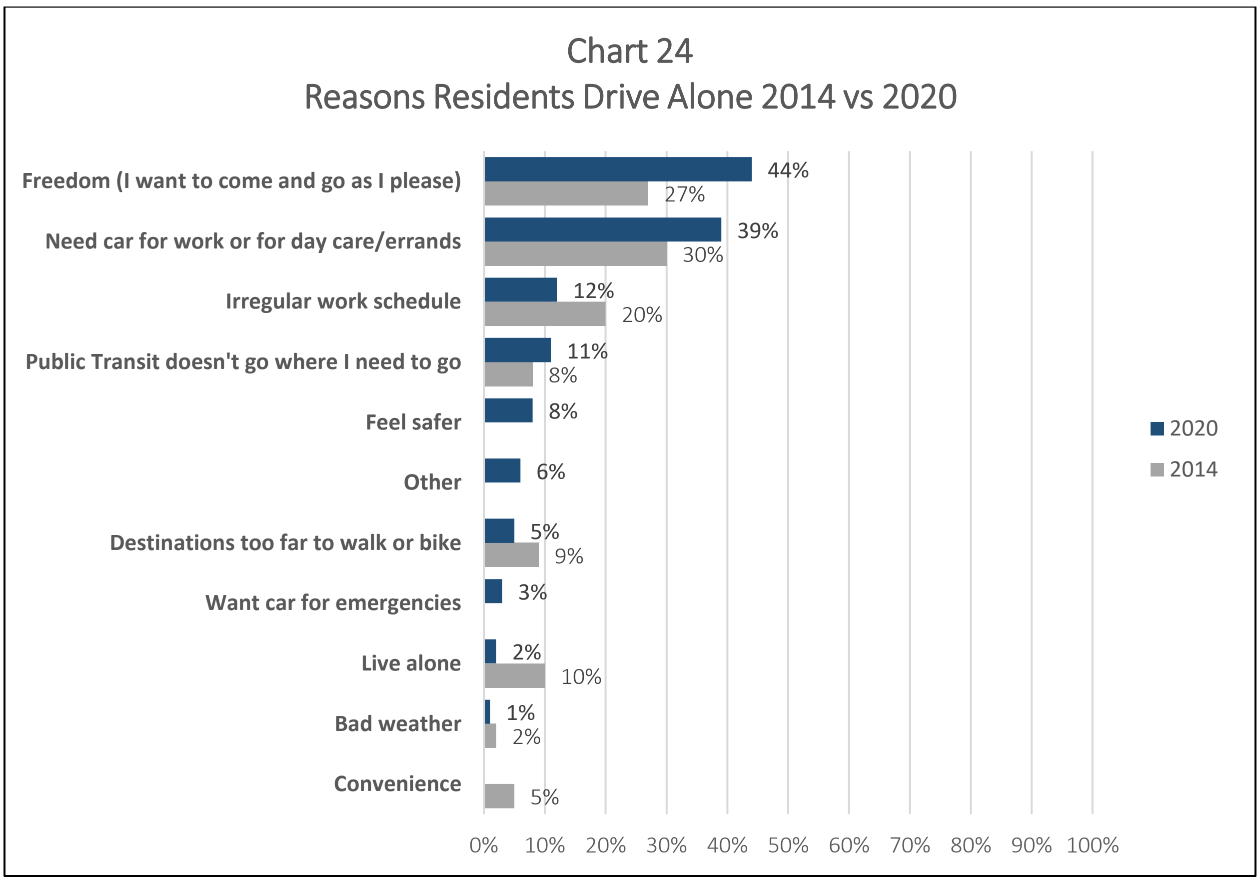
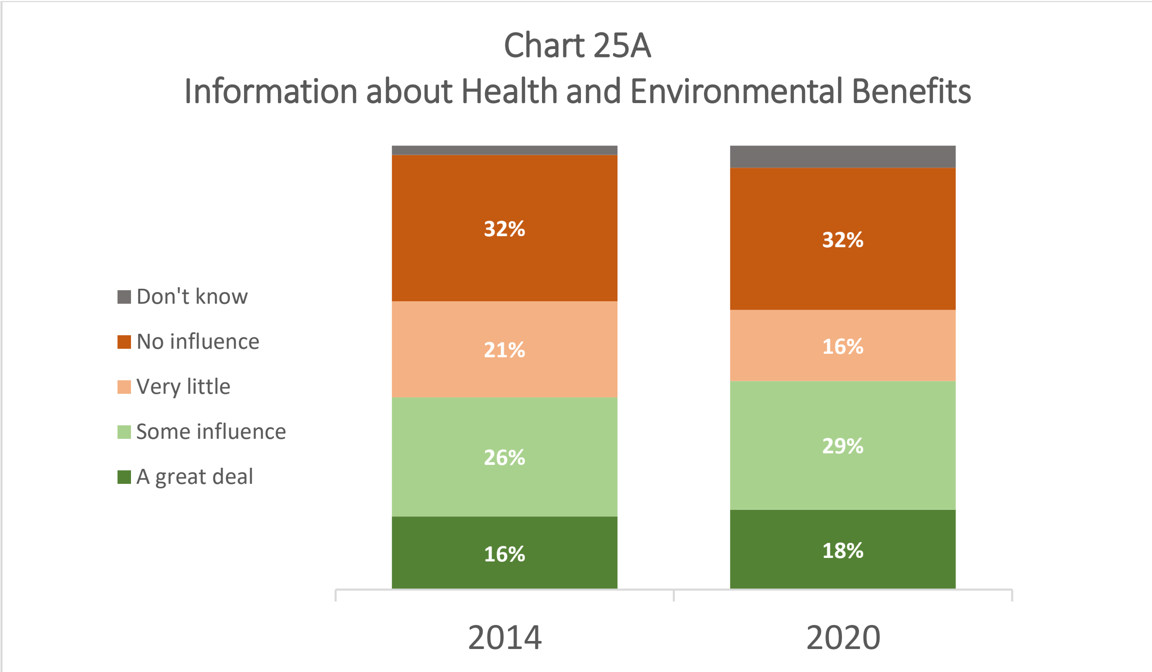
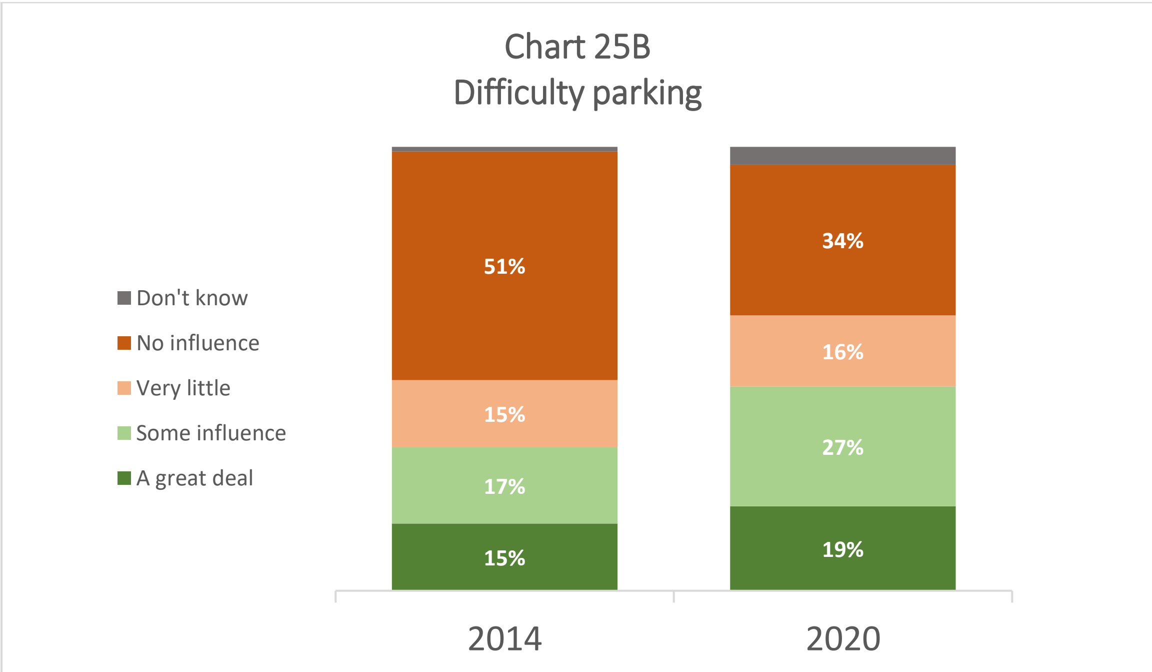


Chart 24
Reasons Residents Drive Alone 2014 vs 2020
Freedom (I want to come and go as I please)
44%
27%
Need car for work or for day care/errands
39%
30%
Irregular work schedule
12%
20%
Public Transit doesn't go where I need to go
11%
8%
Feel safer
8%
Other
6%
Destinations too far to walk or bike
5%
9%
Want car for emergencies
3%
Live alone
2%
10%
Bad weather
1%
2%
Convenience
5%
0% 10% 20% 30% 40% 50% 60% 70% 80% 90% 100%
2020
2014

The following Charts are comparing respondents **Influence on Using Alternatives to Driving Alone** from 2014 and 2020.





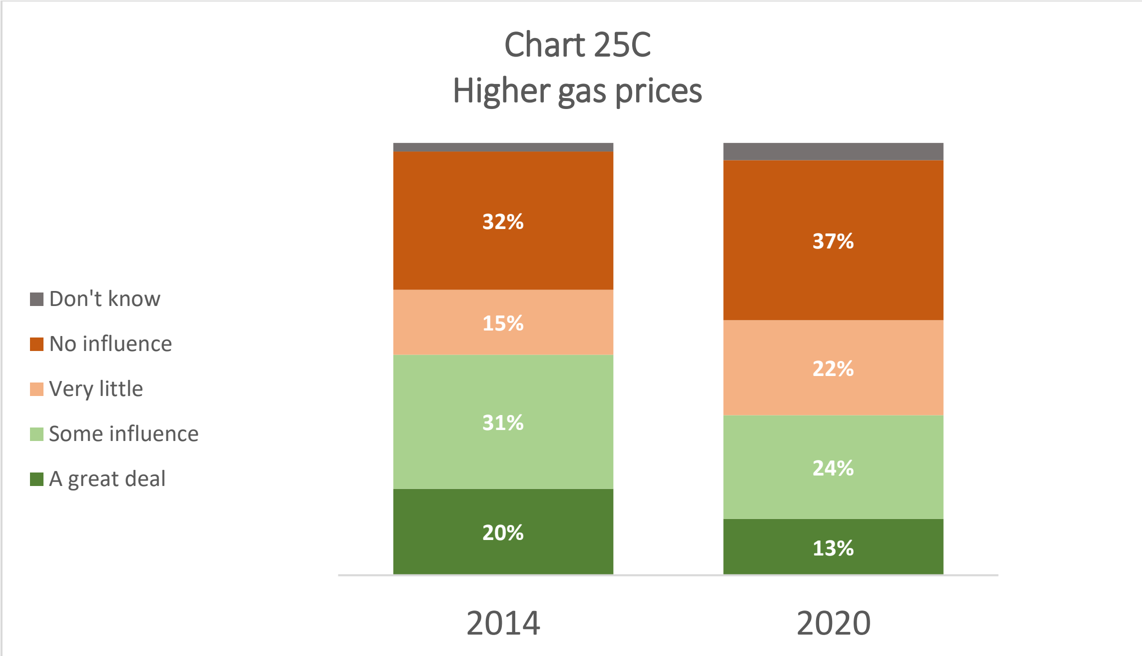


Chart 25C
Higher gas prices
Don't know
No influence
Very little
Some influence
A great deal
32%
15%
31%
20%
37%
22%
24%
13%
2014
2020

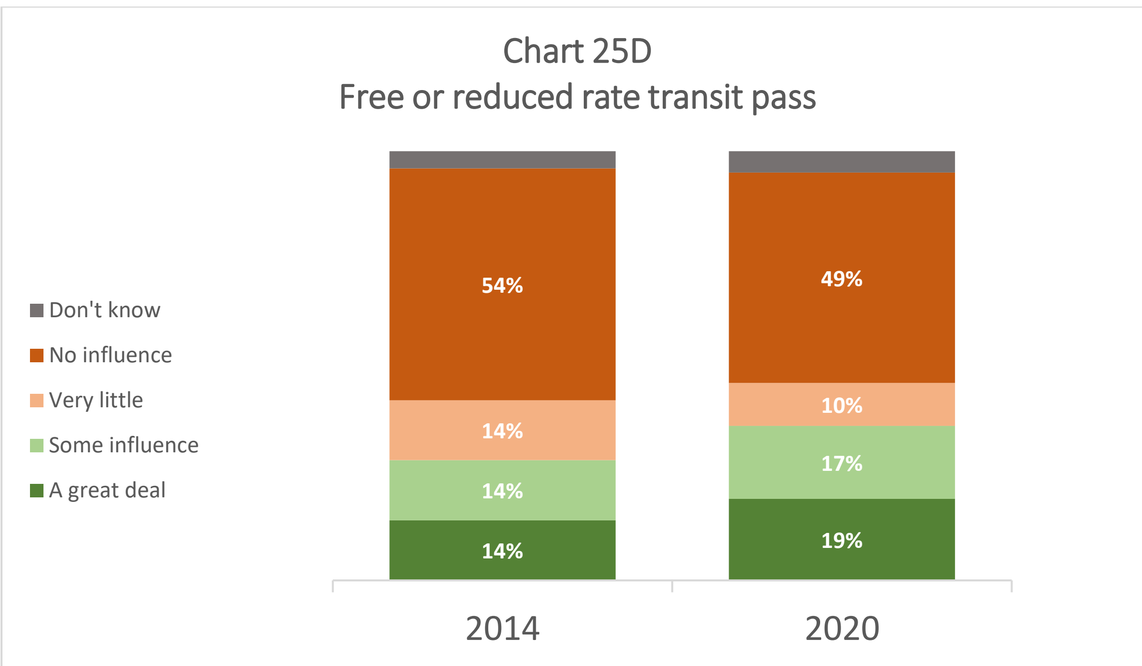


Chart 25D
Free or reduced rate transit pass
Don't know
No influence
Very little
Some influence
A great deal
54%
14%
14%
14%
49%
10%
17%
19%
2014
2020

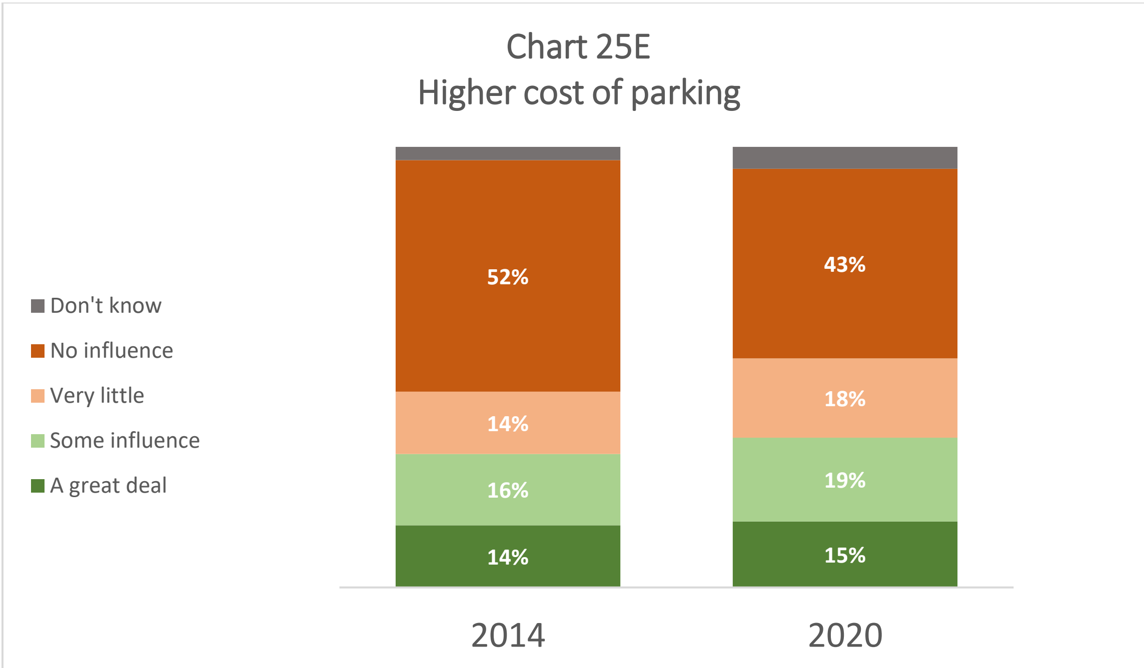


Chart 25E
Higher cost of parking
Don't know
No influence
Very little
Some influence
A great deal
52%
14%
16%
14%
43%
18%
19%
15%
2014
2020

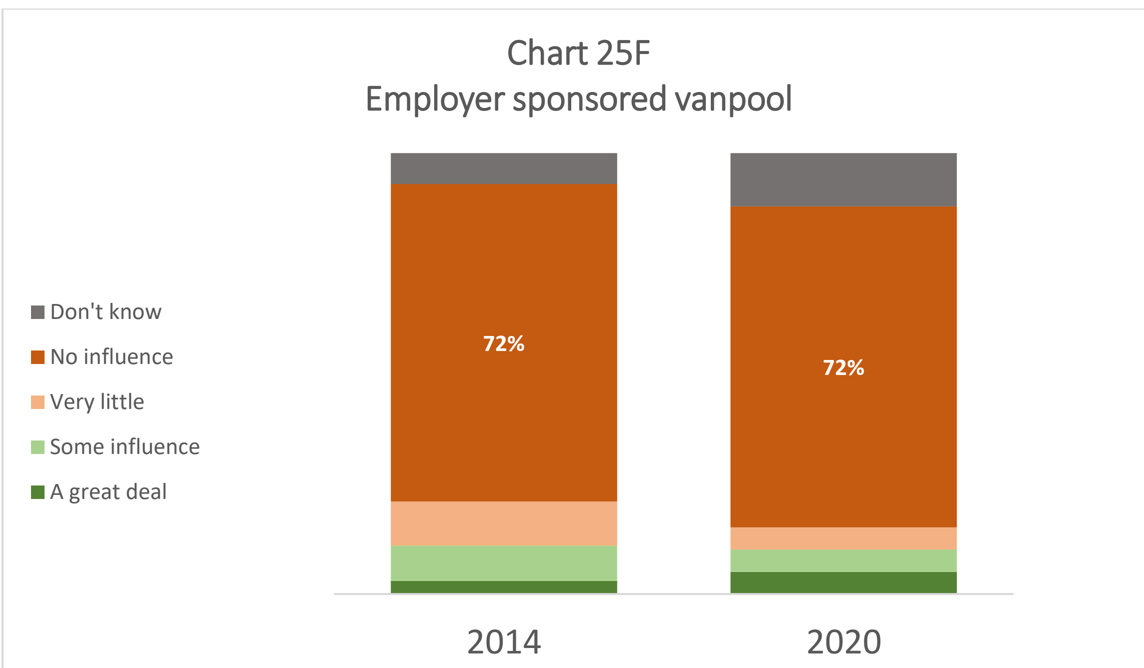


Chart 25F
Employer sponsored vanpool
Don't know
No influence
Very little
Some influence
A great deal
72%
72%
2014
2020

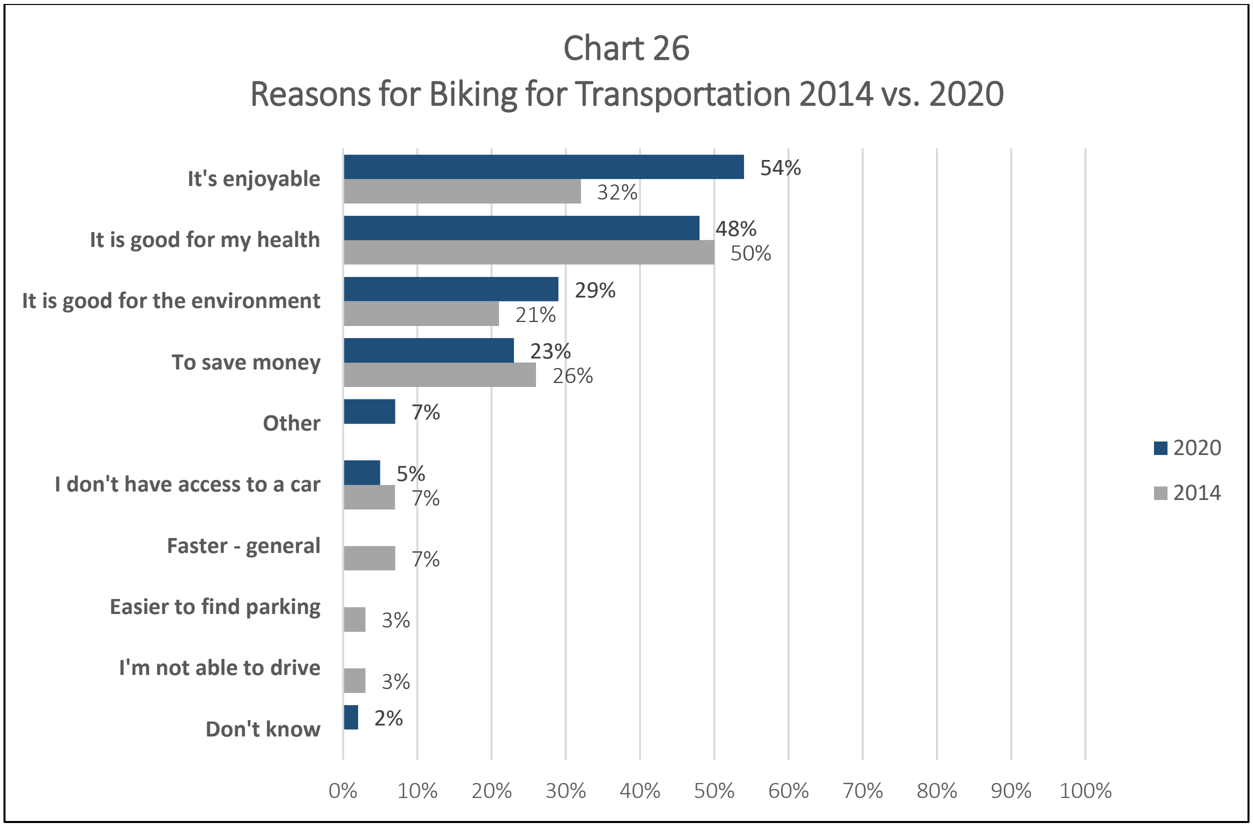


Chart 26
Reasons for Biking for Transportation 2014 vs. 2020
It's enjoyable
54%
32%
It is good for my health
48%
50%
It is good for the environment
29%
21%
To save money
23%
26%
Other
7%
I don't have access to a car
5%
7%
Faster - general
7%
Easier to find parking
3%
I'm not able to drive
3%
Don't know
2%
0%
10%
20%
30%
40%
50%
60%
70%
80%
90%
100%
2020
2014

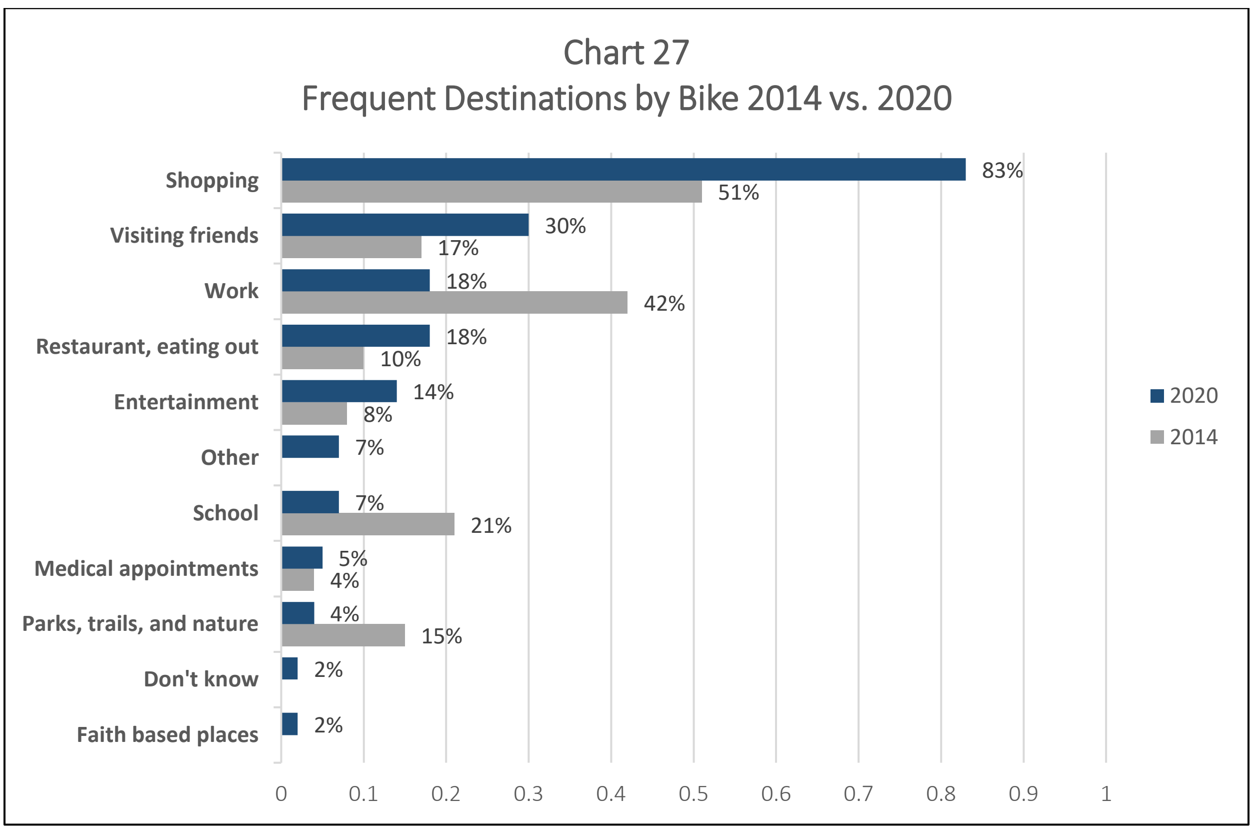


Chart 27
Frequent Destinations by Bike 2014 vs. 2020
Shopping
83%
51%
Visiting friends
30%
17%
Work
18%
42%
Restaurant, eating out
18%
10%
Entertainment
14%
8%
Other
7%
School
7%
21%
Medical appointments
5%
4%
Parks, trails, and nature
4%
15%
Don't know
2%
Faith based places
2%
0
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.8
0.9
1
2020
2014

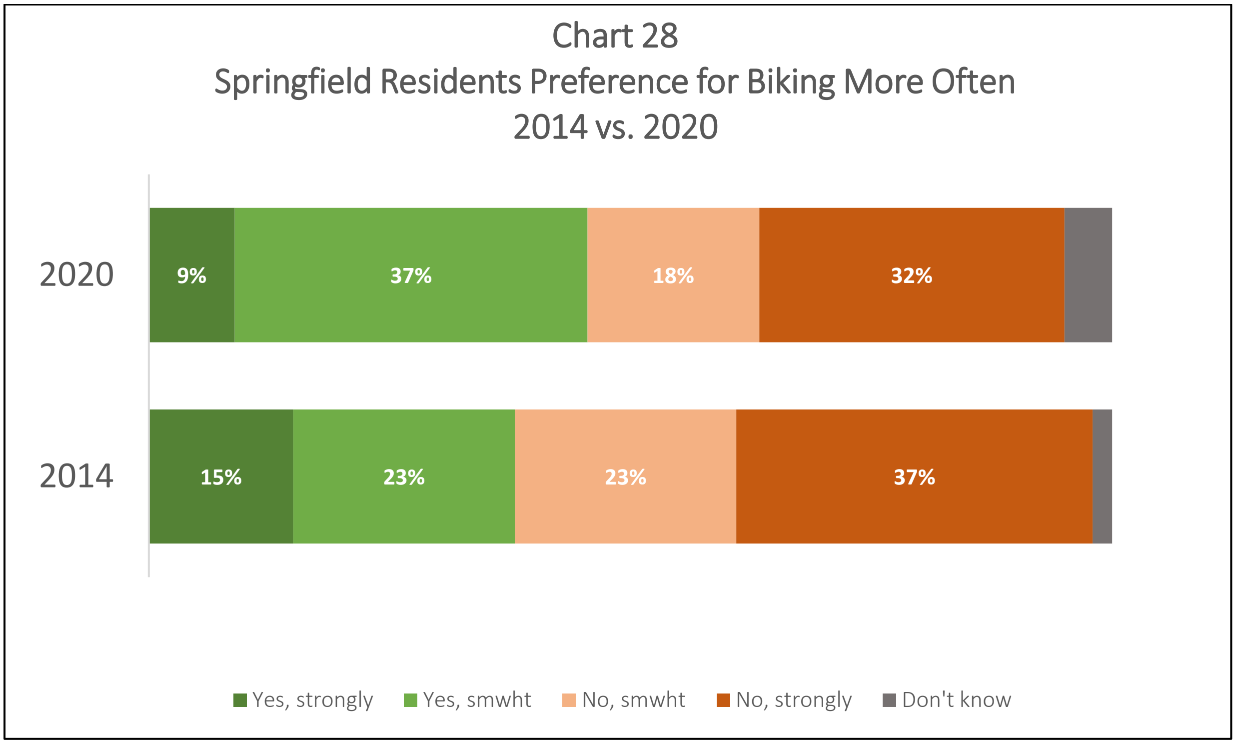


Chart 28
Springfield Residents Preference for Biking More Often
2014 vs. 2020
2020
9%
37%
18%
32%
2014
15%
23%
23%
37%
Yes, strongly
Yes, smwht
No, smwht
No, strongly
Don't know

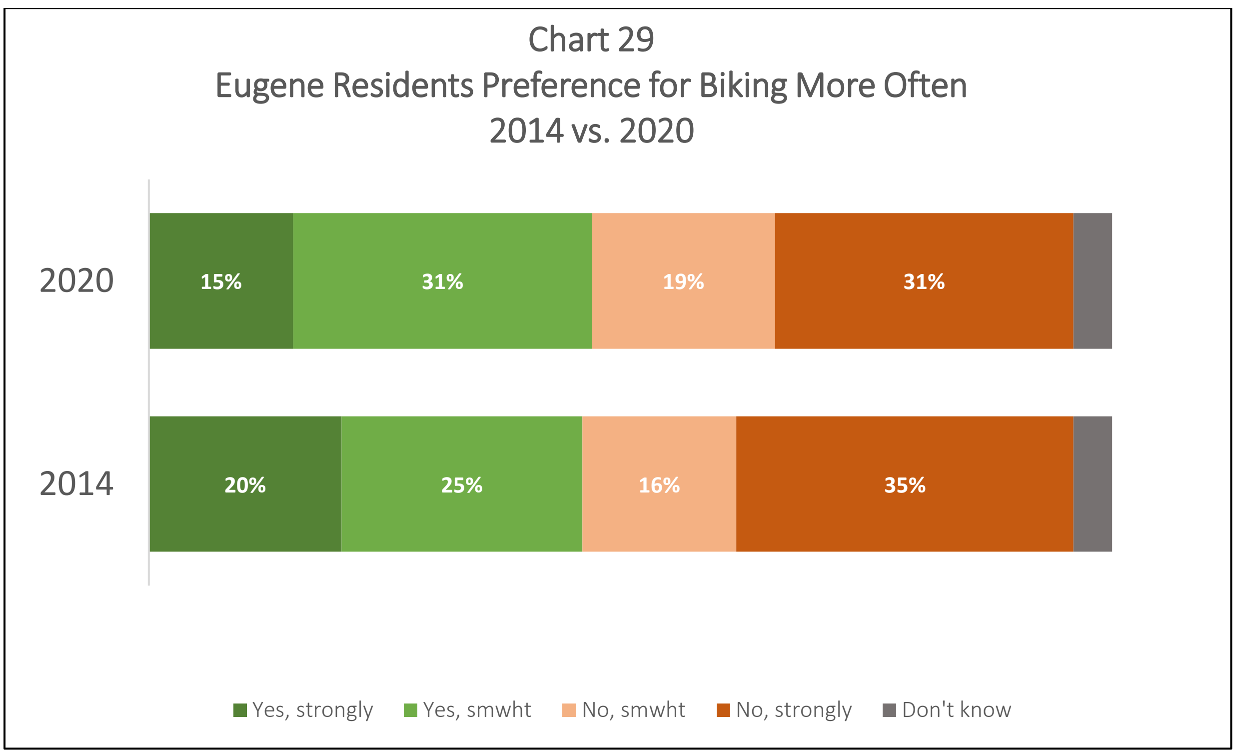


Chart 29
Eugene Residents Preference for Biking More Often
2014 vs. 2020
2020
15%
31%
19%
31%
2014
20%
25%
16%
35%
Yes, strongly
Yes, smwht
No, smwht
No, strongly
Don't know

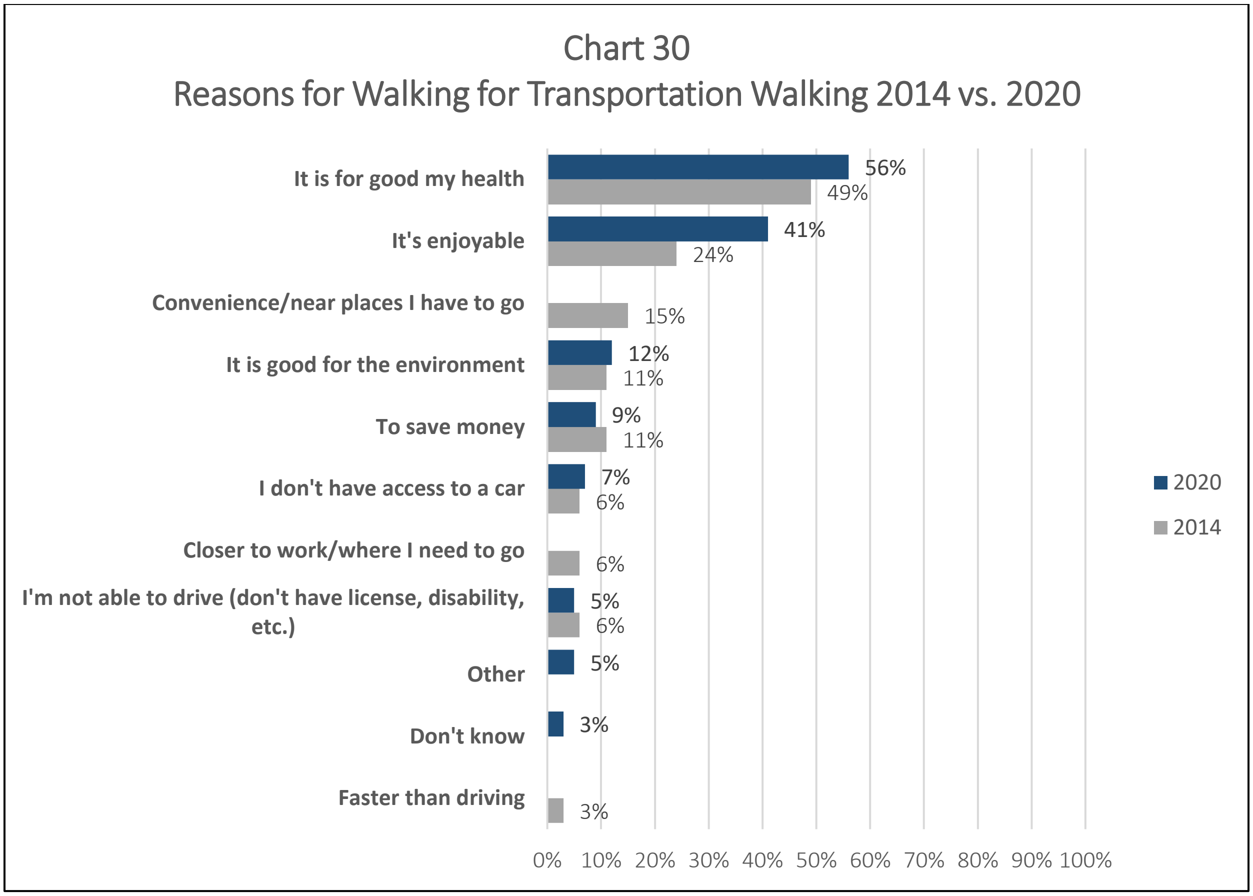


Chart 30
Reasons for Walking for Transportation Walking 2014 vs. 2020
It is for good my health
56%
49%
It's enjoyable
41%
24%
Convenience/near places I have to go
15%
It is good for the environment
12%
11%
To save money
9%
11%
I don't have access to a car
7%
6%
Closer to work/where I need to go
6%
I'm not able to drive (don't have license, disability, etc.)
5%
6%
Other
5%
Don't know
3%
Faster than driving
3%
0% 10% 20% 30% 40% 50% 60% 70% 80% 90% 100%
2020
2014

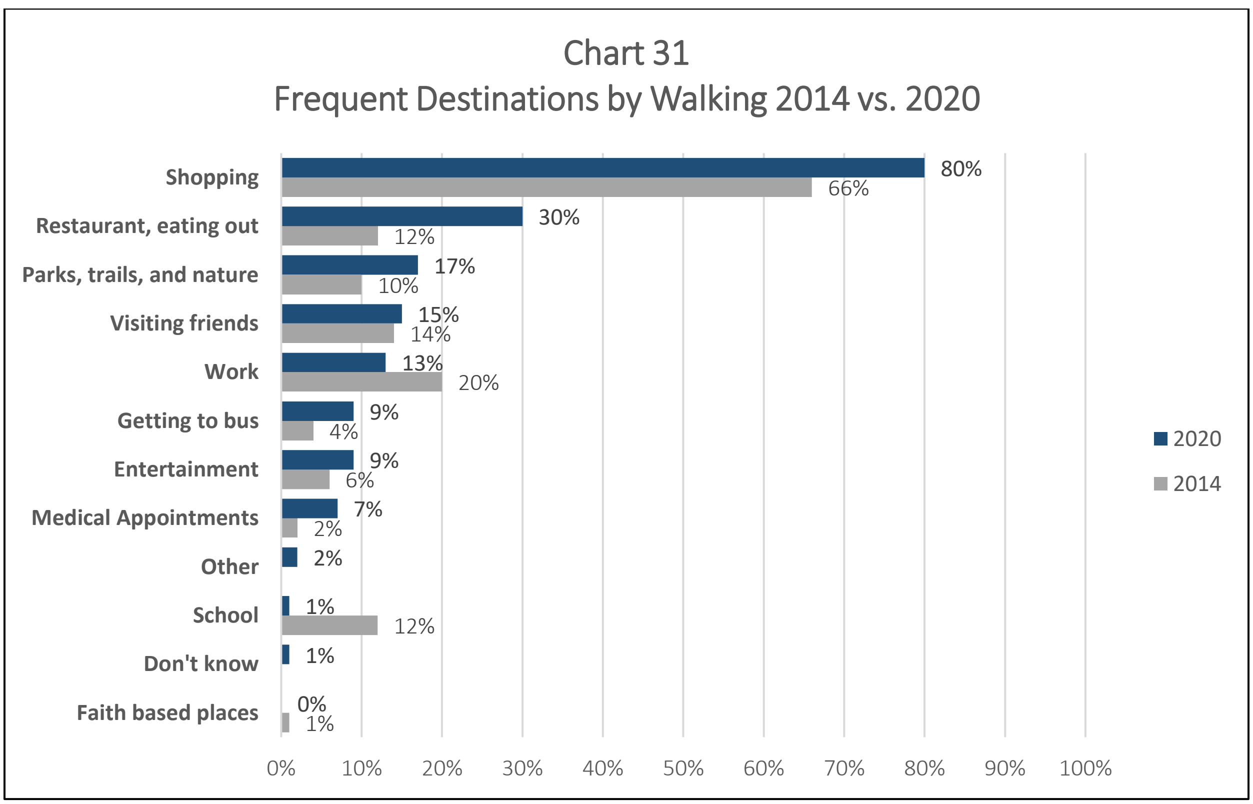


Chart 31
Frequent Destinations by Walking 2014 vs. 2020
Shopping
80%
66%
Restaurant, eating out
30%
12%
Parks, trails, and nature
17%
10%
Visiting friends
15%
14%
Work
13%
20%
Getting to bus
9%
4%
Entertainment
9%
6%
Medical Appointments
7%
2%
Other
2%
School
1%
12%
Don't know
1%
Faith based places
0%
1%
0% 10% 20% 30% 40% 50% 60% 70% 80% 90% 100%
2020
2014

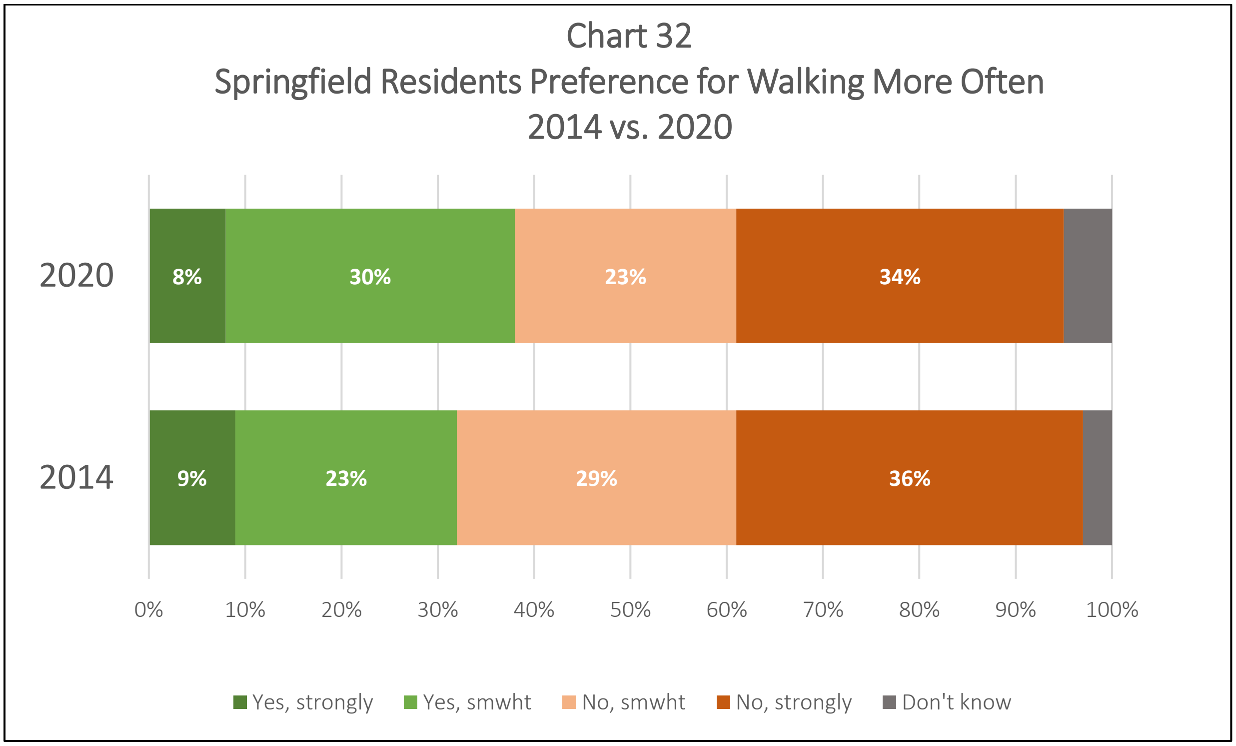


Chart 32
Springfield Residents Preference for Walking More Often
2014 vs. 2020
2020
8%
30%
23%
34%
2014
9%
23%
29%
36%
0%
10%
20%
30%
40%
50%
60%
70%
80%
90%
100%
Yes, strongly
Yes, smwht
No, smwht
No, strongly
Don't know

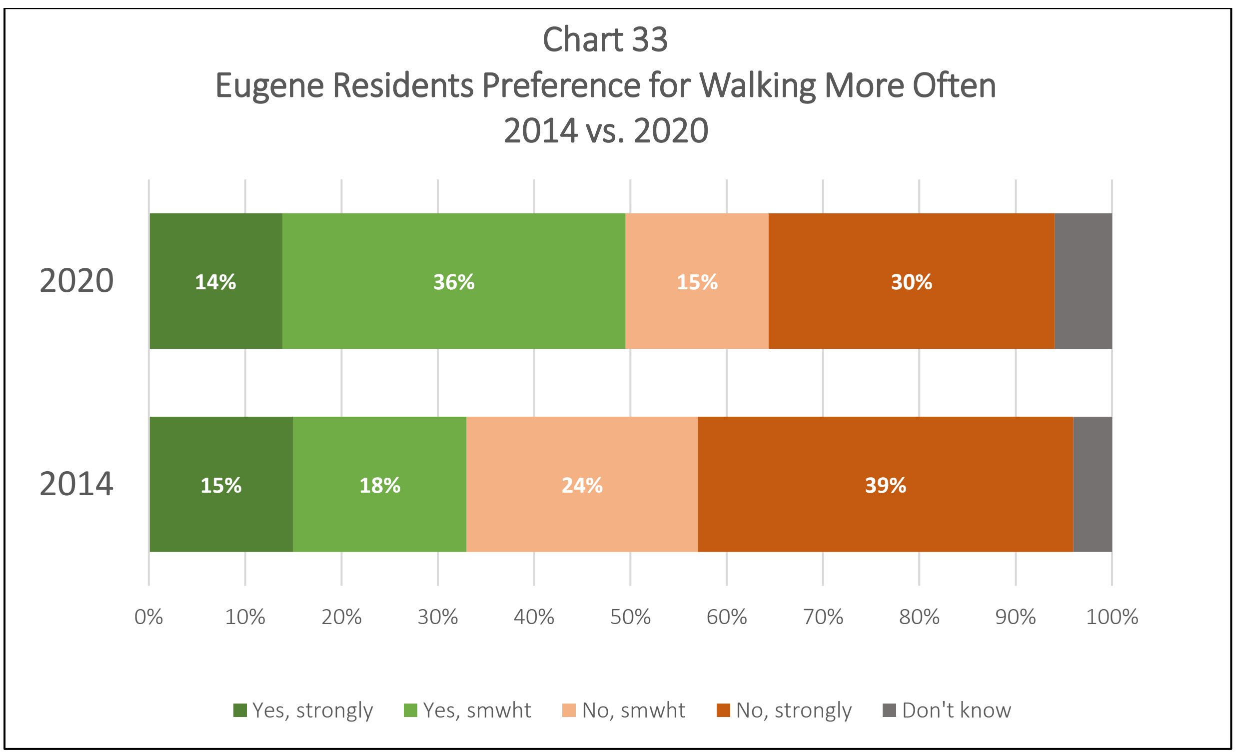
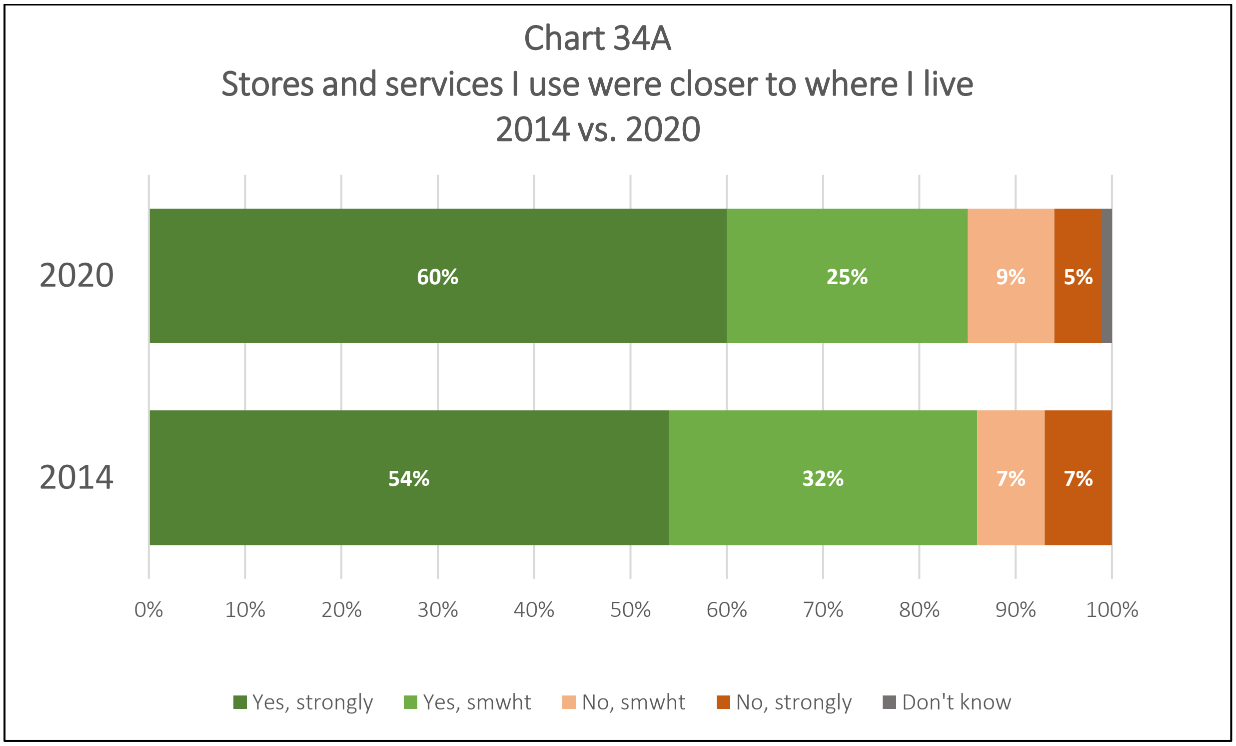
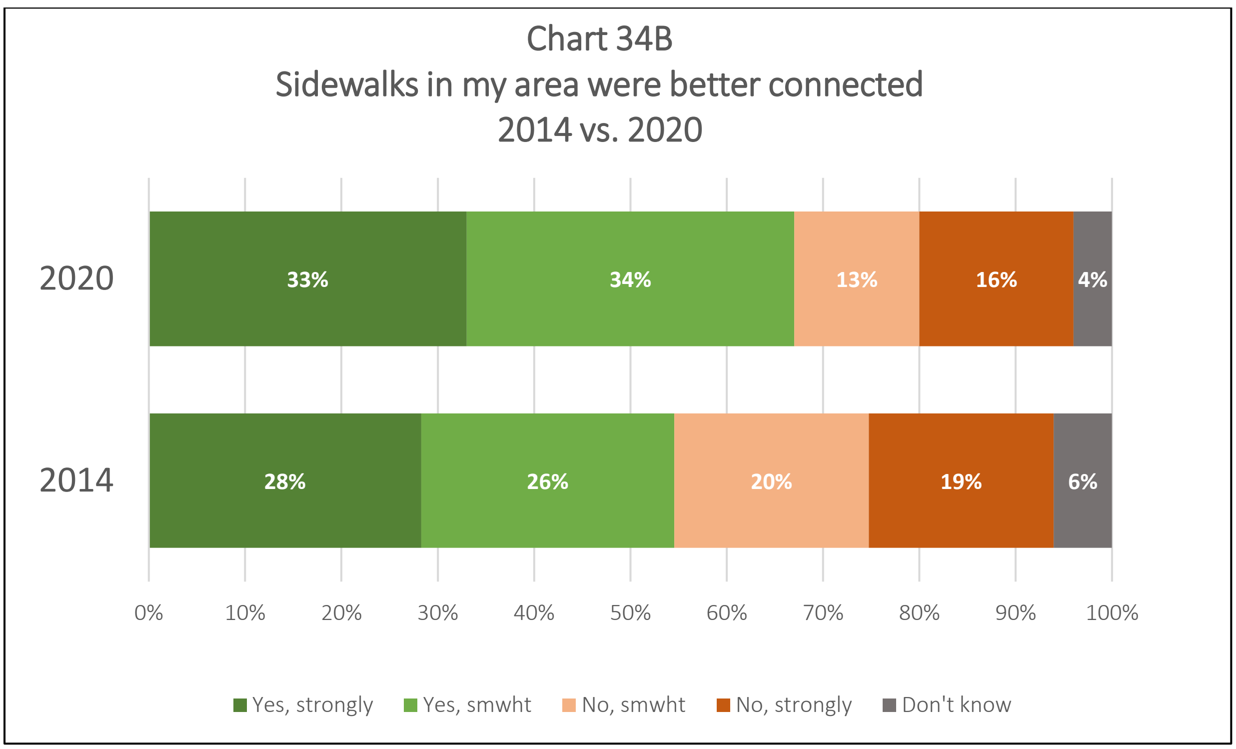


Chart 33
Eugene Residents Preference for Walking More Often
2014 vs. 2020
2020
14%
36%
15%
30%
2014
15%
18%
24%
39%
0%
10%
20%
30%
40%
50%
60%
70%
80%
90%
100%
Yes, strongly
Yes, smwht
No, smwht
No, strongly
Don't know

The following Charts are comparing respondents **Reasons to Walk More** from 2014 and 2020.





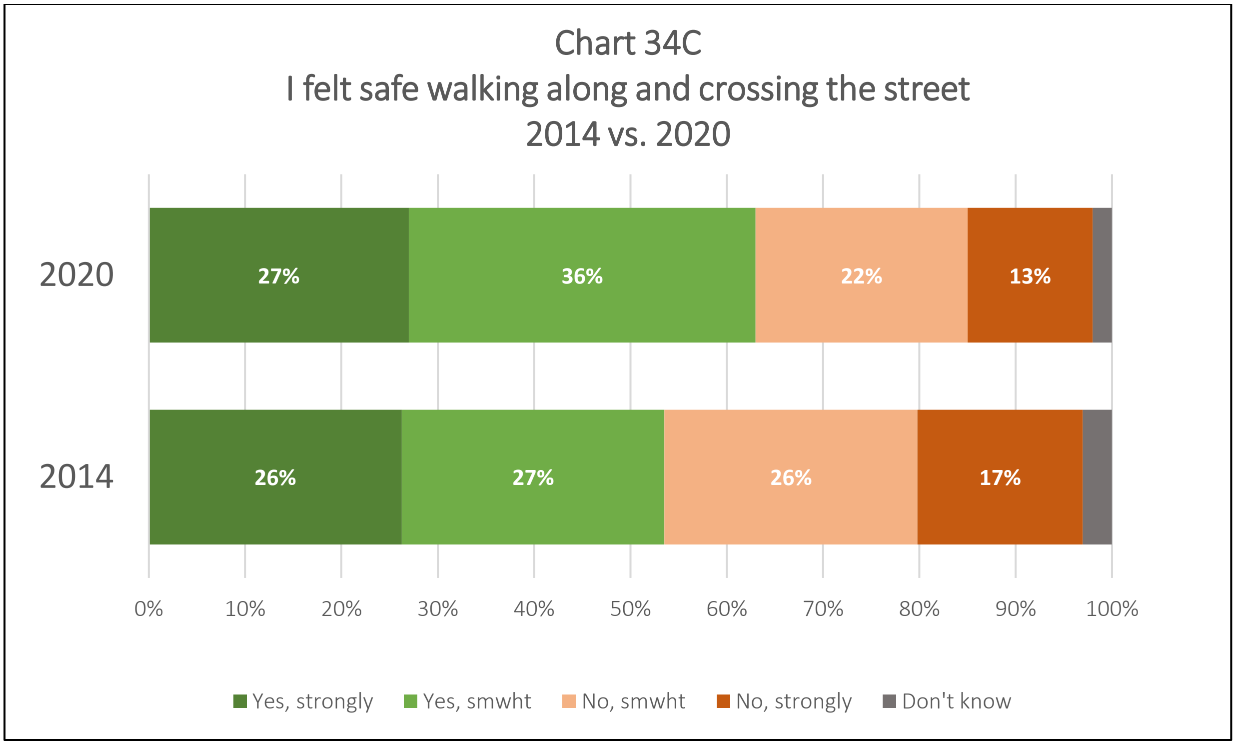


Chart 34C
I felt safe walking along and crossing the street
2014 vs. 2020
2020
27%
36%
22%
13%
2014
26%
27%
26%
17%
0%
10%
20%
30%
40%
50%
60%
70%
80%
90%
100%
Yes, strongly
Yes, smwht
No, smwht
No, strongly
Don't know

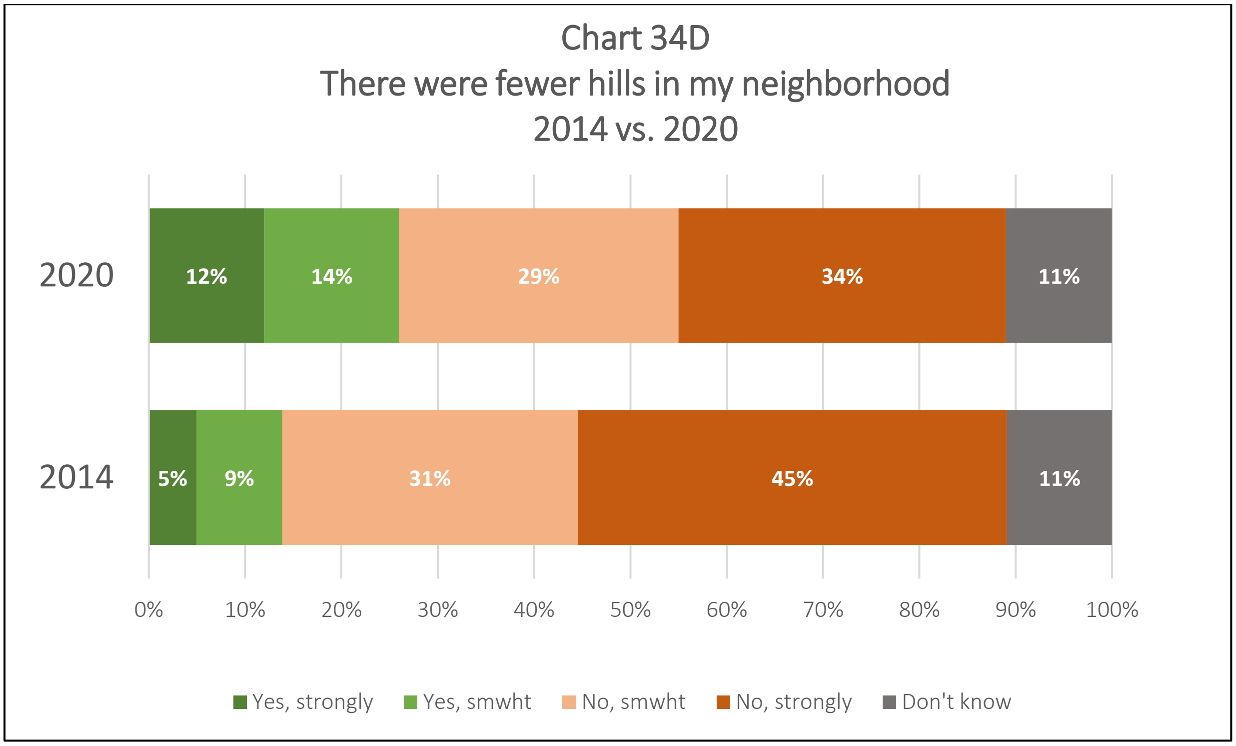


Chart 34D
There were fewer hills in my neighborhood
2014 vs. 2020
2020
12%
14%
29%
34%
11%
2014
5%
9%
31%
45%
11%
0%
10%
20%
30%
40%
50%
60%
70%
80%
90%
100%
Yes, strongly
Yes, smwht
No, smwht
No, strongly
Don't know

5. ANNOTATED QUESTIONNAIRE

DKS / Lane Council of Governments
Travel Behavior and Barriers Benchmark Survey
June 25–July 10, 2020
Central Lane Metropolitan Planning Organization Area Residents
N=502; ±4.9% margin of error
21 minutes
DHM Research
Project #00949

Hello, my name is _______ from [name of fielding house]. I have some questions about transportation issues in your community.

As needed:

- We are not trying to sell you anything.
- The survey should only take a few minutes and I think you will find the questions interesting.
- Your answers are strictly confidential.

GENERAL WARMUP

COVID-19 and the resulting Stay at Home orders have been a big part of everyone's life these past few months. But in thinking about your responses to these questions, do your best to think back to February, before COVID-19 was in Oregon and before the resulting Stay at Home orders.

1. Thinking specifically about transportation in the Eugene-Springfield area, what are the most important transportation issues you would like your local government leaders to do something about? **[Open – collect up to three responses]**

Response category	n=502
Expanding bus transportation system	31%
Improve traffic congestion	19%
Improve road conditions	18%
Increasing bike accessible areas/bike lanes	8%
Improve Beltline	7%
Improve road safety	6%
Safety on busses/ terminals	6%
Don't see any problems/issues	4%
More affordable/free buses	4%
Better sidewalks/pedestrian paths	4%
Bicycle safety	3%
Reduce pollution/ Alternative fuels	1%
More parking	1%
Bike, e-bike, e-scooter share	1%

Carpool options	<1%
All other responses	--
None/Nothing	8%
Don't know	2%

2. ****How frequently are you commuting to work or school between urban and rural areas within Lane County?[1]

Response category	n=502
Daily	29%
Several times a week but not every day	17%
Several times a month	9%
A few times a year	11%
Never	32%
[Don't read] Don't know	2%

3. ****Would you live closer to your workplace if you were able to find an affordable place to live?

Response category	n=502
Yes	31%
No	35%
[Don't read] Not applicable	33%
[Don't read] Refused/Missing	2%

TRAVEL BEHAVIOR

Again, in responding to these questions, try to place yourself back in time – to February 2020 – before the Stay at Home orders resulting from COVID-19.

Typically, how frequently did you use each of the following ways to travel? Daily, Several times a week but not every day, Several times a month, A few times a year, or Never? **[Randomize Q7–Q10]**

Response Category	Daily	Several times a week but not every day	Several times a month	A few times a year	Never	Don't know
4. Drive alone in your personal vehicle	48%	30%	9%	4%	10%	<1%
5. Drive in your personal vehicle with other household members	18%	35%	19%	6%	22%	0%

[1] All questions containing asterisks are new questions that did not appear in the *Eugene–Springfield Metropolitan Area Travel Barriers and Benefits Survey* (2014) conducted by DHM Research.

Response Category	Daily	Several times a week but not every day	Several times a month	A few times a year	Never	Don't know
6. Share a ride with people not from your household (example: Carpool or Vanpool)	3%	7%	18%	24%	47%	1%
7. ****Ride hailing app, such as Uber or Lyft (2014 Carsharing service: Flex car, Zipcar, Car2Go)	2%	1%	9%	29%	58%	1%
8. Bus, other than school bus. This includes EmX **[pronounced: MX]** bus rapid transit	4%	8%	11%	24%	53%	<1%
9. Bicycle for non-recreational purposes such as to work, school, shopping, errands, etc.	9%	8%	10%	18%	54%	2%
10. Walking for non-recreational purposes such as to work, shopping, errands, etc.	12%	18%	19%	20%	31%	<1%

11. Now thinking specifically about trips you took other than to work or school, in a typical week, which of the following forms of transportation did you most frequently use? This could include running errands, grocery shopping, getting to public transportation, recreation, etc. **[Collect up to three most frequent modes]**

Response Category	n=502
Drive alone in your personal vehicle	71%
Drive in your personal vehicle with other household members	51%
Share a ride with people not from your household (example: Carpool or Vanpool)	13%
****Ride-hailing app, like Uber or Lyft (2014 Car sharing like Flex car, Zipcar or Car2Go	6%
Bus, other than school bus. This includes EmX **[pronounced: MX]** bus rapid transit	7%
Bicycle for non-recreational purposes such as shopping, errands, etc.	16%
Walking for non-recreational purposes such as shopping, errands, etc.	16%
[Don't read] Don't know	1%

12. **[If Q11 = 1 drove alone]** What are the reasons that you drive alone? **[Open; do not read list, PROBE: Are there any other reasons? Collect up to three responses]**

Response Category	n=358
Freedom (I want to come and go as I please)	44%
Need car for work or for day care/errands	39%
Irregular work schedule	12%
Public transit doesn't go where I need to go, or takes too long	11%
Feel safer	8%
Destinations too far to walk or bike	5%
Want car for emergencies	3%
Live alone	2%
Bad weather	1%
Other (specify)	6%
[Don't read] Don't know	2%

[If Q5 to Q10 = 1 or 2 or 3] Thinking back to when you first started using alternatives to driving alone in the Eugene-Springfield area, how much influence did each of the following have in your decision, a great deal of influence, some influence, very little influence, or no influence? **[Rotate]**

Response Category n=455	A great deal of influence	Some influence	Very little influence	No influence	Don't know
13. Information about health or environmental benefits	18%	29%	16%	32%	4%
14. Free or reduced rate transit pass	19%	17%	10%	49%	5%
15. Employer sponsored vanpool	5%	5%	5%	72%	12%
16. Difficulty parking	19%	27%	16%	34%	3%
17. Higher cost of parking	15%	19%	18%	43%	4%
18. Higher gas prices	13%	24%	22%	37%	3%

19. Is there anything else that influenced your decision to start using alternatives to driving alone? **[Open, if yes, specify.]**

Response Category	n=455
Convenience	15%
Don't have a vehicle	9%
Exercise/health benefits	8%
Enjoy biking	7%
Economical/save money	6%
Environmental issues/factors	5%
Lack of services	2%
Unable to drive/ losing license	2%
Do not drive alone	2%
Lack of vehicle parking	1%
Bike or e-bike program	1%

All other responses	1%
None/Nothing	45%
Don't know	1%

BIKING

20. **[If Q9 = 1 or 2 or 3 Monthly or more often]** Why do you bicycle for transportation? **Open. Do not read list. Accept up to three responses]**

Response Category	n=132
It's enjoyable	54%
It is good for my health	48%
It's good for the environment	29%
To save money	23%
I don't have access to a car	5%
I'm not able to drive (don't have license, disability, etc.)	0%
Other (please specify)	7%
[Don't read] Don't know	2%

21. **[If Q11 = 6 Bike]** When riding your bike for transportation, not for recreation or exercise, what types of places do you typically go most often? **[Open. Do not read list. Accept up to three responses]**

Response Category	n=81
Shopping	83%
Visiting friends	30%
Work	18%
Restaurant, eating out	18%
Entertainment	14%
School	7%
Medical appointments	5%
Parks, trails, and nature	4%
Faith based places	2%
Getting to bus	--
Other (please specify)	7%
[Don't read] Don't know	2%

22. **[If Q11 = 6 Bike]** Do you ride your bicycle to or from public transportation, like to the bus or EmX **[pronounced: MX]**?

Response Category	n=81
Yes	21%
No	79%
[Don't read] Don't know	--

23. **[If Q9 = 3 or 5 Monthly or less often]** Would you prefer to bike more often for **transportation** purposes than you currently do? Is that strongly or somewhat?

Response Category	n=411
Yes, strongly	14%
Yes, somewhat	32%
No, strongly	32%
No, somewhat	19%
[Don't read] Don't know	4%

[If Q23 = 1 or 2 Yes] Next, I'm going to read you some reasons that people may bike more as a form of transportation. Please tell me if you strongly agree, somewhat agree, somewhat disagree, or strongly disagree with each statement. I would bike more for transportation if…**[Randomize]**

Response Category n=187	Strongly agree	Somewhat agree	Somewhat disagree	Strong disagree	Don't know
24. I felt safer on the roads	44%	28%	15%	11%	3%
25. Bike lanes or paths were available or better connected	46%	30%	9%	8%	7%
26. Quality bike parking were available at destinations	41%	36%	11%	8%	5%
27. Stores and services I use were closer to where I live	39%	32%	16%	9%	5%
28. I knew more about the local bike routes	27%	31%	15%	22%	5%
29. I had access to an electric assist bike	17%	31%	16%	26%	10%

30. Is there anything else that would encourage you to bike more as a form of transportation? **[Open, if yes, specify.]**

Response Category	n=187
Bike parking/storage safety	14%
More bike accessible areas/bike lanes	13%
Safety	9%
If I had a better bike/if I had a bike	8%
Better weather	7%
Incentives—from work or tax break	6%
Bike or e-bike program	5%
If there was better lighting on bike routes/directional signals	5%
Proximity to work	4%
Personal Health/Mental Health	4%
Time—general	1%
None/ Nothing	32%
All other responses	--
Don't know	1%

WALKING

31. **[If Q10 = 1 to 3 Monthly or more often]** Why do you walk for transportation? **[Open. Do not read list, accept up to three responses]**

Response category	n=245
It is good for my health	56%
It's enjoyable	41%
It's good for the environment	12%
To save money	9%
I don't have access to a car	7%
I'm not able to drive (don't have license, disability, etc.)	5%
Other (please specify)	5%
[Don't read] Don't know	3%

32. **[If Q11 = 7 Walk]** When walking for transportation, not for recreation or exercise, what types of places do you typically go most frequently? **[Open. Do not read list, accept up to three responses]**

Response category	n=82
Shopping	80%
Restaurant, eating out	30%
Parks, trails, and nature	17%
Visiting friends	15%
Work	13%
Entertainment	9%
Getting to bus	9%
Medical appointments	7%
School	1%
Faith based places	--
Other (please specify)	2%
[Don't read] Don't know	1%

33. **[If Q10 = 3 to 5 Monthly or less often]** Would you prefer to walk more often for transportation purposes than you currently do? Is that strongly or somewhat?

Response category	n=349
Yes, strongly	13%
Yes, somewhat	34%
No, strongly	31%
No, somewhat	17%
[Don't read] Don't know	5%

[If Q33 = 1 or 2 Yes] Next, I'm going to read you some reasons that people may walk more as a form of transportation. Please tell me if you strongly agree, somewhat agree, somewhat disagree, or strongly disagree with each statement. I would walk more for transportation if… **[Randomize]**

Response category n=163	Strongly agree	Somewhat agree	Somewhat disagree	Strong disagree	Don't know
34. Stores and services I use were closer to where I live	60%	25%	9%	5%	1%
35. Sidewalks in my area were better connected	33%	34%	13%	16%	4%
36. I felt safer walking along and crossing the street	27%	36%	22%	13%	3%
37. There were fewer hills in my neighborhood	12%	14%	29%	34%	11%

38. Is there any other reason that you would walk more as a form of transportation? **[Open. If yes, specify.]**

Response category	n=163
Health/to be healthier	13%
Safety	12%
Physical fitness/exercise	10%
If where I had to go was closer	8%
Time	5%
Better weather	5%
For enjoyment	3%
Give up driving	2%
Economical/to save money	1%
Benches	<1%
None/Nothing	44%
All other responses	--
Don't know	2%

****BUS / PUBLIC TRANSIT

39. ******[If Q8 = 1 to 3 Monthly or more often]** Why do you use a bus, other than a school bus, for transportation? **[Open. Do not read list, accept up to three responses.]**

Response category	n=118
I don't have access to a car	36%
To save money	28%
It's enjoyable	22%
It's good for the environment	16%
I'm not able to drive (don't have license, disability, etc.)	13%
Other (please specify)	9%
[Don't read] Don't know	2%

40. ******[If Q11 = 5 Bus]** When using a bus for transportation, what types of places do you typically go most frequently? **[Open. Do not read list, accept up to three responses.]**

Response category	n=38
Shopping	70%
Entertainment	46%
Restaurant, eating out	17%
Work	17%
Medical appointments	16%
Visiting friends	15%
Getting to bus	12%
School	6%
Faith based places	3%
Parks, trails, and nature	2%
Other	--
[Don't read]	2%

41. ******[If Q8 = 3 to 5 Monthly or less often]** Would you prefer to take the bus more often for transportation purposes than you currently do? Is that strongly or somewhat?

Response category	n=440
Yes, strongly	9%
Yes, somewhat	20%
No, strongly	49%
No, somewhat	20%
[Don't read] Don't know	3%

[If Q41 = 1 or 2 Yes] Next, I'm going to read you some reasons that people may take the bus more as a form of transportation. Please tell me if you strongly agree, somewhat agree, somewhat disagree, or strongly disagree with each statement. I would **take the bus** more for transportation if… **[Randomize]**

Response category n=125	Strongly agree	Somewhat agree	Somewhat disagree	Strong disagree	Don't know
42. ****Buses came more frequently	62%	30%	6%	1%	1%
43. ****I could rely on buses to be on time	38%	44%	7%	8%	3%
44. ****There were good connections to and from transit stops	63%	29%	4%	2%	2%
45. ****I felt personally safe using public transit	45%	32%	12%	9%	3%
46. ****Buses were more comfortable	14%	47%	21%	16%	2%
47. ****There were a county-wide bus service for longer commutes and travel	47%	30%	7%	10%	5%
48. ****I knew it would cost less than driving	33%	45%	14%	7%	1%

49. ****Is there any other reason that you would take the bus more as a form of transportation? **[Open. If yes, specify.]**

Response category	n=125
More frequent service	24%
Bus stations closer	19%
More friendly for disabled	7%
Additional bus routes	6%
Cleaner	5%
Reliable/on time	4%
Safer	4%
More bike friendly	4%
Save money	3%
Car is broken/ has a car instead	3%
Free fare	3%
Schedule restrictions	2%
Protect environment	2%
Bus passes	1%
Homeless	--
None/Nothing	29%
All other responses	--
Don't know	2%

MULTI-MODAL TRANSPORT

When it comes to alternative transportation options, are you very interested, somewhat interested, somewhat uninterested, or not at all interested in the following: **[Randomize]**

Response category n=502	Very interested	Somewhat interested	Somewhat uninterested	Not at all interested	Don't know
50. ****Bike share programs or programs to allow you to try out electric assist bikes	17%	32%	12%	37%	2%
51. ****Programs to encourage the use of electric scooters	16%	27%	14%	41%	2%
52. ****Programs that would make Electric Vehicles more convenient to use, such as more EV charging stations	25%	29%	11%	31%	3%

TELECOMMMUTING

53. ****Do you think the recent experience with COVID-19 and the state stay at home order will make it more likely that telecommuting for work or school will be a part of your future?

Response category	n=502

Yes, very likely	32%
Yes, somewhat likely	14%
No, unlikely	31%
[Don't read] Not applicable	16%
[Don't read] Don't know	6%

54. ****Would you prefer to telecommute to work or school in the future, even at least some of the time, if you had the option?

Response category	n=502
Yes	48%
No	18%
[Don't read] Not an option	10%
[Don't read] Not applicable	18%
[Don't read] Don't know	6%

55. ****[If Q54 = 1 Yes] How many days in a normal five-day work week would you prefer to telecommute to work or school?

Response category	n=240
One day a week	10%
Several days a week	54%
Five days a week	28%
[Don't read] Don't know	8%

DEMOGRAPHICS

These last few questions are to make sure we have talked to a representative portion of the community. They are very important and remember that all of your answers are confidential and not associated with your name in any way.

56. What best described your working status in February 2020, before the Stay at Home orders resulting from COIVD-19?

Response category	n=502
Employed full or part time (Employed)	59%
Student full or part time (Student)	7%
Homemaker (Unemployed)	4%
Unemployed, retired (Unemployed)	24%
Other (Unemployed)	5%
[Don't read] Refused (Unemployed)	1%

57. **[Phone]** Including yourself, how many people live in your household? **[Do not read list; select one]**
[Online:] Including yourself, how many people live in your household? **[Check one]**

Response category	n=502
1	23%
2	35%
3	20%
4	14%
5	3%
6	3%
7	n=2
8 or more	1%
Refused	n=1

58. **[Phone if Q57>1]** How many children under the age of 18 live in your household? **[Online if Q57>1]** How many children under the age of 18 live in your household? **[Check one]**

Response category	n=502
No children	70%
1	14%
2	11%
3	3%
4	1%
5	0%
6 or more	--
Refused	1%

59. How many bikes does your household currently have? **[Record number]**

Response category	n=502
None	28%
1	20%
2	22%
3	13%
4	7%
5 or more	9%
Refused	1%

60. How many vehicles does your household currently have? **[Record number]**

Response category	n=502
None	6%
1	32%
2	40%
3	13%
4	3%
5 or more	4%

Response category	n=502
Refused	1%

61. Which category best describes your 2019 gross household income, before taxes? Remember to include everyone living in your household. Your best estimate will do.

Response category	n=502
Less than $25,000	13%
$25,000 to less than $50,000	23%
$50,000 to less than $75,000	22%
$75,000 to less than $100,000	13%
$100,000 to less than $150,000	11%
$150,000 or more	7%
[Don't read] Refused/Missing	10%

62. Age

Response category	n=502
18–24	12%
25–34	21%
35–54	30%
55–64	14%
65+	23%
Refused	n=2

63. Do you describe your gender as:

Response category	n=502
Male	49%
Female	49%
Non-binary or gender non-conforming	2%
[Don't read] Refused/missing	1%

64. Which of the following best describes your race or ethnicity?

Response category	n=502
African American/Black	3%
Asian/Pacific Islander	5%
Hispanic/Latino	5%
Native American/American Indian	1%
White/Caucasian	84%
Other	2%
[Don't read] Don't know	1%
[Don't read] Refused/Missing	7%

65. Party

Response category	n=502
Democrat	40%
Republican	17%
Independent	8%
Other	6%
Non-affiliated	25%
Missing	4%

Appendix H: Environmental Analysis

Contents

List of Tables and Maps

Purpose

The purpose of this report is to provide a planning-level environmental analysis of the Central Lane Metropolitan Planning Organization (CLMPO) 2045 Regional Transportation Plan (RTP) constrained project list, including potential transportation impacts on six key areas of environmental analysis and strategies to mitigate potential impacts.

Introduction

Regional transportation networks play a vital role in the economic and social health of communities, but without strategic and conscientious planning they can also impact sensitive cultural and environmental resources, vulnerable populations, and community resilience to natural hazards. The CLMPO and its regional partners are committed to the protection of natural and cultural resources as RTP projects are sited, engineered, and built. This environmental analysis compares RTP projects with culturally and environmentally sensitive areas using Geographic Information Systems (GIS) mapping and analysis to help identify where RTP projects may impact the following six areas of analysis and recommend potential mitigation activities: Environmental Justice, Cultural Resources, Air Quality, Water Quality, Sensitive Habitat, and Hazard Mitigation.

The intent for this environmental analysis is to provide a planning-level “flagging” of projects at an early stage of project development—prior to costing, alignment, design, and other decisions—to allow for more meaningful consideration of how to avoid, minimize, or mitigate the impact during project development. It is important to note that the alignments and extents of the projects from the 2045 RTP are planning level at this stage, and just because a project appears to intersect with a given environmental resource does not guarantee it will have a negative impact. Rather, this analysis can serve as a flag for the responsible agency to be aware of potential impacts and to begin planning for potential mitigation strategies early in the development of a project. RTP projects are subject to federal, state, and local regulations regarding impacts to biological and historic resources. Mitigation strategies are specifically addressed as part of the environmental and land use review, consultation, and permitting processes required of all construction projects. Project-level environmental analysis is not performed or required as part of this RTP.

Regulatory Context

The CLMPO’s 2045 RTP is subject to the Fixing America’s Surface Transportation (FAST) Act, which establishes requirements for the scope and content of metropolitan transportation plans. This report addresses federal metropolitan transportation planning requirements for the 2045 RTP to:

- Consider how the RTP will protect and enhance the environment (23 CFR §450.306(b)(5));
- Consider how the RTP will improve the resiliency and reliability of the transportation system and reduce or mitigate stormwater impacts of the transportation system (23 CFR §450.306(b)(9));

- Discuss environmental mitigation activities[1] and potential areas to carry out these activities, including activities that may have the greatest potential to restore and maintain the environmental functions affected by the plan (23 CFR §450.324(f)(10)); and
- Consult with State and local agencies responsible for land use management, natural resources, environmental protection, conservation, and historic preservation concerning the development of the transportation plan, including a comparison of transportation plans with State conservation plans or maps and a comparison of transportation plans to inventories of natural or historic resources (23 CFR §450.306(g)(10)).

Additional federal and state regulations are addressed in detail by the responsible agency during project development, design, and permitting.

Interagency Consultation

In accordance with 23 CFR §450.306(g)(10), the CLMPO consulted with federal, state, local, and tribal entities responsible for land use management, natural resources, environmental protection, conservation, and historic preservation (Table 1). Relevant agencies were solicited for feedback on this Environmental Analysis prior to the public comment period. All feedback is tracked in RTP Appendix F.

Table 1. Interagency Consultation List

Category	Type	Agency (Contact Title)
Airport Operators	City	Eugene Airport (Assistant Airport Director)
Disaster Mitigation	State	Oregon Department of Transportation
	State	Oregon Department of Transportation
Environmental Protection	Federal	U.S. Environmental Protection Agency
	Federal	U.S. Army Corps of Engineers (Eugene Section Chief)
	State	Oregon Department of Transportation Environmental R2 (Environmental Manager)
	State	Oregon Department of Environmental Quality
Freight Management	State	Oregon Department of Transportation Freight (Freight Program Manager)
General	State	Oregon Department of Transportation
Historic Preservation	State	Oregon State Historic Preservation Office (Deputy State Historic Preservation Officer)
Land Use Management	State	Oregon Division of State Lands (Aquatic Resource Planner)
	State	Oregon Department of Land Conservation and Development
Natural Resources	Federal	National Marine Fisheries Service
	Federal	U.S. Fish and Wildlife Service
	State	Oregon Department of Fish and Wildlife (District Fish Biologist)
	Local	Lane Regional Air Protection Agency (Executive Director)

[1] Environmental mitigation strategies are defined in 23 CFR §450.104 as strategies, policies, programs, and actions that, over time, will serve to avoid, minimize, rectify, reduce, or eliminate impacts to environmental resources associated with the implementation of a long-range statewide transportation plan or metropolitan transportation plan.

Category	Type	Agency (Contact Title)
	Local	Lane Regional Air Protection Agency (Operations Manager)
	Local	Lane Regional Air Protection Agency (Air Monitoring and Data Quality Coordinator)
Tribes	Tribes	Confederated Tribes of the Grand Ronde Community in Oregon (Manager, Historic Preservation)
	Tribes	Confederated Tribes of Siletz Indians (Transportation Planner)
	Tribes	Confederated Tribes of Coos, Lower Umpqua, and Siuslaw Indians
	Tribes	University of Oregon Tribal Government Relations (Tribal Liaison)
	Tribes	Lane Community College Native American Student Program (Program Coordinator)

Environmental Context

CLMPO is located in the southern end of the Willamette Valley in Lane County, Oregon, at the base of the foothills of the Cascades and just east of the Coast Range at an elevation of about 450 feet. It lies within the Willamette River Basin near the confluence of the McKenzie River with the main stem of the Willamette River, and the confluence of the Coast and Middle Forks of the Willamette. The area is mostly flat with the occasional volcanic butte and is edged by the South Hills. The climate is one of cool, wet winters and warm, dry summers. Rainfall is about 45 inches per year, falling mostly from October through May.

Historically, the landscape was a diverse combination of wet prairie, wetlands, and ash swales on the valley floor; upland prairie, oak and pine savannas, and oak/fir woodlands on the thinner soils of the foothills; and floodplain forests along the major rivers. Poorly drained clay soils in the valley bottoms held standing water for many months during winter, and the rivers and creeks frequently flooded. Landscape diversity was maintained by the Kalapuya peoples who burned the prairies and savannas to enhance camas production and grasses for the deer and elk herds. White settlement began in the 1840s, and in 1846 Eugene Skinner settled in what would become the City of Eugene. The early settlers turned the open prairies and savannas into farmlands and tiled and drained wet areas. As the Kalapuya were displaced, annual burning ceased, and fir forests became established in the foothills replacing much of the oak woodland and savannas.

Urban development, growth, and infrastructure have also simplified the area's river systems and reduced the off-channel habitat that once supported fish populations. In the 1940s, the Willamette Basin Project built dams on the Willamette River (Fall Creek, Dexter and Lookout Point), the Long Tom River (Fern Ridge Reservoir), and the upper McKenzie River basin, diminishing the frequency and size of floods and allowing control of river levels. Revetments, structures built to stabilize banks, prevented natural river meanders. Finally, the logging of large trees within the riparian floodplain forest has reduced large woody debris,[2] a critical component of healthy riparian ecosystems that provides habitat

[2] Large Wood Debris (LWD) includes any dead, woody plant material, such as fallen trees, logs and stumps, root wads, and piles of branches.

for fish, stabilizes stream channels and banks, contributes to nutrient cycling, and creates mini ecosystems that are biologically diverse.

Avoid, Minimize, Mitigate Framework

The mitigation approach defined in 40 CFR §1508.20 provides a sequential framework for environmental mitigation of transportation projects and provides guidance for all proposed action taken in response to the findings of this analysis:

1. **Avoiding the impact** altogether by not taking certain action or parts of action.
2. **Minimizing impacts** by limiting degree or magnitude of the action and its implementation by using appropriate technology, or by taking affirmative steps to avoid or reduce impacts.
3. **Rectifying the impact** by repairing, rehabilitating, or restoring affected environment.
4. **Reducing or eliminating the impact over time** by preservation and maintenance operations during life of action or project.
5. **Compensating for the impacts** by replacing, enhancing, or providing substitute resources or environments.
6. **Monitoring the impact** and taking appropriate corrective measures.

Methodology and Data

The RTP contains a list of transportation projects that are expected to be constructed within the CLMPO by the horizon year 2045. The project list is developed by the MPO partner agencies and primarily drawn from regional partners' long-range plans.[3] Projects are divided into two lists: the "fiscally constrained" list contains projects for which the anticipated cost is expected to be covered by projected revenue within the RTP's horizon, and the "illustrative" list contains projects identified as important to realize the RTP's goals but unattainable with projected revenues. Each list is further divided into Roadway Projects, Transit Projects, and Bike/Pedestrian Projects.[4] Fiscally constrained projects are the most likely to be built, and the constrained projects list is therefore the focus of this environmental analysis.

For the analysis, projects on the fiscally constrained list were identified as either a point or line in GIS, given a 100-foot buffer, and intersected with environmental and cultural resource data. The number and percent of projects by project type that intersected each area of environmental analysis were then determined using GIS. The locations of projects are planning level at this time. Project-level planning, design, and development includes more intensive study of the area, and alignments or project extents can change to avoid or minimize impact to environmental, cultural, or social resources.

Not every project on the constrained list is included in this analysis. Some projects, most notably transit amenities, do not yet have a project location identified (e.g. general transit stops) or are otherwise not associated with a geographic location (e.g. purchase of buses and bus maintenance projects). Most projects on the list will occur on existing roadways. Some new alignments are listed and are categorized on the maps as "Off-Street Bike/Ped," "New Arterial Link," and "New Collector." A "New Interchange" would likely be built on an existing road, but would require expanded right of way, as would "Added Freeway Lanes/Major Interchange Improvements."

CLMPO has identified six areas of environmental analysis and specific units of analysis for each (Table 2). This analysis utilizes publicly available data. The MPO maintains the transportation database; all other data are created and maintained by the source agencies. If there is an error found in the display or implementation of any of the databases, please contact the MPO. Errors or omissions in the data can only be updated by the source agencies.

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[3] MPO partner agencies include Lane County, the Cities of Eugene, Springfield and Coburg, the Oregon Department of Transportation (ODOT), and Lane Transit District (LTD). The Willamalane Parks and Recreation District also contributes projects. The MPO itself conducts planning and programming and does not construct projects.

[4] Planning projects are not required to be included. The list also does not include pavement resurfacing, bridge replacement, or safety projects that arise due to unanticipated circumstances or as part of regular systems operations, maintenance, or preservation.

Table 2. Units of Analysis and Data Sources

Area of Analysis	Unit of Analysis	Description	Data Source
Environmental Justice	People of Color	People of color include all persons who identified themselves as non-white or Hispanic. People of color are more likely to live in densely populated areas, less likely to have a car, and more likely to use public transportation to commute to work.[5]	United States Census Bureau, American Community Survey
	Low-Income Households	Low-income households include all households whose income is below the poverty level. Low-income households may have a difficult time purchasing and maintaining a personal vehicle.	United States Census Bureau, American Community Survey
	People over 65	People over 65 may choose not to drive or may no longer be able to drive due to age.	United States Census Bureau, American Community Survey
	People with Disabilities	The population with disabilities is defined as all civilian non-institutionalized persons five years and older who identify themselves as disabled. Disability status may impact an individual's ability to live independently, including driving a personal vehicle.	United States Census Bureau, American Community Survey
	Limited English Proficiency	The population with limited English proficiency is defined as all people who reported that they speak a language other than English at home and indicated their ability to speak less than "Very well" ("Well," "Not well," or "Not at all").	United States Census Bureau, American Community Survey
	Historically Excluded Populations	Historically excluded populations include people of color, low-income households, people over 65, and people with disabilities. Concentrations of each of these populations at the block group level are evaluated against the concentration across the entire MPO area.	United States Census Bureau, American Community Survey
Cultural Resources	National Register Historic Places	The National Park Service's National Register of Historic Places was authorized by the National Historic Preservation Act of 1966. It is part of a national program to coordinate and support public and private efforts to identify, evaluate, and protect America's historic and archaeological resources. The Oregon State Historic Preservation Office manages a Statewide inventory of historic sites which includes the National Register of Historic Places.	State Historic Preservation Office, Cities of Eugene and Springfield
	Historic Districts	The cities of Eugene, Springfield, and Coburg each identify historic districts in their zoning codes that are subject to special regulations to preserve the historic character of the neighborhood.	Cities of Eugene, Springfield, and Coburg
Air Quality	PM_{10} Air Quality Maintenance Area	The PM_{10} Air Quality Maintenance Area comprises the Urban Growth Boundaries of Eugene and Springfield.	Lane Regional Air Protection Agency

[5] TCRP Report 49 Using Public Transportation to Reduce the Economic, Social, and Human Costs of Personal Immobility: http://onlinepubs.trb.org/onlinepubs/tcrp/tcrp_rpt_49.pdf

Area of Analysis	Unit of Analysis	Description	Data Source
	303d Impaired and Threatened Waters	The Clean Water Act (CWA) of 1972 established the 303(d) list as a way to categorize and track the nation's impaired waterbodies. Waterbodies that exceed protective water quality standards are identified as impaired and are added to the 303(d) list. Identifying a waterbody as impaired initiates the prioritization and development of a Total Maximum Daily Load (TMDL), which is the calculation of the maximum amount of a pollutant allowed to enter a waterbody so that the waterbody meets water quality standards for that particular pollutant. The CWA requires Oregon to report on the quality of its surface waters every two years. Streams with a listing status of Category 5 are included in the GIS analysis.	Department of Environmental Quality (Oregon Spatial Data Library)
Water Resources	Groundwater Management Area (GWMA)	The groundwater in the Willamette Valley between Eugene and Albany shows signs of contamination from human activity. On May 10, 2004, the Oregon DEQ declared the area a GWMA due to high concentrations of nitrate in the water.[6]	Department of Environmental Quality (Oregon Spatial Data Library)
	Wetlands	The National Wetlands Inventory is a publicly available resource managed by the US Fish and Wildlife Service that provides detailed information on the abundance, characteristics, and distribution of US wetlands. In Oregon, jurisdictions are required to produce Local Wetlands Inventories pursuant to Statewide Planning Goal 5 (Natural Resources, Scenic and Historic Areas, and Open Spaces), which requires local governments to determine the locations, type, and functional capacity of wetlands. The Statewide Wetlands Inventory includes the National Wetlands Inventory and subsets of other key federal datasets to flag areas with greater likelihood of containing unmapped wetlands or waterways. The national, state, and local wetlands inventories are combined into a single wetlands layer for the GIS analysis.	United States Fish and Wildlife Service, Oregon Department of State Lands

[6] Oregon law requires DEQ to declare a GWMA when nitrate contamination in the groundwater is above 1.0 milligrams per liter (mg/L) and the suspected sources are not facilities with permits, such as landfills or incinerators.

Area of Analysis	Unit of Analysis	Description	Data Source
Sensitive Habitat	Conservation Opportunity Areas	The *Oregon Conservation Strategy* is an overarching state strategy for conserving fish and wildlife that provides a shared set of priorities for addressing Oregon's conservation needs. Conservation Opportunity Areas (COAs) are places identified in the Strategy where broad fish and wildlife conservation goals would be best met. They were developed to guide voluntary conservation actions in Oregon.	Oregon Department of Fish and Wildlife *Oregon Conservation Strategy*
	Critical Habitat	The United States Fish and Wildlife Service Critical Habitat spatial data includes critical habitat for species listed as Threatened and Endangered.	United States Fish and Wildlife Service
Hazard Mitigation	FEMA Flood Hazard Zones	The 100-year FEMA floodplain has a 1% annual chance of flooding and a 26% chance of flooding over the life of a 30-year mortgage. A floodplain consists of the floodway and floodway fringe. A floodway is the primary conveyance area of a channel's cross-section that is the natural conduit for flood waters; it must remain open in order to allow flood waters to pass. The flood fringe are lands outside the floodway within the floodplain that store but do not effectively convey floodwaters.	Federal Emergency Management Agency
	Seismic Risk	This analysis combines three seismic risk factors into a single data layer: 1. <u>Liquefaction susceptibility</u> – Liquefaction takes place when loosely packed, water-logged sediments at or near the ground surface lose their strength due to strong ground shaking. 2. <u>Landslide susceptibility</u> – Landslides are the downslope movement of rock, soil, or related debris. The majority of landslides in the northwest are due to continuous rains that saturate soils, but they can also be triggered by earthquakes. 3. <u>Probability of damaging shaking</u> – This is a measure of the probability over the next 50 years of experiencing shaking strong enough to damage weak buildings.	Oregon Department of Geology and Mineral Industries Oregon Seismic Hazards Database

Areas of Environmental Analysis

This section includes six areas of environmental analysis: Environmental Justice, Cultural Resources, Air Quality, Water Resources, Sensitive Habitat, and Natural Hazards. Each sub-section includes background on the area and units of analysis, an analysis of potential impacts from RTP projects, and potential mitigation strategies.

Environmental Justice

BACKGROUND

The transportation system has an enormous impact on public health, mobility, access to opportunity, and the quality of neighborhoods. Transportation policy has created or exacerbated racial and socioeconomic disparities in public health and safety. People of color and low-income communities are more likely to live in proximity to major highways and the associated vehicle exhaust, which is linked to impaired lung development, lung cancer, heart disease, respiratory illness, and premature death. In addition to being less healthy, the transportation system is less safe for low-income communities and people of color.

Environmental justice is the fair treatment and meaningful involvement of all people, regardless of race, color, national origin, or income, with respect to the development, implementation, and enforcement of environmental laws, regulations, and policies. Fair treatment means that no population bears a disproportionate share of negative environmental consequences resulting from industrial, municipal, and commercial operations or policies; meaningful involvement means people have an opportunity to participate in decisions about activities that may affect their environment and/or health. The need to consider environmental justice is embodied in many laws and regulations, including Title VI of the Civil Rights Act of 1964.

As a recipient of state and federal funds, the CLMPO is subject to the provisions of Title VI and maintains a regularly updated Title VI Plan, including consideration for environmental justice. Environmental justice must be considered in all phases of planning and focuses on enhanced public involvement and an analysis of the distribution of benefits and impacts. There are three fundamental environmental justice principles:

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

The CLMPO is committed to preventing discrimination and fostering a just and equitable society and recognizes the key role that transportation services provide in the community. The CLMPO has a long-standing policy to actively ensure non-discrimination and to ensure that transportation planning includes consideration of the unique needs of Title VI protected populations. Detailed information about the CLMPO's policies and procedures relating to Title VI and environmental justice can be found in the CLMPO's 2021 *Title VI and Environmental Justice Plan*, which serves to address Title VI requirements.

ANALYSIS

Table 3 shows bike, pedestrian, and frequent transit access for the following five historically excluded populations[7] as identified by Title VI: people of color, low-income households, population over 65, people with disabilities, and people with limited English proficiency. For the purpose of this analysis, bike access is defined as ½ mile to bike paths, pedestrian access is defined as ¼ mile to bike paths and sidewalks, and frequent transit access is defined as ¼ mile to transit routes with a maximum of 15-minute headways.[8] With full implementation of proposed RTP projects, most of these populations will live in Census Blocks with bike and pedestrian access as shown in Table 3. Thirty-seven percent of people of color, 50% of low-income households, 22% of people over 65, 30% of people with disabilities, and 43% of people with limited English proficiency will have access to frequent transit.

The CLMPO staff recognize two limitations to the results reported in Table 3. First, Census block group centroids were used to establish access to transportation amenities. Because block groups vary in size, actual distance from an individual household location to transportation amenity within each block group will vary. Second, the analysis included any Census block group with any presence of a historically excluded population; given the extent and coverage of the transportation network, the likelihood that a particular type of transportation facility exists within ¼ mile or ½ mile of the centroid of a block group with any presence of one of the five identified populations is very high. However, basic proximity is not necessarily the same as access to high quality transportation facilities. To control for this limitation and add a qualitative lens to the analysis, LTD's Frequent Transit Network (15-minute headways) was used as a proxy for access to high quality transit. Unfortunately, a similar qualifier for bike and pedestrian facilities was not easily isolated from the larger data set. As a result, the analysis appears to indicate extremely high rates of access to bicycle and pedestrian infrastructure (nearly 100%), when in practice many areas within the MPO with high concentrations of historically excluded populations—for example in areas of western Eugene and eastern Springfield—lack safe and connected bike and pedestrian infrastructure.

[7] This term recognizes the fact that the benefits and burdens of transportation investments have not been fairly distributed, with the majority of burdens being placed on low-income communities, communities of color, elderly populations, and people with disabilities.
[8] Only routes that are part of Lane Transit District's Frequent Transit Network, defined as routes with 15-minute headways, are included in this analysis.

Table 4 presents an additional layer of analysis to help understand bike, pedestrian, and frequent transit access in the CLMPO area and add nuance to the analysis presented in Table 3. Rather than calculating access for all Census block groups with any presence of one of five historically excluded populations, this analysis focuses on "Equity Areas," defined as Census block groups containing three or four historically excluded populations in concentrations that exceed the MPO-wide average for these populations.[9] This analysis more directly reveals transportation access for historically excluded populations by focusing on the areas within the CLMPO with the most significant equity concerns. The results in Table 4 reveal significantly lower access to bike facilities, pedestrian facilities, and frequent transit for people who live in these Equity Areas. Future analysis will apply a qualitative lens to the bike and pedestrian access measures to provide additional understanding for access to high quality bike and pedestrian facilities. Staff finds value in presenting the analysis to date with the finding in data limitations and opportunities to further this analysis in the next RTP update.

Table 5 shows the number of 2045 constrained RTP projects with a 100-foot buffer by type that intersect with or are within Equity Areas. Over 50% of projects, 131 in total, intersect with Equity Areas. In many cases, the intersection does not necessarily represent a potential negative impact; projects may benefit the historically excluded populations present by increasing their access to the frequent transit network or bicycle and pedestrian facilities. Maps 1 through 5 show the locations of RTP projects in relation to people of color, low-income households, people over 65, people with disabilities, and limited English proficiency populations. Map 6 shows the locations of RTP projects in relation to Census block groups with greater than average concentrations of historically excluded populations.

Table 3. Historically Excluded Populations' Access to Bike, Ped, and Transit – Entire CLMPO Area

Historically Excluded Population	*Access to Bike Facilities*	*Access to Pedestrian Facilities*	*Access to Frequent Transit*
People of Color	98.2%	97.1%	36.8%
Low-Income	98.8%	97.2%	50.0%
Over 65	97.8%	94.9%	22.0%
People with Disabilities	97.6%	95.8%	29.8%
LEP	99.5%	98.3%	43.0%

[9] This analysis is based on Title VI "Communities of Concern," which are geographic areas of analysis that MPOs construct to identify populations that (1) are more likely to face negative consequences from infrastructure development and/or (2) are less likely to have equitable access to transportation services. "Communities of Concern" is a category broadly used by MPOs and State Departments of Transportation, though federal guidance allows for variation in how the term is defined. The CLMPO includes people of color, low-income households, populations over 65, and people with disabilities in this category. For the purpose of this analysis, Equity Areas are therefore defined as Census block groups that include three or four of these historically excluded populations in concentrations higher than the MPO-wide average. Thirty-four of 184 Census block groups in the CLMPO area are considered Equity Areas according to this analysis.

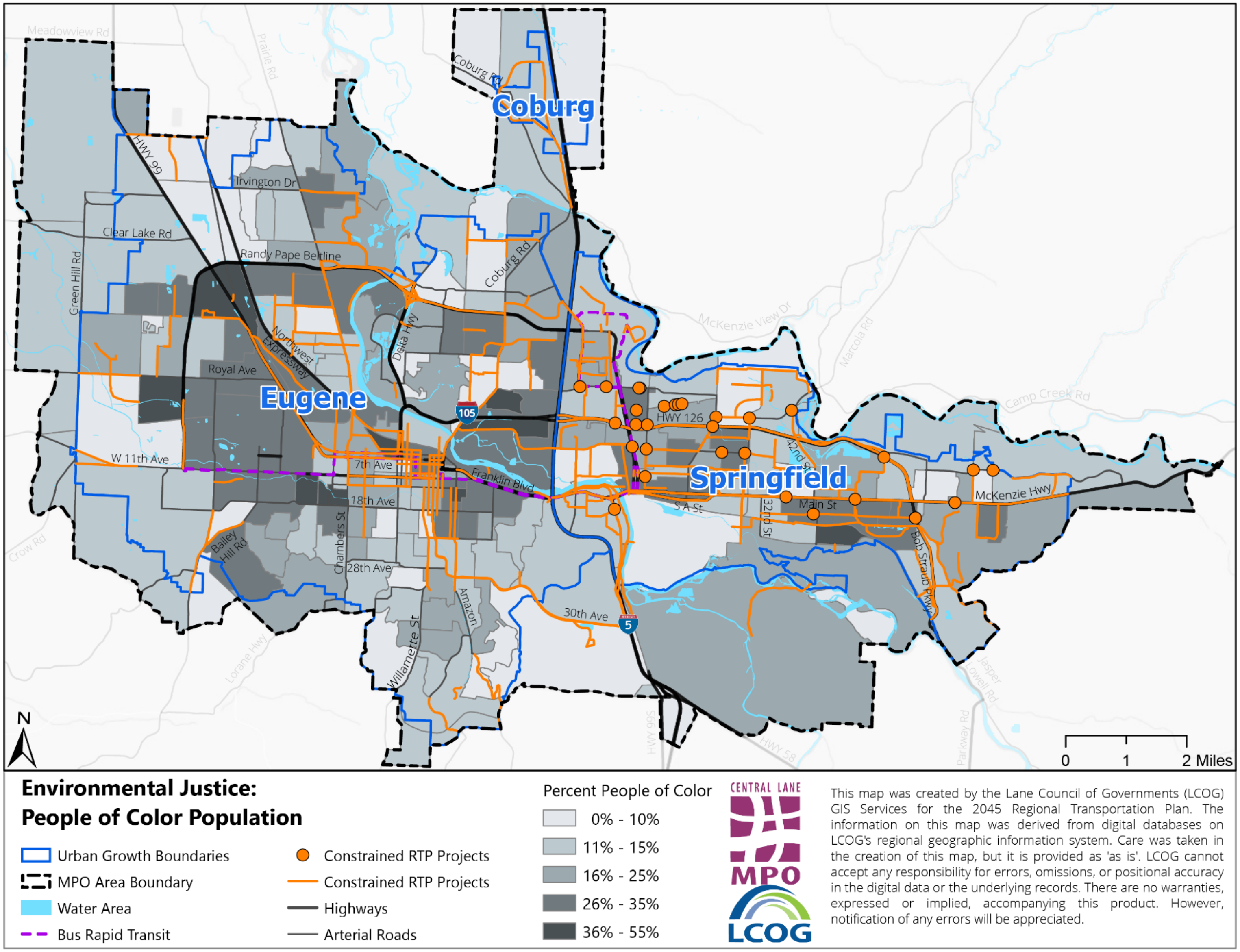
Table 4. Historically Excluded Populations' Access to Bike, Ped, and Transit – Equity Areas

Historically Excluded Population	Access to Bike Facilities	Access to Pedestrian Facilities	Access to Frequent Transit
People of Color	17.9%	23.2%	23.7%
Low-Income	16.2%	20.3%	20.8%
Over 65	17.6%	21.8%	22.6%
People with Disabilities	19.3%	24.6%	25.2%
LEP	20.7%	27.1%	27.2%

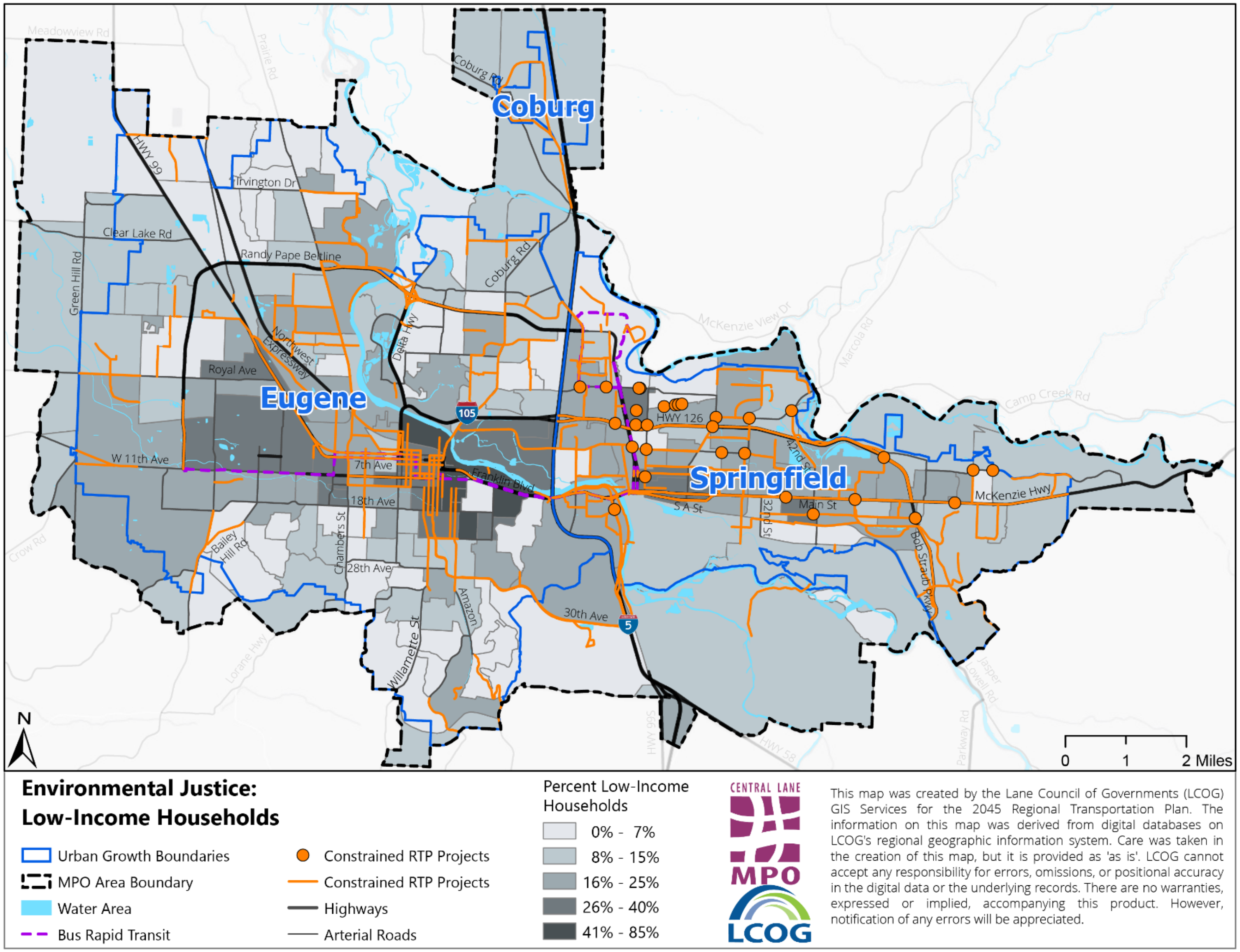
Table 5. 2045 Constrained RTP Projects and Historically Excluded Populations

Project Category	Project Type	Equity Area
Auto	Added Freeway Lanes or Major Interchange Improvements	2
	Arterial Capacity Improvements	11
	New Arterial Link or Interchange	0
	New Collectors	6
	Study	13
	Transit Oriented Development Implementation	1
	Urban Standards	11
Transit	Frequent Transit Network	30
	Stations	5
Bike/Ped	Multi-Use Paths without Road Project	10
	Multi-Use Paths with Road Project	0
	On-Street Lanes or Routes with Road Project	7
	On-Street Lanes or Routes without Road Project	35
	TOTAL	131
	PERCENT OF ALL CONSTRAINED PROJECTS	53%

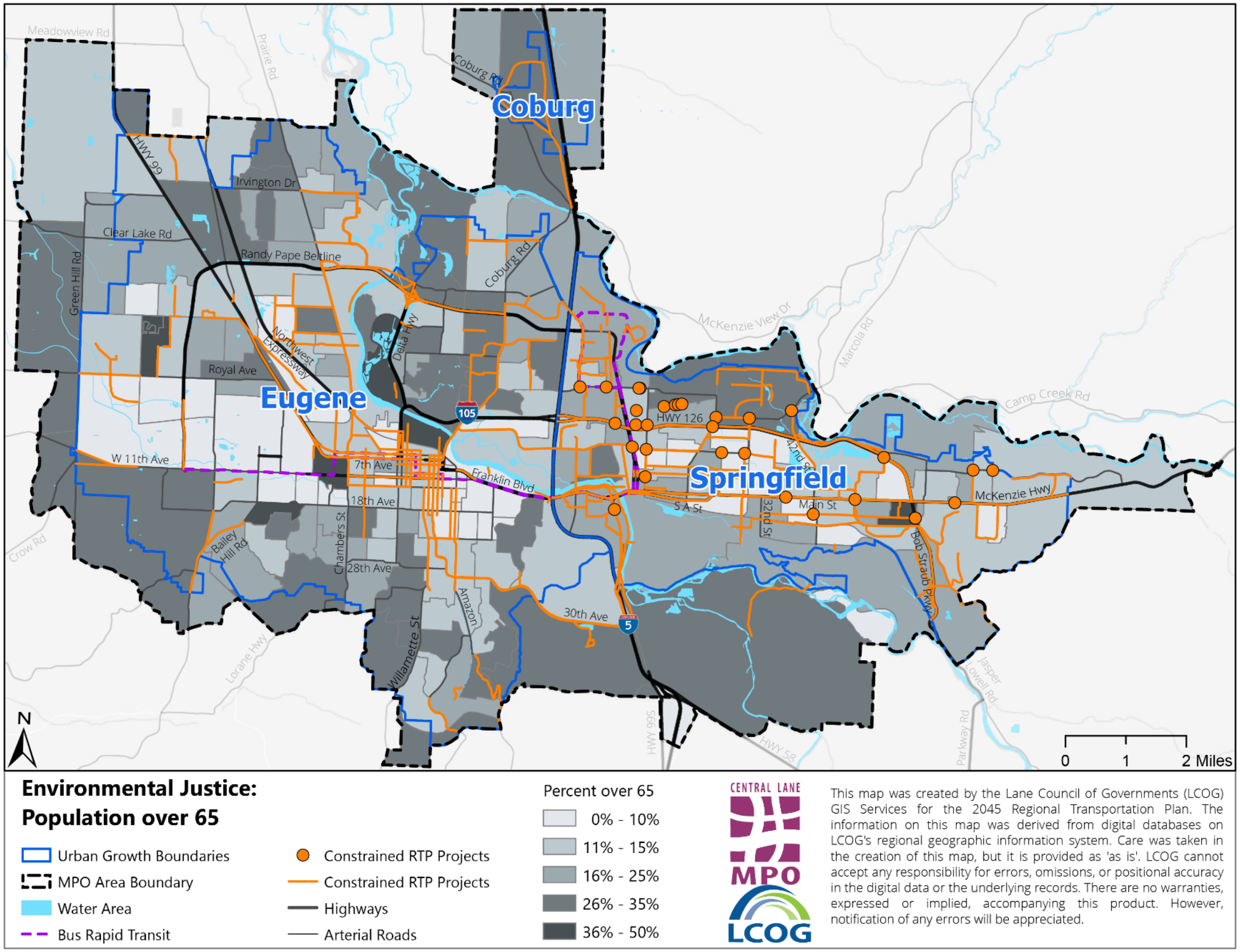
Map 1. Environmental Justice – People of Color Population



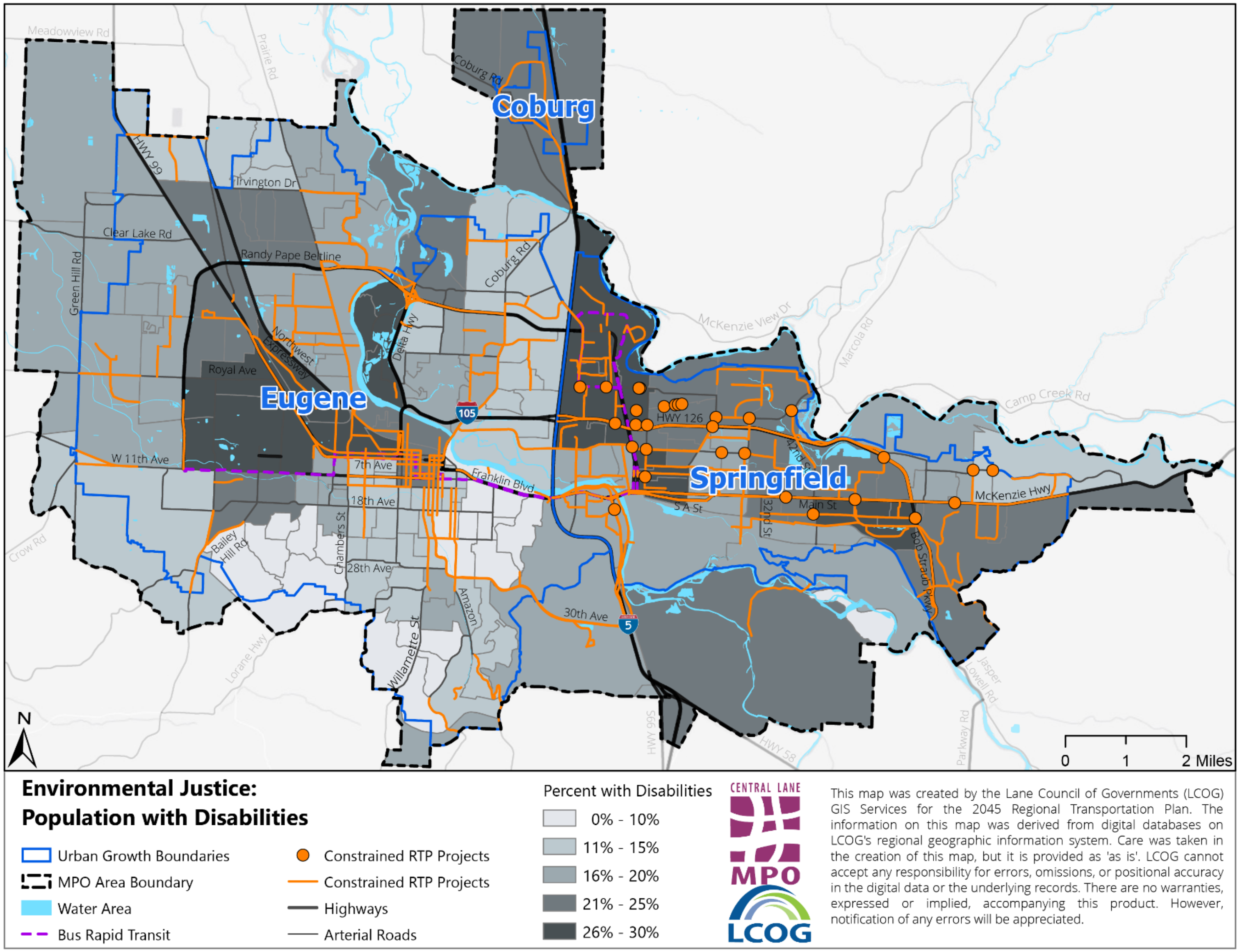
Map 2. Environmental Justice – Concentration of Low-Income Households



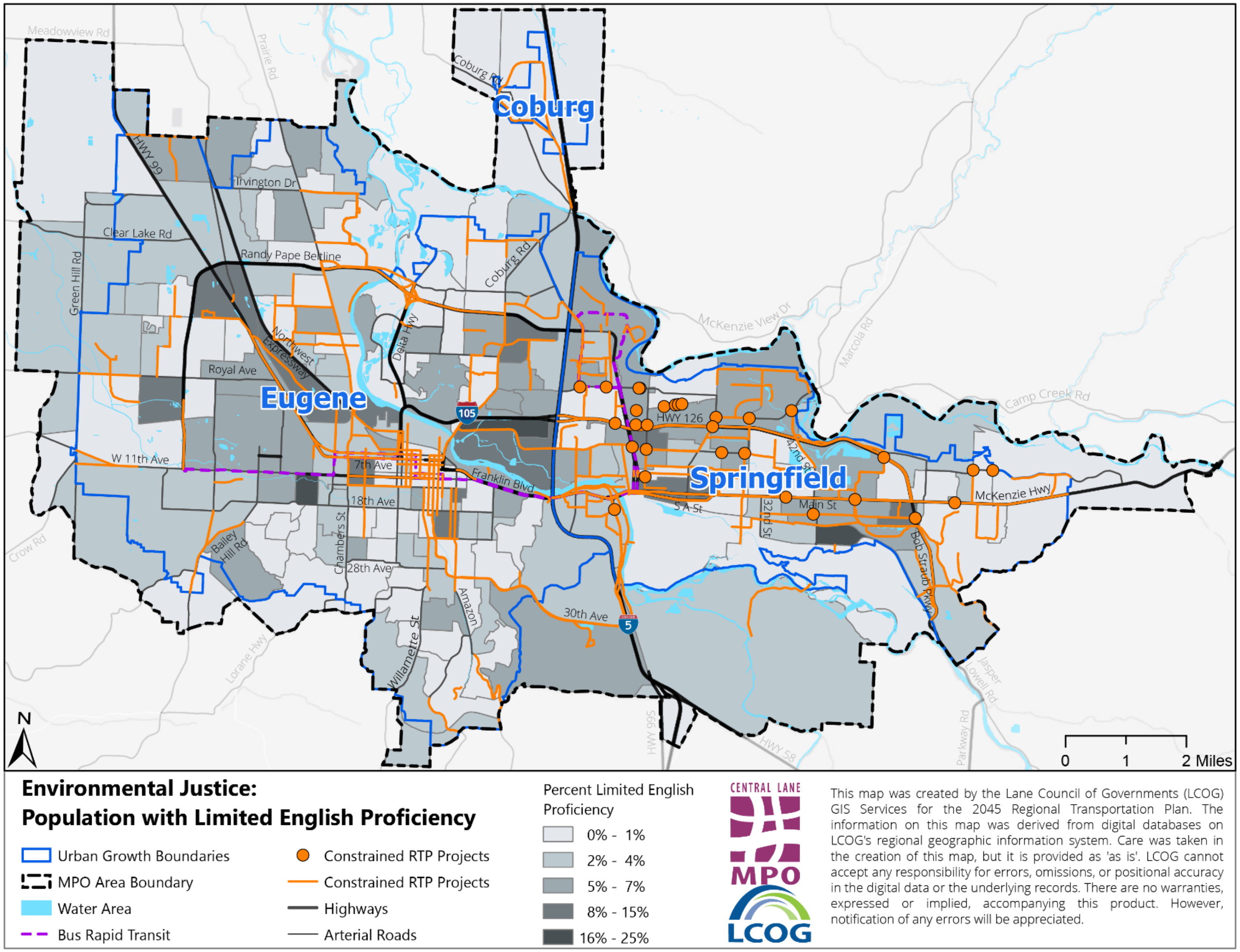
Map 3. Environmental Justice – Concentration of Population over 65



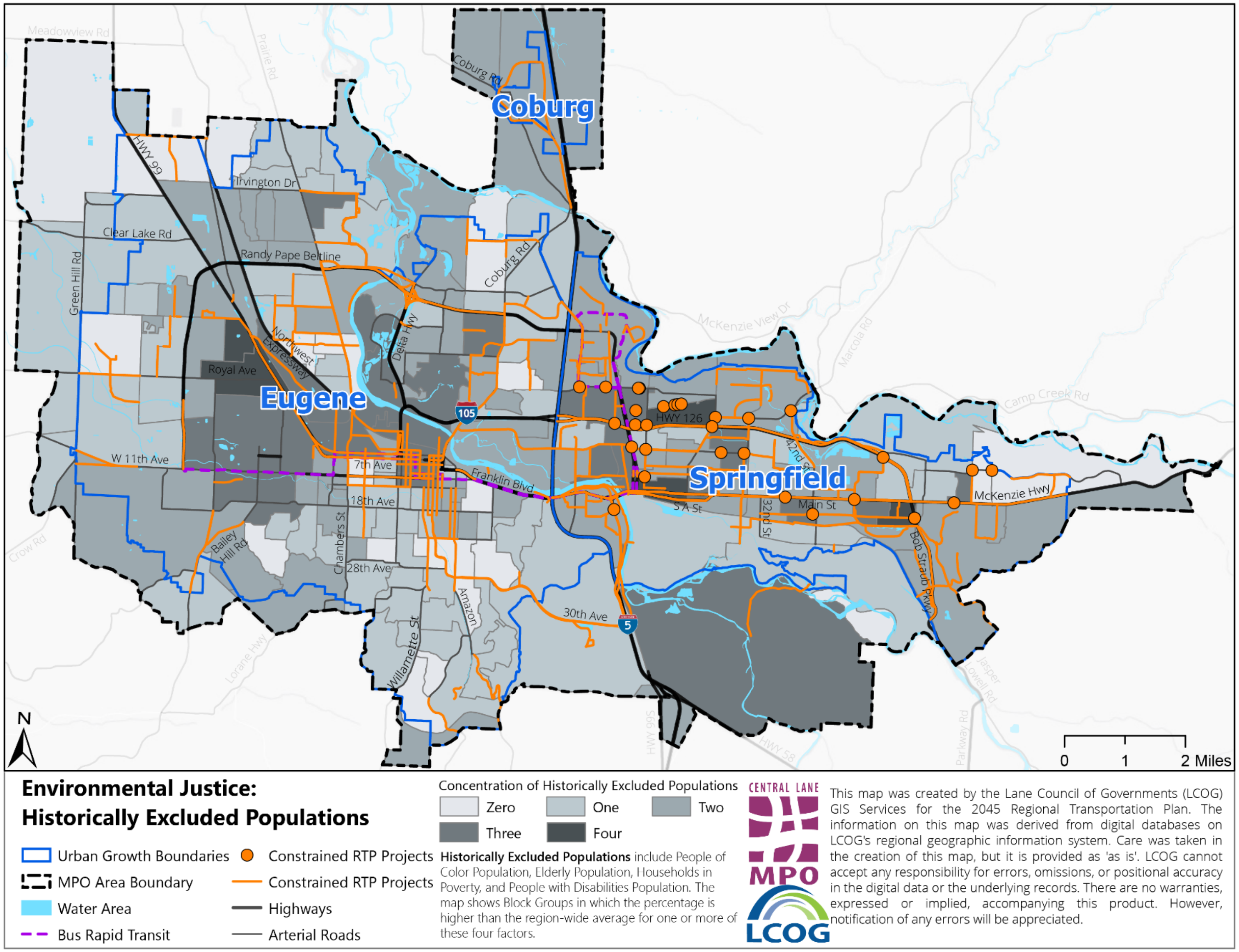
Map 4. Environmental Justice – Concentration of Population with Disabilities



Map 5. Environmental Justice – Concentration of "Limited English Proficiency" Population



Map 6. Environmental Justice – Concentration of Historically Excluded Populations



ENVIRONMENTAL JUSTICE MITIGATION STRATEGIES

Environmental Justice Mitigation Strategies
Utilize the Avoid, Minimize, Mitigate framework to reduce environmental impacts of transportation projects
Document historic assets and use context-sensitive design to complement existing streetscape or architectural features
Consult with tribes if there is potential to impact tribal lands or Native American legacy sites
Build walkable communities and job centers
Implement policies and investments that support increased use of transit, walking, and biking
Improve multimodal network connectivity that promotes biking and walking connections to transit, jobs, and community spaces
Expand the use of parking management and transportation options programs to encourage active transportation
Invest in projects that smooth traffic flow and reduce congestion and idling
Include historically excluded populations in decision making

Cultural Resources

BACKGROUND

Cultural resources, such as historic properties and districts, contribute to the historic and aesthetic value of the built environment, and they can play a significant role in quality of life. Transportation projects that may affect these resources are required to include appropriate mitigation to minimize the impact. Several federal regulations govern historic and cultural preservation with respect to transportation, including the National Historic Preservation Act of 1966, Section 4(f) of the Department of Transportation Act, and the National Environmental Policy Act. Additionally, Oregon Revised Statute (ORS) 358.653 requires state agencies, counties, cities, universities, school districts, and local taxing districts to consult with the Oregon State Historic Preservation Office (SHPO) to avoid inadvertent impacts to historic properties listed in the National Park Service's National Register of Historic Places. The National Register was authorized by the National Historic Preservation Act of 1966. It is part of a national program to coordinate and support public and private efforts to identify, evaluate, and protect America's historic and archaeological resources. SHPO manages a Statewide inventory of historic sites which includes the National Register of Historic Places.

There is no Native American reservation within or adjacent to the CLMPO area. The CLMPO area occupies the traditional homeland of the Kalapuya people. Following treaties between 1851 and 1855, Kalapuya people were forcibly removed to the Coast Reservation in Western Oregon by the United States government. Today, descendants are citizens of the Confederated Tribes of Grande Ronde Community of Oregon and the Confederated Tribes of the Siletz Indians of Oregon, and many descendants still live in the area. Native Land Digital maps many of the Indigenous territories, treaties, and languages in North America and across the world; maps can be found at native-land.ca.

The CLMPO follows the tribal consultation process for the development of statewide transportation plans developed by ODOT in partnership with tribal governments to fulfill the intent of 23 CFR §450. To the greatest extent practicable and to the extent permitted by law, the CLMPO consults with tribal governments prior to taking actions that have substantial direct impact on federally recognized tribal governments. The Confederated Tribes of the Coos, Lower Umpqua, and Siuslaw Indians and the Confederated Tribes of Siletz Indians are contacted during the RTP update period to determine their interest in participating in the RTP update, the extent to which they would like to participate, and the means of receiving information and commenting on the draft documents. The CLMPO conducted outreach with the Confederated Tribes of Siletz Indians of Oregon during the Public Open House for the development of the 2045 RTP, and the Tribes were also consulted during the Environmental Consultation for this report. In addition to RTP process, the CLMPO maintains a strong partnership with the Confederated Tribes of Coos, Lower Umpqua, and Siuslaw Indians to deliver Link Lane transit services connecting the MPO area with the Cities of Florence and Yachats on the coast.

Potential transportation project-related impacts to historic and cultural resources may include physical changes to historic transportation infrastructure, effects of air pollution resources due to increased traffic, and disturbance or infringement on cultural landscapes. The nature of these potential impacts is highly location- and project-specific, and the information about historic and cultural resources is constantly evolving. It is important for each project to be evaluated in the specific context and timeframe in which it is designed with up-to-date information.

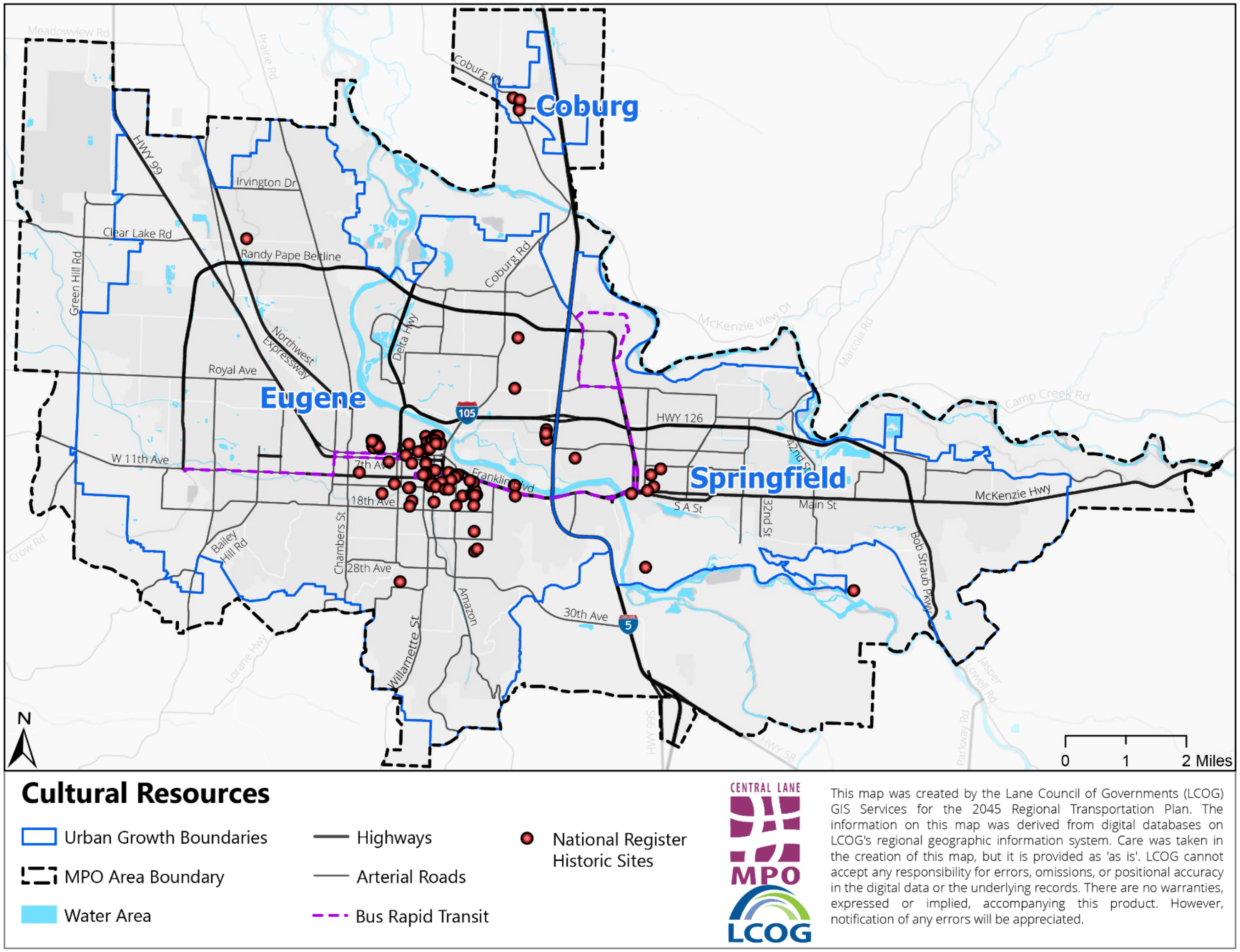
ANALYSIS

Table 6 shows the number of 2045 constrained RTP projects with a 100-foot buffer by type that intersect with historic districts and National Register sites. Seventeen projects potentially impact local Historic Districts, and 38 projects potentially impact sites on the National Register of Historic Places (7% and 15% of all RTP projects, respectively). There are 140 historic sites on the National Register and five historic districts within the CLMPO boundary: Coburg Historic District in Coburg, East Skinner Butte Historic District in Eugene, Eugene Blair Boulevard Commercial Historic District in Eugene, Washburne Historic District in Springfield, and Dorris Ranch Historic District in Springfield. Map 7 shows the locations of National Register Historic Places within the MPO boundary.

Table 6. 2045 Constrained RTP Projects and Cultural Resources

Project Category	*Project Type*	*Historic Districts*	*Historic Places*
Auto	Added Freeway Lanes or Major Interchange Improvements	0	0
	Arterial Capacity Improvements	0	0
	New Arterial Link or Interchange	0	0
	New Collectors	0	0
	Study	0	4
	Transit Oriented Development Implementation	0	1
	Urban Standards	0	1
Transit	Frequent Transit Network	9	24
	Stations	0	1
Bike/Ped	Multi-Use Paths without Road Project	1	0
	Multi-Use Paths with Road Project	0	0
	On-Street Lanes or Routes with Road Project	0	1
	On-Street Lanes or Routes without Road Project	7	6
	TOTAL	17	38
	PERCENT OF ALL CONSTRAINED PROJECTS	7%	15%

Map 7. Cultural Resources



CULTURAL RESOURCES MITIGATION STRATEGIES

Cultural Resources Mitigation Strategies
Utilize the Avoid, Minimize, Mitigate framework to reduce environmental impacts of transportation projects
Document historic assets and use context-sensitive design to complement existing streetscape or architectural features
Consult with tribes if there is potential to impact tribal lands or Native American legacy sites
Build walkable communities and job centers
Implement policies and investments that support increased use of transit, walking, and biking
Improve multimodal network connectivity that promotes biking and walking connections to transit, jobs, and community spaces
Expand the use of parking management and transportation options programs to encourage active transportation
Invest in projects that smooth traffic flow and reduce congestion and idling
Support mixed use development and land use policies that limit sprawl and reduce the need for single occupancy automobile travel
Preserve and document cultural assets
Design new or renovated infrastructure to be context-sensitive; complement existing streetscape or architectural features
Stabilize roads, crossings, and other sources of sediment delivery
Minimize crossings through sensitive resource areas

Air Quality

BACKGROUND

The transportation system has a direct and measurable effect on air quality. Five of the six criteria pollutants designated by the Clean Air Act (CAA) controlled by the National Ambient Air Quality Standards (NAAQS)—carbon monoxide (CO), lead, nitrogen oxides, ozone, and particulate matter—can be byproducts of transportation modes and systems, and they all have adverse human and environmental health impacts. The Eugene-Springfield area is currently designated as a maintenance area for coarse particulate matter (PM_{10}) under the CAA. It was designated as a nonattainment area for PM_{10} in 1987, and in 2013 it was re-designated by the United States Environmental Protection Agency (US-EPA) to attainment with a 10-year limited maintenance plan. The region currently meets air quality conformity standards for all other pollutants.[10]

Although transportation was found not to be a significant contributor to the Eugene-Springfield area's PM_{10} pollution (home wood heating and industrial sources were the major contributors in this case), analysis is required of certain transportation projects in order to ascertain that localized impacts (such as at intersections) do not occur. The CLMPO has prepared an air quality conformity determination (AQCD) for PM_{10} for the 2045 RTP. An AQCD is a finding that proposed transportation activities will not

[10] In 2014, the region completed a 20-year maintenance period for CO, meaning air quality standards for CO have been met for the past 20 years.

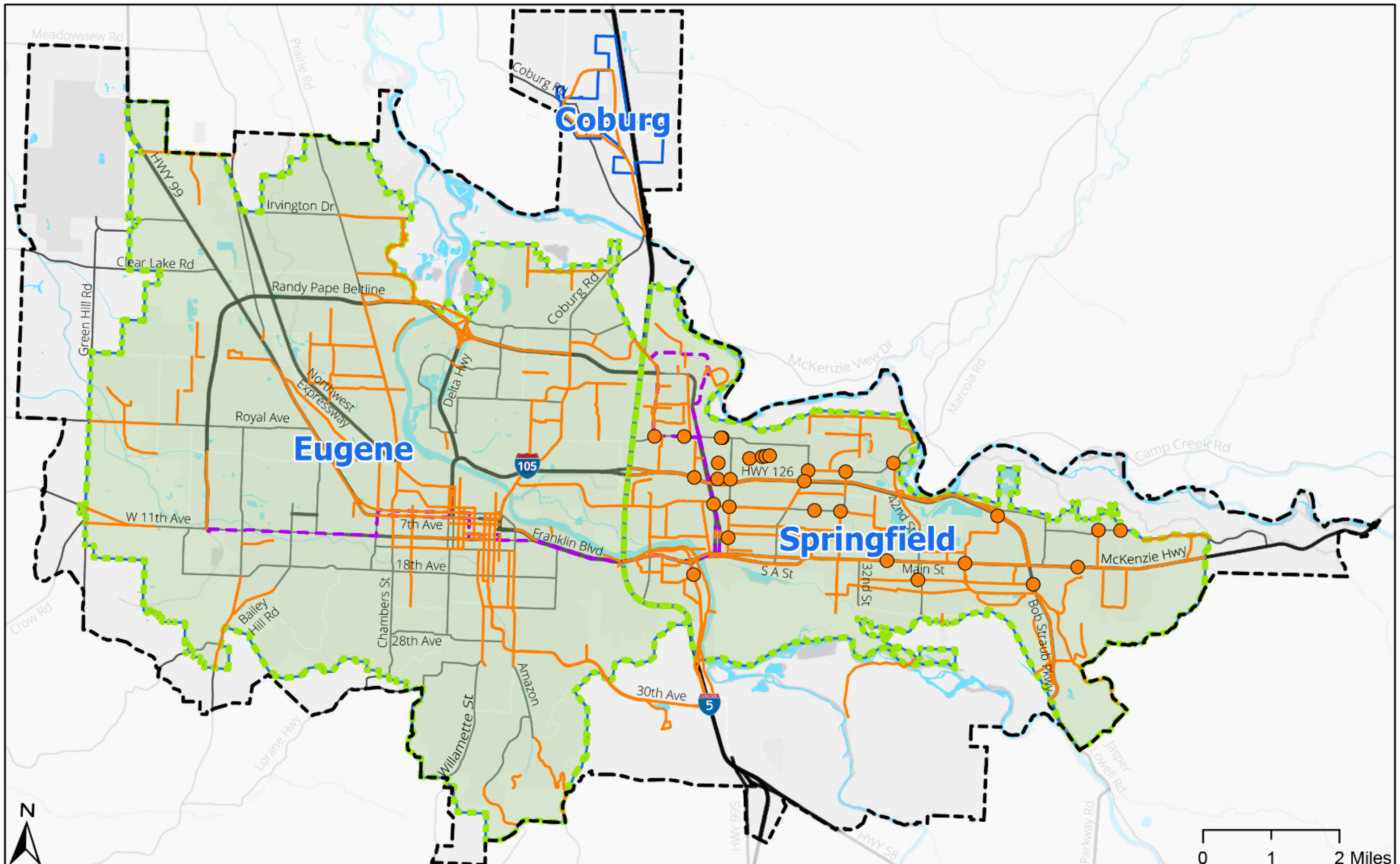
impede this area from continuing to meet air quality standards and will not cause or contribute to new air quality violations. The report is required in areas that have previously been determined to have violated NAAQS standards for at least one of six pollutants identified by US-EPA in the past 20 years. The RTP's AQCD finds that the CLMPO area meets all federal clean air standards. PM_{10} levels remain low, below the limited maintenance plan threshold; the area is in compliance for ozone, $PM_{2.5}$, and carbon monoxide. As required, the AQCD identifies projects on the RTP's constrained list that will require hot spot analysis during project development.

Transportation modes that rely on fossil fuels are also a major source of greenhouse gas (GHG) emissions. The CLMPO's *2010 GHG Inventory for the Eugene-Springfield Metropolitan Area* concluded that the region is responsible for an estimated 3.2 million metric tons of GHG emissions per year, 31% of which is caused by transportation. Transportation's role in climate change, as well as the risks climate change poses to transportation infrastructure, are explored in more detail in RTP Appendix C.

ANALYSIS

The majority of 2045 constrained RTP projects (99%) fall within the Air Quality Maintenance Area for PM_{10}, which comprises the Urban Growth Boundaries of Eugene and Springfield (Map 8).

Map 8. Air Quality Maintenance Area



Air Quality Maintenance Area

- Urban Growth Boundaries
- MPO Area Boundary
- Water Area
- Bus Rapid Transit
- Constrained RTP Projects
- Constrained RTP Projects
- Highways
- Arterial Roads
- Air Quality Maintenance Area

CENTRAL LANE MPO LCOG

This map was created by the Lane Council of Governments (LCOG) GIS Services for the 2045 Regional Transportation Plan. The information on this map was derived from digital databases on LCOG's regional geographic information system. Care was taken in the creation of this map, but it is provided as 'as is'. LCOG cannot accept any responsibility for errors, omissions, or positional accuracy in the digital data or the underlying records. There are no warranties, expressed or implied, accompanying this product. However, notification of any errors will be appreciated.

AIR QUALITY MITIGATION STRATEGIES

Air Quality Mitigation Strategies
Utilize the Avoid, Minimize, Mitigate framework to reduce environmental impacts of transportation projects
Restore all land and water features to their pre-construction condition
Use green infrastructure and low impact development approaches that encourage absorption of stormwater at the source[11]
Plan and implement projects strategically to reduce habitat fragmentation and maintain wildlife travel routes and fish passage
Restore all fish and wildlife habitat to pre-construction condition, including temporarily disturbed vegetation; enhance where possible
Screen sensitive habitats from visual and noise impacts of transportation facilities
Use native trees and plants when replanting or adding vegetation
Preserve and maintain existing trees and tree canopy coverage; plant trees, where appropriate, to maximize tree canopy coverage
Build walkable communities and job centers
Support state efforts to advance cleaner, more fuel-efficient vehicles, including low- and zero-emission vehicles
Implement policies and investments that support increased use of transit, walking, and biking
Improve multimodal network connectivity that promotes biking and walking connections to transit, jobs, and community spaces
Expand the use of parking management and transportation options programs to encourage active transportation
Invest in projects that smooth traffic flow and reduce congestion and idling

Water Resources

BACKGROUND

The transportation system—including paved streets and sidewalks, parking lots, and driveways—creates a vast network of impervious surfaces in the urban landscape. Urban stormwater runoff from impervious surfaces can carry heavy metals and petroleum products directly into nearby streams and waterways, impairing surface and groundwater quality and damaging sensitive aquatic ecosystems. Stormwater systems in the CLMPO area convey water from streets and properties via a system of catch basins, pipes, ditches, and waterways that drain directly into the Willamette River and its tributaries, such as Amazon Creek in Eugene and the McKenzie River in Springfield.[12] Water resources considered in

[11] *Green infrastructure* is the range of measures that use plant or soil systems, permeable pavement or other permeable surfaces or substrates, stormwater harvest and reuse, or landscaping to store, infiltrate, or evapotranspirate stormwater and reduce flows to sewer systems or to surface waters. *Low impact development* refers to systems and practices that use or mimic natural processes that result in the infiltration, evapotranspiration, or use of stormwater in order to protect water quality and associated aquatic habitat.

[12] The Federal Clean Water Act of 1972 prohibits any release of pollutants into waters of the United States without a National Pollutant Discharge Elimination System (NPDES) Permit, which regulates the amount of certain pollutants permissible in a discharge. Large- and medium-sized cities with municipal separate stormwater sewer

this analysis include 303(d) impaired and threatened waters, the Southern Willamette Groundwater Management Area (GWMA), and wetland areas.

303(d) Impaired and Threatened Waters

The Clean Water Act (CWA) of 1972 established the 303(d) list as a way to categorize and track the nation's impaired waterbodies. Waterbodies that exceed protective water quality standards are identified as impaired and are added to the 303(d) list. Identifying a waterbody as impaired initiates the prioritization and development of a Total Maximum Daily Load (TMDL), which is the calculation of the maximum amount of a pollutant allowed to enter a waterbody so that the waterbody meets water quality standards for that particular pollutant. The CWA requires the State of Oregon to report on the quality of its surface waters every two years. Streams with a listing status of Category 5 are included in the GIS analysis.

Southern Willamette Groundwater Management Area

The groundwater in the Willamette Valley between Eugene and Albany shows signs of contamination from human activity. On May 10, 2004, the Oregon Department of Environmental Quality (DEQ) declared the area a GWMA due to high concentrations of nitrate in the water. Oregon law requires DEQ to declare a GWMA when nitrate contamination in the groundwater is above 1.0 milligrams per liter (mg/L) and the suspected sources are not facilities with permits, such as landfills or incinerators.

Wetlands

The National Wetlands Inventory is a publicly available resource managed by the US Fish and Wildlife Service. It provides detailed information on the abundance, characteristics, and distribution of US wetlands. In Oregon, jurisdictions are required to produce Local Wetlands Inventories pursuant to Statewide Planning Goal 5 (Natural Resources, Scenic and Historic Areas, and Open Spaces), which requires local governments to determine the locations, type, and functional capacity of wetlands. The Statewide Wetlands Inventory includes the National Wetlands Inventory and subsets of other key federal datasets to flag areas with greater likelihood of containing unmapped wetlands or waterways. The national, state, and local wetlands inventories are combined into a single wetlands layer for the GIS analysis.

When avoiding or minimizing impacts to wetland areas is not possible, mitigation banks are used to offset such necessary and unavoidable impacts. A mitigation bank is a wetland, stream, or other aquatic resource area that has been restored, established, enhanced, or (in certain circumstances) preserved for the purpose of providing compensation for unavoidable impacts to aquatic resources permitted under Section 404 of the Clean Water Act of 1972 or a similar state or local wetland regulation. A mitigation bank may be created when a government agency, corporation, nonprofit organization, or other entity

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systems (MS4s) that discharge untreated stormwater into local waterbodies—including Eugene and Springfield—are required to obtain NPDES Permits.

undertakes these activities under a formal agreement with a regulatory agency. For mitigation project locations serving multiple transportation projects, responsible agencies should consult with Oregon Department of State Lands Mitigation Specialists for appropriate mitigation planning. Mitigation banks may also be considered as a means to improve water quality or protect from flood hazards, for example by providing additional flood storage. Mitigation banks are evaluated for how they serve regional needs on an ongoing basis.[13] Existing mitigation banks serving the CLMPO area, including service area maps and contact information, can be found at https://www.oregon.gov/dsl/WW/Pages/MitigationMap.aspx.

ANALYSIS

Table 7 shows the number of 2045 constrained RTP projects with a 100-foot buffer by type that intersect with 303d listed streams, the Southern Willamette GWMA, and wetlands. Thirty-two projects (13%) potentially impact 303d listed streams, and 141 projects (57%) potentially impact wetlands. Only one project intersects with the GWMA. Map 9 shows the locations of RTP projects in relation to these three sensitive water resources. The largest concentration of wetlands is located in West Eugene, outside of the urban core. RTP projects should consider both natural watershed boundaries and built infrastructure to minimize the impact to the quality of local water resources. The Oregon Watershed Enhancement Board provides interactive online maps on its website, including Watershed Councils and Legislative Districts (https://www.oregon.gov/oweb/data-reporting/Pages/maps-data.aspx).

At the time of project-level planning, the responsible agency will also need to coordinate and consult with the United States Army Corps of Engineers (USACE) regarding USACE jurisdiction and authority for specific projects in this RTP. USACE will evaluate individual projects pursuant to Section 404 of the CWA and Section 10 of the Rivers and Harbors Act of 1899 to determine whether a project may be subject to Department of the Army permits or other special permissions, typically required for:

- Construction of structures or work performed in or affecting navigable waters of the U.S. portions of the Willamette River and McKenzie River within Lane County;[14]
- Discharge of dredged or fill material into waters of the U.S., including wetlands;[15]
- Alteration, occupation, or use of a Corps federally authorized project, several of which are present in the CLMPO area;[16] and
- Impact to any real estate interest held by the Corps.[17]

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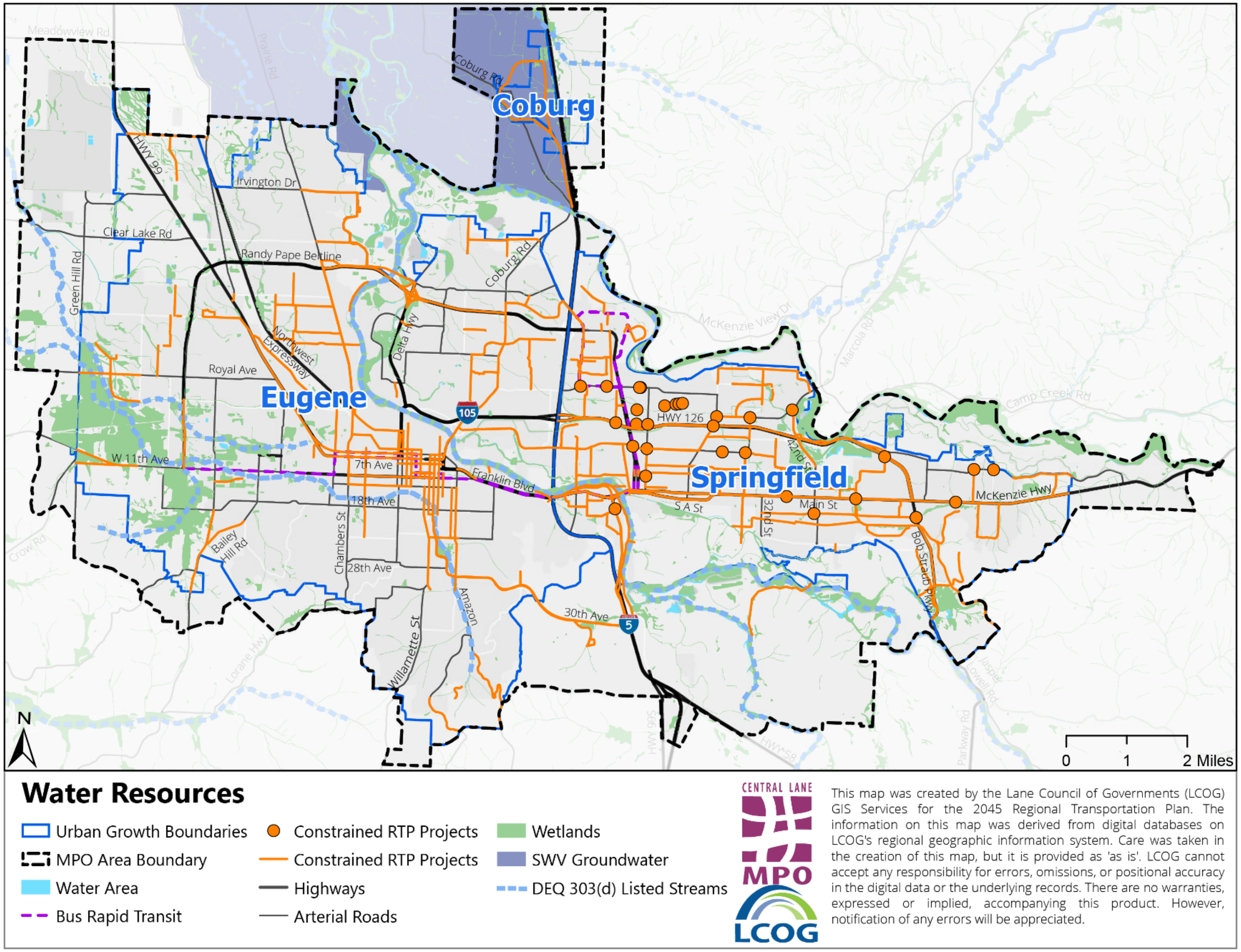
[13] https://www.oregon.gov/dsl/WW/Pages/Mitigation.aspx
[14] Per Section 10 of the Rivers and Harbors Act of 1899.
[15] Per Section 404 of the Clean Water Act.
[16] Per Section 14 of the Rivers and Harbors Act of 1899, codified in 33 U.S.C. § 408 (referred to as "Section 408"). Additional information can be found at: https://www.nwp.usace.army.mil/408/.
[17] More information on the Corps' Real Estate Office is available at: https://www.nwp.usace.army.mil/Library/Aerial-photos/.

Table 7. 2045 Constrained RTP Projects and Water Resources

Project Category	*Project Type*	*303d Streams*	*GWMA*	*Wetlands*
Auto	Added Freeway Lanes or Major Interchange Improvements	1	0	2
	Arterial Capacity Improvements	0	0	7
	New Arterial Link or Interchange	1	0	1
	New Collectors	0	0	14
	Study	5	0	9
	Transit Oriented Development Implementation	0	0	0
	Urban Standards	1	0	19
Transit	Frequent Transit Network	20	1	30
	Stations	0	0	4
Bike/Ped	Multi-Use Paths without Road Project	2	1	19
	Multi-Use Paths with Road Project	0	0	0
	On-Street Lanes or Routes with Road Project	0	0	8
	On-Street Lanes or Routes without Road Project	2	0	28
	TOTAL	32	2	141
	PERCENT OF ALL CONSTRAINED PROJECTS	13%	1%	57%

Map 9. Water Resources



WATER QUALITY MITIGATION STRATEGIES

Water Quality Mitigation Strategies
Utilize the Avoid, Minimize, Mitigate framework to reduce environmental impacts of transportation projects
Design streets to minimize impacts to stream corridors (e.g. by allowing narrow street rights-of-way)
Restore or rehabilitate wetlands and waterways damaged by transportation projects
Purchase wetland credit acres from an existing wetland mitigation bank within the same watershed
Design transportation facilities to avoid or minimize the footprint of new impervious surfaces
Build in and maintain effective drainage systems, including ditches, culverts, and catch basins
Restore all land and water features to their pre-construction condition
Use green infrastructure and low impact development approaches that encourage absorption of stormwater at the source
Properly direct, collect, and convey stormwater runoff to reduce the volume and velocity of surface water runoff
Prevent sedimentation and erosion to the greatest extent possible; limit the amount of exposed soil
Stabilize steep slopes
Install silt fencing, sediment barriers, and other best management practices to secure the project area and prevent erosion
Plan and implement projects strategically to reduce habitat fragmentation and maintain wildlife travel routes and fish passage
Restore all fish and wildlife habitat to pre-construction condition, including temporarily disturbed vegetation; enhance where possible
Screen sensitive habitats from visual and noise impacts of transportation facilities
Use native trees and plants when replanting or adding vegetation
Preserve and maintain existing trees and tree canopy coverage; plant trees, where appropriate, to maximize tree canopy coverage
Build walkable communities and job centers
Support state efforts to advance cleaner, more fuel-efficient vehicles, including low- and zero-emission vehicles
Implement policies and investments that support increased use of transit, walking, and biking
Improve multimodal network connectivity that promotes biking and walking connections to transit, jobs, and community spaces
Expand the use of parking management and transportation options programs to encourage active transportation
Invest in projects that smooth traffic flow and reduce congestion and idling
Stabilize roads, crossings, and other sources of sediment delivery
Utilize stormwater management best practices established in local stormwater plans

Sensitive Habitats

BACKGROUND

In addition to impairing air and water quality and actively altering the climate on which sensitive ecosystems depend, the transportation system threatens biodiversity by contributing to habitat fragmentation, generating noise and light pollution, and bringing vehicles and wildlife into direct conflict. Urban development directly disturbs ecosystems, which can lead to the proliferation of invasive species. Transportation corridors can disrupt the connectivity of forests, grasslands, and waterways that provide critical habitat for wildlife, which can alter food systems, increase temperatures, change interactions among species, and act as barriers to wildlife movement. Habitat fragmentation is particularly detrimental to larger species with greater ranges. In addition to reducing the amount of contiguous habitat, noise and light pollution generated by the transportation system have deleterious effects on both wildlife and human health. Finally, motor vehicles cause a large number of animal fatalities. An estimated one million vertebrates are struck and killed daily on the nation's roads.[18] These accidents pose a significant safety threat to drivers.

The sensitive habitats considered in this analysis include Conservation Opportunity Areas (COAs) and United States Fish and Wildlife Service (USFWS) Critical Habitat. The *Oregon Conservation Strategy* is an overarching state strategy for conserving fish and wildlife that provides a shared set of priorities for addressing Oregon's conservation needs. COAs are places identified in the Strategy where broad fish and wildlife conservation goals would be best met. They were developed to guide voluntary conservation actions in Oregon. The USFWS Critical Habitat spatial data includes critical habitat for species listed as Threatened and Endangered.

ANALYSIS

Table 8 shows the number of 2045 constrained RTP projects with a 100-foot buffer by type that intersect with COAs and USFWS Critical Habitats. Nine projects (4%) potentially impact USFWS Critical Habitat, and 124 projects (50%) potentially impact COAs. Map 10 shows the locations of RTP projects in relation to COAs and critical habitats. There are three threatened and endangered species in the CLMPO area, including the Fender's blue butterfly, Kincaid's lupine, and Willamette daisy. Critical habitats for these protected species are primarily located in the West Eugene area. There are five COAs in the CLMPO region:

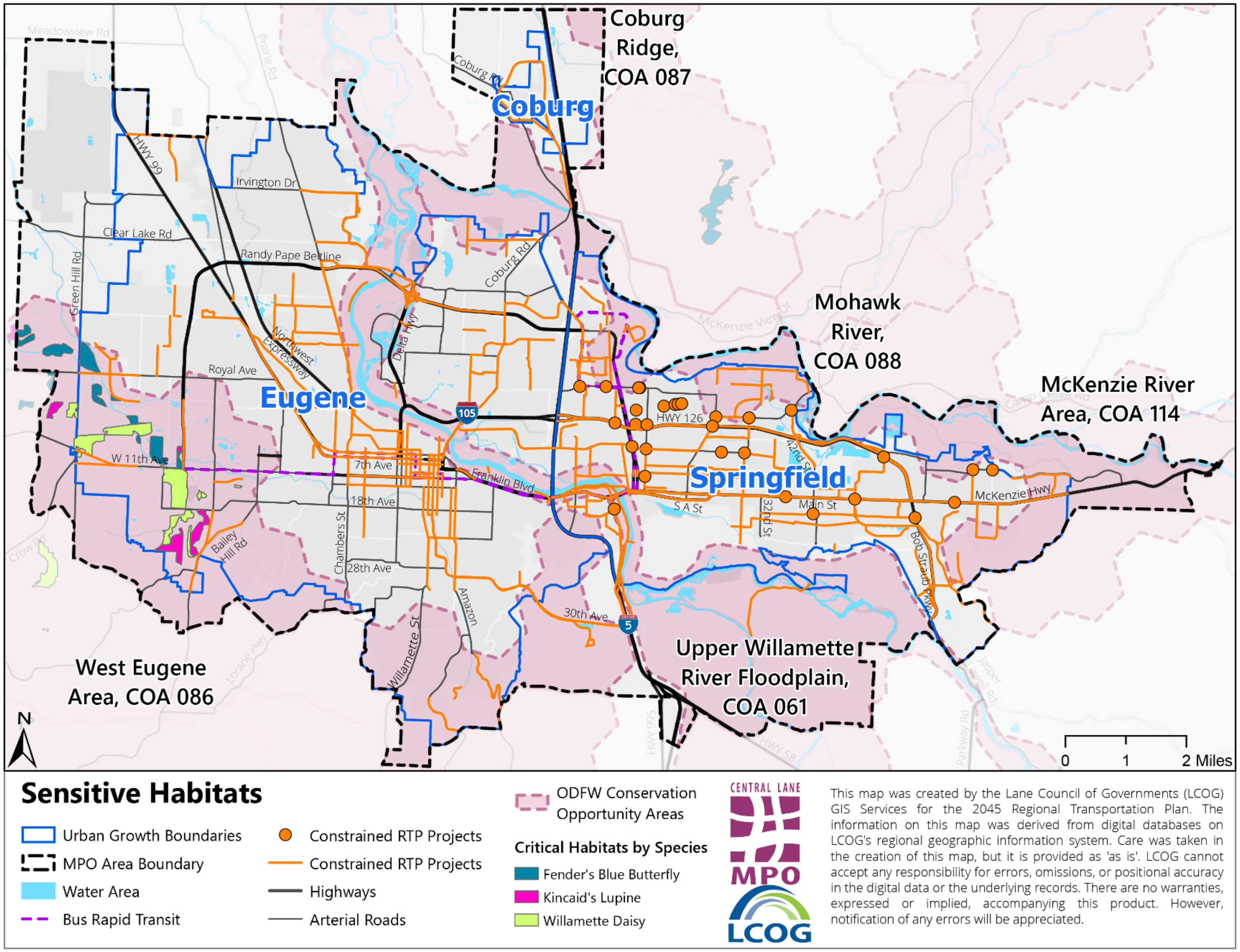
1. West Eugene Area, COA 086
2. Upper Willamette River Floodplain, COA 061
3. McKenzie River Area, COA 114
4. Coburg Ridge, COA 087
5. Mohawk River, COA 088

[18] Goldfarb, *How Roadkill Became an Environmental Disaster.*

Table 8. 2045 Constrained RTP Projects and Sensitive Habitat

Project Category	*Project Type*	*Conservation Opportunity Areas*	*USFWS Critical Habitat*
Auto	Added Freeway Lanes or Major Interchange Improvements	2	1
	Arterial Capacity Improvements	6	1
	New Arterial Link or Interchange	1	0
	New Collectors	15	1
	Study	7	0
	Transit Oriented Development Implementation	0	0
	Urban Standards	21	2
Transit	Frequent Transit Network	29	3
	Stations	3	0
Bike/Ped	Multi-Use Paths without Road Project	15	0
	Multi-Use Paths with Road Project	0	0
	On-Street Lanes or Routes with Road Project	3	1
	On-Street Lanes or Routes without Road Project	22	0
	TOTAL	124	9
	PERCENT OF ALL CONSTRAINED PROJECTS	50%	4%

Map 10. Sensitive Habitats



SENSITIVE HABITAT MITIGATION STRATEGIES

Sensitive Habitat Mitigation Strategies
Utilize the Avoid, Minimize, Mitigate framework to reduce environmental impacts of transportation projects
Design streets to minimize impacts to stream corridors (e.g. by allowing narrow street rights-of-way)
Restore or rehabilitate wetlands and waterways damaged by transportation projects
Purchase wetland credit acres from an existing wetland mitigation bank within the same watershed
Limit in-water construction to designated fisheries windows
Limit fill within floodplains and reduce alterations to floodplain functions
Design transportation facilities to avoid or minimize the footprint of new impervious surfaces
Build in and maintain effective drainage systems, including ditches, culverts, and catch basins
Restore all land and water features to their pre-construction condition
Use green infrastructure and low impact development approaches that encourage absorption of stormwater at the source
Properly direct, collect, and convey stormwater runoff to reduce the volume and velocity of surface water runoff
Prevent sedimentation and erosion to the greatest extent possible; limit the amount of exposed soil
Install silt fencing, sediment barriers, and other best management practices to secure the project area and prevent erosion
Plan and implement projects strategically to reduce habitat fragmentation and maintain wildlife travel routes and fish passage
Restore all fish and wildlife habitat to pre-construction condition, including temporarily disturbed vegetation; enhance where possible
Screen sensitive habitats from visual and noise impacts of transportation facilities
Include wildlife crossing structures[19] that increase permeability and habitat connectivity across transportation infrastructure
Carefully integrate fencing to guide wildlife toward safe crossings under, over, or around transportation infrastructure
Use native trees and plants when replanting or adding vegetation
Minimize light pollution from transportation facilities by following dark sky best practices
Preserve and maintain existing trees and tree canopy coverage; plant trees, where appropriate, to maximize tree canopy coverage
Where possible, preserve existing wildlife corridors connecting critical habitats
Reduce vehicle speeds through critical habitat areas
Install wildlife warning signs
Implement measures to reduce invasive species from entering the area on cars, trucks, boats, boat trailers, or other vehicles
Build walkable communities and job centers
Support state efforts to advance cleaner, more fuel-efficient vehicles, including low- and zero-emission vehicles
Implement policies and investments that support increased use of transit, walking, and biking
Improve multimodal network connectivity that promotes biking and walking connections to transit, jobs, and community spaces

[19] Examples of wildlife crossing structures may include tunnels, viaducts, overpasses, amphibian tunnels, and culverts.

Sensitive Habitat Mitigation Strategies
Expand the use of parking management and transportation options programs to encourage active transportation
Invest in projects that smooth traffic flow and reduce congestion and idling
Stabilize roads, crossings, and other sources of sediment delivery
Minimize crossings through sensitive resource areas
Utilize stormwater management best practices established in local stormwater plans

Natural Hazards

BACKGROUND

The CLMPO transportation system is vulnerable to numerous natural hazards, including stormwater, climate change, earthquakes, drought, extreme weather, geomagnetic disturbance, landslides, riverine flooding, volcanoes, and "non-natural" hazards, including pandemics and terrorism. Though the primary purpose of this analysis is to help identify where transportation projects may negatively impact environmental and cultural resources, the natural environment can also pose risks to transportation infrastructure and human safety that should be considered as projects are developed. This section compares the 2045 RTP constrained list of projects with flood and seismic hazard areas to identify potential conflicts that could undermine the resilience of the transportation system. As with the environmental impacts, this analysis results in a high-level flagging of projects. The new Federal Planning Factor 9, added in 2016 with the passage of the FAST Act, directs MPOs to consider how they will "improve the resiliency and reliability of the transportation system." RTP Appendix C further explores natural hazards and the concept of resilience as it relates to the transportation system in the CLMPO area.

Flooding

Two primary flood-related threats to transportation infrastructure include riverine flooding and stormwater. Lane County has more river miles of floodplain than any other county in the State of Oregon, and much of the CLMPO area is at risk of flooding.[20] According to the Federal Emergency Management Agency (FEMA), flooding is the most common natural disaster.[21] The CLMPO area is protected by several upstream flood control dams on both the McKenzie and Willamette Rivers, and Springfield is protected from the McKenzie River by the 42nd Street Levee.[22] These flood control

[20] Lane County Website, *Floodplain Information.*
[21] The Pew Charitable Trust, *Repeatedly Flooded Properties.*
[22] According to the Eugene-Springfield Multi-Jurisdictional Natural Hazards Mitigation Plan, the 42nd Street levee must be recertified as structurally adequate to maintain its accreditation: "Areas protected by flood control levees, such as Springfield's 42nd Street Levee, were originally mapped as being protected from the 100-year flood incident. However, in response to numerous levee failures during Hurricane Katrina, levees now must also be certified as being structurally adequate to retain their accreditation as flood control structures. If the City of Springfield is unable to obtain certification for the 42nd Street Levee, the next update of the flood control maps for the section of the McKenzie River paralleled by the levee may be prepared as if the levee was not in place. This would greatly increase the area of the City within the mapped 100-year floodplain" (2-36).

structures, built in the 1940s through the 1960s, significantly reduced the risk of riverine flooding from larger rivers and tributaries. However, they do not protect against smaller streams, which still pose a flood risk to the area.

Effective stormwater management is also critical for mitigating issues related to both water quantity and quality. Excess stormwater during a heavy rain event can collect in lower-lying areas and, without sufficient pervious ground to absorb it, can cause flooding that poses a direct risk to human life and property. Inundation and washouts from heavy rainfall can block roads, damage assets, and interrupt utilities, while debris buildup can block drainage systems, which further contributes to flooding. Flooding can cause long-term damage to infrastructure through scour and erosion. Street flooding can also cause damage to property, and, in extreme cases, flash flooding can be life threatening. Potential flood risk to RTP projects that intersect with FEMA floodplains should be given special consideration.

The 100-year FEMA floodplain has a 1% annual chance of flooding and a 26% chance of flooding over the life of a 30-year mortgage. A floodplain consists of the floodway and floodway fringe. A floodway is the primary conveyance area of a channel's cross-section that is the natural conduit for flood waters; it must remain open in order to allow flood waters to pass. The flood fringe are lands outside the floodway within the floodplain that store but do not effectively convey floodwaters.

Seismic Hazard

There is a clear and imminent threat from seismic activity along the Cascadia Subduction Zone (CSZ), a 620-mile fault that runs along the coast from Northern California to Southern British Columbia. According to the Eugene-Springfield Area Multi-Jurisdictional Natural Hazard Mitigation Plan, the odds of a powerful CSZ earthquake with magnitude 8.0 or greater in the next 50 years are roughly one in three. Such an earthquake will cause several minutes of severe ground shaking, large tsunamis, and widespread damage. Without additional investment in seismic resilience, Oregon can expect severe damage to buildings and lifelines that would result in massive loss of life and long-term disruption to the economy.

Transportation infrastructure is extremely vulnerable to ground failure caused by shaking, landslides, and liquefaction. Much of the local road network would be subject to serious damage, but in some cases local roads and streets could provide redundancy for the state highway lifelines. Immediately following a CSZ event, local roads and streets may also provide the only access to critical facilities like hospitals, fire stations, and temporary food and housing. Special consideration for seismic resilience is important for transportation infrastructure that intersects areas at high risk from seismic hazards. This analysis combines three seismic risk factors into a single data layer:

1. Liquefaction susceptibility – Liquefaction takes place when loosely packed, water-logged sediments at or near the ground surface lose their strength due to strong ground shaking.
2. Landslide susceptibility – Landslides are the downslope movement of rock, soil, or related debris. The majority of landslides in the northwest are due to continuous rains that saturate soils, but they can also be triggered by earthquakes.
3. Probability of damaging shaking – This is a measure of the probability over the next 50 years of experiencing shaking strong enough to damage weak buildings.

Emergency Transportation Routes

Transportation networks can play a key role in response and recovery immediately following a natural disaster. Emergency Transportation Routes (ETRs) are priority routes targeted for rapid assessment and debris removal during an emergency to facilitate lifesaving and life-sustaining response activities. There are four types of ETRs:

Local Emergency Response Streets are a network of streets in a single jurisdiction that facilitate ordinary fire, police, and medical emergencies.

Local ETRs are pre-designated routes used during a large-scale event in the initial response phase and early recovery to transport first responders, fuel, supplies, and patients. Local ETRs connect regional nodes to destinations of local importance (e.g. staging areas, essential infrastructure, and intermodal transfer points) and add redundancy to Statewide Lifeline Routes.

Regional ETRs are pre-designated routes that move first responders and supplies across jurisdictional boundaries among regional nodes and connect population centers, critical infrastructure, and services of regional importance. Regional ETRs also connect Statewide Lifeline Routes and local ETRs.

Statewide Lifeline Routes are state-owned roadways identified by ODOT as critical to emergency response and recovery activity. Lifeline Routes connect regions of statewide importance via a few key north-south and east-west routes.

The CLMPO's Intelligent Transportation Systems (ITS) Plan establishes a need for identification of key emergency evacuation routes that are consistent across jurisdictions in the MPO area and identifies route planning for emergencies as a strategy to address incident, emergency, and event management. Based upon the findings of this report, the RTP constrained project list contains a project to develop an ETR Plan for the Central Lane region.

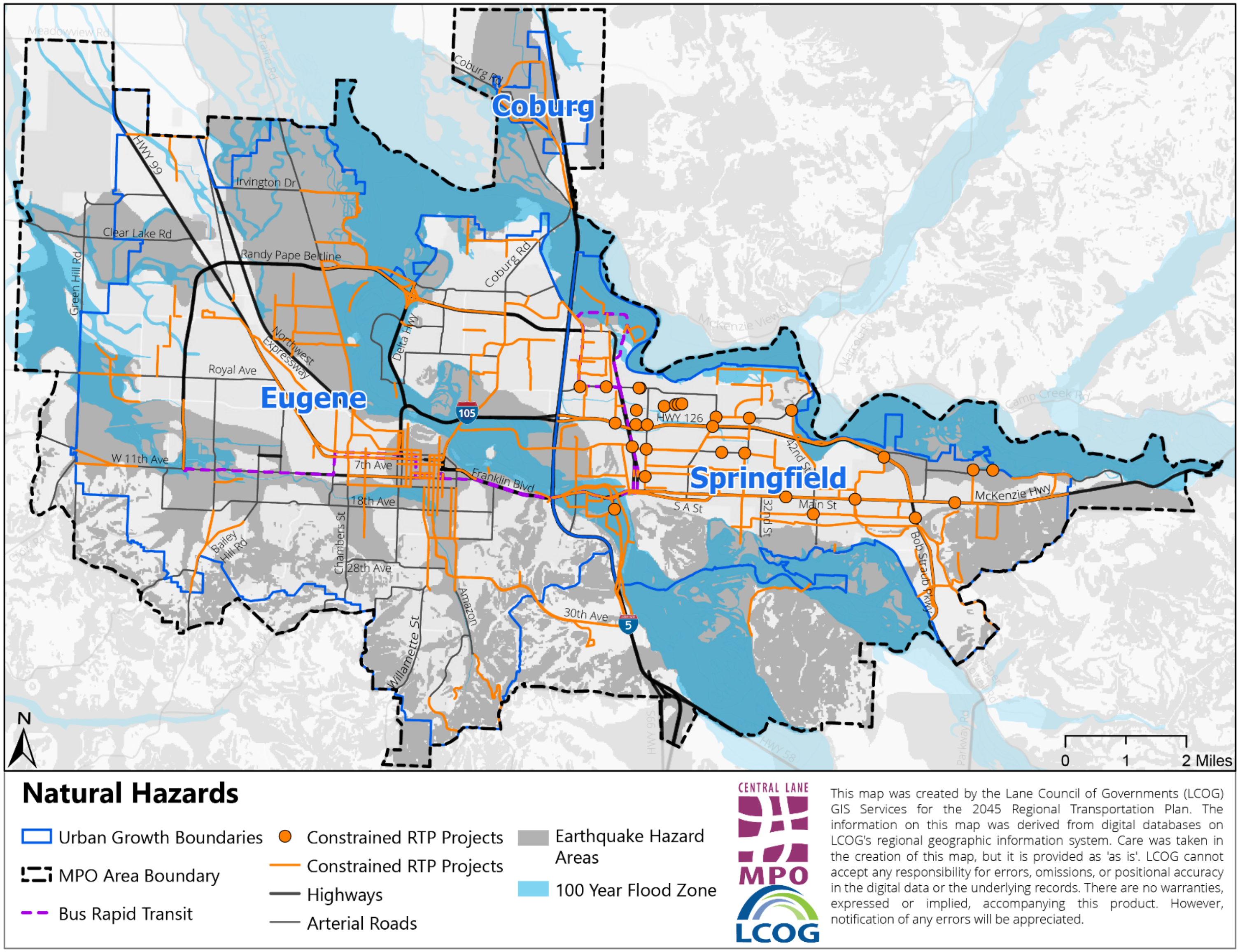
ANALYSIS

Table 9 shows the number of 2045 constrained RTP projects with a 100-foot buffer by type that intersect with FEMA Flood Hazard Zones and seismic hazard zones. One hundred seventeen projects (47%) fall within FEMA Flood Hazard areas and 156 projects (63%) are potentially vulnerable to seismic activity. Map 11 shows the locations of RTP projects in relation to FEMA Flood Zones and seismic hazards. Projects in these zones should incorporate best practices to mitigate potential risks to life and infrastructure.

Table 9. 2045 Constrained RTP Projects and Natural Hazards

Project Category	*Project Type*	*FEMA Flood Hazard*	*Seismic Zones*
Auto	Added Freeway Lanes or Major Interchange Improvements	2	2
	Arterial Capacity Improvements	7	9
	New Arterial Link or Interchange	1	1
	New Collectors	13	14
	Study	6	9
	Transit Oriented Development Implementation	0	1
	Urban Standards	19	21
Transit	Frequent Transit Network	29	29
	Stations	1	7
Bike/Ped	Multi-Use Paths without Road Project	12	21
	Multi-Use Paths with Road Project	0	0
	On-Street Lanes or Routes with Road Project	5	6
	On-Street Lanes or Routes without Road Project	22	35
	TOTAL	117	155
	PERCENT OF ALL CONSTRAINED PROJECTS	47%	63%

Map 11. Natural Hazards



NATURAL HAZARDS MITIGATION STRATEGIES

Natural Hazards Mitigation Strategies
Utilize the Avoid, Minimize, Mitigate framework to reduce environmental impacts of transportation projects
Restore or rehabilitate wetlands and waterways damaged by transportation projects
Purchase wetland credit acres from an existing wetland mitigation bank within the same watershed
Limit fill within floodplains and reduce alterations to floodplain functions
Design transportation facilities to avoid or minimize the footprint of new impervious surfaces
Build in and maintain effective drainage systems, including ditches, culverts, and catch basins
Restore all land and water features to their pre-construction condition
Use green infrastructure and low impact development approaches that encourage absorption of stormwater at the source
Properly direct, collect, and convey stormwater runoff to reduce the volume and velocity of surface water runoff
Prevent sedimentation and erosion to the greatest extent possible; limit the amount of exposed soil
Stabilize steep slopes
Install silt fencing, sediment barriers, and other best management practices to secure the project area and prevent erosion
Plan and implement projects strategically to reduce habitat fragmentation and maintain wildlife travel routes and fish passage
Restore all fish and wildlife habitat to pre-construction condition, including temporarily disturbed vegetation; enhance where possible
Use native trees and plants when replanting or adding vegetation
Preserve and maintain existing trees and tree canopy coverage; plant trees, where appropriate, to maximize tree canopy coverage
Build walkable communities and job centers
Support state efforts to advance cleaner, more fuel-efficient vehicles, including low- and zero-emission vehicles
Implement policies and investments that support increased use of transit, walking, and biking
Improve multimodal network connectivity that promotes biking and walking connections to transit, jobs, and community spaces
Expand the use of parking management and transportation options programs to encourage active transportation
Invest in projects that smooth traffic flow and reduce congestion and idling
Minimize crossings through sensitive resource areas
Design transportation facilities to withstand the effects of a CSZ earthquake, including ground shaking, liquefaction, and landslides
Identify key emergency evacuation routes that are consistent across jurisdictions

Summary of RTP Impacts to Environmental Analysis Areas

Table 10 provides a summary of the intersection of 2045 constrained RTP projects with the six areas of environmental analysis discussed in this report. Nearly all projects intersect with the Air Quality category because the maintenance area boundary for PM_{10} encompasses the UGBs of Eugene and Springfield, which comprise the majority of the MPO area. After Air Quality, the environmental areas of analysis with the highest number of RTP projects that intersect are: Hazard Mitigation (69% of projects), Water Resources (60%), Environmental Justice (53%), and Sensitive Habitat (50%). Though these projects are not guaranteed to have a negative impact on environmental resources and may even provide a benefit (e.g. multi-use paths and on-street lanes may increase access to bicycle and pedestrian infrastructure for Title VI communities, and they may have an overall air quality benefit by encouraging active modes of transportation), special attention should be given during the development of these projects to identify strategies to mitigate any potential negative impacts.

Table 10. Summary of 2045 RTP Projects and Environmental Analysis Areas

Project Category	*Project Type*	*EJ**	*Cultural Resources*	*Air Quality*	*Water Resources*	*Sensitive Habitat*	*Hazard Mitigation*
Auto	Added Freeway Lanes or Major Interchange Improvements	2	0	3	2	2	2
	Arterial Capacity Improvements	12	0	22	8	6	10
	New Arterial Link or Interchange	0	0	1	1	1	1
	New Collectors	6	0	26	15	15	16
	Study	13	4	15	10	7	9
	Transit Oriented Development Implementation	1	1	1	0	0	1
	Urban Standards	11	1	37	20	21	25
Transit	Frequent Transit Network	30	26	31	31	29	31
	Stations	5	1	10	4	3	7
Bike/Ped	Multi-Use Paths Without Road Project	10	1	24	19	15	21
	Multi-Use Paths With Road Project	0	0	0	0	0	0
	On-Street Lanes or Routes With Road Project	7	1	14	8	3	7
	On-Street Lanes or Routes Without Road Project	35	11	60	31	22	40
	TOTAL	**132**	**46**	**244**	**149**	**124**	**170**
	PERCENT OF ALL CONSTRAINED PROJECTS	**53%**	**19%**	**99%**	**60%**	**50%**	**69%**

**EJ = Environmental Justice*

Summary of Potential Mitigation Strategies

Table 11 presents a summary list of all potential mitigation strategies discussed in this report and the areas of environmental analysis each strategy may help address. This list is not exhaustive but may be used as a resource by responsible agencies during project planning and development to address potential impacts of transportation projects flagged through this environmental analysis or identified through the environmental and land use review, consultation, and permitting processes required of all construction projects.

Table 11. Summary of Potential Mitigation Strategies

Mitigation Strategies	Environmental Justice	Cultural Resources	Air Quality	Water Resources	Sensitive Habitats	Natural Hazards
Utilize the Avoid, Minimize, Mitigate framework to reduce environmental impacts of transportation projects						
Design streets to minimize impacts to stream corridors (e.g. by allowing narrow street rights-of-way)						
Restore or rehabilitate wetlands and waterways damaged by transportation projects						
Purchase wetland credit acres from an existing wetland mitigation bank within the same watershed						
Limit in-water construction to designated fisheries windows						
Limit fill within floodplains and reduce alterations to floodplain functions						
Design transportation facilities to avoid or minimize the footprint of new impervious surfaces						
Build in and maintain effective drainage systems, including ditches, culverts, and catch basins						
Restore all land and water features to their pre-construction condition						
Use green infrastructure and low impact development approaches that encourage absorption of stormwater at the source						
Properly direct, collect, and convey stormwater runoff to reduce the volume and velocity of surface water runoff						
Prevent sedimentation and erosion to the greatest extent possible; limit the amount of exposed soil						
Stabilize steep slopes						
Install silt fencing, sediment barriers, and other best management practices to secure the project area and prevent erosion						
Plan and implement projects strategically to reduce habitat fragmentation and maintain wildlife travel routes and fish passage						
Restore all fish and wildlife habitat to pre-construction condition, including temporarily disturbed vegetation; enhance where possible						
Screen sensitive habitats from visual and noise impacts of transportation facilities						

Mitigation Strategies	Environmental Justice	Cultural Resources	Air Quality	Water Resources	Sensitive Habitats	Natural Hazards
Include wildlife crossing structures that increase permeability and habitat connectivity across transportation infrastructure						
Carefully integrate fencing to guide wildlife toward safe crossings under, over, or around transportation infrastructure						
Use native trees and plants when replanting or adding vegetation						
Minimize light pollution from transportation facilities by following dark sky best practices						
Preserve and maintain existing trees and tree canopy coverage; plant trees, where appropriate, to maximize tree canopy coverage						
Where possible, preserve existing wildlife corridors connecting critical habitats						
Reduce vehicle speeds through critical habitat areas						
Install wildlife warning signs						
Implement measures to reduce invasive species from entering the area on cars, trucks, boats, boat trailers, or other vehicles						
Document historic assets and use context-sensitive design to complement existing streetscape or architectural features						
Consult with tribes if there is potential to impact tribal lands or Native American legacy sites						
Build walkable communities and job centers						
Support state efforts to advance cleaner, more fuel-efficient vehicles, including low- and zero-emission vehicles						
Implement policies and investments that support increased use of transit, walking, and biking						
Improve multimodal network connectivity that promotes biking and walking connections to transit, jobs, and community spaces						
Expand the use of parking management and transportation options programs to encourage active transportation						
Invest in projects that smooth traffic flow and reduce congestion and idling						
Include historically excluded populations in decision making						

Mitigation Strategies	Environmental Justice	Cultural Resources	Air Quality	Water Resources	Sensitive Habitats	Natural Hazards
Support mixed use development and land use policies that limit sprawl and reduce the need for single occupancy automobile travel						
Preserve and document cultural assets						
Design new or renovated infrastructure to be context-sensitive; complement existing streetscape or architectural features						
Stabilize roads, crossings, and other sources of sediment delivery						
Minimize crossings through sensitive resource areas						
Design transportation facilities to withstand the effects of a CSZ earthquake, including ground shaking, liquefaction, and landslides						
Utilize stormwater management best practices established in local stormwater plans						
Identify key emergency evacuation routes that are consistent across jurisdictions						

Air Quality
Conformity Determination

2045
Regional Transportation Plan

Adopted January 6, 2022

This report was financed in part by the Oregon Department of Transportation, the Federal Highway Administration, and the Federal Transit Administration.

<<Insert Governor Approval>>

<<Insert USDOT Approval>>

<<Insert MPC Resolution>>

Synopsis

An air quality conformity determination (AQCD) for a transportation plan or program is a finding that proposed transportation activities will not impede this area from continuing to meet air quality standards and will not cause or contribute to new air quality violations. The report is required in areas that have previously been determined to have violated standards for at least one of six pollutants identified by US-EPA. In the Eugene-Springfield area, that pollutant is coarse particulate matter (PM_{10}).

Why are we producing this document?

In December 2021, the Central Lane Metropolitan Planning Organization (CLMPO) (composed of the local transportation agencies of Eugene, Springfield, Coburg, and Lane County, Lane Transit District, and Oregon Department of Transportation (ODOT)) is scheduled to begin implementation of a new Regional Transportation Plan (RTP) upon its adoption at the December 2, 2021 Metropolitan Planning Committee (MPC) meeting. Within this program are projects that generally have regional significance and/or are anticipated to use federal funds.

In areas that have been designated as nonattainment for National Ambient Air Quality Standards (NAAQS), including those that were redesignated to attainment in the past 20 years ("maintenance areas"), an AQCD is required whenever the Metropolitan Transportation Improvement Program (MTIP) or MPO's Metropolitan Plan (RTP) is updated, or every 4 years, whichever comes first. The conformity determination must be adopted as part of the approval process. US Department of Transportation (USDOT) must make the conformity determination before the plan or program can become operative.

Within the Eugene-Springfield area, the only air pollutant with a current air quality maintenance plan is that of ***coarse particulate matter (PM_{10})***. In 2013, the Eugene-Springfield area was re-designated by the Environmental Protection Agency (US-EPA) to attainment for PM_{10} with an approved 10-year Limited Maintenance Plan (LMP). This means that previously poor air quality has improved to the point where it now meets the Clean Air Act NAAQS for PM_{10}. A 20-year maintenance period then began to ensure that no backsliding occurs and that the PM_{10} standard continues to be met. Although transportation was found not to be a significant contributor of PM_{10} pollution (home wood heating and industrial sources were the major contributors), analysis is required of certain transportation projects in order to ascertain that localized impacts (such as at intersections) do not occur. This analysis takes place at the time the project is scoped during design in preparation for construction and is the responsibility of the project sponsor. The AQCD ensures that projects that potentially need to carry out this analysis are identified.

Who takes action?

This report has been prepared by the CLMPO in coordination with the interagency consultation group (IAC) consisting of representatives from several state and federal agencies, including Department of Environmental Quality (DEQ), Department of Transportation (DOT), Environmental Protection Agency (US-EPA), Federal Highway Administration (FHWA), Federal Transit Administration (FTA), Lane Regional Air Protection Agency (LRAPA), and ODOT. The MPC, as the policy board for the CLMPO, must formally adopt the findings described in this report. USDOT must then confer with US-EPA and, if the analysis is acceptable, they will issue a positive ruling. The 2045 RTP may become effective only upon confirmation of this positive ruling.

Findings

The CLMPO area currently meets all federal clean air standards. PM_{10} levels remain low, below the LMP threshold. Of the other criteria pollutants that are monitored, carbon monoxide levels are extremely low and show no sign of rebounding. The area is in compliance with the standards for ozone and particle pollution 2.5 microns and smaller, though vigilance is needed to ensure that this remains so.

Pursuant to [40 CFR Section 93] this conformity determination for the CLMPO 2045 RTP meets all the requirements under the conformity rule.

Purpose

This transportation conformity analysis is being carried out in conjunction with the development of the 2045 RTP of the CLMPO, located in Eugene, OR.

Air Quality Status

Transportation conformity is only required for projects within the boundaries of the designated air quality maintenance area for particulate matter air pollution with an aerodynamic diameter less than or equal to 10 µm in size (PM_{10}). The Eugene and Springfield urban growth boundaries (Map 1) constitute the air quality maintenance area for PM_{10}. The area is approximately 77 square miles in size and is completely contained within the CLMPO boundaries but excludes certain areas within the MPO, such as the City of Coburg and the Eugene Airport.

In August 1987, the Eugene-Springfield area was designated by US-EPA as a PM_{10} non-attainment area due to measured violations of the 24-hour PM_{10} standard (52 FR 29383). In August 1994, US-EPA approved the attainment plan (State Implementation Plan (SIP)) classifying the area as 'moderate' (59 FR 43483 August 24, 1994). Smoke from residential wood heating was determined to be the major contributor. The establishment of a mandatory home wood heating curtailment program was identified as a remedy to reduce wood burning emissions during stagnant air episodes in winter. Continued enforcement of existing controls on local industrial sources was also mandated. The EPA also approved PM_{10} control strategies in the SIP as Reasonably Available Control Technology and Reasonably Available Control Measures (RACT/RACM). No transportation control measures (TCM) were identified, and no transportation emissions budget was determined. US-EPA determined the area was exempted from regional emissions analysis for PM_{10} but that project level conformity requirements continued to apply (Appendix A).

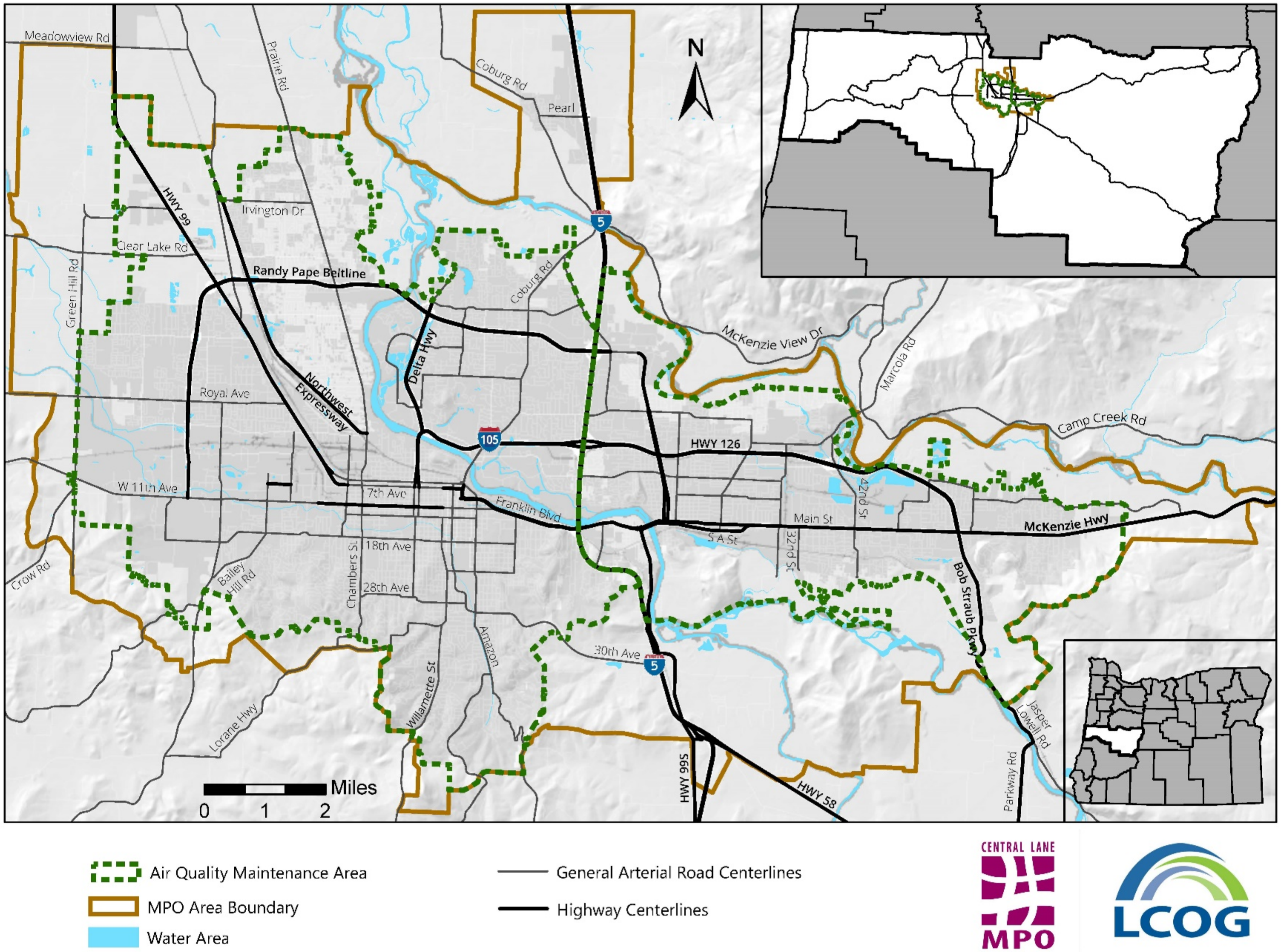
In January 2012, LRAPA submitted a revision to the Oregon PM_{10} SIP demonstrating attainment and describing a 10-year LMP. US-EPA approved the plan, and the area was re-designated as in attainment effective June 10, 2013 (78 FR 21547). The final LMP is included as Appendix F. Per the final LMP, the Eugene-Springfield area met the following EPA criteria to qualify for an LMP:

1. The area should attain the NAAQS.
2. The average 24-hour PM_{10} design value for the area based upon recent 5 years of data should not exceed 98 ug/m^3 (micrograms per cubic meter) and the annual design value should not exceed 40 ug/m^3. (The annual PM_{10} NAAQS was revoked by the EPA on December 18, 2006.)
3. The area should expect only limited growth in on-road motor vehicle PM_{10} emissions.

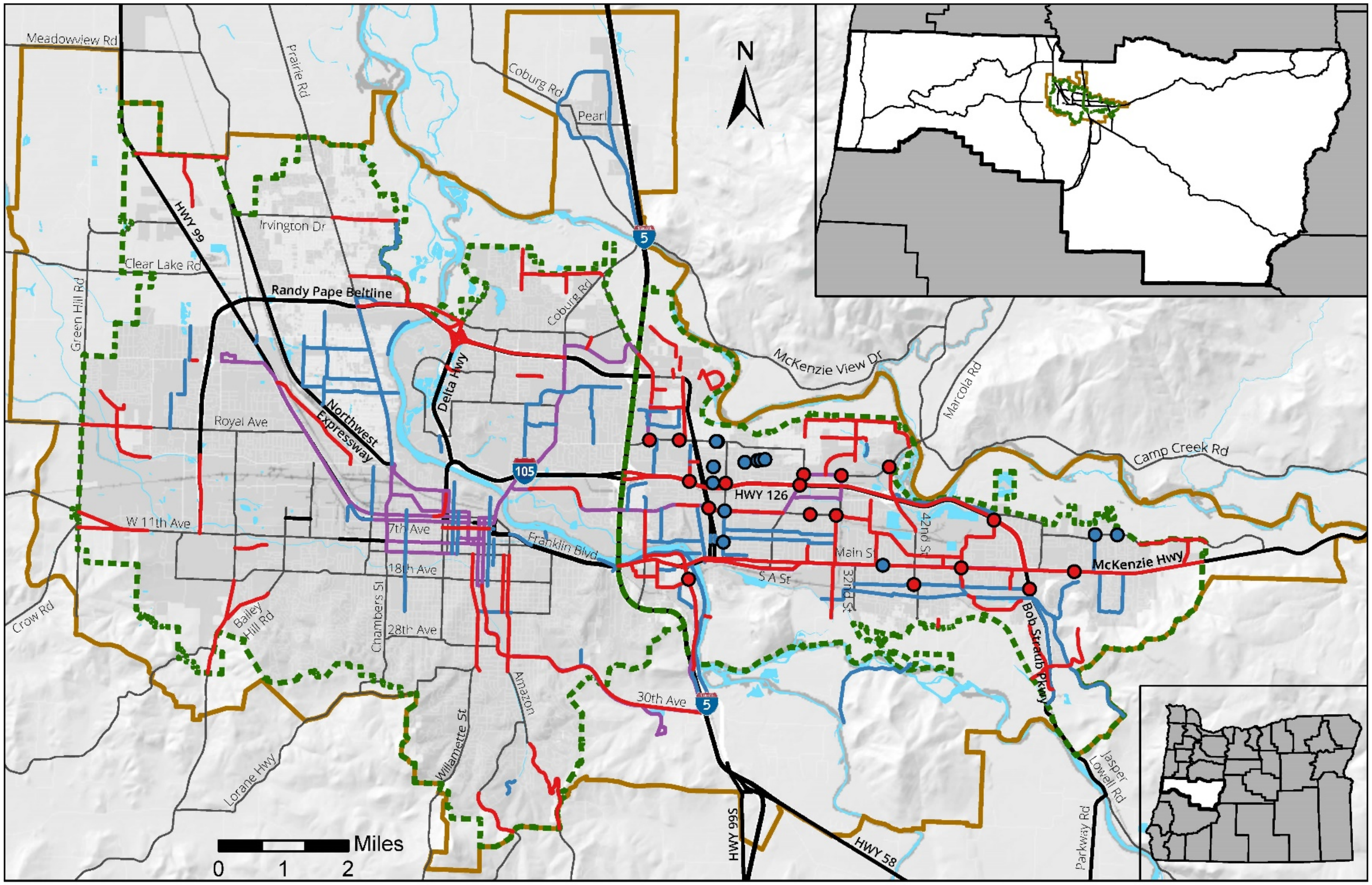
The LMP identified that the area's 24-hour PM_{10} design value of 66 $\mu g/m^3$ (2006-2008) was well below the LMP qualifying critical design value of 98 $\mu g/m^3$. The inventory analysis also demonstrated that only limited growth in PM_{10} emissions from motor vehicles was expected and that these emissions were unlikely to cause a future violation. No TCMs were identified, and no transportation budget was established. There are no contingency measures that involve transportation sources.

With the approval of the LMP, the area continues to be exempt from performing a regional emissions analysis for PM_{10} and there is no 'budget' test. The area, however, must meet project level conformity analyses and must also respond to transportation conformity criteria as specified in 78 FR 21547 and, in particular, in 40 CFR 93.109(e).

Map of Eugene-Springfield Air Quality Maintenance Area



2045 Regional Transportation Plan



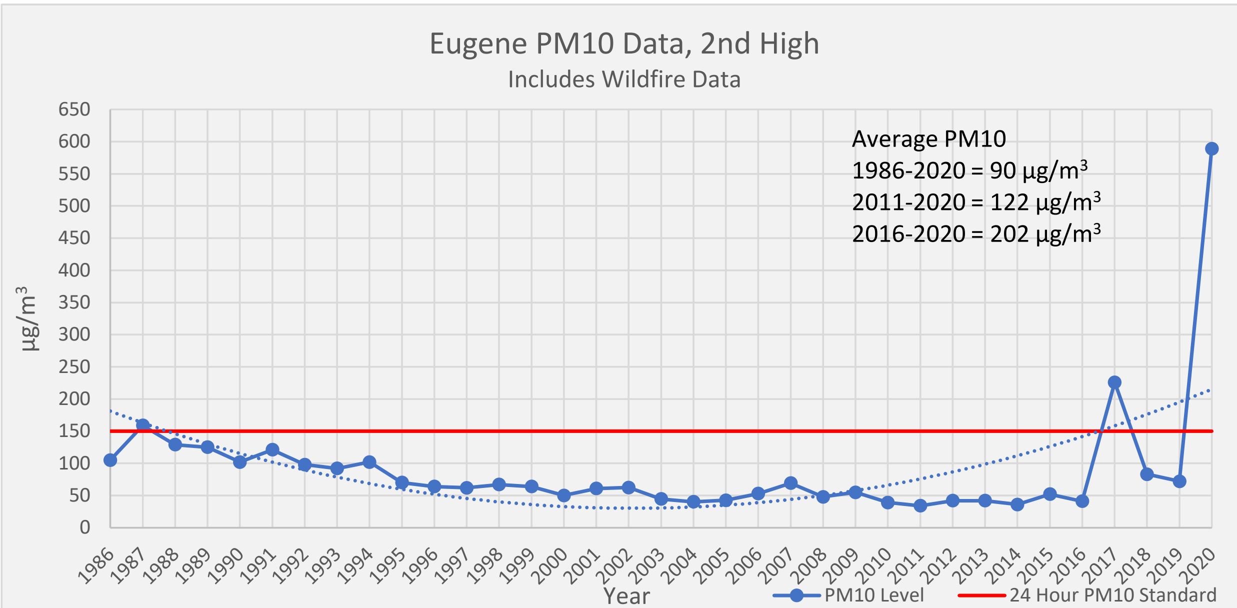
- Fiscally Constrained Roadway Projects
- Fiscally Constrained Bike/Pedestrian Projects
- Fiscally Constrained Roadway Projects
- Fiscally Constrained Bike/Pedestrian Projects
- Fiscally Constrained Transit Projects
- Air Quality Maintenance Area
- Highway Centerlines
- General Arterial Road Centerlines
- MPO Area Boundary
- Water Area

CENTRAL LANE MPO

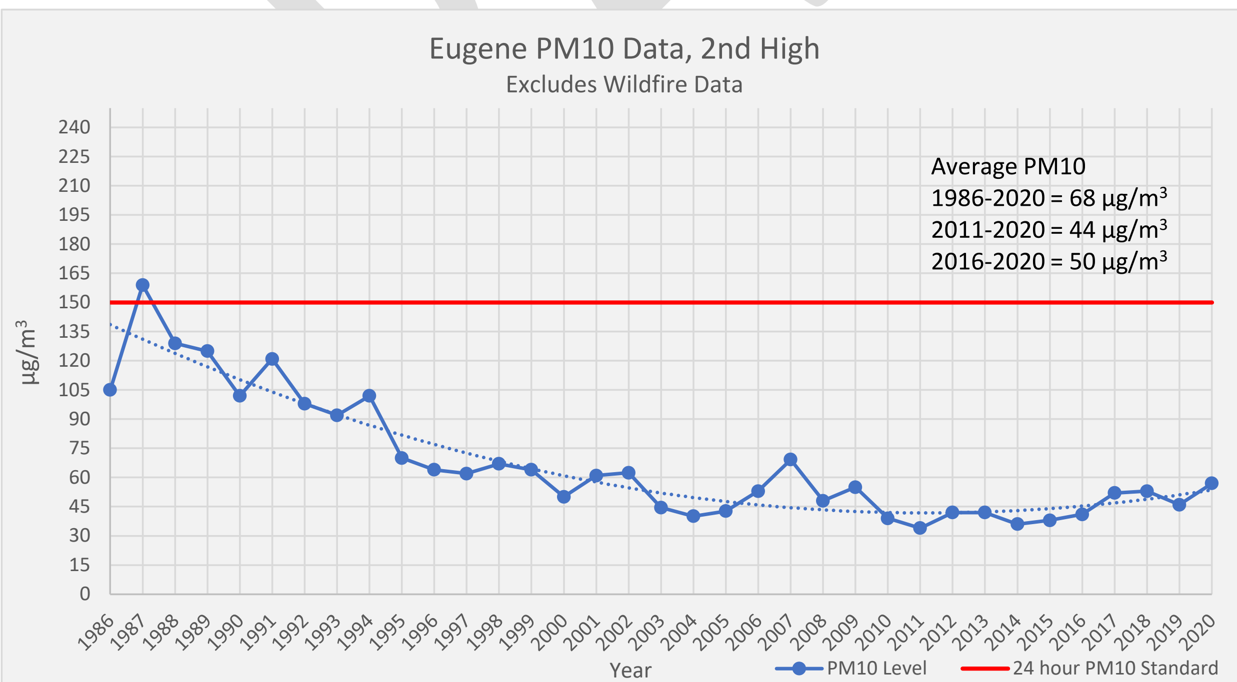
LCOG

2045 Regional Transportation Plan

The annual PM_{10} standard, which was revoked by US-EPA in 2006, has never been exceeded in this area. LRAPA provided the figures below showing the PM_{10} measurements taken by the approved monitor.[1] The top figure reflects PM_{10} measurements including the anomalous wildfire events of 2017 and 2020, while the bottom figure excludes those events. Dismissing the 2017 and 2020 wildfire events, the 24-hour level continues to remain well below the standard, and there have been no exceedances since 1987.[2] The latest data from 2020 shows a 24-hour (5-year) design value of 50 µg/m^3, well below the standard of 150 µg/m^3. These data show that this eligibility is maintained, and that there continues to be very low probability that the region will violate the standard within the period of the maintenance plan.



Source: LRAPA, Site #41-039-0058-881102-1: Highway 99/Key Bank, Eugene-Springfield area.



Source: LRAPA, Site #41-039-0058-881102-1: Highway 99/Key Bank, Eugene-Springfield area.

[1] Site #41-039-0058-881102-1: Highway 99/Key Bank, Eugene-Springfield area.
[2] The US-EPA allows for the removal of wildfire-influenced data to show compliance with a maintenance plan. See Section E.13 of 2016 Revisions to the Exceptional Events Rule: Update to Frequently Asked Questions.

<u>PM_{10} Limited Maintenance Plan Conformity Criteria</u>

On June 10, 2013, US-EPA approved a 10-year LMP for the Eugene-Springfield area. This LMP has a 2023 horizon year. Because of the approved LMP, the CLMPO no longer has to complete a regional emissions analysis for the Eugene-Springfield area for PM_{10} pursuant to 40 CFR 93.109(e). However, other transportation conformity requirements referred to in Table 1 of §93.109(b) continue to apply. Additionally, the approval of the LMP (78 FR 21547) also directs accordance with §93.104, §93.105, §93.108, §93.123 and §93.125.

40 CFR 93.104 ***Frequency of conformity determinations.***

Conformity of transportation plans and TIPS must be determined no less frequently than every four years. Conformity of plan and TIP amendments, except for those that add or delete exempt projects, must be demonstrated prior to approval of the action. All FHWA/FTA projects must be found to conform or must be re-conformed following any significant status or scope change, before they are adopted, accepted, approved or funded.

The 2021-2024 MTIP conformity was confirmed by USDOT on September 30, 2020, and the 2018-2021 MTIP conformity was confirmed September 29, 2017 (Appendix C).

40 CFR 93.105 ***Consultation***

Interagency consultation procedures must be carried out in accord with OAR 340-252-0060 *and the MPO's public involvement policies developed under 23 CFR Part 450.*

A draft of this document along with the project lists was circulated by the MPO to ODOT, US-EPA, Oregon DEQ, LRAPA, and US-DOT (FHWA and FTA) for interagency consultation. The air quality implications of each project are noted to determine which projects are considered exempt with no requirement for hot spot analysis; which are non-exempt but are not of local air quality concern and therefore require qualitative hot spot analysis; and which are non-exempt that have the potential for being projects of local concern, thus requiring quantitative hot spot analysis. In some cases, projects are lacking sufficient detail to make a certain determination now as to their air quality status. As such, the 2045 RTP relies upon the interagency consultation process to ensure ongoing conformity as these planned projects continue to develop.

A public hearing was held at the November 4 MPC meeting. The 30-day public comment period required by the MPO's Public Participation Plan began November 1 and public notice was provided on the MPO's web site and through emails to interested parties in the region.

Members of the Transportation Planning Committee (TPC), the standing committee for interagency coordination and consultation, participated in the development of the project lists, discussed the project list development during TPC meetings throughout January 2021 to May 2021, and reviewed the drafts throughout the development process. TPC reviewed the results of the public comment period and the interagency consultation. Any comments received at the public hearing or submitted during the public comment period are provided as an attachment to this document. Pertinent dates are listed below.

1/2021–9/2021	Coordination with partners to develop/update project list
9/14/2021–10/14/2021	IAC review period
9/30/2021	IAC meeting
11/1/2021–11/30/2021	Public comment period
11/4/2021	Public hearing at MPO policy board meeting
12/16/2021	TPC reviews public comments to date; MPO addresses IAC comments
1/06/2022	MPC adopts RTP and AQCD

The ***project sponsor*** is responsible for assuring the conformity of FHWA/FTA projects and regionally significant projects in the RTP for which hot spot analysis [project level conformity] is required. The project sponsor is also responsible for distributing draft and final project environmental documents prepared by the project sponsor to other agencies. It is the responsibility of the project sponsor to consult with the affected transportation and air quality agencies prior to making a project level conformity determination. These activities occur during the project design planning phase.

40 CFR 93.106 ***Content of transportation plans and timeframe of conformity determinations.***
It has been the past practice of the MPO to include only the forecast year of the RTP. The Plan quantifies the population and employment projected for 2045. The modifications and additions to the highway and transit system are listed including geographical extents along with the high-level descriptions of the planned projects. Multimodal policies are described. Upon federal approval, conformity of the 2045 RTP will expire after four years, anticipated to be Fall or Winter 2025-2026. The next RTP will be completed before that expiration date.

Conformity of the 2021-2024 TIP was approved federally on September 30, 2020, and will expire September 30, 2024, however it is anticipated that a new conformity determination will be in place in 2023 for the 2024-2027 TIP before the current conformity expires.

40 CFR 93.108 ***Transportation plans and TIPs must be fiscally constrained***.
Fiscal constraint is described and affirmed in Chapter 4 of the 2045 RTP. Fiscal constraint is confirmed as well on page 22 in the current 2021-2024 TIP.

40 CFR 93.109 ***Criteria and procedures for determining conformity of transportation plans, programs and projects: General***
(e) This area has an approved limited maintenance plan and as such is not required to satisfy regional emissions analysis for §93.118 and/or §93.119. Other applicable criteria in Table 1 of §93.109(b) are still required including hot spot requirements for certain projects in this PM_{10} area.

40 CFR 93.110 ***The conformity determination must be based on the latest planning assumptions.***
The 2045 RTP was developed using the latest planning assumptions of population, employment, land use, travel and congestion (see Chapters 3 and 6 in the RTP). Service levels of transit are expected to increase over the next few years while fares remain constant with inflation. Transit ridership is expected to increase. No tolls are expected. No TCMs are in effect or are required. Background concentrations of PM_{10} are expected to remain low, based on monitoring trends.

40 CFR 93.111 ***Conformity determination must be based on the latest emission estimation model available.***

Under the LMP, regional emissions modeling is not required for the conformity determination. However, for project level conformity, the CLMPO works with project sponsors and ODOT to determine conformity using the latest emission estimation model published and recommended by USDOT.

40 CFR 93.112 ***Conformity must be determined according to the consultation procedures in this subpart and in the applicable implementation plan, and according to the public involvement procedures established in compliance with 23 CFR Part 450*.**

See §93.105 above. This process is conducted in accord with that laid out in the MPO's public participation plan.

40 CFR 93.113 ***The transportation plan, TIP, or any FWHA/FTA project which is not from a conforming plan or TIP must provide for the timely implementation of TCMs from the applicable implementation plan.***

There are no TCMs specified in the Eugene-Springfield PM_{10} State Implementation Plan.

40 CFR 93.123(b) ***Procedures for determining localized PM_{10} concentrations (hot spot analysis)***

The LMP does not identify any locations, areas or categories of sites of violation or possible violation.

Prior to release of the funding or approval of permits for a project, the regulatory agency will identify projects that must undergo hot spot analysis (see Appendix D for a summary of guiding criteria).

The ***project sponsor*** (the agency responsible for implementing the project) is responsible for assuring the conformity at this time. Refer to the 2045 RTP Project Lists and Map of RTP Projects (both included later in this document) for identification of projects that are deemed at this time as exempt from this requirement, based on §93.126 and §93.127.

40 CFR 93.125 ***No emissions reductions credits can be applied if the control measure is not included in the transportation plan or the TIP or does not require regulatory action unless there are written commitment to implement those control measures*.** (OAR 340-252-0230)

No control measures have been identified.

<u>Regionally Significant Projects</u>

Any projects determined to be of regional significance (regardless of funding source) were included in this review as well. In the CLMPO, the TPC, as the standing committee for air quality under the Oregon Conformity Rulings, has determined regionally significant projects to be:

A transportation project, other than an exempt project, that is on a facility which serves regional transportation needs, such as access to and from the area outside the region, major activity centers in the region, major planned developments such as new retail malls, sports complexes, etc., or transportation terminals as well as most terminals themselves, and would normally be included in the modeling of a metropolitan area's transportation network, including at a minimum:

- All fixed guideway transit facilities that offer an alternative to regional highway travel;
- Projects on facilities classified as arterial level and above;

- Projects on multi-lane facilities that impact speed and/or capacity; and
- Construction of new roadways classified as arterial level and above.

The CLMPO definition is consistent with the FHWA and ODOT definition. FHWA uses the federal code definition. Per 23 CFR § 450.104, "regionally significant project" means a transportation project (other than projects that may be grouped in the TIP and/or STIP or exempt projects as defined in EPA's transportation conformity regulations (40 CFR part 93, subpart A)) that is on a facility that serves regional transportation needs (such as access to and from the area outside the region; major activity centers in the region; major planned developments such as new retail malls, sports complexes, or employment centers; or transportation terminals) and would normally be included in the modeling of the metropolitan area's transportation network. At a minimum, this includes all principal arterial highways and all fixed guideway transit facilities that offer an alternative to regional highway travel.

ODOT relies on the FHWA definition of "regionally significant project," which is an administrative interpretation of the statutory definition (23 CFR § 450.104): "Federal regulation requires that all federally funded transportation projects and all Regionally Significant transportation projects are identified in the STIP. Regionally significant refers to projects with air quality impacts, such as adding more lanes, building a bypass, or installing a new signal. Regionally significant also refers t projects that are of significant interest to the local community."

Summary

Current PM_{10} levels are shown to be well under the NAAQS 24-hour standard, and trends indicate a stable situation.

All requirements for the Transportation Air Quality Conformity Determination have been met and the 2045 RTP of the Central Lane Metropolitan Planning Organization is in conformity.

CONSTRAINED PROJECTS: AUTO

PROJECT CATEGORY: NEW ARTERIAL LINK OR INTERCHANGE

Name	Geographic Limits	Description	Primary Jurisdiction	Air Quality Status*	Est. Cost (2021)	Est. Year of Construction (4-Year Window)	Year of Construction Cost Range		Length	RTP #	Federal Functional Class
Beltline Local Arterial Bridge	Beaver Street to Delta Highway	Construct new 2-lane arterial bridge over the Willamette River connecting Green Acres Road with Division Ave. Include modifications to Beltline/Delta ramps consistent with the Beltline Highway Facility Plan	ODOT, Lane County, City of Eugene	ODOT has conducted project hot spot analysis and during IAC meeting December 2020 found this project was not a project of local air quality concern.	$118,800,000	2025-2029	$134,230,467	$151,665,137	0.95	512	Minor arterial
Eugene-Springfield Highway (also referred to as SR-126 and OR 126)	at Main Street	Construct interchange (intersection improvements needed to calm traffic and integrate multi-modal access at the intersection of two five-lane roadways – SR-126 is currently two travel lanes in each direction with left turn lanes onto Main Street; Main Street is two lanes in each direction with turn lanes onto SR-126 and Bob Straub Parkway.)	ODOT	**Non-exempt**	$50,000,000	2030-2034	$65,810,925	$74,358,848	0	27	Other Freeways and Expressways
Eugene-Springfield Highway (also referred to as SR-126 and OR 126)	at 52nd Street	Construct interchange (intersection improvements needed to calm traffic and integrate multimodal access – SR-126 is currently two travel lanes in each direction with a center median and turn lane; 52nd Street is one travel lane in each direction with a turn lane; intersection lacks sidewalks, pedestrian/ADA accessibility)	ODOT	**Non-exempt**	$40,000,000	2025-2029	$45,195,444	$51,065,703	0	30	Other Freeways and Expressways
				Project Category Subtotal	$208,800,000		$245,236,836	$277,089,688			

**Note: Air quality status is based on planning level project description available from lead agencies and the project site's existing conditions. IAC will review all projects at the time of project development, scoping, and design for determination of project level conformity and hot spot analysis.*

PROJECT CATEGORY: ADDED FREEWAY LANES OR MAJOR INTERCHANGE IMPROVEMENTS

Name	Geographic Limits	Description	Primary Jurisdiction	Air Quality Status*	Est. Cost (2021)	Est. Year of Construction (4-Year Window)	Year of Construction Cost Range		Length	RTP #	Federal Functional Class
Randy Pape Beltline Highway	Roosevelt Boulevard to W. 11th Avenue	Add lanes on Beltline Highway and provide intersection improvements at the W. 11th Avenue and Roosevelt Boulevard intersections.	ODOT, Eugene	**Non-exempt**	$28,100,000	2030-2034	$36,985,740	$41,789,673	1.1	312	Other Principal Arterial
Delta/Beltline Interchange	Delta at Beltline	Interim/safety improvements; replace/revise existing ramps; widen Delta Highway bridge to five lanes	ODOT	**Non-exempt**	$20,000,000	2020-2024	$19,398,642	$21,918,256	0.25	638	Other Freeways and Expressways
Eugene-Springfield Highway (OR 126)	@ Mohawk Boulevard Interchange	Add lanes on ramps	ODOT	**Non-exempt**	$2,000,000	2030-2034	$2,632,437	$2,974,354	0.68	821	Other Freeways and Expressways
				Project Category Subtotal	**$50,100,000**		**$59,016,819**	**$66,682,283**			

**Note: Air quality status is based on planning level project description available from lead agencies and the project site's existing conditions. IAC will review all projects at the time of project development, scoping, and design for determination of project level conformity and hot spot analysis.*

PROJECT CATEGORY: ARTERIAL CAPACITY IMPROVEMENTS

Name	Geographic Limits	Description	Primary Jurisdiction	Air Quality Status*	Est. Cost (2021)	Est. Year of Construction (4-Year Window)	Year of Construction Cost Range		Length	RTP #	Federal Functional Class
Main Street/48th Street	Intersection of Main Street and 48th Street	Construct traffic control improvements	Springfield	**Exempt** 40 CFR 93.126, Safety – Projects that correct, improve, or eliminate a hazardous location or feature	$300,000	2025-2029	$338,966	$382,993	0	69	Other Principal Arterial
Main Street/Mountaingate Drive	Intersection of Main Street and Mountaingate Drive	Construct traffic control improvements	Springfield	**Exempt** 40 CFR 93.126, Safety – Projects that correct, improve, or eliminate a hazardous location or feature	$900,000	2025-2029	$1,016,897	$1,148,978	0	75	Other Principal Arterial

PROJECT CATEGORY: ARTERIAL CAPACITY IMPROVEMENTS

Name	Geographic Limits	Description	Primary Jurisdiction	Air Quality Status*	Est. Cost (2021)	Est. Year of Construction (4-Year Window)	Year of Construction Cost Range		Length	RTP #	Federal Functional Class
42nd Street/Marcola Road	Intersection of 42nd Street and Marcola Road	Construct roundabout[3]	Springfield	Exempt 40 CFR 93.126, Safety – Projects that correct, improve, or eliminate a hazardous location or feature; Traffic control devices and operating assistance other than signalization projects	$2,800,000	2020-2024	$2,715,810	$3,068,556	0	712	Minor Arterial
Harlow Road/Pheasant Boulevard	Intersection of Harlow Road and Pheasant Boulevard	Construct traffic control improvements	Springfield	Exempt 40 CFR 93.126, Safety – Projects that correct, improve, or eliminate a hazardous location or feature	$500,000	2030-2034	$658,109	$743,588	0	744	Minor Arterial
Gateway Street/Harlow Road	Intersection of Gateway Street and Harlow Road	Construct traffic control improvements	Springfield	Exempt 40 CFR 93.126, Safety – Projects that correct, improve, or eliminate a hazardous location or feature	$2,910,000	2030-2034	$3,830,196	$4,327,685	0.5	785	Minor Arterial
Gateway/Beltline Road	International Way to Postal Way	Improve intersections and realign Gateway	Springfield	Exempt 40 CFR 93.126, Safety – Projects that correct, improve, or eliminate a hazardous location or feature; Traffic control devices and operating assistance other than signalization projects	$20,000,000	2025-2029	$22,597,722	$25,532,851	0.9	789	Other Freeways and Expressways
Q Street/5th Street	Intersection of Q Street and 5th Street	Intersection improvements - Construct right turns to the eastbound and northbound approaches or a roundabout.	Springfield	Exempt 40 CFR 93.126, Safety – Projects that correct, improve, or eliminate a hazardous location or feature; Traffic control devices and operating assistance other than signalization projects	$550,000	2030-2034	$723,920	$817,947	0.5	828	Minor Arterial
Centennial Boulevard/28th Street	Intersection of Centennial Boulevard and 28th Street	Construct roundabout	Springfield	Exempt 40 CFR 93.126, Safety – Projects that correct, improve, or eliminate a hazardous location or feature	$1,800,000	2035-2040	$2,759,903	$3,215,046	0	924	Minor Arterial
Centennial Boulevard/21st Street	Intersection of Centennial Boulevard and 21st Street	Construct traffic control improvements	Springfield	Exempt 40 CFR 93.126, Safety – Projects that correct, improve, or eliminate a hazardous location or feature	$290,000	2035-2040	$444,651	$517,980	0	927	Minor Arterial
South 42nd Street/Daisy Street	Intersection of South 42nd Street and Daisy Street	Traffic control improvements - Construct a traffic signal or a roundabout	Springfield	Exempt 40 CFR 93.126, Safety – Projects that correct, improve, or eliminate a hazardous location or feature; Traffic control devices and operating assistance other than signalization projects	$1,800,000	2020-2024	$1,745,878	$1,972,643	0	951	Minor Arterial
Gateway Street	International Way to UGB	Construct 5 lane cross section (currently 3 lane cross section)	Springfield	Non-exempt	$950,000	2025-2029	$1,073,392	$1,212,810	0.63	704	Minor Arterial
42nd Street	Marcola Road to RR Tracks	Modify to 3 lane cross section with stripped bicycle lanes and traffic controls at Marcola Rd and the OR126 westbound ramps	Springfield	Non-exempt	$6,000,000	2020-2024	$5,819,593	$6,575,477	1.05	713	Minor Arterial
Daisy Street/Bob Straub Parkway	Intersection of Daisy Street and Bob Straub Parkway	Traffic control improvements or undercrossing of Bob Straub Parkway	Lane County	Exempt 40 CFR 93.126, Safety – Projects that correct, improve, or eliminate a hazardous location or feature	$3,000,000	2030-2034	$3,948,655	$4,461,531	0	32	Minor Arterial
Franklin Boulevard (OR 126)	I-5 to RR Tracks south of Franklin Blvd/McVay Hwy	Multimodal urban standards and intersection control improvements	Springfield	Exempt 40 CFR 93.126, Safety – Projects that correct, improve, or eliminate a hazardous location or feature	$35,000,000	2020-2024	$33,947,624	$38,356,948	1.29	830	Other Principal Arterial

[3] Per the RTP, a roundabout is defined as a circular intersection with yield control on all approaches, islands to separate flows of traffic from each other and pedestrians, and geometric features to slow down traffic. Roundabouts have many benefits over stop-controlled and signalized intersections. They have proven safety benefits, often have lower delays, can lead to less congestion, can reduce the need for widening, reduce speeds in and around the roundabout, and as a result can benefit the surrounding community.

PROJECT CATEGORY: ARTERIAL CAPACITY IMPROVEMENTS											
Name	Geographic Limits	Description	Primary Jurisdiction	Air Quality Status*	Est. Cost (2021)	Est. Year of Construction (4-Year Window)	Year of Construction Cost Range		Length	RTP #	Federal Functional Class
Franklin Boulevard (OR 225)/East 19th Avenue	Intersection of McVay Hwy and East 19th Ave	Construct a new 2 lane roundabout (currently this intersection does not have traffic controls)	Springfield	Exempt 40 CFR 93.126, Safety – Projects that correct, improve, or eliminate a hazardous location or feature; Traffic control devices and operating assistance other than signalization projects	$2,500,000	2025-2029	$2,824,715	$3,191,606	0	898	Minor Arterial
Franklin Boulevard (OR 225)	East 19th Avenue to I-5	Construct 2 or 3 lane cross-section as needed with sidewalks, bicycle facilities and transit facilities consistent with Main Street/McVay Hwy Transit Feasibility Study and Springfield TSP project T-3.	Springfield	Non-exempt	$47,000,000	2030-2034	$61,862,269	$69,897,317	1.34	899	Minor Arterial
Marcola Road/19th Street	Intersection of Marcola Road and 19th Street	Construct right-turn lane on westbound approach or a roundabout	Springfield	Exempt 40 CFR 93.126, Safety – Projects that correct, improve, or eliminate a hazardous location or feature; Traffic control devices and operating assistance other than signalization projects	$320,000	2020-2024	$310,378	$350,692	0	722	Minor Arterial
28th Street/Marcola Road	Intersection of 28th Street and Marcola Road	Construct a roundabout (intersection is currently signalized)	Springfield	Exempt 40 CFR 93.126, Safety – Projects that correct, improve, or eliminate a hazardous location or feature; Traffic control devices and operating assistance other than signalization projects	$1,900,000	2030-2034	$2,500,815	$2,825,636	0	723	Minor Arterial
W. 11th Avenue	Green Hill Road to Terry Street	Upgrade to 5-lane urban facility with 2 lanes in each direction, a center lane, sidewalk, and shared use path (currently a 2 lane roadway)	ODOT, Eugene	Non-exempt Determined not a project of local air quality concern per IAC meeting July 2021	$12,300,000	2030-2034	$16,189,487	$18,292,277	1	333	Other Principal Arterial
Martin Luther King Jr. Blvd.	Leo Harris Parkway West to Centennial Loop	Add center turn lane[4] on Martin Luther King Jr. Blvd. (currently a 4 lane cross section between Leo Harris Parkway West and Centennial Loop)	Eugene	Exempt 40 CFR 93.126, Safety – Projects that correct, improve, or eliminate a hazardous location or feature; Traffic control devices and operating assistance other than signalization projects	$6,700,000	2024-2028	$7,342,616	$8,296,319	0.21	602	Minor Arterial
Barger Drive	West of Primrose Street to where the street widens to two lanes in each direction west of Randy Papé Beltline Highway	Widen Barger Drive to provide a second through lane in each direction	Eugene	Non-exempt	$1,900,000	2024-2028	$2,082,234	$2,352,688	0.14	497	Minor Arterial
Franklin Blvd.	Alder Street to Walnut Street	4 travel lanes, central planter strip and bus lanes, roundabouts, and shared use paths on both sides.	Eugene	Non-exempt	$43,500,000	2025-2029	$49,150,045	$55,533,952	1	119	Other Principal Arterial
				Project Category Subtotal	$192,920,000		$223,883,875	$253,075,520			

**Note: Air quality status is based on planning level project description available from lead agencies and the project site's existing conditions. IAC will review all projects at the time of project development, scoping, and design for determination of project level conformity and hot spot analysis.*

[4] Per the RTP, a center turn lane, or center two-way left-turn lane (TWLTL) is defined as a lane in the middle of a two-way street that provides left turn access to and from adjacent properties and roadways, while minimizing impacts of left turning vehicles on through traffic. Center TWLTL pavement markings consist of a normal broken yellow line and a normal solid yellow line to delineate the edges of a lane that can be used by traffic in either direction as part of a left-turn maneuver. A TWLTL is followed by a single direction left turn lane(s) or traversable median or non-traversable median on the approach to a signalized intersection. TWLTLs have been used to reduce rear-end, head-on, and turning-related crashes occurring on two-lane roads.

PROJECT CATEGORY: NEW COLLECTORS

Name	Geographic Limits	Description	Primary Jurisdiction	Air Quality Status*	Est. Cost (2021)	Est. Year of Construction (4-Year Window)	Year of Construction Cost Range		Length	RTP #	Federal Functional Class
Riverbend Drive	Extend to International Way	Construct 3-lane cross section with sidewalks and bike lanes	Springfield	Non-exempt	$1,600,000	2020-2024	$1,551,891	$1,753,460	0.19	715	Major Collector
Improvements to serve Riverbend Area	Baldy View Lane, McKenzie-Gateway Loop and Off-Street Path Connections	Improve Baldy View Lane, construct a McKenzie-Gateway Loop connector/new collector and construct off-street path connections. See Springfield 2035 TSP Figure 6.	Springfield	Non-exempt	$10,200,000	2030-2034	$13,425,429	$15,169,205	0.86	756	Collector
79th Street	Thurston Road to Main Street	New 2 lane collector	Springfield	Non-exempt	$8,200,000	2035-2040	$12,572,891	$14,646,319	0.37	18	Minor Collector
Improvements within Jasper-Natron Area	Jasper-Natron Area between Bob Straub Parkway, Jasper Road and Mt. Vernon Road	Construct multiple roadways to serve planned development. See Springfield 2035 TSP Figure 6.	Springfield	Non-exempt	$67,000,000	2030-2034	$88,186,639	$99,640,856	1.35	33,36, 39, 42, 45, 48, 51, 57	Collector
New Collector	Bob Straub Parkway to Mountaingate Drive and Future Local	Construct a new collector with a three-lane cross-section with sidewalks and bicycle facilities	Springfield	Non-exempt	$4,300,000	2020-2024	$4,170,708	$4,712,425	1.03	81	Major Collector
19th Street	Hayden Bridge Road to Yolanda Avenue	Extend existing street as 2-lane collector with sidewalks and bicycle facilities	Springfield	Non-exempt	$2,400,000	2030-2034	$3,158,924	$3,569,225	0.33	703	Minor Collector
V Street	31st Street to Marcola Road	Construct a new collector with a three-lane cross-section with sidewalks and bicycle facilities	Springfield	Non-exempt	$9,000,000	2020-2024	$8,729,389	$9,863,215	0.65	777	Collector
Yolanda Avenue	31st Street to 35th Street	Construct Yolanda Avenue from 31st Street to 33rd Street with sidewalks and bicycle facilities, add sidewalks and bicycle facilities from 33rd Street to 35th Street	Springfield	Non-exempt	$9,900,000	2030-2034	$13,030,563	$14,723,052	0.2	783	Minor Collector
North Gateway Collector	Maple Island Road/ Royal Caribbean Way to International	Construct a new collector with a three-lane cross-section with sidewalks and bicycle facilities.	Springfield	Non-exempt	$4,300,000	2025-2029	$4,858,510	$5,489,563	0.63	798	Collector
Franklin Riverfront Collector	Franklin Blvd/McVay to west portion of Franklin riverfront	Collector to serve Glenwood redevelopment area along riverfront north of Franklin Blvd.	Springfield	Non-exempt	$7,700,000	2020-2024	$7,468,477	$8,438,528	0.7	897	Collector
48th Street	Aster Street to Daisy Street	Extend South 48th Street with a two-lane cross-section with a parallel multi-use 12-foot wide path and roundabout intersection treatment at Daisy Street and South 48th Street	Springfield	Non-exempt	$3,600,000	2025-2029	$4,067,590	$4,595,913	0.3	901	Major Collector
New Collector	Game Farm Road East to International Way	Construct new 3- lane collector with sidewalks and bicycle facilities	Springfield	Non-exempt	$6,300,000	2030-2034	$8,292,176	$9,369,215	0.18	707	Major Collector
Maple Island Road	Game Farm Road/Deadmond Ferry Road to Beltline Road	Extend Maple Island Road with a 2-lane cross-section with sidewalk, bicycle facilities, intersection at Beltline	Springfield	Non-exempt	$3,100,000	2020-2024	$3,006,790	$3,397,330	0.11	706	Minor Collector
New Collector	Laura Street - Pioneer Parkway	Construct new 3-lane collector with sidewalks and bicycle facilities in or near the EWEB powerline corridor with a right-in/right-out intersection at Pioneer Parkway; In the Springfield TSP, PB-7 is required to serve as sidewalk and bikeway	Springfield	Non-exempt	$3,300,000	2030-2034	$4,343,521	$4,907,684	0.12	786	Collector
Centennial Boulevard/ Industrial Avenue	28th Street to 35th Street	Extend with a 3-lane cross-section	Springfield	Non-exempt	$9,500,000	2030-2034	$12,504,076	$14,128,181	0.5	924	Major Collector
Commercial Avenue	Extend between 42nd Street and 48th Street and a north/south extension to serve development to the north between 42nd and 48th (see TSP map)	Extend with a 3-lane cross-section	Springfield	Non-exempt	$19,000,000	2035-2040	$29,132,309	$33,936,593	0.84	19	Major Collector
New Collector	Holly Street - South 48th Street to South 57th Street	Construct new collector with 2-lane cross-section with sidewalks and bicycle facilities	Springfield	Non-exempt	$5,300,000	2025-2029	$5,988,396	$6,766,206	0.94	22	Minor Collector
Mallard Avenue	Gateway Street to Oriole Street	Change Mallard Avenue to a two-lane cross-section with sidewalks and bicycle facilities and extend Mallard Avenue to Gateway Street with a two-lane cross-section with sidewalks and bicycle facilities	Springfield	Non-exempt	$3,000,000	2035-2040	$4,599,838	$5,358,409	0.18	709	Minor Collector
Q Street	@ Laura Street	Construct traffic controls, extend the second westbound through-lane through the Laura Street intersection, and construct a westbound right-turn lane	ODOT, Springfield	Non-exempt	$1,600,000	2025-2029	$1,807,818	$2,042,628	0	717	Major Collector
W. 13th Avenue	Bertelsen Road to Dani Street	New major collector	Eugene	Non-exempt	$3,600,000	2020-2024	$3,491,756	$3,945,286	1	318	Major collector
Colton Way Extension	Royal Avenue to Legacy Extension	New major collector	Eugene	Non-exempt	$3,700,000	2025-2029	$4,180,579	$4,723,578	0.7	429	Major collector
Legacy Extension	Adelman Loop to Roosevelt Blvd	New major collector	Eugene	Non-exempt	$17,500,000	2025-2029	$19,773,007	$22,341,245	1.4	435	Major collector
Awbrey to Enid Connector	Awbrey Lane to Enid Road	New major collector	Eugene	Non-exempt	$7,400,000	2030-2034	$9,740,017	$11,005,110	0.8	441	Major collector

PROJECT CATEGORY: NEW COLLECTORS											
Name	Geographic Limits	Description	Primary Jurisdiction	Air Quality Status*	Est. Cost (2021)	Est. Year of Construction (4-Year Window)	Year of Construction Cost Range		Length	RTP #	Federal Functional Class
Gilham-County Farm Connection	Gilham to County Farm Road	New neighborhood collector	Eugene	Non-exempt	$2,800,000	2020-2024	$2,715,810	$3,068,556	0.7	651	Minor Collector
Shadowview Road	Shadowview Road to Coburg Road via Spectrum Avenue	Extend neighborhood collector with two travel lanes and sidewalks on both sides	Eugene	Non-exempt	$3,200,000	2020-2024	$3,103,783	$3,506,921	0.3	603	Minor Collector
Crow Road/West 11th Avenue/Pitchford area	Crow Road/West 11th Avenue/Pitchford area	Construct collectors and other facilities within Crow Road/West 11th Avenue/Pitchford area needed to serve future development	Eugene	Non-exempt	$21,300,000	2025-2029	$24,066,574	$27,192,487	1.3	333	Collectors
				Project Category Subtotal	$238,800,000		$297,967,461	$338,291,190			

**Note: Air quality status is based on planning level project description available from lead agencies and the project site's existing conditions. IAC will review all projects at the time of project development, scoping, and design for determination of project level conformity and hot spot analysis.*

PROJECT CATEGORY: URBAN STANDARDS											
Name	Geographic Limits	Description	Primary Jurisdiction	Air Quality **Status***	Est. Cost (2021)	Est. Year of Construction (4-Year Window)	Year of Construction Cost Range		Length	RTP #	Federal Functional Class
Game Farm Road South	Mallard Road to Harlow Road	Upgrade to 2-lane urban facility (currently a 2-lane roadway; modify to include sidewalks and bicycle facilities)	Lane County, Springfield	Exempt 40 CFR 93.126, Safety – Widen lanes/resurfacing; Air Quality – Bike and ped facilities	$4,100,000	2030-2034	$5,396,496	$6,097,426	0.93	737	Local
Hayden Bridge Road / 23rd St	19th Street to Marcola Rd	Upgrade to 2-lane urban facility (currently a 2-lane roadway; modify to include sidewalks and bicycle facilities)	Lane County, Springfield	Exempt 40 CFR 93.126, Safety – Widen lanes/resurfacing; Air Quality – Bike and ped facilities	$12,000,000	2030-2034	$15,794,622	$17,846,124	1.78	747	Minor Collector
31st Street	Hayden Bridge Road to U Street	Upgrade to 2 lane urban facility (currently a 2-lane roadway; modify to include sidewalks and bicycle facilities)	Lane County, Springfield	Exempt 40 CFR 93.126, Safety – Widen lanes/resurfacing; Air Quality – Bike and ped facilities	$3,800,000	2030-2034	$5,001,630	$5,651,272	0.58	765	Minor Collector
Laura Street	Old Laura Street to Scotts Glen Drive	Upgrade to 3-lane urban facility (currently a 3-lane roadway; modify to include sidewalks and bicycle facilities)	Lane County, Springfield	Exempt 40 CFR 93.126, Safety – Widen lanes/resurfacing; Air Quality – Bike and ped facilities	$1,575,000	2020-2024	$1,527,643	$1,726,063	0.4	750	Major Collector
Aspen Street	Centennial Boulevard to West D Street	Upgrade to 2 lane urban facility (currently a 2-lane roadway; modify to include sidewalks and bicycle facilities)	Lane County, Springfield	Exempt 40 CFR 93.126, Safety – Widen lanes/resurfacing; Air Quality – Bike and ped facilities	$2,800,000	2030-2034	$3,685,412	$4,164,095	0.44	809	Minor Collector
48th Street	Main Street to G Street	Upgrade to 2 lane urban facility (currently a 2-lane roadway; modify to include a multi-use path on one side of street)	Springfield	Exempt 40 CFR 93.126, Safety – Widen lanes/resurfacing; Air Quality – Bike and ped facilities	$600,000	2025-2029	$677,932	$765,986	0.48	3	Major Collector
52nd Street	OR 126E to G Street	Upgrade to 2 lane urban facility (currently a 2-lane roadway; modify to include a multi-use path on one side of street)	Springfield	Exempt 40 CFR 93.126, Safety – Widen lanes/resurfacing; Air Quality – Bike and ped facilities	$250,000	2020-2024	$242,483	$273,978	0.2	6	Major Collector
G Street	48th Street to 52nd Street	Upgrade to 2 lane urban facility (currently a 2-lane roadway; modify to include a multi-use path on one side of street sidewalks and bicycle facilities)	Springfield	Exempt 40 CFR 93.126, Safety – Widen lanes/resurfacing; Air Quality – Bike and ped facilities	$370,000	2020-2024	$358,875	$405,488	0.31	54	Major Collector
Thurston Road	Weaver Road to UGB	Upgrade to 3 lane urban facility (currently a 2-lane roadway; modify to include sidewalks and bicycle facilities)	Springfield	Non-Exempt	$4,800,000	2035-2040	$7,359,741	$8,573,455	0.61	98	Minor Collector
28th Street	Centennial Boulevard to Main Street	Upgrade to 3 lane urban facility (currently a 3-lane roadway with narrow sidewalk and no bicycle facilities; modify to include standard sidewalks and bicycle facilities); provide intersection and signal improvements at Main Street	Springfield	Non-exempt	$4,300,000	2030-2034	$5,659,740	$6,394,861	0.7	909	Major Collector
35th Street	Olympic Street to Commercial Avenue	Upgrade to 3-lane urban facility (currently a 2-lane roadway; modify to 3 lanes with sidewalks and bicycle facilities)	Springfield	Non-exempt	$3,600,000	2020-2024	$3,491,756	$3,945,286	0.46	918	Major Collector
Commercial Avenue	35th Street to 42nd Street	Upgrade to 3-lane urban facility (currently a 2-lane roadway; modify to 3 lanes with sidewalks and bicycle facilities)	Springfield	Non-exempt	$4,500,000	2025-2029	$5,084,487	$5,744,892	0.81	933	Major Collector
S. 28th Street	Main Street to South F Street	Upgrade to 3-lane urban facility (currently a 2-lane roadway; modify to 3 lanes with sidewalks and bicycle facilities)	Springfield	Non-exempt	$6,000,000	2020-2024	$5,819,593	$6,575,477	0.67	945	Major Collector

PROJECT CATEGORY: URBAN STANDARDS

Name	Geographic Limits	Description	Primary Jurisdiction	Air Quality Status*	Est. Cost (2021)	Est. Year of Construction (4-Year Window)	Year of Construction Cost Range		Length	RTP #	Federal Functional Class
21st Street	D Street to Main Street	Upgrade to 3-lane urban facility (currently a 2-lane roadway with on-street parking and sidewalks; modify to 3 lanes with sidewalks and bicycle facilities)	Springfield	Non-exempt	$2,300,000	2030-2035	$3,027,303	$3,526,543	0.2	962	Minor Collector
36th Street	Commercial Avenue to Main Street	Upgrade to 3-lane urban facility (currently a 2-lane roadway with on-street parking and sidewalks; modify to 3 lanes with sidewalks and bicycle facilities)	Springfield	Non-exempt	$3,000,000	2035-2040	$4,599,838	$5,358,409	0.47	920	Minor Collector
Clearwater Lane	South of Jasper Road within the Springfield UGB	Upgrade to 2 lane urban facility (currently a 2-lane roadway; modify to 2 lanes with sidewalks and bicycle facilities)	Lane County, Springfield	Exempt 40 CFR 93.126, Safety – Widen lanes/resurfacing; Air Quality – Bike and ped facilities	$470,000	2025-2029	$531,046	$600,022	0.11	925	Local
Mallard Avenue	Oriole St. to Game Farm Road	Upgrade to 2 lane urban facility (currently a 2-lane roadway with on-street parking; modify to 2 lanes with sidewalks and bicycle facilities). And extend Mallard Avenue to Gateway Street with a 2-lane cross-section with sidewalks and bicycle facilities.	Springfield	Non-exempt	$4,530,000	2020-2024	$1,454,898	$1,643,869	0.31	710	Local (current)
East 17th Avenue	Glenwood Blvd. to Henderson Ave.	Upgrade to 3-lane urban facility (currently a 2-lane roadway; modify to 3 lanes with sidewalks and bicycle facilities)	Springfield	Non-exempt	$1,900,000	2030-2034	$2,500,815	$2,825,636	0.52	826	Minor Collector
Henderson Avenue	Franklin Boulevard to East 19th Avenue	Upgrade to 3-lane urban facility (currently a 2-lane roadway; modify to 3 lanes with sidewalks and bicycle facilities)	Springfield, Lane County	Non-exempt	$3,400,000	2035-2040	$5,213,150	$6,072,864	0.39	827	Local (current)
East 19th Avenue	Henderson Avenue to McVay Hwy	Upgrade to 3-lane urban facility (currently a 2-lane roadway; modify to 3 lanes with sidewalks and bicycle facilities)	Springfield	Non-exempt	$3,500,000	2030-2034	$4,606,765	$5,205,119	0.49	828	Minor Collector
Yolanda Avenue	23rd Street to 31st Street	Upgrade to 2-lane urban facility (currently a 2-lane roadway; modify with sidewalks and bicycle facilities)	Lane County	Exempt 40 CFR 93.126, Safety – Widen lanes/resurfacing; Air Quality – Bike and ped facilities	$460,000	2025-2029	$519,748	$587,256	0.8	784	Minor Collector
Bertelsen Road	18th Avenue to Bailey Hill Road	Upgrade to minor arterial standards with two travel lanes, center turn lane, bike lanes, sidewalks on both sides, and planting strips (currently a 2-lane roadway)	Eugene	Non-exempt	$3,900,000	2025-2029	$3,782,735	$4,274,060	0.6	315	Minor Arterial
Bailey Hill Road	Warren St to Eugene UGB	Construct to Eugene's minor arterial standards, including two travel lanes, center turn lane, and bike lanes, planter strip, and sidewalks on both sides (currently a 2-lane roadway)	Eugene, Lane County	Non-exempt	$9,200,000	2020-2024	$8,923,375	$10,082,398	1.6	343	Minor Arterial
Bethel Drive	Highway 99 to Roosevelt Blvd	Upgrade to 2-lane urban facility (currently a 2-lane roadway without sidewalks; modify to include sidewalks and bike lanes)	Eugene	Exempt 40 CFR 93.126, Safety – Widen lanes/resurfacing; Air Quality – Bike and ped facilities	$11,800,000	2025-2029	$13,332,656	$15,064,382	1.68	414	Minor Collector
Royal Avenue	Green Hill Road to Terry Street	Upgrade to minor arterial standards with two travel lanes, center turn lane, bike lanes, sidewalks on both sides, and planting strips (currently a 2-lane roadway)	Eugene	Non-exempt	$11,200,000	2020-2024	$10,863,240	$12,274,223	1.01	481	Minor Arterial
Hunsaker Lane / Beaver Street	River Road to Division Avenue	Upgrade to major collector standards with two travel lanes, bike lanes, sidewalks on both sides, and planting strips (currently a 2-lane roadway)	Lane County, Eugene	Non-exempt	$9,300,000	2020-2024	$9,020,369	$10,191,989	1.14	527	Major Collector
Wilkes Drive	River Road to River Loop 1	Upgrade to major collector standards with two travel lanes, center turn lane, bike lanes, sidewalks on both sides, and planting strips (currently a 2-lane roadway)	Lane County, Eugene	Non-exempt	$7,000,000	2025-2029	$7,909,203	$8,936,498	0.93	554	Major Collector
North Gilham Road	Ayres Road to Ashbury Drive	Upgrade to minor arterial standards with two travel lanes, center turn lane, bike lanes, sidewalks on both sides, and planting strips (currently a 2-lane roadway)	Eugene, Lane County	Non-exempt	$1,500,000	2020-2024	$1,454,898	$1,643,869	0.3	662	Minor Collector
County Farm Road	North-to-South Section	Upgrade to major collector standards with two travel lanes, center turn lane, bike lanes, sidewalks on both sides, and planting strips (currently a 2-lane roadway)	Lane County, Eugene	Non-exempt	$4,400,000	2025-2029	$4,267,701	$4,822,016	0.62	631	Major Collector
County Farm Road	West-to-East Section	Upgrade to major collector standards with two travel lanes, center turn lane, bike lanes, sidewalks on both sides, and planting strips (currently a 2-lane roadway)	Eugene	Non-exempt	$3,200,000	2025-2029	$3,615,635	$4,085,256	0.53	632	Major Collector
Goodpasture Island Road	Delta Highway to Happy Lane	Upgrade to minor arterial standards with two travel lanes, center turn lane, bike lanes, sidewalks on both sides, and planting strips (currently a 2-lane roadway)	Eugene	Non-exempt	$163,000	2030-2034	$214,544	$242,410	0.19	664	Minor Arterial
Fox Hollow Road	Donald Street to the UGB	Upgrade Fox Hollow Rd consistent with major collector standards	Eugene, Lane County	Exempt 40 CFR 93.126, Safety – Widen lanes/resurfacing; Air Quality – Bike and ped facilities	$5,700,000	2030-2034	$7,502,445	$8,476,909	0.9	382	Major Collector
				Project Category Subtotal	$135,618,000		$153,440,774	$174,078,131			

**Note: Air quality status is based on planning level project description available from lead agencies and the project site's existing conditions. IAC will review all projects at the time of project development, scoping, and design for determination of project level conformity and hot spot analysis.*

PROJECT CATEGORY: STUDY										
Name	Geographic Limits	Description	Primary Jurisdiction	Air Quality Status*	Est. Cost (2021)	Est. Year of Construction (4-Year Window)	Year of Construction Cost Range		Length	RTP #
Interchange Area Management Plan at OR126E (Expressway) and Main St	Interchange of OR 126E at Main Street in Springfield	The Interchange Area Management Plan (IAMP) will establish an agreement between the City of Springfield and ODOT regarding transportation solutions and/or land use/policy actions needed at this interchange area and how to best balance and manage transportation and land use issues over time. The IAMP is a tool in protecting the function and operations of the state highway interchanges and the supporting local street network.	ODOT, Springfield	**Exempt** 40 CFR 93.126, Other – Planning and technical studies	$250,000	2025-2029	$282,472	$319,161	1.5	96
OR126 Expressway Management Plan	I-5 to Main Street in Springfield	The facility plan will establish an agreement between the City of Springfield and ODOT for managing access on OR 126 Expressway between I-5 and Main Street in Springfield.	ODOT, Springfield	**Exempt** 40 CFR 93.126, Other – Planning and technical studies	$750,000	2030-2034	$987,164	$1,115,383	6.5	835
Main Street/Highway 126	I-5 east to Springfield UGB	The facility plan will establish an agreement between the City of Springfield and ODOT for managing access on Main Street/Highway 126 between I-5 and the Springfield UGB.	Springfield, ODOT	**Exempt** 40 CFR 93.126, Other – Planning and technical studies	$150,000	2020-2024	$145,490	$164,387	6	838
Study to assess multimodal improvements at Beltline Highway and Gateway	Gateway Street between International Way and Gateway Loop	Assess, evaluate, and identify multimodal improvements for Gateway Street at Beltline Highway.	Springfield, ODOT	**Exempt** 40 CFR 93.126, Other – Planning and technical studies	$800,000	2020-2024	$775,946	$876,730	0.36	608
Circulation study at Pioneer Parkway/Q Street/Laura Street	Pioneer Parkway/Q Street/Laura Street	Circulation study to improve safety, access, and capacity at Pioneer Parkway/Q Street/Laura Street	Springfield, ODOT	**Exempt** 40 CFR 93.126, Other – Planning and technical studies)	$300,000	2025-2029	$338,966	$382,993	0.35	718
Main Street (OR126B) crossing study	OR 126 between 5th Street and 15th Street	Study a new crossing of OR 126 between 5th Street and 15th Street	Springfield, ODOT	**Exempt** 40 CFR 93.126, Other – Planning and technical studies	$200,000	2035-2040	$306,656	$357,227	0.79	823
Centennial Boulevard operational improvements study	Centennial Boulevard from Prescott Lant to Mill Street	Operational improvements study of Centennial Boulevard between Prescott Lane and Mill Street	Springfield	**Exempt** 40 CFR 93.126, Other – Planning and technical studies	$100,000	2030-2034	$131,622	$148,718	0.29	818
Pioneer Parkway at Centennial Boulevard Intersection Study	Pioneer Parkway at Centennial Boulevard	Intersection study to improve pedestrian safety at the intersection of Pioneer Parkway and Centennial Boulevard	Springfield	**Exempt** 40 CFR 93.126, Other – Planning and technical studies	$75,000	2020-2024	$72,745	$82,193	0	849
Centennial Boulevard operational improvements study	Centennial Boulevard from Mohawk Boulevard to Pioneer Parkway	Operational improvements study of Centennial Boulevard between Mohawk Boulevard and Pioneer Parkway	Springfield	**Exempt** 40 CFR 93.126, Other – Planning and technical studies	$75,000	2020-2024	$72,745	$82,193	1.08	819
Mohawk Boulevard/Olympic Street/18th Street/Centennial Triangle study of safety and operational improvements	Mohawk Boulevard/Olympic Street/18th Street/Centennial triangle	Study of safety and operational improvements at the Mohawk Boulevard/Olympic Street/18th Street/Centennial triangle	Springfield	**Exempt** 40 CFR 93.126, Other – Planning and technical studies	$100,000	2020-2024	$96,993	$109,591	0.9	916
Bridge Study at the Walnut Road/West D Street to Glenwood Boulevard/Franklin Boulevard intersection	Intersection of Walnut Road/West D Street to Glenwood Boulevard/Franklin Boulevard	Study of a new bridge at the Walnut Road/West D Street to Glenwood Boulevard/Franklin Boulevard intersection	Springfield	**Exempt** 40 CFR 93.126, Other – Planning and technical studies	$750,000	2035-2040	$1,149,960	$1,339,602	0.28	815
Main Street/South A Street Study	Main Street/South A from Mill Street to 21st Street	Study of multimodal improvements from on Main Street/South A Street from Mill Street to 21st Street	Springfield	**Exempt** 40 CFR 93.126, Other – Planning and technical studies	$150,000	2020-2024	$145,490	$164,387	2.98	824
Glenwood Industrial Area Refinement Study	Glenwood industrial area	Refinement study specific to the Glenwood Industrial Area	Springfield	**Exempt** 40 CFR 93.126, Other – Planning and technical studies	$150,000	2030-2034	$197,433	$223,077	0.82	829
Glenwood – Dorris Ranch pedestrian and bicycle bridge study	Across the Willamette River between Glenwood and Dorris Ranch	Study a new pedestrian bicycle bridge crossing the Willamette River and connecting Glenwood and Dorris Ranch	Springfield	**Exempt** 40 CFR 93.126, Other – Planning and technical studies	$750,000	2035-2040	$1,149,960	$1,339,602	0.08	831
Main Street (OR126B)	Facility Plan	20th St to 72nd St	Springfield, ODOT	**Exempt** 40 CFR 93.126, Other – Planning and technical studies	$1,000,000	In progress	$912,481	$1,031,000	2.23	917
South 28th Street to South 32nd Street East/west connectivity study	Between South 28th Street and South 32nd Street (South of Main Street)	Study opportunities for east/west connectivity between South 28th Street and South 32nd street (south of Main Street)	Springfield	**Exempt** 40 CFR 93.126, Other – Planning and technical studies	$100,000	2025-2029	$112,989	$127,664	0.33	918
Study crossing of OR 126 near Thurston	OR 126 near Thurston High School	Study a new crossing of OR 126 Near Thurston High School	Springfield, ODOT	**Exempt** 40 CFR 93.126, Other – Planning and technical studies	$200,000	2025-2029	$225,977	$255,329	0.32	26
Connectivity Study south of OR 126 and Jessica Street	South of OR 126 and adjacent to Springfield's eastern UGB (see Springfield TSP, Figure 8: Transit and Study Projects, Project S-16)	Study connectivity options for the area of Springfield south of OR 126 and along the eastern UGB	Springfield	**Exempt** 40 CFR 93.126, Other – Planning and technical studies	$100,000	2030-2034	$131,622	$148,718	1.89	31

River Crossings	Along the Willamette River	Study ways to increase capacity over the Willamette River to address bridge crossing congestion issues including improvements to an aging Ferry Street Bridge structure and investigation of transit route options for access into downtown via or around the Ferry Street Bridge in conjunction with either Martin Luther King Jr. Boulevard or Coburg Road transit improvements.	Eugene	Exempt 40 CFR 93.126, Other – Planning and technical studies	$100,000	2025-2029	$112,989	$127,664	…	TBD**
Improvements to North-South travel and circulation south of downtown Eugene	Downtown Eugene to South Eugene	Evaluate north/south circulation options on the Oak/Pearl and Hilyard/Patterson Streets couplets.	Eugene	Exempt 40 CFR 93.126, Other – Planning and technical studies	$100,000	2025-2029	$112,989	$127,664	5.49	210
I-105 off-ramp study	I-105 at 6th Avenue	Analyze options to address weaving, operational and safety considerations at the I-105 southbound off-ramp onto 6th Avenue	ODOT, Eugene	Exempt 40 CFR 93.126, Other – Planning and technical studies	$100,000	2025-2029	$112,989	$127,664	0.44	102
Northwest Expressway study of safety and functionality	Northwest Expressway at the Randy Pape Beltline Highway Ramp termini and other locations	Study opportunities to improve the safety and functionality of Northwest Expressway as a major arterial street including by making intersection improvements at the Randy Pape Beltline Highway ramp termini and other locations, by improving signage, and by making other changes to the street	ODOT, Eugene, Lane County	Exempt 40 CFR 93.126, Other – Planning and technical studies	$100,000	2025-2029	$112,989	$127,664	0.35	557
Green Hill Road design study	Entire length of Greenhill Road	Study to determine preferred design solution for the entire corridor	Lane County, Eugene	Exempt 40 CFR 93.126, Other – Planning and technical studies	$500,000	2025-2029	$564,943	$638,321	4.27	485, 454
Beltline Highway environmental study	River Road to Delta Highway	Environmental Study	ODOT	Exempt 40 CFR 93.126, Other – Planning and technical studies	$2,000,000	2018-2021	$1,824,963	$2,000,000	3.46	555
Coburg Freight Connector Study	North of the city of Coburg between Coburg Road and I-5	Study to determine alignment for a new east-west freight route connection between Coburg Rd and I-5, north of the city of Coburg	Lane County, Coburg, ODOT	Exempt 40 CFR 93.126, Other – Planning and technical studies	$250,000	2020-2024	$242,483	$273,978	NA	TBD**
Goshen North Connector Study	McVay Highway to Goshen limits	Implement a study to identify the location of a road that provides local walking, bicycling, and transit use as an alternative of I-5.	Lane County	Exempt 40 CFR 93.126, Other – Planning and technical studies	$415,000	2025-2029	$468,903	$529,807	NA	TBD**
Autzen-UO Campus Gondola/Aerial Tram Study	UO Campus to Autzen Stadium Complex	Study the feasibility of a gondola or aerial tram to connect the University of Oregon to the Autzen Stadium area.	University of Oregon, Eugene	Exempt 40 CFR 93.126, Other – Planning and technical studies	$150,000	2020-2024	$145,490	$164,387	1	TBD**
Ferry Street Bridge Circulation Study	Ferry Street Bridge to Broadway	Evaluate ending the Ferry Street Bridge Viaduct at 6th Avenue to better connect with the downtown street grid	Eugene	Exempt 40 CFR 93.126, Other – Planning and technical studies	$200,000	2025-2029	$225,977	$255,329	NA	TBD**
Lower Coburg Road Traffic Flow Study	Oakway Road to Ferry Street Bridge	Study to develop design concepts for making traffic flow better for all modes on lower Coburg Road	Eugene	Exempt 40 CFR 93.126, Other – Planning and technical studies	$200,000	2020-2024	$193,986	$219,183	NA	TBD**
				Project Category Subtotal	$10,115,000		$10,644,026	$12,329,808		

Note: Air quality status is based on planning level project description available from lead agencies and the project site's existing conditions. IAC will review all projects at the time of project development, scoping, and design for determination of project level conformity and hot spot analysis.

***Note: These projects were added after the maps and the analysis were complete. However, these projects will be included in future mapping and analysis.*

PROJECT CATEGORY: TRANSIT ORIENTED DEVELOPMENT IMPLEMENTATION

Name	Geographic Limits	Description	Primary Jurisdiction	Air Quality Status*	Est. Cost (2021)	Est. Year of Construction (4-Year Window)	Year of Construction Cost Range	
Planning	Various Locations	Planning for implementation of Key Corridor/Mixed Use development	Eugene	Exempt 40 CFR 93.126, Other – Planning activities conducted pursuant to titles 23 and 49 U.S.C.	$3,100,000	2020-2024	$3,006,790	$3,397,330
Planning	Various Locations	Planning for implementation of Key Corridor/Mixed Use development	Springfield	Exempt 40 CFR 93.126, Other – Planning activities conducted pursuant to titles 23 and 49 U.S.C.	$3,100,000	2020-2024	$3,006,790	$3,397,330
				Project Category Subtotal	$6,200,000		$6,013,580	$6,794,660

Note: Air quality status is based on planning level project description available from lead agencies and the project site's existing conditions. IAC will review all projects at the time of project development, scoping, and design for determination of project level conformity and hot spot analysis.

CONSTRAINED PROJECTS: TRANSIT

PROJECT CATEGORY: BUSES AND BUS MAINTENANCE

Name	Geographic Limits	Description	Primary Jurisdiction	Air Quality Status*	Est. Cost (2021)	Est. Year of Construction (4-Year Window)	Year of Construction Cost Range		Length	RTP #
Bus Purchases	N/A	Purchase of new buses for fleet expansion and for bus replacement buses	Lane Transit District	Exempt 40 CFR 93.126, Mass Transit – Purchase of new buses	$67,790,000	2021-2025	$67,790,000	$76,594,978	-	1110
Bus Purchases	N/A	Purchase of new buses for fleet expansion and for bus replacement buses	Lane Transit District	Exempt 40 CFR 93.126, Mass Transit – Purchase of new buses	$31,460,000	2026-2030	$36,648,149	$41,408,234	-	1110
Bus Purchases	N/A	Purchase of new buses for fleet expansion and for bus replacement buses	Lane Transit District	Exempt 40 CFR 93.126, Mass Transit – Purchase of new buses	$55,000,000	2031-2035	$74,636,170	$84,330,370	-	1110
Bus Purchases	N/A	Purchase of new buses for fleet expansion and for bus replacement buses	Lane Transit District	Exempt 40 CFR 93.126, Mass Transit – Purchase of new buses	$55,000,000	2036-2040	$86,944,611	$98,237,506	-	1110
Bus Purchases	N/A	Purchase of new buses for fleet expansion and for bus replacement buses	Lane Transit District	Exempt 40 CFR 93.126, Mass Transit – Purchase of new buses	$55,000,000	2041-2045	$101,282,869	$114,438,105	-	1110
				Project Category Subtotal	$264,250,000		$367,301,799	$415,009,193		

**Note: Air quality status is based on planning level project description available from lead agencies and the project site's existing conditions. IAC will review all projects at the time of project development, scoping, and design for determination of project level conformity and hot spot analysis.*

PROJECT CATEGORY: FREQUENT TRANSIT NETWORK

Name	Geographic Limits	Description	Primary Jurisdiction	Air Quality Status*	Est. Cost (2021)	Est. Year of Construction (4-Year Window)	Year of Construction Cost Range		Length	RTP #
Enhanced Corridor	Study corridors include: Highway 99, River Road, Coburg Road, Martin Luther King Jr. Boulevard/Centennial Boulevard, 30th Avenue/Lane Community College, Main Street - McVay Highway, Valley River Center	LTD system improvements to safety, addressing operational issues related to travel time and improvements to passenger amenities	Lane Transit District	Non-Exempt	$25,000,000	2021-2025	$25,000,000	$28,247,152	-	1117
Enhanced Corridor		LTD system improvements to safety, addressing operational issues related to travel time and improvements to passenger amenities	Lane Transit District	Non-Exempt	$25,000,000	2026-2030	$29,122,814	$32,905,462	-	1117
Enhanced Corridor		LTD system improvements to safety, addressing operational issues related to travel time and improvements to passenger amenities	Lane Transit District	Non-Exempt	$25,000,000	2031-2035	$33,925,532	$38,331,986	-	1117
Enhanced Corridor		LTD system improvements to safety, addressing operational issues related to travel time and improvements to passenger amenities	Lane Transit District	Non-Exempt	$25,000,000	2036-2040	$39,520,278	$44,653,412	-	1117
Bus Rapid Transit (EmX)		EmX system improvements to safety, addressing operational issues related to travel time and improvements to EmX passenger amenities	Lane Transit District	Non-Exempt	$65,000,000	2021-2025	$65,000,000	$73,442,596	-	1115
Bus Rapid Transit (EmX)		EmX system improvements to safety, addressing operational issues related to travel time and improvements to EmX passenger amenities	Lane Transit District	Non-Exempt	$65,000,000	2026-2030	$75,719,316	$85,554,202	-	1115
Bus Rapid Transit (EmX)		EmX system improvements to safety, addressing operational issues related to travel time and improvements to EmX passenger amenities	Lane Transit District	Non-Exempt	$65,000,000	2031-2035	$88,206,382	$99,663,164	-	1115
Bus Rapid Transit (EmX)		EmX system improvements to safety, addressing operational issues related to travel time and improvements to EmX passenger amenities	Lane Transit District	Non-Exempt	$65,000,000	2036-2040	$102,752,722	$116,098,871	-	1115
				Project Category Subtotal	$360,000,000		$459,247,044	$518,896,845		

**Note: Air quality status is based on planning level project description available from lead agencies and the project site's existing conditions. IAC will review all projects at the time of project development, scoping, and design for determination of project level conformity and hot spot analysis.*

PROJECT CATEGORY: GENERAL STOPS AND STATIONS										
Name	Geographic Limits	Description	Primary Jurisdiction	Air Quality Status*	Est. Cost (2021)	Est. Year of Construction (4-Year Window)	Year of Construction Cost Range		Length	RTP #
Passenger Boarding Improvements	Various	Ongoing effort to maintain and/or improve the passenger boarding experience. Improvements include additions or replacements of pads, benches, and shelters	Lane Transit District	Exempt 40 CFR 93.126, Mass Transit – Construction of small passenger shelters and information kiosks. Other – Transportation enhancement activities	22,975,000	2021-2025	$22,975,000	$25,959,133	-	1130
Passenger Boarding Improvements	Various	Ongoing effort to maintain and/or improve the passenger boarding experience. Improvements include additions or replacements of pads, benches, and shelters	Lane Transit District	Exempt 40 CFR 93.126, Mass Transit – Construction of small passenger shelters and information kiosks. Other – Transportation enhancement activities	$14,000,000	2026-2030	$16,308,776	$18,427,059	-	1130
Passenger Boarding Improvements	Various	Ongoing effort to maintain and/or improve the passenger boarding experience. Improvements include additions or replacements of pads, benches, and shelters	Lane Transit District	Exempt 40 CFR 93.126, Mass Transit – Construction of small passenger shelters and information kiosks. Other – Transportation enhancement activities	$12,700,000	2031-2035	$17,234,170	$19,472,649	-	1130
Passenger Boarding Improvements	Various	Ongoing effort to maintain and/or improve the passenger boarding experience. Improvements include additions or replacements of pads, benches, and shelters	Lane Transit District	Exempt 40 CFR 93.126, Mass Transit – Construction of small passenger shelters and information kiosks. Other – Transportation enhancement activities	$20,700,000	2036-2040	$32,722,790	$36,973,025	-	1130
Passenger Boarding Improvements	Various	Ongoing effort to maintain and/or improve the passenger boarding experience. Improvements include additions or replacements of pads, benches, and shelters	Lane Transit District	Exempt 40 CFR 93.126, Mass Transit – Construction of small passenger shelters and information kiosks. Other – Transportation enhancement activities	$12,700,000	2041-2045	$23,387,135	$26,424,799	-	1130
				Project Category Subtotal	$83,075,000		$112,627,871	$127,256,665		

**Note: Air quality status is based on planning level project description available from lead agencies and the project site's existing conditions. IAC will review all projects at the time of project development, scoping, and design for determination of project level conformity and hot spot analysis.*

CONSTRAINED PROJECTS: BIKE/PED

PROJECT CATEGORY: MULTI-USE PATHS WITHOUT ROAD PROJECT											
Name	Geographic Limits	Description	Primary Jurisdiction	Air Quality Status*	Est. Cost (2021)	Est. Year of Construction (4-Year Window)	Year of Construction Cost Range		Length	RTP #	Federal Functional Class
Coburg Loop Phase IV	Starts from the "bend" in segment 2; north along the west side of North Coburg Industrial Way; connecting to the Trails End Park	Construct a new multi-Use Path	Coburg	Outside PM10 air quality maintenance area	$800,000	2020-2024	$775,946	$876,730	475	1005	...
McKenzie River Path	42nd Street to 52nd Street	Construct a new multi-use 12 foot wide path from the existing McKenzie Levee path at 42nd St to 52nd St	Springfield	Exempt 40 CFR 93.126, Air Quality – Bike and ped facilities	$3,700,000	2025-2029	$4,180,579	$4,723,578	1.55	753	Other urban Freeways and Expressways
McKenzie Gateway Path	Extend existing Path to Maple Island Road	Construct a new multi-use 12-foot wide path from the end of the existing Riverbend Hospital path to Maple Island Road	Springfield	Exempt 40 CFR 93.126, Air Quality – Bike and ped facilities	$3,000,000	2030-2034	$3,948,655	$4,461,531	1.3	759	...
Booth Kelly Road	South 28th Street to South 49th Place	Construct a new multi-use 12-foot wide path from South 28th St to South 49th St	Springfield	Exempt 40 CFR 93.126, Air Quality – Bike and ped facilities	$2,817,000	2020-2024	$2,732,299	$3,087,186	2.14	921	...
Glenwood Area Willamette River Path (A)	From end of existing path, east of I-5, to Willamette River bridges	Construct a new multi-use 12-foot wide path from the end of the existing path, east of I-5 to Willamette River bridges	Springfield, Willamalane	Exempt 40 CFR 93.126, Air Quality – Bike and ped facilities	$2,500,000	2020-2024	$2,424,830	$2,739,782	1.22	851	...
Springfield - Mt. Pisgah Connector	Middle Fork Path to Buford Park Road	Construct a new multi-Use Path and bridge across the Willamette River	Willamalane, Lane County, Springfield	Exempt 40 CFR 93.126, Air Quality – Bike and ped facilities	$4,423,000	2030-2034	$5,821,634	$6,577,784	2.78	960	...
New multi-use path	Flamingo Avenue to Gateway Street south of Game Bird Park	Construct a new 12-foot wide multi-use path	Springfield	Exempt 40 CFR 93.126, Air Quality – Bike and ped facilities	$70,000	2025-2029	$79,092	$89,365	0.23	711	...
Wayside Loop	Manor Drive to Riverbend Path	Construct a new multi-use 12-foot wide path from Wayside Lane/Ann Court to the existing Sacred Heart Medical Center-Riverbend path	Springfield	Exempt 40 CFR 93.126, Air Quality – Bike and ped facilities	$80,000	2025-2029	$90,391	$102,131	0.1	759	...
Anderson Lane	By-Gully path to Centennial Blvd.	Add signing and striping on Anderson St and West Quinalt St for bicycle facilities and construct 12-foot wide multi-use path between Anderson Lane and Quinalt St	Springfield	Exempt 40 CFR 93.126, Air Quality – Bike and ped facilities	$90,000	2030-2034	$118,460	$133,846	0.59	813	...
Glenwood Bicycle / Pedestrian Bridge	Downtown Springfield and Glenwood	Build bridge between Downtown Springfield and Glenwood or modify existing Willamette River Bridges	Springfield	Exempt 40 CFR 93.126, Air Quality – Bike and ped facilities	$10,300,000	2020-2024	$9,990,301	$11,287,902	0.22	804	...
Haul Road	Daisy Street to Booth Kelly Road	Construct a new multi-use 12-foot-wide path in the Haul Road right-of-way	Springfield	Exempt 40 CFR 93.126, Air Quality – Bike and ped facilities	$326,000	2020-2024	$316,198	$357,268	0.14	20	...
Haul Road Path	South 49th Place to UGB	Construct a new multi-use 12-foot-wide path	Springfield	Exempt 40 CFR 93.126, Air Quality – Bike and ped facilities	$3,600,000	2030-2034	$4,738,387	$5,353,837	3.32	21	...
Glenwood Area Willamette River Path (B)	Springfield Bridges to Seavey Loop Road	Construct a new multi-use path	Springfield	Exempt 40 CFR 93.126, Air Quality – Bike and ped facilities	$2,900,000	2025-2029	$3,276,670	$3,702,263	1.59	854	...
Fern Ridge West Connector	Royal Street to Fern Ridge Path	Construct a new multi-use path	Eugene, Lane County	Exempt 40 CFR 93.126, Air Quality – Bike and ped facilities	$125,000	2020-2024	$121,242	$136,989	0.8	426	
Spring Boulevard Connector	Central Boulevard to Spring Boulevard	Construct a new shared use path	Eugene	Exempt 40 CFR 93.126, Air Quality – Bike and ped facilities	$554,000	2025-2029	$625,957	$707,260	0.22	281	...
Avalon Street	Candlelight Drive to N Danebo	Construct a new multi-use path	Eugene	Exempt 40 CFR 93.126, Air Quality – Bike and ped facilities	$87,000	2030-2034	$114,511	$129,384	0.36	403	...
West Bank Path Completion	Formac to Owosso Bridge	Construct new concrete multi-use path for Riverbank trail system	Eugene	Exempt 40 CFR 93.126, Air Quality – Bike and ped facilities	$900,000	2036-2040	$872,939	$986,322	0.59	556	...
South Bank Path	Autzen Connector to Rail underpass	Construct a new multi-use path	Eugene	Exempt 40 CFR 93.126, Air Quality – Bike and ped facilities	$5,770,000	2036-2040	$5,596,508	$6,323,417	0.51	169	...

PROJECT CATEGORY: MULTI-USE PATHS WITHOUT ROAD PROJECT											
Name	Geographic Limits	Description	Primary Jurisdiction	Air Quality Status*	Est. Cost (2021)	Est. Year of Construction (4-Year Window)	Year of Construction Cost Range		Length	RTP #	Federal Functional Class
E. 30th Avenue Path	Hilyard to Spring	Construct a new multi-use path	Eugene	Exempt 40 CFR 93.126, Air Quality – Bike and ped facilities	$2,749,000	2025-2029	$3,106,057	$3,509,490	1.16	209	Minor Arterial
W. 7th Avenue Path	W. 5th Avenue to Garfield Street	Construct a new multi-use path	Eugene	Exempt 40 CFR 93.126, Air Quality – Bike and ped facilities	$951,000	2025-2029	$1,074,522	$1,214,087	0.4	101	Other urban Freeways and Expressways
I-5 Off-Ramp Path	South Bank Path to Riverview Street	Construct a new multi-use path	Eugene	Exempt 40 CFR 93.126, Air Quality – Bike and ped facilities	$639,000	2025-2029	$721,997	$815,775	0.32	189	Other urban Freeways and Expressways
W. Amazon Drive Path	Martin Street to southern section of W. Amazon Drive	Construct a new multi-use path	Eugene	Exempt 40 CFR 93.126, Air Quality – Bike and ped facilities	$709,000	2030-2034	$687,682	$777,002	0.36	212	…
Division Avenue Sidewalk Path	Lone Oak Ave. to Beaver Street	Construct a new multi-use path	Eugene	Exempt 40 CFR 93.126, Air Quality – Bike and ped facilities	$701,000	2025-2029	$792,050	$894,926	0.54	512	Other urban Freeways and Expressways
Franklin Boulevard Sidewalk Path	Alder Street to Millrace Park Path	Construct a new multi-use path	Eugene	Exempt 40 CFR 93.126, Air Quality – Bike and ped facilities	$273,000	2025-2029	$308,459	$348,523	0.18	122	Other Urban Principal Arterial
West Bank Path Extension	Division Avenue (at Beaver Street) to Wilkes Drive	Construct new concrete multi-use path to extend Riverbank path system	Eugene	Exempt 40 CFR 93.126, Air Quality – Bike and ped facilities	$3,209,000	2025-2029	$3,112,512	$3,516,784	1.62	564	Urban Collector
Beaver-Wilkes Multi-Use Path	Beaver Street to Wilkes Drive along Eugene's UGB	Construct a separated multi-use path facility	Lane County	Exempt 40 CFR 93.126, Air Quality – Bike and ped facilities	$2,700,000	2025-2029	$3,050,692	$3,446,935	2	170	…
Bob Straub Parkway	57th Street to Jasper Road	Construct multi-use path on both sides of Bob Straub Parkway	Lane County	Exempt 40 CFR 93.126, Air Quality – Bike and ped facilities	$ 3,000,000	2030-2035	$3,948,655	$4,599,838	1.6	410	Minor Arterial
Berkley Park Path	Wilson Street to Fern Ridge Path	Construct a new multi-use path	Eugene	Exempt 40 CFR 93.126, Air Quality – Bike and ped facilities	$521,825	2025-2029	$589,603	$666,184	0.13	TBD**	…
River Road/Santa Clara Pedestrian & Bicycle Bridge	Grove Street to Ruby Avenue	Construct a new pedestrian and bicycle bridge	Eugene	Exempt 40 CFR 93.126, Air Quality – Bike and ped facilities	$12,000,000	2025-2029	$13,558,633	$15,319,711	0.20	TBD**	…
North Delta Path	East side of north Delta Road from Stapp Drive to Ayres Road	Construct a new multi-use path	Eugene	Exempt 40 CFR 93.126, Air Quality – Bike and ped facilities	$600,000	2020-2024	$581,959	$657,548	0.44	TBD**	…
				Project Category Subtotal	$70,094,825		$77,357,420	$87,543,378			

Note: Air quality status is based on planning level project description available from lead agencies and the project site's existing conditions. IAC will review all projects at the time of project development, scoping, and design for determination of project level conformity and hot spot analysis.

***Note: These projects were added after the maps and the analysis were complete. However, these projects will be included in future mapping and analysis.*

PROJECT CATEGORY: MULTI-USE PATHS WITH ROAD PROJECT											
Name	Geographic Limits	Description	Primary Jurisdiction	Air Quality Status *	Est. Cost (2021)	Est. Year of Construction (4-Year Window)	Year of Construction Cost Range		Length	RTP #	Federal Functional Class
Beaver Street –Hunsaker Lane	Division Ave to River Road	Construct consistent with Beaver-Hunsaker Corridor Study recommendations	Lane County, Eugene	Exempt 40 CFR 93.126, Air Quality – Bike and ped facilities	$9,300,000	2020-2024	$9,020,369	$10,191,989	1.5	173	…
				Project Category Subtotal	$9,300,000		$9,020,369	$10,191,989			

Note: Air quality status is based on planning level project description available from lead agencies and the project site's existing conditions. IAC will review all projects at the time of project development, scoping, and design for determination of project level conformity and hot spot analysis.

PROJECT CATEGORY: ON-STREET LANES OR ROUTES WITH ROAD PROJECT*											
Name	Geographic Limits	Description: Lane or Route Component of Road Project	Primary Jurisdiction	Air Quality Status*	Est. Cost for Entire Project (2021)	Est. Year of Construction (4-Year Window)	Year of Construction Cost Range		Length	RTP #*	Federal Functional Class
Aspen Street	Menlo Loop to West D Street	Stripe bicycle lanes on the roadway	Lane County, Springfield	See project 809					0.58	809	Minor Collector
42nd Street	Marcola Road to Railroad Tracks	Striped bicycle lane on the roadway	Springfield	See project 713					1.1	713	Minor Arterial
Extend South 48th St to Daisy St	Daisy St and South 48th St	Extend S. 48th St with a two-lane cross-section with a parallel multi-use 12-foot wide path and roundabout intersection treatment at Daisy St and 48th St	Springfield	See project 901					0.3	901	...
28th Street	Centennial Boulevard to Main Street	Stripe bicycle lanes on the roadway	Springfield	See project 909					0.7	909	Urban Collector
35th Street	Olympic Street to Commercial Avenue	Stripe bicycle lanes on the roadway	Springfield	See project 918					0.57	918	Urban Collector
Commercial Street	35th Street to 42nd Street	Stripe bicycle lanes on the roadway	Springfield	See project 933					0.7	933	Urban Collector
S. 28th Street	Main St to South F St	Stripe bicycle lanes on the roadway	Springfield	See project 945					0.51	945	Urban Collector
21st Street	D Street to Main Street	Stripe bicycle lanes on the roadway	Springfield	See project 962					0.2	962	Minor Collector
Green Hill Road	Barger Drive to West 11th Avenue	Stripe bicycle lanes on the roadway	Lane County, Eugene	See project 454					2.27	454	Minor Arterial
				Project Category Subtotal	NA (part of larger project)		NA (part of larger project)	NA (part of larger project)			

Note: Air quality status is based on planning level project description available from lead agencies and the project site's existing conditions. IAC will review all projects at the time of project development, scoping, and design for determination of project level conformity and hot spot analysis.

PROJECT CATEGORY: ON-STREET LANES OR ROUTES WITHOUT ROAD PROJECT											
Name	Geographic Limits	Description	Primary Jurisdiction	Air Quality Status*	Est. Cost (2021)	Est. Year of Construction (4-Year Window)	Year of Construction Cost Range		Length	RTP #	Federal Functional Class
66th Street	Thurston Road to Main Street	Stripe bicycle lanes on the roadway	Springfield	Exempt 40 CFR 93.126, Air Quality – Bike and ped facilities	$25,000	2020-2024	$24,248	$27,398	0.55	12	Minor Collector
S. 67th Street	Ivy Street to Main Street	Add shared-use signing and striping and construct sidewalks to fill gaps	Springfield	Exempt 40 CFR 93.126, Air Quality – Bike and ped facilities	$160,000	2025-2029	$180,782	$204,263	0.3	92	Minor Collector
S. 70th Street	Main Street to Ivy Street	Add shared-use signing and striping	Springfield	Exempt 40 CFR 93.126, Air Quality – Bike and ped facilities	$50,000	2025-2029	$56,494	$63,832	0.6	94	Minor Collector
Ivy Street	S. 67th Street to S. 70th Street	Add shared-use signing and striping	Springfield	Exempt 40 CFR 93.126, Air Quality – Bike and ped facilities	$20,000	2030-2034	$26,324	$29,744	0.3	99	Minor Collector
Yolanda Avenue	23rd Street to 31st Street	Stripe bicycle lanes on the roadway	Springfield, Lane County	Exempt 40 CFR 93.126, Air Quality – Bike and ped facilities	$20,000	2016-2019	$17,169	$18,815	0.8	784	Minor Collector
5th Street	Centennial Boulevard to A Street	Add bicycle facility signing and striping	Springfield	Exempt 40 CFR 93.126, Air Quality – Bike and ped facilities	$50,000	2020-2024	$48,497	$54,796	0.35	806	Urban Collector
Mill Street	Centennial Boulevard to Main Street	Restripe for bicycle facilities with signing	Springfield	Exempt 40 CFR 93.126, Air Quality – Bike and ped facilities	$90,000	2020-2024	$87,294	$98,632	0.99	837	Urban Collector
Nugget, 15th, 17th, 19th in Glenwood	Glenwood	Stripe bicycle lanes on the roadway	Lane County	Exempt 40 CFR 93.126, Air Quality – Bike and ped facilities	$160,000	2020-2024	$155,189	$175,346	1.58	845	Minor Collector
Rainbow Drive	Centennial Boulevard to West D Street	Restripe for bicycle facilities with signing	Springfield	Exempt 40 CFR 93.126, Air Quality – Bike and ped facilities	$60,000	2020-2024	$58,196	$65,755	0.55	848	Minor Collector
G Street	5th Street to 28th Street	Stripe bicycle lanes on the roadway	Springfield	Exempt 40 CFR 93.126, Air Quality – Bike and ped facilities	$75,000	2020-2024	$72,745	$82,193	1.6	899	Major Collector
36th Street	Commercial Street to Main Street	Stripe bicycle lanes on the roadway	Springfield	Exempt 40 CFR 93.126, Air Quality – Bike and ped facilities	$3,000,000	2020-2024	$2,909,796	$3,287,738	0.3	939	Minor Collector
48th/G/52nd	High Banks Road to Aster Street	Construct a new multi-use 12-foot wide path from High Banks Road to Aster St.	Springfield	Exempt 40 CFR 93.126, Air Quality – Bike and ped facilities	$1,600,000	2025-2029	$1,807,818	$2,042,628	1.2	6	Urban Collector

PROJECT CATEGORY: ON-STREET LANES OR ROUTES WITHOUT ROAD PROJECT

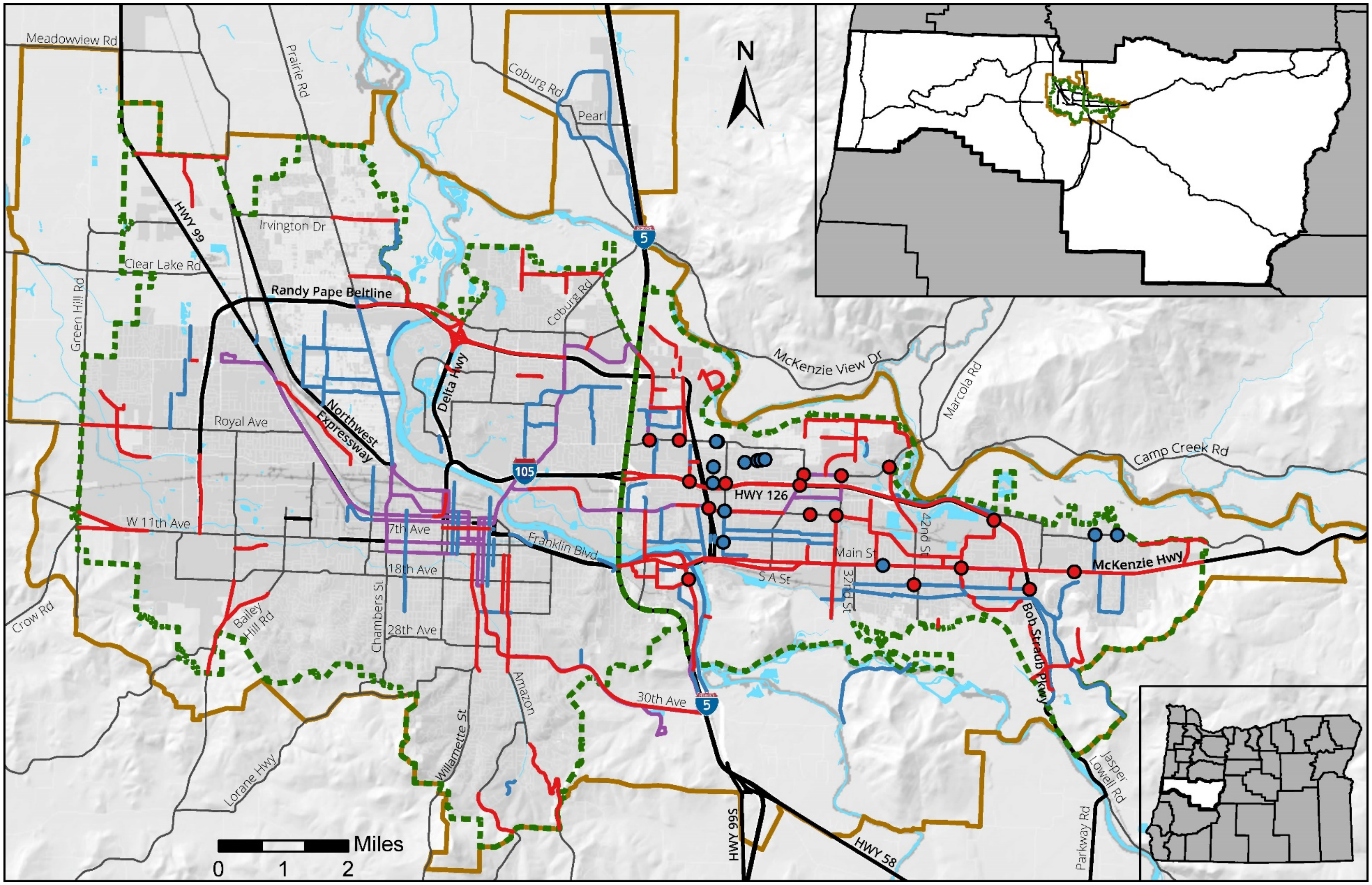
Name	Geographic Limits	Description	Primary Jurisdiction	Air Quality Status*	Est. Cost (2021)	Est. Year of Construction (4-Year Window)	Year of Construction Cost Range		Length	RTP #	Federal Functional Class
Virginia Ave / Daisy Street	South 32nd St to Bob Straub Parkway	Add bicycle facility signing and striping	Springfield	Exempt 40 CFR 93.126, Air Quality – Bike and ped facilities	$130,000	2020-2024	$126,091	$142,469	2.58	903	Major Collector
Pioneer Parkway	Pioneer Parkway at D, E, and F Streets	Add crosswalks on Pioneer Parkway with signage	Springfield	Exempt 40 CFR 93.126, Safety – Pavement marking; Air Quality – Bike and ped facilities	$80,000	2020-2024	$77,595	$87,673	…	299	Major Collector
D, E, or F Streets	5th Street to 28th Street	Add bicycle facility signing and striping	Springfield	Exempt 40 CFR 93.126, Air Quality – Bike and ped facilities	$190,000	2020-2024	$184,287	$208,223	2.52	805	Major Collector
Hartman Lane/Don Street	South of Harlow Road to OR 126	Add signing and striping for bicycle facilities and construct sidewalks to fill gaps	Springfield	Exempt 40 CFR 93.126, Air Quality – Bike and ped facilities	$180,000	2020-2024	$174,588	$197,264	0.55	714	…
Oakdale Street/Pheasant Street/et al.	Game Farm Road to Gateway Road	Add signing and striping for bicycle facilities	Springfield	Exempt 40 CFR 93.126, Air Quality – Bike and ped facilities	$80,000	2016-2019	$68,675	$75,261	1.14	708	Minor Arterial
West D	Mill Street to D Street Path	Add bicycle facility signing and striping	Springfield	Exempt 40 CFR 93.126, Air Quality – Bike and ped facilities	$10,000	2020-2024	$9,699	$10,959	0.36	817	Minor Collector
West D	Aspen Street to D Street Path	Add bicycle facility signing and striping; construct sidewalks to fill gaps	Springfield	Exempt 40 CFR 93.126, Air Quality – Bike and ped facilities	$190,000	2025-2029	$214,678	$242,562	0.49	816	Minor Collector
A Street	5th Street to 10th Street	Restripe for bicycle facilities with signing	Springfield	Exempt 40 CFR 93.126, Air Quality – Bike and ped facilities	$40,000	2020-2024	$38,797	$43,837	0.35	822	Major Collector
33rd Street	V Street to EWEB Path	Add shared-use signing and striping	Springfield	Exempt 40 CFR 93.126, Air Quality – Bike and ped facilities	$10,000	2025-2029	$11,299	$12,766	0.18	724	…
Mountaingate Drive	Mountaingate Entrance to Dogwood Street	Add shared-use signing and striping, construct sidewalks and drainage improvements to fill gaps	Springfield	Exempt 40 CFR 93.126, Air Quality – Bike and ped facilities	$260,000	2030-2024	$342,217	$284,937	0.77	27	Minor Collector
Hayden Bridge Way/Grovedale Drive	Hayden Bridge Way/3rd Street, Hayden Bridge	Add a crosswalk and RRFB	Lane County	Exempt 40 CFR 93.126, Safety – Pavement marking; Air Quality – Bike and ped facilities	$260,000	2025-2029	$293,770	$331,927	0.01	721	Major Collector
EWEB Path	Path crossings of 2nd Street, 9th Street, 11th Street, Rose Blossom Drive, Debra Street, 15th Street, 33rd Street and 35th Street	Improve path crossings to emphasize path priority and improve safety	Springfield	Exempt 40 CFR 93.126, Safety – Pavement marking; Air Quality – Bike and ped facilities	$50,000	2020-2024	$48,497	$54,796	0.76	720	…
2nd Street/Q Street	2nd Street/Q Street	Add a crosswalk with RRFB	Springfield	Exempt 40 CFR 93.126, Safety – Pavement marking; Air Quality – Bike and ped facilities	$90,000	2020-2024	$87,294	$98,632	0	719	Urban Collector
5th Street	At Centennial Boulevard	Add bicycle facilities through the intersection	Springfield	Exempt 40 CFR 93.126, Air Quality – Bike and ped facilities	$560,000	2020-2024	$543,162	$613,711	0	820	Major Collector
5th Street	@ D Street	Add bicycle facility signing and striping to improve visibility	Springfield	Exempt 40 CFR 93.126, Air Quality – Bike and ped facilities	$10,000	2025-2029	$11,299	$12,766	0	821	Major Collector
Main Street	@ 38th Street	Add a mid-block crosswalk with a RRFB	Springfield	Exempt 40 CFR 93.126, Safety – Pavement marking; Air Quality – Bike and ped facilities	$90,000	2030-2034	$118,460	$133,846	0	923	Other Urban Fwys & Expressways
Bob Straub Parkway	@ Daisy Street	Add a pedestrian/bicycle signal and crossing, coordinate with Springfield TSP's R-44	Lane County, Springfield	Exempt 40 CFR 93.126, Safety – Pavement marking; Air Quality – Bike and ped facilities	$90,000	2020-2024	$87,294	$98,632	0	24	Minor Arterial

PROJECT CATEGORY: ON-STREET LANES OR ROUTES WITHOUT ROAD PROJECT

Name	Geographic Limits	Description	Primary Jurisdiction	Air Quality Status*	Est. Cost (2021)	Est. Year of Construction (4-Year Window)	Year of Construction Cost Range		Length	RTP #	Federal Functional Class
Thurston Road	@ 66th Street	Add crosswalk with RRFB	Springfield	Exempt 40 CFR 93.126, Safety – Pavement marking; Air Quality – Bike and ped facilities	$90,000	2025-2029	$101,690	$114,898	0	28	Urban Collector
Thurston Road	69th Street	Add crosswalk with RRFB	Springfield	Exempt 40 CFR 93.126, Safety – Pavement marking; Air Quality – Bike and ped facilities	$90,000	2025-2029	$101,690	$114,898	0	29	Urban Collector
Citywide	Citywide	Install mid-block crossings City-wide with RRFBs	Springfield	Exempt 40 CFR 93.126, Safety – Pavement marking; Air Quality – Bike and ped facilities	$4,400,000	2025-2029	$4,971,499	$5,617,227	0	TBD**	...
Oakway Road	Coburg Road to Cal Young Road	Protected Bike Lane	Eugene	Exempt 40 CFR 93.126, Safety – Pavement marking; Air Quality – Bike and ped facilities	$2,184,000	2025-2029	$2,118,332	$2,393,474	0.96	604	Minor Arterial
Cal Young Road	Willakenzie Road to Oakway Road	Protected Bike Lane	Eugene	Exempt 40 CFR 93.126, Safety – Pavement marking; Air Quality – Bike and ped facilities	$508,000	2025-2029	$492,726	$556,724	0.22	605	Minor Arterial
Willakenzie Road	I-5 Path to Cal Young Road	Protected Bike Lane	Eugene	Exempt 40 CFR 93.126, Safety – Pavement marking; Air Quality – Bike and ped facilities	$3,141,000	2025-2029	$3,046,557	$3,442,262	1.38	607	Urban Collector
River Road	Division Avenue to Northwest Expressway	Protected Bike Lane	Eugene	Exempt 40 CFR 93.126, Safety – Pavement marking; Air Quality – Bike and ped facilities	$4,441,000	2025-2029	$4,307,468	$4,866,949	2.49	565	Urban Principal Arterial
Garfield Street	Roosevelt Boulevard to W. 6th Avenue	Stripe bicycle lanes on the roadway	Eugene	Exempt 40 CFR 93.126, Safety – Pavement marking; Air Quality – Bike and ped facilities	$93,000	2020-2024	$90,204	$101,920	0.68	145	Urban Collector
Lincoln Street	W 5th Ave to W 13th Ave	Protected Bike Lane	Eugene	Exempt 40 CFR 93.126, Safety – Pavement marking; Air Quality – Bike and ped facilities	$1,419,000	2020-2024	$1,376,334	$1,555,100	0.61	161	...
McKinley Street	5th Avenue to 7th Avenue	Stripe bicycle lanes on the roadway	Eugene	Exempt 40 CFR 93.126, Safety – Pavement marking; Air Quality – Bike and ped facilities	$26,000	2020-2024	$25,218	$28,494	0.19	163	Urban Collector
Mill Street	10th Avenue to 15th Avenue	Stripe bicycle lanes on the roadway	Eugene	Exempt 40 CFR 93.126, Safety – Pavement marking; Air Quality – Bike and ped facilities	$91,000	2020-2024	$88,264	$99,728	0.76	166	...
Polk Street	5th Avenue to 18th Avenue	Stripe bicycle lanes on the roadway	Eugene	Exempt 40 CFR 93.126, Safety – Pavement marking; Air Quality – Bike and ped facilities	$250,000	2020-2024	$242,483	$273,978	1.0	175	Urban Collector
High Street	E 6th Avenue to E 19th Avenue	Protected Bike Lane	Eugene	Exempt 40 CFR 93.126, Safety – Pavement marking; Air Quality – Bike and ped facilities	$2,267,000	2020-2024	$2,198,836	$2,484,434	0.99	187	Minor Arterial
High Street	E 4th Avenue to E 6th Avenue	Bike Lane	Eugene	Exempt 40 CFR 93.126, Safety – Pavement marking; Air Quality – Bike and ped facilities	$16,500	2020-2024	$16,004	$18,083	0.15	186	Minor Arterial
8th Avenue	Lincoln St to E Broadway	Protected Bike Lane	Eugene	Exempt 40 CFR 93.126, Air Quality – Bike and ped facilities	$1,221,000	2020-2024	$1,184,287	$1,338,110	0.53	162	Urban Collector

PROJECT CATEGORY: ON-STREET LANES OR ROUTES WITHOUT ROAD PROJECT											
Name	Geographic Limits	Description	Primary Jurisdiction	Air Quality Status*	Est. Cost (2021)	Est. Year of Construction (4-Year Window)	Year of Construction Cost Range		Length	RTP #	Federal Functional Class
E 24th Avenue	Willamette Street to Alder Street	Protected Bike Lane	Eugene	**Exempt** 40 CFR 93.126, Air Quality – Bike and ped facilities	$1,189,000	2020-2024	$1,153,249	$1,303,040	0.52	201	Minor Arterial
Prairie Road	Maxwell Road to Highway 99	Stripe bicycle lanes on the roadway	Eugene	**Exempt** 40 CFR 93.126, Safety – Pavement marking; Air Quality – Bike and ped facilities	$19,000	2020-2024	$18,429	$20,822	0.15	495	Minor Arterial
Gilham Road	Ashbury to Ayers Road	Stripe bicycle lanes on the roadway	Eugene	**Exempt** 40 CFR 93.126, Safety – Pavement marking; Air Quality – Bike and ped facilities	$83,000	2020-2024	$80,504	$90,961	0.61	662	Minor Collector
Valley River Way (A)	Valley River Drive to Valley River Connector	Sidewalk Path	Eugene	**Exempt** 40 CFR 93.126, Air Quality – Bike and ped facilities	$465,000	2025-2029	$451,018	$509,599	0.23	694	Urban Collector
Franklin Blvd.	Brooklyn to Willamette River	Stripe bicycle lanes on the roadway	Springfield	**Exempt** 40 CFR 93.126, Air Quality – Bike and ped facilities	$34,000	2020-2024	$32,978	$37,261	0.25	807	Other Urban Principal Arterial
McVay Highway (OR99)	I-5 to 30th Ave	Stripe bicycle lanes on the roadway	ODOT	**Exempt** 40 CFR 93.126, Air Quality – Bike and ped facilities	$96,000	2020-2024	$93,113	$105,208	0.71	834	Urban Minor Arterial
Highway 99	Prairie Rd to Barger Dr	Stripe bicycle lanes on the roadway	Eugene	**Exempt** 40 CFR 93.126, Air Quality – Bike and ped facilities	$44,000	2020-2024	$42,677	$48,220	0.33	TBD**	Other Freeways and Expressways
				Project Category Subtotal	$31,797,500		$32,055,678	$33,922,791			

**Note: Air quality status is based on planning level project description available from lead agencies and the project site's existing conditions. IAC will review all projects at the time of project development, scoping, and design for determination of project level conformity and hot spot analysis.*
***Note: These projects were added after the maps and the analysis were complete. However, these projects will be included in future mapping and analysis.*



Fiscally Constrained Roadway Projects

Fiscally Constrained Bike/Pedestrian Projects

Fiscally Constrained Roadway Projects

Fiscally Constrained Bike/Pedestrian Projects

Fiscally Constrained Transit Projects

Air Quality Maintenance Area

Highway Centerlines

General Arterial Road Centerlines

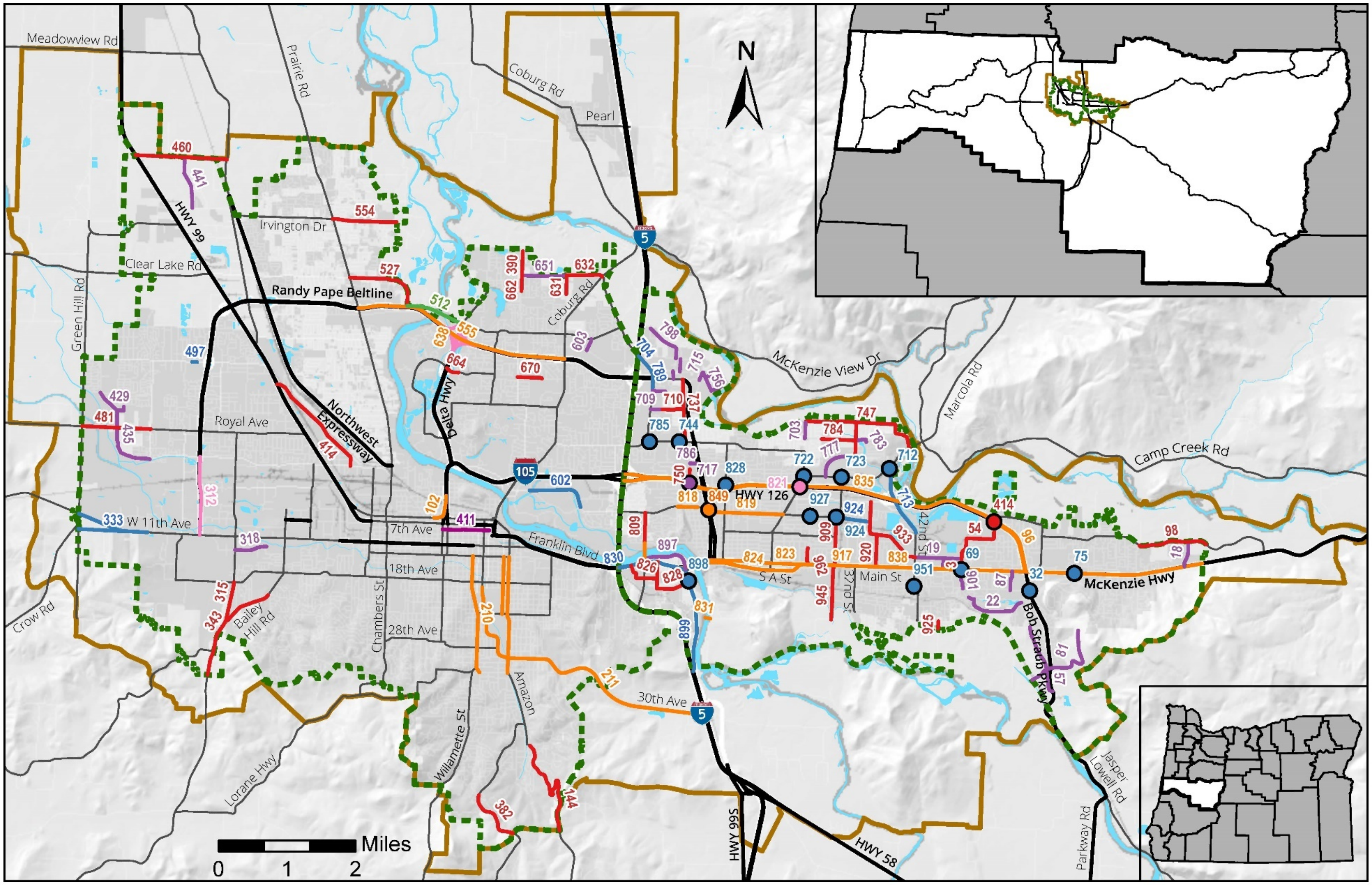
MPO Area Boundary

Water Area

CENTRAL LANE MPO

LCOG

2045 Regional Transportation Plan



Roadway Projects

- Added Freeway Lanes or Major Interchange Improvements
- Arterial Capacity Improvements
- New Collectors
- Study
- Urban Standards

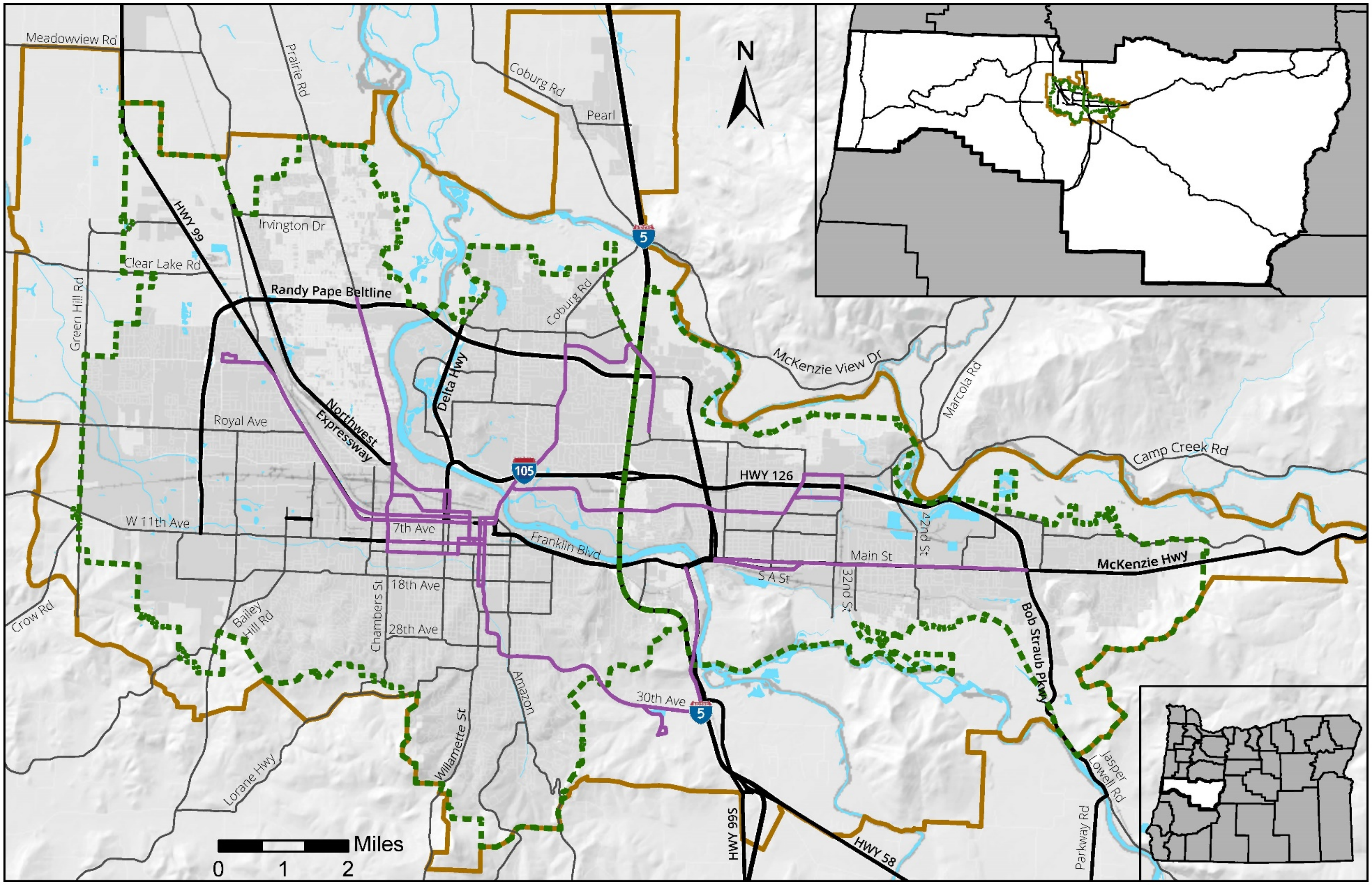
- Added Freeway Lanes or Major Interchange Improvements
- Arterial Capacity Improvements
- New Arterial Link or Interchange
- New Collectors
- Study
- Transit Oriented Development Implementation
- Urban Standards

- Air Quality Maintenance Area
- Highway Centerlines
- General Arterial Road Centerlines
- MPO Area Boundary
- Water Area

CENTRAL LANE MPO

LCOG

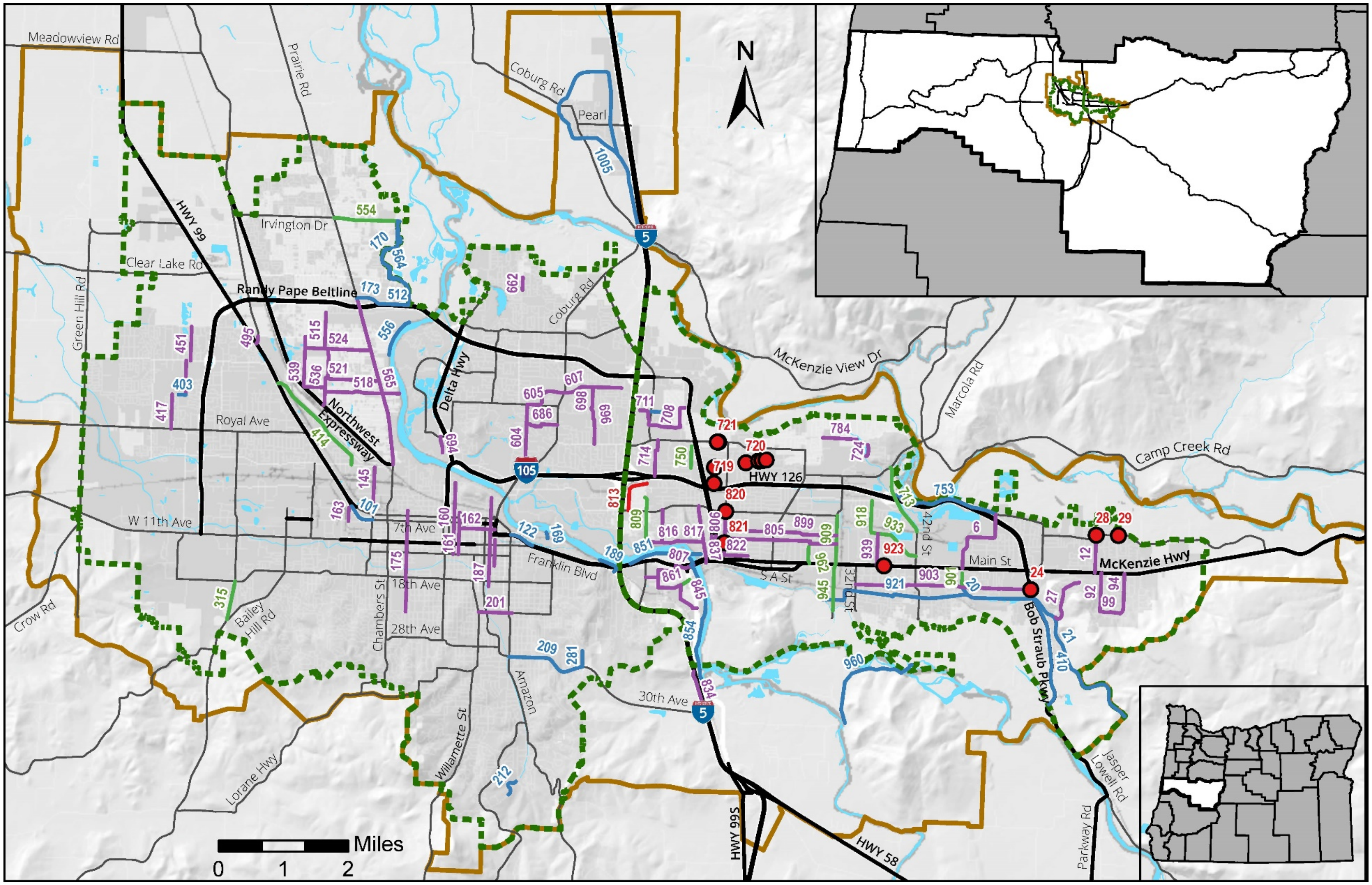
2045 Regional Transportation Plan



Fiscally Constrained Transit Projects
Air Quality Maintenance Area
Highway Centerlines
General Arterial Road Centerlines
MPO Area Boundary
Water Area

CENTRAL LANE MPO
LCOG

2045 Regional Transportation Plan



Bike/Pedestrian Projects

- On-Street Lanes or Routes Without Road
- Multi-Use Paths With Road
- Multi-Use Paths Without Road
- On-Street Lanes or Routes With Road
- On-Street Lanes or Routes Without Road

- Air Quality Maintenance Area
- Highway Centerlines
- General Arterial Road Centerlines
- MPO Area Boundary
- Water Area

CENTRAL LANE MPO

LCOG

2045 Regional Transportation Plan

APPENDIX A

Exemption from Regional Emissions Analysis

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 10
1200 Sixth Avenue
Seattle, Washington 98101

LANE COUNCIL OF GOVERNMENTS
RECEIVED
OCT 0 5 1994

Reply To
Attn Of: AT-082

OCT 0 3 1994

Mr. Don Arkell, Director
Lane Regional Air Pollution Authority
225 North 5th, Suite 501
Springfield, OR 97477-4671

Dear Mr. Arkell:

This is in response to your letter to Chuck Clarke regarding the "Memorandum of Understanding - Transportation Conformity Analysis for the Eugene-Springfield MPO", dated September 9, 1994. The letter was also signed by George Kloeppel, the LCOG Executive Director.

The final federal conformity rule does allow for exempting areas from the regional emissions analysis of the conformity rule if certain criteria are met. I believe your letter demonstrates that the Eugene-Springfield area meets the PM_{10} conformity criteria and therefore, I concur with your conclusion that the conformity determination is not required to satisfy the PM_{10} criteria for regional emissions analysis. The preamble for the federal rule, however, does not allow for relief from project level analysis. The projects within the PM_{10} nonattainment area must comply with the project level conformity requirements as specified in the federal conformity regulation.

I also concur with your findings regarding analysis for conformity findings with regard to meeting the carbon monoxide criteria. Regional emission test will apply only in the Central Area Transportation Study (CATS) boundary, consistent with the approved redesignation. Regional emission analysis will not apply outside the CATS boundary. Again, project level conformity requirements are not affected by this finding and continue to apply throughout the nonattainment area, consistent with the federal regulation.

Thank you for requesting our concurrence with this conformity proposal. Questions regarding our concurrence can be directed to Mike Lidgard at (206)553-4233.

Sincerely,

Jim McCormick

Jim McCormick, Director
Air and Toxics Division

cc: George Kloeppel, LCOG

Printed on Recycled Paper

APPENDIX B
Letter from US-EPA to LRAPA

APPENDIX A

LANE REGIONAL
AIR POLLUTION AUTHORITY

(503) 726-2514 • FAX (503) 726-1205
225 North 5th, Suite 501
Springfield, OR 97477-4671

Donald R. Arkell, Director

September 9, 1994

Mr. Chuck Clarke
Region 10 Administrator
Environmental Protection Agency
1200 6th Avenue
Seattle, WA 98101

Re: Memorandum of Understanding - Transportation Conformity Analysis for the Eugene-Springfield MPO

Dear Mr. Clarke:

The preamble for the final Federal Conformity Rule states:

> ..in some nonattainment and maintenance areas, the SIP may demonstrate that highway and transit vehicle emissions are an insignificant contributor to the nonattainment problem, for example, CO or PM_{10} violations near industrial sources. For areas with control strategy SIPs which have already been submitted and which demonstrate that motor vehicle emissions (including exhaust, evaporative, and reentrained dust emissions) are insignificant and reductions are not necessary for attainment, the conformity determination is not required to satisfy the criteria for regional emissions analysis of that pollutant. 58 Fed. Reg. 62194 (November 24, 1993).

The Eugene-Springfield PM_{10} SIP, which has been submitted to EPA for approval, establishes that emissions from motor vehicles is not significant and concludes that control of emissions from motor vehicles is not necessary to demonstrate attainment with the PM_{10} standards. There has not been an exceedance of the PM_{10} standards in this area since 1987. Currently, the Lane Regional Air Pollution Authority (LRAPA) is developing a maintenance plan as part of a request for redesignation to attainment status for PM_{10}. On the basis of these facts, we conclude that conformity determinations for PM_{10} are not required by federal regulation.

Effective February 4, 1994, the Eugene-Springfield area was redesignated to attainment status for CO. As noted in the December 6, 1993, Federal Register notice of Approval and Promulgation of Redesignation, a study performed by LRAPA during 1985 concluded that there were two hot spot locations near downtown Eugene which were isolated microscale problem areas. The Federal Register notice states the following (page 64163):

Due to the nature of Eugene's CO violations, (i.e., hot spots only) LRAPA's emission inventory contains only on-road mobile and home wood heating emissions within the Central Area Transportation Study boundary. All point sources within the Eugene AQMA are located at a sufficient distance away as to not contribute significantly to the violations.

Since the approved SIP and redesignation only contains an emissions budget for the Central Area Transportation Study (CATS) boundary, we conclude that except for projects within the CATS boundary, regional emissions tests do not apply for purposes of conformity. As specified in the final rule on conformity, regionally significant projects within the Eugene-Springfield AQMA boundary and outside of the CATS boundary would be subject to project-level conformity analysis. Following guidance contained in the final rule, we would, at a minimum, conduct project level analysis for facilities that serve regional needs and are normally accounted for in our modeling.

These findings and conclusions will be jointly reviewed and reaffirmed or modified no less frequently than five-year intervals. This review will occur as necessary when pollutant concentrations of either CO, Ozone or PM_{10} approach NAAQS and motor vehicle emissions are a significant cause.

We are requesting your concurrence with the findings and conclusions stated above. Questions regarding this proposal can be directed to Tom Schwetz (LCOG) at (503) 687-4044 or Ralph Johnston (LRAPA) at (503) 726-2514. It is our intention to use this memo as the basis for our conformity determination of the region's recently adopted TIP. This determination must be established in time for FHWA to make its conformity determination for Oregon's STIP (October 1). Your quick reply on this matter would be greatly appreciated.

George K. Kloeppel — George Kloeppel, LCOG Executive Director

Donald R. Arkell — Don Arkell, LRAPA Director

cc: ODOT Environmental Services Section
ODOT Region 2
DEQ
FHWA
FTA

APPENDIX C:
AQCD For 21-24 MTIP

U.S. DEPARTMENT OF TRANSPORTATION

Federal Highway Administration
Oregon Division
530 Center Street, Suite 420
Salem, Oregon 97301
503-399-5749

Federal Transit Administration
Region 10
915 Second Avenue, Room 3142
Seattle, Washington 98174-1002
206-220-7954

September 30, 2020

Reply to: HDA-OR/
FTA-TRO-10
File Code:
724.420

Mr. Paul Thompson
Transportation Program Manager
Central Lane Metropolitan Planning Organization
859 Willamette Street, Suite 500
Eugene, OR 97401

Subject: Air Quality Conformity Determination for the CLMPO 2021-2024 Metropolitan Transportation Improvement Program (TIP)

Dear Mr. Thompson:

The Clean Air Act Amendments of 1990 (CAAA) require that transportation plans, programs, and projects cannot create new National Ambient Air Quality Standards (NAAQS) violations, increase the frequency or severity of existing NAAQS violations or delay the attainment of the NAAQS. The Federal Highway Administration and Federal Transit Administration is required to make a transportation conformity determination in nonattainment and maintenance areas as outlined in 40 CFR 93.104 and 23 CFR Part 450. The CAAA requires States and Metropolitan Planning Organizations (MPOs) to demonstrate, through the conformity process, that the transportation program is consistent with the State Implementation Plan (SIP). Transportation conformity ensures the Federal funding and approval are given to those transportation activities that are consistent with air quality goals and do not worsen air quality or interfere with the purpose of the SIP.

The United States Environmental Protection Agency (EPA) approved the Eugene-Springfield limited maintenance plan (LMP) for particulate matter of less than 10 microns (PM_{10}), effective June 10, 2013 (78 FR 21547). With the approved LMP, the CLMPO is not required to complete regional emissions analysis, however all other transportation conformity requirements still apply (40 CFR 93.109(b)).

FHWA and FTA have completed a review of the Central Lane Metropolitan Planning Organization (CLMPO) conformity determination for the 2021-2024 MTIP, adopted by the Metropolitan Policy Committee (MPC) on May 7, 2020. Based on our review of the CLMPO conformity determination and documentation e-mailed on August 11, 2020, we find that the 2021-2024 MTIP conforms to the SIP in accordance with the Transportation Conformity Rule and the Oregon Conformity SIP. This federal conformity determination was made after interagency consultation with EPA Region 10, Oregon Department of Environmental Quality (ODEQ), Lane Regional Air Protection Agency

(LRAPA), and the Oregon Department of Transportation (ODOT), pursuant to the Transportation Conformity Rule.

If you have any questions, please contact Ms. Jasmine Harris of FHWA at (503) 316-2561 or Mr. Jeremy Borrego of FTA at (206) 220-7956.

Sincerely,

PHILLIP A DITZLER Digitally signed by PHILLIP A DITZLER Date: 2020.09.30 17:39:16 -07'00'	LINDA M GEHRKE Digitally signed by LINDA M GEHRKE Date: 2020.09.30 13:51:03 -07'00'
Phillip A. Ditzler Division Administrator Federal Highway Administration	Linda M. Gehrke Regional Administrator Federal Transit Administration

cc:

EPA	Karl Pepple, Environmental Protection Specialist
	Adam Clark, Environmental Protection Specialist
ODEQ	Rachel Sakata, Senior Air Quality Planner
ODOT	Natalie Liljenwall, Environmental Engineer
	Bill Johnston, Region 3 Planning Manager
	Erik Havig, Planning Section Manager
	Alice Bibler, Program & Funding Service Manager
	Jeff Flowers, Statewide Investment Management Section Manager
	Marsha Hoskins, Public Transit Manager
	Lisa Nell, Planning & Development Manager Region 2
CLMPO	Dan Callister, Associate Transportation Planner
LRAPA	Merlyn Hough, Director

AQCD For 18-21 MTIP

U.S. DEPARTMENT OF TRANSPORTATION

Federal Highway Administration
Oregon Division
530 Center Street, Suite 420
Salem, Oregon 97301
503-399-5749

Federal Transit Administration
Region 10
915 Second Avenue, Room 3142
Seattle, Washington 98174-1002
206-220-7954

September 29, 2017

In Reply Refer To:
HAD-OR/ FTA-TRO-10

Mr. Paul Thompson
Transportation Program Manager
Central Lane Metropolitan Planning Organization
859 Willamette Street, Suite 500
Eugene, OR 97401

Dear Mr. Thompson:

The Clean Air Act Amendments of 1990 (CAAA) require that transportation plans, programs, and projects cannot create new National Ambient Air Quality Standards (NAAQS) violations, increase the frequency or severity of existing NAAQS violations or delay the attainment of the NAAQS. The U.S. Department of Transportation (FHWA and FTA) is required to make a transportation conformity determination in non-attainment and maintenance areas as outlined in 40 CFR 93.104 (Frequency of Conformity Determinations) and 23 CFR Part 450 (FHWA and FTA Planning Rule). The CAAA requires States and Metropolitan Planning Organizations (MPOs) to demonstrate, through the conformity process, that the transportation program as a whole is consistent with the State Implementation Plan (SIP). Transportation conformity ensures that Federal funding and approval are given to those transportation activities that are consistent with air quality goals and do not worsen air quality or interfere with the purpose of the SIP.

The United States Environmental Protection Agency (EPA) approved the Eugene-Springfield limited maintenance plan (LMP) for particulate matter of less than 10 microns (PM_{10}), effective June 10, 2013 (78 FR 21547; April 11, 2013). With the approved LMP, the Central Lane Metropolitan Planning Organization (CLMPO) is not required to complete regional emissions analysis; however, all other transportation conformity requirements still apply (40 CFR 93.109(b)).

FHWA and FTA have completed a review of the CLMPO conformity determination for the 2018-2021 MTIP, adopted by the CLMPO Policy Committee on May 4, 2017. Based on our review of the CLMPO conformity determination and documentation submitted to our offices on June 12, 2017, we find that the 2018-2021 MTIP conforms to the SIP in accordance with the Transportation Conformity Rule and the Oregon Conformity SIP. This Federal conformity determination was made after interagency consultation with EPA Region 10, Oregon Department of Environmental Quality, and Oregon Department of Transportation, pursuant to the Transportation Conformity Rule.

Please contact Ms. Rachael Tupica of FHWA at (503) 316-2549 or Mr. Jeremy Borrego of FTA at (206) 220-7956 if you have any questions.

Sincerely,

PHILLIP A DITZLER Digitally signed by PHILLIP A DITZLER DN: c=US, o=U.S. Government, ou=DOT FHWASalemOR, ou=FHWA FHWASalemOR, cn=PHILLIP A DITZLER Date: 2017.09.29 12:00:39 -07'00'	LINDA M GEHRKE Digitally signed by LINDA M GEHRKE DN: c=US, o=U.S. Government, ou=FTA FTASeattleWA, ou=DOT FTASeattleWA, cn=LINDA M GEHRKE Date: 2017.09.29 11:03:51 -07'00'
Phillip A. Ditzler Division Administrator Federal Highway Administration	Linda M. Gehrke Regional Administrator Federal Transit Administration

cc:

FHWA	Rachael Tupica, Senior Transportation Planner
FTA	Jeremy Borrego, Transportation Program Specialist
	Ned Conroy, Community Planner
EPA	Karl Pepple, Environmental Protection Specialist
	Claudia Vaupel, Air Quality Planner
ODEQ	Dave Nordberg, Transportation Planning Coordinator
ODOT	Natalie Liljenwal, Environmental Engineer
	Terry Cole, Region 2 Planning Manager
	Erik Havig, Planning Section Manager
	Jeff Flowers, Program and Funding Services Manager
LRAPA	Merlyn Hough, Director

APPENDIX D

Notes on Project Conformity[5] – Localized PM_{10} hot spot violations, 40 CFR 93.116

The *Project Sponsor* is designated as the agency responsible for implementing the project. The agency is lead for developing the hot spot analysis, meeting interagency consultation and public participation requirements, and documenting the project-level conformity determination.

PM hot spot analyses are generally included in documents prepared to meet NEPA requirements. However, if the scope of a project is substantially changed after NEPA has been completed, another project-level conformity determination may be needed.

The design concept and scope of the project must be consistent with that included in the conforming transportation plan and transportation improvement program (40 CFR93.114).

The MPO should be consulted for the latest planning assumptions. PM hot-spot analyses must be based on these assumptions in place when the analysis begins (40 CFR 93.110).

Projects fall into three categories: *exempt* under 40 CFR 93.126 and 93.128; *of local air quality concern* under 40 CFR 93.123(b)(1); and *non-exempt and not of local air quality concern*.

Projects of local air quality concern are defined in 93.123(b)(1) and require PM_{10} hot spot analysis. These are

(i) New highway projects that have a significant number of diesel vehicles, and expanded highway projects that have a significant increase in the number of diesel vehicles;

For example[6]:

- new highways with an AADT of greater than 125,000, and an 8% or more share of AADT is diesel trucks.
- new exit ramps or other improvements to connect a highway or expressway to a major freight, bus or intermodal terminal.

(ii) Projects affecting intersections that are at Level-of-Service D, E, or F with a significant number of diesel vehicles, or those that will change to Level-of-Service D, E, or F because of increased traffic volumes from a significant number of diesel vehicles related to the project;

---

[5] Transportation Conformity Guidance for Quantitative Hot−Spot Analyses in $PM_{2.5}$and PM_{10} Nonattainment and Maintenance Areas. US Environmental Protection Agency. EPA-420-B-13-053. November 2013. https://nepis.epa.gov (search for document 420B13053), December 2016.

[6] Project Level Conformity Hot-Spot Analysis (Highways), FHWA Resource Center, https://www.fhwa.dot.gov/resourcecenter/teams/airquality/plc_hotspotanalysis.cfm; December 2016.

(iii) New bus and rail terminals and transfer points that have a significant number of diesel vehicles congregating at a single location;

(iv) Expanded bus and rail terminals and transfer points that significantly increase the number of diesel vehicles congregating at a single location;

- For example, an existing bus or intermodal terminal that has a large vehicle fleet where the number of diesel buses increases by 50% or more, as measured by bus arrivals.

(v) Projects in or affecting locations, areas, or categories of sites which are identified in the $PM_{2.5}$ or PM_{10} applicable implementation plan or implementation plan submission, as appropriate, as sites of violation or possible violation. [Note: none are identified in the Eugene-Springfield implementation plan.]

[Note: in the criteria above, 'significant' is subject to interagency consultation]

For **non-exempt projects that are not of local air quality concern**, state and local project sponsors should document in their project-level conformity determinations that the requirements of 40 CFR 93.116 are met without hot-spot analysis. These categorizations are subject to interagency consultation.

40 CFR 93.105 also requires a proactive public involvement process for public review and comment. NEPA public involvement typically satisfies this requirement.

APPENDIX E

Public Comments Received

A public hearing was held November 4, 2021 at the meeting of the Metropolitan Policy Committee, held remotely via Zoom.

A public comment period was open October 29 through December 10. Comments were solicited via the MPO's website and social media.

Comments received from public as well as from local, State, and Federal agency staff have been incorporated into this document, as well as staff comments received through the interagency consultation process regarding project air quality conformity.

APPENDIX F

LANE REGIONAL AIR PROTECTION AGENCY

REQUEST FOR REDESIGNATION TO ATTAINMENT AND MAINTENANCE PLAN FOR EUGENE/SPRINGFIELD PM_{10} (December, 2011)

TABLE OF CONTENTS

Introduction:

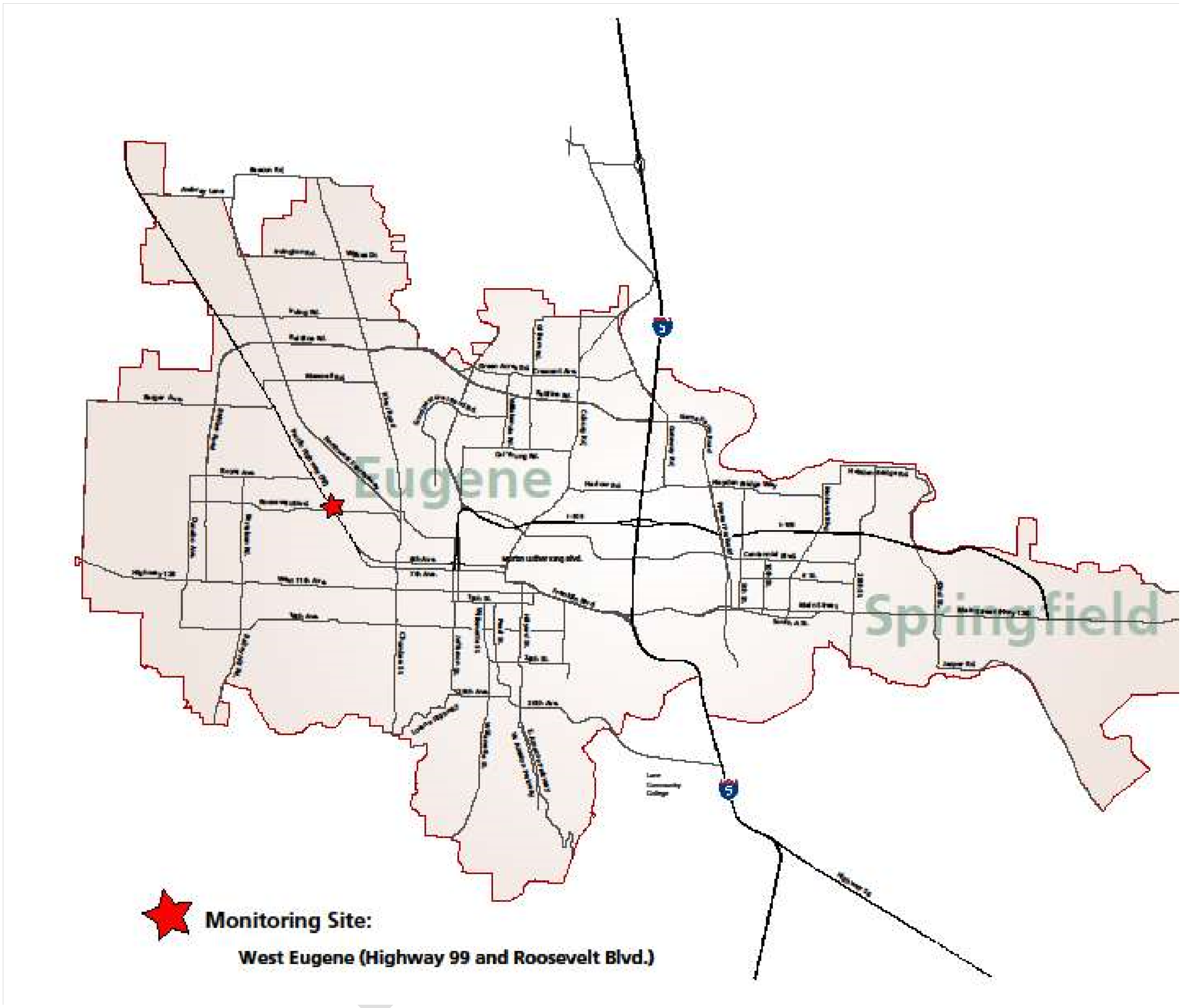
On August 7, 1987, the federal Environmental Protection Agency (EPA) categorized areas of the Nation into three groups based upon the likelihood that the area would violate the PM_{10} National Ambient Air Quality Standard (NAAQS) and the existing State Implementation Plan (SIP) would require revision in order to protect the PM_{10} NAAQS. Group I Areas were those having a 95% certainty of violating the PM_{10} NAAQS. Group II Areas were those having a 20 % to 95% probability of violating the PM_{10} NAAQS. The remaining areas below 20% probability were classed as Group III. Based upon the available ambient data, the area within the Eugene-Springfield Urban Growth Boundary (UGB) was classified by the EPA as a Group I Area. This area is defined in Oregon Administrative Rules 340-204-0010 (see Figure 1).

In response to this action, Lane Regional Air Protection Agency (LRAPA) adopted a SIP amendment in 1990 and an addendum in 1991 to address the new requirements of the federal Clean Air Act Amendments of 1990. These were subsequently adopted by the Oregon Environmental Quality Commission (EQC) and were submitted as an attainment plan to the EPA in November 1991 (see 59 FR 434870). This plan demonstrated attainment of the PM_{10} NAAQS by December 31, 1992, and demonstrated maintenance of the PM_{10} NAAQS through the year 2000. This plan was approved by the EPA in August 1994 (see 59 FR 434870 August 24, 1994). EPA also approved PM_{10} control strategies in the SIP as Reasonably Available Control Technology and Reasonably Available Control Measures (RACT/RACM).

LRAPA has continued to implement the control strategies defined in the SIP and the UGB has not exceeded the 24 hour PM_{10} NAAQS since 1987. The annual PM_{10} NAAQS has never been exceeded. Based upon the monitoring data and the intent to maintain the current control strategies, it has been LRAPA=s intent to officially request redesignation of this area to attainment. For this to occur, the federal Clean Air Act requires LRAPA to develop a maintenance plan for which EPA requires dispersion modeling and projections of emissions 10 years into the future. This effort would place an excessive burden on LRAPA=s limited resources. In addition, the NAAAQS have undergone significant changes over the years with new particulate standards being added and subsequent lawsuits. This process was not finally resolved until 2006. As a result, LRAPA has delayed formally requesting redesignation.

Figure 1

Eugene/Springfield Urban Growth Boundary



The EPA has also issued guidance to streamline the process to redesignate an area from Anon-attainment@ to Aattainment@ for PM_{10} NAAQS. This new option was termed a Limited Maintenance Plan (LMP). It will allow areas which clearly meet the standards to effectively redesignate without using dispersion modeling and without projecting future emissions. LRAPA has chosen to use this option to prepare a maintenance plan and request redesignation for the Eugene-Springfield UGB to attainment for PM_{10}.

According to EPA guidance, to qualify for the LMP option an area should meet the following criteria:

1. The area should attain the NAAQS.

2. The average 24 hour PM_{10} design value for the area based upon recent 5 years of data should not exceed 98 ug/m^3 (micrograms per cubic meter) and the annual design value should not exceed 40 ug/m^3. (The annual PM_{10} NAAQS was revoked by the EPA on December 18, 2006.)

3. The area should expect only limited growth in on-road motor vehicle PM_{10} emissions.

As detailed in Appendix A, this area clearly attains the NAAQS, and the design values are well below the defined limits. In addition, although the existing SIP for this area (confirmed by October 3, 1994, correspondence from EPA Region 10) demonstrates that motor vehicles are not a significant contributor to PM_{10} emissions in this area, a regional analysis of on-road motor vehicle PM_{10} emission was performed (see Appendix A) and demonstrated only limited growth in emissions. As a result, this area qualifies for the LMP option.

LRAPA has prepared this LMP for PM_{10} to demonstrate attainment with the PM_{10} NAAQS, provide a maintenance plan to assure continued attainment, and formally request redesignation of the UGB to attainment for the PM_{10} NAAQS.

Demonstration of Attainment:

On July 1, 1987, the EPA revised Title 40, Part 50 of the Code of Federal Regulations (40 CFR 50), which changed the particulate matter NAAQS from total suspended particulate to particulate matter less than or equal to 10 microns in size (PM_{10}). The primary and secondary NAAQS for PM_{10} are as follows:

24 hour Standard: The NAAQS for PM_{10} is 150 ug/m^3 for a 24 hour average concentration. The standard is not to be exceeded more than once per year on average over 3 years, as determined in accordance with 40 CFR 50.

Annual Standard: The annual NAAQS for PM_{10} is 50 ug/m^3 for an annual arithmetic mean. The standard is attained when the expected annual arithmetic mean concentration is less than or equal to 50 ug/m^3, as determined in accordance with 40 CFR 50. (This standard was revoked on December 18, 2006)

Since PM_{10} monitoring began in 1984, the UGB has exceeded the 24 hour NAAQS on 15 occasions, 12 of which occurred during an extensive period of cold temperatures and poor ventilation in December of 1985. The last exceedance of the 24 hour standard occurred in January of 1987. The 24 hour standard exceedances have all occurred during the Winter months. The annual standard has never been exceeded. Based upon the historical ambient monitoring data, the UGB was found to be in violation of only the 24 hour PM_{10} standard .

The original PM_{10} attainment plan was adopted by LRAPA in March 1990. Since adoption was prior to the CAA amendments of 1990, an addendum to the plan incorporating a contingency plan (as required by the 1990 CAA amendments) was adopted by LRAPA in October 1991. The amended plan was submitted to EPA in November, 1991. The EPA approved the plan in October 1994.

The analysis used to develop the plan indicated that on a worst case winter day (when exceedances were likely to occur) residential wood combustion emissions contributed 68% of the total local emissions into the airshed . The dispersion modeling analysis used to develop the plan demonstrated that on those poor air quality days, residential wood combustion emissions contributed over 90% of the ambient impact. As a result, it was determined that the mandatory curtailment of residential wood combustion emissions would be necessary and sufficient to achieve attainment. PM_{10} emission reductions from other sources were not needed. Preceded by a voluntary program that began in 1986, the mandatory curtailment plan began in November, 1991. Each of the jurisdictions within the UGB enacted ordinances prohibiting the use of solid - fuel space heating devices under certain conditions (see Appendix B). Enforcement of the ordinances has been delegated by Lane County, the City of Eugene, and the City of Springfield to LRAPA. The program consists of a multi-stage advisory issued daily each winter from November 1 through the end of February. The daily determination of which stage to initiate is based upon forecast meteorology and air quality. During good air quality conditions, a Agreen@ advisory which allows residential wood combustion is issued. If conditions are deteriorating, a yellow advisory which requests voluntary curtailment of the practice is issued. If PM_{10} levels are forecast to be near or exceed the standard, a red advisory prohibiting the practice (with an exemption for economic need) is issued. Since the mandatory program began, it has not been necessary to issue a red advisory and the PM_{10} standard has not been exceeded. The mandatory home wood heating curtailment program is considered to be RACM and is permanent and enforceable (see 59 FR 163 8/24/94).

LRAPA currently maintains a PM_{10} monitoring network which includes one site within the UGB (see Figure 1). This site meets the federal monitoring requirements contained in 40 CFR 58. As demonstrated by the historical monitoring data, and confirmed by a saturation monitoring study conducted by LRAPA in 1989, the HWY 99 site (# 410390058) measures the highest PM_{10} concentrations within the UGB. As depicted in the following table, the 24 hour concentrations at this site over a recent 9 year period remain well below the PM_{10} NAAQS of 150ug/m^3.

Table 1

HWY 99 Site # 410390058
24 Hour PM_{10} Concentration (ug/m^3)

Year	annual high	annual 2nd high	3 yr 2nd high
2000	73	50	---
2001	65	61	---
2002	66	62	66
2003	45	44	65
2004	59	40	62
2005	50	43	50
2006	68	53	59
2007	78	69	69
2008	56	48	69

The annual levels are also well below the former PM_{10} NAAQS of 50 ug/m^3.

Table 2

Hwy 99 Site # 410390058
Annual Mean (ug/m^3)

Year	Annual Mean
2000	19
2001	19
2002	19
2003	19
2004	17
2005	17
2006	19
2007	16
2008	17

The monitoring data clearly demonstrates attainment with the PM_{10} NAAQS in accordance with 40 CFR 50.

Maintenance Plan:

EPA=s Limited Maintenance Plan Option (LMP) permits states to submit streamlined maintenance plans for areas that meet qualifying criteria. This option is specifically designed to redesignate areas that are at little risk of violating the PM_{10} standard. Areas qualifying for the LMP must meet the following criteria:

1. The area should attain the NAAQS

2. The average 24 hour PM_{10} design value for the area based upon 5 years of data should not exceed 98 ug/m^3, and the annual design value should not exceed 40 ug/m^3.

3. The area should expect only limited growth in on-road motor vehicle PM_{10} emissions.

The detailed analysis of the LMP criteria is contained in Appendix A. This analysis clearly demonstrates attainment with the NAAQS. The 24 hour design value of 66 ug/m^3 is well below the criteria level of 98 ug/m^3 and the annual design value of 17ug/m^3 is well below the criteria level of 40 ug/m^3. In addition, the motor vehicle emission analysis demonstrates only a minimal increase in emissions. As a result, this area is qualified to submit an LMP.

Annual and 24 hour PM_{10} emission inventories of significant sources were developed for the 2008 attainment year. As required in the LMP option, 2008 is within the five most recent years of monitoring data used to determine whether or not the area meets LMP option qualifying criteria. The methodology used and the details of the calculations for each source category are found in Appendix C. In each case, EPA approved methods were used. As summarized in Table 3, residential wood combustion remains the primary source of PM_{10} on winter days, while point sources dominate the annual emissions.

Table 3

2008 Estimated PM_{10} Emissions for the Eugene/Springfield UGB

Source	Annual (tons/year)	Winter Day (tons/day)
Point Sources	1,624.1	4.4
Residential wood combustion	728.2	8.5
Road Dust	281.2	0.8
Motor vehicle exhaust, brake and tire wear	120.3	0.4
Total	2,753.8	14.1

In the 1985 base year emission inventory developed for the 1990 SIP 7,051 tons of PM_{10} were emitted while in the 2008 annual E.I. only 2,754 tons were emitted.

There has been a 61% reduction in annual PM_{10} emissions since 1985. In 1985 the 24 hour Winter day emissions were estimated at 31.4 tons, while in 2008 this estimate was only 14.1 tons, a 55% decrease in PM_{10} emissions. Although a quantitative explanation for all of the decline is not available, it is readily apparent that the precipitous decline in the wood products industry has drastically reduced the point source emissions. The lack of logging activity has also reduced the availability of cord wood. In addition, some older uncertified woodstoves and inserts have been replaced with cleaner burning more efficient certified woodstoves and inserts. Public awareness of the daily woodburning advisories has also resulted in less wood burning. As a result, residential wood combustion has been drastically reduced. In 1985, 85,325 tons of cord wood were burned in the UGB while in 2008 the estimate is 50,609 tons, a 41% reduction.

LRAPA has relied upon a mandatory residential wood combustion curtailment program to attain and maintain compliance with the PM_{10} NAAQS. This program has been successfully implemented within the UGB. It is the intent of LRAPA to continue to implement this program to ensure continued attainment with the ambient standards. Since this area qualifies for the LMP option, maintenance of the ambient standard is presumed to be satisfied.

LRAPA has recently implemented the following additional control measures to ensure that this area continues to meet the PM_{10} NAAQS (see Appendix B for details of the local ordinances).

1. Solid fuel space heating devices shall be prohibited from burning plastics, petroleum by-products, petroleum treated materials, rubber products, animal remains, animal or vegetable matter resulting from the handling, preparation, cooking, or service of food, or of any other material which normally emits dense smoke or noxious odors.

2. During a Green or Yellow advisory the discharge of emissions from a solid fuel space heating device shall be limited to a maximum opacity of 40%. There will be a 10 minute exemption during every 4 hour period for the building of a new fire.

In addition, the State of Oregon has recently adopted the "Heat Smart" law. This law requires the removal and decommissioning of any uncertified woodstove or fireplace insert from a home when it is sold.

As depicted in the existing SIP for this area, and confirmed by October 3, 1994, correspondence from EPA Region 10 (see Appendix E), motor vehicles are not a significant contributor to PM_{10} emissions in this area and therefore regional PM_{10} conformity determinations are not required. Hot spot conformity analysis for projects meeting federal criteria will continue to be required. This current analysis reaffirms the status of motor vehicles as an insignificant contributor to PM_{10} emissions in this area.

Although industrial sources are not the significant contributor to PM10 exceedances, industrial emissions growth will be controlled through New Source Review regulations. The Lowest Achievable Emission Rate (LAER) requirement for non-attainment areas will be replaced by Best Available Control Technology (BACT) for maintenance areas. Offsets and net air quality benefit will also be required.

As described in Appendix D, the 24 hour $PM_{2.5}$ standard would be violated well before the PM_{10} standard was reached. A violation of the $PM_{2.5}$ standard would trigger SIP action for that pollutant which would also provide additional controls for PM_{10} emissions. Although monitoring for $PM_{2.5}$ would technically be adequate to demonstrate compliance with the PM_{10} NAAQS, as resources allow, LRAPA will continue to monitor for PM_{10}.

Appendix A

Eugene-Springfield PM_{10} Non-Attainment Area Limited Maintenance Plan Qualification Analysis

According to EPA guidance, to qualify for the LMP option an area should meet the following applicable criteria:

1. The area should attain the NAAQS.

2. The average 24 hour PM_{10} design value for the area based upon recent 5 years of data should not exceed 98 ug/m^3 and the annual design value should not exceed 40 ug/m^3.

3. The area should expect only limited growth in on-road motor vehicle PM_{10} emissions.

Attainment with NAAQS:

As demonstrated by the historical monitoring data and confirmed by a saturation monitoring study conducted by LRAPA in 1989, the Hwy 99 Site (# 410390058) measures the highest PM_{10} concentrations within the non-attainment area. Recent data from this site demonstrates that this area clearly attains the NAAQS of 150 ug/m^3 for the 24 hour standard and the former 50 ug/m^3 annual standard.

Eugene-Springfield UGB
PM_{10} Concentrations (ug/m^3)
Hwy 99 Site # 410390058

Year	Annual Highest 24 hour Concentration (ug/m^3)	Annual Mean (ug/m^3)
2000	73	19
2001	65	19
2002	66	19
2003	45	19
2004	59	17
2005	50	17
2006	68	19
2007	78	16
2008	56	17

24 Hour Design Value:

As recommended in EPA guidance, the Upper 10% Tail Exponential Distribution Method was used to calculate the 24 hour design value. Data from the Hwy 99 Site was used for the calculation. As depicted in the following, this area=s 24 hour design value is 66 ug/m^3 which is well below the guidance level of 98 ug/m^3.

Calculate the average of the rolling 3 year design values for the 5 year period using the Upper 10% Tail Exponential Distribution:

equation: $DV = X_{90} + 3.61\ (U_{90} - X_{90})$

where: DV = design value
X_{90} = 90th percentile concentration
U_{90} = mean of the upper 10% of samples

For the period 2004 - 2006 there were 359 samples (no data was flagged):

X_{90} = 35 ug/m^3
U_{90} = 42 ug/m^3
DV = 35 ug/m^3 + 3.61(42 ug/m^3 - 35.0 ug/m^3) = 60 ug/m^3

For the period 2005 - 2007 there were 359 samples (no data was flagged):

X_{90} = 34 ug/m^3
U_{90} = 43 ug/m^3
DV = 34 ug/m^3 + 3.61(43 ug/m^3 - 34 ug/m^3) = 66 ug/m^3

For the period 2006 - 2008 there were 360 samples (no data was flagged):

X_{90} = 33 ug/m^3
U_{90} = 44 ug/m^3
DV = 33 ug/m^3 + 3.61(44 ug/m^3 - 33 ug/m^3) = 73 ug/m^3

Average 24 Hour Design Value:

(60 ug/m^3 + 66 ug/m^3 + 73 ug/m^3)/3 = **66 ug/m^3**

Annual Design Value:

The annual design value is 17 ug/m^3 which is well below the guidance level of 40 ug/m^3.

Calculate the average of the rolling 3 year design value for the 5 year period using the annual means of the 4 quarters:

Year	Quarterly Annual Mean (ug/m^3)
2008	17
2007	16
2006	19
2005	17
2004	17

For the period 2004 - 2006:

Annual DV = (17 ug/m^3 + 17 ug/m^3 +19 ug/m^3)/3 = 17.67 ug/m^3

For the period 2005 - 2007:

Annual DV = (17 ug/m^3 + 19 ug/m^3 + 16 ug/m^3)/3 = 17.33 ug/m^3

For the period 2006 - 2008:

Annual DV = (19 ug/m^3 + 16 ug/m^3 + 17 ug/m^3)/3 = 17.33 ug/m^3

Average Annual DV = (17.67 ug/m^3 + 17.33 ug/m^3 + 17.33 ug/m^3)/3 = 17 **ug/m^3**

Motor Vehicle Regional Analysis:

Using the method recommended in EPA Guidance, an on-road motor vehicle regional analysis was performed. As depicted in the following, there will be only limited growth in on-road motor vehicle PM_{10} emissions.

EPA Guidance Equation:

DV + (VMTpi * DVmv) $\leq$ MOS

where: DV = area design value

VMTpi = projected % increase in vmt 10 years from base year (projected increase in VMT from 2008 - 2018 is 14.3% - from local MPO transportation modeling estimate)

DVmv = motor vehicle design value based upon on-road portion of base year EI

MOS = margin of safety for PM_{10} standard: 98 ug/m^3 for 24 hour standard and 40 ug/m^3 for annual standard

24 hour analysis:

From 2008 attainment year winter day EI

total winter day emissions = 14.1 tons
total motor vehicle winter day emissions = 1.2 tons

% mv = 8.5

DV = 66 ug/m^3

VMTpi = 0.143

DVmv = 5.61 ug/m^3

66 ug/m^3 + (0.143 * 5.61 ug/m^3) = 67 ug/m^3

annual analysis:

From 2008 base year EI

total annual emissions = 2,753.8 tons

total motor vehicle annual emissions = 401.5 tons

% mv = 14.58

DV = 17 ug/m^3

VMTpi = 0.143

DVmv = 2.48 ug/m^3

17 ug/m^3 + (0.143 * 2.48 ug/m^3) = 17 ug/m^3

Appendix B

Local Home Wood Heating Ordinances

Eugene Code

6-16 12/28/2007

Solid Fuel Space Heating Devices

6.250 Solid Fuel Space Heating Devices - Definitions. As used in sections 6.255 to 6.265, the following words and phrases mean:

City manager. City manager or designee, including, if the city manager so designates, LRAPA.

Green advisory. A 24-hour period beginning at 4:00 p.m. when PM10 levels are forecast by LRAPA to be less than 100 micrograms per cubic meter and PM2.5 levels are forecast to be less than 25 micrograms per cubic meter. **LRAPA**. Lane Regional Air Pollution Authority, a regional air quality control authority established under the provisions of, and with authority and powers derived from, Oregon Revised Statutes 468.500 et seq.

Opacity. The degree to which an emission reduces transmission of light or obscures the view of an object in the background.

Pellet stove. An enclosed solid fuel space heating device designed and operated to burn manufactured solid fuel and having an air-to-fuel ratio greater than 35-to-1 as determined by the federal test method described in 40 CFR Part 60.534.

Person. Any individual, partnership, corporation, association, governmental subdivision or public or private organization of any character.

Person in charge of property. An agent, occupant, lessee, tenant, contract purchaser, or other person having possession or control of property. **PM2.5**. Solid or liquid particulate matter (excluding uncombined water) with an aerodynamic diameter less than or equal to 2.5 micrometers. **PM10**. Solid or liquid particulate matter (excluding uncombined water) with an aerodynamic diameter less than or equal to 10 micrometers. Eugene Code

6-17 12/28/2007

Sole source of heat. A solid fuel space heating device which constitutes the only source of heating in a private residence. A solid fuel space heating device shall not be considered to be the sole source of heat if the private residence is equipped with any permanently installed furnace or heating system utilizing oil, natural gas, electricity or propane.

Solid fuel space heating device. Any device designed or operated to burn solid fuel for the heating of the interior of a building, including, but not limited to, solid fuel burning stoves, fireplaces or wood stoves of any nature, combination fuel furnaces or boilers used for space heating which can burn solid fuel, and solid fuel burning cooking stoves. "Solid fuel space heating device" does not include natural gas fired artificial fireplaces.

Stage I red advisory. A 24-hour period beginning at 4:00 p.m. when PM10 levels are forecast by LRAPA to be greater than or equal to 125 micrograms per cubic meter but less than 150 micrograms per cubic meter, or when PM2.5 levels are forecast by LRAPA to be greater than or equal to 30 micrograms per cubic meter but less than 35 micrograms per cubic meter, within the Eugene-Springfield Metropolitan Area General Plan Urban Growth Boundary.

Stage II red advisory. A 24-hour period beginning at 4:00 p.m. when PM10 levels are forecast by LRAPA to be greater than or equal to 150 micrograms per cubic meter, or when PM2.5 levels are forecast by LRAPA to be greater than or equal to 35 micrograms per cubic meter, within the Eugene-Springfield Metropolitan Area General Plan Urban Growth Boundary.

Visible emissions. The reduction in transmission of light or the obscuring of the view of an object in the background caused by the air pollutants emitted by the heating device. This does not include the visual distortion caused by the heated air emitted by the heating device.

Yellow advisory. A 24-hour period beginning at 4:00 p.m. when PM10 levels are forecast by LRAPA to be greater than or equal to 100 micrograms per cubic meter but less than 125 micrograms per cubic meter, or when PM2.5 levels are forecast to be greater than or equal to 25 micrograms per cubic meter but less than 30 micrograms per cubic meter.

(Section 6.250 added by Ordinance No. 19731, enacted Novem ber 5, 1990, effective January 1, 1991; am ended by Ordinance No. 19815, enacted Decem ber 2, 1991; Ordinance No. 20261, enacted July 22, 2002, effective August 22, 2002; and Ordinance No. 20399, enacted Novem ber 26, 2007, effective Decem ber 28, 2007.) **6.255 Solid Fuel Space Heating Devices - Prohibitions**.

(1) No person in charge of property during a Stage I Red Advisory shall operate or allow to be operated a solid fuel space heating device which emits visible emissions into the air outside of the building housing the Eugene Code 6-18 12/28/2007 device, unless the person has been granted an exemption to use the device by the city manager.

(2) No person in charge of property during a Stage II Red Advisory shall operate or allow to be operated a solid fuel space heating device unless:

(a) The person has been granted an exemption to use the device by the city manager; or

(b) The person is operating a pellet stove which emits no visible emissions into the air outside of the building housing the device.

(3) No person in charge of property shall at any time allow to be initiated or maintained in a solid-fuel space-heating device the burning of any plastics, wire insulation, petroleum by-products (with the exception of natural-gas-fueled log lighters), petroleum-treated materials, rubber products, animal remains, or animal or vegetable matter resulting from the handling, preparation, cooking, or service of food, or of any other

material which normally emits dense smoke, noxious odors, or
hazardous air contaminants.

(4) During a green or yellow advisory, no person in charge of property shall operate or allow to be operated a solid-fuel space-heating device which discharges emissions that are of an opacity greater than 40 percent. This provision does not apply to the emissions during the building of a new fire, for a period or periods aggregating no more than ten minutes in any four-hour period.

(Section 6.255 added by Ordinance No. 19731, enacted Novem ber 5, 1990, effective January 1,
1991; am ended by Ordinance No. 19815, enacted Decem ber 2, 1991; and Ordinance No.
20261, enacted July 22, 2002, effective August 22, 2002.)

6.260 Solid Fuel Space Heating Devices - Exemptions. Notwithstanding section 6.255 of this code, a person in charge of property may operate a solid fuel space heating device during a Stage I or Stage II Red Advisory if that person has previously obtained one of the following exemptions from the city manager:

(a) Sole source of heat exemption. A person in charge of property who signs a sworn statement that their solid fuel space heating device is the sole source of heat for their residence. This exemption shall expire on July 1 of each year and must be renewed annually. This exemption shall not be issued after June 30, 1996.

(b) Economic need exemption. Persons in charge of property who satisfy criteria established under the Low Income Energy Assistance Program as administered by the Lane County Housing Authority and as established by the United States Department of Energy. This exemption shall expire on July 1 of each year and must be renewed annually thereafter.

(Section 6.260 added by Ordinance No. 19731, enacted Novem ber 5, 1990, effective January 1,
1991.)

Eugene Code
6-19 12/28/2007

6.265 Solid Fuel Space Heating Devices - Enforcement. In addition to, and not in lieu of any other enforcement mechanism authorized by this code, upon a determination that a person has violated section 6.255 of this code, the city manager may impose upon the violator and any other person in charge of the property, an administrative penalty not greater than $500, as provided by section 2.018 of this code. The city manager also is authorized to designate LRAPA to enforce and administer the provisions of sections 2.655 to 2.670 of this code, including LRAPA's use of administrative and hearing procedures adopted by LRAPA in its duly promulgated regulations.

(Section 6.265 added by Ordinance No. 19731, enacted Novem ber 5, 1990, effective January 1,
1991.)

Lane Code
RESTRICTION ON USE OF SOLID FUEL SPACE HEATING DEVICES

RESTRICTION ON USE OF SOLID FUEL SPACE HEATING DEVICES
9.120 Purpose and Findings.

(1) The health, safety and welfare of the citizens of Lane County are adversely affected by the degradation of air quality. Violations of federal ambient air quality standards, as measured by the Lane Regional Air Pollution Authority (LRAPA), occur periodically in Lane County.

(2) Wood and other solid fuel combustion for space heating produces particulate matter and other emissions which are physically harmful and aesthetically unpleasant, and which contribute to the degradation of air quality and the violation of federal ambient air quality standards.

(3) Periodic restriction of the use of solid fuel space heating devices will improve air quality. LRAPA has the expertise to determine when such air quality is at such a level that such restriction is necessary to preserve the health, safety and welfare of the citizens of Lane County.

(4) It is the intent of Lane County that the penalty section of this ordinance not take effect until November 1, 1991. *(Revised by Ordinance No. 9-90, Effective 1.18.91)* **9.125 Definitions.**

As used herein, the following words and phrases shall mean:

Green Advisory. A 24-hour period beginning at 4:00 p.m. when PM10 levels are forecast by LRAPA to be less than 100 micrograms per cubic meter and PM2.5 levels are forecast to be less than 41 micrograms per cubic meter, within the Eugene/Springfield Metropolitan Area General Plan Urban Growth Boundary.

Lane Regional Air Pollution Authority. A regional air quality control authority established under the provisions of and with the authority and powers derived from ORS 468.500 et seq.

Opacity. The degree to which an emission reduces transmission of light or obscures the view of an object in the background.

Pellet Stove. An enclosed solid fuel space heating device designed and operated to burn manufactured solid fuel and having an air-to-fuel ratio greater than 35-to-1 as determined by the federal test method described in 40 CFR Part 60.534 Person. Any individual, partnership, corporation, association, governmental subdivision or public or private organization of any character.

Person in Charge of Property. An agent, occupant, lessee, tenant, contract purchaser, or other person having possession or control of property.

PM2.5. Solid or liquid particulate matter (excluding uncombined water) with an aerodynamic diameter less than or equal to 2.5 micrometers.

PM10. Solid or liquid particulate matter (excluding uncombined water) with an aerodynamic diameter less than or equal to 10 micrometers.

Sole Source of Heat. A solid fuel space heating device which constitutes the only source of heating in a private residence. A solid fuel space heating device shall not be

considered to be the sole source of heat if the private residence is equipped with any permanently-installed furnace or heating system utilizing oil, natural gas, electricity or propane.
Solid Fuel Space Heating Device. Any device designed or operated to burn solid fuel for the heating of the interior of a building, including, but not limited to, solid fuel burning stoves, fireplaces or wood stoves of any nature, combination fuel furnaces or boilers used for space heating which can burn solid fuel, and solid fuel burning cooking stoves. "Solid fuel space heating device" does not include natural gas-fired artificial fireplaces.
Stage I Red Advisory. A 24-hour period beginning at 4:00 p.m. when PM10 levels are forecast by LRAPA to be greater than or equal to 125 micrograms per cubic
9.130 Lane Code 9.140
9-10 LC9 meter but less than 150 micrograms per cubic meter, or when PM2.5 levels are forecast by LRAPA to be greater than or equal to 55 micrograms per cubic meter but less than 65 micrograms per cubic meter, within the Eugene/Springfield Metropolitan Area General Plan Urban Growth Boundary.
Stage II Red Advisory. A 24-hour period beginning at 4:00 p.m. when PM10 levels are forecast by LRAPA to be greater than or equal to 150 micrograms per cubic meter, or when PM2.5 levels are forecast by LRAPA to be greater than or equal to 65 micrograms per cubic meter, within the Eugene/Springfield Metropolitan Area General Plan Urban Growth Boundary.
Visible Emissions. The reduction in transmission light or the obscuring of the view of an object in the background caused by the air pollutants emitted by the heating device. This does not include the visual distortion caused by the heated air emitted by the heating device.
Yellow Advisory. A 24-hour period beginning at 4:00 p.m. when PM10 levels are forecast by LRAPA to be greater than or equal to 100 micrograms per cubic meter but less than 125 micrograms per cubic meter, or when PM2.5 levels are forecast to be greater than or equal to 41 micrograms per cubic meter but less than 55 micrograms per cubic meter, within the Eugene/Springfield Metropolitan Area General Plan Urban Growth Boundary. *(Revised by Ordinance No. 9-90, Effective 1.18.91; 1-00, 4.12.00; 13-03, 10.23.03)* **9.130 Area of Applicability.**
The Metropolitan Area General Plan Urban Growth Boundary adopted in 1982 as amended through June 2003, excluding the area within the city limits of Eugene and Springfield. *(Revised by Ordinance No. 9-90, Effective 1.18.91; 13-03, 10.23.03)*
9.135 Prohibitions.
(1) Stage I Red Advisory. No person in charge of property during a Stage I Red Advisory shall operate or allow to be operated a solid fuel space heating device which emits visible emissions into the air outside of the building housing the device unless the person in charge of the property has been granted an exemption to use the device by LRAPA.
(2) Stage II Red Advisory. No person in charge of property during a Stage II Red Advisory shall operate or allow to be operated a solid fuel space heating device unless the person in charge of the property has been granted an exemption to use the device by LRAPA or unless the person is operating a pellet stove which emits no visible emissions into the air outside of the building housing the device.
(3) Green or Yellow Advisory. No person in charge of property during a green or yellow advisory shall operate or allow to be operated a solid fuel space heating device which discharges emissions that are of an opacity greater than forty (40) percent. This provision does not apply to the emissions during the building of a new fire, for a period or periods aggregating no more than ten (10) minutes in any four (4) hour period.

(4) Prohibited Materials. No person in charge of property shall at any time allow to be initiated or maintained in a solid fuel space heating device the burning of any plastics, wire insulation, petroleum by-products (with the exception of natural-gas-fueled log lighters), petroleum treated materials, rubber products, animal remains, or animal or vegetable matter resulting from the handling, preparation, cooking, or service of food, or of any other material which normally emits dense smoke, noxious odors, or hazardous air contaminants. *(Revised by Ordinance No. 9-90, Effective 1.18.91; 1-00, 4.12.00; 13-03, 10.23.03)*

9.140 Exemption for Economic Need.

Exemption from LC 9.135 above for Stage II and/or Stage I Red Advisories may be obtained from LRAPA for economic need. Persons in charge of property who satisfy criteria established under the Low Income Energy Assistance Program as administered by 9.145 Lane Code 9.215
9-11 LC9 the Lane County Housing Authority and as established by the United States Department of Energy are exempt from LC 9.135 above for both Stage I and Stage II Red Advisories. Individual exemptions shall expire on July 1 of each year and must be renewed annually.
(Revised by Ordinance No. 9-90, Effective 1.18.91; 1-00, 4.12.00)

9.145 Enforcement.

The Board of County Commissioners designates LRAPA to enforce the prohibitions contained herein. The investigation, initiations of proceedings, adjudication of a failure to comply and appeal of such shall be regulated by the adopted administrative and hearing procedures of LRAPA set forth in its Rules and Regulations.
The County shall also retain the right to investigate and enforce the terms of this ordinance. Existing citation, complaint, violation, or failure to comply procedures applicable to the County may be utilized to prosecute such failures to comply. *(Revised by Ordinance No. 9-90, Effective 1.18.91; 1-00, 4.12.00)*

9.150 Penalties.

Failure to comply with LC 9.135 above shall be subject to administrative enforcement pursuant to LC Chapter 5, including a monetary penalty of a minimum of $50 to a maximum of $500 for each day in which such failure to comply occurs. This remedy is cumulative and is in addition to any and all other remedies available to Lane County.
(Revised by Ordinance No. 9-90, Effective 1.18.91; 1-00, 4.12.00)

Springfield Code

AIR POLLUTION
4.500 Lane Regional Air Protection Agency.

The Lane Regional Air Protection Agency (LRAPA) is the primary authority responsible for the control and/or abatement of air pollution in the city. As part of its duties LRAPA is responsible under its rules and regulations and Oregon Administrative Rules, for administering the most current Oregon Revised Statutes which concern air quality. [Section 4.500 amended by Ordinance No. 6216, enacted February 22, 2008.]

4.502 City Responsibilities.

On any matters pertaining to air quality that are not administered by LRAPA, the city will comply with the most current Oregon Revised Statutes which concern air quality and the adopted state implementation plan for the Eugene-Springfield Area.

4.504 Abatement.

Nothing in sections 4.500 to4.512 shall restrict the right of the city to abate a nuisance in any matter otherwise.

Solid Fuel Space Heating Devices.
4.508 Prohibitions.

(1) Stage I Red Advisory. No person in charge of property during a Stage I Red Advisory shall operate or allow to be operated a solid fuel space heating device which emits visible emissions into the air outside of the building housing the device unless the person in charge of the property has been granted an exemption to use the device by LRAPA.

(2) Stage II Red Advisory. No person in charge of property during a Stage II Red Advisory shall operate or allow to be operated a solid fuel space heating device unless the person in charge of the property has been granted an exemption to use the device by LRAPA or unless the person is operating a pellet stove which emits no visible emissions into the air outside of the building housing the device.

(3) No person in charge of property shall at any time allow to be initiated or maintained in a solid-fuel space-heating device the burning of any plastics, wire insulation, petroleum by-products, petroleum-treated materials, rubber products, animal remains, or animal or vegetable matter resulting from the handling, preparation, cooking or service of food, or of any other material which normally emits dense smoke, noxious odors, or hazardous air contaminants. This section does not prohibit use of natural gas fuels to light solid fuels.

(4) During a green or yellow advisory, no person in charge of property shall operate or allow to be operated a solid-fuel space-heating device which discharges emissions that are of an opacity greater than 40 percent. This provision does not apply to the emissions during the building of a new fire, for a period or periods aggregating no more than 10 minutes in any four-hour period. [Section 4.508 amended by Ordinance No. 6026, enacted December 2, 2002.]

4.510 Exemptions.

A person in charge of property may operate a solid fuel space heating device during a Stage I or Stage II Red Advisory if that person has previously obtained one of the following exemptions from LRAPA.

(1) Sole Source of Heat: A person in charge of property who signs a sworn statement that the solid fuel space heating device is the sole source of heat for that persons residence is exempt from section 2 above. Individual exemptions shall expire on July 1 of each year and must be renewed annually. This exemption shall not be issued by LRAPA after June 30, 1996.

(2) Economic Need: Persons in charge of property who satisfy criteria established under

the Low Income Energy Assistance Program as administered by the Springfield Utility Board and as established by the United States Department of Energy are exempt from the prohibitions established herein. Individual exemptions shall expire on July 1 of each year and must be renewed annually.

4.512 Enforcement.

(1) LRAPA is hereby authorized and designated to enforce and administer the process of sections 4.508 through 4.512 of the code in accordance with the adopted administrative and hearing procedures of LRAPA set forth in its rules and regulations adopted November 10, 1992.

(2) Violations. Penalties shall be in accordance with applicable state laws and LRAPA “Rules of Practice and Procedures” adopted February 13, 1990.

Appendix C

2008 Attainment Year Emission Inventory for the Eugene-Springfield UGB

An annual and a Winter day emission inventory have been developed for the Eugene-Springfield UGB. The methodology used for developing the emission inventory for each source category is discussed. In each case, EPA approved methods were used.

The results of this analysis are summarized in Table C1. As the data depicts, residential wood combustion is the primary contributor of PM_{10} to the airshed on Winter days when historically this area has exceeded the 24 hour standard.

Table C1

2008 estimated PM_{10} emissions for the Eugene/Springfield UGB

Source	Annual (tons/year)	Winter Day (tons/day)
Point Sources	1,624.1	4.4
Residential wood combustion	728.2	8.5
Road Dust	281.2	0.8
Motor vehicle exhaust, brake and tire wear	120.3	0.4
Total	2,753.8	14.1

Point Sources:
Although the EPA definition of a point source for PM_{10} in moderate non-attainment areas is one having emissions $\geq$ 100 tons/year, for the purposes of this emissions inventory sources $\geq$ 10 tons/year will be included. This more complete listing of sources creates a more accurate estimate of the impact of point sources in this area. Within the UGB there are 10 sources which have Federal Title V Operating Permits, 3 sources with Synthetic Minor Operating Permits, and 9 sources with LRAPA Air Contaminant Discharge Permits (ACDP), which have annual PM_{10} emissions $\geq$ 10 tons/year. The permitted Plant Site Emission Limits were used to estimate emissions for 2008, since actual emissions are not available. All of these sources operate with a fairly consistent production rate year-round. The estimate of daily emissions is a direct fraction of the annual emissions.

Title V Sources:

Permit #	Name	Annual PM_{10} (t/y)

203129	G.P. Resins	12.4
203102	Murphy	64.0
204402	Kingsford mfg.	194.0
207510	Mckenzie Forrest Products	219.8
207050	Rosboro	213.0
208866	Sierra Pine	214.9
208256	Trus Joist Eugene	61.4
208850	International Paper	305.0
200529	Flakeboard America MDF	70.0
208864	Pacific States Plywood	34.0

Synthetic Minor Sources:

Permit #	Name	Annual PM_{10} (t/y)
202805	Forrest Paint	17.0
208557	University of Oregon Boiler	24.6
208894	Whittier Wood Products	23.7

ACDP Sources:

Permit #	Name	Annual PM_{10} (t/y)
201270	Cafeto Custom Roasting	14.0
206122	Caffe Pacori	14.0
202528	Emerald Forest Products #1	49.0
203103	Georgia Pacific Irving	15.7
208250	Mckenzie Forest Products	10.6
202108	Northwest Hardwoods	11.0
207488	Ridgeline	15.0
207075	Rexius Forest Byproducts	14.0
207459	Seneca Sawmill	27.0

Total Point Source Annual Emissions = 1,624.1 tons/year
Point Source Daily Emission Estimate = 4.4 tons/day

Area Sources:

Residential Wood Combustion:

Emissions were developed from the estimated use of wood stoves, pellet stoves, and fireplaces within the UGB. Estimates of usage were made using the results of the most recent survey; a 2009 study performed by Advanced Marketing Research Inc. (see Appendix F). The emission factors used were from EPA AP42 tables 1.9-1 and 1.10-1. The daily usage was estimated using Heating Degree Days for the worst case winter day in 2008.

2008 Residential Wood Combustion PM10 Emissions Estimates Eugene-Springfield UGB

Wood Burning Device	# of households using device[1]	2008 total fuel burned[2] (tons)	PM_{10} emission factor[3] (lbs/ton)	2008 Emission[4] (tons)
fireplace	18,233	19,327	34.6	334.4
woodstove and fireplace insert uncertified	8,104	15,641	30.6	239.3
phase II certified catalytic Wood stove and insert	8,104	15,641	16.2	126.7
Pellet stove	7,091	6,311	8.8	27.8

Total Annual PM_{10} Emissions from RWC = 728.2 tons
The Worst Case Winter Day PM_{10} Emissions from RWC = 8.5 tons[5]

1. Household Calculations:

The Lane Council of Governments (the local Metropolitan Planning Organization) estimates a total of 101,296 households within the Eugene-Springfield UGB during 2008.

The 2009 survey provides estimates of the percentage of households using a particular type of wood burning device as follows:

fireplace w/o insert and other misc. devices = 18%
conventional woodstoves and fireplace inserts = 8% phase
II certified woodstoves = 8% pellet stoves = 7%

(total households) (fraction using device) = number of households using device

2. Total Fuel Burned Calculations:

Based upon discussions with local firewood retailers and with federal agencies that provide firewood cutting permits, the primary species used for firewood in this area is Douglas Fir.

the density of Douglas Fir is 32 lbs/ft^3 (EPA AP42 Appendix A)

the volume of a cord of wood is approximately 80 ft^3 (EPAvol III chapter 2 EIIP RWC Jan 2001)

therefore, one cord of Douglas Fir weighs 1.28 tons

Based upon previous local surveys, the heating season for the Eugene/Springfield UGB is defined as October through March.

The most recent formal survey was conducted in 2009 with fuel usage estimates for 2008.

The 2009 survey provides estimates of the amount of wood burned by each type of wood burning device as follows:

fireplace w/o insert - an average of 0.83 cords per device per year
(0.83 cords) (1.28 tons/cord) = 1.06 tons per device per year

conventional woodstoves and fireplace inserts - an average of 1.51 cords per device per year (1.51 cords) (1.28 tons/cord) = 1.93 tons per device per year

phase II certified woodstoves - an average of 1.51 cords per device per year (1.51 cords)(1.28 tons/cord) = 1.93 tons per device per year

pellet stoves - burned an average of 0.89 tons of pellets per year

PM10 emission factors:

EPA AP 42 tables 1.9-1 and 1.10-1

3. 2008 emissions calculation:

(2008 total fuel burned (tons)) (PM_{10} emission factor (lbs/ton)) (1/2000 lbs/ton) = 2008 PM_{10} emissions (tons)

4. Worst Case Day Emissions:

For the worst case day emissions estimate, it was assumed that the amount of wood burned is directly proportional to the Heating Degree Days (HDD). As defined by the National Weather Service, a HDD is calculated by averaging the daily maximum and minimum temperatures and for each degree that number is below 65 degrees, it is one degree day. Therefore, if the maximum and minimum temperatures average to 63 degrees, that is 2 degree days.

The peak HDD date in 2008 was 12/16/08 with 46 HDD. To compute the daily emissions estimate multiply the ratio of the peak day HDD to the total season HDD with the season total emission estimate. The season total HDD for 2008 was 3,927.

(46/3,927) (728.2 tons) = 8.5 tons

On Road Mobile Sources:

Road Dust:

Emissions estimates for Road Dust were developed using EPA AP42 emission factors and VMT estimates from the Lane Council of Governments (the local MPO) as follows:

equation 1 in AP42 section 13.2.1

$E = k(sL/2)^{0.65} * (W/3)^{1.5} - C$

where:

$E = PM_{10}$ emission factor (lbs/VMT)
k = particle size multiplier = 0.016 lbs/VMT (AP42 table 13.2-1.1) sL = silt loading using AP42 table 13.2.1-3
5,000 - 10,000 ADT = 0.06 g/m^2 >
10,000 ADT = 0.03 g/m^2
from LCOG (personal communication) 76% of VMT in the UGB is on roads > 10,000 ADT
sL = (0.76)(0.03) + (0.24)(0.06) = 0.037 g/m^2 W = average weight of vehicles = 2.5 tons (ODOT personal communication)
C = emission factor for fleet exhaust, brake wear, and tire wear
= 0.00047 lbs/VMT (AP42 table 13.2.1-2)

E = 0.000439 lbs/VMT

Annual Adjustment:

equation 2 in AP42 section 13.2.1

$E_{ann} = E (1 - P/4N)$

where:

P = number of wet days in 2008 = 143
N = number of days in the year = 366

E_{ann} = 0.000396 lbs/VMT

VMT estimates:

LCOG (personal communication) provided VMT estimates

average weekday VMT = 4.19×10^6

annual VMT = 1.42×10^9

Annual emission estimate = 281.2 tons/year

Daily emission estimate = 0.83 tons/day

Motor Vehicle Exhaust, Brake Wear, and Tire Wear:

The emissions were estimated using emission factors from EPA Mobile 6.2.
The VMT estimates were from the Lane Council of Governments (the local MPO).

Winter PM_{10} emission factor for exhaust, brake, and tire wear = 0.078 g/mi

Summer PM_{10} emission factor for exhaust, brake and tire wear = 0.0757g/mi

Composite annual emission factor = 0.0769 g/mi

Average weekday VMT = 4.19×10^6

Annual VMT = 1.42×10^9

Annual PM_{10} Emission Estimate = 120.3 tons/year

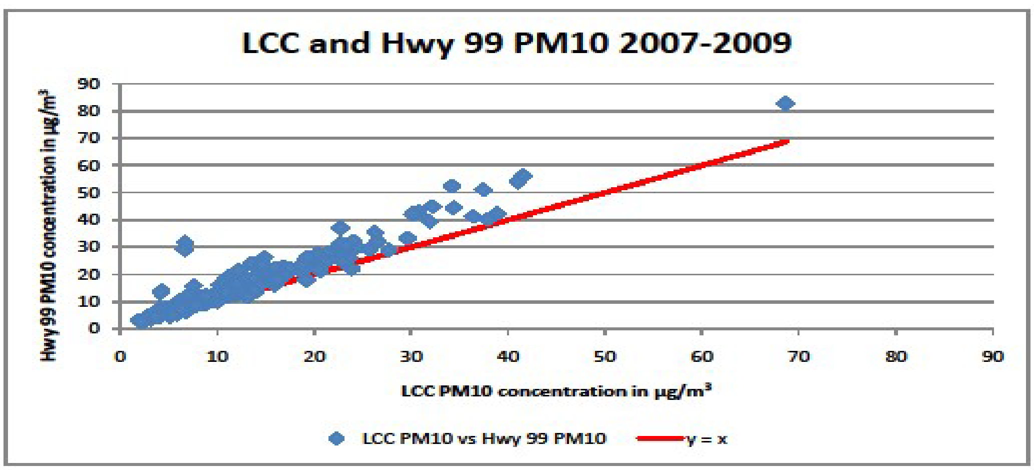
Winter Day PM_{10} Emission Estimate = 0.4 tons/day

Appendix D

PM_{10} / $PM_{2.5}$ Relationship

In order to describe the relationship between PM_{10} and $PM_{2.5}$ in the Eugene/Springfield area, a brief analysis is summarized here. It is LRAPA's assertion that PM_{10} monitoring is unnecessary in this air shed because the ratio of $PM_{2.5}$ to PM_{10} is high enough to ensure that the 24-hr $PM_{2.5}$ standard would be violated before the PM_{10} standard was reached.
There are two existing PM_{10} monitoring sites in this area that were established in 1985, AQS number 410390013 (LCC) and AQS number 410390058 (Hwy 99). The Hwy 99 site has also monitored $PM_{2.5}$ since 2007. A third site, AQS number 410390060 (AMZ), has previously monitored PM_{10} and currently monitors PM_{10} as a toxic metals method, funded through a temporary HAP project.
The most important fact regarding PM levels in Eugene/Springfield is that neither PM_{10} nor $PM_{10}c$ (coarse) are pollutants of concern here. There has not been an exceedance of the 24-hr PM_{10} standard since 1987. The 2007-2009 design values are 60 µg/m³ and 50 µg/m³ for Hwy 99 and LCC, respectively. Figure 1 shows that the Hwy 99 site is clearly the higher of the two sites. During the 2007-2009 period, the highest 24-hr $PM_{10}c$ value measured was 42 µg/m³. This is 57% of the 2006 proposed standard of 70 µg/m³.

Figure 1



The collocated PM_{10} and $PM_{2.5}$ data for 2007-2009 from Hwy 99 was used to examine the $PM_{2.5}/PM_{10}$ ratio. Figure 2 shows that as the $PM_{2.5}$ concentration approaches 25 µg/m³, the ratio is equal to or greater than 50%. It follows that at or above 25 µg/m³ of $PM_{2.5}$, the PM_{10} concentrations would be equal to, or less than, twice the $PM_{2.5}$ concentration. Figure 3 displays another way to view the PM ratio. The coarse fraction only rises (that is, the ratio decreases) as the PM_{10} concentration reduces to insignificant values.

Figure 2

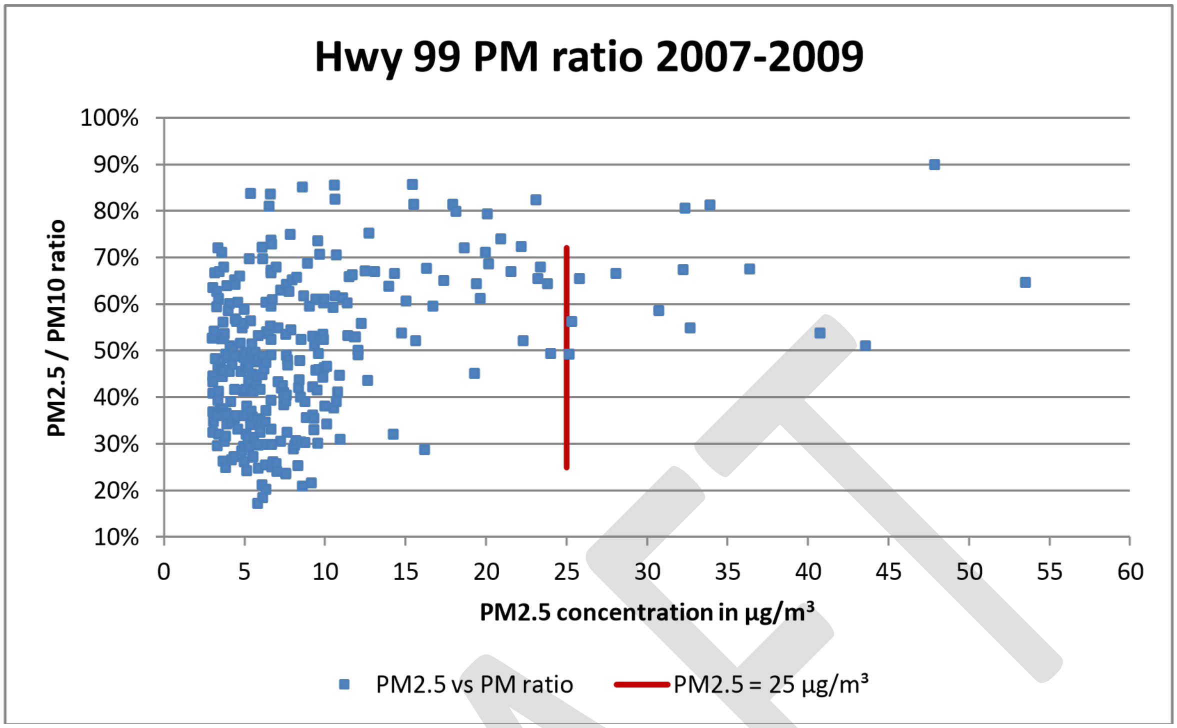
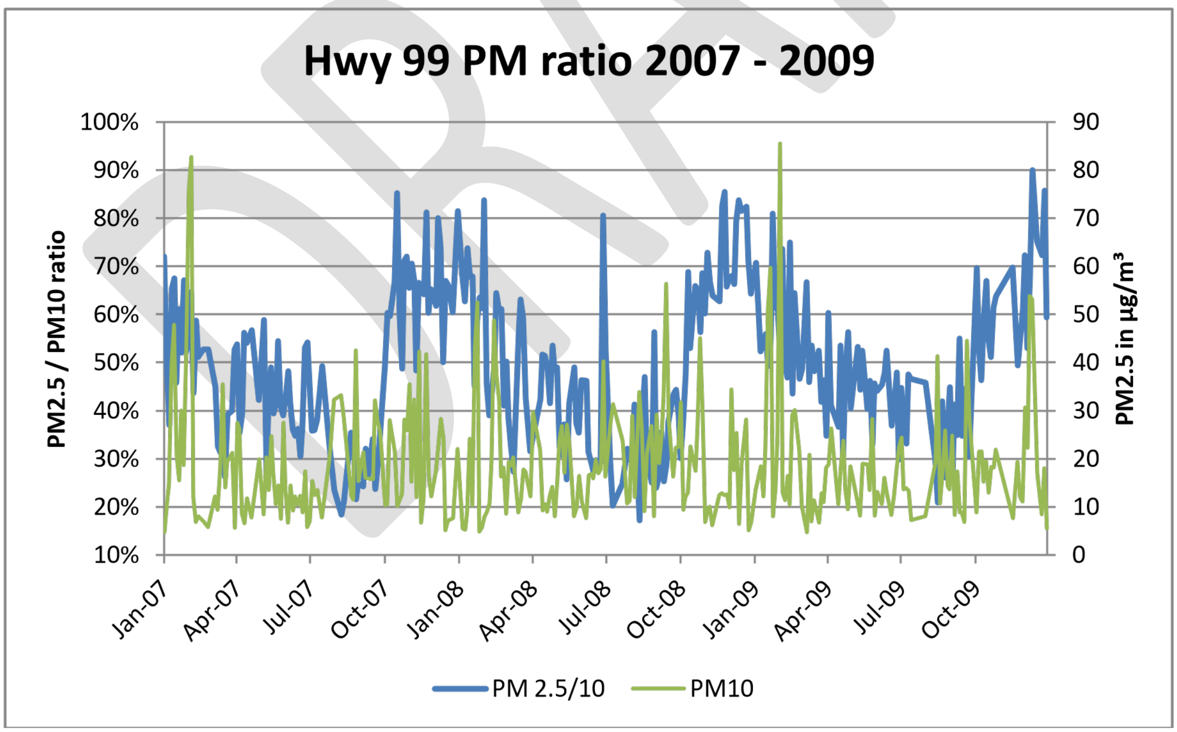
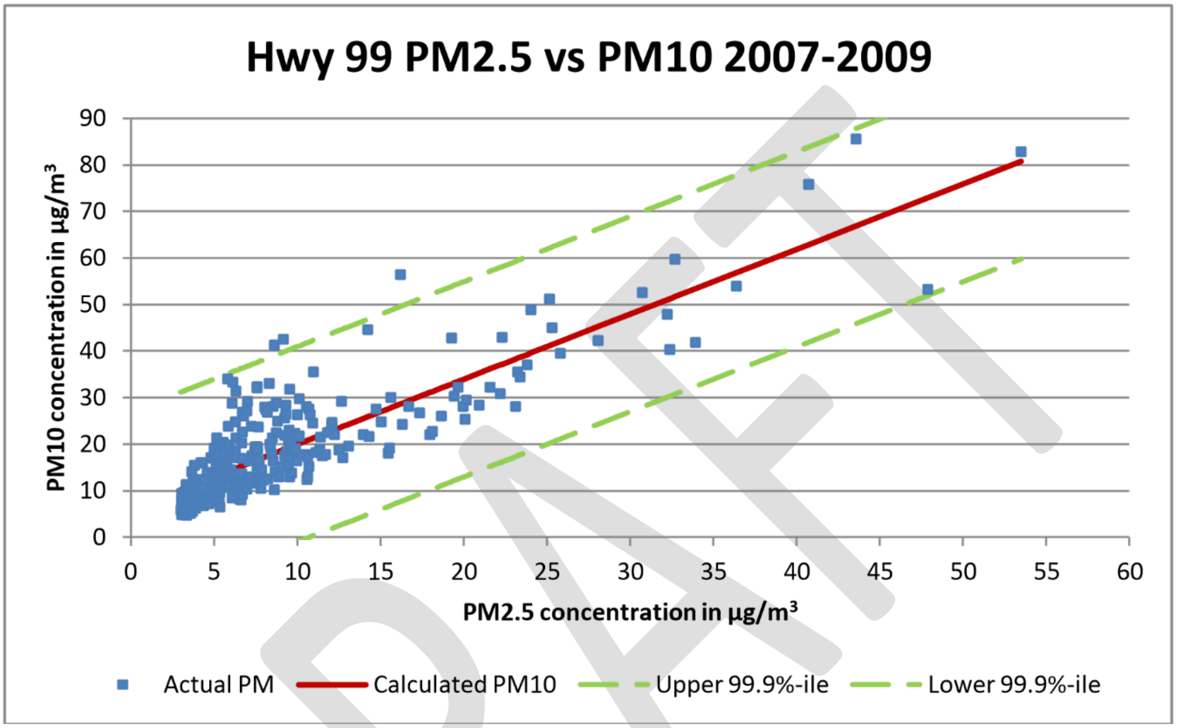


Figure 3



Finally, results of a regression analysis lead to the same conclusion. A simple linear regression was performed on 291 pairs of collocated observations (>= 3 µg/m³) of $PM_{2.5}$ and PM_{10}. This regression line predicts a PM_{10} concentration ($PM_{10} = 1.397 * PM_{2.5} + 6.005$) from an observed $PM_{2.5}$ concentration with a good deal of certatinty ($r^2 = 0.708$). Using a conservative limit of 99.9%, upper and lower confidence intervals are +/- 21 µg/m³. Figure 4 shows that at the point of a 24-hr $PM_{2.5}$ exceedance, PM_{10} levels remain at 50% of the 24 hr PM_{10} standard.

Figure 4



Appendix E

EPA determination of Transportation Conformity for PM10

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 10
1200 Sixth Avenue
Seattle, Washington 98101

OCT 0 3 1994

Reply To
Attn Of: AT-082

Mr. Don Arkell, Director
Lane Regional Air Pollution Authority
225 North 5th, Suite 501
Springfield, OR 97477-4671

Dear Mr. Arkell:

This is in response to your letter to Chuck Clarke regarding the "Memorandum of Understanding - Transportation Conformity Analysis for the Eugene-Springfield MPO", dated September 9, 1994. The letter was also signed by George Kloeppel, the LCOG Executive Director.

The final federal conformity rule does allow for exempting areas from the regional emissions analysis of the conformity rule if certain criteria are met. I believe your letter demonstrates that the Eugene-Springfield area meets the PM_{10} conformity criteria and therefore, I concur with your conclusion that the conformity determination is not required to satisfy the PM_{10} criteria for regional emissions analysis. The preamble for the federal rule, however, does not allow for relief from project level analysis. The projects within the PM_{10} nonattainment area must comply with the project level conformity requirements as specified in the federal conformity regulation.

I also concur with your findings regarding analysis for conformity findings with regard to meeting the carbon monoxide criteria. Regional emission test will apply only in the Central Area Transportation Study (CATS) boundary, consistent with the approved redesignation. Regional emission analysis will not apply outside the CATS boundary. Again, project level conformity requirements are not affected by this finding and continue to apply throughout the nonattainment area, consistent with the federal regulation.

Thank you for requesting our concurrence with this conformity proposal. Questions regarding our concurrence can be directed to Mike Lidgard at (206)553-4233.

Sincerely,

Jim McCormick

Jim McCormick, Director
Air and Toxics Division

cc: George Kloeppel, LCOG

Printed on Recycled Paper

Appendix F

FUEL USE SURVEY CONDUCTED FOR LANE REGIONAL AIR PROTECTION AGENCY

October, 2009

ADVANCED MARKETING
RESEARCH INC.

P.O. Box 5244 · Eugene, OR 97405 · Phone/Fax 541-345-6600 · www.advancedmarketingresearch.com

TABLE OF CONTENTS

EXECUTIVE SUMMARY

Primary Heat Source (Q3-4)
Natural gas forced air heaters and electric heat pumps top the list as primary sources of heat for Eugene/Springfield area residents, with 25% each. Electric ceiling heat and electric wall heaters are each the primary source of heat for 13%, and electric forced air is the source of heat for 12%.

The electric heat pump has moved up from 8% in 2001 to 25% currently, while electric ceiling heat has gone from 33% and first place in 2001, down to 13% currently.

Secondary Heat Sources (Q5-6)
43% of residents do not have a secondary source of heat, down from 56% in 2001. 16% use a wood fireplace as a secondary source of heat, 8% use a gas fireplace, 8% use electric wall heaters, and 8% use wood stoves.

Changes in Primary Heat Source (Q7-10)
7% are considering a change in their primary heat source, consistent with 6% in 2001. Of those considering a change (n=29), 66% are planning to switch to an electric heat pump (up from 23% in 2001), 10% are planning to get electric forced air, and 3% are planning to get gas forced air (down from 27% in 2001).

For those considering a switch (n=29), cost is the reason for 38%, efficiency is the reason for 31%,
and 24% don't like their current system. (See Table 10V for verbatim responses.)

Current Use of Wood Stoves (Q11-13)
18% of residents currently have a wood stove, consistent with 15% in 2001. 44% of the wood stoves are over fifteen years old. 11% are eleven to fifteen years old, 25% are five to ten years old, and 11% are less than five years old. 8% of the wood stoves are of unknown age.

Of those with wood stoves (n=72), 10% do not use them at all. 42% burn less than one cord per year, 22% burn one to two cords per year, and 22% burn three or more cords each year. 4% are unsure how much wood they burn.

Current Use of Pellet Stoves (Q14-16)
7% of residents currently have a pellet stove, consistent with 3% in 2001. 27% of the pellet stoves are under five years old, down from 55% in 2001. 43% are five to ten years old, 13% are eleven to fifteen years old, and 13% are over fifteen years old. 3% of the pellet stoves are of unknown age.

Of those with pellet stoves (n=30), 7% do not use them at all. 23% burn 1 to 25 bags of pellets per year. 37% burn 26 to 50 bags per year. 20% burn 51 to 75 bags per year. 14% burn over 75 bags each year.

Current Use of Wood-Burning Fireplaces (Q17-18)

31% of residents currently have a wood-burning fireplace, consistent with 37% in 2001.

Of those with wood-burning fireplaces (n=125), 42% do not use them at all, up from 29% in 2001. 47% burn less than one cord per year, 7% burn one to two cords per year, and 3% burn three or more cords each year. 1% are unsure how much wood they burn.

Awareness of LRAPA (Q19)

70% have heard of the Lane Regional Air Protection Agency, consistent with 70% in 2001 but up from 55% in 1997. 27% have not heard of the agency. 1% are unsure.

FUEL USE SURVEY FOR LANE REGIONAL AIR PROTECTION AGENCY
October, 2009

PURPOSE OF THE STUDY

The purpose of this study is to assist LRAPA in determining patterns of fuel usage.

METHODOLOGY

Advanced Marketing Research was hired to conduct the research project in order to obtain unbiased and statistically valid results.

Using questions proposed by LRAPA, Advanced Marketing Research designed a questionnaire instrument to be administered by telephone. Using a random list of Eugene/Springfield area residents as a sampling frame, 404 interviews were completed. Telephone interviews were conducted between October 9 and October 18, 2009.

Proper data analysis techniques were employed by Advanced Marketing Research to avoid introducing unnecessary error and bias into the study.

QUOTAS OBSERVED

The residential population was sampled using the following quotas:

Males	45% to 55%
Females	45% to 55%
Age 65+	Not to exceed 25%

RESPONSE RATE

Of the 492 qualified respondents reached by telephone, 404 interviews were completed, for a response rate of 82%. The overall breakdown of numbers dialed is as follows:

Refusals	88
Disconnects	46
Wrong Numbers	5
Language Barrier	4
Spanish Language Barrier	6
Business Numbers	16
Fax	17
No Answer	65
Answering Machine	498
Busy Signal	14
Call Backs	13
Respondent Not Available	6
Completed Interviews	404
Total Numbers Dialed	1,182

TESTS FOR DIFFERENCES BETWEEN PROPORTIONS

When looking at the data tables, differences between percentage amounts can be misleading, and statistical tests must be conducted to determine if the differences are statistically significant. The computer makes these calculations for us, and the results are occasional plus or minus signs at the bottom of certain cells. These indicate that those answers are more different from everybody else's answers than could be expected due to chance, given the sample sizes involved. Plus signs are used if the group picks that answer *more* often than everyone else; minus signs if it is *less* than everyone else. The number of plus or minus signs indicates the level of statistical significance. One means the 90% level, two the 95% level, and three the 99% level. For example, two plus signs would mean that you can be 95% sure that the people represented by that group really would pick that answer more often than the people represented by the rest of the sample. It should be noted that this test can only be done for banner columns that contain at least 30 people. Because of this requirement, it is possible that the test will be done for some banner columns on a table and not for others.

NOTES ON CHI SQUARE

The chi square value and its associated probability are printed beneath the first column in each banner heading. The probability (p=.xxx) indicates the probability that the heading and row variables are *not* related is .xxx. For example, a .05 probability of not being related means a 95 percent chance of being related.

DEMOGRAPHIC CHARACTERISTICS OF THE SAMPLE (Q20-24)

	2009	2001
Gender		
Male	50%	47%
Female	50	53
Age		
18-24	3%	8%
25-34	7	16
35-44	21	20
45-54	20	16
55-64	27	20
65+	21	18
Residence		
Eugene	67%	78%
Springfield	33	22
Own or Rent		
Own	91%	76%
Rent	9	24

BOUND ON ERROR

	SAMPLE SIZE		Bound on Error at
SEX	Frequency	Percent	95%
Confidence Level			
Male	200	50%	6.4%
Female	204	50%	6.3%
AGE			
18-24	14	3%	--
25-34	27	7%	--
35-44	85	21%	9.7%
45-54	79	20%	10.1%
55-64	108	27%	8.6%
65+	86	21%	9.7%
RESIDENCE			
Eugene	272	67%	5.5%
Springfield	132	33%	7.8%
OWN/RENT			
Own	366	91%	4.7%
Rent	38	9%	14.6%
TOTAL	404	100%	4.5%*

* What this means is that we are 95% certain that the mean response of the entire population of Eugene/Springfield area residents lies within (plus or minus) 4.5% of the survey response.

MINIMUM DIFFERENCE IN PERCENTAGE POINTS REQUIRED FOR STATISTICAL SIGNIFICANCE IN COMPARISON OF REPORTED PERCENTAGES FOR SUBGROUPS WITH 95% CONFIDENCE

Subsample	50	100	150	200	250	300	350	400	450	500	600
50	20%	17%	16%	15%	15%	15%	15%	15%	15%	15%	15%
100		14%	13%	12%	12%	11%	11%	11%	11%	11%	11%
150			11%	11%	10%	10%	10%	9%	9%	9%	9%
200				10%	9%	9%	9%	8%	8%	8%	8%
250					9%	8%	8%	8%	8%	8%	7%
300						8%	8%	7%	7%	7%	7%
350							7%	7%	7%	7%	6%
400								7%	7%	7%	6%
450									7%	6%	6%
500										6%	6%
600											6%

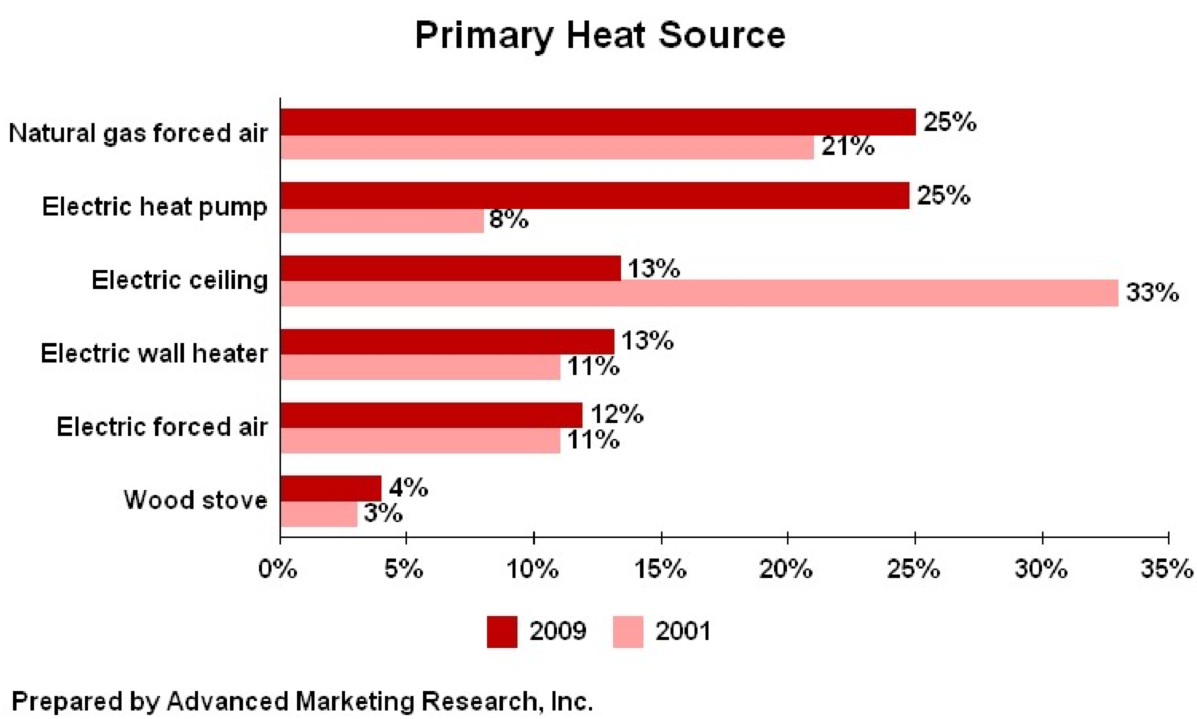
Minimums are for reported percentages near 50%. When much smaller or much larger percentages are reported, a slightly smaller minimum is required.

ANALYSIS OF DATA

PRIMARY HEAT SOURCE (Q3-4)

Natural gas forced air heaters and electric heat pumps top the list as primary sources of heat for Eugene/Springfield area residents, with 25% each. Electric ceiling heat and electric wall heaters are each the primary source of heat for 13%, and electric forced air is the source of heat for 12%.

The electric heat pump has moved up from 8% in 2001 to 25% currently, while electric ceiling heat has gone from 33% and first place in 2001, down to 13% currently.

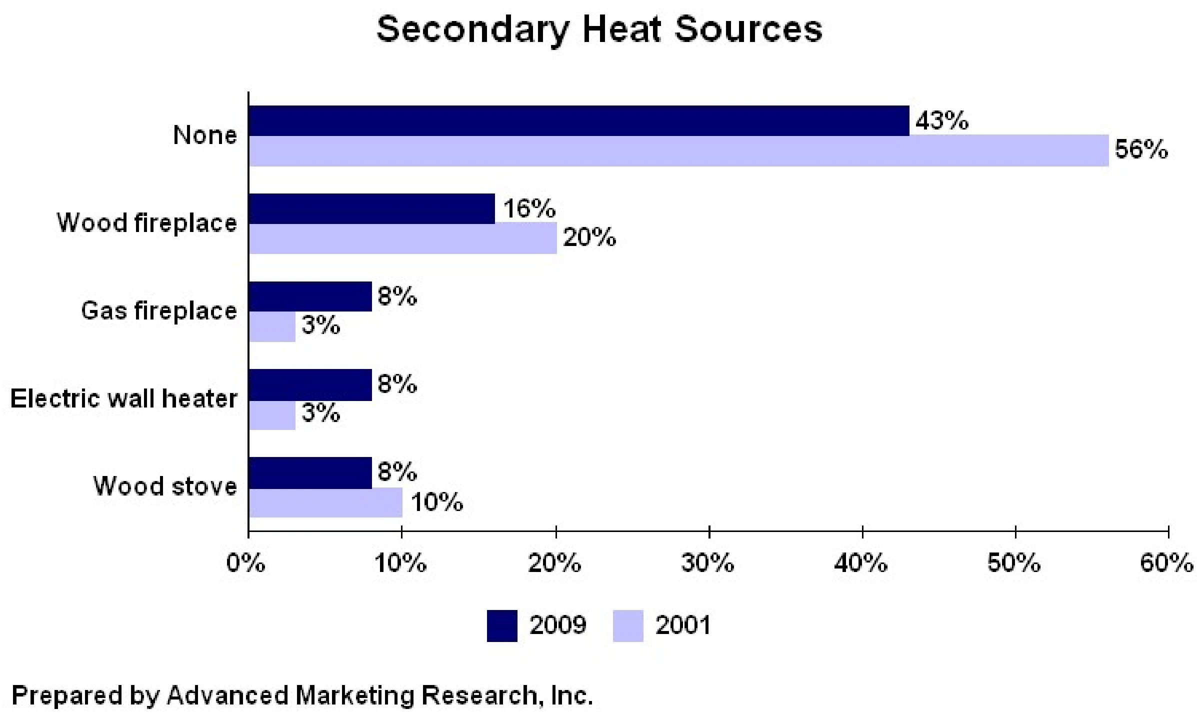


Demographic Differences

Homeowners and Eugene residents are more likely than others to have natural gas forced air as their primary source of heat. Homeowners are more likely than renters to have an electric heat pump. Renters are more likely than owners to have electric ceiling heat or electric wall heaters as their primary sources of heat.

SECONDARY HEAT SOURCES (Q5-6)

43% of residents do not have a secondary source of heat, down from 56% in 2001. 16% use a wood fireplace as a secondary source of heat, 8% use a gas fireplace, 8% use electric wall heaters, and 8% use wood stoves.



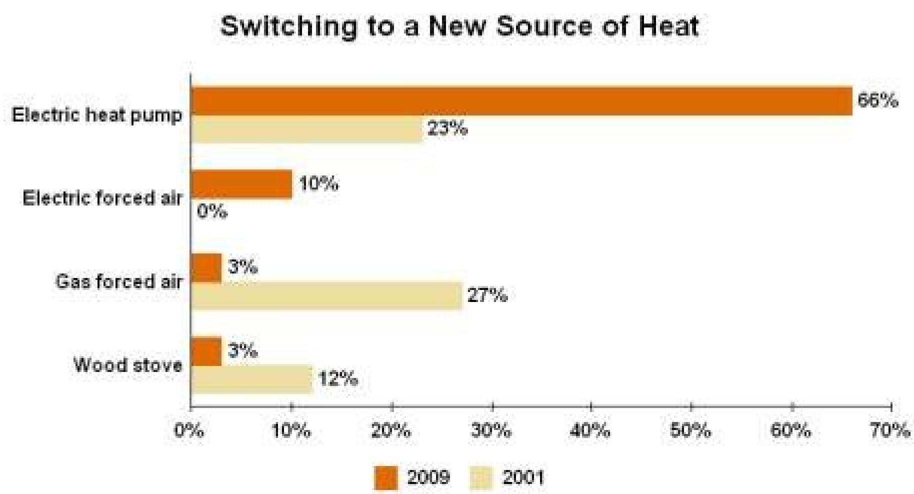
Demographic Differences

35 to 44 year-olds and renters are more likely than others to not have a secondary source of heat in their household. 55 to 64 year-olds are more likely than others to use a wood fireplace as a secondary source of heat. Eugene residents are more likely than Springfield residents to use a gas fireplace or an electric wall heater as a secondary source of heat. Males are more likely than females to use a wood stove as a secondary source of heat.

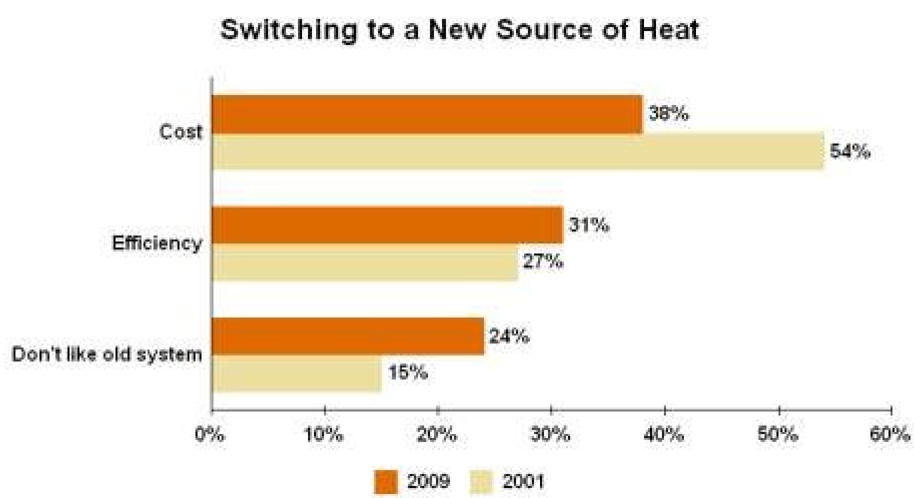
CHANGES IN PRIMARY HEAT SOURCE (Q7-10)

7% are considering a change in their primary heat source, consistent with 6% in 2001. Of those considering a change (n=29), 66% are planning to switch to an electric heat pump (up from 23% in 2001), 10% are planning to get electric forced air, and 3% are planning to get gas forced air (down from 27% in 2001).

For those considering a switch (n=29), cost is the reason for 38%, efficiency is the reason for 31%, and 24% don't like their current system. (See Table 10V for verbatim responses.)



Based on those considering a change (n<30)

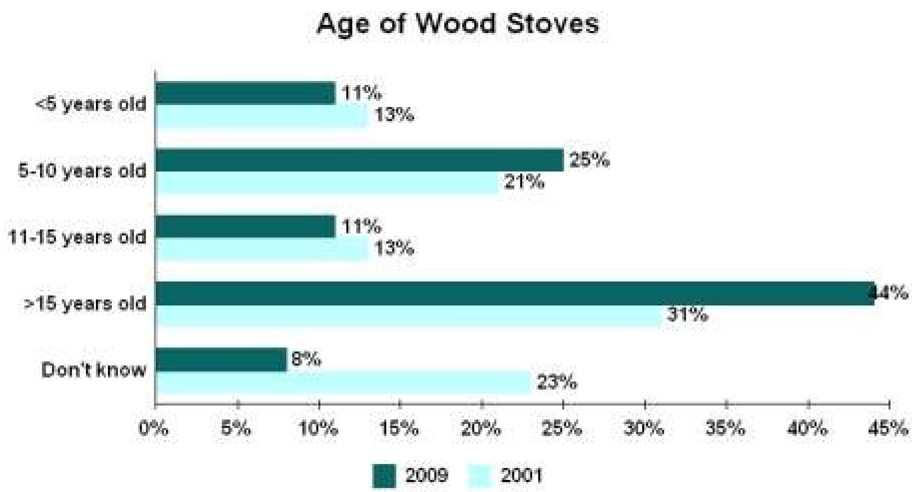


Based on those considering a change (n<30)

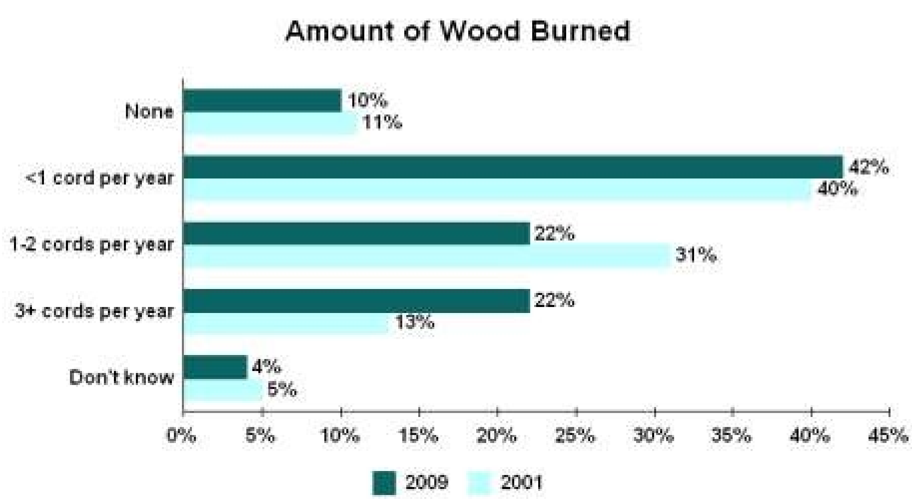
CURRENT USE OF WOOD STOVES (Q11-13)

18% of residents currently have a wood stove, consistent with 15% in 2001. 44% of the wood stoves are over fifteen years old. 11% are eleven to fifteen years old, 25% are five to ten years old, and 11% are less than five years old. 8% of the wood stoves are of unknown age.

Of those with wood stoves (n=72), 10% do not use them at all. 42% burn less than one cord per year, 22% burn one to two cords per year, and 22% burn three or more cords each year. 4% are unsure how much wood they burn.



Based on those with wood stoves (n<75)



Based on those with wood stoves (n<75)

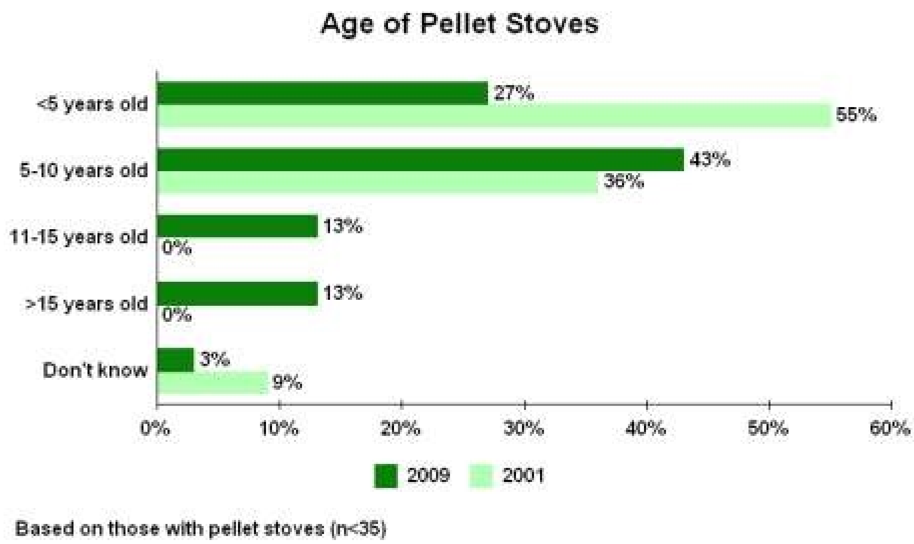
Demographic Differences

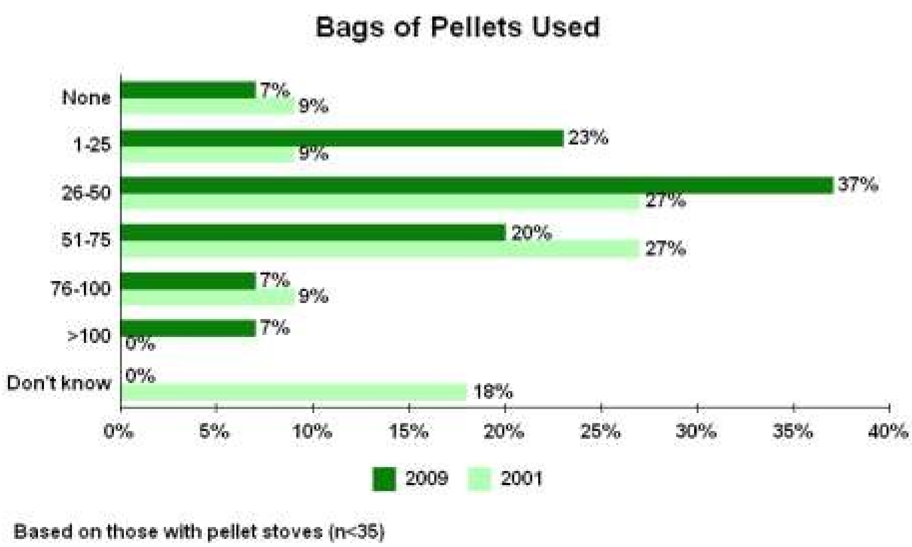
55 to 64 year-olds are more likely than others to have a wood stove.

CURRENT USE OF PELLET STOVES (Q14-16)

7% of residents currently have a pellet stove, consistent with 3% in 2001. 27% of the pellet stoves are under five years old, down from 55% in 2001. 43% are five to ten years old, 13% are eleven to fifteen years old, and 13% are over fifteen years old. 3% of the pellet stoves are of unknown age.

Of those with pellet stoves (n=30), 7% do not use them at all. 23% burn 1 to 25 bags of pellets per year. 37% burn 26 to 50 bags per year. 20% burn 51 to 75 bags per year. 14% burn over 75 bags each year.

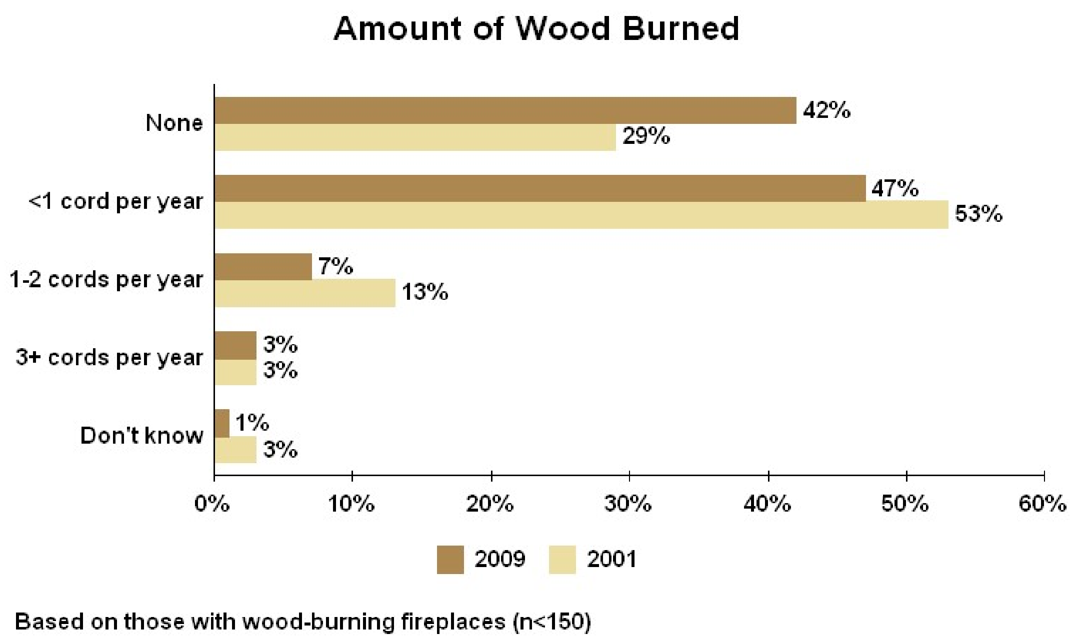




CURRENT USE OF WOOD-BURNING FIREPLACES (Q17-18)

31% of residents currently have a wood-burning fireplace, consistent with 37% in 2001.

Of those with wood-burning fireplaces (n=125), 42% do not use them at all, up from 29% in 2001. 47% burn less than one cord per year, 7% burn one to two cords per year, and 3% burn three or more cords each year. 1% are unsure how much wood they burn.

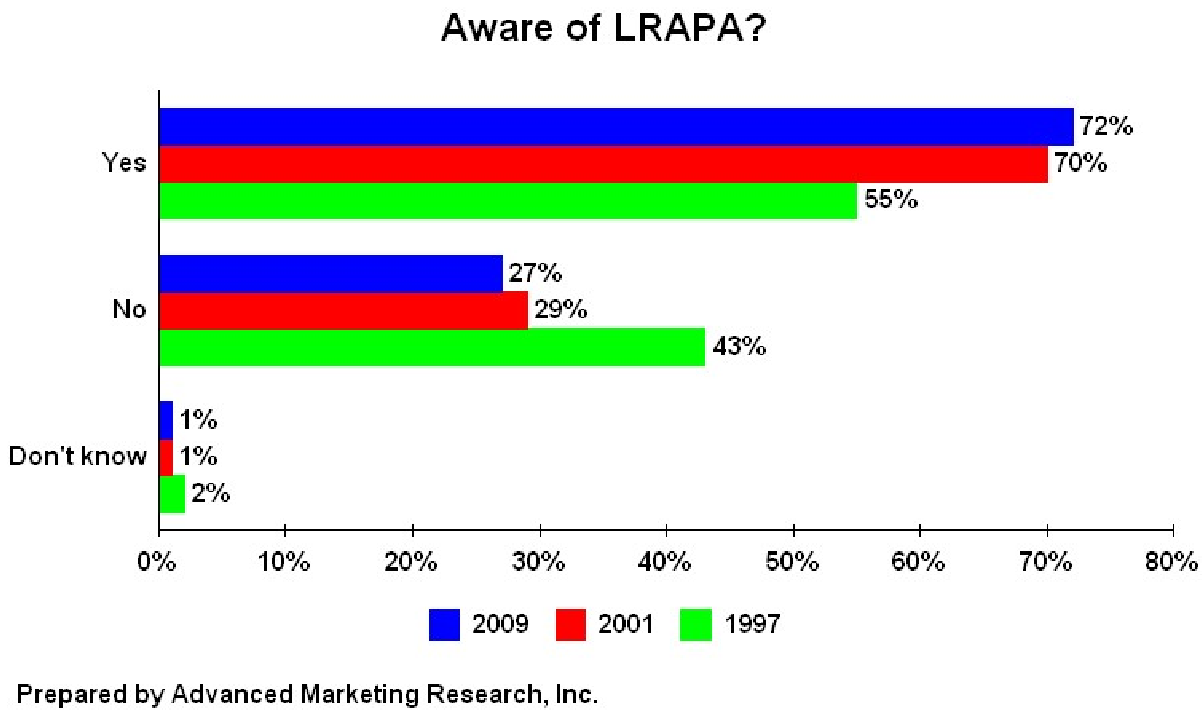


Demographic Differences

35 to 44 year-olds are less likely than others to have a wood-burning fireplace. Females are more likely than males to say they never use their wood-burning fireplace.

AWARENESS OF LRAPA (Q19)

72% have heard of the Lane Regional Air Protection Agency, consistent with 70% in 2001 but up from 55% in 1997. 27% have not heard of the agency. 1% are unsure.



Demographic Differences

55 to 64 year-olds are more likely than others to say they have heard of LRAPA. 18 to 34 year-olds are less likely than others to say they are familiar with the agency.

Appendix J: Illustrative Project List

ILLUSTRATIVE PROJECTS: AUTO

PROJECT CATEGORY: NEW COLLECTOR LINK											
Name	Geographic Limits	Description	Primary Jurisdiction	Air Quality Status³	Est. Cost (2021)	Est. Year of Construction (4-Year Window)	Year of Construction Cost Range		Length	RTP #	Federal Functional Class
New Collector	Pioneer Parkway to South 2nd Street	Construct a new collector between Pioneer Parkway and South 2nd Street	Springfield	Non-exempt	$700,000	2035-2040	$1,073,296	$1,250,296	0.14	910	Minor Collector
South 14th Street Extension	South A Street to south of the Union Pacific Railroad mainline	Extend South 14th Street south of the Union Pacific Railroad mainline with a 3-lane cross-section with sidewalks and bicycle facilities	Springfield	Non-exempt	$1,300,000	2035-2040	$1,993,263	$2,321,977	0.13	825	Minor Arterial
New Collector - South B Street	South 5th Street to 14th Street	Extend South B Street with a 3-lane cross-section with sidewalks and bicycle facilities	Springfield	non-exempt	$7,500,000	2035-2040	$11,499,596	$13,396,024	0.55	913	Minor Collector
South 28th Street	South F Street to South M Street	Modify South 28th Street to a 3-lane cross-section with sidewalks and bicycle facilities	Springfield	Exempt - Safety-widen lanes/ resurfacing/ add medians; Air Quality -bike and ped facilities	$5,300,000	2035-2040	$8,126,381	$9,466,523	0.55	919	Major Collector
South 54th Street	Main Street to Daisy Street	New 2-lane collector	Springfield	non-exempt	$960,000	2040-2045	$1,714,691	$1,997,465	0.28	87	Minor Collector
New Collector	South of Kruse Way and east of Gateway Road	Construct new collector	Springfield	non-exempt	$3,100,000	2040-2045	$5,537,023	$6,450,148	0.19	705	Minor Collector
			Project Category Subtotal		$18,860,000		$29,944,250	$34,882,433			

PROJECT CATEGORY: ARTERIAL CAPACITY IMPROVEMENTS											
Name	Geographic Limits	Description	Primary Jurisdiction	Air Quality Status³	Est. Cost (2021)	Est. Year of Construction (4-Year Window)	Year of Construction Cost Range		Length	RTP #	Federal Functional Class
42nd Street at Highway 126 Westbound Ramp	42nd St at OR126E	Traffic control and other improvements at interchange	Springfield, ODOT	non-exempt	$500,000	2040-2045	$893,068	$1,040,346	0	799	Minor Arterial

Glenwood Blvd	I-5 to Franklin Blvd.	Convert Glenwood Blvd. from three-lane to five-lane cross-section	Springfield	non-exempt	$2,210,000	2040-2045	$3,947,362	$4,598,331	0.5	836	Minor Arterial
Bob Straub Parkway	Mt. Vernon Road to the Springfield UGB	Change Bob Straub Parkway to a three-lane cross-section with sidewalks and bicycle facilities	Lane County, Springfield	Exempt - Safety-widen lanes/resurfacing/ add medians; Air Quality -bike and ped facilities	$2,450,000	2040-2045	$4,376,034	$5,097,697	1.17	66	Minor Arterial
Main St. (OR 126)	72nd St. to Springfield UGB	Modify Main St. to a three-lane cross section with sidewalks and bike facilities	ODOT, Springfield	Exempt - Safety-widen lanes/resurfacing/ add medians; Air Quality -bike and ped facilities	$10,000,000	2040-2045	$17,861,365	$20,806,928	0.97	30	Other Principal Arterial
Randy Pape Beltline Highway	River Road to Coburg Road	Improve facility consistent with the Beltline Highway Facility Plan -- complete components of the project that are not covered by the project on the within 20-years list.	ODOT, Eugene	non-exempt; regionally significant; project of local air quality concern	$685,000,000	2040-2045	$1,223,503,488	$1,425,274,576	6.39	555	other freeways and expressways
Northwest Expressway	River Road to Irvington Drive	Provide improvements to facilitate vehicular movement along the Northwest Expressway corridor	Eugene, Lane County	non-exempt		2040-2045			4.45	566	Minor Arterial
30th Ave/McVay Highway/I-5 Interchange	31st Ave/McVay Highway/I-5 Interchange	Widen 30th Avenue structure over I-5 as well as McVay Highway and Franklin Boulevard ramp terminals to accommodate future multimodal users and motor vehicle capacity and improve safety for all modes.	Lane County, ODOT		$65,000,000	2040-2045	$116,098,871	$135,245,033			
30th Ave Exit Ramp	30th Ave Exit to Gonyea Rd	Remove clover ramp to improve access. (Dependent on implementation of Lane County TSP Project 118)	Lane County		$950,000	2040-2045	$1,696,830	$1,976,658			
Green Hill Road	Barger Drive to Airport Road	Construct to major collector standards with two 11' travel lanes and 6' shoulders on both sides. Integrate systemic safety measures.	Lane County, Eugene		$2,875,000	2040-2045	$5,135,142	$5,981,992			
Green Hill Road	Highway 126 to Crow Road	Construct to major collector standards with two 11' travel lanes and 6' shoulders on both sides. Integrate systemic safety measures.	Lane County, Eugene		$600,000	2040-2045	$1,071,682	$1,248,416			

	Project Category Subtotal	$769,585,000		$1,374,583,842	$1,601,269,978

PROJECT CATEGORY: ADDED FREEWAY LANES OR MAJOR INTERCHANGE IMPROVEMENTS

Name	Geographic Limits	Description	Primary Jurisdiction	Air Quality Status³	Est. Cost (2021)	Est. Year of Construction (4-Year Window)	Year of Construction Cost Range		Length	RTP #	Federal Functional Class
I-5	@ Willamette River/ Franklin Boulevard Interchange @ Glenwood Interchange	Interchange reconstruction to create one full interchange to improve operations and safety, reconstruct ramps and bridges to modern standards, and provide for 6 lanes on I-5.	ODOT	non-exempt; regionally significant; project of local air quality concern	$45,000,000	2040-2045	$80,376,142	$93,631,177	0	150	Urban Interstate
I-105	Washington/ Jefferson Street Bridge	Add lane to 6th Ave. off-ramp	ODOT	non-exempt; regionally significant; project of local air quality concern	$6,200,000	2040-2045	$11,074,046	$12,900,295	0.25	151	Urban Interstate
I-105	Washington/ Jefferson Street Bridge	Extend third NB lane over bridge to Delta Highway exit ramp	ODOT	non-exempt; regionally significant; project of local air quality concern	$8,400,000	2040-2045	$15,003,546	$17,477,820	0.75	154	Urban Interstate
I-5	I-105 to OR 58 (Goshen)	Widen I-5 to 6 lanes. Reconstruct 30th Ave Interchange to improve operations and safety, reconstruct ramps and bridges to modern standards	ODOT	non-exempt; regionally significant; project of local air quality concern	$65,000,000	2040-2045	$116,098,871	$135,245,033	5.66	257	Urban Interstate
Eugene-Springfield Highway (OR-126E) at Pioneer Parkway	Pioneer Parkway/ Q Street	Interchange improvements	ODOT	non-exempt; regionally significant; project of local air quality concern	$21,700,000	2040-2045	$38,759,162	$45,151,034	0	727	Other Freeways and Expressways
Eugene-Springfield Highway (OR-126E)	I-5 to Mohawk Boulevard	Widen to 6 lanes	ODOT	non-exempt; regionally significant; project of local air quality concern	$29,000,000	2040-2045	$51,797,958	$60,340,092	2.6	728	Other Freeways and Expressways
I-5	@ City of Coburg interchange (Phase 2)	Interchange improvements	ODOT, Lane County	Outside the PM10 AQMA	$35,000,000	2040-2045	$62,514,777	$72,824,248	0	1004	Urban Interstate
				Project Category Subtotal	$210,300,000		$375,624,502	$437,569,698			

PROJECT CATEGORY: URBAN STANDARDS											
Name	Geographic Limits	Description	Primary Jurisdiction	Air Quality Status³	Est. Cost (2021)	Est. Year of Construction (4-Year Window)	Year of Construction Cost Range		Length	RTP #	Federal Functional Class
Jasper Road	S. 42nd Street to Springfield UGB	Modify Jasper Road to a three-lane cross-section with sidewalks and bicycle facilities	Lane County, Springfield	Exempt - Safety-widen lanes/resurfacing/ add medians; Air Quality -bike and ped facilities	$6,663,525	2040-2045	$11,901,965	$13,864,749	1.01	60	Major Collector
Oakdale Ave	Pheasant Blvd. to Game Farm Road	Modify Oakdale Ave to a two-lane cross-section with sidewalks and bicycle facilities	Springfield		$100,000	2040-2045	$178,614	$208,069	0.08		
Franklin Blvd	Jenkins Dr to Mill St	Upgrade to urban facility	ODOT	Non-exempt	$6,191,000	2040-2045	$11,057,971	$12,881,569	1.2	839	
			Project Category Subtotal		$12,954,525		$23,138,550	$26,954,387			

ILLUSTRATIVE PROJECTS: TRANSIT

PROJECT CATEGORY: FREQUENT TRANSIT NETWORK									
Name	Geographic Limits	Description	Primary Jurisdiction	Air Quality Status³	Est. Cost (2021)	Est. Year of Construction (4-Year Window)	Year of Construction Cost Range		RTP #
Enhanced Corridor	TBD - see study corridors map for identified potential corridors		Lane Transit District	Non-Exempt	$25,000,000	2041-2045	$46,037,668	$52,017,320	1116
Bus Rapid Transit (EmX)	TBD - see study corridors map for identified potential corridors		Lane Transit District	Non-Exempt; Regionally significant project	$65,000,000	2041-2045	$119,697,936	$135,245,033	904
			Project Category Subtotal		$90,000,000		$165,735,604	$187,262,353	

ILLUSTRATIVE PROJECTS: BIKE/PEDESTRIAN

PROJECT CATEGORY: MULTI-USE PATHS WITHOUT ROAD

Name	Geographic Limits	Description	Primary Jurisdiction	Air Quality Status³	Est. Cost (2021)	Est. Year of Construction (4-Year Window)	Year of Construction Cost Range		Length	RTP #	Federal Functional Class
Coburg Loop Path: Armitage Park Connector	McKenzie View Rd. intersection at Coburg Rd. north (most likely) along former rail grade connecting adjacent to Roberts Rd. to Assessors Map 16-03-33-40, Tax Lot 00700	A 10' wide hard surface, multiuse path extending approximately one mile between Southern end of Roberts Rd., Coburg and Armitage County Park, Eugene on the McKenzie River	Coburg	Outside PM10 air quality maintenance area	$940,000	2040-2045	$1,678,968	$1,955,851	1.3	1001	...
New multi-use path	South 2nd Street to South B Street	Construct a new multi-use 12-foot wide path from South 2nd St to South B St	Springfield	exempt - Air Quality - bike and ped facilities	$600,000	2040-2045	$1,071,682	$1,248,416	0.16	911	...
New multi-use path	South 2nd Street to Island Park	Construct a new multi-use 12-foot wide path along the Mill Race	Springfield	exempt - Air Quality - bike and ped facilities	$3,100,000	2040-2045	$5,537,023	$6,450,148	0.18	912	...
I-5 Path	Willamette River Area Path to By-Gully Path	Construct a new multi-use 12-foot wide path parallel to I-5 from Willamette River area path/Eastgate Woodlands to the end of the By-Gully Path	Springfield	exempt - Air Quality - bike and ped facilities	$1,662,500	2040-2045	$2,969,452	$3,459,152	0.95	814	...
By Gully Path Extension	Pioneer Parkway to 5th Street	Construct a new multi-use 12-foot wide path from the existing By-Gully path at Pioneer Parkway to 5th St	Willamalane, Springfield	exempt - Air Quality - bike and ped facilities	$192,500	2040-2045	$343,831	$400,533	0.11	812	...
Extend EWEB Trail	Pioneer Parkway to Don St	Construct a new multi-use 12-foot wide path in the EWEB powerline corridor from Pioneer Parkway to Don St with a crossing of Pioneer Parkway and Laura St	Springfield		$857,500	2040-2045	$1,531,612	$1,784,194	0.49		...
Springfield Christian School Channel Path	Dornoch St to Laura St	Construct a new multi-use 12-foot wide path from Dornoch St to Laura St	Springfield		$1,330,000	2040-2045	$2,375,562	$2,767,321	0.76		...
16th Avenue Connector	Fern Ridge Path to Jefferson Street	Multi-Use Path	Eugene	exempt - Air Quality - bike and ped facilities	$164,000	2040-2045	$292,926	$341,234	0.09	112	...
Augusta Street Path	Laurel Hill Park to 30th Avenue	Multi-Use Path	Eugene	exempt - Air Quality - bike and ped facilities	$1,441,000	2040-2045	$2,573,823	$2,998,278	0.79	221	...

West Bank Path (B)	Hileman Co. Park to Beltline Highway	Multi-Use Path	Lane County	exempt - Air Quality - bike and ped facilities	$6,800,000	2040-2045	$12,145,728	$14,148,711	3.75	551	...
Fern Ridge West Connector	Royal Street to Fern Ridge Path	Multi-Use Path	Eugene, Lane County	exempt - Air Quality - bike and ped facilities	$125,000	2040-2045	$223,267	$260,087	0.8	426	...
Willamette McKenzie Path	Beltline Road to Armitage Park	Multi-Use Path	Eugene, Lane County	exempt - Air Quality - bike and ped facilities	$9,000,000	2040-2045	$16,075,228	$18,726,235	4.99	699	...
Fern Ridge Path #3	Royal Avenue to Fern Ridge Reservoir	Multi-Use Path	Eugene, Lane County	exempt - Air Quality - bike and ped facilities	$1,600,000	2040-2045	$2,857,818	$3,329,108	0.91	426	...
				Project Category Subtotal	$27,812,500		$49,676,921	$57,869,269			

PROJECT CATEGORY: ON-STREET LANES OR ROUTES WITH ROAD

Name	Geographic Limits	Description	Primary Jurisdiction	Air Quality Status³	Est. Cost (2021)	Est. Year of Construction (4-Year Window)	Year of Construction Cost Range		Length	RTP #	Federal Functional Class
McVay Highway	I-5 to Franklin Boulevard	Striped Lane	Springfield		$203,000	2040-2045	$362,586	$422,381	1.5	833	
				Project Category Subtotal	$203,000		$362,586	$422,381			

PROJECT CATEGORY: ON-STREET LANES OR ROUTES WITHOUT ROAD

Name	Geographic Limits	Description	Primary Jurisdiction	Air Quality Status³	Est. Cost (2021)	Est. Year of Construction (4-Year Window)	Year of Construction Cost Range		Length	RTP #	Federal Functional Class
Jefferson Street	5th Avenue to 28th Avenue	Striped Lane	Eugene		$206,000	2040-2045	$367,944	$428,623	0.89	157	
Washington Street	5th Avenue to 13th Avenue	Striped Lane	Eugene		$83,000	2040-2045	$148,249	$172,698	0.53	266	
				Project Category Subtotal	$289,000		$516,193	$601,320			

Appendix K: LCOG Trip-Based Travel Demand Model Methodology Report

LCOG "Kate" v1.0 Trip-Based Travel Demand Model
Methodology Report

December 2020

Prepared by Metro and Parametrix on behalf of the Lane Council of Governments

Table of Contents

List of Tables

List of Figures

2020 Kate v1.0 Trip-Based Demand Model

This document summarizes the technical specifications for the travel demand model used in the central Lane County area. It includes descriptions of the model structure, model application, the variables employed in model equations and their coefficients.

The model, which uses the person trip as the unit of analysis, was originally developed by Metro for use in the Portland-Vancouver metropolitan area and subsequently modified and transferred to the Lane Council of Governments (LCOG) to be applied in the region consisting of the Eugene-Springfield metropolitan area and Coburg.

The underlying model is regularly updated to incorporate new data and research findings. Since the last report in 2015, a number of model enhancements have been implemented. When compared to the previous trip-baed model used by LCOG, the Kate model offers the following methodological advances:

- All major model components have been re-estimated using data collected in the 2011 Oregon Household Activity Survey (OHAS), Portland/Vancouver and Eugene area samples.
- The auto and transit access network has been substantially revised. Centroid connector distances are a function of TAZ size, which both improves representation of vehicle-miles driven on local streets and results in median transit walk distances that are consistent with those observed in OHAS. Intra-zonal distances are also a function of zone size and connector lengths rather than the older "nearest neighbor" method.
- TAZ transit coverage factors have been eliminated, and walk access to transit has been added to all non-freeway links. Where previous transit access + egress distances were limited by connector lengths (typically a total of 0.26 miles), walk access + egress is now capped at one mile, and a new transit mode choice variable discourages trips where out-of-vehicle time exceeds in-vehicle time.
- Walk distance (Wdist) is calculated using the transit access network, which includes pedestrian-only facilities.
- Destination choice logsums now include both travel time and travel cost variables, as well as alternative-specific constants for the available modes to each destination zone.

Features of former models that have been rendered unnecessary by these enhancements include:

- The share of trips by transit from a given TAZ was restricted by transit coverage factors
- Each transit boarding node required a centroid connector. Most transit trips boarded the nearest route, even if walking a few blocks to a more direct route would eliminate a transfer or result in less travel time.

An outline of the document structure is provided below. Most of the document describes the modeling of internal person trips. The flow chart shown in Appendix A gives a visual description of the logic contained in sections B through G.

- Section A describes the base input data used in all stages of model specification.
- Section B describes pre-generation—the development of household characteristics by TAZ.
- Section C describes the trip generation models for internal person trips by trip purpose.
- Section D describes the multimodal accessibility functions used in the mode choice model.
- Section E describes the destination choice model for internal person trips.
- Section F describes the mode choice model.
- Section G describes the time of day (peaking) factors.

A Input Data

The Kate model requires a variety of input data.

A.1 Land Use and Access Measurement Data

A.1.a Socioeconomic and Land Use Data

The socioeconomic and land use data used in Metro's modeling process are listed below:

- H.I.A. – Sixty-four categories of households are formed when the following characteristics are cross-classified:
  - Household size by four groups (1, 2, 3, 4+)
  - Income class by four groups (< $25K, $25-$50K, $50-$100K, > $100K), 2010 dollars
  - Age of household head by four groups (25<, 25-54,55-64, >65)
- Employment categories
  - Agriculture, Mining, and Forestry
  - Arts, Entertainment, and Recreation
  - Construction
  - Education
  - Food Services and Drinking Places
  - Government
  - Health and Social Services
  - Manufacturing (except high-tech)
  - Manufacturing – High Tech
  - Other Services
  - Professional and Business Services
  - Retail and Consumer Services
  - Transportation, Warehousing, and Utilities
  - Wholesale Trade
- Number of local intersections

A.1.b Accessibility Measure Calculation

The following base accessibility variables are computed for use in the model:

- Number of employees within 30 minutes of transit travel time (includes walk and wait time)
- Households within ½ mile of each zone
- Retail employment within ½ mile of each zone
- Total employment within ½ mile of each zone
- Number of local intersections within ½ mile of each zone

Composite accessibility measures (commonly referred to as “mix” variables) are then developed to account for both the relative magnitudes of and the interactions between three urban design variables known to affect travel behavior. This has an added benefit of eliminating the collinearity problem associated with using these variables individually:

- Household density
- Employment density
- Intersection density (a measure of street connectivity)

Two accessibility variables are computed: one uses retail employment density (MixRet) and the other uses total employment density (MixTot). The household and employment values are normalized to intersection units using geometric means. The natural log is used to transform the variables’ units for compatibility with other variables in the auto ownership, multimodal accessibility, and mode choice models. Here is the equation form:

Mix = Ln ((int*(emp*(int.mean / emp.mean)) * (hh*(int.mean / hh.mean))) /
(int + (emp*(int.mean / emp.mean)) + (hh*(int.mean / hh.mean))))

where:

- int = Number of local intersections within ½ mile of each zone
- emp = Retail OR Total employment within ½ mile of each zone
- hh = Households within ½ mile of each zone
- int.mean = Mean int value across all zones
- emp.mean = Mean emp value across all zones
- hh.mean = Mean hh value across all zones

A.2 Travel Time Data

Travel time is an important variable in the destination choice and mode choice models.

Door-to-door travel time is used for the model estimation, and zone-to-zone travel time is used for the calibration. Travel time data in this section refer to zone-to-zone travel time.

For all modes but bike and walk, two sets of weekday travel time matrices are developed:

- Peak: A.M. 2-hour peak (07:00-08:59)
- Off-Peak: Mid-day 1-hour (12:00-12:59)

Household survey data are used to estimate the percentage of peak vs. off-peak travel for each trip purpose (except school). These factors determine which proportion of trips experience peak vs. off-peak travel times in the multimodal accessibility functions and mode choice models:

TABLE 1. Peak Factors Applied to Skims in Mode Choice Models

Trip Purpose		Peak Skims	Off-Peak Skims
HBW	Home-Based Work	0.5482	0.4518
HBshop	Home-Based Shopping	0.3017	0.6983
HBrec	Home-Based Recreation	0.3796	0.6204
HBoth	Home-Based Other	0.3985	0.6015
NHBW	Non-Home-Based Work	0.4452	0.5548
NHBNW	Non-Home-Based Non-Work	0.3731	0.6269
HBcoll	Home-Based College	0.4892	0.5108

A.2.a Auto Skims

Auto skims are saved from assignments run within the Emme software package using its proprietary SOLA algorithm. These equilibrium assignments use volume-delay functions in calculating congested times based on link length, capacity, and free-flow speed. Autos and freight trucks are assigned simultaneously, with trucks represented as passenger car equivalents (PCEs) to account for the additional road space that they consume as well as being subjected to parameters in the path choice algorithm that cause them to prioritize higher order facilities

A.2.b Transit Skims

Transit assignments follow the auto assignments, with transit speed determined as a function of the underlying auto speed except where transit vehicles operate on exclusive right-of-way. The transit pathfinding algorithm considers auxiliary (walk) time, wait time (initial and transfer), boarding time, and in-vehicle time. Wait times at certain nodes and in-vehicle times on certain line segments are reduced by applying factors designed to account for perceptions of time that vary by stop and vehicle characteristics.

Wait times are calculated as 50% of line headway, with composite times considered where multiple lines are available. Timed transfer locations receive no special consideration. In order to maximize consistency with the mode choice model, walk times in the transit assignments are weighted by a factor of 2.42, which is the time equivalent of the HBW mode choice coefficient on auxiliary time. Similarly, boarding time is calculated as the time equivalent of the HBW mode choice coefficient on the number of transfers, with the resulting value of 3.86 minutes applied universally.

The transit assignment algorithm is multi-path and allocates trips among eligible paths by (1) distributing flow between multiple outgoing centroid connectors using an embedded logit model based on total transit time to the destination; and (2) distributing flow between multiple lines at a stop node by considering frequency and total transit time to destination.

The peak and off-peak transit skims saved from these assignments account for differences in levels of transit service and network congestion. The following matrices are developed for each time period:

- In-vehicle time by transit sub-mode (bus, BRT)
- Walk time (access + transfer + egress)
- First wait time
- Transfer wait time
- Number of transfer boardings

Initial wait time and total accumulated transfer wait time each have a maximum value of 30 minutes, meaning that any higher value in these skim matrices will be set to 30 minutes. In addition, transit is considered to be unavailable for trips between zone pairs where more than one mile total walking distance is required.

A.3 Trip Cost Data

Travel cost is an input to the mode choice model. All cost values are in 2010 dollars.

A.3.a Auto Operating Cost
Auto operating cost varies by mode:

- Drive Alone = ($0.1774 / mile*distance) + (½ of parking charge in attraction zone)
- Shared Ride Driver = [($0.1774 / mile*distance) + (½ of parking charge in attraction zone)] * .667
- Shared Ride Passenger = [($0.1774 / mile*distance) + (½ of parking charge in attraction zone)] * .333
- Park and Ride = $0.1774 / mile*distance (between production zone and lot)

A.3.b Parking Charges
The parking charge used as an input to auto cost varies by trip purpose:

- Home-based work (HBW) and home-based college (HBcoll) use long-term parking charge.
- Other trip purposes use short-term parking charge (½ of long-term parking charge).

A.3.c Transit Fare
Transit fares used in the model are calculated as averages weighted by LTD cash and non-cash fares, and vary by attraction zone based on the number of employees in each TAZ that have a group pass. In addition, the transit fares assumed for home-based college (HBcoll) trips account for the fact that University of Oregon and Lane Community College students receive transit passes that enable them to travel throughout the transit system for free.

A.4 Transportation Service Inputs

Various transportation service inputs are applied at different stages in the model:

- Transit routes with average frequencies for the AM peak, PM peak, and midday off-peak periods
- Park-and-ride lot locations and capacities
- Zone-to-zone generalized costs from dedicated bicycle network

B Pre-Generation

Several models must be run before starting the travel demand process. This stage is called pre-generation and includes the worker model, the auto ownership model, and the children model.

These models were estimated using a multinomial logit procedure. The listed utilities are converted into probabilities to determine the number of workers, cars, and children in each TAZ. The following example probability is used for zero-worker households:

$$\mathrm{Prob}_{\text{0-worker HH}} = \mathrm{U}_{\text{0-workerHH}} \;/\; (\, \mathrm{U}_{\text{0-workerHH}} + \mathrm{U}_{\text{1-workerHH}} + \mathrm{U}_{\text{2-workerHH}} + \mathrm{U}_{\text{3-workerHH}} \,)$$

The parameters used in the pre-generation models are unchanged from the Portland Metro implementation.

B.1 Worker Model

The worker model estimates the number of households with 0, 1, 2, and 3 or more workers.

B.1.a Variable Definitions

HHsize	=	1 person, 2 person, 3 person, 4+ person
Workercl	=	0 worker, 1 worker, 2 worker, 3+ worker
Income1	=	1 if 2010 household income < $25,000
Income2	=	1 if 2010 household income >= $25,000 and < $50,000
Income3	=	1 if 2010 household income >= $50,000 and < $100,000
Income4	=	1 if 2010 household income >= $100,000
Agecat1	=	1 if age of household head 18-24
Agecat2	=	1 if age of household head 25-54
Agecat3	=	1 if age of household head 55-64
Agecat4	=	1 if age of household head >=65

B.1.b Calibrated Choice Utilities

Constants may differ from the original estimation due to the calibration process. These coefficients are the same as in the calibration code.

0 worker households

U = **exp (** 7.9 – 2.1436*HHsize + 6.1394*Income1 + 3.0767*Income2 + 0.9966*Income3 – 6.4436*Agecat1 – 3.7234*Agecat2 – 3.4183*Agecat3 **)**

1 worker households

U = **exp (** 6.99 – 1.8731*HHsize + 3.7194*Income1 + 2.2650*Income2 + 0.7563*Income3 – 2.9635*Agecat1 – 0.4402*Agecat2 – 1.3386*Agecat3 **)**

2 worker households

U = **exp (** 5.315 – 1.2747*HHsize + 1.2257*Income1 + 0.7633*Income2 + 0.2345*Income3 – 0.7721*Agecat1 + 0.6739*Agecat2 – 0.4320*Agecat3 **)**

3+ worker households

U = **exp (** 0 **)**

B.1.c Estimated Variable Coefficients

TABLE 2. Worker Model

Variable	0 worker		1 worker		2 worker	
	Coefficient	Z-Statistic	Coefficient	Z-Statistic	Coefficient	Z-Statistic
Calib Constant	7.9		6.99		5.315	
Constant	8.1802	43.3	7.2623	40.1	5.3724	29.6
HHsize	-2.1436	-50.8	-1.8731	-48.1	-1.2747	-34.1
Income1	6.1394	30.4	3.7194	19.1	1.2257	6.2
Income2	3.0767	28.8	2.2650	24.3	0.7633	8.3
Income3	0.9966	12.9	0.7563	13.3	0.2345	4.4
Agecat1	-6.4436	-32.1	-2.9365	-16.1	-0.7721	-4.1
Agecat2	-3.7234	-27.7	-0.4402	-3.4	0.6739	5.1
Agecat3	-3.4183	-24.3	-1.3386	-9.7	-0.4320	-3.1

The worker model was estimated from 2012_5yr PUMS for the 4-county Portland Metro region. The 3+ worker choice utility is held constant at zero. Income4 and Agecat4 are the reference categories for Income and Agecat.

B.2 Auto Ownership Model

Auto ownership is an important input to the mode choice models.

The model estimation dataset includes all (OHAS) surveyed households that reported income and whose locations could be geocoded.

B.2.a Variable Definitions

Hhsize1	=	1 person
Hhsize2	=	2 person
Hhsize3	=	3 person
Hhsize4	=	4+ person
Worker0	=	0 worker
Worker1	=	1 worker
Worker2	=	2 worker
Worker3	=	3+ worker
Income	=	1 if 2010 household income < $25,000
	=	2 if 2010 household income >= $25,000 and < $50,000
	=	3 if 2010 household income >= $50,000 and < $100,500
	=	4 if 2010 household income >= $100,000
SFPC	=	Percentage of TAZ dwellings that are single-family detached units
logMIXTHM	=	LN (Total employment accessibility within ½ mile + 1) (see Section A.1.b)
Tot30Tk	=	(Total employment within 30 minutes by mid-day transit) /1000

B.2.b Calibrated Choice Utilities

0 car households

U = **exp (** -3.0278 + 4.9228*h1w0 + 3.8632*h1w1 + 1.6074*h2w0 + 0.9721*h2w1 + 0.7961*h2w2 + 2.6325*h3w0 + 0.75*h3w1 + 0.4637*h3w2 + h4w0 + 0.5*h4w1 + 0.25*h4w2 – 1.6745*income – 2.0721*sfpc + 0.0169*Tot30Tk + 0.4233*logMIXTHM **)**

1 car households

U = **exp (** -1.4954 + 6.3568*h1w0 + 5.9245*h1w1 + 4.0594*h2w0 + 3.4905*h2w1 + 2.9585*h2w2 + 3.4712*h3w0 + 3.5113*h3w1 + 2.6011*h3w2 + 2.6011*h3w3 + 2.8079*h4w0 + 3.2346*h4w1 + 2.8861*h4w2 – 0.8833*income – 1.5633*sfpc + 0.0102*Tot30Tk + 0.2223*logMIXTHM **)**

2 car households

U = **exp (** -1.8268 + 2.7548*h1w0 + 2.3944*h1w1 + 2.5439*h2w0 + 2.0346*h2w1 + 1.8537*h2w2 + 2.0169*h3w0 + 1.7867*h3w1 + 1.5335*h3w2 + 0.7326*h3w3 + 1.2802*h4w0 + 2.2461*h4w1 + 2.0506*h4w2 – 0.1749*income + 0.0038*Tot30Tk + 0.1544*logMIXTHM **)**

3+ car households

U = **exp (** 0 **)**

B.2.c Estimated Variable Coefficients

TABLE 3. Auto Ownership Model

Variable	0 car		1 car		2 car	
	Coefficient	T-Statistic	Coefficient	T-Statistic	Coefficient	T-Statistic
Calib Constant	-3.0278		-1.4954		-1.8268	
Constant	-1.3028	-1.63	-1.4954	-1.82	-1.8268	-3.87
HHsize1:Wkr0	4.9228	9.00	6.3568	8.36	2.7548	6.95
HHsize1:Wkr1	3.8632	7.17	5.9245	7.96	2.3944	6.94
HHsize2:Wkr0	1.6074	2.85	4.0594	5.58	2.5439	8.65
HHsize2:Wkr1	0.9721	1.75	3.4905	4.82	2.0346	7.25
HHsize2:Wkr2	0.7961	1.28	2.9585	4.08	1.8537	6.80
HHsize3:Wkr0	2.6325	3.58	3.4712	4.35	2.0169	4.84
HHsize3:Wkr1	0.7500	*fixed*	3.5113	4.49	1.7867	5.28
HHsize3:Wkr2	0.4637	0.96	2.6011	3.48	1.5335	5.38
HHsize3:Wkr3	--	na	2.6011	3.48	0.7326	1.93
HHsize4:Wkr0	1.0000	*fixed*	2.8079	3.30	1.2802	2.16
HHsize4:Wkr1	0.5000	*fixed*	3.2346	4.34	2.2461	7.33
HHsize4:Wkr2	0.2500	*fixed*	2.8861	3.90	2.0506	7.39
Income	-1.6745	-12.72	-0.8833	-10.36	-0.1749	-2.50
SFPC	-2.0721	-5.23	-1.5633	-6.06	--	na
Tot30Tk	0.0169	7.24	0.0102	5.52	0.0038	2.39
logMIXTHM	0.4233	5.13	0.2223	5.34	0.1544	4.64

The 3+ car choice utility is held constant at zero. HHSize4:Wkr3 is the reference category for Size x Wkr.

While the Worker and Children models use only HIA demographic inuts, Auto Ownership is influenced by changes in land use and transit service.

B.3 Children Model

The school trip purpose requires the calculation of the number of households with 0, 1, 2, or 3+ children.

B.3.a Variable Definitions

HHsize	= 1 person, 2 person, 3 person, 4+ person
Age4	= 1 if age of household head 18-24
	= 2 if age of household head 25-54
	= 3 if age of household head 55-64
	= 4 if age of household head >=65

B.3.b Calibrated Choice Utilities

This model was not changed in calibration.

0 child households

U = **exp (** -4.069012*HHsize + 6.922379*Age4 **)**

1 child households

U = **exp (** -2.425297*HHsize + 4.598579 *Age4 **)**

2 child households

U = **exp (** -0.6128247*HHsize + 1.639239*Age4 **)**

3+ child households

U = **exp (** 0 **)**

B.3.c Estimated Variable Coefficients

TABLE 4. Children Model

Variable	**0 child**		**1 child**		**2 child**	
	Coefficient	T-Statistic	Coefficient	T-Statistic	Coefficient	T-Statistic
HHsize	-4.069012	-24.3	-2.425297	-15.5	-0.6128247	-4.0
Agecat4	6.922379	22.8	4.598579	15.5	1.639239	5.5

The 3+ child choice utility is held constant at zero.

C Trip Generation

Average weekday person trips are generated for eight trip purposes:

- HBW – Home-Based Work
- HBshop – Home-Based Shopping
- HBrec – Home-Based Recreation
- HBoth – Home-Based Other (excludes school and college)
- NHBW – Non-Home-Based Work
- NHBNW – Non-Home-Based Non-Work
- HBcoll – Home-Based College
- HBsch – Home-Based School

For each zone, the number of households in each demographic category is multiplied by a production rate. The number of trips is then factored up to match regional control totals by applying a calibration factor which varies by purpose. The demographic categories, production rates, and calibration factors are described by purpose in the following subsections.

Most home-based trips are generated by production zone in the two steps described above, then they are attached to an attraction zone within the destination choice models. Non-home-based trips add an extra step within generation: the allocation of trip productions to zones according to the non-home TAZs where they actually occur. NHBW trip productions are allocated to workplace TAZ's, while NHBNW trip productons are allocated to place of trip origin. Finally, school and college generation models incorporate trip attraction, whereas the other purposes address attraction through the destination choice models.

The parameters used in the generation models are unchanged from the Portland Metro implementation.

C.1 HBW (Home-Based Work)

C.1.a Productions

HBW trips are produced solely by the number of workers in a household:

- Input Variable: Number of workers
- Output: Person trips (all modes), by zone of production (home)

TABLE 5. HBW Production Rates

Workers	Rate
1	1.386047
2	2.462282
3+	3.578358

C.1.b Attractions

HBW trip attractions are estimated by the following procedure:

- A regional average trip rate per employee is generated by dividing the sum of HBW productions by total employees.
- Trip attractions are generated by multiplying the average trip rate by the total employment in each TAZ.

C.1.c Scaling

Final HBW trips are generated by the following procedure:

- Total employment (multiplied by a calibration factor of 1.36) is divided by total productions to produce a production factor.
- Final HBW trips are calculated by multiplying the number of productions in each TAZ by the production factor.

C.2 HBshop (Home-Based Shopping)

HBshop productions are generated by a cross-classification model:

- Input Variables: Household size, Number of workers
- Output: Person trips (all modes), by zone of production (home)

TABLE 6. HBshop Production Rates

	Workers			
HHsize	**0**	**1**	**2**	**3+**
1	0.5889655	0.3597194		
2	1.02852	0.7578216	0.6313181	
3	1.371429	1.121711	0.9657534	0.8703704
4+	1.847826	1.260241	0.9130435	1.14375

The resulting trips are multiplied by a calibration factor of 1.025.

C.3 HBrec (Home-Based Recreation)

HBrec productions are generated by a cross-classification model:

- Input Variable: Household size by worker status
- Output: Person trips (all modes), by zone of production (home)

TABLE 7. HBrec Production Rates

HHsize	**all household members work**	**some household members do not work**
1	0.1783567	0.2772414
2	0.4122894	0.5582865
3	0.5462963	0.7933884
4+		1.43126

The resulting trips are multiplied by a calibration factor of 1.025.

C.4 HBoth (Home-Based Other)

HBoth productions are generated by a cross-classification model:

- Input Variable: Household size by worker status
- Output: Person trips (all modes), by zone of production (home)

TABLE 8. HBoth Production Rates

HHsize	all household members work	some household members do not work
1	0.6723447	1.187586
2	1.421209	2.076545
3	1.916667	2.613932
4+		4.027823

The resulting trips are multiplied by a calibration factor of 1.025.

C.5 NHBW (Non-Home-Based Work)

Production of non-home-based trips in trip-based models takes place in two steps. First, household trip generation rates are used to determine how many trips are produced regionally. Then, those productions are spatially allocated to where they actually originate. A set of TAZ allocation weights were estimated using transposed destination choice (i.e., “origin choice”) models with TAZ size variables only.

C.5.a Production Totals

Total NHBW productions are initially generated solely by number of workers in the household:

- Input Variable: Number of workers
- Output: Person trips (all modes), regional control totals

TABLE 9. NHBW Household Production Rates

Workers	Rate
0	0.107864
1	0.835659
2	1.723404
3+	2.33209

The resulting trips are multiplied by a calibration factor of 1.025.

C.5.b Production Spatial Allocation

NHBW Productions are allocated to TAZs using the following production allocation weights shown in Table 10. Total regional productions are scaled to control totals obtained from household productions above. See Section E.1.b for a description of employment sectors used here and in the Destination Choice models.

TABLE 10. NHBW Production Allocation Weights

TAZ Variable	Coefficient	T-Statistic
Agrfrm	1.0000	*fixed*
Areart	0.3906	2.78
Constr	4.2207	5.69
Educat	2.7456	6.17
FoodSv	1.0000	*fixed*
Govmnt	4.0960	8.45
Health	1.5311	2.20
MHitec	1.7315	2.58
Mfacrt	1.7315	2.58
Othser	2.7732	3.07
Probns	2.0138	3.84
Retcns	1.0000	*fixed*
Tranwu	1.9232	2.08
Wholes	1.7315	2.58
households	0.4462	-4.49

C.6 NHBNW (Non-Home-Based Non-Work)

C.6.a Pre-Production

NHBNW productions are initially estimated by a cross-classification model:

- Input Variables: Household size by worker status
- Output: Person trips (all modes), regional control totals

TABLE 10. NHBNW Production Rates

HHsize	all household members work	some household members do not work
1	0.511022	1.165517
2	0.9187314	1.651685
3	1.425926	1.956316
4+		3.161211

The resulting trips are multiplied by a calibration factor of 1.025.

C.6.b Production Spatial Allocation

NHBNW Productions are allocated to TAZs using the following production allocation weights shown in Table 12. Total regional productions are scaled to control totals obtained from household productions above. See Section E.1.b for a description of employment sectors used here and in the Destination Choice models.

TABLE 12. NHBNW Production Allocation Weights

TAZ Variable	Coefficient	T-Statistic
Agrfrm	0.0898	-2.88
Areart	0.3694	-4.21
Constr	0.0016	-2.70
Educat	0.1845	-15.56
FoodSv	0.2753	-7.54
Govmnt	0.1653	-12.26
Health	0.0926	-14.28
MHitec	0.0016	-2.70
Mfacrt	0.0016	-2.70
Othser	1.0000	*fixed*
Probns	0.0498	-12.01
Retcns	0.4971	-7.96
Tranwu	0.0424	-5.05
Wholes	0.0016	-2.70

C.7 HBcoll (Home-Based College)

C.7.a Productions

HBcoll productions are generated by a cross-classification model:

- Input Variables: Household size, Age group (age of household head)
- Output: Person trips (all modes), by zone of production (home)

TABLE 11. HBcoll Production Rates

	Age Group			
Hhsize	**<25**	**25-54**	**55-64**	**>65**
1	0.5384615	0.0473684	0.0059761	0.007837
2	0.375	0.1138107	0.0289079	0.0183357
3	0.6666667	0.1226576	0.1610487	0.1413043
4+	0.8333333	0.1359852	0.468254	0.2758621

The resulting trips are multiplied by a calibration factor of 1.5

Note that HBColl productions apply to households only, since group quarters (e.g., dormitories, fraternities) were not surveyed.

C.8 HBsch (Home-Based School)

HBsch productions are generated by a cross-classification model using the combined Portland-Vancouver-Salem-Eugene samples of the 2011 OHAS. HBSchool person-trips include both students and adult escorts for the home-to-school and school-to-home trip.

- Input Variables: Household size, Number of children
- Output: Person trips (all modes), by zone of production (home)

TABLE 12. HBsch Production Rates

	Children			
HHsize	**0**	**1**	**2**	**3+**
1	--	--	--	--
2	--	1.978448	--	--
3	--	1.84793	3.326389	--
4+	--	2.248879	3.441193	5.103783

D Multimodal Accessibility Functions

Modal accessibility functions were estimated as an input to the destination choice and mode choice models. For each trip purpose, they measure the utility of choosing one of seven discrete modes.

Drive alone – only available to households with at least one car
Drive with passenger – only available to households with at least one car
Auto passenger
Transit by walk access – only available if total walk distance (access + transfer + egress) does not exceed one mile
Transit by park-and-ride access – only available if attraction zone has parking cost; only available for home-based non-school trips; utilities and lot usage for formal park-and-ride lots and informal park-and-ride locations are calculated by a nested park-and-ride lot choice model
Bike – utilities and distances are produced by a stand-alone tool based on a dedicated bicycle network
Walk – only available for trips with a distance less than five miles

The logsum of all modal utilities is a key input to the destination choice model (Section E). It is generated as follows for each trip purpose (and for some purposes, by income group):

$$\mathbf{Ln}\ \mathbf{(}\ U_{\text{Drive Alone}} + U_{\text{Drive with Passenger}} + U_{\text{Auto Passenger}} + U_{\text{Walk to Transit}} + U_{\text{Park\&Ride}} + U_{\text{Bike}} + U_{\text{Walk}}\ \mathbf{)}$$

The parameters used in the multimodal accessibility functions are unchanged from the Portland Metro implementation with the exception of the alternative-specific constants, which were re-estimated.

D.1 Variables Used in Multimodal Accessibility Functions

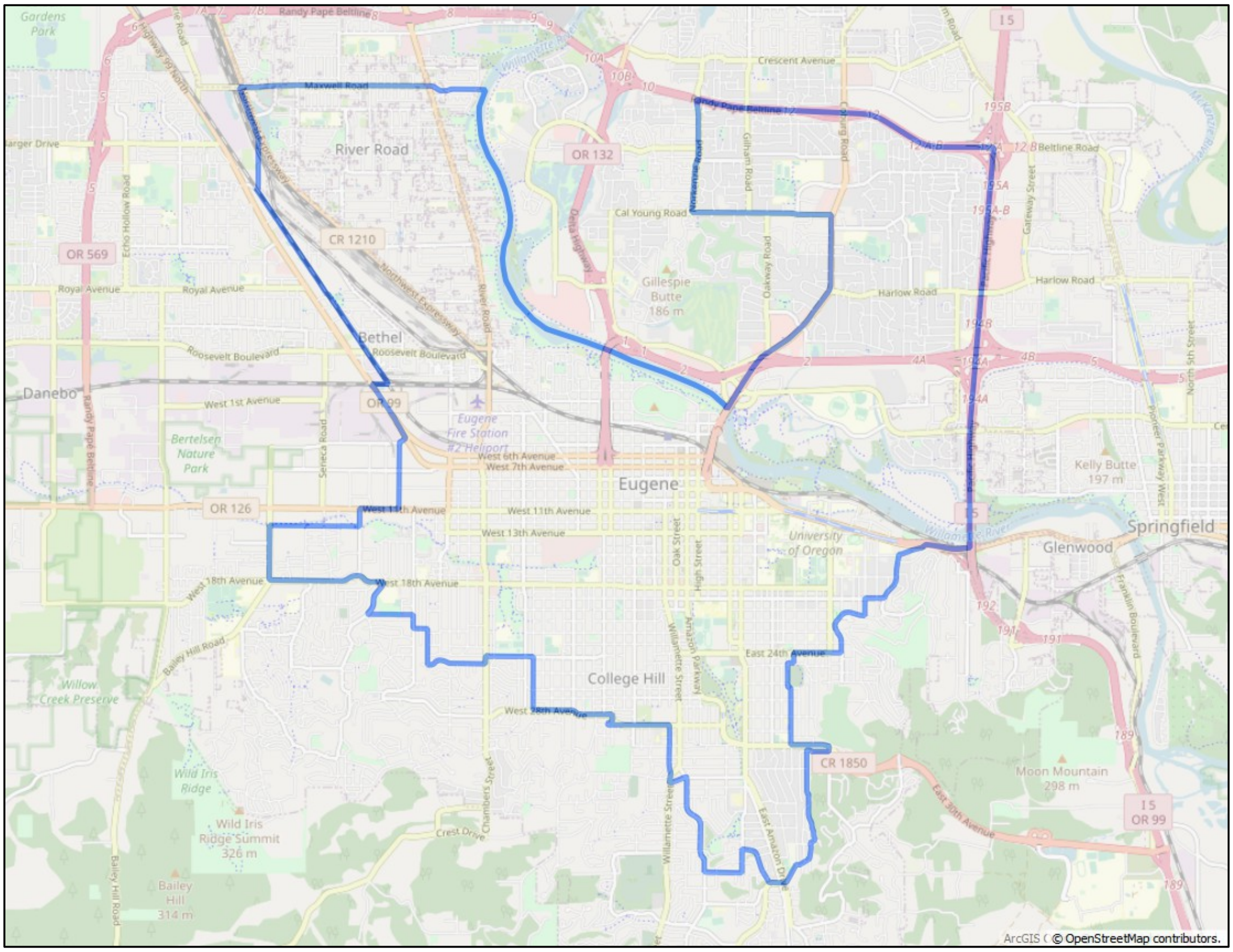
D.1.a Variable Definitions

IvTime = In-vehicle travel time (minutes, varies by mode)
WalkTime = Walk time (minutes), by mode:
- Drive Alone: vehicle egress at trip end (5 min in CBD, 2 min elsewhere)
- Shared Ride: Drive Alone walk time plus 5 minutes
- Transit Modes: access to first stop plus egress from last stop at 3 mph
- Walk: zone-to-zone time via key walk-accessible links at 3 mph (for trips < 5 miles)

TranWait1 = Transit initial wait time (minutes)
TranWait2 = Transit transfer wait time (minutes)
TranModc = Transit mode constant (varies by transit path)
TranStypc = Transit stop type constant (varies by transit path)
TranXfrs = Transit # of transfers
TrOVIV = ratio of total out-of-vehicle time to in-vehicle time
Formal = 1 if considering formal park-and-ride lots
Informal = 1 if considering informal park-and-ride locations
Shadow = Park-and-ride lot shadow cost (calculated by lot choice model)
BikeDist = Bicycle trip distance (miles)
Cbutil = Bicycle commute route attractiveness
Nbutil = Bicycle non-commute route attractiveness
BikeResPref = 1 if production zone in bicycle user residential preference area (see Figure 1)
LowInc = 1 if household income <$25K (2010$)
MidInc = 1 if household income $25-100K (2010$)
HighInc = 1 if household income $100K+ (2010$)
OpCost = Out-of-pocket cost, by mode:
- Drive Alone: 100% of $0.1774 / mile (2010$)
- Drive with Passenger: 66.7% of $0.1774 / mile (2010$)
- Auto Passenger: 33.3% of $0.1774 / mile (2010$)
- Walk-access Transit: transit fare (2010$)
- Park-and-ride: $0.1774 / mile for auto leg, transit fare for transit leg

PkgCost = Parking cost, by mode:
- Drive Alone: 100% of long-term parking charge in attraction zone
- Drive with Passenger: 66.7% of long-term parking charge in attraction zone
- Auto Passenger: 33.3% of long-term parking charge in attraction zone

FIGURE 1. Bicycle User Residential Preference Area



D.2 HBW (Home-Based Work)

D.2.a Peak / Off-Peak Weights

HBW: 54.82% peak skims, 45.18% off-peak skims

D.2.b Calibrated Choice Utilities

Drive Alone

U = **exp (** -0.0414*IvTime – 0.1*WalkTime – 0.309*LowInc*OpCost – 0.252*MidInc*OpCost – 0.252*HighInc*OpCost – 0.509*LowInc*PkgCost – 0.509*MidInc*PkgCost – 0.461*HighInc*PkgCost **)**

Drive with Passenger

U = **exp (** -3.57 – 0.0414*IvTime – 0.1*WalkTime – 0.309*LowInc*OpCost – 0.252*MidInc*OpCost – 0.252*HighInc*OpCost – 0.509*LowInc*PkgCost – 0.509*MidInc*PkgCost – 0.461*HighInc*PkgCost **)**

Auto Passenger

U = **exp (** -3.55 – 0.0414*IvTime – 0.1*WalkTime – 0.309*LowInc*OpCost – 0.252*MidInc*OpCost – 0.252*HighInc*OpCost – 0.509*LowInc*PkgCost – 0.509*MidInc*PkgCost – 0.461*HighInc*PkgCost **)**

Transit by Walk Access

U = **exp (** -1.07 + TranModc + TranStypc – 0.0414*IvTime – 0.0543*TranWait1 – 0.061*TranWait2 – 0.1*WalkTime – 0.16*TranXfrs – 0.4*TrIVOV – 0.309*LowInc*OpCost – 0.252*MidInc*OpCost – 0.252*HighInc*OpCost **)**

Park and Ride

Park and Ride uses older model specifications; only the mode-specific constant and informal constant were recalibrated in 2017. The coefficient on auto in-vehicle time is doubled in order to maintain a balance between auto and transit time that is comparable to the observed relationship; otherwise, too many trips include unreasonably high auto times as travelers choose to drive to the periphery of the CBD before boarding transit.

U = **exp (** 1.85 + 0.75***ln**(**exp**(Formal*0.5***ln**($\sum_{1\rightarrow N}$ [**exp**(($U_{AutoLeg}$ + $U_{TransitLeg}$ + Shadow) / (0.5*0.75))])) + **exp**(Informal*0.5***ln**($\sum_{1\rightarrow N}$ [**exp**((-4.5 + $U_{AutoLeg}$ + $U_{TransitLeg}$ + Shadow) / (0.5*0.75))])) **)**

where

$U_{AutoLeg}$ = -0.0414*2*IvTime – 0.309*LowInc*OpCost – 0.252*MidInc*OpCost – 0.252*HighInc*OpCost

and

$U_{TransitLeg}$ = -0.0414*IvTime – 0.0543*TranWait1 – 0.061*TranWait2 – 0.1*WalkTime – 0.16*TranXfrs – 0.309*LowInc*OpCost – 0.252*MidInc*OpCost – 0.252*HighInc*OpCost

and

N = number of formal park-and-ride lots or informal par-and-ride locations under consideration

Bike

U = **exp (** 0.294 – 0.469*BikeDist + 0.0274*Cbutil + 0.762*BikeResPref **)**

Walk

U = **exp (** -0.315 **–** 0.1*WalkTime **)**

D.2.c Estimated Variable Coefficients

TABLE 13. HBW Multimodal Accessibility Functions – Auto Modes

Variable	Drive Alone		Drive with Passenger		Auto Passenger	
	Coefficient	T-Statistic	Coefficient	T-Statistic	Coefficient	T-Statistic
Constant			*-3.57*		*-3.55*	
IvTime	-0.0414	*fixed*	-0.0414	*fixed*	-0.0414	*fixed*
WalkTime	-0.1	*fixed*	-0.1	*fixed*	-0.1	*fixed*
LowIncOpCost	-0.309	*fixed*	-0.309	*fixed*	-0.309	*fixed*
MidIncOpCost	-0.252	*fixed*	-0.252	*fixed*	-0.252	*fixed*
HighIncOpCost	-0.252	*fixed*	-0.252	*fixed*	-0.252	*fixed*
LowIncPkgCost	-0.509	*fixed*	-0.509	*fixed*	-0.509	*fixed*
MidIncPkgCost	-0.509	*fixed*	-0.509	*fixed*	-0.509	*fixed*
HighIncPkgCost	-0.461	*fixed*	-0.461	*fixed*	-0.461	*fixed*

TABLE 14. HBW Multimodal Accessibility Functions – Transit Modes

Variable	Walk Access		Park and Ride	
	Coefficient	T-Statistic	Coefficient	T-Statistic
Constant	-1.07	-8.19	1.85	*fixed*
Ivtime	-0.0414	*fixed*	-0.0414	*fixed*
Wait1	-0.0543	*fixed*	-0.0543	*fixed*
Wait2	-0.061	*fixed*	-0.061	*fixed*
WalkTime	-0.1	*fixed*	-0.1	*fixed*
Transfers	-0.16	*fixed*	-0.16	*fixed*
TrIVOV	-0.4	*fixed*		
LowIncOpCost	-0.309	*fixed*	-0.309	*fixed*
MidIncOpCost	-0.252	*fixed*	-0.252	*fixed*
HighIncOpCost	-0.252	*fixed*	-0.252	*fixed*
Nested Park & Ride Lot Choice Model				
Informal Constant			-5.0	
Park & Ride Nest			0.75	
Formal Nest			0.5	
Informal Nest			0.5	

TABLE 15. HBW Multimodal Accessibility Functions – Nonmotorized Modes

Variable	Bike		Walk	
	Coefficient	T-Statistic	Coefficient	T-Statistic
Constant	0.294	3.95	-0.315	-2.66
BikeDist	-0.469	*fixed*		
Cbutil	0.0274	*fixed*		
BikeResPref	0.762	*fixed*		
WalkTime			-0.1	*fixed*

D.3 HBshop, HBrec, HBoth (Other Home-Based)

D.3.a Peak / Off-Peak Weights

HBshop: 30.17% peak skims, 69.83% off-peak skims
HBrec: 37.96% peak skims, 62.04% off-peak skims
HBoth: 39.85% peak skims, 60.15% off-peak skims

D.3.b Calibrated Choice Utilities

Drive Alone

U = **exp (** -0.0315*IvTime – 0.125*WalkTime – 0.255*LowInc*OpCost – 0.255*MidInc*OpCost – 0.174*HighInc*OpCost – 0.731*LowInc*PkgCost – 0.393*MidInc*PkgCost – 0.393*HighInc*PkgCost **)**

Drive with Passenger

U = **exp (** -1.4*Shop – 1.12*Rec – 1.11*Oth -0.0315*IvTime – 0.125*WalkTime – 0.255*LowInc*OpCost – 0.255*MidInc*OpCost – 0.174*HighInc*OpCost – 0.731*LowInc*PkgCost – 0.393*MidInc*PkgCost – 0.393*HighInc*PkgCost **)**

Auto Passenger

U = **exp (** -1.83*Shop – 1.48*Rec – 1.58*Oth -0.0315*IvTime – 0.125*WalkTime – 0.255*LowInc*OpCost – 0.255*MidInc*OpCost – 0.174*HighInc*OpCost – 0.731*LowInc*PkgCost – 0.393*MidInc*PkgCost – 0.393*HighInc*PkgCost **)**

Transit by Walk Access

U = **exp (** -0.0991*Shop – 0.634*Rec – 0.693*Oth + TranModc + TranStypc – 0.0315*IvTime – 0.05*TranWait1 – 0.05*TranWait2 – 0.125*WalkTime – 0.16*TranXfrs – 1*TrIVOV – 0.255*LowInc*OpCost – 0.255*MidInc*OpCost – 0.174*HighInc*OpCost **)**

Park and Ride

Park and Ride uses older model specifications; only the mode-specific constant and informal constant were recalibrated in 2017. The coefficient on auto in-vehicle time is doubled in order to maintain a balance between auto and transit time that is comparable to the observed relationship; otherwise, too many trips include unreasonably high auto times as travelers choose to drive to the periphery of the CBD before boarding transit.

U = **exp (** -3.1*Shop – 2*Rec – 2.2*Oth + 0.75***ln**(**exp**(Formal*0.5***ln**($\sum_{1\to N}$ [**exp**(($U_{AutoLeg}$ + $U_{TransitLeg}$ + Shadow) / (0.5*0.75))])) + **exp**(Informal*0.5***ln**($\sum_{1\to N}$ [**exp**((-4 + $U_{AutoLeg}$ + $U_{TransitLeg}$ + Shadow) / (0.5*0.75))])) **)**

where

$U_{AutoLeg}$ = -0.0315*2*IvTime – 0.255*LowInc*OpCost – 0.255*MidInc*OpCost – 0.174*HighInc*OpCost

and

$U_{TransitLeg}$ = -0.0315*IvTime – 0.05*TranWait1 – 0.05*TranWait2 – 0.125*WalkTime – 0.16*TranXfrs – 0.255*LowInc*OpCost – 0.255*MidInc*OpCost – 0.174*HighInc*OpCost

and

N = number of formal park-and-ride lots or informal par-and-ride locations under consideration

Bike

U = **exp (** 1.53*Shop + 1.11*Rec + 1.32*Oth – 0.223*BikeDist + 0.126*Nbutil + 0.929*BikeResPref **)**

Walk

U = **exp (** -0.392*Shop + 0.306*Rec – 0.471*Oth – 0.125*WalkTime **)**

D.3.c Estimated Variable Coefficients

TABLE 16. HBshop, HBrec, HBoth Multimodal Accessibility Functions – Auto Modes

Variable	Drive Alone		Drive with Passenger		Auto Passenger	
	Coefficient	T-Statistic	Coefficient	T-Statistic	Coefficient	T-Statistic
Shop Constant			-1.4		-1.83	
Rec Constant			-1.12		-1.48	
Oth Constant			-1.11		-1.58	
IvTime	-0.0315	*fixed*	-0.0315	*fixed*	-0.0315	*fixed*
WalkTime	-0.125	*fixed*	-0.125	*fixed*	-0.125	*fixed*
LowIncOpCost	-0.255	*fixed*	-0.255	*fixed*	-0.255	*fixed*
MidIncOpCost	-0.255	*fixed*	-0.255	*fixed*	-0.255	*fixed*
HighIncOpCost	-0.174	*fixed*	-0.174	*fixed*	-0.174	*fixed*
LowIncPkgCost	-0.731	*fixed*	-0.731	*fixed*	-0.731	*fixed*
MidIncPkgCost	-0.393	*fixed*	-0.393	*fixed*	-0.393	*fixed*
HighIncPkgCost	-0.393	*fixed*	-0.393	*fixed*	-0.393	*fixed*

TABLE 17. HBshop, HBrec, HBoth Multimodal Accessibility Functions – Transit Modes

Variable	Walk Access		Park and Ride	
	Coefficient	T-Statistic	Coefficient	T-Statistic
Shop Constant	-0.0991	-0.53	-3.1	*fixed*
Rec Constant	-0.634	-2.34	-2	*fixed*
Oth Constant	-0.693	-4.98	-2.2	*fixed*
IvTime	-0.0315	*fixed*	-0.0315	*fixed*
TranWait1	-0.05	*fixed*	-0.05	*fixed*
TranWait2	-0.05	*fixed*	-0.05	*fixed*
WalkTime	-0.125	*fixed*	-0.125	*fixed*
TranXfrs	-0.16	*fixed*	-0.16	*fixed*
TrIVOV	-1	*fixed*		
LowIncOpCost	-0.255	*fixed*	-0.255	*fixed*
MidIncOpCost	-0.255	*fixed*	-0.255	*fixed*
HighIncOpCost	-0.174	*fixed*	-0.174	*fixed*
Nested Park & Ride Lot Choice Model				
Informal Constant			-4.5	
Park & Ride Nest			0.75	
Formal Nest			0.5	
Informal Nest			0.5	

TABLE 18. HBshop, HBrec, HBoth Multimodal Accessibility Functions – Nonmotorized Modes

Variable	Bike		Walk	
	Coefficient	T-Statistic	Coefficient	T-Statistic
Shop Constant	1.53	7.53	-0.392	-3.46
Rec Constant	1.11	3.71	0.306	2.38
Oth Constant	1.32	9.20	-0.471	-5.98
BikeDist	-0.223	*fixed*		
Nbutil	0.126	*fixed*		
BikeResPref	0.929	*fixed*		
WalkTime			-0.125	*fixed*

D.4 NHBW (Non-Home-Based Work)

D.4.a Peak / Off-Peak Weights

NHBW: 44.52% peak skims, 55.48% off-peak skims

D.4.b Calibrated Choice Utilities

Drive Alone

U = **exp (** -0.0452*IvTime – 0.157*WalkTime – 0.194*OpCost – 0.557*PkgCost **)**

Drive with Passenger

U = **exp (** -2.58 – 0.0452*IvTime – 0.157*WalkTime – 0.194*OpCost – 0.557*PkgCost **)**

Auto Passenger

U = **exp (** -2.77 – 0.0452*IvTime – 0.157*WalkTime – 0.194*OpCost – 0.557*PkgCost **)**

Transit by Walk Access

U = **exp (** 0.458 + TranModc + TranStypc – 0.0452*IvTime – 0.118*TranWait1 – 0.118*TranWait2 – 0.157*WalkTime – 0.16*TranXfrs – 0.194*OpCost – 1*TrOVIV **)**

Bike

U = **exp (** -0.91 **–** 0.22*BikeDist + 0.0829*Nbutil + 1.11*BikeResPref **)**

Walk

U = **exp (-**0.0611 – 0.157*WalkTime **)**

D.4.c Estimated Variable Coefficients

TABLE 19. NHBW Multimodal Accessibility Functions – Auto Modes

Variable	**Drive Alone**		**Drive with Passenger**		**Auto Passenger**	
	Coefficient	T-Statistic	Coefficient	T-Statistic	Coefficient	T-Statistic
Constant			-2.58		-2.77	
IvTime	-0.0452	*fixed*	-0.0452	*fixed*	-0.0452	*fixed*
WalkTime	-0.157	*fixed*	-0.157	*fixed*	-0.157	*fixed*
OpCost	-0.194	*fixed*	-0.194	*fixed*	-0.194	*fixed*
PkgCost	-0.557	*fixed*	-0.557	*fixed*	-0.557	*fixed*

TABLE 20. NHBW Multimodal Accessibility Functions – Transit Modes

Variable	Walk Access	
	Coefficient	T-Statistic
Constant	0.458	2.65
IvTime	-0.0452	*fixed*
TranWait1	-0.118	*fixed*
TranWait2	-0.118	*fixed*
WalkTime	-0.157	*fixed*
TranXfrs	-0.16	*fixed*
OpCost	-0.194	*fixed*
TrIVOV	-1	*fixed*

TABLE 21. NHBW Multimodal Accessibility Functions – Nonmotorized Modes

Variable	Bike		Walk	
	Coefficient	T-Statistic	Coefficient	T-Statistic
Constant	-0.91	-4.96	-0.0611	-0.63
BikeDist	-0.22	*fixed*		
Nbutil	0.0829	*fixed*		
BikeResPref	1.11	*fixed*		
WalkTime			-0.157	*fixed*

D.5 NHBNW (Non-Home-Based Non-Work)

D.5.a Peak / Off-Peak Weights

NHBNW: 37.31% peak skims, 62.69% off-peak skims

D.5.b Calibrated Choice Utilities

Drive Alone

U = **exp (** -0.0278*IvTime – 0.125*WalkTime – 0.15*OpCost – 0.335*PkgCost **)**

Drive with Passenger

U = **exp (** -0.433 – 0.0278*IvTime – 0.125*WalkTime – 0.15*OpCost – 0.335*PkgCost **)**

Auto Passenger

U = **exp (** -1.36 – 0.0278*IvTime – 0.125*WalkTime – 0.15*OpCost – 0.335*PkgCost **)**

Transit by Walk Access

U = **exp (** -3.49 + TranModc + TranStypc – 0.0278*IvTime – 0.0781*TranWait1 – 0.0841*TranWait2 – 0.125*WalkTime – 0.16*TranXfrs – 1*TrIVOV – 0.15*OpCost **)**

Bike

U = **exp (** -1.87 **–** 0.251*BikeDist + 0.0829*Nbutil + 0.879*BikeResPref **)**

Walk

U = **exp (** -0.631 – 0.125*WalkTime **)**

D.5.c Estimated Variable Coefficients

TABLE 22. NHBNW Multimodal Accessibility Functions – Auto Modes

Variable	Drive Alone		Drive with Passenger		Auto Passenger	
	Coefficient	T-Statistic	Coefficient	T-Statistic	Coefficient	T-Statistic
Constant			-0.433		-1.36	
IvTime	-0.0278	*fixed*	-0.0278	*fixed*	-0.0278	*fixed*
WalkTime	-0.125	*fixed*	-0.125	*fixed*	-0.125	*fixed*
OpCost	-0.15	*fixed*	-0.15	*fixed*	-0.15	*fixed*
PkgCost	-0.335	*fixed*	-0.335	*fixed*	-0.335	*fixed*

TABLE 23. NHBNW Multimodal Accessibility Functions – Transit Modes

Variable	Walk Access	
	Coefficient	T-Statistic
Constant	-3.49	-33.48
IvTime	-0.0278	*fixed*
TranWait1	-0.0781	*fixed*
TranWait2	-0.0841	*fixed*
WalkTime	-0.125	*fixed*
TranXfrs	-0.16	*fixed*
TrIVOV	-1	*fixed*
OpCost	-0.15	*fixed*

TABLE 24. NHBNW Multimodal Accessibility Functions – Nonmotorized Modes

Variable	Bike		Walk	
	Coefficient	T-Statistic	Coefficient	T-Statistic
Constant	-1.87	-5.99	-0.631	-6.93
BikeDist	-0.251	*fixed*		
Nbutil	0.0829	*fixed*		
BikeResPref	0.879	*fixed*		
WalkTime			-0.125	*fixed*

D.6 HBcoll (Home-Based College)

D.6.a Peak / Off-Peak Weights

HBcoll: 48.92% peak skims, 51.08% off-peak skims

D.6.b Calibrated Choice Utilities

Drive Alone

U = **exp (** -0.0346*IvTime – 0.08*WalkTime – 0.463*LowInc*OpCost – 0.383*MidInc*OpCost – 0.184*HighInc*OpCost – 0.463*LowInc*PkgCost – 0.383*MidInc*PkgCost – 0.184*HighInc*PkgCost **)**

Drive with Passenger

U = **exp (** -3.9 – 0.0346*IvTime – 0.08*WalkTime – 0.463*LowInc*OpCost – 0.383*MidInc*OpCost – 0.184*HighInc*OpCost – 0.463*LowInc*PkgCost – 0.383*MidInc*PkgCost – 0.184*HighInc*PkgCost **)**

Auto Passenger

U = **exp (** -2.55 – 0.0346*IvTime – 0.08*WalkTime – 0.463*LowInc*OpCost – 0.383*MidInc*OpCost – 0.184*HighInc*OpCost – 0.463*LowInc*PkgCost – 0.383*MidInc*PkgCost – 0.184*HighInc*PkgCost **)**

Transit by Walk Access

U = **exp (** -1.06 + TranModc + TranStypc – 0.0346*IvTime – 0.055*TranWait1 – 0.055*TranWait2 – 0.08*WalkTime – 0.15*TranXfrs – 0.463*LowInc*OpCost – 0.383*MidInc*OpCost – 0.184*HighInc*OpCost **)**

Park and Ride

Park and Ride uses older model specifications; only the mode-specific constant and informal constant were recalibrated in 2017. The coefficient on auto in-vehicle time is doubled in order to maintain a balance between auto and transit time that is comparable to the observed relationship; otherwise, too many trips include unreasonably high auto times as travelers choose to drive to the periphery of the CBD before boarding transit.

U = **exp (** 2.85 + 0.75***ln**(**exp**(Formal*0.5***ln**($\sum_{1\rightarrow N}$ [**exp**(($U_{AutoLeg}$ + $U_{TransitLeg}$ + Shadow) / (0.5*0.75))])) + **exp**(Informal*0.5***ln**($\sum_{1\rightarrow N}$ [**exp**((-5.5 + $U_{AutoLeg}$ + $U_{TransitLeg}$ + Shadow) / (0.5*0.75))])) **)**

where

$U_{AutoLeg}$ = -0.0346*2*IvTime – 0.463*LowInc*OpCost – 0.383*MidInc*OpCost – 0.184*HighInc*OpCost

and

$U_{TransitLeg}$ = -0.0346*IvTime – 0.055*TranWait1 – 0.055*TranWait2 – 0.08*WalkTime – 0.15*TranXfrs – 0.463*LowInc*OpCost – 0.383*MidInc*OpCost – 0.184*HighInc*OpCost

and

N = number of formal park-and-ride lots or informal par-and-ride locations under consideration

Bike

U = **exp (** 0.625 – 0.3*BikeDist + 0.108*Cbutil **)**

Walk

U = **exp (** -0.235 – 0.08*WalkTime **)**

D.6.c Estimated Variable Coefficients

TABLE 25. HBcoll Multimodal Accessibility Functions – Auto Modes

Variable	**Drive Alone**		**Drive with Passenger**		**Auto Passenger**	
	Coefficient	T-Statistic	Coefficient	T-Statistic	Coefficient	T-Statistic
Constant			-3.9		-2.55	
IvTime	-0.0346	*fixed*	-0.0346	*fixed*	-0.0346	*fixed*
WalkTime	-0.08	*fixed*	-0.08	*fixed*	-0.08	*fixed*
LowIncOpCost	-0.463	*fixed*	-0.463	*fixed*	-0.463	*fixed*
MidIncOpCost	-0.383	*fixed*	-0.383	*fixed*	-0.383	*fixed*
HighIncOpCost	-0.184	*fixed*	-0.184	*fixed*	-0.184	*fixed*
LowIncPkgCost	-0.463	*fixed*	-0.463	*fixed*	-0.463	*fixed*
MidIncPkgCost	-0.383	*fixed*	-0.383	*fixed*	-0.383	*fixed*
HighIncPkgCost	-0.184	*fixed*	-0.184	*fixed*	-0.184	*fixed*

TABLE 26. HBcoll Multimodal Accessibility Functions – Transit Modes

Variable	Walk Access		Park and Ride	
	Coefficient	T-Statistic	Coefficient	T-Statistic
Constant	-1.06	-5.08	2.85	*fixed*
IvTime	-0.0346	*fixed*	-0.0346	*fixed*
TranWait1	-0.055	*fixed*	-0.055	*fixed*
TranWait2	-0.055	*fixed*	-0.055	*fixed*
WalkTime	-0.08	*fixed*	-0.08	*fixed*
TranXfrs	-0.15	*fixed*	-0.15	*fixed*
LowIncOpCost	-0.463	*fixed*	-0.463	*fixed*
MidIncOpCost	-0.383	*fixed*	-0.383	*fixed*
HighIncOpCost	-0.184	*fixed*	-0.184	*fixed*
Nested Park & Ride Lot Choice Model				
Informal Constant			-6.0	
Park & Ride Nest			0.75	
Formal Nest			0.5	
Informal Nest			0.5	

TABLE 27. HBcoll Multimodal Accessibility Functions – Nonmotorized Modes

Variable	Bike		Walk	
	Coefficient	T-Statistic	Coefficient	T-Statistic
Constant	0.625	0.13	-0.235	-0.73
BikeDist	-0.3	*fixed*		
Cbutil	0.108	*fixed*		
WalkTime			-0.08	*fixed*

E Destination Choice

The destination choice models were developed using a multinomial logit estimation procedure. Only HBW has separate models by income group. For other home-based trip purposes, income-specific LogSums are weighted.

The destination choide models were completely re-estimated for the LCOG implementation.

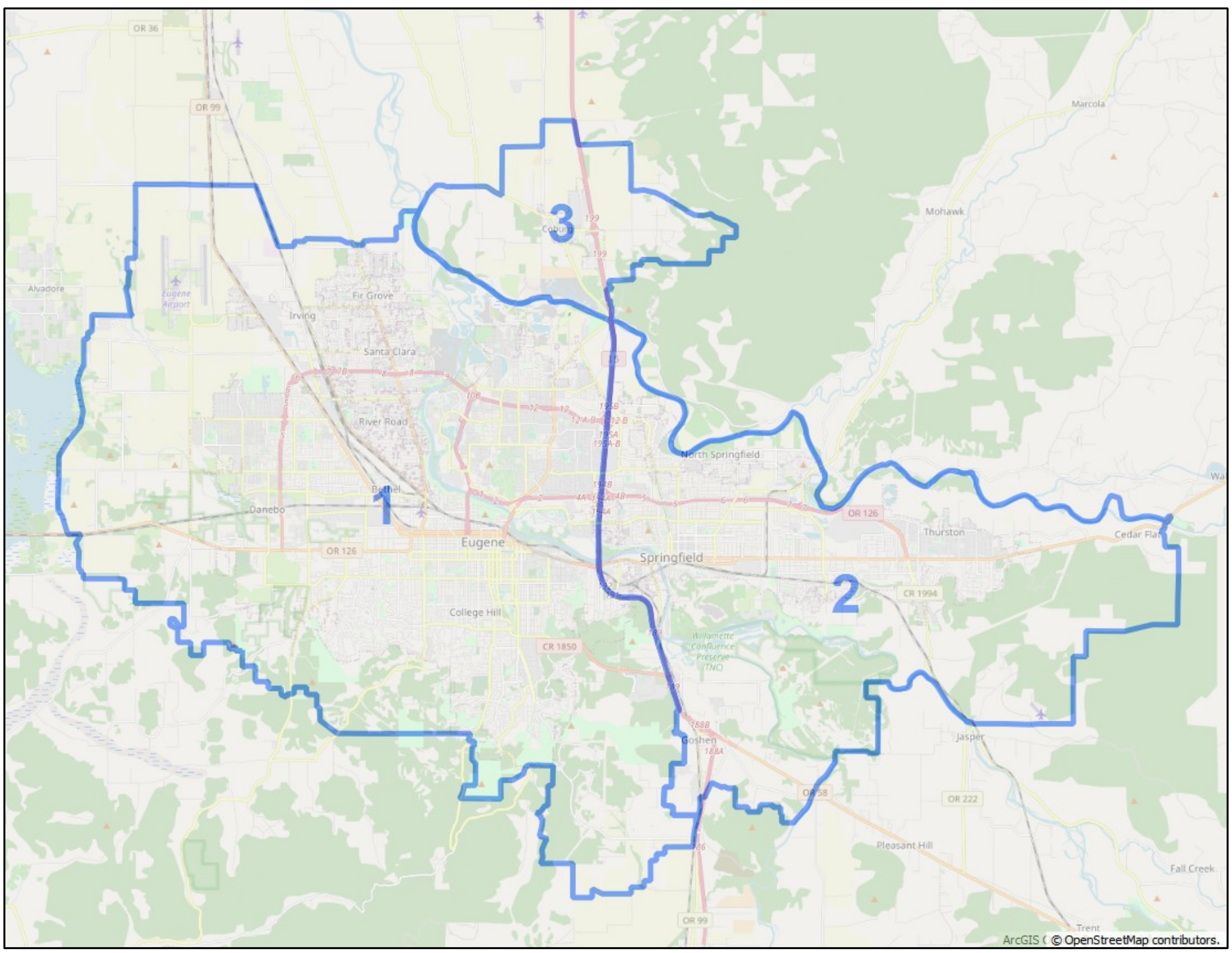
E.1 Variables Used in Destination Choice Models

E.1.a Accessibility Variable Definitions

The numbers in the district interaction variables represent travel associated with the districts displayed in Figure 2.

LogSum	=	Logsum of multimodal accessibility functions (all modes)
LogDist	=	Log of [distance (miles) + 1]
Eug2Spr	=	1 if trip is produced in Eugene (1) and attracted to Springfield (2)
Spr2Eug	=	1 if trip is produced in Springfield (2) and attracted to Eugene (1)
AllCob	=	1 if trip has one end in Coburg (3) and the other end in Eugene (1) or Springfield (2)
IntraDist	=	1 if trip does not cross a district boundary

FIGURE 2. District Interaction Variables Used in Destination Choice



E.1.b Zonal Size Variable Definitions

Zonal size variables are applied at the attraction zone.

TABLE 28. Zonal Size Variables Used in Destination Choice Models

Name	Employment Sectors	NAICS
AerEmp	**Arts, Entertainment, and Recreation**	71
AmfEmp	**Agriculture, Mining & Forestry**	11,21
ConEmp	**Construction**	23
EduEmp	**Education**	61
FsdEmp	**Food Services and Drinking Places**	722
GovEmp	**Government**	All where owner = public, except 61 (edu)
HssEmp	**Health and Social Services**	62
MfgEmp	**Manufacturing (except high tech)**	31-33 (except 334)
MhtEmp	**Manufacturing - High tech**	334
OsvEmp	**Other Services (except Public Administration)**	81
PbsEmp	**Professional and Business Services**	51-56
RcsEmp	**Retail and Consumer Services**	44,45,721
TwuEmp	**Transportation, Warehousing and Utilities**	22,48,49
WtEmp	**Wholesale Trade**	42
Households	**Households**	
OutAcres	**Outdoor Activity Acres**	
ParkAcres	**Park Acres**	
CollEnr	**College Enrollment**	

E.2 HBW (Home-Based Work)

E.2.a Calibrated Choice Utilities

HBW – Low Income Households

U = **exp (** 0.2*LogSum – 1.615*LogDist*Eug2Spr – 1.353*LogDist*Spr2Eug – 1.59*LogDist*AllCob – 1.04*LogDist*IntraDist + 0.2417*AerEmp + 1*AmfEmp + 0.0164*ConEmp + 0.1054*EduEmp + 0.2417*FsdEmp + 0.0164*GovEmp + 0.1381*HssEmp + 0.0376*MfgEmp + 1*MhtEmp + 0.2417*OsvEmp + 0.0646*PbsEmp + 0.0693*RcsEmp + 0.0164*TwuEmp + 0.1466*WtEmp **)**

HBW – Middle Income Households

U = **exp (** 0.2*LogSum – 1.277*LogDist*Eug2Spr – 2.102*LogDist*Spr2Eug – 1.25*LogDist*AllCob – 0.82*LogDist*IntraDist + 1*AerEmp + 0.12*AmfEmp + 0.208*ConEmp + 0.591*EduEmp + 0.3499*FsdEmp + 0.5605*GovEmp + 0.5769*HssEmp + 0.3042*MfgEmp + 1*MhtEmp + 1*OsvEmp + 0.2753*PbsEmp + 0.12*RcsEmp + 0.1979*TwuEmp + 0.2645*WtEmp **)**

HBW – High Income Households

U = **exp (** 0.2*LogSum – 0.447*LogDist*Eug2Spr – 0.676*LogDist*Spr2Eug – 1.12*LogDist*AllCob – 0.86*LogDist*IntraDist + 0.5735*AerEmp + 0.1097*AmfEmp + 0.5735*ConEmp + 0.5735*EduEmp + 0.1097*FsdEmp + 0.5735*GovEmp + 0.5735*HssEmp + 0.5735*MfgEmp + 1*MhtEmp + 1*OsvEmp + 0.5735*PbsEmp + 0.1097*RcsEmp + 0.5735*TwuEmp + 0.1097*WtEmp **)**

E.2.b Estimated Variable Coefficients

TABLE 29. HBW Destination Choice Model

Variable	Low Income <25K		Middle Income 25-100K		High Income 100K+	
	Coefficient	T-Statistic	Coefficient	T-Statistic	Coefficient	T-Statistic
LogSum	0.2	*fixed*	0.2	*fixed*	0.2	*fixed*
Calib LogDist * Eug2Spr	-1.615		-1.277		-0.447	
LogDist * Eug2Spr	-0.665	-4.87	-0.477	-7.81	-0.497	-7.22
Calib LogDist * Spr2Eug	-1.353		-2.102		-0.676	
LogDist * Spr2Eug	-0.353	-2.18	-0.602	-5.93	-0.696	-5.29
LogDist * AllCob	-1.590	-2.43	-1.250	-3.29	-1.120	-2.61
Calib LogDist * IntraDist	-1.040		-0.820		-0.860	
LogDist * IntraDist	-1.340	-7.08	-1.120	-11.35	-1.160	-10.10
AerEmp	0.2417	-2.63	1	*fixed*	0.5735	-2.06
AmfEmp	1	*fixed*	0.1200	-4.84	0.1097	-4.61
ConEmp	0.0164	-3.08	0.2080	-2.92	0.5735	-2.06
EduEmp	0.1054	-4.33	0.5910	-2.57	0.5735	-2.06
FsdEmp	0.2417	-2.63	0.3499	-2.66	0.1097	-4.61
GovEmp	0.0164	-3.08	0.5605	-2.48	0.5735	-2.06
HssEmp	0.1381	-3.86	0.5769	-2.55	0.5735	-2.06
MfgEmp	0.0376	-3.63	0.3042	-3.95	0.5735	-2.06
MhtEmp	1	*fixed*	1	*fixed*	1	*fixed*
OsvEmp	0.2417	-2.63	1	*fixed*	1	*fixed*
PbsEmp	0.0646	-4.04	0.2753	-4.93	0.5735	-2.06
RcsEmp	0.0693	-4.12	0.1200	-4.84	0.1097	-4.61
TwuEmp	0.0164	-3.08	0.1979	-2.94	0.5735	-2.06
WtEmp	0.1466	-2.69	0.2645	-2.59	0.1097	-4.61

E.3 HBshop, HBrec, HBoth (Other Home-Based)

E.3.a LogSum Weights

TABLE 30. HBshop, HBrec, HBoth LogSum Weights

Income Group	HBShop LogSum Weight	HBRec LogSum Weight	HBoth LogSum Weight
Low Income < $25K	0.208	0.191	0.242
Middle Income $25-100K	0.695	0.650	0.619
High Income $100K+	0.097	0.159	0.139

E.3.b Calibrated Choice Utilities

HBShop

U = **exp (** 1.33*LogSum – 3.95*LogDist*Eug2Spr – 3.82*LogDist*Spr2Eug – 0.949*LogDist*AllCob – 1.99*LogDist*IntraDist + 0.0773*FsdEmp + 0.1588*OsvEmp + 1*RcsEmp **)**

HBRec

U = **exp (** 0.547*LogSum – 1.693*LogDist*Eug2Spr – 1.699*LogDist*Spr2Eug – 0.906*LogDist*AllCob – 2.05*LogDist*IntraDist + 0.2322*AerEmp + 0.0074*EduEmp + 0.0529*FsdEmp + 0.045*GovEmp + 0.0012*Households + 0.2837*OutAcres + 1*ParkAcres/10 **)**

HBoth

U = **exp (** 0.789*LogSum – 1.05*LogDist*Eug2Spr – 0.505*LogDist*Spr2Eug – 1.6*LogDist*AllCob – 1.56*LogDist*IntraDist + 1*AerEmp + 0.0129*AmfEmp + 0.0392*ConEmp + 0.2753*EduEmp + 1*FsdEmp + 0.4892*GovEmp + 0.3746*HssEmp + 0.0129*MfgEmp + 0.0129*MhtEmp + 1*OsvEmp + 0.1212*PbsEmp + 0.357*RcsEmp + 0.0392*TwuEmp + 0.0392*WtEmp + 0.1327*Households **)**

E.3.c Estimated Variable Coefficients

TABLE 31. HBshop, HBrec, HBoth Destination Choice Models

Variable	**HBshop**		**HBrec**		**HBoth**	
	Coefficient	T-Statistic	Coefficient	T-Statistic	Coefficient	T-Statistic
LogSum	1.33	*fixed*	0.547	*fixed*	0.789	*fixed*
Calib LogDist * Eug2Spr	-3.950		-1.693		-1.050	
LogDist * Eug2Spr	-1.450	-16.00	-0.893	-13.84	-1.350	-26.89
Calib LogDist * Spr2Eug	-3.820		-1.699		-0.505	
LogDist * Spr2Eug	-1.320	-12.55	-0.899	-8.60	-0.905	-17.17
LogDist * AllCob	-0.949	-3.03	-0.906	-2.55	-1.600	-8.31
Calib LogDist * IntraDist	-1.990		-2.050		-1.560	
LogDist * IntraDist	-2.290	-23.21	-2.050	-28.11	-1.860	-35.12
AerEmp			0.2322	-7.99	1	*fixed*
AmfEmp					0.0129	-5.10
ConEmp					0.0392	-4.84
EduEmp			0.0074	-14.96	0.2753	-10.90
FsdEmp	0.0773	-6.46	0.0529	-16.77	1	*fixed*
GovEmp			0.0450	-16.42	0.4892	-5.81
HssEmp					0.3746	-8.61
MfgEmp					0.0129	-5.10
MhtEmp					0.0129	-5.10
OsvEmp	0.1588	-8.23			1	*fixed*
PbsEmp					0.1212	-8.92
RcsEmp	1	*fixed*			0.3570	-7.17
TwuEmp					0.0392	-4.84
WtEmp					0.0392	-4.84
Households			0.0012	-12.30	0.1327	-21.50
OutAcres			0.2837	-6.65		
ParkAcres / 10			1	*fixed*		

E.4 NHBW & NHBNW (Non-Home-Based)

E.4.a Calibrated Choice Utilities

NHBW

U = **exp (** 0.57*LogSum – 1.87*LogDist*Eug2Spr – 1.74*LogDist*Spr2Eug – 1.75*LogDist*AllCob – 1.75*LogDist*IntraDist + 0.5684*AerEmp + 0.0189*AmfEmp + 0.0189*ConEmp + 0.2254*EduEmp + 1*FsdEmp + 0.2837*GovEmp + 0.1275*HssEmp + 0.0189*MfgEmp + 0.0189*MhtEmp + 0.0954*OsvEmp + 0.1313*PbsEmp + 0.5684*RcsEmp + 0.0954*TwuEmp + 0.0189*WtEmp + 0.1023*Households **)**

NHBNW

U = **exp (** 1.65*LogSum – 1.59*LogDist*Eug2Spr – 1.334*LogDist*Spr2Eug – 0.852*LogDist*AllCob – 1.38*LogDist*IntraDist + 0.3694*AerEmp + 0.0898*AmfEmp + 0.0016*ConEmp + 0.1845*EduEmp + 0.2753*FsdEmp + 0.1653*GovEmp + 0.0926*HssEmp + 0.0016*MfgEmp + 0.0016*MhtEmp + 1*OsvEmp + 0.0498*PbsEmp + 0.4971*RcsEmp + 0.0424*TwuEmp + 0.0016*WtEmp **)**

E.4.b Estimated Variable Coefficients

TABLE 32. Non-Home-Based Destination Choice Models

Variable	NHBW		NHBNW	
	Coefficient	T-Statistic	Coefficient	T-Statistic
LogSum	0.57	6.31	1.65	14.50
LogDist * Eug2Spr	-1.87	-24.73	-1.19	-21.90
LogDist * Spr2Eug	-1.74	-18.65	-0.934	-14.53
LogDist * AllCob	-1.75	-23.56	-0.852	-4.43
LogDist * IntraDist	-1.75	-23.56	-1.68	-31.85
AerEmp	0.5684	-3.47	0.3694	-4.21
AmfEmp	0.0189	-6.11	0.0898	-2.88
ConEmp	0.0189	-6.11	0.0016	-2.70
EduEmp	0.2254	-9.28	0.1845	-15.56
FsdEmp	1	*fixed*	0.2753	-7.54
GovEmp	0.2837	-6.66	0.1653	-12.26
HssEmp	0.1275	-9.61	0.0926	-14.28
MfgEmp	0.0189	-6.11	0.0016	-2.70
MhtEmp	0.0189	-6.11	0.0016	-2.70
OsvEmp	0.0954	-3.65	1	*fixed*
PbsEmp	0.1313	-8.37	0.0498	-12.01
RcsEmp	0.5684	-3.47	0.4971	-7.96
TwuEmp	0.0954	-3.65	0.0424	-5.05
WtEmp	0.0189	-6.11	0.0016	-2.70
Households	0.1023	-16.99		

E.5 HBcoll (Home-Based College)

E.5.a LogSum Weights

TABLE 33. HBcoll LogSum Weights

Income Group	HBcoll LogSum Weight
Low Income < $25K	0.343
Middle Income $25-100K	0.566
High Income $100K+	0.091

E.5.b Calibrated Choice Utility

U = **exp (** 0.2*LogSum – 1.35*LogDist*Eug2Spr – 1.35*LogDist*Spr2Eug – 1.35*LogDist*AllCob – 1.35*LogDist*IntraDist + 0.1119*CollEnr **)**

E.5.c Estimated Variable Coefficients

Variable	HBcoll	
	Coefficient	T-Statistic
LogSum	0.2	*fixed*
LogDist * Eug2Spr	-1.35	*fixed*
LogDist * Spr2Eug	-1.35	*fixed*
LogDist * AllCob	-1.35	*fixed*
LogDist * IntraDist	-1.35	*fixed*
CollEnr	0.1119	-9.61

E.6 HBsch (Home-Based School)

$U = \mathbf{exp}\ (\ \mathbf{ln}\ (\ ATTR_j\ ) - 0.6{*}T_{ij} + 0.012{*}T_{ij}^2\ )$

Where:

i = from zone
j = to zone
T = mid-day auto travel time

F Mode Choice Model

Modal accessibility functions were estimated as an input to the destination choice and mode choice models. For each trip purpose, they measure the utility of choosing one of seven discrete modes.

Drive alone – only available to households with at least one car
Drive with passenger – only available to households with at least one car
Auto passenger
Transit by walk access – only available if total walk distance (access + transfer + egress) does not exceed one mile
Transit by park-and-ride access – only available if attraction zone has parking cost; only available for home-based non-school trips; utilities and lot usage for formal park-and-ride lots and informal park-and-ride locations are calculated by a nested park-and-ride lot choice model
Bike – utilities and distances are produced by a stand-alone tool based on a dedicated bicycle network
Walk – only available for trips with a distance less than five miles

Probabilities are applied to distributed trips to determine the number of trips by each mode. An example probability of choosing the Drive Alone mode follows:

$$Prob_{Drive\ Alone} = U_{Drive\ Alone}\ /\ (\ U_{Drive\ Alone} + U_{Drive\ w/Pass} + U_{Passenger} + U_{Walk\ to\ Transit} + U_{Park\&Ride} + U_{Bike} + U_{Walk}\ )$$

The parameters used in the mode choice models are unchanged from the Portland Metro implementation with the exception of (1) those associated with the bicycle mode, which were re-estimated; and (2) the alternative-specific constants, which were adjusted during model calibration.

F.1 Variables Used in Mode Choice Models

F.1.a Variable Definitions

- IvTime = In-vehicle travel time (minutes, varies by mode)
- WalkTime = Walk time (minutes), by mode:
    - Drive Alone: vehicle egress at trip end (5 min in CBD, 2 min elsewhere)
    - Shared Ride: Drive Alone walk time plus 5 minutes
    - Transit Modes: access to first stop plus egress from last stop at 3 mph
    - Walk: zone-to-zone time via key walk-accessible links at 3 mph (for trips < 5 miles)
- TranWait1 = Transit initial wait time (minutes)
- TranWait2 = Transit transfer wait time (minutes)
- TranModc = Transit mode constant (varies by transit path)
- TranStypc = Transit stop type constant (varies by transit path)
- TranXfrs = Transit # of transfers
- TrOVIV = ratio of total out-of-vehicle time to in-vehicle time
- Formal = 1 if considering formal park-and-ride lots
- Informal = 1 if considering informal park-and-ride locations
- Shadow = Park-and-ride lot shadow cost (calculated by lot choice model)
- BikeDist = Bicycle trip distance (miles)
- Cbutil = Bicycle commute route attractiveness
- Nbutil = Bicycle non-commute route attractiveness
- BikeResPref = 1 if production zone in bicycle user residential preference area (see Figure 1)
- LowInc = 1 if household income <$25K (2010$)
- MidInc = 1 if household income $25-100K (2010$)
- HighInc = 1 if household income $100K+ (2010$)
- OpCost = Out-of-pocket cost, by mode:
    - Drive Alone: 100% of $0.1774 / mile (2010$)
    - Drive with Passenger: 66.7% of $0.1774 / mile (2010$)
    - Auto Passenger: 33.3% of $0.1774 / mile (2010$)
    - Walk-access Transit: transit fare (2010$)
    - Park-and-ride: $0.1774 / mile for auto leg, transit fare for transit leg
- PkgCost = Parking cost, by mode:
    - Drive Alone: 100% of long-term parking charge in attraction zone
    - Drive with Passenger: 66.7% of long-term parking charge in attraction zone
    - Auto Passenger: 33.3% of long-term parking charge in attraction zone
- MixRetP = Retail employment access within ½ mile of production zone (see Section A.1.b)
- MixTotA = Total employment access within ½ mile of attraction zone (see Section A.1.b)
- Cval0 = 1 if no cars in household
- Cval1 = 1 if fewer cars than workers in household (cars > 0)
- HH1 = 1 if 1 person household
- HH2 = 1 if 2 person household
- HH34 = 1 if 3+ person household
- Work1 = 1 if one (and only one) worker in household

F.2 HBW (Home-Based Work)

F.2.a Calibrated Choice Utilities

Drive Alone

U = **exp (** -0.0414*IvTime – 0.1*WalkTime – 0.309*LowInc*OpCost – 0.252*MidInc*OpCost – 0.252*HighInc*OpCost – 0.509*LowInc*PkgCost – 0.509*MidInc*PkgCost – 0.461*HighInc*PkgCost – 1.9*Cval1 **)**

Drive with Passenger

U = **exp (-**3.32 – 0.0414*IvTime – 0.1*WalkTime – 0.309*LowInc*OpCost – 0.252*MidInc*OpCost – 0.252*HighInc*OpCost – 0.509*LowInc*PkgCost – 0.509*MidInc*PkgCost – 0.461*HighInc*PkgCost – 1.02*Cval1 - 1.4*HH1 + 0.729*HH34 **)**

Auto Passenger

U = **exp (-**3.56 – 0.0414*IvTime – 0.1*WalkTime – 0.309*LowInc*OpCost – 0.252*MidInc*OpCost – 0.252*HighInc*OpCost – 0.509*LowInc*PkgCost – 0.509*MidInc*PkgCost – 0.461*HighInc*PkgCost + 0.299*HH2 + 0.0297*ln(MixRetP) + 0.0506*ln(MixTotA) **)**

Transit by Walk Access

U = **exp (** -2.34 + TranModc + TranStypc – 0.0414*IvTime – 0.0543*TranWait1 – 0.061*TranWait2 – 0.1*WalkTime – 0.16*TranXfrs – 0.4*TrIVOV – 0.309*LowInc*OpCost – 0.252*MidInc*OpCost – 0.252*HighInc*OpCost + 0.08*ln(MixTotA) + 1.34*Cval0 + 0.349*Cval1 + 0.784*Work1 **)**

Park and Ride

Park and Ride uses older model specifications; only the mode-specific constant and informal constant were recalibrated in 2017. The coefficient on auto in-vehicle time is doubled in order to maintain a balance between auto and transit time that is comparable to the observed relationship; otherwise, too many trips include unreasonably high auto times as travelers choose to drive to the periphery of the CBD before boarding transit.

U = **exp (** 1.85 + 0.75***ln**(**exp**(Formal*0.5***ln**($\sum_{1\to N}$ [**exp**(($U_{AutoLeg}$ + $U_{TransitLeg}$ + Shadow – 1.498*Cval1) / (0.5*0.75))])) + **exp**(Informal*0.5***ln**($\sum_{1\to N}$ [**exp**((-4.5 + $U_{AutoLeg}$ + $U_{TransitLeg}$ + Shadow – 1.498*Cval1) / (0.5*0.75))])) **)**

where

$U_{AutoLeg}$ = -0.0414*2*IvTime – 0.309*LowInc*OpCost – 0.252*MidInc*OpCost – 0.252*HighInc*OpCost

and

$U_{TransitLeg}$ = -0.0414*IvTime – 0.0543*TranWait1 – 0.061*TranWait2 – 0.1*WalkTime – 0.16*TranXfrs – 0.309*LowInc*OpCost – 0.252*MidInc*OpCost – 0.252*HighInc*OpCost

and

N = number of formal park-and-ride lots or informal par-and-ride locations under consideration

Bike

U = **exp (** 0.12 – 0.469*BikeDist + 0.0274*Cbutil + 0.762*BikeResPref + 0.0517*ln(MixTotA) **)**

Walk

U = **exp (** -0.88 **–** 0.1*WalkTime + 0.107*ln(MixRetP) **)**

F.2.b Estimated Variable Coefficients

TABLE 34. HBW Mode Choice Model – Auto Modes

Variable	Drive Alone		Drive with Passenger		Auto Passenger	
	Coefficient	T-Statistic	Coefficient	T-Statistic	Coefficient	T-Statistic
Calib Constant			-3.32		-3.56	
Constant			-3.72	-31.72	-4.41	-19.18
IvTime	-0.0414	-4.74	-0.0414	-4.74	-0.0414	-4.74
Calib WalkTime	-0.1		-0.1		-0.1	
WalkTime	-0.0791	-14.01	-0.0791	-14.01	-0.0791	-14.01
LowIncOpCost	-0.309	-2.83	-0.309	-2.83	-0.309	-2.83
MidIncOpCost	-0.252	-6.34	-0.252	-6.34	-0.252	-6.34
HighIncOpCost	-0.252	-6.34	-0.252	-6.34	-0.252	-6.34
LowIncPkgCost	-0.509	-13.53	-0.509	-13.53	-0.509	-13.53
MidIncPkgCost	-0.509	-13.53	-0.509	-13.53	-0.509	-13.53
HighIncPkgCost	-0.461	-11.65	-0.461	-11.65	-0.461	-11.65
Ln(MixRetP)					0.0297	1.46
Ln(MixTotA)					0.0506	2.37
Cval1	-1.9	-18.06	-1.02	-5.07		
HH1			-1.4	-3.3		
HH2					0.299	2.69
HH34			0.729	5.45		

TABLE 35. HBW Mode Choice Model – Transit Modes

Variable	Walk Access		Park and Ride	
	Coefficient	T-Statistic	Coefficient	T-Statistic
Calib Constant	-2.34		1.85	
Constant	-2.34	-13.25	-6.504	-7.3
Ivtime	-0.0414	*-4.74*	-0.0414	*-4.74*
Wait1	-0.0543	-3.69	-0.0543	-3.69
Wait2	-0.061	-4.66	-0.061	-4.66
Calib WalkTime	-0.1			
WalkTime	-0.0791	-14.01	-0.0791	-14.01
Transfers	-0.16	*fixed*	-0.16	*fixed*
Calib TrIVOV	-0.4			
TrIVOV	-0.0519	-2.65		
LowIncOpCost	-0.309	-2.83	-0.309	-2.83
MidIncOpCost	-0.252	-6.34	-0.252	-6.34
HighIncOpCost	-0.252	-6.34	-0.252	-6.34
Ln(MixTotA)	0.08	*fixed*		
Work1	0.784	5.58		
Cval0	1.34	6.22		
Cval1	0.349	2.07	-1.498	-3.3
Nested Park & Ride Lot Choice Model				
Informal Constant			-4.5	
Park & Ride Nest			0.75	
Formal Nest			0.5	
Informal Nest			0.5	

TABLE 36. HBW Mode Choice Model – Nonmotorized Modes

Variable	Bike		Walk	
	Coefficient	T-Statistic	Coefficient	T-Statistic
Calib Constant	0.12		-0.88	
Constant	-2.51	-7.35	-1.82	-4.74
BikeDist	-0.469	-9.56		
Cbutil	0.0274	10.79		
BikeResPref	0.764	4.68		
Calib WalkTime			-0.1	
WalkTime			-0.0791	-14.01
Ln(MixTotA)	0.0517	*fixed*		
Ln(MixRetP)			0.107	2.54

F.3 HBshop, HBrec, HBoth (Other Home-Based)

F.3.a Calibrated Choice Utilities

Drive Alone

U = **exp (** -0.0315*IvTime – 0.125*WalkTime – 0.255*LowInc*OpCost – 0.255*MidInc*OpCost – 0.174*HighInc*OpCost – 0.731*LowInc*PkgCost – 0.393*MidInc*PkgCost – 0.393*HighInc*PkgCost – 0.704*Cval1 **)**

Drive with Passenger

U = **exp (** -1.25*Shop – 1.17*Rec – 1.01*Oth -0.0315*IvTime – 0.125*WalkTime – 0.255*LowInc*OpCost – 0.255*MidInc*OpCost – 0.174*HighInc*OpCost – 0.731*LowInc*PkgCost – 0.393*MidInc*PkgCost – 0.393*HighInc*PkgCost – 0.436*Cval1 – 1.63*HH1 + 0.889* HH34 **)**

Auto Passenger

U = **exp (** -0.73*Shop – 0.23*Rec – 0.38*Oth -0.0315*IvTime – 0.125*WalkTime – 0.255*LowInc*OpCost – 0.255*MidInc*OpCost – 0.174*HighInc*OpCost – 0.731*LowInc*PkgCost – 0.393*MidInc*PkgCost – 0.393*HighInc*PkgCost – 1.41*HH1 + 0.256*HH34 **)**

Transit by Walk Access

U = **exp (** -2.47*Shop – 3.93*Rec – 3.83*Oth + TranModc + TranStypc – 0.0315*IvTime – 0.05*TranWait1 – 0.05*TranWait2 – 0.125*WalkTime – 0.16*TranXfrs – 1*TrIVOV – 0.255*LowInc*OpCost – 0.255*MidInc*OpCost – 0.174*HighInc*OpCost + 0.213*ln(MixTotA) + 1.96*Cval0 + 0.665*Cval1 **)**

Park and Ride

Park and Ride uses older model specifications; only the mode-specific constant and informal constant were recalibrated in 2017. The coefficient on auto in-vehicle time is doubled in order to maintain a balance between auto and transit time that is comparable to the observed relationship; otherwise, too many trips include unreasonably high auto times as travelers choose to drive to the periphery of the CBD before boarding transit.

U = **exp (** -3.1*Shop – 2*Rec – 2.2*Oth + 0.75***ln**(**exp**(Formal*0.5***ln**($\sum_{1\to N}$ [**exp**(($U_{AutoLeg}$ + $U_{TransitLeg}$ + Shadow) / (0.5*0.75))])) + **exp**(Informal*0.5***ln**($\sum_{1\to N}$ [**exp**((-4 + $U_{AutoLeg}$ + $U_{TransitLeg}$ + Shadow) / (0.5*0.75))])) **)**

where

$U_{AutoLeg}$ = -0.0315*2*IvTime – 0.255*LowInc*OpCost – 0.255*MidInc*OpCost – 0.174*HighInc*OpCost and

$U_{TransitLeg}$ = -0.0315*IvTime – 0.05*TranWait1 – 0.05*TranWait2 – 0.125*WalkTime – 0.16*TranXfrs – 0.255*LowInc*OpCost – 0.255*MidInc*OpCost – 0.174*HighInc*OpCost

and

N = number of formal park-and-ride lots or informal par-and-ride locations under consideration

Bike

U = **exp (** 1.61*Shop + 3.1*Rec + 1.59*Oth – 0.223*BikeDist + 0.126*Nbutil + 0.929*BikeResPref + 0.212*ln(MixTotA) **)**

Walk

U = **exp (** -0.74*Shop + 0.41*Rec – 0.13*Oth – 0.125*WalkTime + 0.188*ln(MixRetP) **)**

F.3.b Estimated Variable Coefficients

TABLE 37. HBshop, HBrec, HBoth Mode Choice Model – Auto Modes

Variable	**Drive Alone**		**Drive with Passenger**		**Auto Passenger**	
	Coefficient	T-Statistic	Coefficient	T-Statistic	Coefficient	T-Statistic
Calib Shop			-1.25		-0.73	
Calib Rec			-1.17		-0.23	
Calib Oth			-1.01		-0.38	
Shop			-1.56	-32.21	-1.89	-34.42
Rec			-1.17	-20.87	-1.4	-22.98
Oth			-0.983	-28.87	-1.5	-38.77
IvTime	-0.0315	-2.16	-0.0315	-2.16	-0.0315	-2.16
Calib WalkTime	-0.125		-0.125		-0.125	
WalkTime	-0.0906	-27.55	-0.0906	-27.55	-0.0906	-27.55
LowIncOpCost	-0.255	-7.47	-0.255	-7.47	-0.255	-7.47
MidIncOpCost	-0.255	-7.47	-0.255	-7.47	-0.255	-7.47
HighIncOpCost	-0.174	-3.99	-0.174	-3.99	-0.174	-3.99
LowIncPkgCost	-0.731	-3.1	-0.731	-3.1	-0.731	-3.1
MidIncPkgCost	-0.393	-5.2	-0.393	-5.2	-0.393	-5.2
HighIncPkgCost	-0.393	-5.2	-0.393	-5.2	-0.393	-5.2
Cval1	-0.704	-9.07	-0.436	-5.25		
HH1			-1.63	-16.37	-1.41	-14.85
HH34			0.889	22.77	0.256	5.75

TABLE 38. HBshop, HBrec, HBoth Mode Choice Model – Transit Modes

Variable	Walk Access		Park and Ride	
	Coefficient	T-Statistic	Coefficient	T-Statistic
Calib Shop	-2.47		-3.1	
Calib Rec	-3.93		-2	
Calib Oth	-3.83		-2.2	
Shop	-4.95	-9.89	-7.023	-3.8
Rec	-4.4	-8.63	-7.023	-3.8
Oth	-5.03	-10	-7.023	-3.8
IvTime	-0.0315	-2.16	-0.0315	-2.16
Calib TranWait1	-0.05		-0.05	
TranWait1	-0.0824	-4.7	-0.0824	-4.7
Calib TranWait2	-0.05		-0.05	
TranWait2	-0.074	-4.42	-0.074	-4.42
Calib WalkTime	-0.125		-0.125	
WalkTime	-0.0906	-27.55	-0.0906	-27.55
TranXfrs	-0.16	*fixed*	-0.16	*fixed*
Calib TrIVOV	-1			
TrIVOV	-0.121	-3.11		
LowIncOpCost	-0.255	-7.47	-0.255	-7.47
MidIncOpCost	-0.255	-7.47	-0.255	-7.47
HighIncOpCost	-0.174	-3.99	-0.174	-3.99
Ln(MixTotA)	0.212	6.18		
Ln(MixRetP)	0.203	5.2		
Cval0	1.96	12.4		
Cval1	0.665	3.93		
Nested Park & Ride Lot Choice Model				
Informal Constant			-4	
Park & Ride Nest			0.75	
Formal Nest			0.5	
Informal Nest			0.5	

TABLE 39. HBshop, HBrec, HBoth Mode Choice Model – Nonmotorized Modes

Variable	Bike		Walk	
	Coefficient	T-Statistic	Coefficient	T-Statistic
Calib Shop	1.61		-0.74	
Calib Rec	3.1		0.41	
Calib Oth	1.59		-0.13	
Shop	-3.74	-11.64	-2.6	-15.29
Rec	-2.73	-8.63	-1.41	-8.44
Oth	-3.73	-12.05	-2.15	-13.83
BikeDist	-0.223	*fixed*		
Nbutil	0.126	7.05		
BikeResPref	0.929	5.45		
Calib WalkTime			-0.125	
WalkTime			-0.0906	-27.55
Ln(MixTotA)	0.212	*fixed*		
Calib Ln(MixRetP)			0.188	
Ln(MixRetP)			0.229	13.99

F.4 NHBW (Non-Home-Based Work)

F.4.a Calibrated Choice Utilities

Drive Alone

U = **exp (** -0.0452*IvTime – 0.157*WalkTime – 0.194*OpCost – 0.557*PkgCost **)**

Drive with Passenger

U = **exp (** -2.68 – 0.0452*IvTime – 0.157*WalkTime – 0.194*OpCost – 0.557*PkgCost **)**

Auto Passenger

U = **exp (** -2.87 – 0.0452*IvTime – 0.157*WalkTime – 0.194*OpCost – 0.557*PkgCost **)**

Transit by Walk Access

U = **exp (** 0.03 + TranModc + TranStypc – 0.0452*IvTime – 0.118*TranWait1 – 0.118*TranWait2 – 0.157*WalkTime – 0.16*TranXfrs – 0.194*OpCost – 1*TrOVIV **)**

Bike

U = **exp (** -1.18 **–** 0.22*BikeDist + 0.0829*Nbutil + 1.11*BikeResPref + 0.1*Ln(MixTotA) **)**

Walk

U = **exp (** -1.49 – 0.157*WalkTime + 0.248*ln(MixRetP) **)**

F.4.b Estimated Variable Coefficients

TABLE 40. NHBW Mode Choice Model – Auto Modes

Variable	Drive Alone		Drive with Passenger		Auto Passenger	
	Coefficient	T-Statistic	Coefficient	T-Statistic	Coefficient	T-Statistic
Calib Constant			-2.68		-2.87	
Constant			-2.43	-46.75	-2.99	-48.6
IvTime	-0.0452	-2.49	-0.0452	-2.49	-0.0452	-2.49
WalkTime	-0.157	-16.7	-0.157	-16.7	-0.157	-16.7
OpCost	-0.194	-3.33	-0.194	-3.33	-0.194	-3.33
PkgCost	-0.557	-5.41	-0.557	-5.41	-0.557	-5.41

TABLE 41. NHBW Mode Choice Model – Transit Modes

Variable	Walk Access	
	Coefficient	T-Statistic
Calib Constant	0.03	
Constant	-1.76	-2.76
IvTime	-0.0452	-2.49
TranWait1	-0.118	-5.07
TranWait2	-0.118	-5.07
WalkTime	-0.157	-16.7
TranXfrs	-0.16	*fixed*
OpCost	-0.194	-3.33
Calib TrIVOV	-1	
TrIVOV	0	*fixed*
Calib Ln(MixTotA)	0	
Ln(MixTotA)	-0.161	-6.18

TABLE 42. NHBW Mode Choice Model – Nonmotorized Modes

Variable	Bike		Walk	
	Coefficient	T-Statistic	Coefficient	T-Statistic
Calib Constant	-1.18		-1.49	
Constant	-4.96	-52.56	-2.12	-5.52
BikeDist	-0.22	*fixed*		
Nbutil	0.0829	2.29		
BikeResPref	1.11	2.67		
WalkTime			-0.157	-16.7
Calib Ln(MixRetP)			0.248	
Ln(MixRetP)			0.2553	10.6
Ln(MixTotA)	0.1	*fixed*		

F.5 NHBNW (Non-Home-Based Non-Work)

F.5.a Calibrated Choice Utilities

Drive Alone

U = **exp (** -0.0278*IvTime – 0.125*WalkTime – 0.15*OpCost – 0.335*PkgCost **)**

Drive with Passenger

U = **exp (** -1.73 – 0.0278*IvTime – 0.125*WalkTime – 0.15*OpCost – 0.335*PkgCost **)**

Auto Passenger

U = **exp (** -2.56 – 0.0278*IvTime – 0.125*WalkTime – 0.15*OpCost – 0.335*PkgCost **)**

Transit by Walk Access

U = **exp (** 0.16 + TranModc + TranStypc – 0.0278*IvTime – 0.0781*TranWait1 – 0.0841*TranWait2 – 0.125*WalkTime – 0.16*TranXfrs – 1*TrIVOV – 0.15*OpCost + 0.128*ln(MixTotA) + 0.135*ln(MixRetP) **)**

Bike

U = **exp (** -0.86 **–** 0.251*BikeDist + 0.0829*Nbutil + 0.879*BikeResPref + 0.172*ln(MixTotA) **)**

Walk

U = **exp (** -2.26 – 0.125*WalkTime + 0.301*ln(MixRetP) **)**

F.5.b Estimated Variable Coefficients

TABLE 43. NHBNW Mode Choice Model – Auto Modes

Variable	Drive Alone		Drive with Passenger		Auto Passenger	
	Coefficient	T-Statistic	Coefficient	T-Statistic	Coefficient	T-Statistic
Calib Constant			-1.73		-2.56	
Constant			-0.491	-18.74	-1.37	-41.17
IvTime	-0.0278	-1.63	-0.0278	-1.63	-0.0278	-1.63
Calib WalkTime	-0.125		-0.125		-0.125	
WalkTime	-0.0886	-14.68	-0.0886	-14.68	-0.0886	-14.68
OpCost	-0.15	-2.94	-0.15	-2.94	-0.15	-2.94
PkgCost	-0.335	-5.91	-0.335	-5.91	-0.335	-5.91

TABLE 44. NHBNW Mode Choice Model – Transit Modes

Variable	**Walk Access**	
	Coefficient	T-Statistic
Calib Constant	0.16	
Constant	-3.8	-4.82
IvTime	-0.0278	-1.63
TranWait1	-0.0781	-2.85
TranWait2	-0.0841	-2.97
Calib WalkTime	-0.125	
WalkTime	-0.0886	-14.68
TranXfrs	-0.16	*fixed*
Calib TrIVOV	-1	
TrIVOV	-0.15	*fixed*
OpCost	-0.15	-2.94

TABLE 45. NHBNW Mode Choice Model – Nonmotorized Modes

Variable	**Bike**		**Walk**	
	Coefficient	T-Statistic	Coefficient	T-Statistic
Calib Constant	-0.86		-2.25	
Constant	-4.26	-7.47	-3.73	-11.9
BikeDist	-0.251	-2.67		
Nbutil	0.0829	*fixed*		
BikeResPref	0.879	3.07		
Calib WalkTime			-0.125	
WalkTime			-0.0886	-14.68
Ln(MixRetP)			0.301	10.1
Ln(MixTotA)	0.172	*fixed*		

F.6 HBcoll (Home-Based College)

F.6.a Calibrated Choice Utilities

Drive Alone

U = **exp (** -0.0346*IvTime – 0.08*WalkTime – 0.463*LowInc*OpCost – 0.383*MidInc*OpCost – 0.184*HighInc*OpCost – 0.463*LowInc*PkgCost – 0.383*MidInc*PkgCost – 0.184*HighInc*PkgCost – 1.36*Cval1 **)**

Drive with Passenger

U = **exp (** -3.87 – 0.0346*IvTime – 0.08*WalkTime – 0.463*LowInc*OpCost – 0.383*MidInc*OpCost – 0.184*HighInc*OpCost – 0.463*LowInc*PkgCost – 0.383*MidInc*PkgCost – 0.184*HighInc*PkgCost **)**

Auto Passenger

U = **exp (** -1.95 – 0.0346*IvTime – 0.08*WalkTime – 0.463*LowInc*OpCost – 0.383*MidInc*OpCost – 0.184*HighInc*OpCost – 0.463*LowInc*PkgCost – 0.383*MidInc*PkgCost – 0.184*HighInc*PkgCost **)**

Transit by Walk Access

U = **exp (-**0.76 + TranModc + TranStypc – 0.0346*IvTime – 0.055*TranWait1 – 0.055*TranWait2 – 0.08*WalkTime – 0.15*TranXfrs – 0.463*LowInc*OpCost – 0.383*MidInc*OpCost – 0.184*HighInc*OpCost + 0.763*Cval0 + 0.528*Cval1 + 0.1*ln(LogMixTotA) **)**

Park and Ride

Park and Ride uses older model specifications; only the mode-specific constant and informal constant were recalibrated in 2017. The coefficient on auto in-vehicle time is doubled in order to maintain a balance between auto and transit time that is comparable to the observed relationship; otherwise, too many trips include unreasonably high auto times as travelers choose to drive to the periphery of the CBD before boarding transit.

U = **exp (** 2.85 + 0.75***ln**(**exp**(Formal*0.5***ln**($\sum_{1\rightarrow N}$ [**exp**(($U_{AutoLeg}$ + $U_{TransitLeg}$ + Shadow) / (0.5*0.75))])) + **exp**(Informal*0.5***ln**($\sum_{1\rightarrow N}$ [**exp**((-5.5 + $U_{AutoLeg}$ + $U_{TransitLeg}$ + Shadow) / (0.5*0.75))])) **)**

where

$U_{AutoLeg}$ = -0.0346*2*IvTime – 0.463*LowInc*OpCost – 0.383*MidInc*OpCost – 0.184*HighInc*OpCost

and

$U_{TransitLeg}$ = -0.0346*IvTime – 0.055*TranWait1 – 0.055*TranWait2 – 0.08*WalkTime – 0.15*TranXfrs – 0.463*LowInc*OpCost – 0.383*MidInc*OpCost – 0.184*HighInc*OpCost

and

N = number of formal park-and-ride lots or informal par-and-ride locations under consideration

Bike

U = **exp (** 7.63 – 0.3*BikeDist + 0.108*Cbutil **+** 0.1*Ln(MixTotA) **)**

Walk

U = **exp (-**0.95 – 0.08*WalkTime + 0.119*ln(MixRetP) **)**

F.6.b Estimated Variable Coefficients

TABLE 46. HBcoll Mode Choice Model – Auto Modes

Variable	Drive Alone		Drive with Passenger		Auto Passenger	
	Coefficient	T-Statistic	Coefficient	T-Statistic	Coefficient	T-Statistic
Calib Constant			-3.87		-1.95	
Constant			-3.08	-12.85	-3.01	-16.8
IvTime	-0.0346	-1.48	-0.0346	-1.48	-0.0346	-1.48
Calib WalkTime	-0.08		-0.08		-0.08	
WalkTime	-0.0615	-4.25	-0.0615	-4.25	-0.0615	-4.25
LowIncOpCost	-0.463	-2.36	-0.463	-2.36	-0.463	-2.36
MidIncOpCost	-0.383	-3.58	-0.383	-3.58	-0.383	-3.58
HighIncOpCost	-0.184	-1.61	-0.184	-1.61	-0.184	-1.61
LowIncPkgCost	-0.463	-2.36	-0.463	-2.36	-0.463	-2.36
MidIncPkgCost	-0.383	-3.58	-0.383	-3.58	-0.383	-3.58
HighIncPkgCost	-0.184	-1.61	-0.184	-1.61	-0.184	-1.61
Cval1	-1.36	-3.5				

TABLE 47. HBcoll Mode Choice Model – Transit Modes

Variable	Walk Access		Park and Ride	
	Coefficient	T-Statistic	Coefficient	T-Statistic
Calib Constant	-0.76		2.85	
Constant	-2.07	-1.99	-1.175	-3.4
IvTime	-0.0346	-1.48	-0.0346	-1.48
Calib TranWait1	-0.055		-0.055	
TranWait1	-0.0296	-1.15	-0.0296	-1.15
Calib TranWait2	-0.055		-0.055	
TranWait2	-0.0296	-1.15	-0.0296	-1.15
Calib WalkTime	-0.08		-0.08	
WalkTime	-0.0615	-4.25	-0.0615	-4.25
TranXfrs	-0.15	*fixed*	-0.15	*fixed*
LowIncOpCost	-0.463	-2.36	-0.463	-2.36
MidIncOpCost	-0.383	-3.58	-0.383	-3.58
HighIncOpCost	-0.184	-1.61	-0.184	-1.61
Cval0	0.763	1.28		
Cval1	0.528	1.35		
Nested Park & Ride Lot Choice Model				
Informal Constant			-5.5	
Park & Ride Nest			0.75	
Formal Nest			0.5	
Informal Nest			0.5	

TABLE 48. HBcoll Mode Choice Model – Nonmotorized Modes

Variable	Bike		Walk	
	Coefficient	T-Statistic	Coefficient	T-Statistic
Calib Constant	7.63		-0.95	
Constant	-3.73	-7.49	-1.83	-1.29
BikeDist	-0.3	*fixed*		
Cbutil	0.108	2.33		
Calib WalkTime			-0.08	
WalkTime			-0.0615	-4.25
Ln(MixRetP)			0.119	0.81
Ln(MixTotA)	0.1	*fixed*		

F.7 HBsch (Home-Based School)

The HBsch model assumes fixed mode shares developed from OHAS data for all trips in the Eugene-Springfield-Coburg model area. Walk trips longer than one mile and bike trips longer than four miles (90^{th} percentile OHAS distances) are disallowed and apportioned among remaining modes.

TABLE 49. HBsch Mode Choice Model

Mode	HBsch Mode Share
Auto Driver	0.276
Auto Passenger	0.164
Transit	0.028
Walk	0.391
Bike	0.049
School Bus	0.092

G Time of Day Factors

Time of day travel is estimated separately for auto and transit, and the factors are direction-specific. Factors can be estimated for any hour by using start time data from the 2010-11 household activity survey. Hourly peaking factors for both Production->Attraction and Attraction->Production trip ends for all trip purposes are provided in the tables on the following pages.

TABLE 50. Hourly peaking factors: HBW and HBO

Time Period	HBW Auto PA	HBW Auto AP	HBW Transit PA	HBW Transit AP	HBO Auto PA	HBO Auto AP	HBO Transit PA	HBO Transit AP
0:00 - 0:59	-	0.0011	-	-	-	0.0015	-	-
1:00 - 1:59	0.0002	0.0007	-	0.0324	-	0.0005	-	-
2:00 - 2:59	-	0.0026	-	-	-	-	-	-
3:00 - 3:59	0.0043	0.0007	-	-	0.0002	-	-	-
4:00 - 4:59	0.0070	-	-	-	0.0025	-	-	-
5:00 - 5:59	0.0740	-	0.0200	-	0.0031	0.0005	-	-
6:00 - 6:59	0.0639	0.0005	0.0783	-	0.0122	0.0019	0.0033	-
7:00 - 7:59	0.1243	0.0046	0.2149	-	0.0309	0.0071	0.1423	-
8:00 - 8:59	0.0755	0.0036	0.0083	0.0462	0.0483	0.0140	0.0388	0.0244
9:00 - 9:59	0.0364	0.0129	0.0346	-	0.0364	0.0122	0.1199	0.0348
10:00 - 10:59	0.0221	0.0410	-	0.0052	0.0515	0.0286	0.0595	0.0039
11:00 - 11:59	0.0177	0.0110	0.0413	0.0031	0.0307	0.0388	0.0555	0.0167
12:00 - 12:59	0.0203	0.0181	0.0048	0.0366	0.0266	0.0294	0.0576	0.0858
13:00 - 13:59	0.0379	0.0308	-	0.0214	0.0317	0.0246	-	0.0167
14:00 - 14:59	0.0103	0.0239	0.0067	-	0.0510	0.0411	0.0529	0.0238
15:00 - 15:59	0.0051	0.0352	-	0.0316	0.0342	0.0370	0.0303	0.0284
16:00 - 16:59	0.0084	0.0759	0.0324	0.1855	0.0263	0.0507	0.0459	0.0632
17:00 - 17:59	0.0056	0.1125	-	0.1938	0.0382	0.0541	-	0.0251
18:00 - 18:59	0.0109	0.0340	-	-	0.0370	0.0592	-	0.0251
19:00 - 19:59	0.0010	0.0163	-	-	0.0180	0.0195	-	-
20:00 - 20:59	0.0002	0.0144	-	0.0026	0.0071	0.0281	-	0.0459
21:00 - 21:59	0.0009	0.0121	-	-	0.0078	0.0289	-	-
22:00 - 22:59	0.0069	0.0092	-	-	0.0012	0.0229	-	-
23:00 - 23:59	0.0035	0.0023	-	-	0.0002	0.0043	-	-

TABLE 51. Hourly peaking factors: HBS and HBR

Time Period	HBS Auto PA	HBS Auto AP	HBS Transit PA	HBS Transit AP	HBR Auto PA	HBR Auto AP	HBR Transit PA	HBR Transit AP
0:00 - 0:59	-	-	-	-	-	-	-	-
1:00 - 1:59	-	-	-	-	-	-	-	-
2:00 - 2:59	-	-	-	-	-	0.0057	-	-
3:00 - 3:59	-	-	-	-	-	-	-	-
4:00 - 4:59	-	-	-	-	0.0044	-	-	-
5:00 - 5:59	0.0015	-	-	-	0.0334	0.0010	-	-
6:00 - 6:59	0.0038	0.0004	-	-	0.0191	0.0305	-	-
7:00 - 7:59	0.0069	0.0041	0.0039	-	0.0207	0.0113	-	-
8:00 - 8:59	0.0098	0.0074	0.0039	-	0.0446	0.0055	-	-
9:00 - 9:59	0.0364	0.0175	0.0298	-	0.0310	0.0133	0.0359	-
10:00 - 10:59	0.0270	0.0267	0.0964	0.0039	0.0228	0.0231	0.5181	-
11:00 - 11:59	0.0321	0.0259	0.0270	0.0496	0.0228	0.0223	-	-
12:00 - 12:59	0.0233	0.0375	0.0579	0.0323	0.0154	0.0172	-	0.0263
13:00 - 13:59	0.0683	0.0665	0.0714	0.0435	0.0191	0.0175	-	-
14:00 - 14:59	0.0259	0.0529	0.1445	0.0824	0.0127	0.0106	0.0526	0.1120
15:00 - 15:59	0.0308	0.0424	-	0.2071	0.0208	0.0175	-	0.0359
16:00 - 16:59	0.0123	0.0483	0.0145	0.0053	0.0547	0.0420	-	0.0526
17:00 - 17:59	0.0245	0.0723	-	0.1123	0.0801	0.0566	-	0.1402
18:00 - 18:59	0.0137	0.0606	-	0.0145	0.0319	0.0396	-	0.0263
19:00 - 19:59	0.0424	0.0446	-	-	0.0563	0.0557	-	-
20:00 - 20:59	0.0052	0.0383	-	-	0.0031	0.0536	-	-
21:00 - 21:59	0.0268	0.0067	-	-	0.0072	0.0353	-	-
22:00 - 22:59	0.0255	0.0063	-	-	0.0007	0.0306	-	-
23:00 - 23:59	-	0.0255	-	-	0.0057	0.0047	-	-

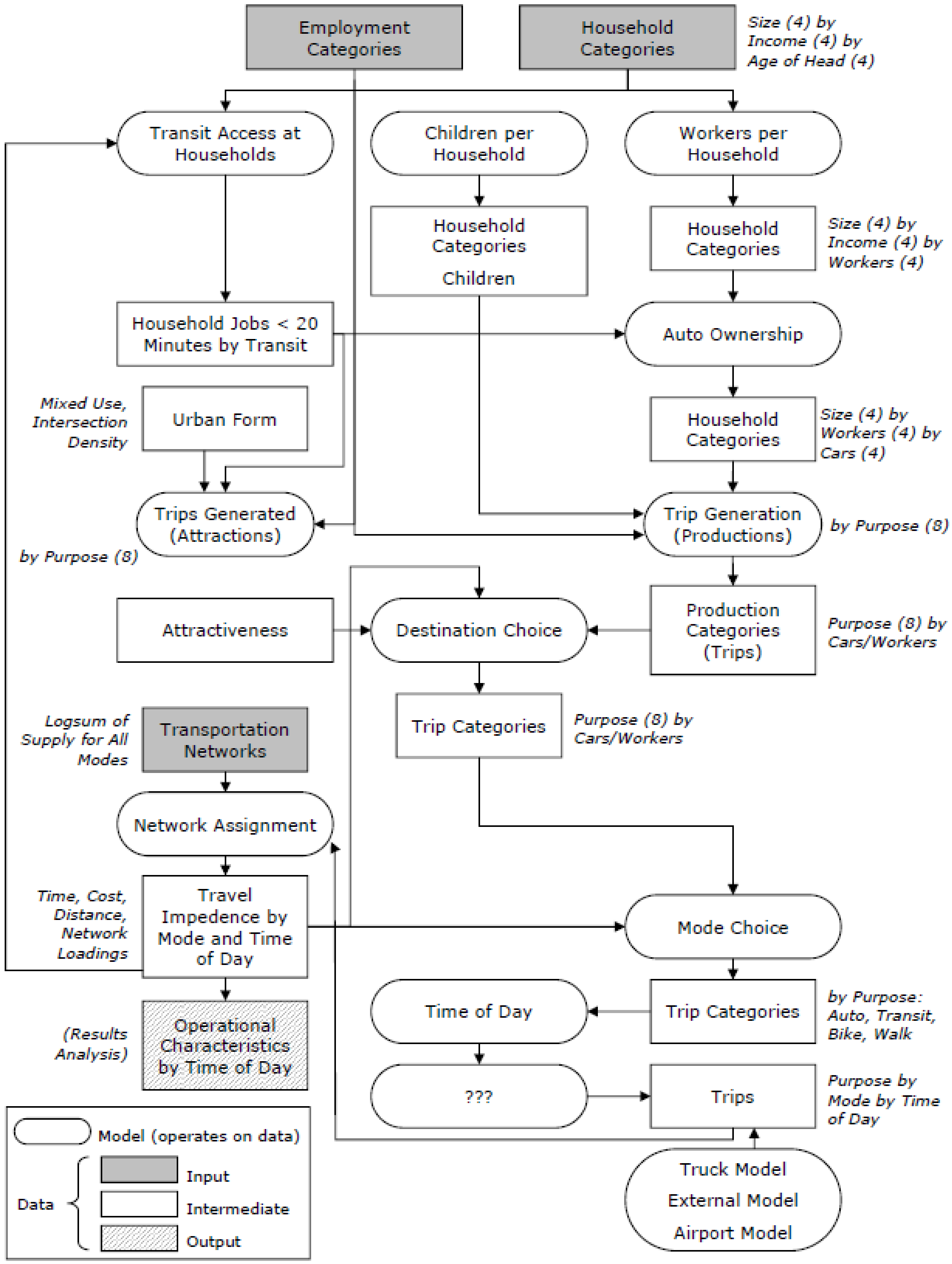
TABLE 52. Hourly peaking factors: College and School

Time Period	College Auto PA	College Auto AP	College Transit PA	College Transit AP	School Auto PA	School Auto AP	School Transit PA	School Transit AP
0:00 - 0:59	-	-	-	-	0.0004	0.0004	-	-
1:00 - 1:59	-	-	-	-	-	-	-	-
2:00 - 2:59	-	-	-	-	-	-	-	-
3:00 - 3:59	-	-	-	-	-	-	-	-
4:00 - 4:59	-	-	-	-	-	-	-	-
5:00 - 5:59	-	-	-	-	-	-	-	-
6:00 - 6:59	-	-	0.0197	-	0.0035	0.0015	0.0072	-
7:00 - 7:59	0.0741	-	0.0354	-	0.0796	0.0102	0.4704	-
8:00 - 8:59	0.0116	0.0009	0.1626	-	0.2216	0.1718	0.0830	-
9:00 - 9:59	0.0343	0.0026	0.0928	-	0.0152	0.0266	0.0165	-
10:00 - 10:59	0.0239	0.0080	0.1771	0.0250	0.0043	0.0054	0.0062	-
11:00 - 11:59	0.3265	0.0111	0.0297	0.0704	0.1509	0.1357	-	-
12:00 - 12:59	0.0057	0.0463	-	-	0.0038	0.0188	0.0039	-
13:00 - 13:59	0.0040	0.0115	0.0208	0.0669	0.0025	0.0032	-	0.0165
14:00 - 14:59	0.0041	0.0106	-	0.0268	0.0315	0.0175	-	0.0807
15:00 - 15:59	0.0017	0.0271	-	0.0435	0.0106	0.0294	-	0.3056
16:00 - 16:59	0.0040	0.2505	-	0.0044	0.0016	0.0083	-	0.0039
17:00 - 17:59	0.0207	0.0910	0.0060	0.1584	0.0092	0.0105	-	-
18:00 - 18:59	0.0076	0.0066	-	-	0.0011	0.0202	-	0.0062
19:00 - 19:59	-	-	-	0.0547	-	0.0006	-	-
20:00 - 20:59	-	0.0086	-	0.0060	0.0011	0.0015	-	-
21:00 - 21:59	-	0.0055	-	-	0.0007	0.0007	-	-
22:00 - 22:59	-	0.0015	-	-	-	-	-	-
23:00 - 23:59	-	-	-	-	-	-	-	-

TABLE 53. Hourly peaking factors: Non-Home, Externals, and Trucks

Time Period	NHBW Auto PA	NHBW Auto AP	NHBW Transit PA	NHBW Transit AP	NHBNW Auto OD	NHBNW Transit OD	Externals	Heavy Trucks	Medium Trucks
0:00 - 0:59	-	-	-	-	0.0002	-	0.0132	0.0151	0.0055
1:00 - 1:59	-	-	-	-	-	-	0.0132	0.0161	0.0048
2:00 - 2:59	-	-	-	-	-	-	0.0132	0.0142	0.0062
3:00 - 3:59	-	-	-	-	0.0002	-	0.0132	0.0166	0.0068
4:00 - 4:59	0.0004	0.0004	-	-	-	-	0.0132	0.0217	0.0140
5:00 - 5:59	0.0004	0.0049	-	-	0.0008	-	0.0132	0.0297	0.0200
6:00 - 6:59	0.0024	0.0035	-	-	0.0038	-	0.0560	0.0445	0.0355
7:00 - 7:59	0.0136	0.0578	-	0.0174	0.0328	0.0138	0.0628	0.0564	0.0540
8:00 - 8:59	0.0111	0.0888	-	0.0096	0.0520	0.0100	0.0628	0.0609	0.0830
9:00 - 9:59	0.0195	0.0402	0.0141	0.2320	0.0580	0.0192	0.0558	0.0721	0.0869
10:00 - 10:59	0.0246	0.0440	0.0124	-	0.0635	0.0325	0.0558	0.0778	0.0847
11:00 - 11:59	0.0447	0.0514	0.0167	-	0.0759	0.0634	0.0558	0.0750	0.0837
12:00 - 12:59	0.0457	0.0432	0.1494	0.0096	0.0880	0.0677	0.0558	0.0717	0.0821
13:00 - 13:59	0.0456	0.0457	-	0.3149	0.1027	0.0538	0.0558	0.0691	0.0791
14:00 - 14:59	0.0351	0.0311	0.0174	0.0089	0.1223	0.0741	0.0596	0.0666	0.0801
15:00 - 15:59	0.0489	0.0418	0.0316	0.0220	0.1045	0.0905	0.0724	0.0573	0.0727
16:00 - 16:59	0.0774	0.0209	0.0279	0.0174	0.0775	0.1972	0.0724	0.0465	0.0551
17:00 - 17:59	0.1036	0.0052	0.0861	0.0052	0.0877	0.1865	0.0724	0.0364	0.0429
18:00 - 18:59	0.0221	0.0028	-	-	0.0309	0.0190	0.0596	0.0352	0.0330
19:00 - 19:59	0.0055	0.0059	-	-	0.0392	-	0.0326	0.0298	0.0227
20:00 - 20:59	0.0032	0.0025	-	0.0071	0.0346	0.1723	0.0326	0.0259	0.0169
21:00 - 21:59	0.0005	0.0009	-	-	0.0079	-	0.0326	0.0228	0.0120
22:00 - 22:59	0.0046	-	-	-	0.0169	-	0.0132	0.0200	0.0099
23:00 - 23:59	0.0002	-	-	-	0.0006	-	0.0132	0.0186	0.0084

Appendix A – Metro Model Forecasting Model Structure



Appendix L: Use Model Documentation

CONTENTS

1. MODELING OVERVIEW AND STRUCTURE

MODEL SYSTEM OBJECTIVES, CAPABILITIES, AND LIMITATIONS

DESIGN OBJECTIVES

UrbanSim is an urban simulation system developed over the past several decades to better inform deliberation on public choices with long-term, significant effects. A key motivation for developing such a model system is that the urban environment is complex enough that it is not feasible to anticipate the effects of alternative courses of action without some form of analysis that could reflect the cause and effect interactions that could have both intended and possibly unintended consequences.

UrbanSim was designed to attempt to reflect the inter-dependencies in dynamic urban systems, focusing on the real estate market and the transportation system, initially, and on the effects of individual interventions, and combinations of them, on patterns of development, travel demand, and household and firm location. Some goals that have shaped the design of UrbanSim, and some that have emerged through the past decades of seeing it tested in the real world, are the following:

OUTCOME GOALS

- Enable a wide variety of stakeholders (planners, public agencies, citizens and advocacy groups) to explore the potential consequences of alternative public policies and investments using credible, unbiased analysis.
- Facilitate more effective democratic deliberation on contentious public actions regarding land use, transportation and the environment, informed by the potential consequences of alternative courses of action that include long-term cumulative effects on the environment, and distributional equity considerations.
- Make it easier for communities to achieve a common vision for the future of the community and its broader environment, and to coordinate their actions to produce outcomes that are consistent with this vision.

IMPLEMENTATION GOALS

- Create an analytical capacity to model the cause and effect interactions within local urban systems that are sufficiently accurate and sensitive to policy interventions to be a credible source for informing deliberations.
- Make the model system credible by avoiding bias in the models though simplifying assumptions that obscure or omit important cause-effect linkages at a level of detail needed to address stakeholder concerns.
- Make the model design behaviorally clear in terms of representing agents, actions, and cause - effect interactions in ways that can be understood by non-technical stakeholders, while making the statistical methods used to implement the model scientifically robust.
- Make the model system open, accessible and transparent, by adopting an Open Source licensing approach and releasing the code and documentation on the web.

- Encourage the development of a collaborative approach to development and extension of the system, both through open source licensing and web access, and by design choices and supporting organizational activities.
- Test the system extensively and repeatedly, and continually improve it by incorporating lessons learned from applications, and from new advances in methods for modeling, statistical analysis, and software development.

DESIGN GOALS

The original design of UrbanSim adopted several elements to address these implementation goals, and these have remained foundational in the development of the system over time. These design elements include:

- The representation of individual agents: initially households and firms, and later, persons and jobs.
- The representation of the supply and characteristics of land and of real estate development, at a fine spatial scale: initially a mixture of parcels and zones, later gridcells of user-specified resolution.
- The adoption of a dynamic perspective of time, with the simulation proceeding in annual steps, and the urban system evolving in a path dependent manner.
- The use of real estate markets as a central organizing focus, with consumer choices and supplier choices explicitly represented, as well as the resulting effects on real estate prices. The relationship of agents to real estate tied to specific locations provided a clean accounting of space and its use.
- The use of standard discrete choice models to represent the choices made by households and firms and developers (principally location choices). This has relied principally on the traditional Multinomial Logit (MNL) specification, to date.
- Integration of the urban simulation system with existing transportation model systems, to obtain information used to compute accessibilities and their influence on location choices, and to provide the raw inputs to the travel models.
- The adoption of an Open Source licensing for the software, written originally in Java, and reimplemented using the Python language. The system has been updated and released continually on the web since 1998.

KEY FEATURES

- The model simulates the key decision makers and choices impacting urban development; in particular, the mobility and location choices of households and businesses, and the development choices of developers.
- The model explicitly accounts for land, structures (houses and commercial buildings), and occupants (households and businesses).
- The model simulates urban development as a dynamic process over time and space, as opposed to a cross-sectional or equilibrium approach.
- The model simulates the land market as the interaction of demand (locational preferences of businesses and households) and supply (existing vacant space, new construction, and redevelopment), with prices adjusting to clear the market.

- The model incorporates governmental policy assumptions explicitly, and evaluates policy impacts by modeling market responses.
- The model is based on random utility theory and uses logit models for the implementation of key demand components.
- The model is designed for high levels of spatial and activity disaggregation, with a zonal system identical to travel model zones.
- The model presently addresses both new development and redevelopment, using parcel-level detail.

CAPABILITIES

UrbanSim has been developed to support land use, transportation and environmental planning, with particular attention to the regional transportation planning process. It has been designed to perform several tasks.

1. It can predict land use information for input to the travel model, for periods of 10 to 40 years into the future, as needed for regional transportation planning.
2. It can predict the effects on land use patterns from alternative investments in roads and transit infrastructure, alternative transit levels of service, or alternative roadway and transit pricing, over long-term forecasting horizons. Scenarios can be compared using different transportation network assumptions to evaluate the relative effects on development from a single project or a more wide-reaching change in the transportation system, such as extensive congestion pricing.
3. It can predict the effects of changes in land use regulations on land use. This includes the effects of policies to relax or increase regulatory constraints on development of different types, such as an increase in the allowed Floor Area Ratios (FAR) on specific sites, or allowing mixed-use development in an area previously zoned only for one use.
4. It can predict land use development patterns induced by investments in transit.
5. It can predict the effects of environmental policies that impose constraints on development, such as protection of wetlands, floodplains, riparian buffers, steep slopes, or seismically unstable areas.
6. It can predict the effects of changes in the macroeconomic structure or growth rates on land use. Periods of rapid or slow growth, or even decline in some sectors, can lead to changes in the spatial structure of the city and the model system is designed to analyze these shifts.
7. It can predict the possible effects of changes in demographic structure and composition of the city on land use and on the spatial patterns of clustering of residents of different social characteristics, such as age, household size, and income.
8. It can examine the potential impacts of major development projects (both actual and hypothetical) on land use and transportation. This can be used to explore the impacts of a corporate relocation or to compare alternative sites for a major development project.

ASSUMPTIONS AND LIMITATIONS OF THE MODEL SYSTEM

UrbanSim is a model system, and models are abstractions, or simplifications, of reality. Only a small subset of the real world is reflected in the model system, as needed to address the kinds of uses outlined above. Like any model, or analytical method, that attempts to examine the potential effects of an action on one or more outcomes, there are limitations to be aware of. Some of the assumptions made in developing the model system also imply limitations for its use. Some of the more important of the assumptions and limitations are:

- **Boundary effects are ignored**. Interactions with adjacent metropolitan areas are ignored.
- **The land use regulations are assumed to be binding constraints on the actions of developers**. This is equivalent to assuming that developers who wish to construct a project that is inconsistent with current land use regulations cannot get a waiver or modification of the regulations in order to accommodate the project. This assumption is more reflective of reality in some places than others, depending on how rigorously enforced land policies are in that location. Clearly there are cities in which developer requests for a variance from existing policies meets with little or no resistance. For the purposes the model system is intended, however, this assumption, and the limitation that it does not completely realistically simulate the way developers influence changes in local land use policies, may be the most appropriate. It allows examination of the effects of policies, under the expectation that they are enforced, which allows more straightforward comparisons of policies to be made. *[However, the Eugene-Springfield UrbanSim model system implementation is the first of its kind to include a capability for simulating rezoning and conditional uses, and the fees and costs involved, within the constraints of the existing comprehensive plans.]*
- **Large-scale and microscopic events cannot be accurately predicted**. While this limitation applies to any and every model, not just UrbanSim, it bears repeating since the microscopic level of detail of UrbanSim leads to more temptation to over-invest confidence in the micro-level predictions. Though the model as implemented in the Eugene-Springfield area predicts the location choices of individual jobs, households, and developers, the intent of the model is to predict patterns rather than discrete individual events. No individual prediction made by the model, such as the development of a specific development project on a single parcel in a particular year 20 years from now, is likely to be correct. But the tendencies for parcels in that area to have patterns or tendencies for development is what the model is intended to represent. Model users should therefore not expect to accurately predict large-scale, idiosyncratic events such as the development of a specific high-rise office building on a specific parcel. It would be advisable to aggregate results, and/or to generate multiple runs to provide a distribution of results. A related implication is that the lower level of sensitivity and appropriate use of the model system needs to be determined by a combination of sensitivity testing, experience from use, and common sense. It would not be likely, for example, that changing traffic signalization on a particular collector street intersection would be a large enough event to cause significant changes in model results. *[As part of model validation and sensitivity testing, the LCOG model was tested for the effect of variation in the random seed on model results. A large number of runs were performed with only the random seed varying. These runs were analyzed statistically and the model results were found to not be unrealistically affected by the stochasticity of the random seed.]*
- **Errors in input data will limit the model to some extent**. Efforts were made to find obvious errors in the data, and to prevent these from affecting the results, but there was not sufficient time or resources to thoroughly address all data problems encountered, including some extreme values, missing values, and inconsistencies within and among data sources. The noise in the input data limits to some extent the accuracy of the model, though the statistical estimation of the parameters should help considerably in developing unbiased parameters even in the presence of missing data and other data errors. Over a longer period of time, it would be well worth investigating how much difference errors in input data make in model results, and to fine-tune a strategy to invest in data where it makes the most effective use of scarce resources.
- **Behavioral patterns are assumed to be relatively stable over time**. One of the most common assumptions in models, and one rarely acknowledged, is that behavioral patterns will not change dramatically over time. Models are estimated using observed data, and the parameters reflect a

certain range of conditions observed in the data. If conditions were to change dramatically, such as massive innovation in currently unforeseen fuel technology, it is probably the case that fundamental changes in consumption behavior, such as vehicle ownership and use, would result.

MODEL SIMULATION SEQUENCE

(based on simulate.py)

The LCOG UrbanSim model is composed of many submodels. These run in a coordinated way for multiple simulation years, depending on the simulation set up.

These models are currently designed to run in the following order. Specific named models are identified in quotes. These named models are grouped into functional sets that represent the bigger working pieces of the model, representing demand, supply, price and allocation dimensions of the modeling process.

MODEL NAMES

```
start_of_year_models
    'skim_swapper'
    'scheduled_development_events_model'

transition_models
    'household_transition'
    'job_transition'

developer_models
    feasibility_step
        'feasibility'
    developer_steps
        if calibrated:
            'residential_developer_calib'
            'non_residential_developer_calib'
        else
            'residential_developer'
            'non_residential_developer'

price_models
    'repm_residential'
    'repm_rent_industrial'
    'repm_rent_retail'
    'repm_rent_office'

location_models
    if calibrated:
        hlcms
            'hlcm1_calib'
            'hlcm2_calib'
        elcms
            'elcm1_calib'
            'elcm2_calib'
```

```
            'elcm3_calib'
            'elcm4_calib'
            'elcm5_calib'
            'elcm6_calib'
            'elcm7_calib'
            'elcm8_calib'
            'elcm9_calib'
            'elcm10_calib'
            'elcm11_calib'
            'elcm12_calib'
            'elcm13_calib'
            'elcm14_calib'
    else
        hlcms
            'hlcm1'
            'hlcm2'
        elcms
            'elcm1'
            'elcm2'
            'elcm3'
            'elcm4'
            'elcm5'
            'elcm6'
            'elcm7'
            'elcm8'
            'elcm9'
            'elcm10'
            'elcm11'
            'elcm12'
            'elcm13'
            'elcm14'

end_of_year_models
    'generate_indicators'
```

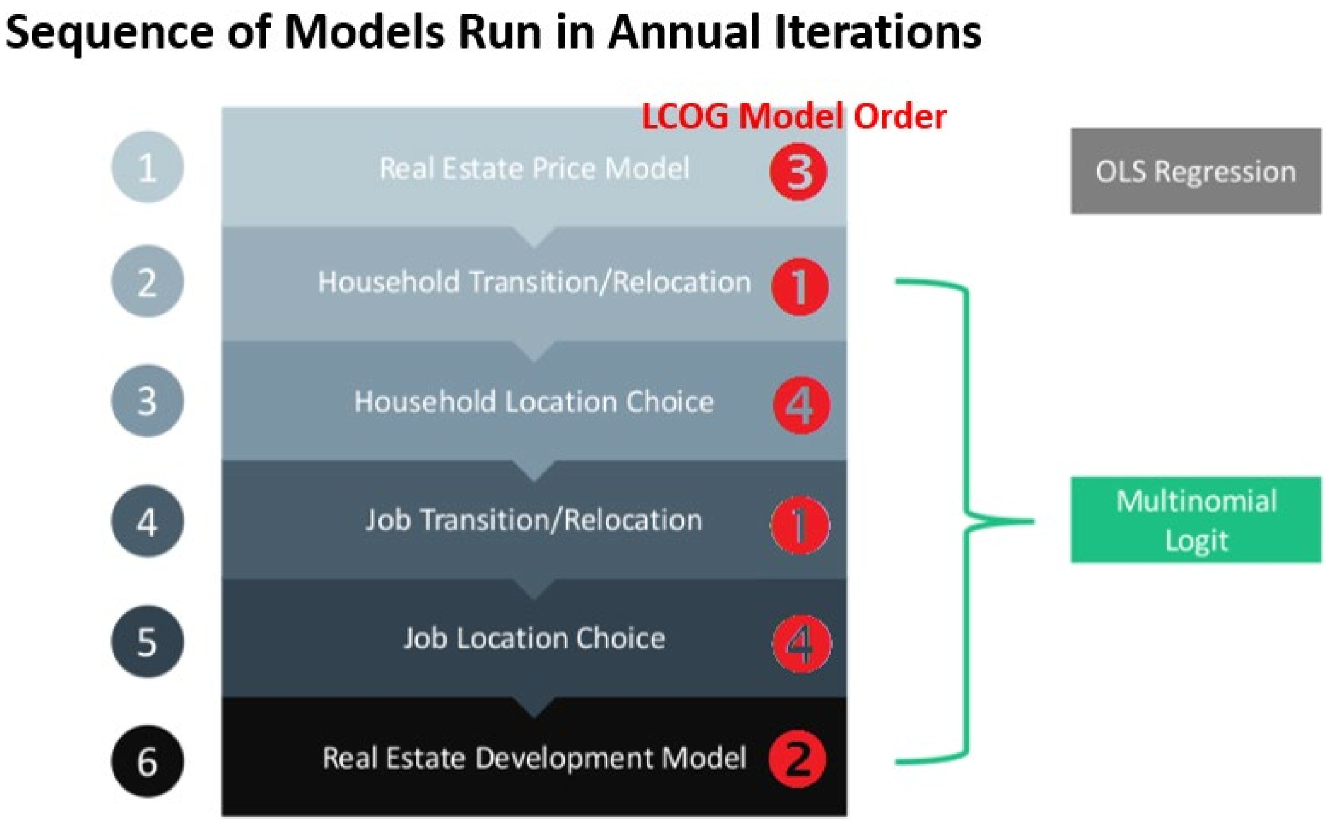
SIMULATE BASE YEAR (E.G. 2011)

```
'scenario_definition'
'build_networks'
'generate_indicators'
price_models
```

SIMULATE FORECAST YEARS (E.G. 2012-2035)

```
start_of_year_models
transition_models     (demand)
developer_models      (supply)
price_models          (price)
location_models       (allocation)
end_of_year_models
```

Note: Early presentations on the UrbanSim model sometimes depict this sequence in an different order. See for example the following image (correct sequence in red).



CUSTOMIZATIONS AND ENHANCEMENTS

This page lists the customizations, enhancements, and new features that the current phase of the LCOG UrbanSim model uses.

LCOG Model enhancements

- Various developer model enhancements
- Index-inspired indicators
- The random point generation within polygon functionality
- Prototype implementation (in branch) of pandana access variable involving querying the GTFS transit schedule
- Pandana mid-segment breaks for better pedestrian-scale accessibility

UrbanSim/UrbanCanvas features that the model was an early adopter of

- Latest implementation of gradient-based price equilibration
- Back-propagation-based calibration methodology
- Parcel version of UrbanCanvas Modeler
- Draft deployment of the UrbanCanvas Jupyterhub service

2. DATA

DATA INVENTORY

The data assessment and needs analysis presented here reflects a parcel-level UrbanSim implementation utilizing a proforma-based real estate supply model.

Typically, when a region embarks on implementing UrbanSim, large amounts of raw data must be processed into a form usable for model estimation and simulation (i.e. an ETL step). Data from many different sources are reconciled into one common framework, and the data is then subjected to cleaning and imputation. Because of LCOG's history of modeling and parcel-level data tracking, there were many existing data resources to draw from and we weren't starting from truly "raw" datasets, but there was still work involved in connecting various datasets together into a unified whole for UrbanSim.

The processed form of all the datasets described in this memo can be viewed in the UrbanCanvas Modeler user interface.

PARCELS AND BUILDINGS

LCOG provided building and parcel data, which UrbanSim staff then processed for use in both UrbanSim and UrbanCanvas Modeler. The provided building and parcel data represent the year 2020 and are the result of aggregation into super-parcels (dissolved tax-lots) and aggregate buildings (all improvements for each parcel combined). The processed buildings/parcels were then used in later data processing steps such as household allocation to building, and the tables were uploaded to the UrbanCanvas platform. The building/parcel tables have been incorporated into the model system.

UrbanSim documentation

Parcel geometry:
https://cloud.urbansim.com/docs/general/documentation/urbansim%20parcel%20model%20data.html#parcel-geometry

Parcel attributes:
https://cloud.urbansim.com/docs/general/documentation/urbansim%20parcel%20model%20data.html#parcel-attributes

Building attributes:
https://cloud.urbansim.com/docs/general/documentation/urbansim%20parcel%20model%20data.html#buildings

Original files on Google Drive

Parcels: https://drive.google.com/open?id=1QebxHoM8OtMRE-eqBddLL0MvjB3lj1OW

Buildings: https://drive.google.com/open?id=1bFHW_Ynr48V5KbptaKjQu04ljijyV4-O

Github Issues

Parcels: https://github.com/urbansim/lcog/issues/13

Buildings: https://github.com/urbansim/lcog/issues/12

HOUSEHOLDS

UrbanSim staff synthesized a population at the block group level and then prepared scripts/notebooks to validate the population and allocate household records to the building level. The household/person tables have been incorporated into the model system.

UrbanSim documentation

Household table:
https://cloud.urbansim.com/docs/general/documentation/urbansim%20parcel%20model%20data.html#households

Persons table:
https://cloud.urbansim.com/docs/general/documentation/urbansim%20parcel%20model%20data.html#persons-optional

Original files on Google Drive

Households: https://drive.google.com/open?id=11wcBPsT7KIbFozvw5sKNKTovgPpIfc5W

Persons: https://drive.google.com/open?id=1La1E0GGeZqUj_vQki_oxs-Hl9BNNIW_s

Github Issues

https://github.com/urbansim/lcog/issues/3

JOBS

LCOG provided a shapefile of job points with firm_id and sector_id. UrbanSim used these points to assign jobs to a building, and where no building exists, to impute a building (imputation was necessary because 2010 data did not include all non-residential buildings; 2020 data is more complete and this step should be unnecessary going forward). The jobs table has been incorporated into the model system.

UrbanSim documentation

Jobs table: https://cloud.urbansim.com/docs/general/documentation/urbansim%20parcel%20model%20data.html#jobs

Original files on Google Drive

Jobs shapefile with firm_id: https://drive.google.com/open?id=1yZjtCbQ9P9Y_5LiZgUHFkF5_YiE8CZGr

Github Issues

Define employment sectors: https://github.com/urbansim/lcog/issues/5

Prepare jobs table: https://github.com/urbansim/lcog/issues/6

TRAVEL_DATA AND ZONES

LCOG provided a shapefile of travel model zones, along with AM auto skims and mid-day auto skims. These were processed into an UrbanSim `travel_data` table, and are a key input to skim-based accessibility variables used in various UrbanSim submodels.

UrbanSim documentation

Zones geometry: https://cloud.urbansim.com/docs/general/documentation/urbansim%20parcel%20model%20data.html#travel-model-zones

Skims: https://cloud.urbansim.com/docs/general/documentation/urbansim%20parcel%20model%20data.html#travel-model-skims

Original files on Google Drive

Directory containing zones and skims: https://drive.google.com/open?id=1VBjamnzcJlpdmdHauAmRxGuSKho4kjGt

Github Issues

https://github.com/urbansim/lcog/issues/17

NETWORK NODES/EDGES

UrbanSim staff prepared an initial pedestrian network based on publicly available OpenStreetMap data, and processed into UrbanSim-ready nodes/edges table. Similarly, a transit network based on Lane Transit District schedules from September, 2018 (as reflected in their GTFS feed) was prepared. These tables allow the simulation to calculate on-the-fly network-based ped/transit accessibility variables, such as "retail jobs within 400 meters" or "population within 10 minutes transit time". Based on LCOG feedback, pedestrian edges are divided at their mid-point to more accurately reflect the starting-points and ending-points of trips, as UrbanSim's network accessibility calculator (`pandana`) associates parcels with nodes.

UrbanSim documentation

Network overview: https://cloud.urbansim.com/docs/general/documentation/uploads.html#transportation-networks

Nodes: https://cloud.urbansim.com/docs/general/documentation/uploads.html#nodes

Edges: https://cloud.urbansim.com/docs/general/documentation/uploads.html#edges

Original files on Google Drive

Pedestrian edges/nodes, and transit edges/nodes can be found at: https://drive.google.com/open?id=1540xOl2sNjcfmIbTWQqc7ukji-HG-FnQ

Github Issues

https://github.com/urbansim/lcog/issues/49

PROFORMA INPUTS

UrbanSim staff prepared a configuration file named `proforma.yaml` that contains all proforma input parameters. The various cost inputs were adjusted from Bay Area values to Eugene-Springfield values based on a regional scaling factor from R.S. Means, a vendor of construction cost data that has regional construction cost indexes. The configuration file lives in Github as: https://github.com/urbansim/lcog/blob/master/lcog/configs/proforma.yaml

UrbanSim documentation

Proforma docstrings: https://github.com/UDST/developer/blob/master/developer/sqftproforma.py#L14-L175

Existing proforma overview wiki: https://github.com/urbansim/lcog/wiki/Developer-model-memo

Original files on Google Drive

N/A- the data went directly into the Github repo as /configs/proforma.yaml

Github Issues

https://github.com/urbansim/lcog/issues/32

https://github.com/urbansim/lcog/issues/31

BUILDING_TYPES

LCOG has decided on an UrbanSim building typology based on their available data/categories and also considering UrbanSim considerations such as the use of building types for segmenting vacancy rates, the price model, building type dummies in location choice models, proforma inputs, and zoning. The current building types table used by the model is located on Github at: https://github.com/urbansim/lcog/blob/master/lcog/data/building_types.csv

UrbanSim documentation

https://cloud.urbansim.com/docs/general/documentation/urbansim%20block%20model%20data.html#block-building-types-table

Original files on Google Drive

Original is in buildings.zip: https://drive.google.com/open?id=1bFHW_Ynr48V5KbptaKjQu04ljijyV4-O

Formatted: https://drive.google.com/open?id=1D2Q8wwD3zVrATDLfUjCAqYr0lLudf4cJ

Github Issues

https://github.com/urbansim/lcog/issues/10

DATA PRE-PROCESSING PIPELINE

PROCESSING

A script was developed to create a single, repeatable pipeline of steps that processes most data provided by the client and outputs a simulation-ready model_data.h5 file. This makes the LCOG data pre-processing more replicable and cleaner.

POPULATION SYNTHESIS

One step in preparing the model input data is synthesizing a population, and then allocating the resulting synthetic population from the aggregate synthesis geography (e.g. block group) to the building level. UrbanSim is a microsimulation that operates on disaggregate data (individual household and persons). Since we don’t observe disaggregate data, we synthesize it based on the aggregate information we observe ("marginals") combined with a sample of disaggregate records ("microdata" e.g. PUMS). The synthesizer tries to expand the microdata in such a way as to approximate the marginals.

We use the SynthPop synthesizer, available in the Urban Data Science Toolkit on Github: https://github.com/UDST/synthpop

The synthesis methodology that SynthPop implements is detailed in the PopGen population synthesis paper: http://www.scag.ca.gov/Documents/PopulationSynthesizerPaper_TRB.pdf

Synthesis-related considerations include:

Are there enough dwelling units in each control geography for the households to occupy?

What marginal variables to utilize in the aggregate data?

What kind of logic to use in block-group -> building allocation?

How well does the resulting synthetic population match controlled variables of interest?

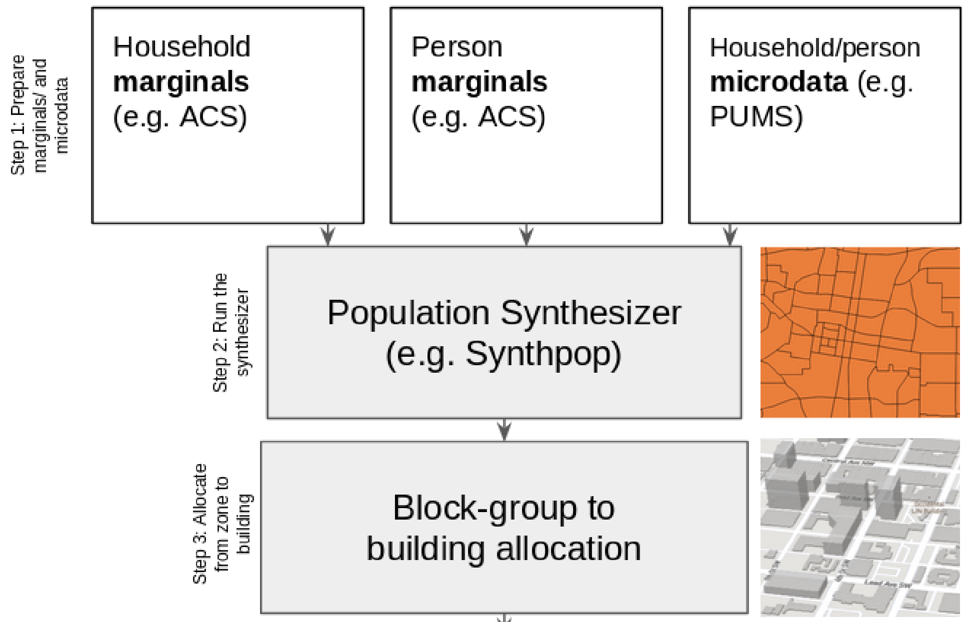
In the LCOG repo, in the scripts/data_pipeline subdirectory, population synthesis is represented by the following scripts/notebooks:

lane_county_pop_synthesis.py: synthesis script that synthesizes population using SynthPop, formats records according to the UrbanSim schema, and then writes out the results to .csv.

`Population_Synthesis_Validation.ipynb: calculates validation metrics

household_allocation.py: probabilistic assignment of households to buildings using ACS table B25124 "Tenure by Household Size by Units in Structure" to inform the type of structure that households by tenure/size are likely to occupy.

The following diagram gives an overview of the population synthesis workflow:



Households Table

Column Name	Data Type	Description
household_id	integer	Unique identifier
building_id	integer	Building household resides in
tenure	integer	own (1) vs rent (2)
persons	integer	Number of people in household
workers	integer	Number of workers in household
age_of_head	integer	Age of head of the household
income	integer	Income of household
children	integer	Number of children in household
race_id	integer	Race of head of household
cars	integer	Number of cars in household

ZONING IMPUTATION

Zoning imputation in the LCOG model is represented by the following steps:

1. Get building and parcel data
2. Group the building and parcel data by zoning polygon
3. Calculate the 90th percentile floor-area ratio and 90th percentile dwelling units per acre within each zoning polygon
4. Use the 90th percentiles as the maximum-allowable density value within each zoning polygons
5. Calculate the unique list of building_type_id's that have been built and are existing in the base data within each zoning polygon. Use this as the allowable building types that may be constructed within each zoning polygon.

6. In the zoning table, for null values in the max_far / max_dua columns, use the 90th percentile in each zoning polgyon as calculated above. Similarly, if the allowable building types need to be imputed, use the unique building types within each zoning polygon as the imputed placeholder set.
7. The code that performs the above zoning imputation logic lives in datasources.py in a function named "imputed_zoning". The imputation occurs at the beginning of each simulation run, so if new zoning data is swapped in the imputation procedure will just do less work when the simulation starts.

3. DEMAND-SIDE MODELS: LOCATION CHOICE AND PRICE

SPECIFICATION STRATEGY

This section discusses the approach taken with respect to model estimation. The following UrbanSim models in the LCOG model system required statistical estimation of parameters.

- the household location choice model (MNL)
- the employment location choice model (MNL)
- the hedonic model of real estate prices (OLS regression)

All estimated coefficients were generated within UrbanSim via Jupyter notebooks. Coefficients are estimated on local LCOG data and not borrowed.

Specification of the location choice models in UrbanSim involves deciding which `alternative` (i.e. location) characteristics to be considered in the model (i.e. explanatory variables). It also involves determining whether to stratify the estimation by some characteristic of the agents making location choices (i.e. segmentation). Stratification reflects the hypothesis that different groups of agents have different locational preferences. For specifying price models, the modeler decides which observations dataset to use (e.g. buildings), which explanatory variables to use, and how to segment the model into submodels (e.g. by building type).

Both adding/dropping explanatory variables and changing the model stratification are easy to do in the UrbanSim framework and the notebooks that have been prepared for LCOG. New variables are defined using simple `pandas` expressions (syntax of the Python pandas library). Each model can be iteratively re-specified and re-estimated quickly during the process of developing a desired model specification. In UrbanSim, the model estimation process is tied closely to simulation. Estimation and simulation both take place within the same code-base and framework. In a properly configured model, simulation can occur right after estimation.

We have variable categories in mind when starting the specification/estimation process (based on hypotheses in the literature), but the specific variables to use depend on local data, review of estimation results (examining coefficient sign, significances, measures-of-fit, and other diagnostics), and an iterative process of trying different specifications.

Variable categories we seek to include in location choice model specifications include real estate characteristics, regional accessibility variables, local accessibility variables, and price. For example, a regional accessibility variable we might try is: employment within 20 minutes auto travel time in the A.M. peak period. This variable would be calculated based on skims from the travel model (stored in the UrbanSim travel_data table). A local accessibility variable we might try is whether there is a school within one mile along the local street network, or retail square footage within a half mile. These kinds of variables would be calculated using the Pandana network accessibility library. In the location choice models, price is a key variable that we try in the specifications. It is hypothesized that, ceteris paribus, households/employment will prefer lower prices (i.e. price will have a negative coefficient), although it is not uncommon in discrete choice models of housing location to find insignificant or even counter-intuitive signs on price variables due to omitted variables that are correlated with price. We also typically include clustering variables. For example, household income interacted with mean income within 400 meters may be tried as an explanatory variable to identify tendencies for income clustering. Similarly, in the employment location choice model, we may try a variable for the number of jobs of the same sector within the zone to capture agglomeration economies.

We start the variable selection process by adding variables to the specification based on behavioral considerations. For example, typical household location choice model explanatory variable categories include:

- price
- residential building characteristics (e.g. year_built)
- neighborhood characteristics
- local and regional accessibility
- interaction variables such as price interacted with income, or a demographic attribute interacted with a location attribute

Typical employment location choice model explanatory variables include:

- price
- building characteristics (e.g. building type, year_built)
- agglomeration/clustering (e.g. number of jobs within same sector within one mile)
- density (e.g. employment density, population density)
- regional accessibility (skim-based or logsums, e.g. population_within_20_minutes)
- local accessibility (e.g. local street-network based variable)
- composition of households and employment in neighborhood
- If retail-sector, population-seeking variables

Typical real estate price model explanatory variables include:

- distance to local amenities/disamenities
- building characteristics (e.g. year_built)
- regional accessibility (skim-based or logsums, e.g. employment_within_15_minutes)

- neighborhood characteristics (e.g. density, local accessibility, composition)
- Small-area vacancy rates
- Possible (only as needed): geographic dummies for local fixed effects

New variables are defined as python/orca functions in variables.py, and then the variable is added to a model specification using the notebooks, and then the model is estimated and evaluated. We check for fit and significance. If a key behavioral variable (e.g. accessibility) has an intuitive sign but is not significant, we may still retain it for sensitivity reasons.

After trying a set of intuitive behavioral variables, if the model fit is still low, we iteratively try other variables in the specification which have less intuitive interpretations. These less intuitive behavioral variables may be proxying for unobserved factors / unaccounted behaviors, and they help the model to have appropriate spatial associations if behavioral variables alone result in low measures of fit.

For any variable added to a model specification, we consider the resulting metrics:

- Variable significance (t-score)
- Model fit (r2, pseudo-r2)
- Inter-variable correlation matrix to check for multicollinearity (see the plots in the notebook). Correlation coefficients above .6 or so may lead us to reject a variable.
- Variable skew. Excessively skewed variables can result in unreliably estimated parameters. A skew value of greater than 5 or 10 often means we'll try log-transforming the variable to reduce skewnesss.
- Visual assessment of probability plots, or predicted price plots in the case of price models
- If a specification results in a warning being printed about lack of convergence, we make sure to re-run estimation, as the coefficients may not be valid.

MODEL ESTIMATION RESULTS

INTRODUCTION

A set of model estimation notebooks have been prepared to facilitate re-estimation of the parameters of the LCOG UrbanSim Model:

- Relocation-Tenure Binary Logit Models.ipynb
- Location Choice Model Estimation.ipynb
- Price Model Estimation.ipynb

When executed, these notebooks generate configuration files with persisted coefficients that can be committed back to the project repository. Each notebook allows for adding/dropping explanatory variables, reconfiguring and re-segmenting models, running estimation, and visualizing various diagnostics.

RELOCATION-TENURE BINARY LOGIT MODELS

The **relocation choice model** simulates whether a household decides to move to another housing unit or not. The discrete choice model used for this decision is the Binary Logit Model where the choice is represented in the *recent mover oneyear* column with 1: moved within the last year or 0: not moved within the last year. For better accuracy of the data, the team has decided to estimate the model based on the households table created from the disaggregate PUMS data.

After deciding to relocate or not, the households that do decide to move (their building_id is equal to -1), the **tenure choice model** will indicate whether they will rent or own their next living space. This model is also a Binary Logit Choice model and estimated on the pums data for data accuracy reasons. The decision variable is a dummy one called "tenure_own", where 1 means they own the house and 0 they rent it.

To account for the different behavior among the income groups, three more tenure choice models are calculated: 'tenure_choice_model1', 'tenure_choice_model2' and 'tenure_choice_model3'. The process is the same as the one explained above with the exception that, in the definition and register cells, a filter for income_quartile is added.

LOCATION CHOICE MODEL

After deciding to move and deciding on owning or renting a place, the newly-moved or created households have to choose a housing unit in a building to live in. The **households location choices** are simulated with a large multinomial logit model. To estimate the parameters, the definition cell sets that the *households* (choosers), specifically the ones who recently moved (chooser_filter), choose from the *buildings* (alternatives) a _building_id (choice_column) which have a constraint capacity based on the *residential units* (alt_capacity). The variables in the model specification are defined in the select_variables list. So, if the user would like to re-estimate the model with different variables, the select_variables list will have to be modified.

In the same way as the tenure choice model, different models are estimated for households in different income segments: low-income (first income quartile), Mid-income (second income quartile) and High-income households (third and fourth income quartile).

Employment location choice models are also estimated in this notebook. Large Multinomial logit models are estimated based on the 'jobs' table as choosers and the buildings and building_id as the alternative and choices respectively with the capacity constraint of job spaces in each building. Likewise the households location choices, the location decisions for jobs are also segmented. A model for each job sector is estimated.

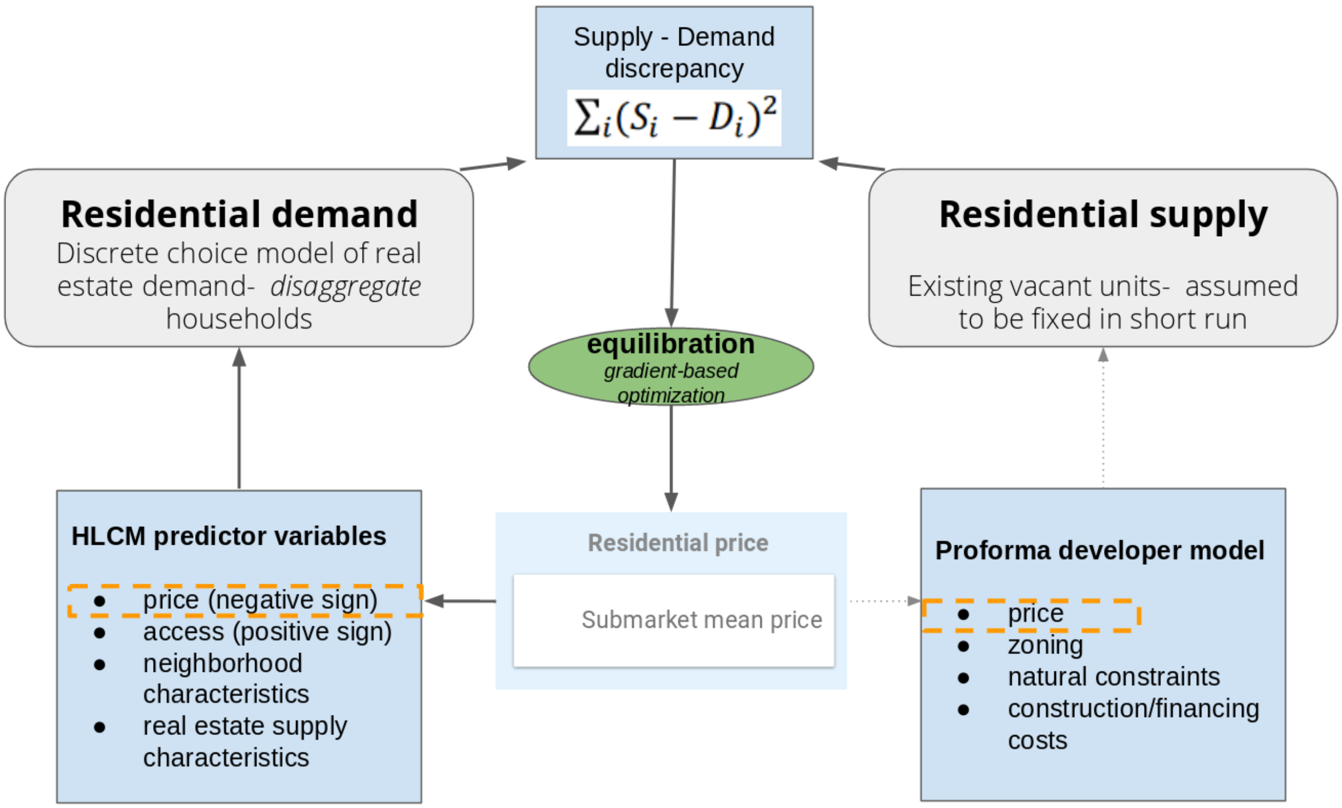
PRICE MODEL

Price data from current buildings enables the usage of regression models to estimate future buildings' prices based on various factors. Ordinary Least Squared- Regression Models are estimated. A specific model is calculated for each type of building for which we observ rents.

DEMAND – PRICE EQUILIBRIUM

Figure 1 summarizes the structure of the equilibration setup.

Figure 1



4. SUPPLY-SIDE MODEL: URBANSIM'S PROFORMA

DEVELOPER MODEL OVERVIEW

SUMMARY

This section provides a high-level overview of UrbanSim's developer model and its input parameters. The aim is to provide a general description of the process through which the model represents decisions taken by developers in the real estate market. Understanding the general logic behind the model, as well as the role of each input parameter, will allow refining the proforma inputs to better represent the context in LCOG's region.

Broadly speaking, the developer model is divided in two steps: feasibility and developer. The feasibility step tests multiple combinations of land use and Floor-Area-Ratio (FAR) for every parcel in the model, returning the most profitable FAR and building configurations for each land use combination in each parcel. This information is then used by the developer step to select the parcels in which new buildings will be built to match existing residential and non-residential demand. A more detailed description of the two steps is given below, followed by a documentation of the parameters that go into the proforma.

FEASIBILITY STEP

The feasibility step simulates the typical process that a developer would undergo when deciding what type of development would be most profitable for a given parcel, and applies this same logic to all the parcels in the model at a time. The main process can be outlined as follows:

- The proforma is initialized based on the user inputs from the proforma.yaml file, including information about the specific forms that will be tested. Here, each form will represent a combination of land uses that could potentially be built in a parcel (i.e. 80% retail, 20% residential).
- The sites to analyze and their characteristics are defined based on the parcels table, removing previously pipelined development sites.
- For each form (corresponding to a given land use mix):
    - Each potential development site is assigned an acquisition cost that comes from the current yearly rent (either empirical data of rents in the city or forecasts).
    - The model estimates the costs and revenues that would result from building at different alternative densities in the site (This is done by estimating costs and revenues that could be obtained from different FARs in each site, with the list of FARs to test being specified by the user inside proforma.yaml).
    - Profit calculations for each potential FAR include the effect of parking requirements, parking costs, building costs at different heights, profit ratio requirements, building efficiency, parcel coverage, cap rate, among others.
    - Zoning constraints such as maximum FAR and allowable uses are taken into account at this point, filtering out those developments that are unfeasible or not allowed. For maximum FAR, the model selects the minimum between the max_far field, and the max FAR that would result from other zoning limits (max heights, max dua, etc).
    - The model generates a feasibility table with the building characteristics that yielded maximum profit for each development site. Building characteristics that make part of the feasibility table include FAR, parking configuration, building sqft, parking ratio, stories, construction time, residential sqft, non-residential sqft, building cost, finacing cost, total cost, building revenue, and profit.

The core cost and revenue calculations performed to select the most profitable FAR for each development site for each potential form (land use or land use combination) take place within the Square Foot Proforma API, inside the lookup() function of the feasibility step. The general logic for these calculations is the following:

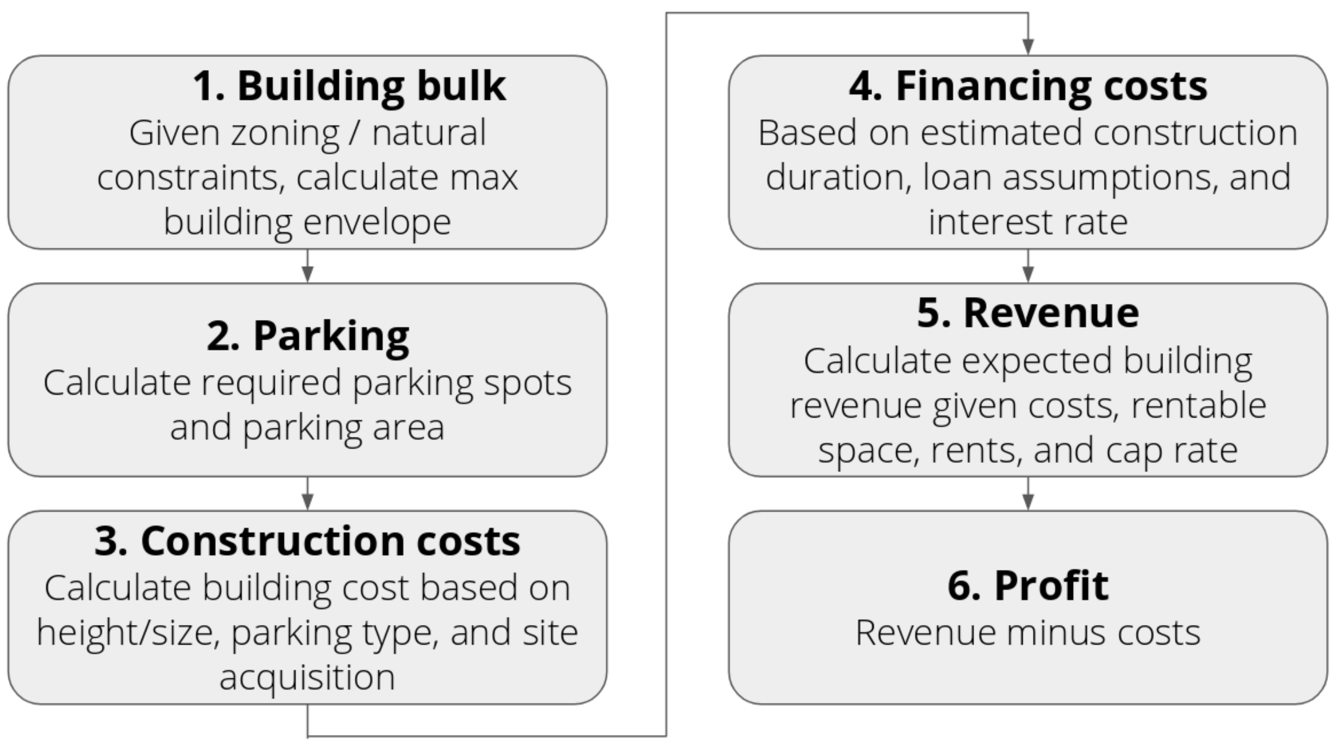
- Total building area (building bulk) is calculated multiplying FAR by the site area (square feet).
- Building costs are calculated multiplying built area by cost per square foot for the given building configuration.
- Total construction costs are calculated as the sum of building costs and land costs.
- The loan amount is calculated as total construction costs times loan-to-cost ratio.

- Financing costs are calculated based on the loan amount using the following variables: construction time, drawdown factor, interest rate, loan fees.
- Total development costs are calculated as the sum of construction costs and financing costs.
- To calculate the area that will generate rent, common areas and parking are subtracted from the total building area using the parking_sqft_ratio and building_efficiency variables.
- The area that generates rent is multiplied by weighted rent values and divided by the cap rate to calculate the revenue that will be generated by the building.
- Finally, the profit is calculated as the revenue minus total development costs.
- Costs, revenues, and profits are all allowed to be modified by the user through custom callback functions.

One important thing to note is that the feasibility step does all the profit calculations in terms of square feet, and has no representation of units (it does not differentiate between rent attained by 1BR, 2BR, or 3BR). Since getting data on unit mixes in the current building stock is extremely difficult, most feasibility computations here happen on a square foot basis, and the developer step handles the translation to units.

Figure 1 shows the sequence in which the various categories of computations undertaken by the feasibility step take place.

Figure 1: Feasibility steps in the UrbanSim proforma



DEVELOPER STEP

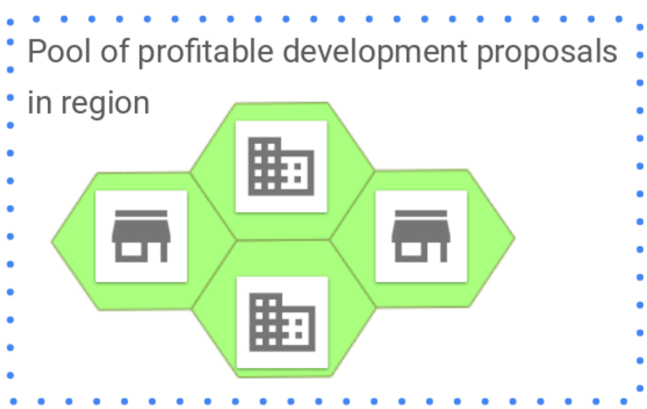
Having identified the development configuration that would maximize profit for each site-form combination, the main objective of the developer step is to select the sites where buildings will be added on a given simulation year to satisfy demand, and to modify the buildings table to reflect this extra capacity. The main input for the developer step is the feasibility table resulting from the previous step, as well as the demand for residential units and non-residential space on a given simulation year.

For a given simulation year, the developer step can be described as follows:

- The demand for residential units (target_units) is calculated based on the number of forecasted households, the number of existing residential units, and the target vacancy rate. Similarly, the demand for non-residential square footage is calculated based on the number of jobs generated in a given year, the number of available job spaces, and a target vacancy rate.
- The probability of selecting a given building/development is calculated based on the profit values from the feasibility table. The default function calculates this probability for each site in the feasibility table as the ratio between the profit per unit of area of the site and the sum of profit per unit of area over all feasible sites.
- Using the probability distribution over the potential development sites, the model runs a random function to select specific sites where new developments will be built to meet existing residential demand.
- Both the function to calculate probability based on profit values, and the function to select development sites based on the probability distribution can be customized by the user.
- Selected developments are dropped from the feasibility table.
- The buildings table is updated, adding extra capacity in terms of new buildings and new residential units.

Figure 2 summarizes the functionality of the developer step.

Figure 2: Developer step overview



1. Sample proposals to actually build, weighting by profitability
2. Build until target vacancy rates are met
3. Format selected proposals as new building records and insert into the regional buildings table

PROFORMA CUSTOMIZATION POINTS

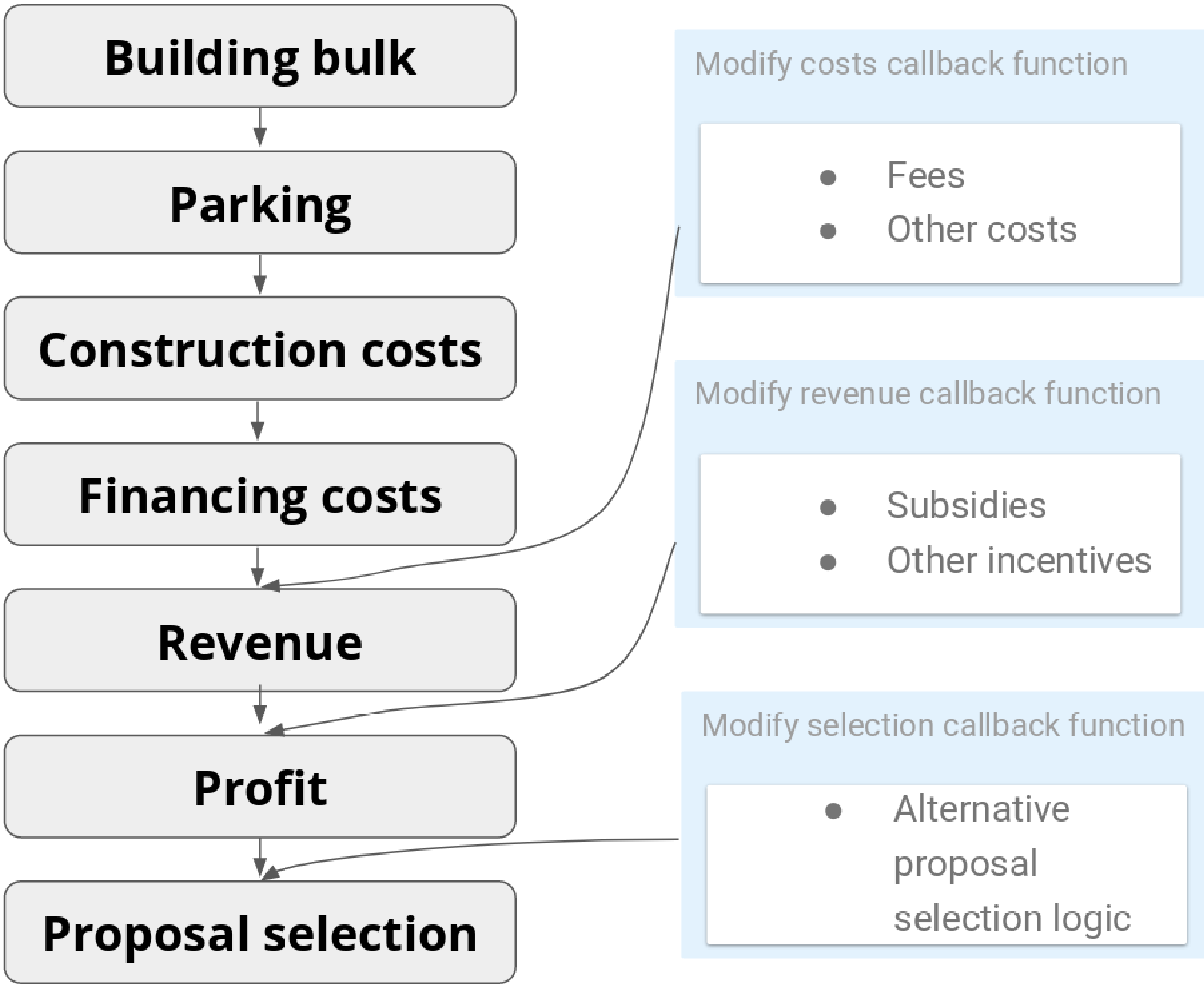
The UrbanSim proforma has particular points in its model flow where custom user logic can be readily inserted (see Figure 3 below). The user provides a function for one or more of these points, and the proforma model applies that function to customize the standard proforma mechanics. The customization points are:

1. Modification of costs
2. Modification of revenue
3. Modification of proposal selection

The first two options are the typical route for applying region-specific costs and incentives. For example, geographic-specific fees can be applied via #1, and geographic-specific subsidies can be applied via #2. The third option facilitates modification of the developer model's proposal selection logic- so adjustments to probabilities, or adjustments to the standard profitability-weighted random sampling, can be applied. These various hooks are already utilized by the LCOG model to apply various enhancements undertaken as part of the model development project. For example, rezoning fees are applied via #1, and #3 is applied to scale the selection probability of conditional uses.

Figure 3 shows the main points in the developer model flow where custom user logic can be inserted.

Figure 3: Customization steps in the UrbanSim proforma



PROFORMA PARAMETERS

The proforma parameters are used by the feasibility step to calculate profitability.

PARAMETERS LIST

fars: (float)

FAR is the ratio between built area (building bulk) and parcel area. The fars parameter in the proforma corresponds to a list of FARs that will be tested in each parcel in terms of profit.

uses: (list)

A list of land uses that will be represented by the model. This list only includes uses for which there is observed or estimated rent data. By default, the uses are retail, industrial, office, and residential.

residential_uses: (list)

A list with "true" for those uses that are residential, and "false" for those that aren't.

forms: (dict)

In the developer model logic, a form represents a land use or land use mix to test. The forms parameter corresponds to a dictionary where keys are names for the form and values are also dictionaries where keys are uses and values are the proportion of that use used in this form. The values of the dictionary should sum to 1.0. For instance, a form called "residential" might have a dictionary of space allocations equal to {"residential": 1.0} while a form called "mixedresidential" might have a dictionary of space allocations equal to {"retail": .1, "residential" .9] which is 90% residential and 10% retail.

parking_configs: (list)

An expert parameter that is usually unchanged. By default, it is set to ['surface', 'deck', 'underground']. Very semantic differences in the computation are performed for each of these parking configurations. Generally speaking it will break things to change this array, but an item can be removed if that parking configuration should not be tested.

parking_rates: (dict)

A dictionary of rates per thousand square feet where keys are the land uses from the list specified in the uses parameter. The ratios are typically in the range 0.5 - 3.0 or similar. A key-value pair of "retail": 2.0 would be two parking spaces per 1,000 square feet of retail. Since this is a per square foot pro forma, the typical parking ratio of spaces per residential unit must be converted to parking spaces per 1,000 square feet.

sqft_per_rate: (float)

The number of square feet per parking unit for use in the parking_rates parameter above. By default, this is set to 1,000 but can be overridden.

parking_sqft_d: (dict)

A dictionary where keys are the three parking configurations listed in the parking_configs parameter, and values are square foot uses of parking spaces in that configuration. This is to capture the fact that surface parking is usually more space intensive than deck or underground parking.

parking_cost_d: (dict)

The parking cost for each parking configuration. Keys are the name of the three parking configurations listed in the parking_configs parameter, and values are dollars per square foot for parking in that configuration. Used to capture the fact that underground and deck are far more expensive than surface parking.

building_efficiency: (float)

In the model, the building_efficiency parameter turns total FAR into the amount of space which gets a square foot rent, since there are some common and open spaces in a building. On the other hand, the cost is calculated with the entire building area.

parcel_coverage: (float)

The ratio of the building footprint to the parcel size. Also used to turn an FAR into a height to cost properly.

height_per_story: (float)

The per-story height for the building used to turn an FAR into an actual height.

max_retail_height: (float)

The maximum height of retail buildings to consider.

max_industrial_height: (float)

The maximum height of industrial buildings to consider.

heights_for_costs: (list)

A list of “break points” as heights at which construction becomes more expensive. Generally, these are the heights at which construction materials change from wood, to concrete, to steel. Costs are also given as lists by use for each of these break points and are considered to be valid up to the break point. A list would look something like [15, 55, 120, np.inf].

costs: (dict)

The keys are uses from the uses parameter, and the values are a list of floating point numbers of same length as the “height_for_costs” parameter. A key-value pair of “residential”: [160.0, 175.0, 200.0, 230.0] would say that the residential use if $160/sqft up to 15ft in total height for the building, $175/sqft up to 55ft, $200/sqft up to 120ft, and $230/sqft beyond.

construction_sqft_for_months: (list)

Analogous to heights_for_costs, but for building construction time. A list of “break points” as building square footage at which construction takes a different length of time. Default values are [10000, 20000, 50000, np.inf].

construction_months: (dict)

Analogous to the costs parameter, but for building construction time. The keys are land uses from the uses parameter above and the values are a list of floating-point numbers of same length as the construction_sqft_for_months parameter. A key-value pair of "residential": [12.0, 14.0, 18.0, 24.0] along with the default values for construction_sqft_for_months below would say that buildings with 10,000 sq. ft. or less take 12 months, those between 10,000 and 20,000 sq. ft. take 14 months, etc.

profit_factor: (float)

The ratio of profit a developer expects to make above the break-even rent. Should be greater than 1.0, (i.e. a 10% profit would be a profit factor of 1.1.)

cap_rate: (float)

A cap rate is often described as the ratio of annual revenue to initial investment. A developer will require a certain cap rate to consider a property to be profitable. Another way to think of the cap rate is as the maximum rate a developer is willing to invest initially in return for a certain cash flow per year in the future. This means a cash flow of $1/year is profitable if it costs no more than 1/cap_rate in present dollars. The ratio of 1/cap_rate can also be thought of as the acceptable number of years to reach full (100%) return on the initial investment. For example, a cap rate of 10% (cap_rate: 0.10) would have full ROI after 10 years (1/0.10 = 10). From this third way of thinking, a final definition of cap rate as 1/years-to-reach-full-ROI can be also be expressed. A cap rate is a macroeconomic input that is widely available on the internet.

loan_to_cost_ratio: (float)

The proportion of construction loans to the total construction cost.

interest_rate: (float)

The interest rate for construction loans

drawdawn_factor: (float)

The factor by which financing cost is reduced by applying interest only to funds withdrawn in phases.

loan_fees: (float)

The percentage of loan size that is added to costs as other fees

residential_to_yearly: (boolean)

Whether to use the cap rate to convert the residential price from total sales price per sqft to rent per sqft

forms_to_test: (list of strings – optional)

Pass the list of the names of forms to test for feasibility - if set to None will use all the forms available in config

pass_through: (list of strings - optional)

Will be passed to the feasibility lookup function - is used to pass variables from the parcel dataframe to the output dataframe, usually for debugging

simple_zoning: (boolean – optional)

This can be set to use only max_dua for residential and max_far for non-residential. This can be handy if you want to deal with zoning outside of the developer model.

only_built: (boolean - optional)

The feasibility step will return the buildings that are profitable when the only_built parameter is set to "True", and will return both profitable and not profitable buildings when the parameter is set to "False".

parcel_filter: (string - optional)

A filter to apply to the parcels data frame to remove parcels from consideration - is typically used to remove parcels with buildings older than a certain date for historical preservation, but is generally useful.

proposals_to_keep: (int - optional)

The number of feasible proposals to keep per parcel. This allows sub-optimal proposals with a given form to be retained. Sub-optimal proposals often represent lower-density outcomes. Defaults to 1, meaning that only the most profitable proposal for a given form is retained.

LCOG DEVELOPER MODEL ENHANCEMENTS

Enhanced developer model functionality was implemented for the LCOG model so as to represent re-zoning, special planning costs, and attribute updating related to city/UGB/overlay status. This section describes the enhancements, with a focus how things are implemented in the model.

REZONING

The first step in representing rezoning in the context of the current UrbanSim proforma is to create a table that represents every parcel/zoning_type combination, so that the feasibility step of the developer model can calculate the feasibility of every possible combination of parcel and zoning_type. The result is a computed table that we are calling `site_proposals` in the model, and it represents every combination of parcel/zoning that could be developed (given the input data), along with associated costs/probabilities. The resulting table is fed into the proforma so that the model calculates the development feasibility of each possible parcel/zoning combination, accounting for associated costs.

If 5 zoning designations could potentially apply to a given parcel, then there will 5 rows in the `site_proposals` table for this parcel. The plan_compatible_zones table indicates which zoning_id's are associated with each plan, and the plan_id of each parcel is then used to look up the possible zoning_id's a parcel could have given re-zoning. Only zoning designations where `can_rezone == True` are allowed to be re-zoned.

Rezoning costs are from the plan_compatible_zones table, and they account for whether a parcel is within-the-ugb / outside-the-ugb / within-city. The parcel table notes the status of each parcel with regard to it's location within-the-ugb / outside-the-ugb / within-city.

COST ADJUSTMENTS

LCOG has provided UrbanSim with development costs related to factors related to zoning, rezoning, conditional-uses, and annexation. These costs vary by location. UrbanSim coded a function to apply the relevant costs associated with each site proposal (combination of parcel and possible zoning ID), and then applied these costs in the proforma via the cost call-back functionality. For example, LCOG provided cost columns in the `zone_overlay_types`, `allowable_building_types`, and `plan_compatible_zones` tables, and these are now incorporated into the feasibility calculations.

With these costs in place, profitability in the proforma is influenced. The cost functions were tested by simulating with various input values for an example parcel. When costs exceeded a certain threshold, development was no longer financially feasible. When costs were decreased, profitability increased.

CAPACITY REDUCTION FACTORS

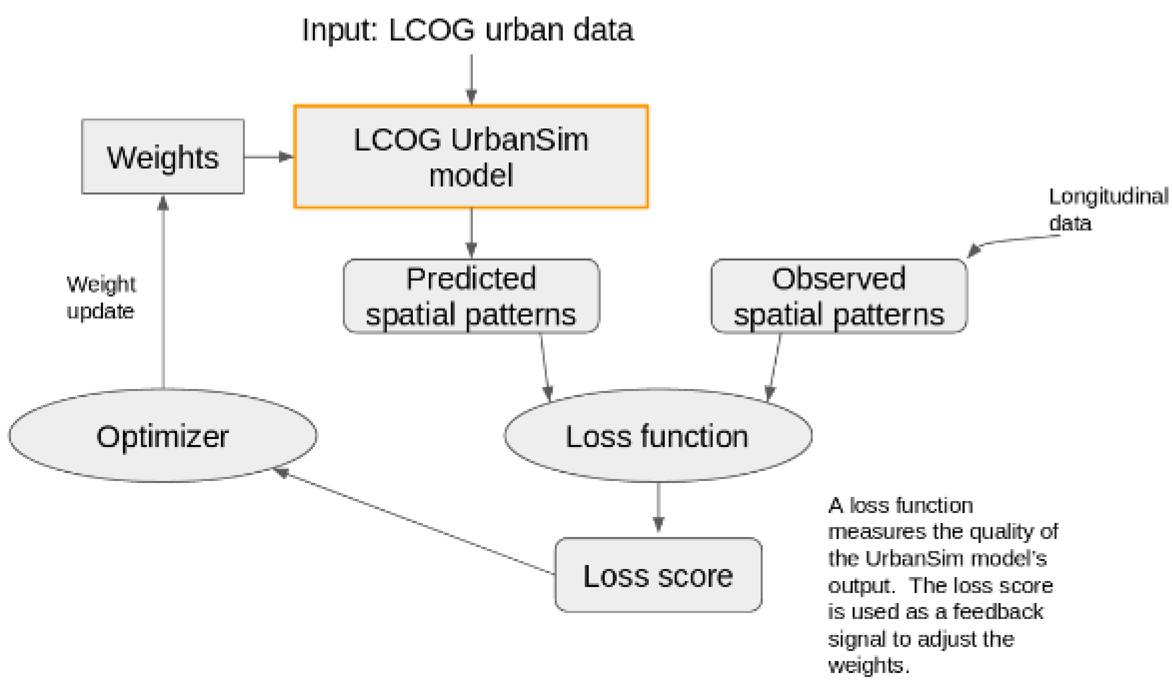
A developer model enhancement was implemented to adjust developable capacity downwards for large parcels. This adjustment represents the notion that net developable land should account for land set-aside for infrastructure and amenities[1], and the adjustment will be different for different sized parcels. The model does not adjust the land area attribute on the parcels table directly, but only adjusts land area as perceived by the developer model. This functionality will help to prevent over-building on larger parcels in the model.

5. CALIBRATION, VALIDATION, AND MODEL OUTPUTS

MODEL CALIBRATION METHODOLOGY

This section documents the approach to UrbanSim model calibration that we took for the LCOG UrbanSim land use model project. The core concepts behind the UrbanSim calibration approach taken for this project are *automatic differentiation* and *gradient-based optimization*. Whereas in past UrbanSim projects we have used brute force or black-box optimization methods to calibrate the model to observed longitudinal data, for this project we use automatic differentiation plus gradient descent to calibrate the model. Figure 1 shows a high-level overview of the calibration process.

Figure 1: Calibration overview



The general idea is to have each model component (the location choice and proforma models) generate summed probabilities across alternatives. Add an objective function at the end (e.g. how well observed longitudinal patterns are matched), and use differentiation to calculate the gradient of the loss with respect to the model's parameters, which we can then optimize with gradient descent. Auto-differentiation plus gradient-descent is the same way a neural network is trained (i.e. the backpropagation algorithm), so we can use the same libraries to implement.

Summed probabilities, in particular capacity-constrained summed probabilities, are a good proxy for actual simulation outcomes, as they represent all simulation logic except the monte carlo step (so outcomes are float values of expected growth instead of discrete values). The summed probabilities are then calibrated to approximate observed longitudinal data on spatial patterns of growth using gradient descent. Being able to calculate exact gradients speeds up the calibration process compared to previous approaches, and also facilitates calibrating behavioral variable coefficients directly instead of just spatial dummies.

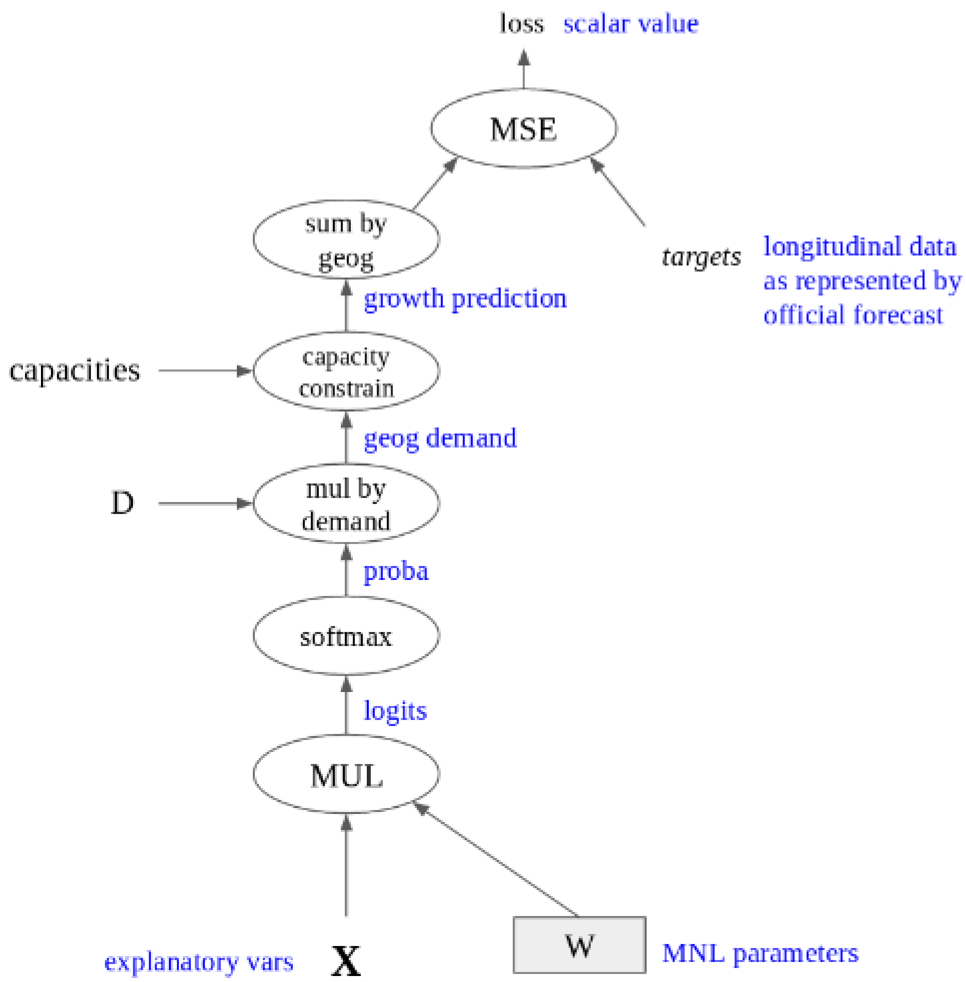
For calibrating location choice models, the steps are:

1. Multiply explanatory variables by coefficients to get logits
2. Apply softmax transform to logits to get probabilities
3. Sum the probabilities by geography

4. Calculate loss by taking the mean squared error (MSE) between summed probabilities and observed data on spatial patterns of longitudinal growth
5. Take gradient of the loss function with respect to the location choice model parameters
6. Pass gradients to an optimizer that performs gradient descent to adjust the model parameters in the direction that lowers the loss.

Figure 2 shows the computation graph for calibrating a particular location choice submodel. This is the graph through which we trace gradients and conduct gradient-based optimization. The backpropagation algorithm, as implemented in automatic differentiation libraries, allows us to compute the derivatives of this graph via the chain rule of calculus.

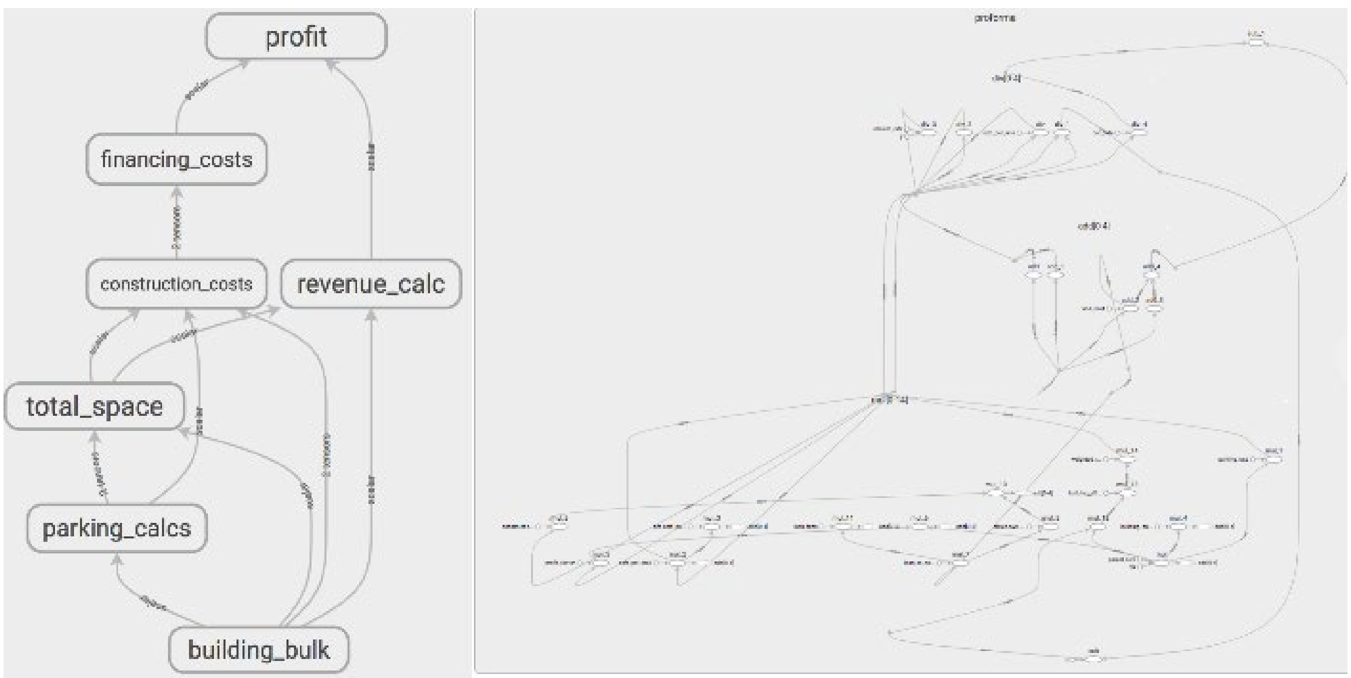
Figure 2: Computation graph for calibrating a location choice submodel



For calibrating the proforma model, the first step was to code a differentiable version of the current UrbanSim proforma, as differentiability is a prerequisite for calculating exact gradients using automatic differentiation. Given gradients, we can then optimize the proforma. The parameters being optimized are spatial cost shifters (coefficients on geographic dummies) as well as cost shift coefficients on behavioral variables from the demand models. These various cost-shift parameters are tuned such that the proforma generates results that approximate observed longitudinal patterns of supply growth. A differentiable proforma, through which we can trace gradients, also means that any of the proforma parameters could be optimized given data, not just cost shifters, but for now we restrict the calibration to the cost shifters. A differentiable proforma that is optimized via gradient descent given observed data can be considered more of a `learned` model rather than simply a rule-based profitability calculator that previous proformas represented. To make the proforma differentiable, the main change was to replace the height-to-cost and space-to-construction-months step functions with continuous approximations (since step functions aren't differentiable).

To calibrate the proforma, we calculate the gradient of the MSE loss function with respect to the proforma's cost shifter parameters. We then optimize the parameter values to minimize the loss. Figure 3 shows the computation graph of a proforma model- the chain rule is applied to this graph to get derivatives.

Figure 3: Computation graph of the current UrbanSim proforma



In both location choice model calibration and proforma calibration, we conduct reverse-mode differentiation (i.e. backpropagation) on the computation graph to calculate gradients of the scalar-valued loss function (mean-squared error between simulated/observed outcomes) with respect to array-valued arguments (the various model parameters we want to calibrate). We then pass the gradients to an optimizer and do gradient-based optimization to adjust parameter values and minimize the loss.

MODEL CALIBRATION RESULTS

CALIBRATION GOALS

- Move relative spatial variation of simulated growth towards observed patterns
- Proxy for unobserved costs and variables not accounted for by the location choice models as specified
- Incorporate information from longitudinal data (model estimation is based on cross-sectional data)

CALIBRATING THE PROFORMA MODEL

UrbanSim's model of real estate supply simulates the location, type and density of real estate development at the level of specific parcels. Proforma-based profitability calculations for every parcel in the region are run each simulation year. The calculations account for variables such as price, costs by structure type, fees, and zoning. This section describes the calibration of the real estate supply predictions. simulated, with adjustments made after each iteration to move the simulation in the direction of the spatial pattern of growth represented by tract-level data. Note: the calibration period was simulated without the scheduled_development_model (i.e. pipeline projects), so that UrbanSim was responsible for all supply predictions during calibration runs.

The 2010-2015 period was iteratively simulated (the model base-year is currently 2010). After each iteration, cost shifters in the proforma were updated in the direction that would move the simulation towards the targets. Cost shifters are a function of the model's explanatory variables, and the parameters of the cost shifters are learned as part of the calibration process. For example, if low density locations tends to have growth undershot, parameters associated with low density locations will be adjusted so that new real estate development becomes more attractive. Calibrated parameters are tuned separately for residential/non-residential. Parameter updates are based on gradient descent, with gradients calculated based on auto-differentiation through the proforma logic and a mean-squared-error loss function.

It’s important to note that although the model was calibrated over a few simulation years, calibration does not pre-determine model outcomes: typical simulations will be run well beyond the calibration period to 2040 and beyond, and UrbanSim accounts for a wide variety of variables that will influence growth separate from the calibration process. For example, locations that have historically grown very rapidly can run out of zoned capacity halfway through the simulation, shifting growth to locations that historically experienced slower growth. Changing congestion effects and price effects can also influence the spatial distribution of growth in the simulation. These are examples of complex feedbacks that UrbanSim is designed to represent.

Calibration notebooks were prepared so that the proforma calibration process can be replicated.

METRICS

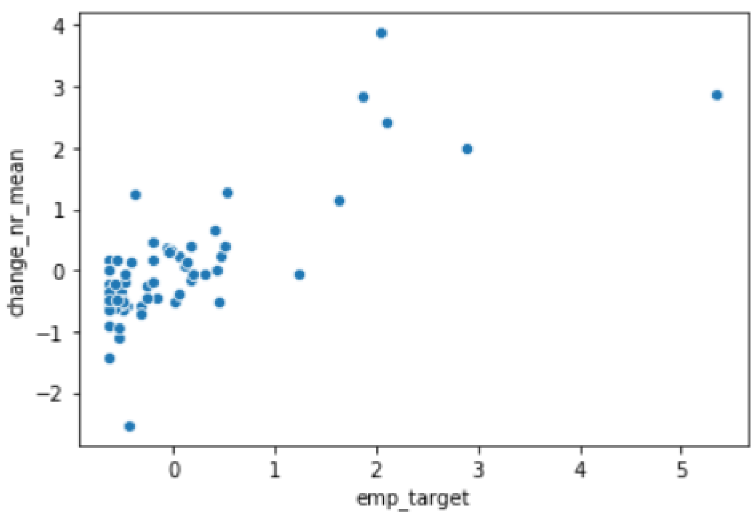
Validation metrics for Dwelling unit growth, 2010 - 2015

- MSE is 1.8948610753713644

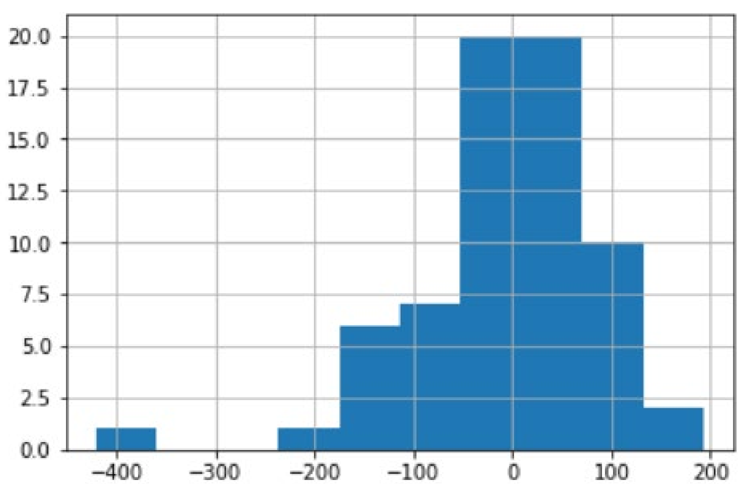
- RMSE is 1.37653952917138
- Prediction R2 is 0.5207503259568577
- Correlation is 0.760375162978429

Validation metrics for Nonres-space growth, 2010 - 2015

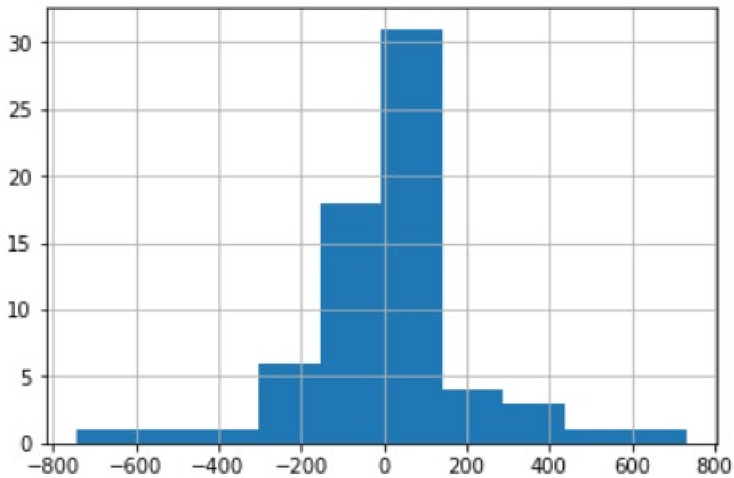
- MSE is 1.868264823081719
- RMSE is 1.3668448423583852
- Prediction R2 is 0.566758741640798
- Correlation is 0.7833793708203989



Dwelling unit deltas



Nonres-space deltas



MODEL VALIDATION

We run land use models to try and forecast future socio-economic and land use patterns given various sets of assumptions and policies. We desire to validate the land use model to help confirm that the model reasonably represents urban growth and to better understand the model so as to use it appropriately. Model validation can take many forms. In the current project, model validation will consist of 1.) comparing simulation results to observed longitudinal data, and 2.) sensitivity tests.

1. COMPARING MODEL RESULTS TO LONGITUDINAL DATA

The model system as a whole was run from 2010 to 2016, and the simulated changes were compared to longitudinal data on observed changes in the same period to assess model performance (for unit and household change, the 2013 ACS 5-year and the 2018 ACS 5-year were used for observed data). The table below shows the tract-level correlation between simulated and observed for each dimension of change, and the plots below summarize the comparison.

Table 1: Tract-level correlation between simulated and observed, 2010 - 2016

change_type	correlation
dwelling unit	0.618
household	0.472
non-residential sqft	0.704
job	0.656

Figure 1: Scatter plot of simulated vs observed dwelling units, 2010 – 2016

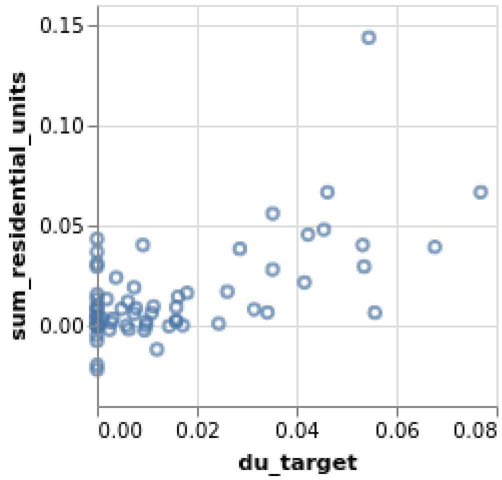


Figure 2: Scatter plot of simulated vs observed nonres-sqft, 2010 – 2016

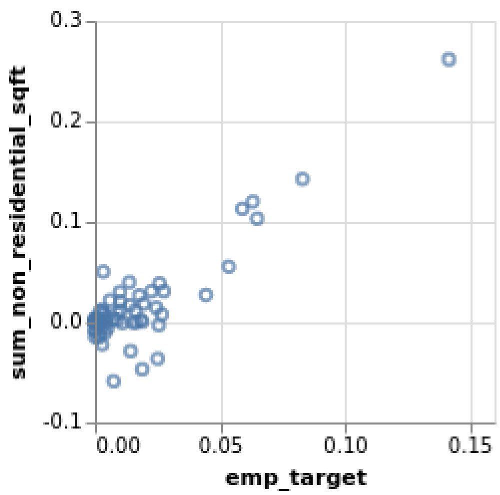


Figure 3: Scatter plot of simulated vs observed households, 2010 – 2016

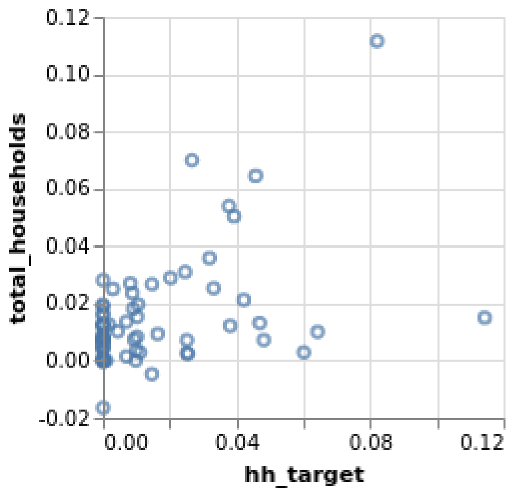
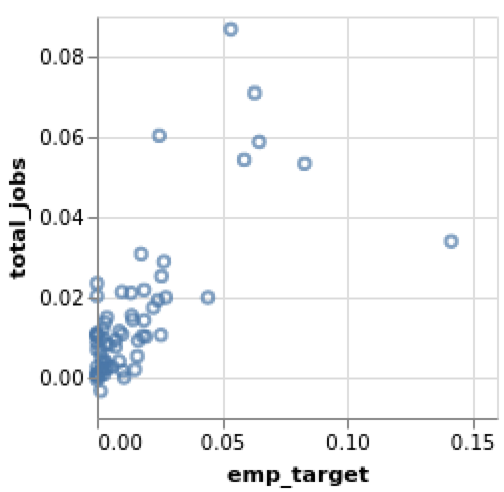


Figure 4: Scatter plot of simulated vs observed jobs, 2010 – 2016

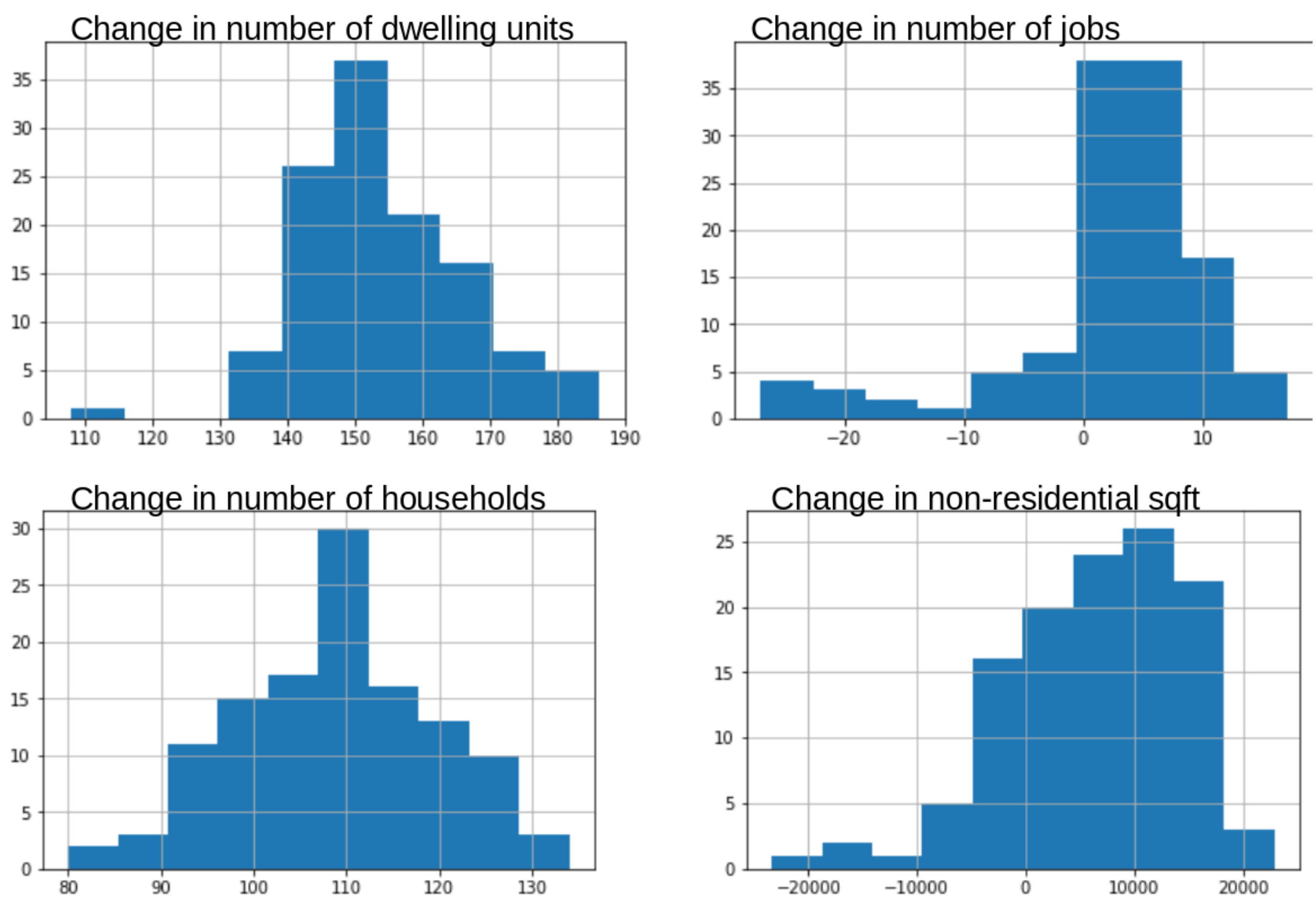


STOCHASTICITY EVALUATION

UrbanSim is a microsimulation-based model, and there will be random variation from run to run when the random seed is allowed to vary. The forecast will be different for each possible value of the random seed. Most major model components in UrbanSim have a random component, often involving converting a probability distribution into a set of discrete decisions using monte carlo simulation. Monte carlo simulation is used because we are modeling the discrete decisions of individual decision-makers: UrbanSim's data structures are disaggregate, and UrbanSim treats aggregate outcomes as the result of many individual decisions. This has implications for interpretation of model results. Output from a single model run is a single "draw" from the distribution of possible model outputs. Benefits that are a byproduct of microsimulation include more realistic accounting of agent heterogeneity, being able to summarize outputs for any agent type (supporting things like equity analysis), and allowing model specifications to focus on behavioral factors that apply in a disaggregate modeling context. If results need to be replicable, the random seed can always be fixed.

To evaluate the extent of stochasticity, so as to inform appropriate use of the model, the 2010 to 2015 period was simulated 120 times, and results summarized at the tract level. Note that these runs assumed a simple %1 annual growth rate for both households and jobs, to make the effect of randomness easier to isolate. For each major dimension of change (households, dwelling units, employment, non-residential square footage), the mean and standard deviation of tract outcomes was calculated. 120 runs provides a large enough sample of runs to get a reasonable sense for the central tendency and breadth of model outputs. The results indicate that tract-level results do vary from run to run, but are reasonably stable overall. Figures 1-4 below show, for a single example tract (tract_id: 41039005200), histograms of indicator outcomes across the runs.

Figure 1: Histogram of indicator outcomes for tract 41039005200



OUTPUT INDICATORS AND CHARTS

INTRODUCTION

The LCOG model currently exports key output indicators and charts to the `lcog/lcog/runs` folder in `.csv` and `.json` format, which then get exported to the platform user interface for visualization.

This section describes the main logic behind the process that generates output indicators and charts, and presents instructions that will enable the user to generate custom indicators and charts. The code structure is explained first, followed by a description of the parameters that can be changed to customize outputs.

CODE STRUCTURE

Output indicators and charts are generated in the `models.py` script, as part of the `generate_indicators()` function. The function itself is divided into three main sections, which are presented below.

1. General output indicators:

Based on custom parameters that can be defined in `configs/output_parameters.yaml`, this section exports two `.csv` files for each simulation year. The first file `(parcel_indicators_general_year.csv)` contains the selected output variables for each parcel, and the second one `(zone_indicators_general_year.csv)`contains the selected output variables for each zone.

2. Output indicators by building type:

This section exports the same output variables defined in `configs/output_parameters.yaml`, but disaggregated by building type. Variables that are exclusive of residential building types are only calculated for buildings that have `is_residential==True`, and variables that are exclusive of non residential types are only calculated for building types that have `is_non_residential==True`. As with the general output indicators, this section exports one file for parcels and one file for zones (`parcel_indicators_building_type_year.csv` and `zone_indicators_building_type_year.csv`, respectively) .

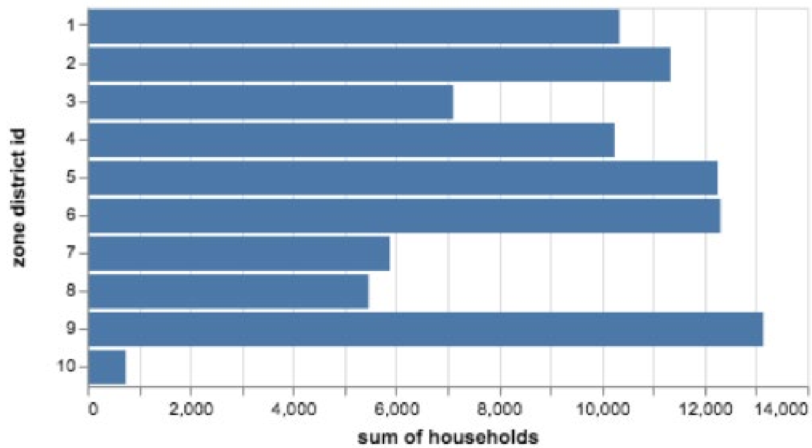
3. Chart indicators:

When the simulation reaches the `forecast_year`, five main types of charts are exported for each output variable, and also for each variable by acre. The five types of charts are described below, together with examples of the charts generated when using `total_households` as a variable, `zone_district_id` as `large_geography`, and `block_id` as `small_geography`. Output variables and aggregation geographies can be modified in `configs/output_parameters.yaml`, as it is described in the last section of this page.

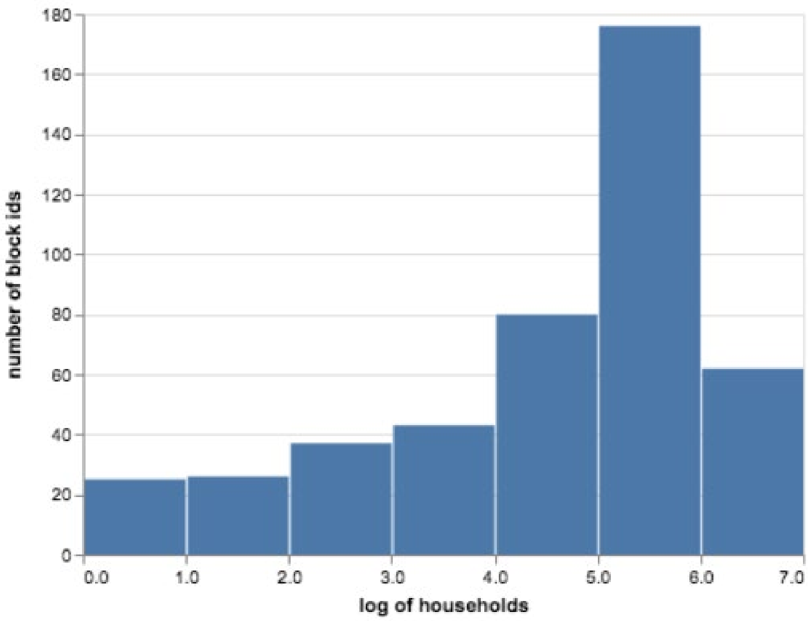
Charts generated using data from the zones table

Most relevant charts can be created by aggregating data available at the parcel and zone level. To facilitate plotting in terms of the size of the dataset to plot, the main charts generated by the model start from data at the zone level. Four types of charts are generated from zone data for each variable. The examples below show these four types of charts, where `total_households` is the variable, `zone_district_id` is the value for the `large_geography` parameter, and `block_id` is the value for the `small_geography` parameter:

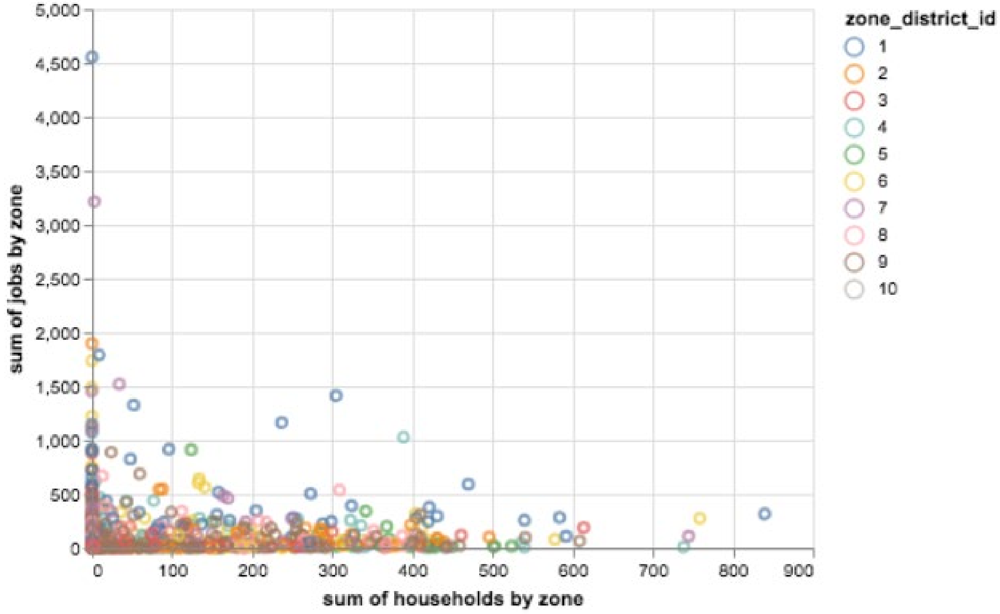
- Bar chart showing the sum or mean of the variable by an aggregate geography.



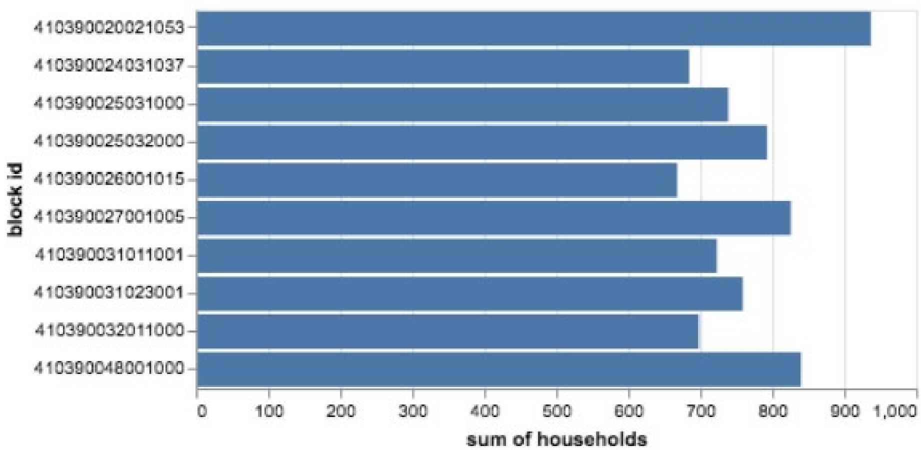
- Histogram showing the count of geographies that have different values for the sum/mean of the variable. The x scale was transformed to the logarithm of the variable:



- Scatter plots comparing the sum/mean of the variable with the sum/mean of all other predefined output variables (Individual data points correspond to zones):

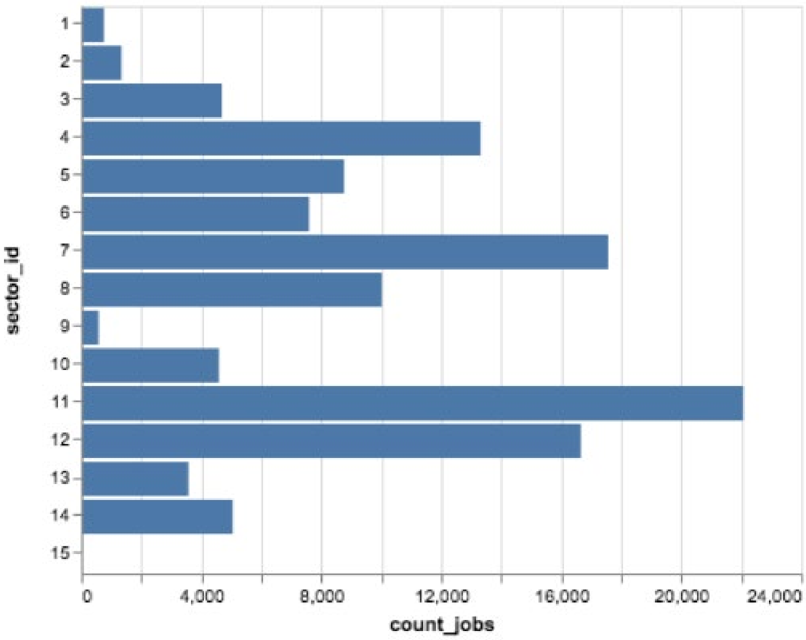


- Bar chart with the `block_id's` that have the top 10 sum or mean values for the variable



Charts generated using data from the jobs table

While the most relevant charts can be created by aggregating data available at the zone level, the user might also need to generate charts from other types of data. One example of this is a bar chart of number of jobs by `sector_id`, which is currently being generated by the model:



INPUT PARAMETERS

The main input parameters used to generate output indicators and charts can be customized within the `configs/output_parameters.yaml` file. To modify the variables that are exported after each simulation year or add new charts for the forecast year, the following fields can be modified by the user within the `.yaml` file:

- output_variables:
  - parcels: list of the parcel variables that will be exported as a `.csv` for every simulation year. These can include the variables shown below, plus any of the the proportion variables and spatially smoothed variables described in `adds_dict_proportions()` and `adds_derived_vars_dict()` :
    - total_households
    - total_jobs
    - sum_residential_units
    - sum_residential_sqft
    - sum_job_spaces
    - sum_non_residential_sqft
    - sum_persons
    - sum_workers
    - sum_children
    - sum_cars
    - sum_acres
    - sum_income

        - sum_recent_mover
        - mean_sqft_per_unit
        - mean_job_spaces
        - mean_year_built
        - mean_sector_id
        - mean_acres
        - mean_persons
        - mean_workers
        - mean_children
        - mean_cars
        - mean_income
        - mean_age_of_head
        - mean_x
        - mean_y
        - mean_value_per_unit
        - mean_value_per_sqft
        - median_building_type_id
        - median_income_quartile
        - median_tenure
        - median_race_of_head
        - median_sector_id
        - density_households
        - density_jobs
        - ratio_jobs_to_households
        - ratio_workers_to_persons
        - ratio_households_to_residential_units
        - residential_vacancy_rate
        - non_residential_vacancy_rate
        - remaining_nonresidential_sqft_capacity
        - remaining_residential_unit_capacity
    - zones: list of the zone variables that will be exported for every simulation year. These can include all of the parcel variables, plus
        - residential_vacancy_rate
        - non_residential_vacancy_rate
- chart data:
    - geography_large (str, default is `zone_district_id`): id of the geography that will be used to aggregate zone data into categories for the first type of chart presented above. To generate a manageable number of categories in the chart, this field should have 15 or less unique values.

- geography_small (str, default is `block_id`): id of the geography that will be used to generate a histogram of the variable, and to create a bar chart with the top 10 values of the variable.
- chart_variables (dict): dictionary of the variables that will be used to generate the four initial types of charts described above. The keys are the aggregation functions that will be used (sum or mean), and the values are the variables that will generate charts for each aggregation function.
  - sum (list): variables that will be aggregated into charts using sums. These can include variables such as total_households, total_jobs, sum_residential_units, sum_non_residential_sqft, sum_job_spaces, sum_persons, sum_workers, sum_children, sum_cars, sum_hispanic_head, sum_recent_mover, sum_acres, sum_land_value.
  - mean (list): variables that will be aggregated into charts using the mean value. These include variables such as residential_vacancy_rate, non_residential_vacancy_rate, mean_income, mean_value_per_unit.
- custom_charts (dict): dictionary of the variables that will be used to generate the fifth type of chart described in section 3 of this wiki, which is not based on zones data but directly on households, buildings, or jobs data. The keys are the names of the tables containing the variables of interest (households, buildings, or jobs), and the values are the variables from these tables that will be used to generate custom bar charts.

Note: the `gen_custom_barchart()` function currently only supports the creation of bar charts of an agent aggregated by existing categories of a variable (`households` by `income_quartile`, `buildings` by `building_type_id`, `jobs` by `sector_id`).

6. PROJECT COORDINATION

HIGH-LEVEL PROJECT GOALS

This application of UrbanSim to the Eugene-Springfield Metro region has been developed in close collaboration with LCOG/CLMPO staff.

The focus of the model development effort was on developing a model system for forecasting and scenario analysis, tied to the UrbanCanvas Cloud Platform. Location choice models and real estate price models were implemented, along with a proforma-based developer model and other supporting model components.

The first phase of the LCOG UrbanSim model development process began in February 2018 and is expected to be completed in July 2019. This is the first version of the model, with 2010 input data. The second model development phase will update the base-year data to 2016, re-estimate certain models based on new data/variables, and conduct additional calibration, validation, and sensitivity testing. The goal of the first two phases of development is to have a well-built and well-understood model by January of 2020.

HIGH-LEVEL PROJECT SCHEDULE

- *2018*- Initial base-year data development and setting up initial model structures
- *2019*- Model estimation, calibration, deployment, indicators, and enhancements
- *2020*- Finish current-phase model, base-year data transition

DELIVERABLES

This page lists the deliverables associated with the complete working model. These deliverables will allow LCOG to run the model (both locally and using the cloud platform) and to run associated model development scripts.

- Documentation of data processing
  - [x] Data pre-processing pipeline
- Documentation of enhancements
  - [x] Proforma enhancements
  - [x] Other enhancements
- Documentation of model estimation
  - [x] Use of the model estimation notebooks
  - [x] Model estimation results
- Documentation of model function
  - [x] Developer Model Memo
- Documentation of model calibration/validation/sensitivity-testing
  - [x] Summarizing model evaluation and use of the relevant notebooks
  - [x] Calibration
    - > Methodogy
    - > Results
  - [x] Validation
  - [ ] Sensitivity Testing

- ☑ Stochasticity

- Documentation of outputs
  - ☑ Output indicators and charts
  - ☑ How to change the standard output indicators of the model

- Documentation of model installation and synching
  - ☑ Installing the model locally
  - ☑ Keeping the cloud-based model synched via Github

- On-site training meeting
  - ☑ *Occurred on January 28-29, 2019*

MODEL DEVELOPMENT WORKFLOW DIAGRAM