Appendix H: Environmental Analysis

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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.

[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

[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
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
Water Resources	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)
	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. 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.	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.

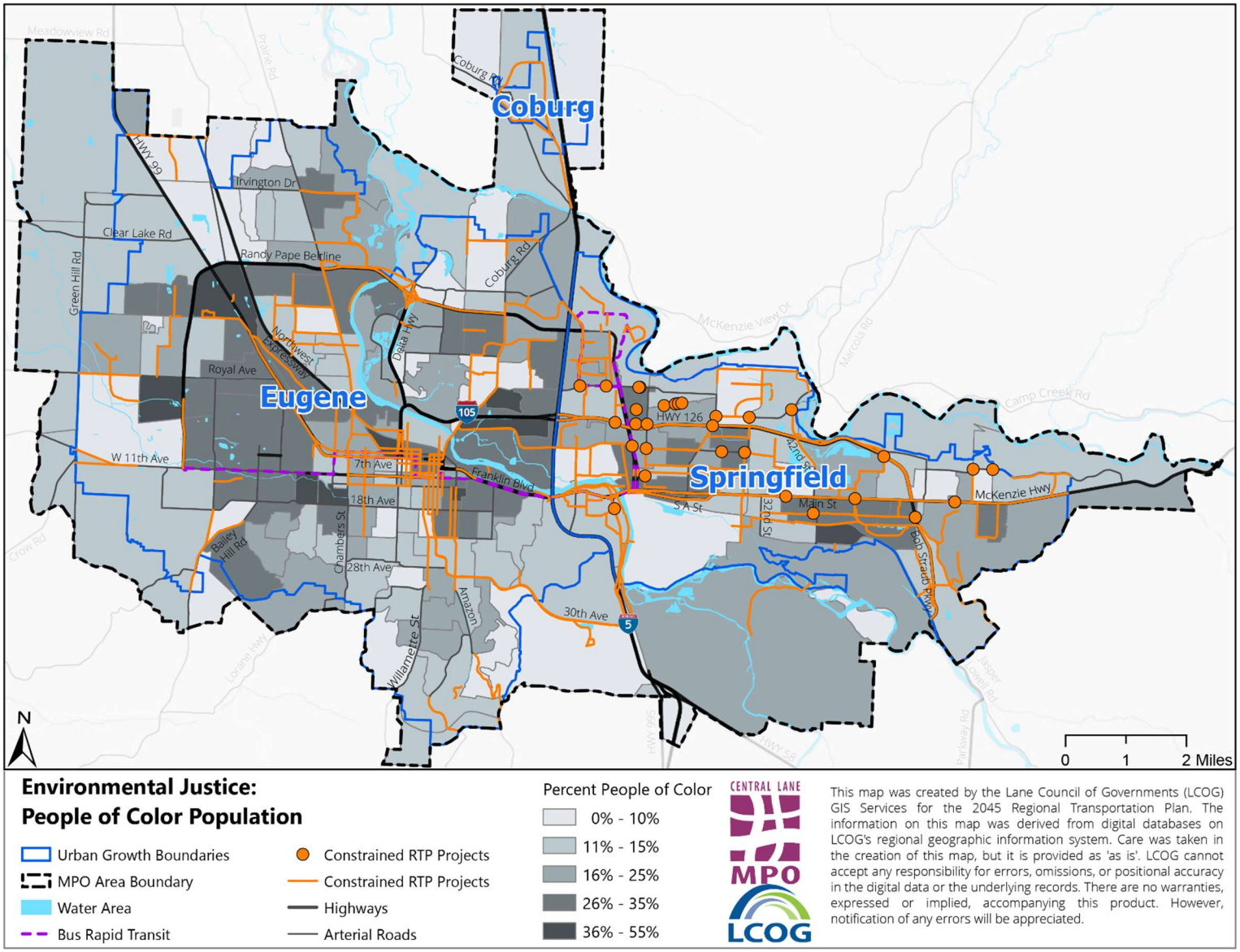
Table 4. Historically Excluded Populations' Access to Bike, Ped, and Transit – Equity Areas

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%

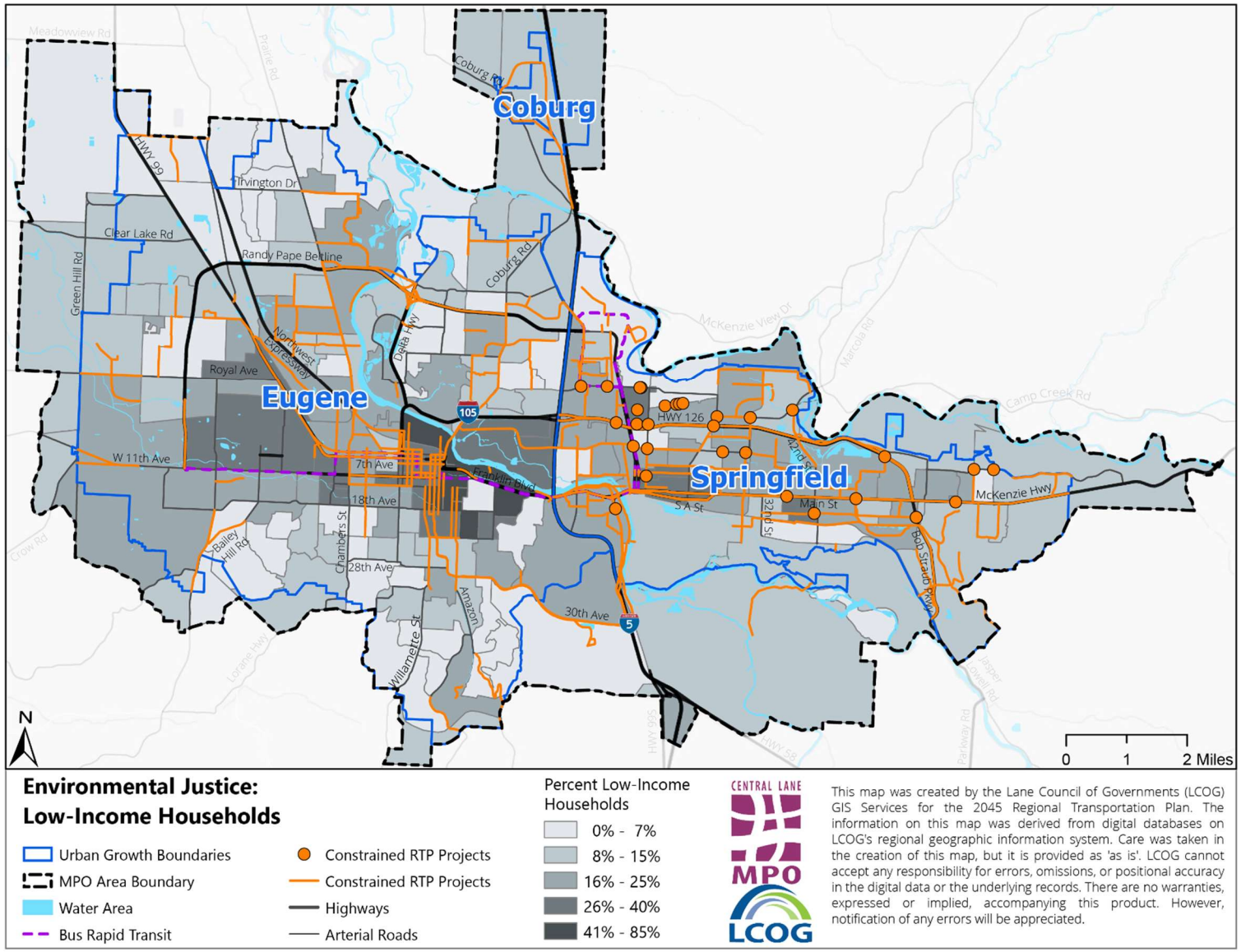
Table 5. 2045 Constrained RTP Projects and Historically Excluded Populations

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%

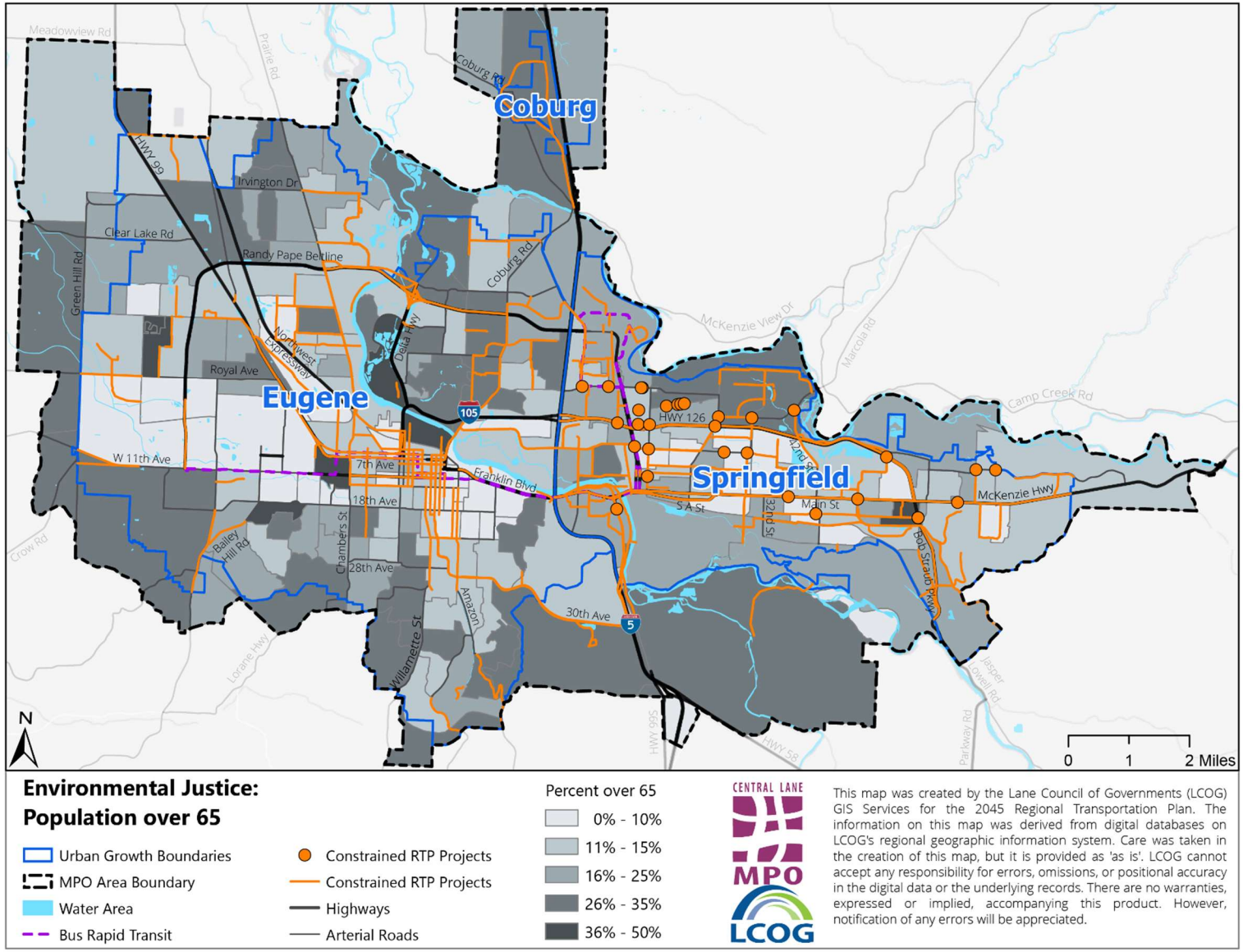
Map 1. Environmental Justice – People of Color Population


Coburg
Eugene
Springfield
Meadowview Rd
Coburg Rd
Prairie Rd
HWY 99
Irvington Dr
Clear Lake Rd
Green Hill Rd
Randy Pape Beltline
Coburg Rd
Delta Hwy
Northwest Expressway
Royal Ave
McKenzie View Dr
Marcola Rd
Camp Creek Rd
HWY 126
42nd St
105
W 11th Ave
7th Ave
Franklin Blvd
18th Ave
5 A St
32nd St
Main St
McKenzie Hwy
Bailey Hill Rd
Chambers St
28th Ave
Amazon
30th Ave
5
Willamette St
Gateway Blvd
Crow Rd
Lorane Hwy
Jasper
Powell Rd
Parkway Rd
N
0
1
2 Miles
Environmental Justice:
People of Color Population
Urban Growth Boundaries
MPO Area Boundary
Water Area
Bus Rapid Transit
Constrained RTP Projects
Constrained RTP Projects
Highways
Arterial Roads
Percent People of Color
0% - 10%
11% - 15%
16% - 25%
26% - 35%
36% - 55%
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.

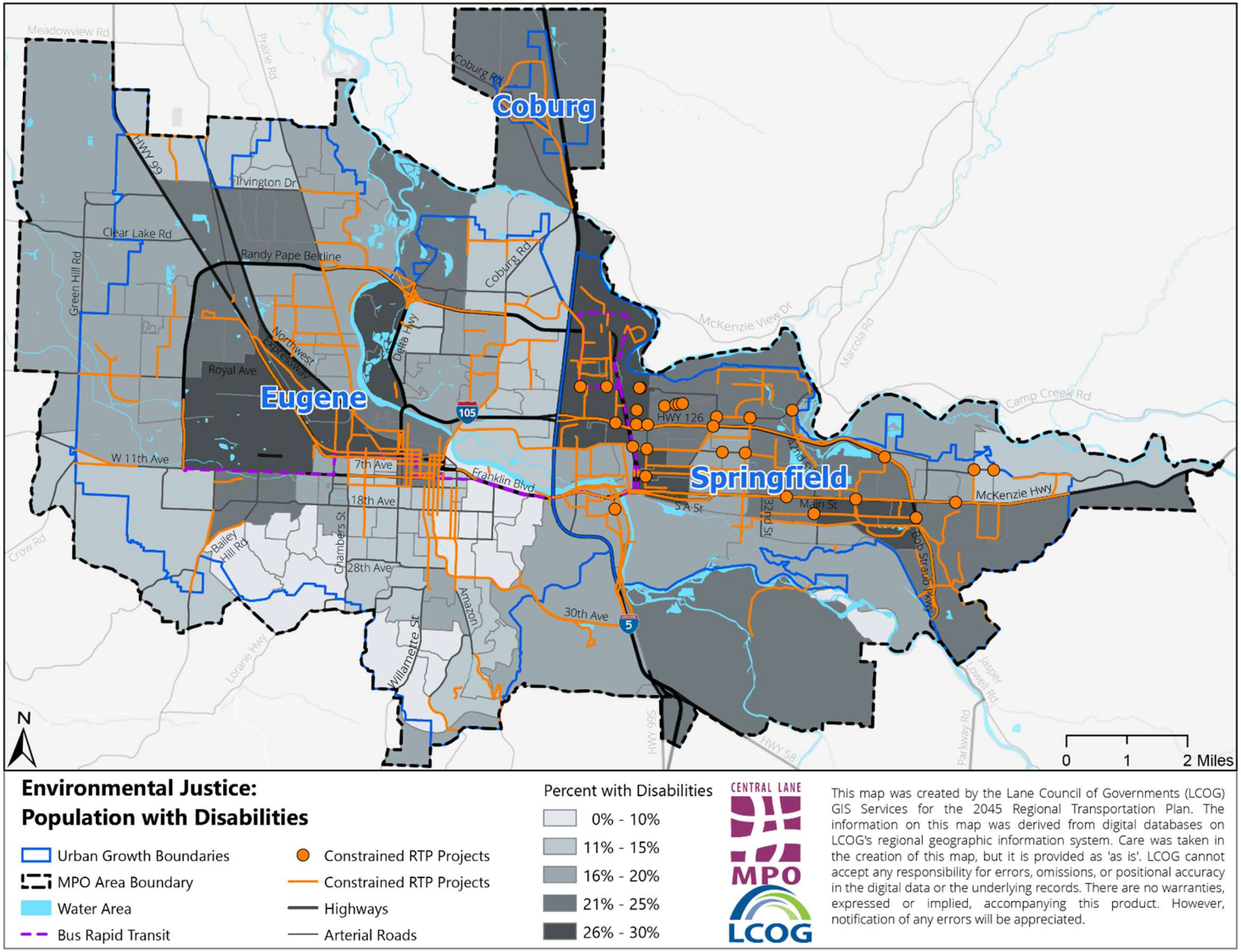
Map 2. Environmental Justice – Concentration of Low-Income Households



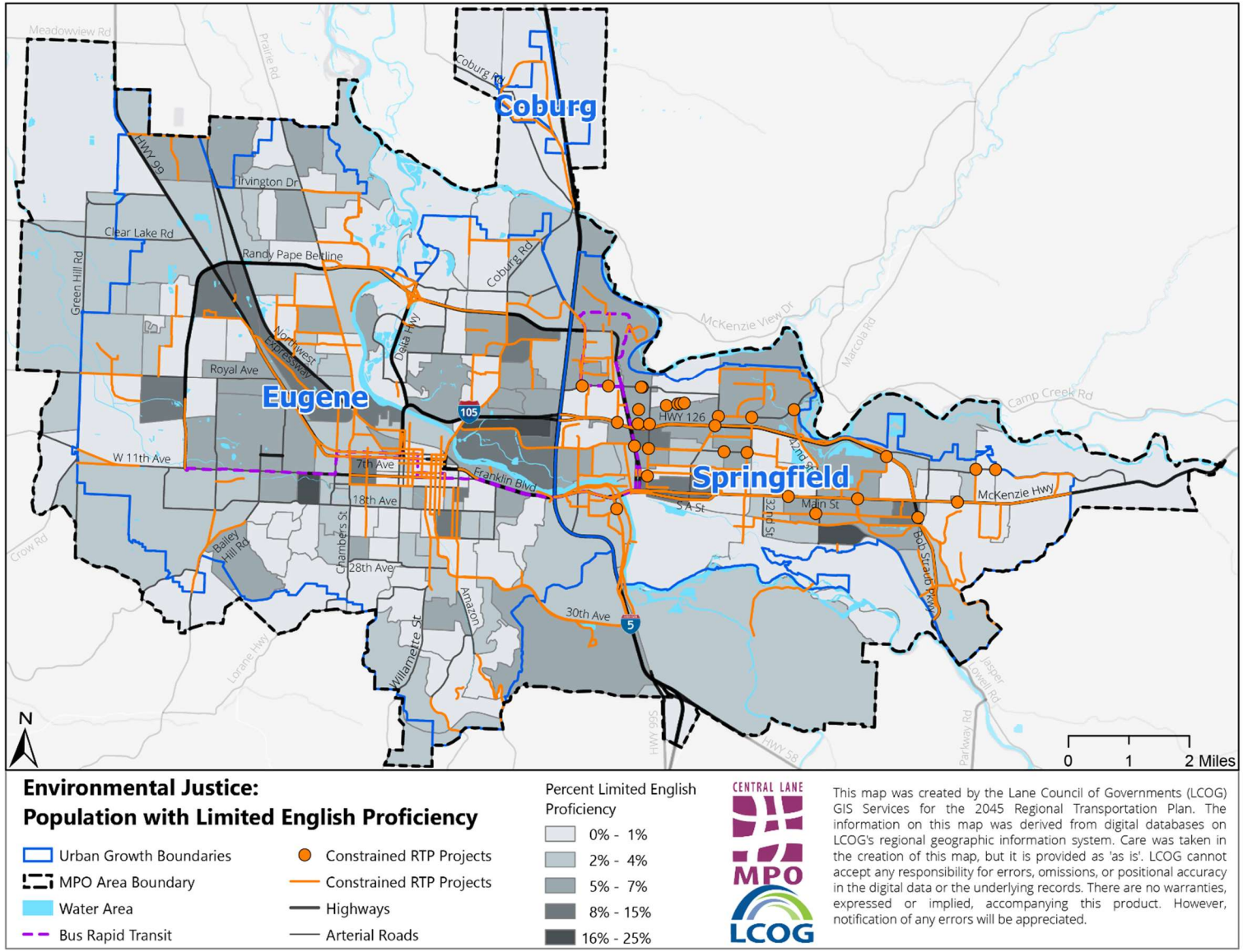
Map 3. Environmental Justice – Concentration of Population over 65



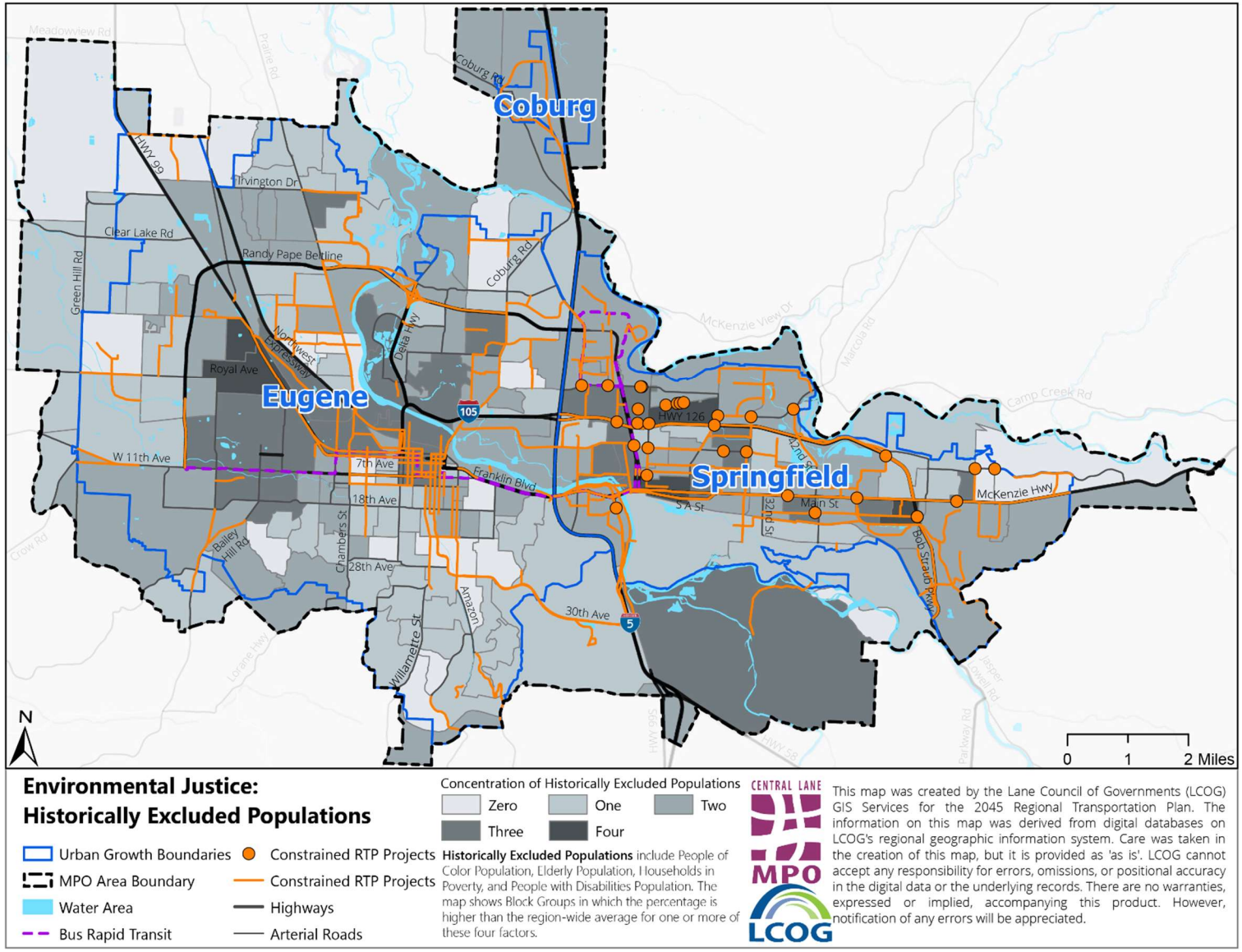
Map 4. Environmental Justice – Concentration of Population with Disabilities



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.

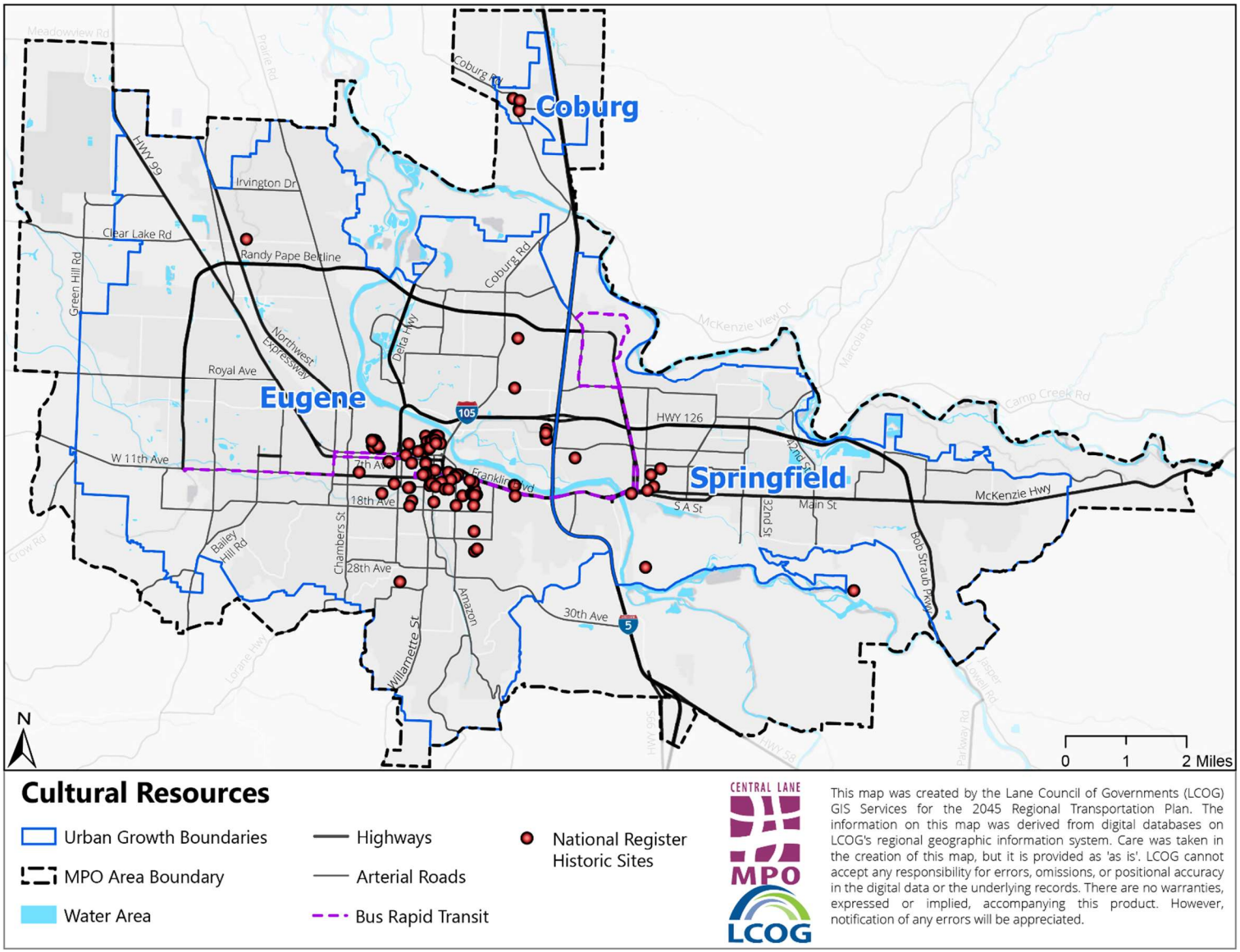
ANALYSIS

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

[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.

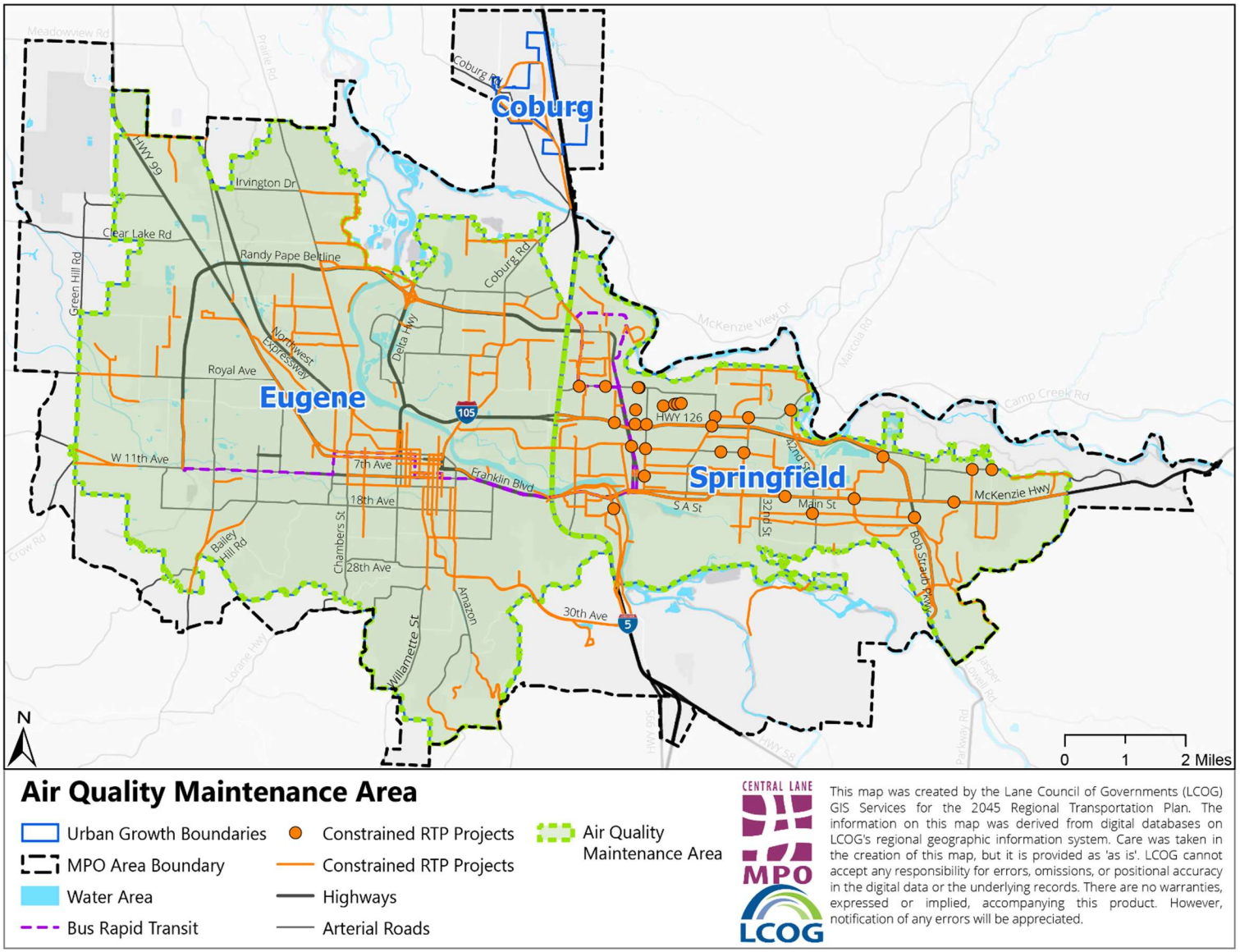
(AQCD) for PM_{10} for the 2045 RTP. An AQCD is a finding that proposed transportation activities will not impede this area from continuing to meet air quality standards and will not cause or contribute to new air quality violations. The report is required in areas that have previously been determined to have violated 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 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

systems (MS4s) that discharge untreated stormwater into local waterbodies—including Eugene and Springfield—are required to obtain NPDES Permits.

bank may be created when a government agency, corporation, nonprofit organization, or other entity 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:

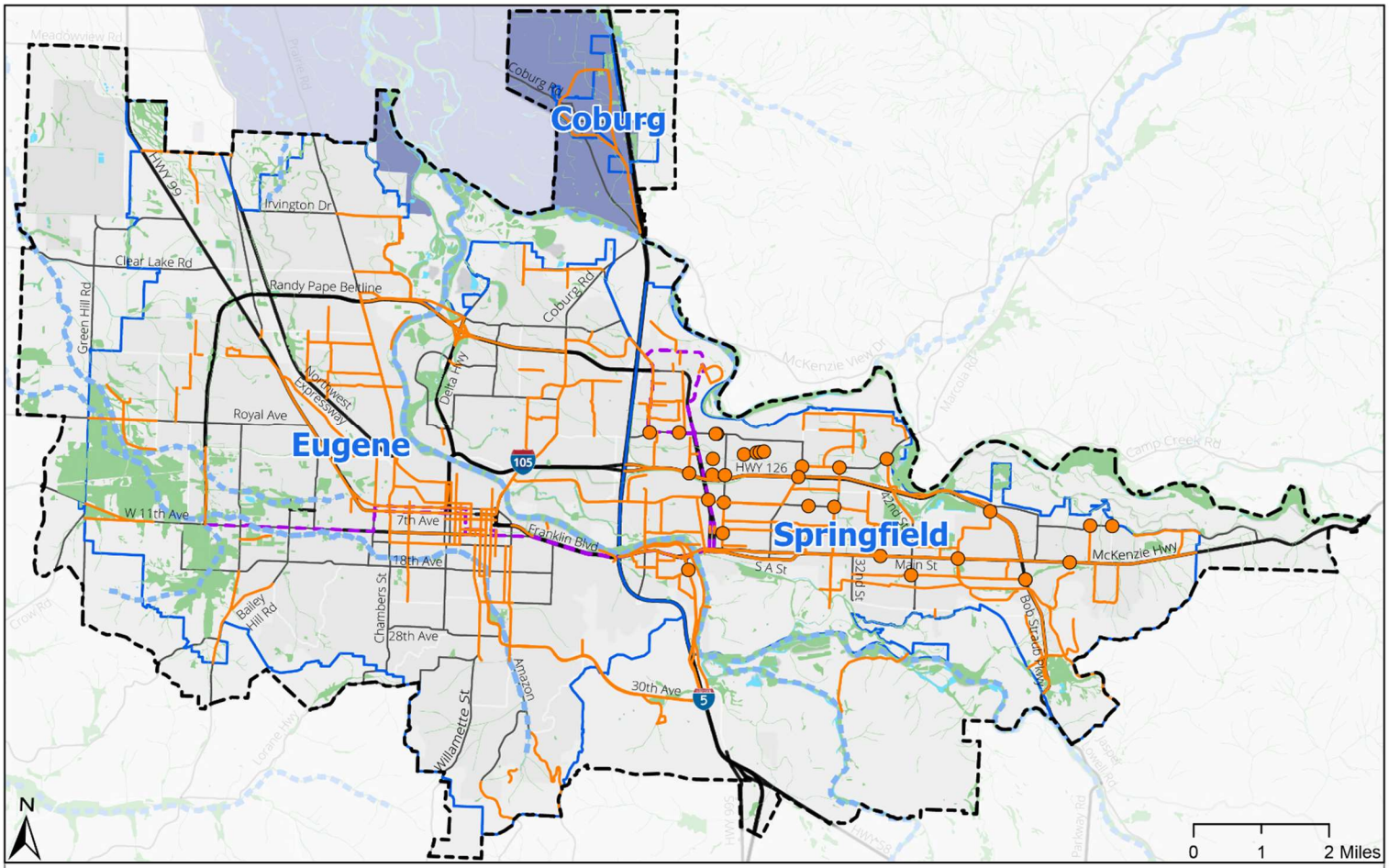
- Construction of structures or work performed in or affecting navigable waters of the U.S. portions of the Willamette River and McKenzie River within Lane County;[14]
- Discharge of dredged or fill material into waters of the U.S., including wetlands;[15]
- Alteration, occupation, or use of a Corps 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]

[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

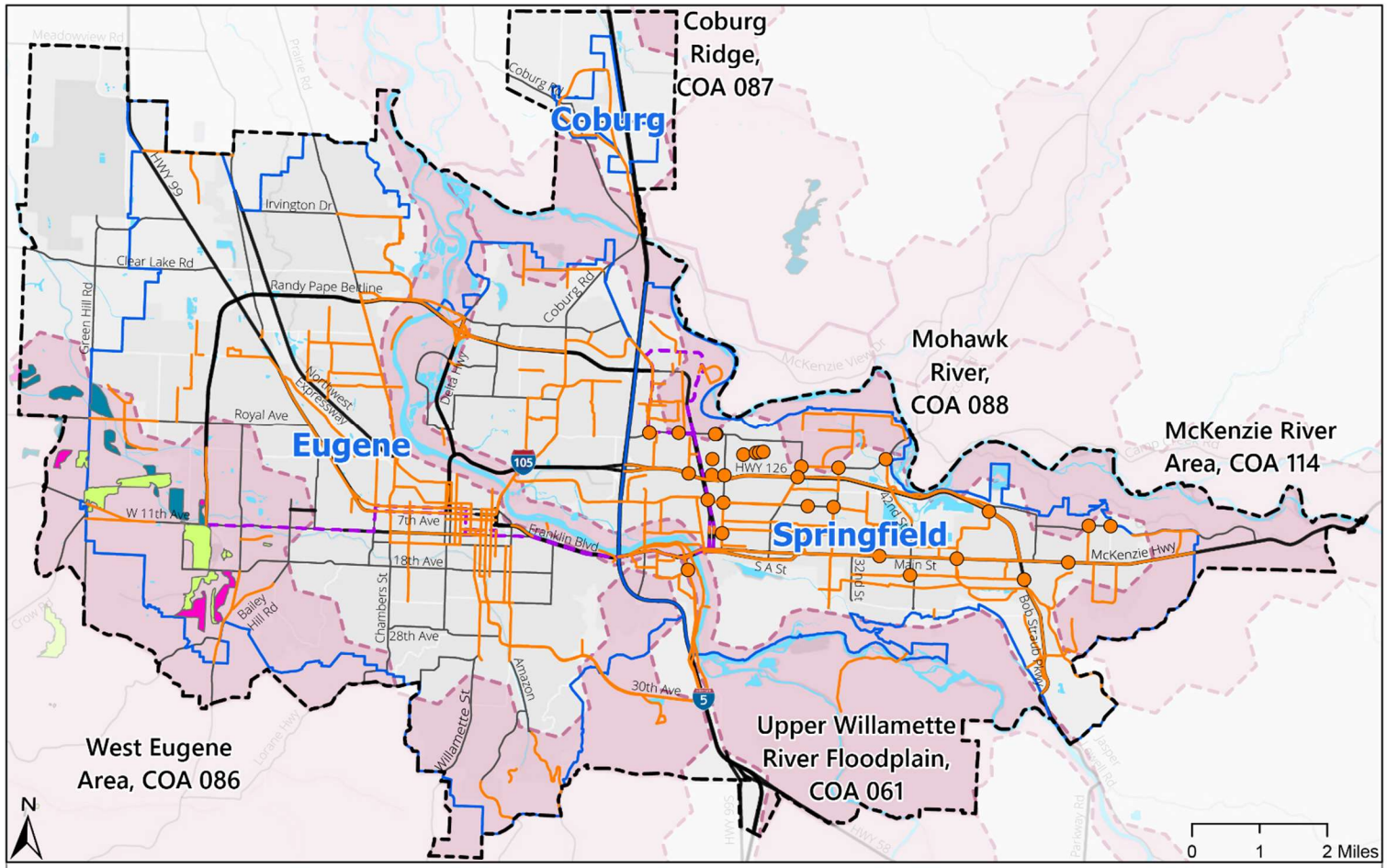
[18] Goldfarb, *How Roadkill Became an Environmental Disaster.*

5. Mohawk River, COA 088

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.

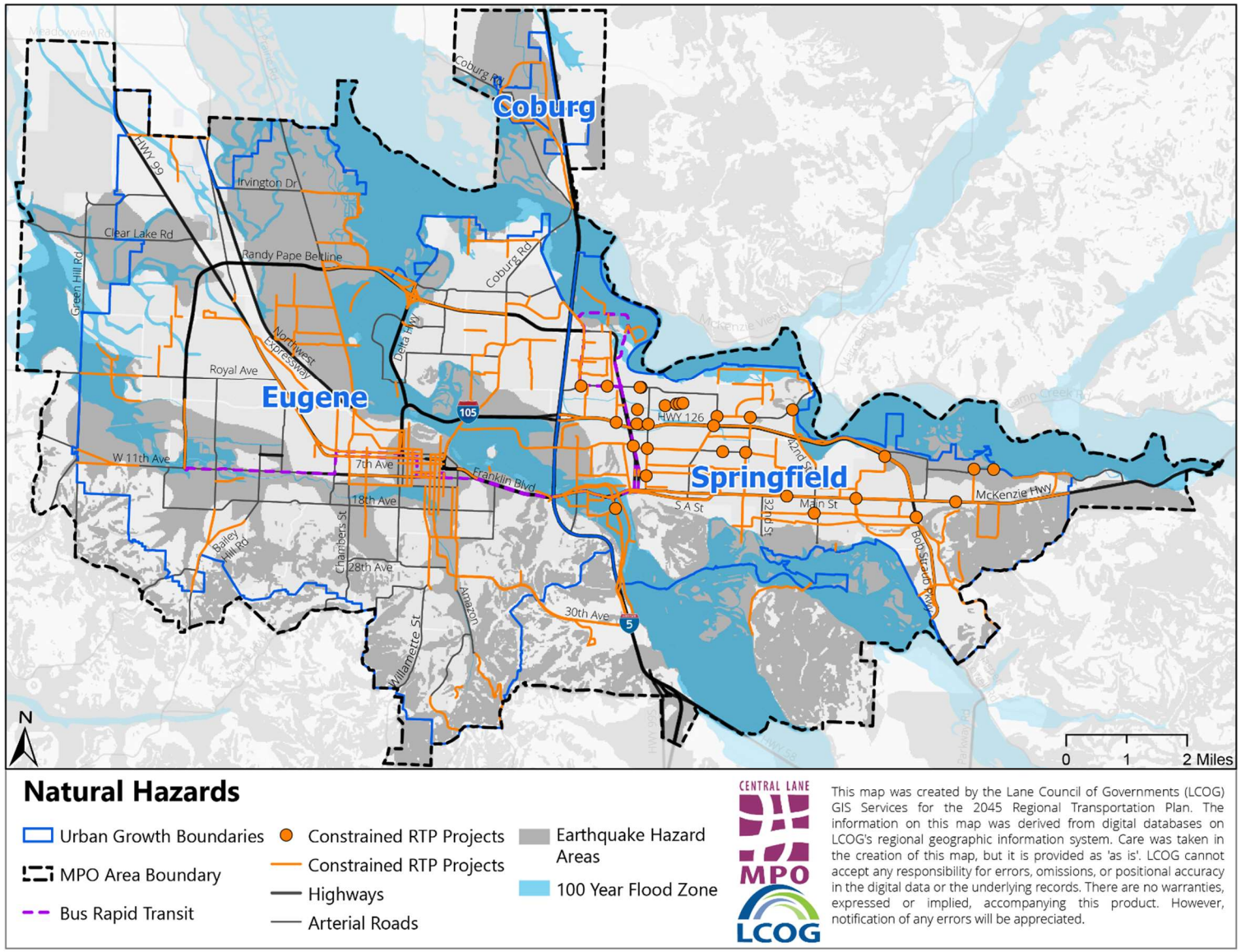
ANALYSIS

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						

Mitigation Strategies	Environmental Justice	Cultural Resources	Air Quality	Water Resources	Sensitive Habitats	Natural Hazards
Include historically excluded populations in decision making	■					
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						■