APPENDIX A: PUBLIC OUTREACH SUMMARY

Appendix A – Public Outreach Efforts Summary (Draft*)

Sept. 8, 2023 – **State of the City** event at Alpenglow Park. MPO tabled at the event with CET. Well attended but minimal interest. Informed folks of what the MPO is and our upcoming MTP update, directing them to the webpage.

Sept. 13, 2023 – **Farmers Market at The Commons**. MPO joined GMD table for long-range projects underway (CFA's, Stevens Ranch, MTP Update). Well attended but minimal interest. Informed folks of what the MPO is and our upcoming MTP update, directing them to the webpage.

Oct. 5, 2023 – Online goals **questionnaire opens**.

Oct. 6, 2023 – **BPRD Fall Community Celebrations** event. MPO hosted a "Vote for Your Top Transportation Goals" activity using 3 jellybeans per person or per family. Approx 250 people w/ ~8% Spanish-speaking attended event. Received 270 total votes (total jellybean count) from 90 families and individuals. All materials available in English and Spanish with interpreter.

Oct. 18, 2023 – **Presented at CET's RPTAC meeting** to get feedback on most important MTP Goals. Results were: #1 Goal 1, #2 Goal 4, #3 Goal 6

Oct. 19, 2023 – **Sent email to COB TSP Update list** (2019, ~350 email addresses) and **MPO Title VI Email List** directing them to project webpage. Webpage hosted a goals questionnaire.

Oct 2023 - **Policy Board Meeting** – Presented preliminary results of goals surveys.

Nov 2023 - **TAC Meeting** - Presented preliminary results of goals surveys.

Nov. 10, 2023 – **City of Bend CFA Open House** event. MPO hosted a "vote for your top transportation goals" activity. Approx 75 ppl attended event. Received 55 votes (~18ppl).

Nov. 20, 2023 – Online goals **questionnaire closes**.

Dec. 12, 2023 – **Letters sent to Tribes** (Confederated Tribes of Warm Springs, Klamath Tribes, and Burns-Paiute Tribe).

Jan. 5, 2024 – **News release on COB website and notification to "interested parties"** re: upcoming TAC and Policy Board meetings to review results of needs analysis, funding analysis, and draft project list.

Jan. 9, 2024 - **TAC Meeting** – Presented updated results of goals surveys (outreach effort #1 complete).

Jan. 19, 2024 - **Policy Board Meeting** – Presented updated results of goals surveys.

April 25, 2024 – **Presented at CET's RPTAC meeting** giving an update on the MTP update project and opportunity to ask questions/get more information.

June 13, 2024 - **Presented at CET's RPTAC meeting** giving an update on the MTP update project and opportunity to ask questions/get more information.

July 26, 2024 – **BPRD Summer Community Celebrations Event** – Presented maps of prioritized projects matched with funding available/expected, explained process. Included a Jenga trivia game for attendees. Approx. 200 attendees and ~30% Latino with ~5% LEP populations. MPO staff served as translator.

Aug. 14, 2023 – **CityFest Event** - – Presented maps of prioritized projects matched with funding available/expected, explained process. Included a Jenga trivia game for attendees.

Aug. 16, 2023 – **Online Open House** goes live.

*Remaining Aug – Sept efforts to be included here for final draft of MTP.

Table 1: Results of Public Input on Transportation Goals, 2023

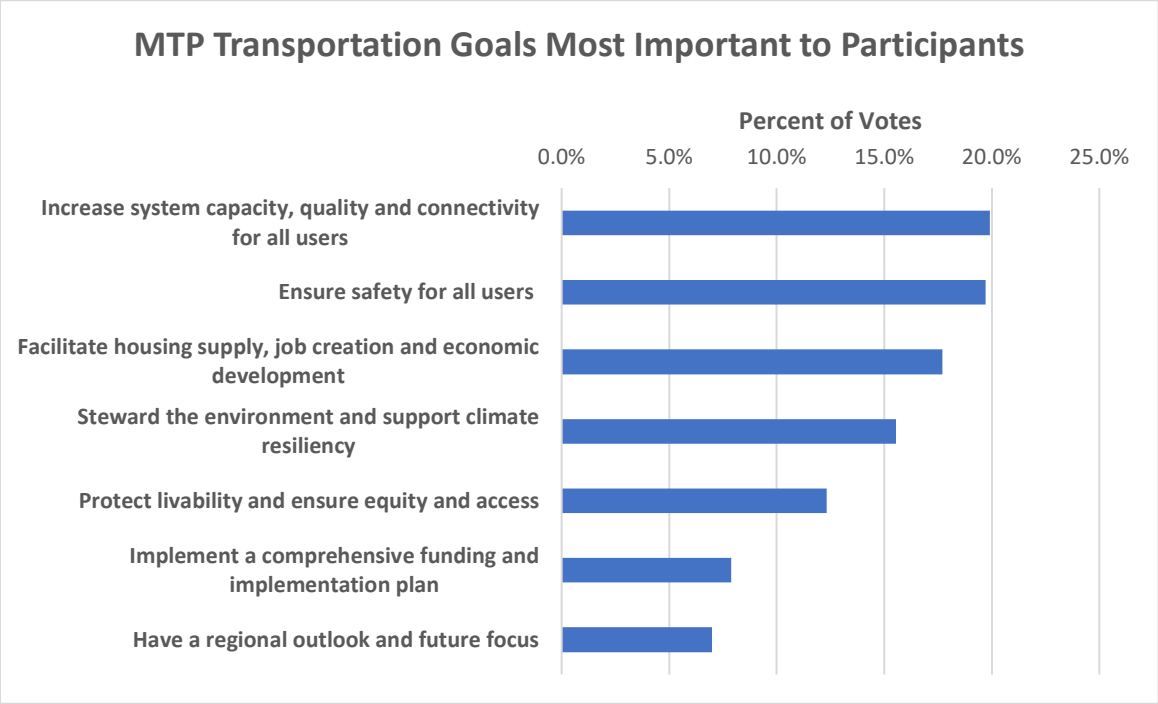
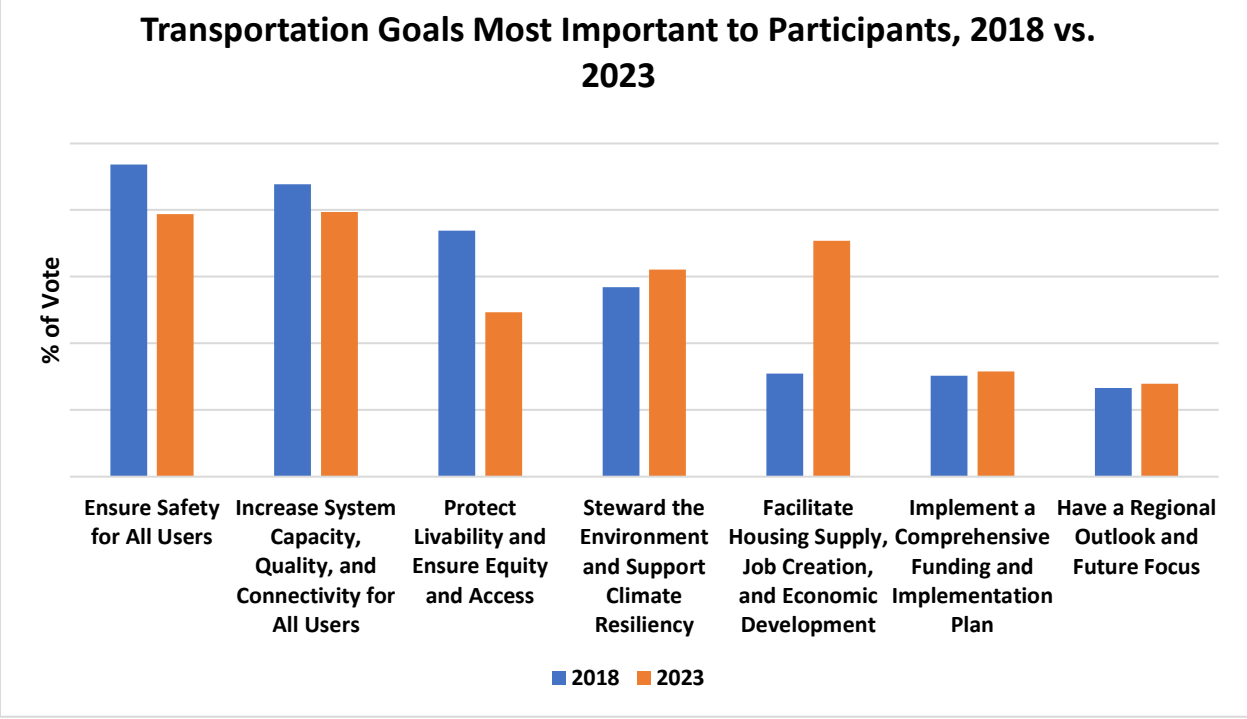


Table 2: Comparison of Results of Public Input on Transportation Goals, 2018 vs 2023



APPENDIX B: ENVIRONMENTAL CONSIDERATIONS

Appendix B: Environmental Considerations

Introduction

Consideration of environmental factors is a requirement of federal legislation (IIJA). The purpose of this section is to:

- Provide information on existing environmental factors in the Bend MPO area.
- Include a high-level environmental analysis, mapping the MTP financially constrained list of projects with environmental data to identify potential conflicts and potential mitigation.

The environmental factors in this section include:

- Water Resources
- Fish, Wildlife and Habitat Resources
- Air Quality
- Scenic Resources
- Historic and Cultural Resources
- Recreation Resources
- Environmental Justice

Water Resources

Wetlands

The City of Bend completed a Local Wetlands Inventory (LWI) in 2002, which revealed no known significant wetland resources (as defined in Oregon Statewide Planning Goal 5) outside of the riparian corridor of the Deschutes River within the Bend UGB, as shown in Maps 1 and 2. The entirety of the Deschutes River within the UGB was evaluated as a single wetland system, and within it a total of ten significant wetland units were identified. The City must meet state requirements for protecting these wetland units.

For areas of the Bend MPO outside of the Bend UGB, the U.S. Fish and Wildlife Service (USFWS) National Wetlands Inventory has identified areas of freshwater forested/shrub wetlands north along the Deschutes River from Tumalo State Park through the community of Tumalo. These mapped wetlands are subject to county, state, and federal fill and removal regulations.

Flood Plains

The Federal Emergency Management Agency (FEMA) updated the delineation of the 100-Year Flood Plain in 2007, as shown in Maps 1 and 2. Within the Bend MPO area, a 100-year flood plain exists along the Deschutes River, including a very small section of residential roadway in the community of Tumalo.

Stormwater Management
The City of Bend is currently updating its 2014 Stormwater Master Plan with projected completion in 2025. The purpose of this plan is to provide a 20-year capital improvements plan to manage priority existing and projected future stormwater conveyance, flooding, and water quality issues.

For stormwater quality, the City recently updated and implements a more specific Integrated Stormwater Management Plan that is necessary for meeting Oregon Department of Environmental Quality (DEQ) stormwater permit requirements. The plan has multiple components including Construction Site Activities, Post-Construction Controls, Municipal Maintenance, and Monitoring that may influence transportation planning.

The City of Bend Utility Department is responsible for city-owned or operated storm drainage facilities, while drainage and maintenance for the three highways that run though Bend are the responsibility of the Oregon Department of Transportation (ODOT).

Recommendations
A focus on low impact development site design concepts and adherence to City Standards and Specifications, and Bend Code Title 16 in transportation design planning, will be sufficient to meet these stormwater plan requirements.

Water Quality
Within the Bend MPO, the Upper Deschutes River is currently listed on the DEQ 303(d) list of water quality limited waterways because portions of the river do not meet state water quality criteria for flow modification, habitat modification, temperature, pH, sedimentation and turbidity. Tumalo Creek is also listed on the DEQ 303(d) list because some segments of the creek do not meet state water quality criteria for flow modification and temperature.

The DEQ is required by the U.S. Environmental Protection Agency (EPA) to develop Total Maximum Daily Load (TMDL) plans with requirements for pollutant load limits and management actions to be implemented by agencies and other identified parties to bring the river into compliance with water quality standards. As of the date of this document, DEQ has not yet started the process to establish Deschutes River or Tumalo Creek TMDLs or related requirements for local agencies such as the City of Bend.

Drinking Water
Drinking water sources for Bend include surface water from Bridge Creek, a tributary of Tumalo Creek, and production from 20 wells that draw water from the productive aquifer that lies beneath the city. The City routinely monitors regulated and unregulated contaminants from both surface water and groundwater sources. As a proactive measure to manage its groundwater resource, the City completed a Source Water Assessment (SWA) for their wells in 2013. For surface water, a SWA was also completed in 2013. A SWA identifies potential contamination sources associated with existing land uses, ranks them according to their potential threat and provides input for

city management strategies to protect drinking water sources. The City is currently completing an updated Groundwater Protectiveness Demonstration that will be used to help refine design standards for allowed locations, depths, and pre-treatment requirements for stormwater underground injection facilities (e.g. drywells) to protect groundwater and drinking water source quality.

The City of Bend produces an Annual Water Quality Report which includes information on how Bend's drinking water complies with and exceeds state and federal requirements.

Best Management Practices

The Central Oregon Stormwater Manual was last updated in 2010 and was developed as a collaborative effort between Central Oregon cities, counties, and the Central Oregon Intergovernmental Council. The manual uses the best available stormwater management guidance from Oregon and Eastern Washington to create a reference for engineers, builders, and local government staff on the design and construction of runoff treatment and flow control facilities. The Best Management Practices (BMPs) that make up the core of the manual, coupled with more recently updated City of Bend municipal code, development codes and engineering standards, are intended to comply with relevant federal and state regulations, and are established to be suitable to the unique climatic and hydro-geologic conditions of the region. Road projects must comply with these codes, standards and manual.

Agency Comments re: MTP Project List and Water Resources (Maps 1 & 2):

ALL listed projects will need to comply with Title 16 of Bend Municipal Code which identifies requirements for managing stormwater/drainage and preventing eroded sediment and potential pollutants from entering drainage systems and potentially surface waters and/or groundwater. The requirements include erosion control requirements during the construction phase and permanent stormwater management facilities that include pre-treatment elements such as swales, sedimentation manholes, and other measures in the City Engineering Standards and the Central Oregon Stormwater Manual.

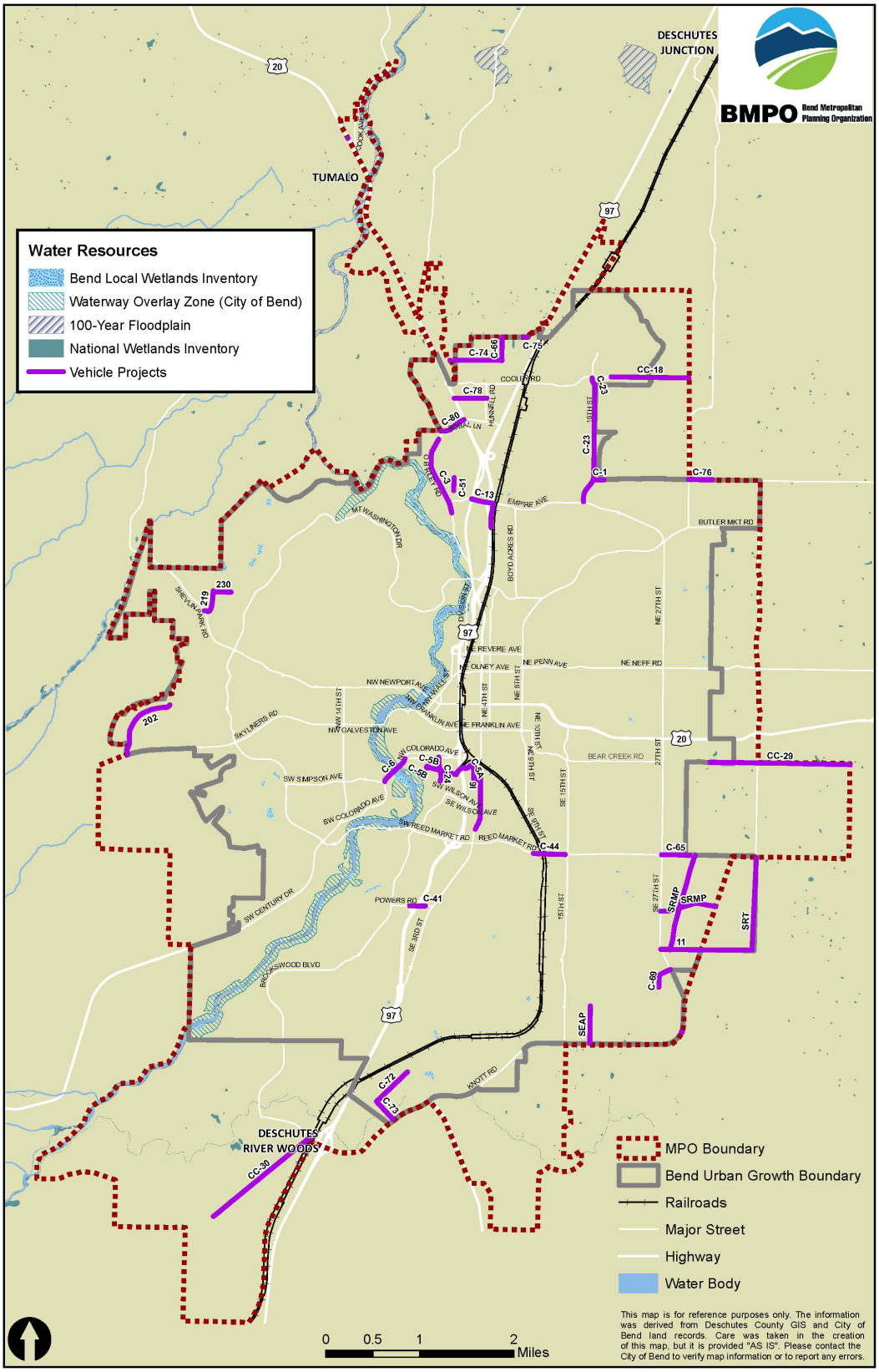
Projects that are located across or adjacent to the river (or potentially irrigation canals) may also require permits from state and federal agencies related to protecting and mitigating impacts to water and natural resources. These agencies can include the OR Division of State Lands, OR DEQ, US Army Corps of Engrs, and others. These projects are also likely to trigger City Waterway Overlay Zone protective requirements (Development Code 2.7.600).

Specific projects that are likely to have direct potential impact to the Deschutes River and therefore trigger ALL of the above requirements:

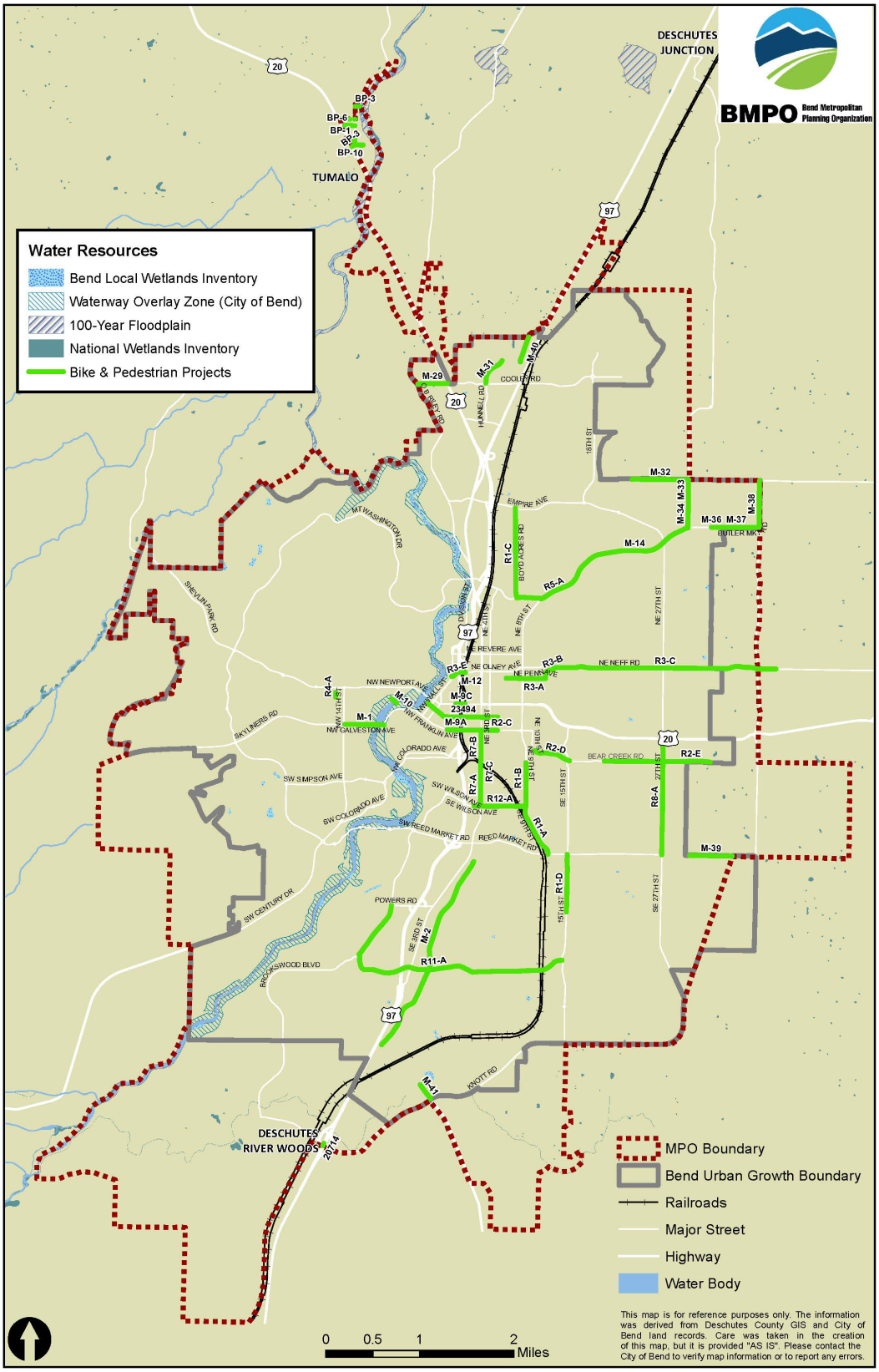
Vehicle Project C-6 (Colorado)
Bike/Ped Projects M1 (Galveston), M10 (Drake Park pedestrian bridge)

Note: It is not clear on the maps which projects may cross irrigation canals (except for a few where the word "canal" is specifically included in the title such as M-34).

Map 1: Water Resources with MTP Vehicle Projects Overlay



Map 2: Water Resources with MTP Bike & Pedestrian Projects Overlay



Fish, Wildlife & Habitat Resources

Threatened and Endangered Species, and Critical Habitat

Under federal law, the USFWS and National Oceanic and Atmospheric Administration (NOAA) share responsibility for implementing the federal Endangered Species Act (ESA) of 1973 (Public Law 93-205, 16 United States Code ([USC[) § 1531), as amended. In general, USFWS has oversight for land and freshwater species and NOAA for marine and anadromous fish species. In addition to information about listed species, the USFWS Oregon Field Office maintains a list of Species of Concern.

Under state law (Oregon Revised Statutes 496.171 to 496.192) the Fish and Wildlife Commission, through the Oregon Department of Fish and Wildlife (ODFW), maintains the list of native wildlife species in Oregon that have been determined to be either threatened or endangered according to criteria set forth by rule (Oregon Administrative Rule [OAR] 635-100-0105). Plant listings are handled through the Oregon Department of Agriculture. Most invertebrate listings are conducted through the Oregon Natural Heritage Program.

Under Oregon's Sensitive Species Rule (OAR 635-100-040), a "sensitive" species classification was created that focuses fish and wildlife management and research activities on species that need conservation attention. Sensitive species are assigned one of two subcategories. "Critical" sensitive species are imperiled with extirpation from a specific geographical area of the state because of small population sizes, habitat loss or degradation, and/or immediate threats. Critical sensitive species may decline to the point of qualifying for threatened or endangered status if conservation actions are not taken. "Vulnerable" sensitive species are facing one or more threats to their populations and/or habitats.

The USFWS maintains "IPaC" (Information for Planning and Consulting), an on-line project planning tool that identifies the location of federally listed species and other resources such as critical habitat which could potentially be affected by various types of activities, including transportation projects. Table 1 contains federal and state status information specific to Bend and the surrounding area for listed species.

Table 1: Threatened, Endangered, and Sensitive Species in or near Bend MPO

Common Name	Category	Federal Status	State Status	Special Needs	Limiting Factors
Northwest Pond Turtle	Reptile	Proposed Threatened	None	Specialized habitats	Habitat loss, predation, road mortality
Gray Wolf	Mammal	Endangered	Delisted	Contained in Oregon Wolf Conservation and Management Plan	Availability of disturbance-free areas
Yellow-billed Cuckoo	Bird	Threatened	Candidate	Riparian habitat	Overgrazing, river flow management
Oregon Spotted Frog	Amphibian	Threatened	Sensitive-Critical	Perennial water bodies with good breeding and overwintering conditions	Predation, competition
Bull Trout	Fish	Threatened	Sensitive	Cool Temps, channel complexity, migratory corridors	Connectivity
Great Basin Redband Trout	Fish	Species of Concern	Sensitive	Migratory corridors, pool habitats	Channelization, water withdrawal, riparian conditions

Source: IPaC, www.oregonconservationstrategy.org, and www.fws.gov/oregonfwo/, accessed January 2024.

Listed Plants

According to Oregon Department of Agriculture mapping, two plant species may be found within the Bend MPO that are listed as federal and state Species of Concern; Howell's thelypody (federal Species of Concern) found in lower elevation river valleys, and Peck's milkvetch (state Species of Concern) found in sage/juniper environments.

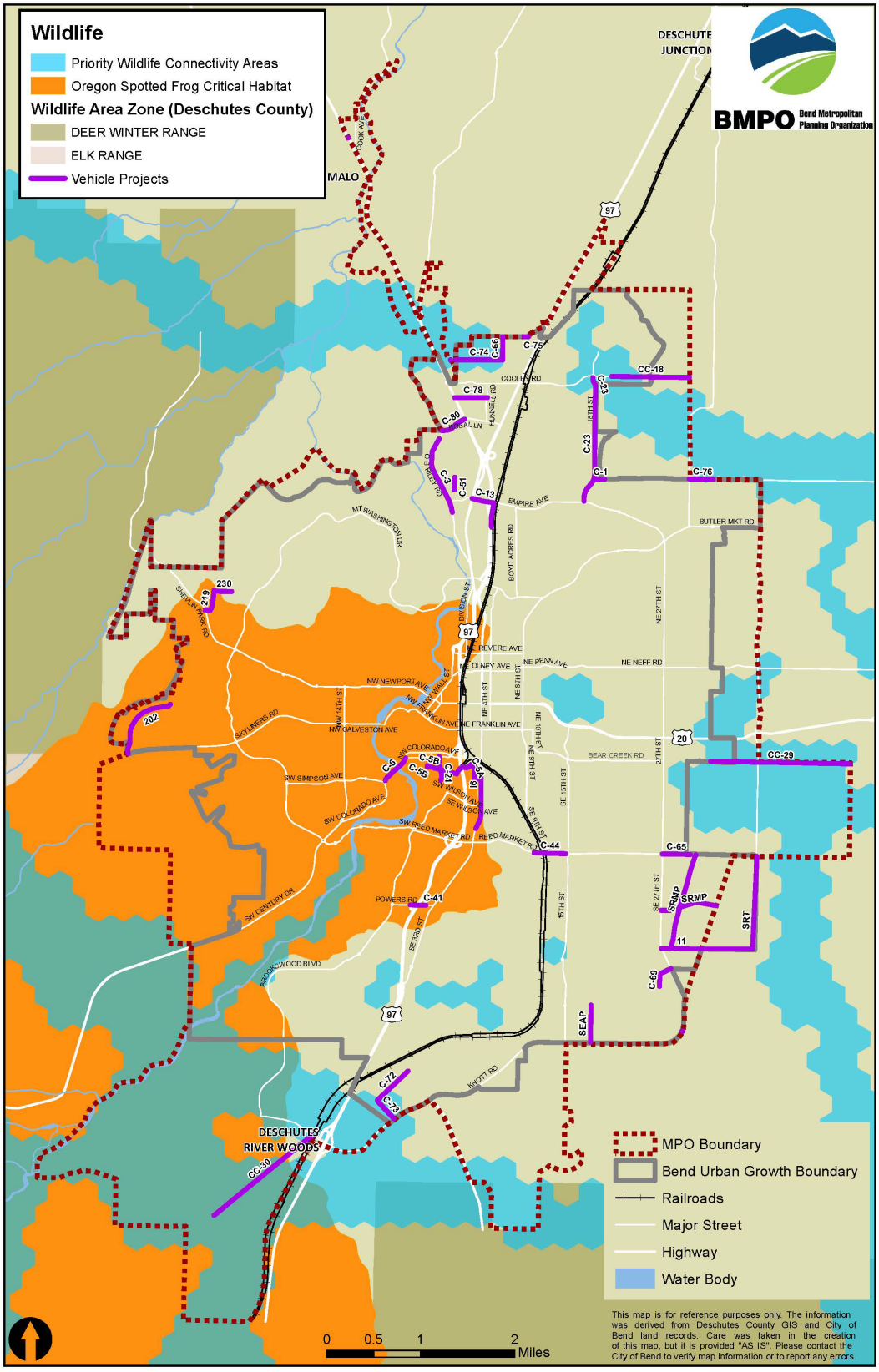
Critical Habitat

In 2016, the USFWS designated critical habitat for the Oregon Spotted Frog under the Endangered Species Act. Maps 3 and 4 show this area along the Deschutes River within the city of Bend, and further south.

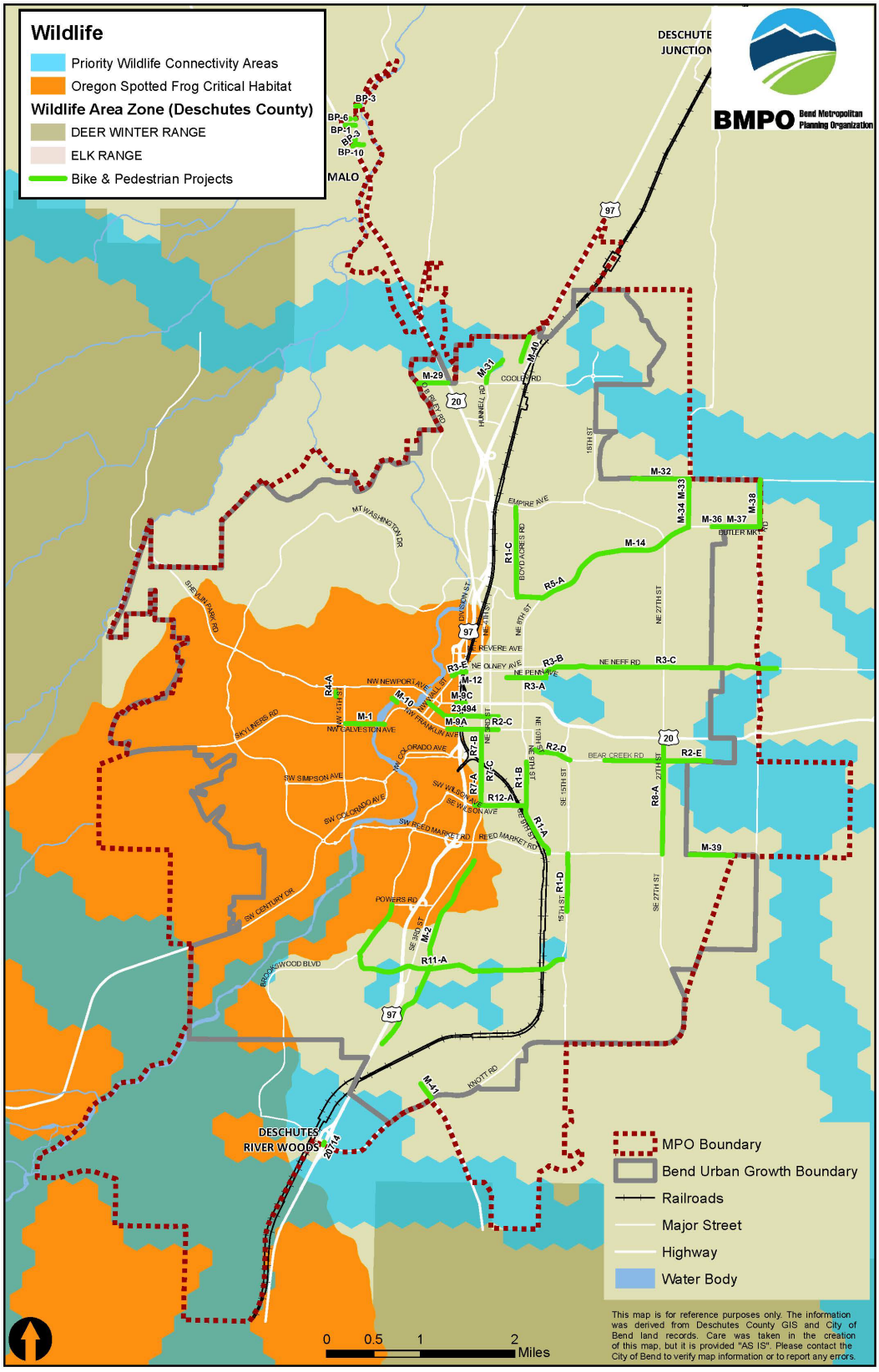
Fish Passage

Many miles of stream habitat in Oregon are not producing fish because of passage barriers, many being road culverts. Maps 5 and 6 show barriers to fish passage in the Bend area as identified by ODFW.

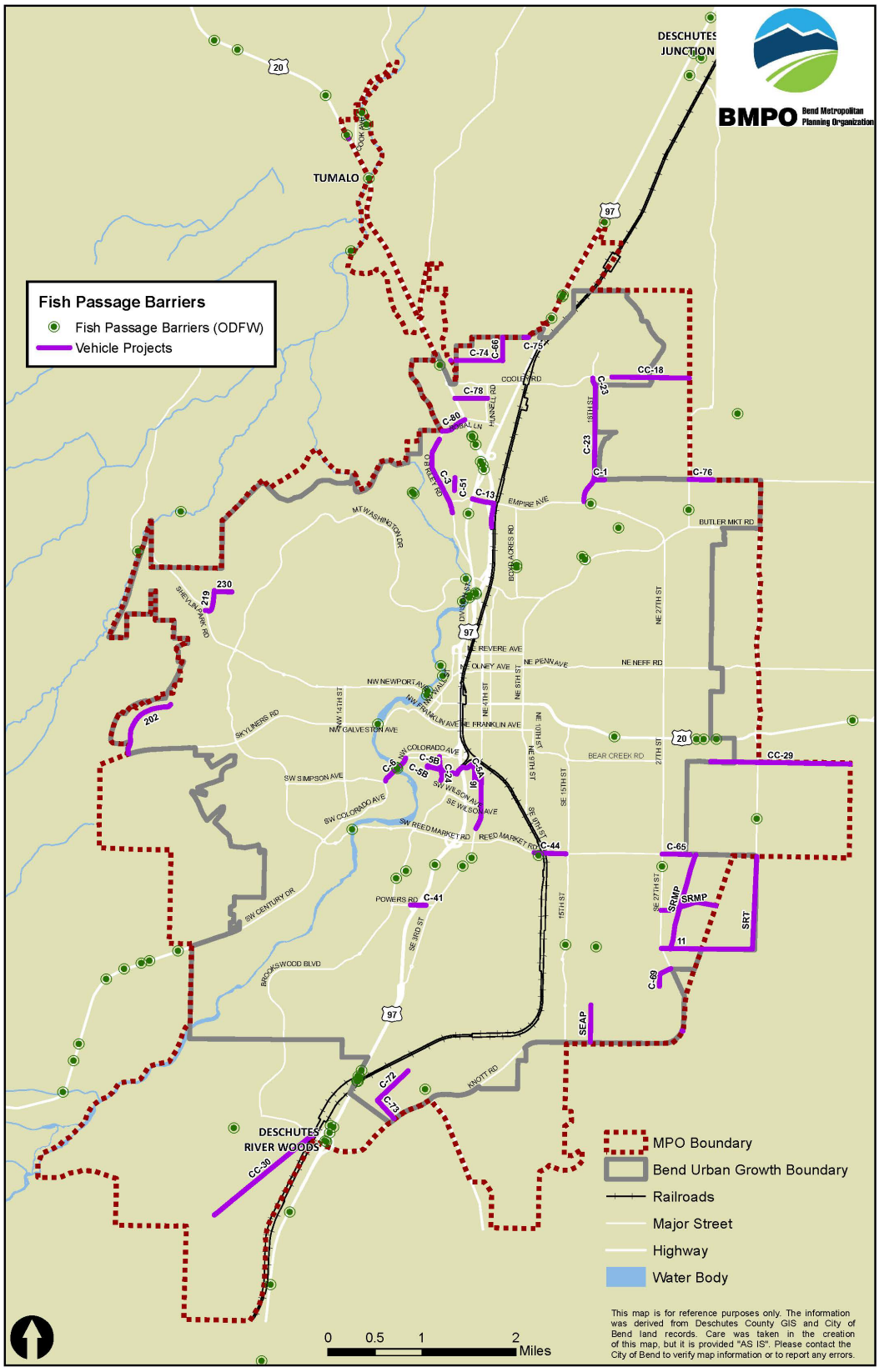
Map 3: Wildlife Habitat with MTP Vehicle Projects Overlay



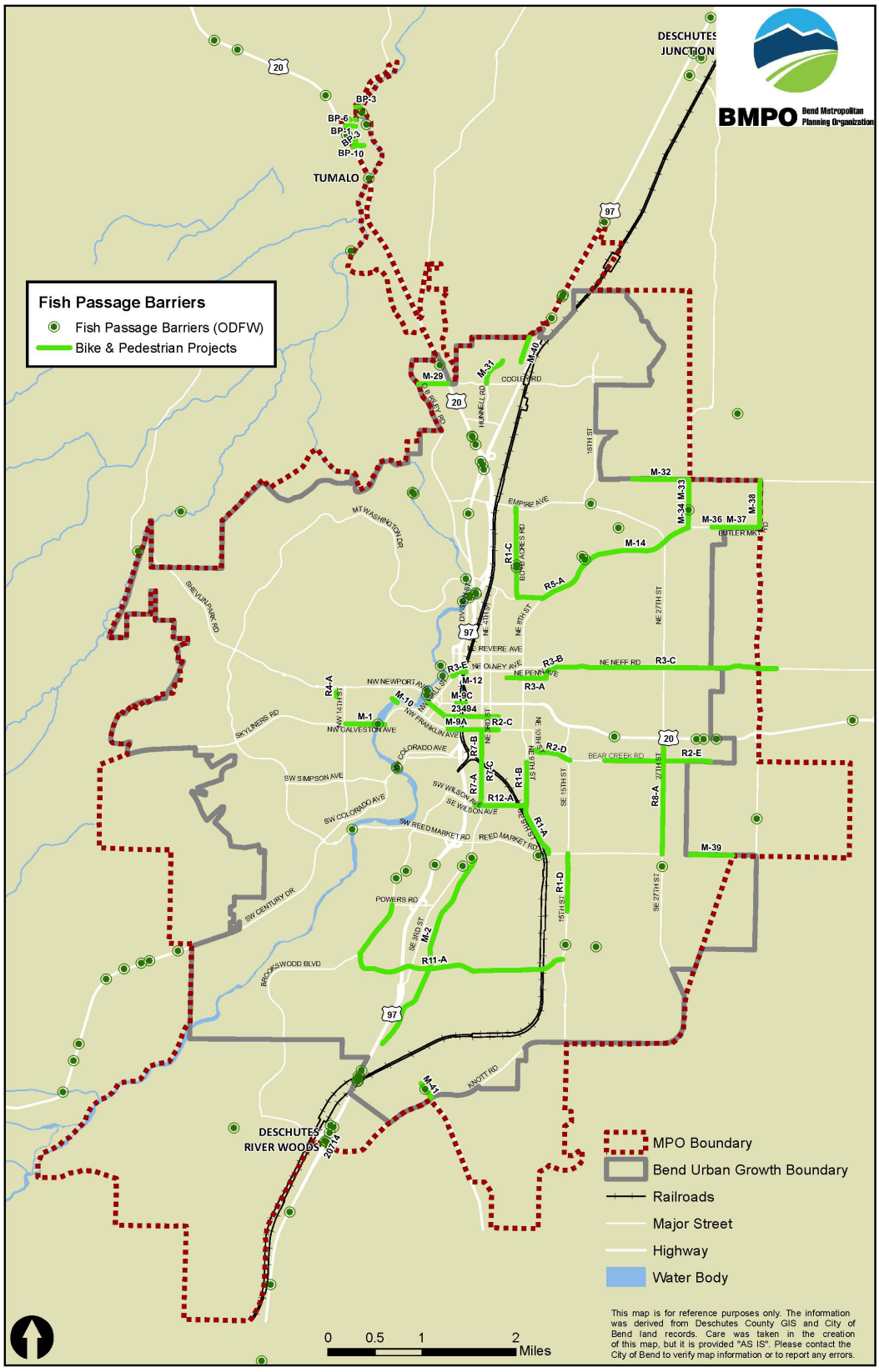
Map 4: Wildlife Habitat with MTP Bike & Pedestrian Projects Overlay



Map 5: Fish Passage Habitat with MTP Vehicle Projects Overlay



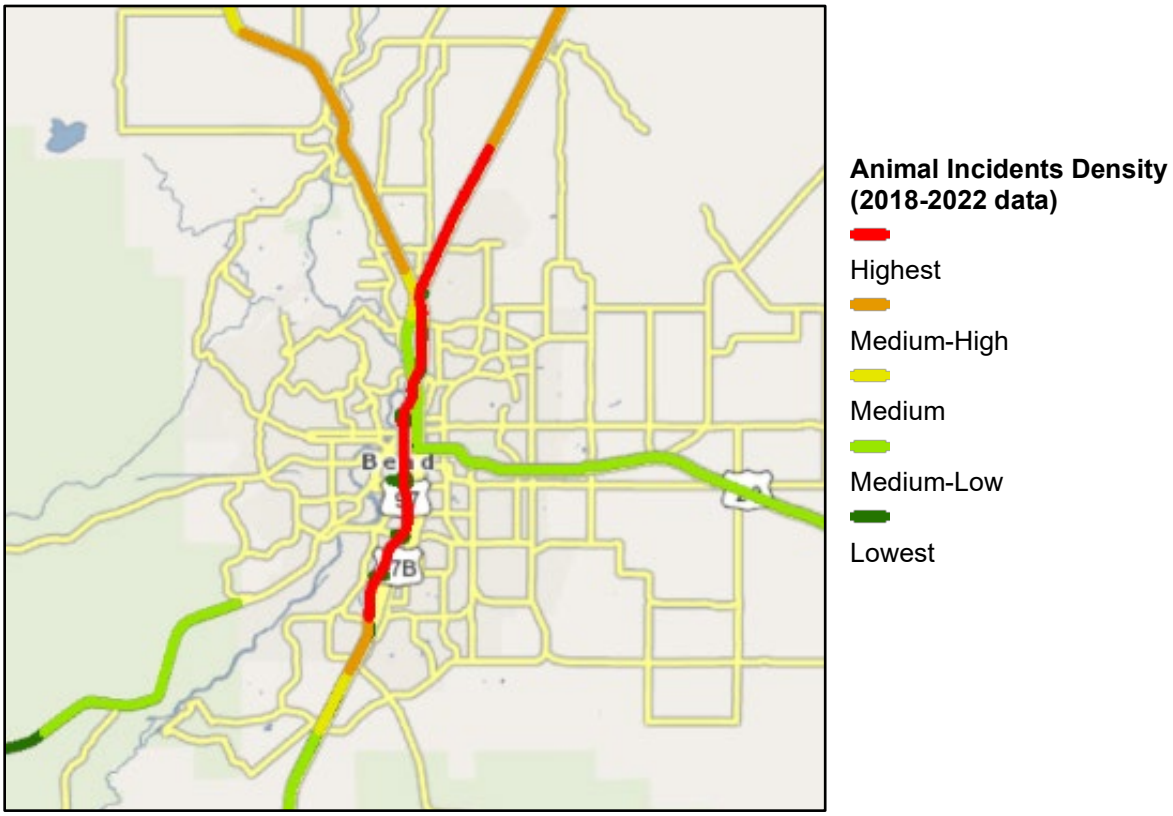
Map 6: Fish Passage Barriers with MTP Bike & Pedestrian Projects Overlay



Wildlife Crossing

Figure 1 identifies animal-vehicle collision densities, also known as hot spots, along state highways in and around the city of Bend. Highway 97 through and just north of Bend falls into the highest density category of animal-vehicle collisions. Note that according to ODOT datasets, on average, over 90% of the animals struck were deer.

Figure 1: Animal-Vehicle Collision Densities (>90% Deer)



Source: ODOT TransGIS, Accessed Feb. 2024

Highway 97 through Deschutes County and Bend includes 50-miles of roadway with portions having been identified as barriers to migrating deer and elk. In 2023, 171 animals (152 deer) were reported killed along this stretch of highway. Collaborative efforts between ODOT and ODFW resulted in the 2012 construction of wildlife passage structures under Highway 97 just a few miles south of Bend. Currently, an ODOT study is being conducted along Highway 20 from Bend to Suttle Lake to determine where future wildlife crossings may be needed.

In 2022, ODFW completed a statewide modeling effort to identify Priority Wildlife Connectivity Areas (PWCA's) throughout Oregon. PWCA's are an interconnected network to help facilitate wildlife movement made up of the following:

- *Regions* – Large, contiguous areas with highest-value habitat for species movement.

- *Connectors* – The best available habitat for facilitating movement from Region to Region.
- *Steppingstones* – Remnant areas of intact habitat within developed areas that may help wildlife movement through urban areas.

PWCA's are shown in Maps 3 and 4.

Protected Areas
City of Bend protects water resources under the designated Waterway Overlay Zone (WOZ), as shown on Maps 1 and 2.

The WOZ includes the following sub-zones, which provide various types of protection:

- *Riparian Corridor* – defines minimum setbacks from Deschutes River and Tumalo Creek and significant wetlands.
- *Deschutes River Corridor Design Review* – design review for building within 100 feet of the river; criteria and process to determine setbacks.
- *River Corridor Areas of Special Interest* – unique areas (primarily rimrock and canyons) with protection criteria.
- *Flood Plain* – criteria and process for development in the floodplain.

The Deschutes County Development Code includes an Open Space and Conservation Zone (Chapter 18.48) which is intended to protect designated areas of scenic and natural resources; to restrict development in areas with fragile, unusual or unique qualities; to protect and improve the quality of the air, water and land resources and to plan development that will conserve open space.

The purpose of the Wildlife Area Combining Zone (Chapter 18.88) is to "conserve important wildlife areas in Deschutes County; to protect an important environmental, social and economic element of the area; and to permit development compatible with the protection of the wildlife resource." This zone provides protection for migrating elk and deer primarily through the type and density of allowed uses. This zone is shown on Maps 3 and 4 as deer and elk range, and migration corridors.

State and Federal Wild and Scenic Rivers are also protected. Please see Scenic Resources on the following pages of this appendix for more information.

Agency Comments (abbreviated) re: MTP Project List and Fish, Wildlife & Habitat Resources (Maps 3-6):

Thanks for including ODFW on this notification. Do to the presence of Redband Trout in the Deschutes River, all of the potential projects that involve new crossings or modification of existing crossings (road or path) of the Deschutes should be reviewed by ODFW for fish passage approval. Please contact Jerry George (CCed here) to confirm the presence of native migratory fish at such locations. These appear to be projects…BikePed: BP-3, M-10, & M-1 Vehicle: C-6.

Air Quality

According to the 2022 Air Quality Monitoring Annual Report from the DEQ, the air pollutants of primary concern in Oregon, because they degrade air most frequently, are:

- PM2.5 and PM10 - fine particulate matter mostly from wood smoke, other combustion sources, cars and dust; and
- ozone.

The EPA identifies transportation (fossil fuel combustion) as the largest source of greenhouse gas (GHG) pollutants and is one of the greatest contributors to smog (ozone-causing pollution). DEQ estimates that transportation is responsible for approximately 38% of Oregon's climate pollution.

National Ambient Air Quality Standards

Under the Clean Air Act, the EPA sets air quality standards and periodically updates the standards to ensure that they are continuously protective of public health. State and local agencies are required to monitor air quality within their jurisdictions and to use their monitoring data as the basis to classify areas as one of the following:

- "Attainment" (meeting the standards)
- "Nonattainment" (not meeting the standards)
- "Unclassifiable" (not enough information to classify)

The EPA recently tightened the PM2.5 standard. With this, the Bend MPO area continues to meet air quality standards and is still classified as an "attainment" area.

Air Quality Index

The Air Quality Index (AQI) is a health index which converts concentrations of pollutants into health levels and is based on data collected from the DEQ's air monitors. Table 2 shows the AQI for the years 2018-2022 for the Bend MPO area, based on fine particulate matter (PM2.5). All four Bend area air quality monitoring sites collect pollutant data for PM2.5 only.

Table 2: 2018-2022 Bend Air Quality Index (based on PM2.5)

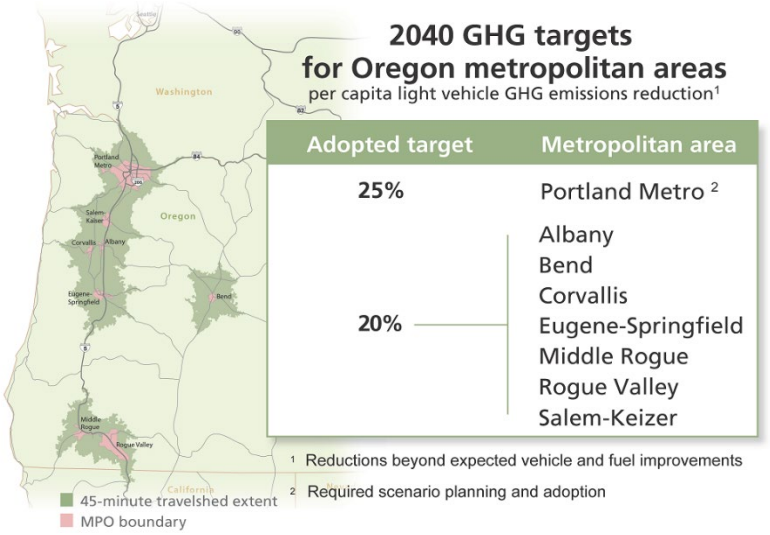
	Good	Moderate	Unhealthy for Sensitive Groups (USG)	Unhealthy	Very Unhealthy	Hazardous		
All Days							**Missing Days**	**Expected Days**
2022	310	50	3	1	1	0	0	365
2021	314	27	9	8	1	1	5	365
2020	320	33	5	0	2	6	0	365
2019	345	13	0	0	0	0	7	365
2018	307	47	5	4	0	0	2	365

Source: 2022 Oregon DEQ Air Quality Annual Report

Nearly 95% of days identified as Unhealthy for Sensitive Groups, Unhealthy, Very Unhealthy, and Hazardous were due to wildfire smoke.

Oregon Greenhouse Gas Reduction Targets
In 2022, the Land Conservation and Development Commission (LCDC) updated Oregon's Transportation Planning Rules (TPR) and related administrative rules, including the Metropolitan GHG Reduction Targets. These rules now require cities and counties located within MPO areas to change their transportation and land use plans to significantly reduce GHG pollution from light vehicles. The 2040 per capita GHG reduction target for the City of Bend is 20% below 1990 levels, as shown in Figure 2.

Figure 2: Greenhouse Gas Reduction Targets for Cities and Counties within Metropolitan Areas



Source: www.oregon.gov, DLCD Climate Change webpage, accessed February 2023.

Additionally in 2022 and associated with the rule updates, the LCDC adopted the Climate Friendly and Equitable Communities (CFEC) Program. The program gives applicable cities and counties a more aggressive path forward to reduce climate pollution, provides more transportation and housing choices, and promotes equitable land use planning outcomes. At the time of this MTP plan update, the City of Bend had recently completed their Climate Friendly Areas Study, with remaining CFEC requirements to be completed by the 2029 deadline.

In 2016, as required by the TPR, the City of Bend developed and adopted the Bend Integrated Land Use and Transportation Plan (ILUTP).

The ILUTP sets standards and policy direction for the Bend area to reduce Vehicle Miles Traveled (VMT), including associated vehicle emissions. Such measures and strategies contained in the ILUTP to reduce VMT (and GHG) include:

- Allowing for additional mixed-use development and up-zoning for infill development
- Expanding opportunities for walking and cycling
- Implementing complete street improvements
- Managing parking more efficiently
- Transit improvements

Scenic Resources

There are significant scenic resources within the Bend MPO. Views of Three Sisters, Mt. Bachelor, Tumalo Mountain and Broken Top along with the Deschutes River are all visible and prominent. Numerous protections exist for scenic resources, including:

- County Landscape Management Zones
- Cascade Lakes National Scenic Byway
- State Scenic Waterway designation
- Federal Wild and Scenic River designation

These designated areas are protected resources with varying levels of requirements that must be taken into account for applicable transportation projects. These areas are identified on Map 7 and described below.

County Landscape Management Combining Zone
The purposes of this zone designation are to maintain and enhance scenic and natural landscapes as seen from designated roads, rivers or streams. The County regulates new structures and landscaping to avoid impacts to scenic views from roads, on rimrock and near rivers. The Zone applies to all areas within ¼ mile of roads within the Zone, in the State Scenic Waterway and the Federal Wild and Scenic River Corridor, and all areas within 660 feet of rivers and streams otherwise identified as landscape management corridors.

National Scenic Byway
The route on Forest Highway 46 between Bend and Highway 58 is designated as the Cascade Lakes National Scenic Byway. It begins with the Tour Route in Drake Park and follows Galveston to 14th Street. The Byway begins at the edge of the UGB on the way to Mt. Bachelor at the Deschutes National Forest boundary, travels through the Cascade Lakes recreation area adjacent to the Three Sisters Wilderness and ends at the junction of Road 61 and Highway 58 near Crescent Lake. There are numerous goals and site design guidelines for the Byway that are contained in the 2018 Corridor Management and Interpretive Plan. It is important to note that the 2018 plan update incorporated elements of the Bend 2030 Community Vision and Action Plan. This resulted in the inclusion of goals and strategies for multi-modal connectivity, stewardship and conservation education through partnerships and dialogue-based collaborative processes, and cultural tourism events with community partners.

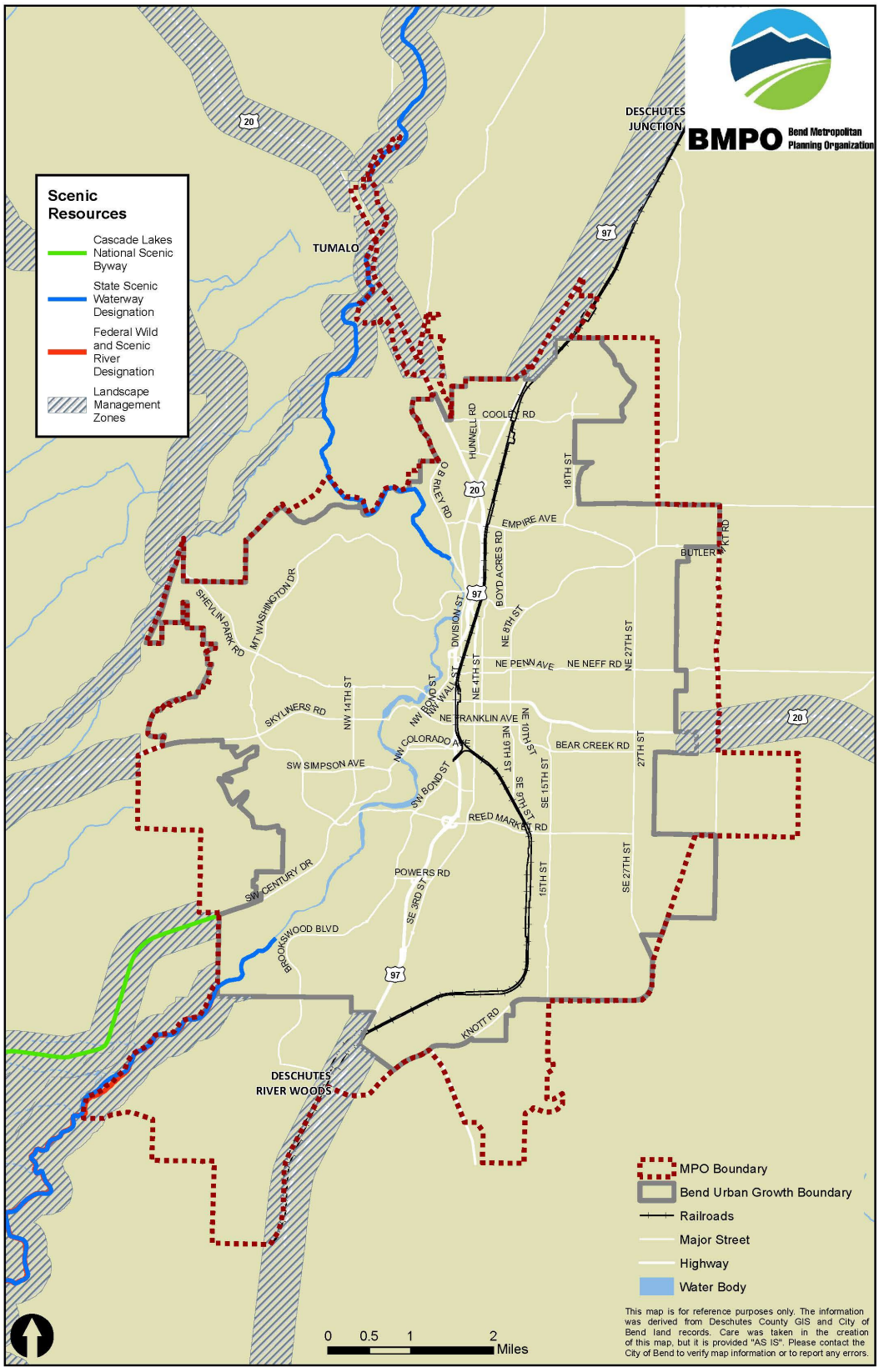
While there are no specific regulations associated with the Byway, it is a nationally and regionally recognized resource as well as a part of Oregon's state scenic byways program. The U.S. Forest Service administers the program, and the Federal Highway Administration (FHWA) administers related grant programs. Grant funds have been secured in the past for projects along the Cascade Lakes National Scenic Byway, such as 2014 construction funds for the Welcome Station, the multi-use path undercrossing and trail connectors. A list of priority projects is provided in the 2018 Corridor Management and Interpretive Plan.

Scenic Waterways and Wild and Scenic River Designation

Of the approximately 14 miles of river within the Bend MPO, about 10.8 miles are designated "scenic". There are two sections of State Scenic Waterway in the Bend MPO – one in the north and the other at the south end – encompassing a total of 8.4 miles (Map 7: Scenic Resources). The south section enters the MPO's southern boundary and ends at the Central Oregon Irrigation District diversion. The north section starts just below the North Unit Dam (near Mt. Washington Drive) and continues through the MPO to the north. Oregon State rules govern the Scenic Waterway program, and The Upper Deschutes Wild and Scenic River and State Scenic Waterway Comprehensive Management Plan contains specific rules that address setbacks, building color, vegetation retention, river crossings, screening and timber harvest for the southern section within a ¼ mile of the designated river sections. Oregon Parks and Recreation Department administers the program.

There is one stretch of National Wild and Scenic River within the Bend MPO that begins just outside the Bend city limits and is about 2.4 miles long. Protection for federal scenic rivers is focused on the "outstandingly remarkable values" that have been identified for the river, including geologic, hydrologic, fishery, vegetative, wildlife, cultural, recreational, and scenic values. Although nearly 30-years old, The Upper Deschutes Wild and Scenic River and State Scenic Waterway Comprehensive Management Plan (1996) identifies goals, standards and guidelines for each of the values. This program has similar goals to the state program but differs in the type of protection offered. The U.S. Forest Service administers this program.

Map 7: Scenic Resources



Historic and Cultural Resources

Historic Resources

Based on the Historic Sites Database from the Oregon State Historic Preservation Office data, there are two National Register of Historic Places Historic Districts in the Bend MPO (Drake Park Historic District and Old Town Historic District). They include 409 properties listed on the National Register of Historic Places and 27 individually listed properties (including the two historic districts). There are also numerous individually designated historic and cultural buildings and sites.

In addition to the listings on the National Register, Bend City Council adopted a list of historic and cultural resources that has been approved by the LCDC. These properties may also be protected by Section 4(f) for transportation projects.

The Bend Landmarks Commission is the review body for projects that may affect a designated cultural or historical site within the city. The City of Bend maintains an interactive Historic Resources Map with details of historic places and districts.

Cultural Resources

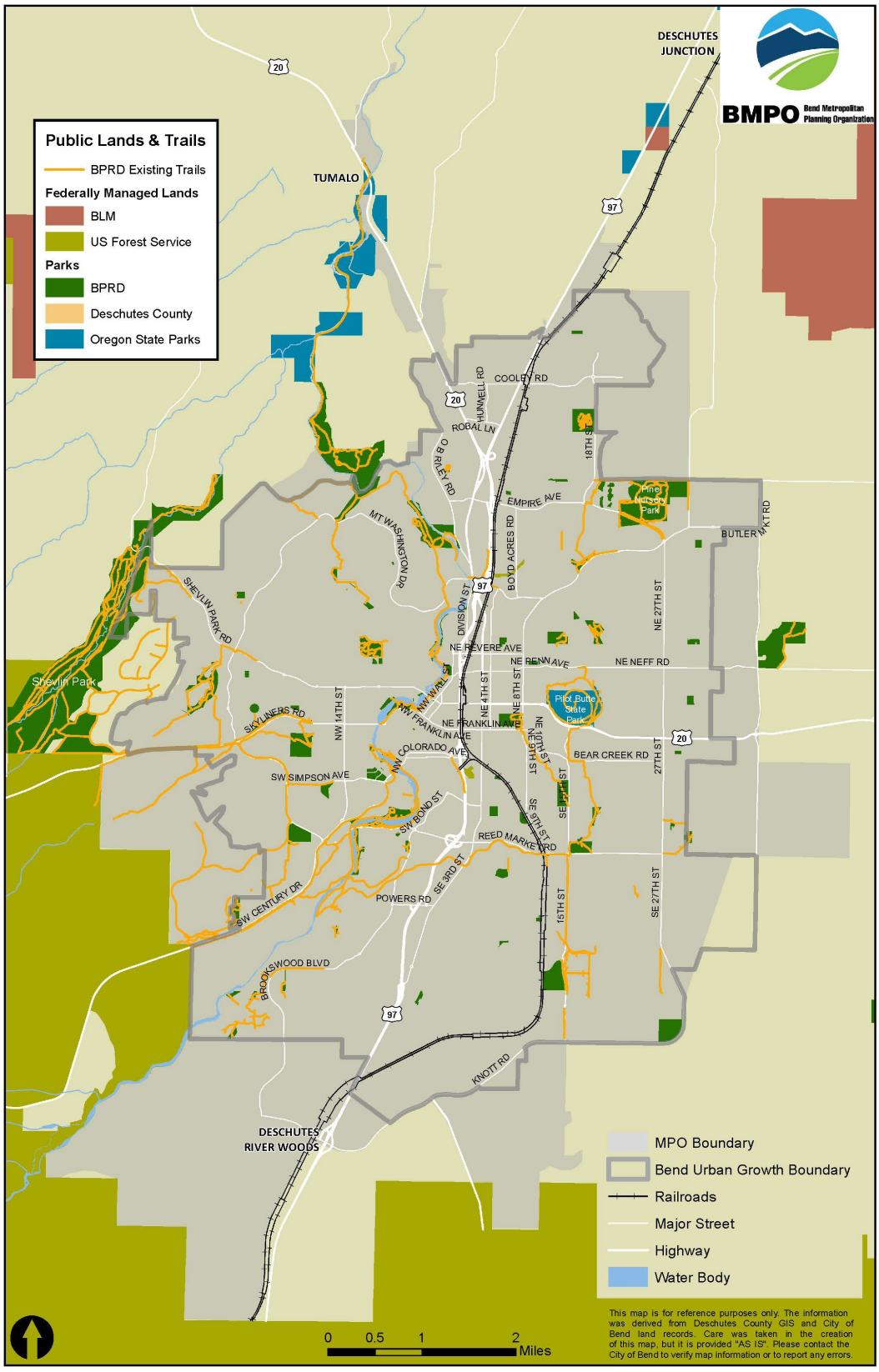
The Confederated Tribes of Warm Springs, the Burns Paiute Tribe and the Klamath Tribe have historic ties to the Bend MPO area. The Bend MPO, ODOT and Deschutes County have tribal consultation processes. The Oregon State Historic Preservation Office (SHPO) maintains a statewide archaeological inventory database; however, due to the sensitivity of the information, access to these records is restricted. A request for review by SHPO would be necessary on a case-by-case basis when specific transportation projects are funded.

Section 4(f)

Section 4(f) refers to the original section within the U.S. Department of Transportation Act of 1966 which provided for consideration of park and recreation lands, wildlife and waterfowl refuges, and historic sites during transportation project development. The law, codified in 49 U.S.C. §303 and 23 U.S.C. §138, applies only to the U.S. Department of Transportation (U.S. DOT) and is implemented by the FHWA and the Federal Transit Administration through the regulation 23 Code of Federal Regulations (CFR) 774.

Section 4(f) properties include significant publicly owned parks, recreation areas and wildlife or waterfowl refuges, or any publicly or privately owned historic site listed or eligible for listing on the National Register of Historic Places. Section 4(f) applies to projects that receive funding from or require approval by an agency of the U.S. DOT. Before approving a project that uses Section 4(f) property, FHWA must determine that there is no feasible and prudent alternative that avoids the Section 4(f) properties and that the project includes all possible planning to minimize harm to the Section 4(f) properties; or FHWA makes a finding that the project has a de minimis impact on the property. Public lands and trails are included in Map 8, and the City of Bend maintains an interactive Historic Resources Map. There are no state or federal wildlife / waterfowl refuges within or near the Bend MPO area.

Map 8: Public Lands and Trails



Recreation Resources

This section is related to the previous Historic and Cultural Resources section and Fish, Wildlife, and Habitat Resources section, since all are provided some protection under Section 4(f) of the U.S. Department of Transportation Act (see Cultural Resources). There are significant recreation resources within the Bend MPO as shown on Map 8.

Various agencies provide park land and facilities in the Bend MPO area, including Oregon Parks and Recreation Department, Deschutes County, and the City of Bend; however, the primary provider of parks and trails is the Bend Parks and Recreation District (BPRD). BPRD currently manages over 80 parks and open spaces, and approximately 70 miles of trail within the Bend MPO. In addition to all the recreation land and facilities within the Bend MPO, the area is surrounded by thousands of acres of land managed by the Bureau of Land Management (BLM) and the Deschutes National Forest. The forest/urban interface lands on Bend's west side are receiving increasing recreation use from Bend's population growth and tourism.

There are two federal acts that provide protection to recreational lands under certain conditions. The provisions for protection are in Section 6(f)(3) of the Land and Water Conservation Fund (LWCF) and in Section 4(f) of the U.S. Department of Transportation Act 1966.

Section 6(f)(3) of the LWCF Act states "No property acquired or developed with assistance under this section shall, without the approval of the Secretary, be converted to other than public outdoor recreation uses. The Secretary shall approve such conversion only if he finds it to be in accord with the then existing comprehensive statewide outdoor recreation plan and only upon such conditions as he deems necessary to assure the substitution of other recreation properties of at least equal fair market value and of reasonably equivalent usefulness and location." This "anti-conversion" requirement applies to all parks and other sites that have been the subject of Land and Water grants of any type, whether for acquisition of parkland, development or rehabilitation of facilities.

There are numerous recreation facilities within the Bend MPO that have been supported by LWCF monies over the years, including the Juniper Swim and Fitness Center, Skyline Sports Complex, and Hollinshead Historical Park as well as numerous smaller community and neighborhood park projects. The LWCF program provides matching grants to states and local governments for the acquisition and development of public outdoor recreation areas and facilities.

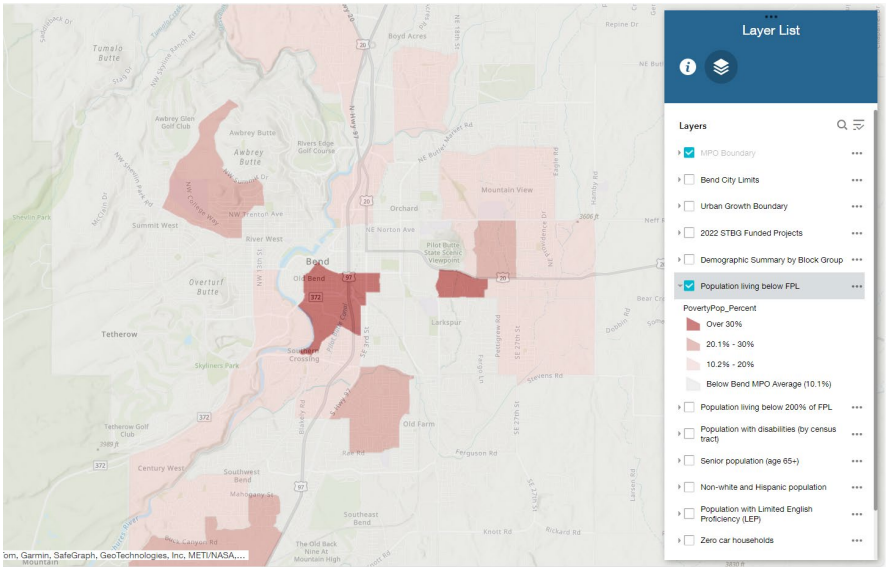
Section 4(f) of the US Department of Transportation Act (described earlier in this section) also provides protection to recreation lands from transportation projects. FHWA projects (federally funded) are prohibited from using land from a publicly owned park or recreation area unless there is no feasible and prudent alternative to the use of land. Section 4(f) does not apply to planned trails if the land for the planned trail is not currently publicly owned. Additional criteria would need to be met for Section 4(f) to apply to any planned trail on publicly owned land.

Environmental Justice

Environmental justice in transportation planning, as required by Executive Order 12898, seeks to avoid, minimize or mitigate disproportionately high or adverse human health and environmental effects, including social and economic effects on minority and low-income populations that could potentially result from transportation projects. This includes disproportionately high and adverse effects on human and environmental health, including social and economic effects for those populations.

The Bend MPO addresses environmental justice in the BMPO Title VI Plan (2019) and contains other related information on its Public Participation & Your Rights webpage, which includes access to the Bend MPO Equity Mapping Tool. This tool uses the most recent data available to identify areas of Bend containing higher than average percentages of Environmental Justice, Title VI, and other historically disadvantaged populations. MTP project locations have been added to the mapping tool and can be displayed relative to the equity-related population data contained in the online tool.

Figure 3: Screenshot of Bend MPO Equity Mapping Tool



Source: www.bendmpo.org

APPENDIX C: EXISTING AND FUTURE NEEDS MEMORANDUM

EXISTING AND FUTURE NEEDS MEMORANDUM

DATE: December 27, 2023

TO: Andrea Napoli & Tyler Deke | Bend MPO

FROM: Emily D'Antonio, Eileen Chai, Kayla Fleskes-Lane, PE & Aaron Berger, PR | DKS Associates

SUBJECT: Bend 2045 MTP Update: Existing and Future Needs Project #24068-000

INTRODUCTION

The purpose of this memo is to document existing and future transportation needs within the Metropolitan Planning Area (MPA) as a part of the Bend Metropolitan Transportation Plan (MTP) update. Building off recently completed local and regional transportation planning efforts, these needs will help to complete and prioritize the MTP Project List, which is intended to address identified needs within the MPA over the next 20 years.

This memorandum contains the following sections:

- **Methodology** – This section documents the methodology for the analysis, which focuses on a review of past planning work, analysis of recent transportation trends, modeling assumptions to support the identification of needs, and changes to future needs based on updates to growth horizon and trends beyond the assumptions used for adopted local plans.
- **Summary of Needs** – This section summarizes the key themes identified throughout this memo that will help identify potential gaps or changes in needs that will then inform the initial MTP project list, which will be initially developed from local adopted plans.
- **Needs for People Walking and Biking** – This section documents existing and future needs for people walking and biking, based on a summary of past planning work and additional analysis to reflect current and future conditions.
- **Needs for People Riding Transit** – This section documents existing and future needs for people riding transit, based on a summary of past planning work and additional analysis to reflect current and future conditions.
- **Needs for People Driving and Freight** – This section documents existing and future needs for people driving and freight, based on a summary of past planning work and additional analysis to reflect current and future conditions.

METHODOLOGY

To support the identification of needs, this memorandum focuses on the breakdown of system needs by mode, separated into the following categories:

- Walking and Biking
- Transit
- Motor Vehicle

Each modal needs section is further refined into the following categories:

- Prior Plan Review
- Recent Trend Analysis
- Updated Future Needs

The following sections describe the methodology used for each of these categories to clearly identify existing and future roadway system needs for the MPA.

PRIOR PLAN REVIEW

Since the last MTP Update, several large planning efforts have been completed and adopted in and around the Bend MPA. These planning efforts provided robust existing conditions and future needs assessment within the Bend MPA. These plans are discussed in more detail below and help inform the needs analysis for each transportation mode:

- **Deschutes County Transportation System Plan (TSP) – Draft (2023)** – The most recent draft was released in August 2023 and adoption is expected before the adoption of this MTP Update. The TSP projects and implementation tasks were informed by technical analyses of existing transportation conditions and forecast year 2040 deficiencies. Existing needs, opportunities, and constraints reflect an inventory of the County transportation system conducted in 2019 and 2020.
- **Deschutes County Transportation Safety Action Plan (TSAP) (2019)** – The Deschutes County TSAP provides a comprehensive multidisciplinary approach to transportation safety in Deschutes County. This plan was adopted in 2019 and examined ODOT crash data for the years 2012-2016. The County was recently awarded funding to update the TSAP, which will include more current crash data.
- **Deschutes County Intelligent Transportation System (ITS) Plan (2020)** – The Deschutes County ITS Plan is an update to the 2011 Deschutes County ITS plan and was adopted in April 2020. The plan was a collaborative effort to implement technology solutions to improve the overall safety and management of the transportation system across the region.
- **Cascades East Transit (CET) Transit Master Plan (2020)** – The 2040 Cascades East Transit Master Plan outlines a framework for providing transit and related services to Central Oregon for the next 20 years (2040), based on 2017 ridership data and needs.
- **Bend Transportation Safety Action Plan (TSAP) (2019)** – The Bend Area TSAP focuses on the area within the Bend Urban Growth Boundary. This plan was adopted in 2019 and examined crash data from ODOT in the years 2012-2016. The City of Bend was recently awarded funding to update the TSAP, which will include more current crash data.
- **Bend Transportation System Plan/Metropolitan Transportation Plan (2020/2019)** – The most recent Bend MTP was adopted in 2019 and the City of Bend TSP was adopted in 2020. Field observations and data collection that informed both plans were conducted in the spring of 2018 and both plans utilized a future forecast year of 2040 to help establish the future needs.

Since the Bend TSP was more recently adopted than the Bend MTP, most of the discussion in this section is focused on the TSP.

- **ODOT Refinement Plans and Studies (varies)** – Since the adoption of the Bend TSP, several large refinement studies along ODOT facilities or adjacent City roadways have also been completed or are currently in progress within the MPA. The needs from the following plans were summarized: US 97/Baker Road Interchange Area Management Plan (IAMP) (on-going), Bend US 20 Facility Plan (on-going), US 97 at Reed Market Road Operations and Safety Study (2023), US 97 Bend North Interchange Study (2022) and US 97 Parkway Plan (2021).
- **Tumalo Community Plan Update (2023)** - appendix to the Deschutes County Comprehensive Plan that includes a Transportation analysis led by DLCD.

All the aforementioned plans outline existing conditions within the study area and the region's present and future needs at the time of their completion. Since most of these planning efforts occurred over three years ago, an analysis of recent (2023) transportation trends was conducted to determine whether the existing needs from these prior planning efforts are still applicable, as discussed in the *Recent Trend Analysis* section below.

RECENT TREND ANALYSIS

As previously mentioned, the last MTP update included an existing conditions analysis based on 2018 transportation conditions. The transportation modal sections later in this memo highlight similarities and changes to the transportation system that have occurred since 2018, utilizing available data in relevance to each mode of transport analyzed. Trend data was obtained from the following sources:

- INRIX probe (speed) data accessed from Regional Integrated Transportation Information System (RITIS).
- Strava Heatmaps – A heat map showing places of high activity based on Strava user (bicyclists) data.
- Automatic Traffic Recorders (ATR) – Permanent sensors that continuously collect the number of vehicles on a roadway.
- Population estimates from American Community Survey 5-year data and Portland State University (PSU) Population Research Center Annual Oregon Population Report.

Unless otherwise noted, the data from these listed data sources compares April 2018 to April 2023, avoiding the need to adjust for the seasonal congestion patterns prevalent in Bend. In general, the transportation trends across the region were found to have remained relatively similar (with a few exceptions) and many of the existing needs from these prior planning efforts are still applicable, as documented in each of the transportation modal needs sections.

UPDATED FUTURE NEEDS

While many of the prior planning efforts included analysis of future transportation needs, future land use growth assumptions have since changed. This memorandum documents the assumptions and findings from the most current update to the Bend-Redmond Model (BRM), a regional travel demand model encompassing both the Bend MPO, the City of Redmond, and a large portion of Deschutes County. The BRM is the key tool used to evaluate future land use and transportation

scenarios. The critical input assumptions used for the BRM to perform the future needs analysis are land use and roadway network. These assumptions are discussed in the subsequent sections.

PRESENT AND FUTURE LAND USE GROWTH

Population estimates and forecasts were examined for Deschutes County, unincorporated areas in the County, and the City of Bend to understand the effect of both the current and future transportation demand on the MPA's transportation system.

Current Land Use Growth

Since 2018, the population of Bend has grown by over 13,000 people (nearly 15%), as shown in Table 1.

TABLE 1: POPULATION ESTIMATES (2018-2022)

	2018[A]	2019	2020[B]	2021	2022	GROWTH 2018-2022
DESCHUTES COUNTY OVERALL	188,980	193,000	199,263	203,916	207,561	18,581 (9.8%)
CITY OF BEND	89,505	91,385	99,453	101,153	102,834	13,329 (14.8%)

A. 2018 & 2019 values were obtained from the Population Research Center at Portland State University 2020 Annual Oregon Population Report Tables published 4/15/2021.

B. 2020-2022 values were obtained from the Population Research Center at Portland State University 2022 Annual Oregon Population Report Tables 4/24/2023.

Year-over-year, PSU population estimates indicate that the City of Bend grew by approximately 2%, except for 2019 to 2020, when the population increased by almost 9%. This change was most likely due to the COVID-19 pandemic, as more jobs switched to remote work environments and Bend became an unintentional work-from-home hub due to its proximity to recreational opportunities.

Future Land Use Growth

The population of both Deschutes County as a whole and the City of Bend is projected to grow significantly by 2045, as shown in Table 2.

TABLE 2: POPULATION FORECAST

AREA	YEAR 2020	YEAR 2045	% GROWTH
DESCHUTES COUNTY OVERALL	198,253	292,443	48%
BEND UGB	99,598	155,806	56%

Source: Chen, C., Sharygin, E., Whyte, M., Loftus, D., Rynerson, C., Alkitkat, H. (2022). Coordinated Population Forecast for Deschutes County, its Urban Growth Boundaries (UGB), and Area Outside UGBs 2022-2072. Population Research Center, Portland State University

Though the population is forecast to grow substantially (nearly 50% between 2020 and 2045), it is no longer growing at a rate as great as was anticipated during the last MTP update. Estimates prepared by the Population Research Center at Portland State University predict the population in Bend to reach 144,365[1] people by 2040 which is a decrease of about 6% compared to previous estimates (153,700) in the last MTP.

Figure 1 highlights the geographic distribution of expected growth in households within the Bend MPA. From 2019 (the BRM base year) to 2045, approximately 32,000 new households are expected to be added within the Bend MPA. Most of this household growth is expected to occur within the City of Bend in the Core Area near downtown, the Southeast Area and in the Stevens Ranch and Stevens Road Tract areas to the east. Some of the largest amounts of housing growth are near the MPO boundaries, the remaining areas of undeveloped land within the Bend UGB.

Employment is also expected to increase within the Bend MPA as more people move to the area, with approximately 34,000 new jobs expected within the City of Bend between 2019 and 2045. Figure 2 highlights the locations of expected growth in employment within the Bend MPA. The forecasted job growth is spread throughout the City of Bend central areas (along 3rd Street and US 97) and the Downtown areas, the recent UGB expansion areas in the south, southeast, and northeast, and around the colleges in the west.

[1] Coordinated Population Forecast 2022-2072: Deschutes County, Population Research Center, Portland State University June 30, 2022

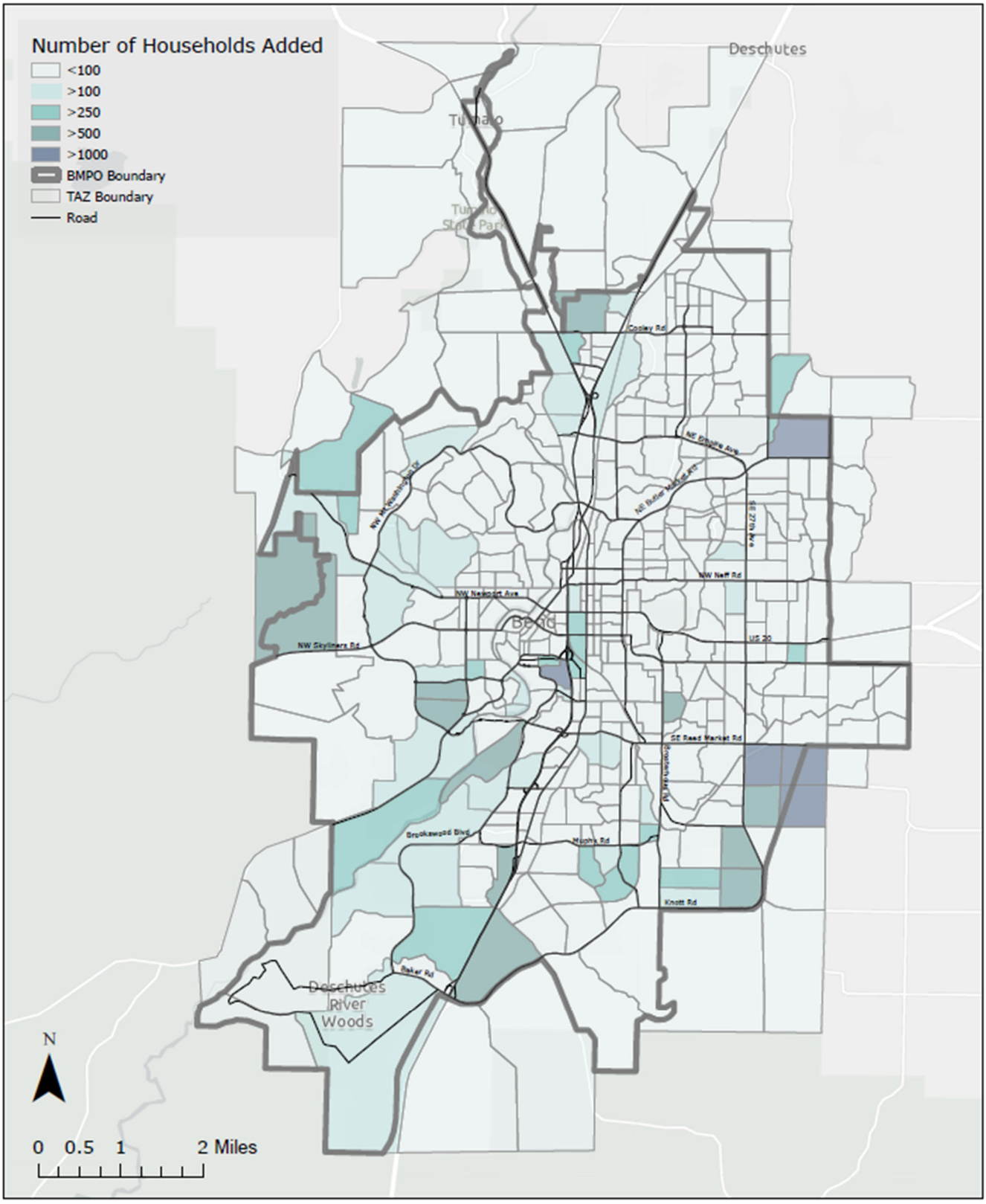


FIGURE 1. PROJECTED HOUSEHOLD GROWTH (2019-2045)

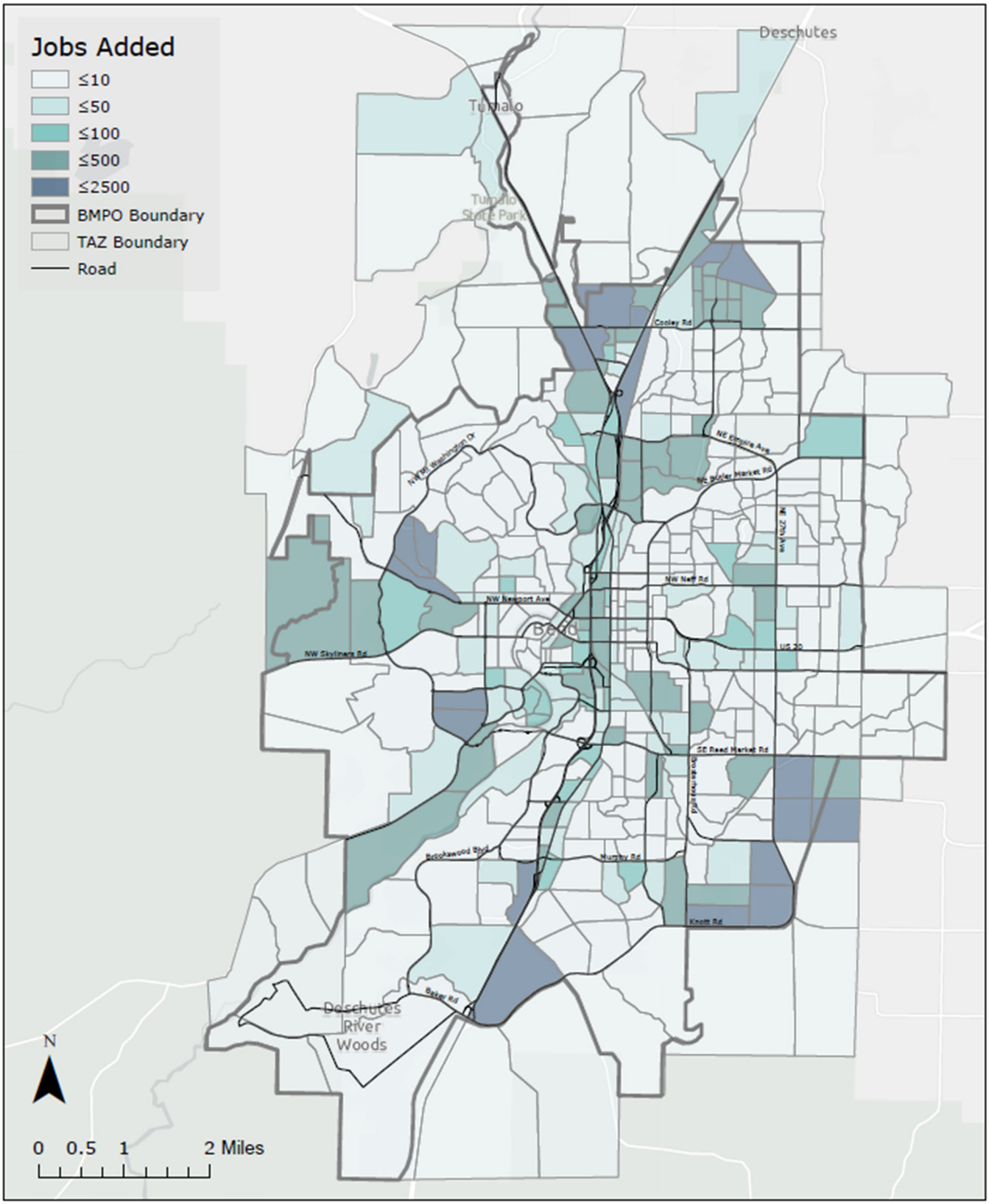


FIGURE 2. PROJECTED EMPLOYMENT GROWTH (2019-2045)

COMMITTED PROJECTS

To better understand the transportation system needs associated with the updated Bend MPA land use forecasts, a baseline 2045 "Committed" roadway network scenario was developed and modeled in the BRM. The Committed scenario assumes that the Bend MPA will experience its projected growth in population and employment and the demand for the transportation facilities will increase accordingly. The Committed roadway network includes projects likely to be constructed withing the next five years that have committed/programmed funding to construct, either through the City of Bend's Capital Improvement Program (CIP), the Oregon Statewide Transportation Improvement Program (STIP), and BMPO Metropolitan Transportation Program (MTIP), or other clearly designated and committed funding sources. The transportation improvements assumed for the 2045 Committed Scenario are shown in Figure 3 and listed in Table 3.

TABLE 3: COMMITTED PROJECT LIST

FORMER PLAN PROJECT ID	PROJECT NAME	PROJECT DESCRIPTION	FUNDING SOURCE
1TNPS	Neff/ Purcell Boulevard	Intersection Capacity and Safety Improvements	Bend CIP
20378	Archie Briggs Road Bridges	Replace bridge with one that meets current standards	Federal
20714	US 97: Multi-Use Trail	Bend to Lava Butte Multi-Use Path	Federal
21756	US 20: Central Oregon Hwy Culverts Corridor	Design right-of-way and utility relocation for a future culvert replacement and repair	Federal
22739	US 97: I-84 to California Border	Install National Electric Vehicle Infrastructure	Federal
22742	US 20: From US101 to the Idaho Border	Install National Electric Vehicle Infrastructure	Federal
22767	Driver Feedback Signs	Install two speed feedback signs on each of the following roads: Alfalfa Market Rd, Burgess Rd, Cline Falls Hwy, Day Rd, Old Bend-Redmond Hwy, Powell Butte Hwy, South Canal Blvd and South Century Dr.	Federal
22774	NE Norton Ave	Installation of bike boulevard along NE Norton Avenue from 4th Street to 12th Street	Federal
22791	US 20: (3rd Street) at Empire	Replace the Traffic signals at the intersection of US 20 at Empire Avenue (planning and design only)	Federal
B-20	US 20 and Cook Avenue	Intersection safety and capacity Improvements	Federal and County

FORMER PLAN PROJECT ID	PROJECT NAME	PROJECT DESCRIPTION	FUNDING SOURCE
B-21	US 20 and Old Bend-Redmond Highway	Intersection safety and capacity improvements	Federal and County
C-2	Purcell Blvd Extension	Purcell Boulevard extension from Full Moon Drive to Jackson Avenue	City CIP
C-5	Aune Road Extension	Aune Road extension from Bond Street to 3rd Street	GO Bond
C-18	US 97 NB On Ramp and SB Off Ramp	Northbound and southbound ramp improvements at Murphy Road	GO Bond
C-22	3rd and Wilson Avenue	Intersection improvements	GO Bond
C-26	US 20 Intersection Safety	Intersection improvements at US 20 and Robal Road and the roadways in the vicinity	Federal, ODOT, City
C-40	US 97 North Pkwy Extension (Phase 2)	Improvements in the US 97 Bend North Corridor Project	Federal, ODOT, City
CET 8	Bend Service Enhancement Plan	Enhancement to Route 8	Federal and ODOT
M-4	Greenwood Avenue and 2nd Street	Intersection improvements	ARTS
23494	Hawthorne Ave Pedestrian and Bike Overcrossing	Shared Use Path between NE 1st and NE 5th Street	ODOT and City
R7-A	Railroad and Wilson Ave	3rd Street crosswalk between railroad and Wilson Ave	GO Bond
R7-B	Railroad and Franklin Ave	3rd Street crosswalk between railroad and Franklin Ave	GO Bond
R7-C	Underpass	3rd Street underpass of railroad	GO Bond
R12-A	Wilson Ave Improvements	Pedestrian and bicycle improvements from 2nd Street to SE 9th Street	GO Bond
RMRP 1A	Reed Market Road and Brookswood Boulevard and Bond Street	Turn lane improvements	City CIP

FORMER PLAN PROJECT ID	PROJECT NAME	PROJECT DESCRIPTION	FUNDING SOURCE
RMRP 2	Reed Market Road and Chamberlain Street	Pedestrian improvements	GO Bond
RMRP 6A	3rd Street and Brosterhous Road	Striping and lighting improvements	City CIP

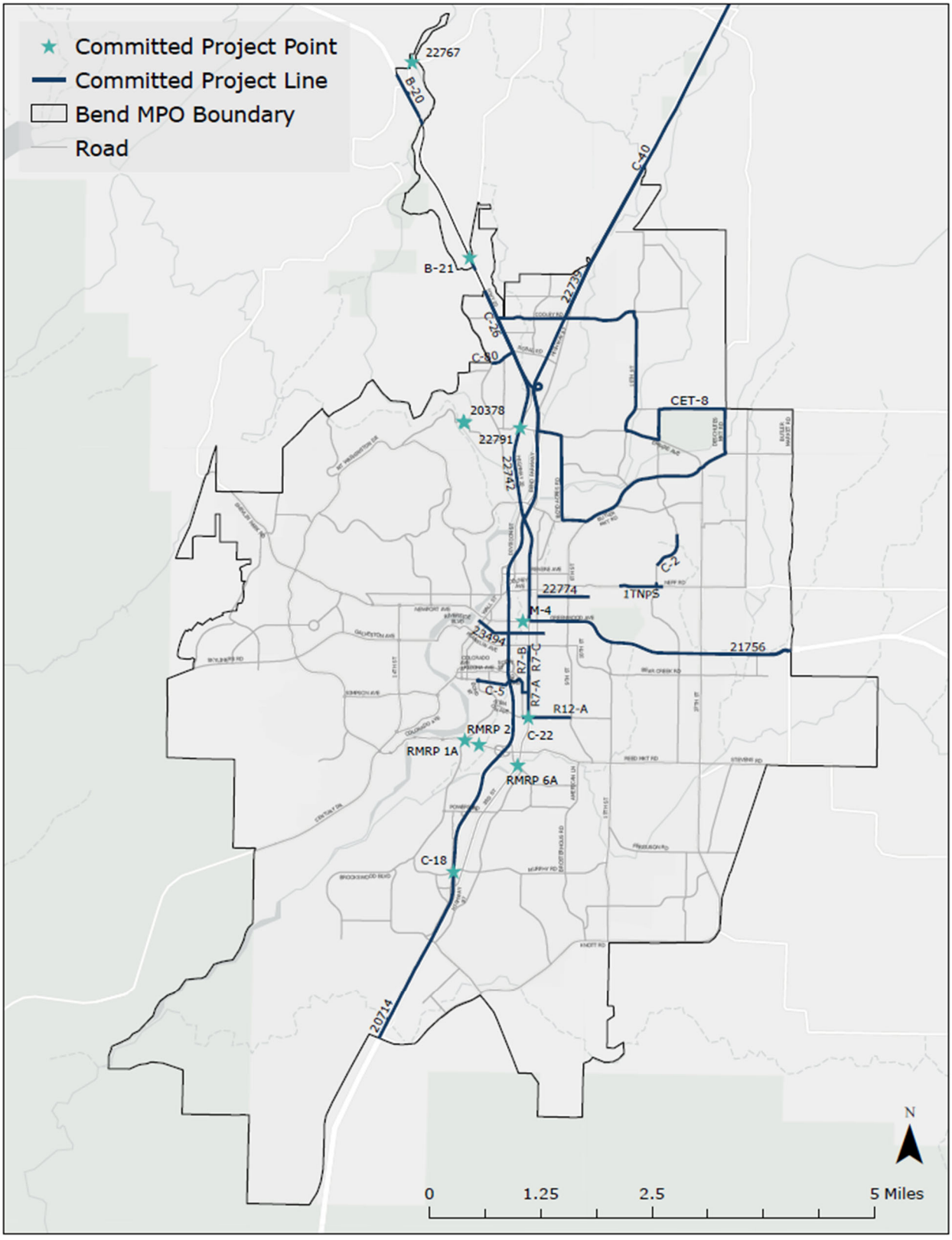


FIGURE 3. COMMITTED PROJECTS

SUMMARY OF NEEDS

Overall, the critical needs identified in the plans reviewed in this memorandum have not significantly changed since the conclusions of these prior efforts, and still include:

- Need for improved intersection safety.
- Need for increased pedestrian and bicycle system quality and connections in Bend and Tumalo
- Need for congestion mitigation, particularly on US 97, major east-west corridors, north-south corridors in Bend, and at nodes where major east-west corridors cross north-south corridors.
- Need to keep up with evolving and emerging technology.
- Increased service coverage and frequency for public transit
- Enhanced coordination between jurisdictions and agencies.

The model used for this analysis is not able to code the quality and safety of active transportation facilities and therefore tends to underrepresent the total number of active transportation and transit trips taken.

More investments in filling sidewalk gaps, both on the outer edges of the Bend MPA, like in Tumalo and Deschutes River Woods, and throughout the City of Bend, are necessary to encourage more walking trips. An increase in protected bicycle infrastructure is also necessary to encourage the participation of those most hesitant towards bicycling. Investing in active transportation and encouraging further mode shift will help to alleviate future vehicle stress on the roadway system, as discussed in more detail in subsequent sections.

For people riding transit, issues related to adequate CET service still exist. Even with the addition of two new routes in the Committed project list, a driver shortage has led to the inability to meet the goals of improved headways as well as Sunday service.

For people driving and freight traffic, while there has been continued investment in transportation within the Bend MPA since the adoption of the last MTP, gaps and strains within the transportation network continue. The City of Bend and Deschutes County projected population growth within the MPA will continue to put more vehicles on the road and transportation users will continue to increase both in the interior and around the edges of the Bend MPA. Roadway networks in these areas will need to be built mindfully to accommodate the increase in vehicle traffic while also allowing for all transportation modes to get to where they need to be.

NEEDS FOR PEOPLE WALKING AND BIKING

A unique characteristic of the Bend MPA is the popularity of walking, running, and biking as compared to similarly sized communities. Needs for improvement of existing bicycle and pedestrian infrastructure (as well as additional infrastructure to create a more complete connected network) will always exist in the area and will continuously evolve. The following sections summarize:

- Needs for people walking and biking identified in prior planning efforts.
- Analysis of recent trends for people walking and biking and whether recent trends change the relevance of needs identified in prior planning efforts.
- Future active transportation needs based on new 2045 land use growth forecasts.

PRIOR PLAN REVIEW – BICYCLE AND PEDESTRIAN NEEDS

DESCHUTES COUNTY TRANSPORTATION SYSTEM PLAN (TSP) (DRAFT 2023)

Tumalo – a smaller, unincorporated community in the Bend MPA – was identified as the area within the county with the highest percentage of youth. Areas like Tumalo do not have dedicated bicycle facilities, and several of the roadways adjacent to schools or other pedestrian trip generators are missing sidewalks.

Providing additional connections within Tumalo for people walking was determined to be a key priority in the TSP, as well as providing regional bicycle connections that could serve broad transportation functions, such as commuting, recreation, or daily services. For example, a major designated bike route within the county is the Twin Bridges Scenic Bikeway. The bikeway exists within the Bend MPA and completely within the county boundaries. The bikeway loops 36 miles from Bend through Central Oregon.

A main issue identified along other County roadways is lack of width for comfortable and convenient connections for people walking and riding bicycles. Many of the County's bikeways and highways do not have paved shoulders that are at least six feet wide. This is standard for ODOT highways, but the County standard for paved shoulders is 3 to 5 feet. County roadways on the fringe of the Bend UGB also do not meet City of Bend standards. Providing shoulders on all County collectors and arterials in the next 20 years is currently not feasible due to constraints such as available right-of-way, environmental issues, property impacts, and the high costs to construct them. Many designated bikeways and highways do not currently have a wide enough paved shoulder to meet these requirements, including within the Bend MPA.

DESCHUTES COUNTY TRANSPORTATION SAFETY ACTION PLAN (TSAP) (2019)

Pedestrian crashes constitute a relatively low share of overall crashes in Deschutes County. However, when pedestrians are involved in crashes, the results are more likely to be severe than in crashes involving only vehicles. On the County system, four moderate-injury pedestrian crashes were reported between 2012 and 2016. Of those crashes, two occurred within the Bend MPA. One pedestrian crash occurred at the intersection of Baker Road and Riverwoods Drive in the Deschutes River Woods community. Another occurred near the intersection of US 97 and Bowery Lane.

Bicyclists also represent a vulnerable segment of the road user population. Bicyclist crashes accounted for less than 1% of total crashes in the county and approximately 3% of fatal/incapacitating crashes. Fifteen bicyclist crashes were reported on county facilities between 2012 and 2016. These fifteen crashes each resulted in some level of injury, four of which (27%) resulted in an incapacitating injury. Six of the fifteen occurred in the Bend MPA–two of which resulted in serious injury. The locations of serious injury crashes were at the intersection of NW Shelvin Park Road and the Fremont Road Trail, and the intersection of Cheyenne Road and Cherokee Road.

Of intersections that were identified as Top Sites for Safety Improvement, only US20/ Ward Road/ Hamby Road was an intersection with a pedestrian or bicyclist crash; however, since this crash data was collected a roundabout with enhanced bicycle and pedestrian infrastructure has been installed at this intersection.

BEND TRANSPORTATION SYSTEM PLAN (TSP) (2020)

An issue identified in the Bend TSP is that existing topographic constraints and the built environment limit the scope and scale of continuous, low-stress bicycle and pedestrian facilities in the city. Bend has also continued to grow over the past decades and the annexed areas generally lack complete urban streets and connected grid systems. Some neighborhoods had a relatively high proportion of arterials and collectors without sidewalks, such as southwest and southeast Bend. In addition:

- 22% of arterials and collectors were missing sidewalks completely.
- 18% of arterials and collectors had no dedicated bicycle facilities.
- Of the 82% of arterials and collectors that had dedicated bicycle facilities, more than half lacked separation/buffers for those facilities.

Some key corridors in the core of Bend lack dedicated bicycle facilities, including sections of 3rd Street, 4th Street, Greenwood Avenue, and Hawthorne Avenue. The fringes of Bend within the MPA also have gaps in the bicycle network. Injuries and fatal crashes involving pedestrians and cyclists were clustered along higher-speed, higher-volume roadways, and multi-lane roadways lacking enhanced crossings where there were no dedicated facilities.

As documented in Appendix B of the Bend TSP, several safety issues were identified. Crash data was analyzed for the years 2011-2016 and key findings from the analysis included:

- 66 crashes involved pedestrians and seven resulted in a pedestrian fatality. Three fatal crashes occurred on US 20 between Butler Market Road and Revere Avenue, and one fatal crash occurred on 4th Street between Butler Market Road and Revere Avenue. The other three fatal crashes occurred closer to the fringes of the MPO boundaries on SE 3rd, NE 27th, and US 97.
- There were 139 vehicle-bicycle crashes during the period and of those crashes, two were fatalities.

BEND TRANSPORTATION SAFETY ACTION PLAN (TSAP) (2019)

The Bend TSAP examined crash data from 2012-2016. In that period 50 crashes involved a pedestrian and 112 involved a bicyclist. Twelve pedestrian crashes and eight bicycle crashes

resulted in serious or fatal injury. Of the locations where vulnerable road user crashes occurred, the 3rd Street & Butler Market Road/ Mount Washington Drive area, and the 3rd Street near Miller Avenue were provided projects for safety improvement.

ODOT REFINEMENT PLANS AND STUDIES

One of the key needs for people walking and biking identified in the US 97 Parkway Plan, Baker Road IAMP and the US 97 Reed Market Road Operations and Safety Study was the lack of low-stress walking and biking crossings of US 97 through Bend. Grade-separated crossings are generally far apart (>1,000 feet) and typically do not include low-stress facilities. In addition, the US 97 Parkway Plan identified the need for low-stress walking and biking routes parallel to US 97. The Bend US 20 Facility Plan also identified the need to improve conditions for people walking and biking along US 20 through Bend.

TUMALO COMMUNITY PLAN UPDATE (2023)

This plan indicated a continued need for sidewalk infill, ADA improvements related to potential future transit connections, traffic calming measures, and improved pedestrian crossings within the unincorporated community of Tumalo.

The active transportation analysis found safety needs at the Cline Falls Hwy and Tumalo Road Intersection. It also found gaps in pedestrian connectivity along Bruce Avenue, the 4th Street to Fitness Trail dirt path and Wharton Avenue. Additional needs identified were a formalized Tumalo Walking Loop to promote physical fitness and a Tumalo to Tumalo State Park Trail.

RECENT ACTIVE TRANSPORTATION TREND ANALYSIS

The City of Bend has five pedestrian and bicyclist counters under its jurisdiction. These counters are on Colorado Avenue, Franklin Avenue, Galveston Avenue, Newport Avenue, and Portland Avenue. All counters are located on bridges where the roads cross the Deschutes River except for the one at Franklin Avenue, which is located on the rail undercrossing. Data was obtained for April 2018 and April 2023.

Table 4 highlights trends at counters that were not broken or unavailable. In these locations, pedestrian and bicyclist activities primarily exhibited an upward trend. Anecdotally, e-bike usage in Bend has also increased since 2018. E-bikes allow users to travel further distances at faster speeds. The increased popularity of e-bikes is something that should be considered in project and plan development.

TABLE 4: DAILY AVERAGE PEDESTRIAN AND BICYCLIST COUNTS

LOCATION	2018		2023		CHANGE	
	Pedestrian	Bicyclist	Pedestrian	Bicyclist	Pedestrian	Bicyclist
FRANKLIN AVENUE	116	74	99	86	-15%*	16%
COLORADO AVENUE	45	45	63	41	40%	-9%*
GALVESTON AVENUE	355	92	450	131	27%	42%

Source: Data obtained for the month of April 2018 and 2023 from the City of Bend automatic recorders.

**Decrease could be due to issues with the automatic recorder.*

In addition to pedestrian and bicyclist counters, Strava can be used to identify locations of higher pedestrian and bicyclist activity. Strava is a service that allows users to track their physical exercise within an app. Users must have a smartphone, tend to have higher incomes, and their trips are generally recreational. The heat maps show areas of high activity based on a year's worth of aggregated user data, which is updated monthly.

Figure 4 and Figure 5 display this data below. Areas in white represent corridors with relatively higher levels of activity and dark blue areas represent relatively lower levels of activity. Looking at heat maps produced by Strava, most pedestrian and bicyclist activity today occurs near the downtown area and along the river. More activity occurs on the west side of the river than on the east.

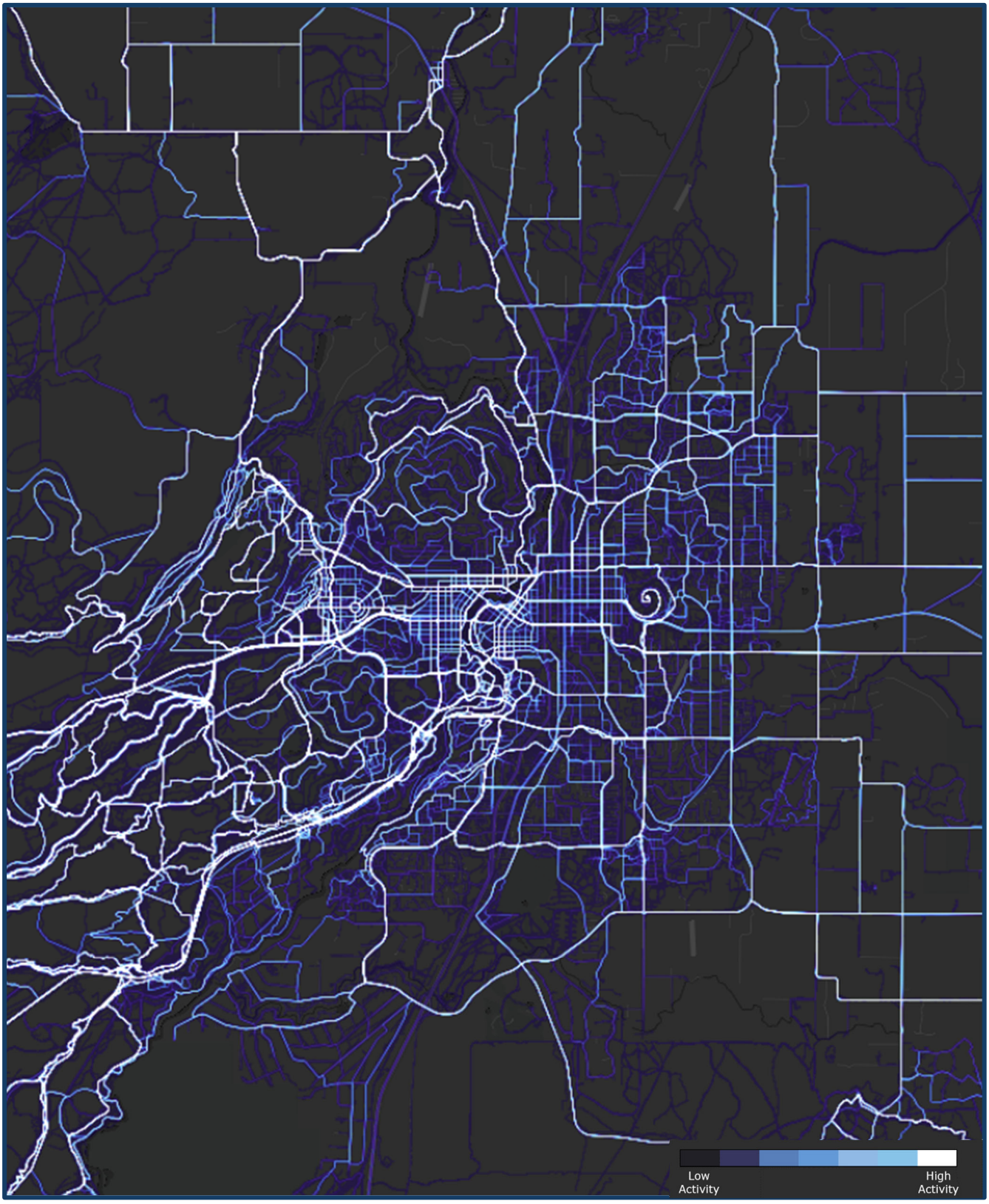


FIGURE 4: BICYCLE HEAT MAP

Source: Strava User Data 2022-2023 Retrieved November 2023

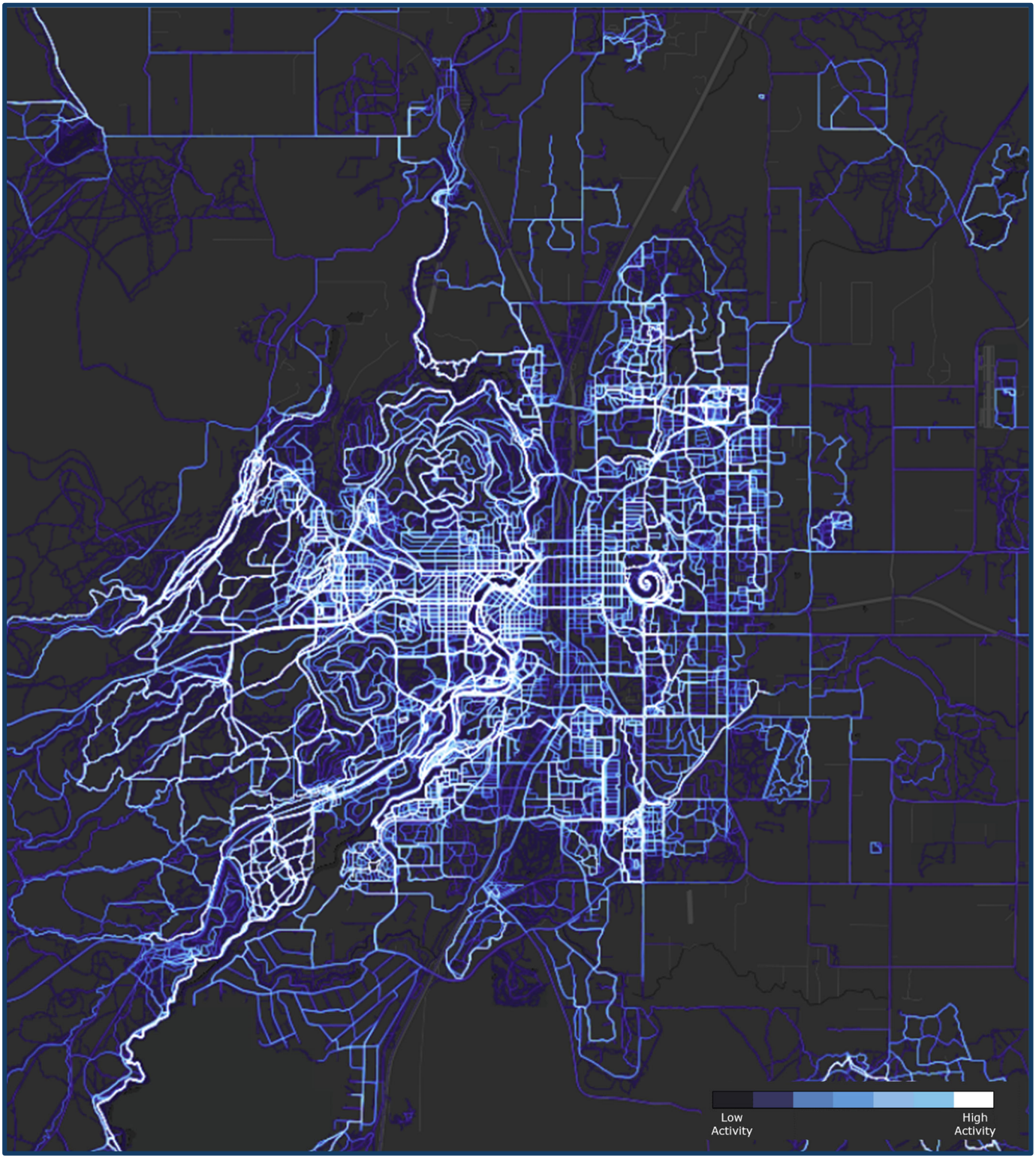


FIGURE 5: PEDESTRIAN HEAT MAP

Source: Strava User Data 2022-2023 Retrieved November 2023

Since the adoption of the TSP, the City has prioritized implementing pedestrian and bicycle facilities, including:

- Completion of the Neighborhood Greenways in 2020, which consisted of three phases and had the goal of providing safer connections, reducing traffic speeds, and helping people cross busy streets.
- In 2022, the City completed a feasibility study to identify improvement opportunities at three locations (Greenwood Avenue, Franklin Avenue, and Second Street). The construction of improvements at those three study locations is set to begin in 2024. The completion of these projects will improve both safety and east-west connectivity in the central core area of Bend.
- In 2023, the City developed a Pedestrian Network Implementation Plan to determine the areas of greatest need and prioritize sidewalk infill and improvement projects needed to create a complete pedestrian network and low stress facilities.
- The City is currently in the design process with funds allocated to construct pedestrian and bicyclist improvements along Olney Avenue, Bear Creek Road, 27th Street, and the Aune Street Extension, including key crossings along 3rd Street.
- The City is also in the process of designing two new crosstown bikeways (one east-west and one north-south route) that will provide a continuous connection for people walking and biking across Bend.

While the City is making significant investments in active transportation infrastructure, many of the needs from the TSP remain and the continued demand for active transportation over the past several years further emphasizes the need for improvements.

UPDATED FUTURE ACTIVE TRANSPORTATION NEEDS

As housing and employment growth continues (particularly dense, mixed-use developments), the demand for walking and biking trips is expected to increase if agencies within the MPA continue to invest in walking and biking infrastructure. Additionally, e-bike usage has continued to increase in Bend based on anecdotal accounts. Nationally, e-bike sales in the U.S have grown by over 300% between 2019 and 2021[2], and it is anticipated that e-bikes could be used for a continually growing number of trips in the future.

Two measures to help understand walking and biking demand were evaluated using the BRM:

- **Mode split**– Mode split provides a quantitative measure of how projects/programs shift trips between walking, biking, transit, and auto trips. A higher percentage of non-single occupancy vehicle (non-SOV) trips also has the potential to reduce congestion, improve air quality, and livability.
- **Vehicle demand on Key Routes**– The City of Bend designated Key Walking and Bicycling Routes (Key Routes) in its TSP. These routes will have dedicated investment in bicycle and pedestrian infrastructure to improve the connectedness of the network as a whole and increase the number of Low-Stress miles for bicyclists and pedestrians. Key Routes with significant

[2] Toll, Micha. Feb 2022. *US electrical bicycle sales tracking toward one million annually, global market heading to $40B with a 'B', https://electrek.co/2022/02/08/us-electric-bicycle-sales-tracking-towards-1-million-annually-global-market-heading-to-40b-with-a-b/*

increases in motor vehicle travel demand (and potentially an increase in the level of stress experienced by people walking and biking) were identified in the BRM. Note that the BRM generally only includes collector and arterial roadways, so there is no data associated with some lower-classification routes.

MODE SPLIT

To understand future active transportation demand, mode split in the 2045 Committed scenario was compared to the 2019 Base Year scenario. Table 5 shows the change in the number of active transportation trips between the two scenarios.

TABLE 5: CHANGE IN DAILY ACTIVE TRANSPORTATION TRIPS

MODE	2019 BASE	2045 COMMITTED	% CHANGE
PEDESTRIAN	10.2%	11.9%	1.6%
BICYCLE	3.4%	3.4%	0%

Even with limited investment in improved pedestrian and bicycle infrastructure through the Committed project list, a significant increase in demand for walking and biking modes still exists, indicating that many of the current active transportation needs are expected to continue into the future.

VEHICLE DEMAND ON KEY ROUTES

In 2045, the expected increase in population will yield additional vehicle trips taken. Ideally, these vehicle trips would not occur on Key Routes, helping reduce the level of stress for people walking and biking. Figure 6 shows the change in daily vehicle volumes along designated Key Routes.

The Key Route with the largest increase in daily traffic volumes is along SE 27th Street between US 20 and Ferguson Road. This segment of 27th street does not yet have needed safety features such as left turn lanes, illumination, and safe crossings for cyclists and pedestrians. The on-going Bear Creek Road & 27th Street project is designing improvements along SE 27th Street, although funding has not been identified to bring the roadway up to City standards and additional walking and biking enhancements will likely be needed. SE 15th Avenue, Murphy Road, SE Wilson Avenue, and SW Century Drive are all also projected to experience increases of between 1,000 and 5,000 in daily vehicle trips.

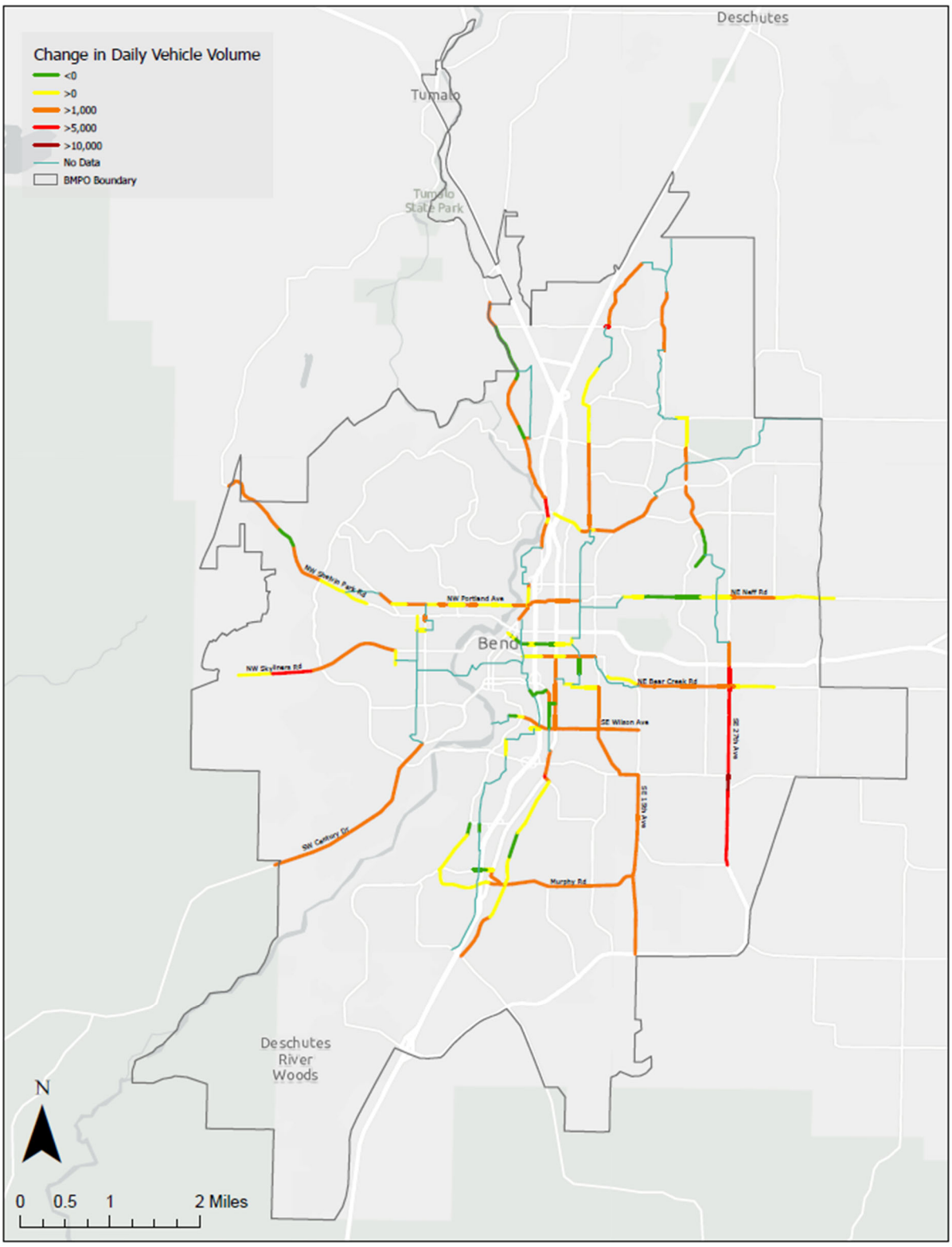


FIGURE 6: CHANGE IN DAILY VEHICLE VOLUME (2019-2045) ALONG DESIGNATED KEY WALKING AND BIKING ROUTES

NEEDS FOR PEOPLE RIDING TRANSIT

The main public transit provider within the Bend MPA is Cascades East Transit (CET), although several other providers provide service to areas outside of Central Oregon. CET is operated by the Central Oregon Intergovernmental Council (COIC) and has coverage primarily in Central Oregon with routes in Bend, La Pine, Madras, Prineville, Redmond, Sisters, and Warm Springs. The following sections summarize:

- Needs for people riding transit identified in prior planning efforts.
- Analysis of recent trends for people taking transit and whether recent trends change the relevance of needs identified in prior planning efforts.
- Future transit needs based on new 2045 land use growth forecasts.

PRIOR PLAN REVIEW – TRANSIT NEEDS

CASCADES EAST TRANSIT (CET) TRANSIT MASTER PLAN (2020)

Service Provided

There were nine fixed service routes within the City of Bend at the time of the existing conditions analysis for the CET Transit Master Plan in 2020 (Routes 1, 2, 3, 4, 5, 6, 7, 10, and 11). The existing conditions analysis was based on 2017 ridership data. Headways for these routes ranged from as short as 30 minutes to as long as 60 minutes. Routes 24, 29 and 30 provided connections to neighboring cities outside of Bend. Route 24 between Redmond and Bend had the highest ridership and the highest revenue hours of those routes at the time.

CET also offers Bend Dial-a-Ride, a complementary paratransit service for disabled individuals and low-income senior citizens who do not live near CET fixed-route bus service. Most trips for the service are between locations in downtown and east Bend.

To help reduce congestion related to recreational traffic, CET offered a variety of recreational shuttle services in 2017. These included Ride the River, the Mt. Bachelor Winter Shuttle, and the Lava Butte Shuttle. Since the adoption of the plan in 2020, a Mt. Bachelor Summer Shuttle has been added. Ride the River decreases the need for riders to park vehicles adjacent to Drake Park; the Mt. Bachelor Winter Shuttle offers a shuttle service in the winter season from Bend to Mt. Bachelor; and the Lava Butte shuttle transports riders to the top of Lava Butte. Recreational shuttle service ranges from three to nine dollars for a round-trip fare.

System Performance

Relative to the population it serves, the amount of service CET provided in 2018 is average for both rural and urban peers, according to the analysis performed in Technical Memo #1 of the CET Transit Master Plan. Routes were individually analyzed based on ridership data from October 2018. Ridership per capita and productivity were also close to the middle of the rural providers, but at the low end when compared to urban providers. Routes 1,3,4 and 7 had the highest ridership and productivity when compared to the other routes. High ridership on these routes is in line with the top five destination zones.

For routes that connect Bend with outer cities, Route 24 connecting Redmond to Bend saw the highest ridership on the first trip to Bend from Redmond (6:37 a.m.) and the 2:23 p.m. trip to Redmond. Afternoon trips, particularly to Redmond, tend to run late on the route. This could be representative of Redmond residents coming to Bend for the day for either work or leisure activities, then returning home.

Route 29, which connects Bend and Sisters, had low ridership. Service for the route started in February of 2017. Before the start of the service, there was no direct connection between Bend and Sisters. Performing outreach to determine the cause of low ridership was recommended.

Route 30, which connects La Pine and Bend also had low ridership. The potential to improve access to the route in La Pine and revaluation of the possibility of servicing Sun River was noted.

Lack of control of rail traffic from the BNSF railway tends to cause delays during the p.m. peak, which was seen throughout most routes. It was also noted that routes with 45-minute headways cause difficulty for system users to transfer and connect to other routes at Hawthorne Station, especially with the potential for delay.

Transit Master Plan Needs

The following transit service needs were highlighted in the plan.

- **Fixed Route Service Needs:**
  - More frequent routes on North and South 3rd Street and Greenwood Avenue.
  - Frequent fixed-route transit service added to north of Greenwood Road, east of Pilot Butte, along NE 27th Avenue, downtown, Old (Central) Bend, and western Bend along Newport Avenue
  - More service coverage in Bend, especially the NE and SE Bend and St. Charles area.
  - More connections to Old Mill, one of the area's major centers for employment, shopping, and recreation.
  - More direct connections to downtown from the east side.
  - Addition of limited Sunday service and early evening service.
  - 30-minute headways for Saturday service on select routes.
  - Extended Saturday service hours for fixed route service.
  - Exploring moving from a spoke-and-hub model to a multi-centric model to lessen the transit impact at Hawthorne Station and reduce dependency on transfers.
  - More frequent service between Bend and Redmond
  - Increased service on Saturdays and during the evening for regional service
  - Vanpools to dispersed employment sites
- **Recreational Service Needs (Routes where CET should expand its recreational services):**
  - Sunriver
  - Black Butte Ranch
  - High Desert Museum
  - OSU Cascades

- Smith Rock
- Popular Central Oregon Sno-parks
- Mt. Bachelor and Cascades Lakes

- **Capital Needs:**
  - Additional peak buses for Routes 1, 4, and 7
  - A new short route to downtown Bend
  - Fare payment configuration to create additional fare payment options
- **Technology Needs**
  - Transit Signal Priority for all corridors on the primary transit network in Bend
  - Automated stop announcements and displays on buses
  - Upgraded communication equipment for drivers and operations staff
  - One app/platform for fare payment and trip planning
  - Upgraded and/ or replaced computer-aided dispatch/ AVL software and equipment
  - Real-time arrival information at bus stops
  - Improved Dial-A-Ride dispatch/scheduling system

DESCHUTES COUNTY TRANSPORTATION SYSTEM PLAN (TSP) (DRAFT 2023)

The Deschutes County TSP calls out the previously discussed masterplan and commits to continuing to partner on transit projects that serve the community within its boundaries.

DESCHUTES COUNTY INTELLIGENT TRANSPORTATION SYSTEMS (ITS) PLAN (2020)

The Deschutes County ITS Plan highlighted key transit ITS elements deployed by CET. These elements included:

- A Google Maps-based online trip planner
- A transit mobile app providing trip planning and real-time arrival predictions
- Automatic vehicle location installed on vehicles fleetwide and integrated with the computer-aided dispatch system
- An electronic fare collection system using TouchPass, a contactless smart card with mobile app support (CET has gone fare-free for fixed routes but still collects fares for recreational shuttle services)

At the time, OSU-Cascades operated Ride Bend, a pilot on-demand app-based transit service, available for use by everyone.

BEND TRANSPORTATION SYSTEM PLAN (TSP) (2020)

At the time of the TSP, the following transit service needs in Bend were identified:

- Lack of public transit options to the airport
- Limited transit service in the outer section of the City/MPA
- Lack of transit service on Sundays

- Limited inter-city and regional service
- No fixed transit service for close-in communities of Tumalo and Deschutes River Woods
- Fewer than half of the arterials and collectors within ¼ mile of a transit stop had sidewalks on at least one side of the roadway or dedicated bicycle facilities.

Congestion also impacted the operations of transit service in Bend. Motor vehicle congestion at key locations on US 20, US 97, 27th Street, and east-west bridge crossings impacted transit service reliability during the p.m. peak hour. Colorado Avenue/Simpson Avenue and Brookswood Boulevard/Reed Market Road were two roundabouts that also impacted transit service reliability during the p.m. peak hour.

The TSP was completed before the previously discussed CET Transit Master Plan. To ensure a coordinated set of infrastructure recommendations, the City and CET collaborated throughout the planning process to reflect the current and future vision for transit service within the community.

TUMALO COMMUNITY PLAN UPDATE (DRAFT 2023)

The CET masterplan identified a stop in Tumalo as a new addition to Route 29 as part of the 2040 Master Plan. The CET vehicle for this new connection in Tumalo would be a Ford Transit van, which has a maximum capacity of 8 people. The CET stop must be ADA accessible and connect to a sidewalk network. The plan suggested adding the stop on Bruce Avenue between 7th Street and the Tumalo Community Church or the Tumalo Country Store.

RECENT TRANSIT TRENDS ANALYSIS

Since the adoption of the CET Transit Master Plan, fixed route and on-demand services went fare-free during the COVID-19 pandemic in 2020 and have remained fare-free since. CET now contracts with Umo Mobility for electronic fares on recreational routes. CET also launched Passio Go, which shows all active fixed-route buses in the Cascades East Transit Network.

Route 10 was suspended in September 2021 due to driver shortages. In response, Route 11 was switched from 1 hour to 30-minute headways. Overall, fixed route service was disrupted in 2020 due to the COVID-19 pandemic and driver shortages, but as of April 30, 2023, 30-minute weekday frequencies have returned to routes 1, 3, 7, and 11. All other routes continue to have 45-minute headways. The addition of Route 9 occurred in October 2023, which serves southeast Bend along 15th Street and Murphy Road. There are also plans for the addition of Route 8 to serve the northeast area of Bend, running along 18th Street and Butler Market Road depending on bus driver recruitment. Driver shortages continue to be the largest strain on CET operations today, affecting the ability to increase headways or add Sunday service for the fixed-route system.

Routes still operate out of Hawthorne Station on a hub and spoke method. Since the adoption of the Deschutes County ITS plan, CET has created a system for users to see real-time bus positioning which was identified in the needs section of the ITS plan.

UPDATED FUTURE TRANSIT NEEDS

As housing and employment growth continues (particularly dense, mixed-use developments), the demand for transit trips is expected to increase. To help understand this future demand, the change in transit trips were evaluated using the BRM. To understand future transit needs, the 2045 Committed scenario was compared to the 2019 Base scenario. The increase in the number of transit trips is shown in Table 6. The investment in transit within the Committed Project List shows there will be an increase in transit trips. This is due, in part, to two transit lines added to the Committed scenario in comparison to the 2019 scenario, and also to expected housing and employment growth in areas with existing transit service. The addition of new lines increases the transit coverage for both northeast and southeast Bend as shown in Figure 7.

TABLE 6: CHANGE IN DAILY TRANSIT TRIPS

MODE	2019 BASE	2045 COMMITTED	% CHANGE
TRANSIT DEMAND	700	1,200	71%
PARK AND RIDE TRIPS	100	200	100%
WALK TO BUS TRIPS	700	1,100	57%

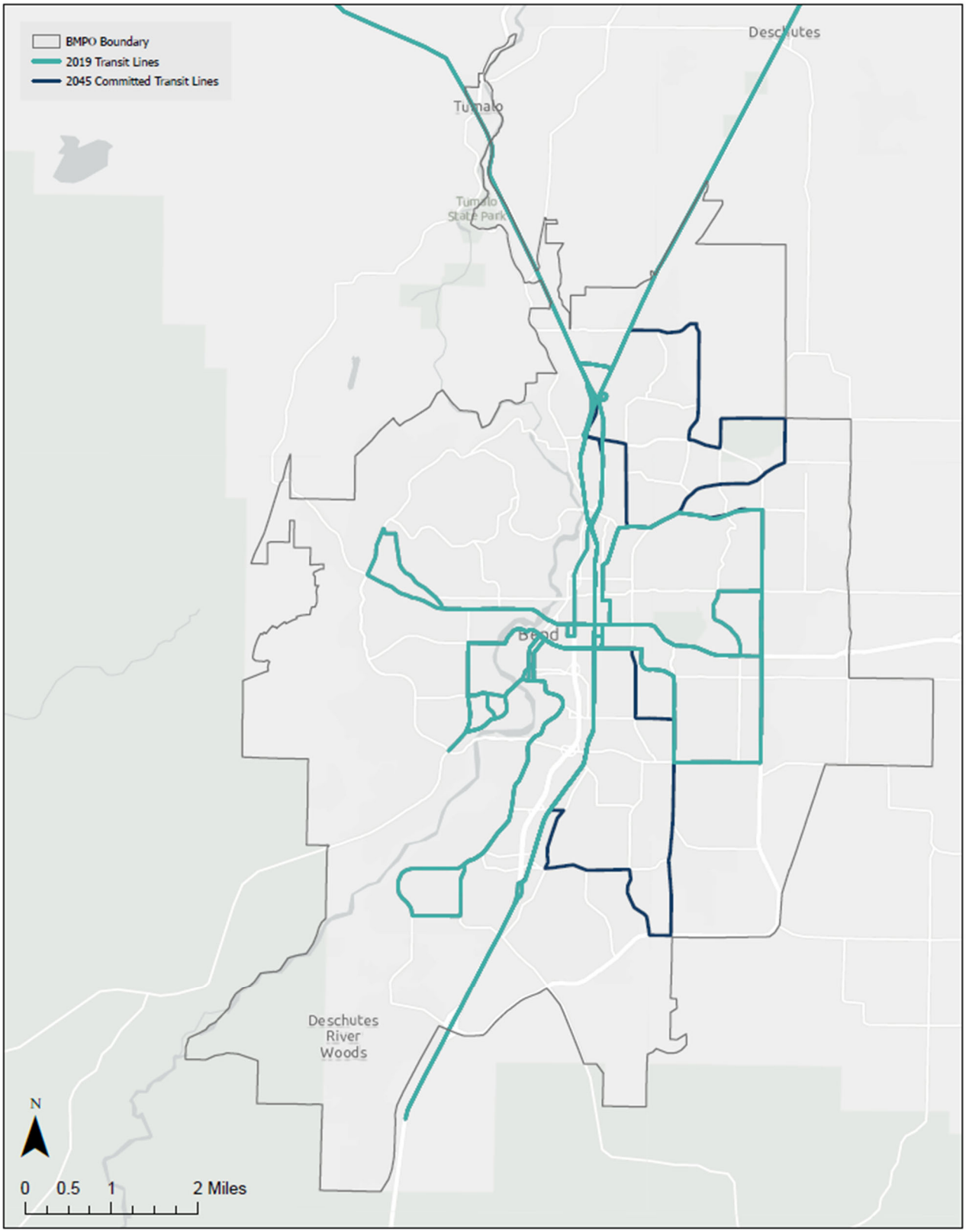


FIGURE 7: CHANGE IN BEND MPA TRANSIT NETWORK 2019-2045

NEEDS FOR PEOPLE DRIVING

One of the most common ways to get around the Bend MPA is by motor vehicle. Proximity to popular recreational opportunities, as well as constrained geography cause various stresses on the region's motor vehicle system, creating congestion and delays. This section summarizes the motor vehicle needs for the Bend MPA and is organized as follows:

- Review of motor vehicle needs identified in recently completed planning efforts within the MPA, with a focus on key themes and system and corridor level findings.
- Recent motor vehicle traffic trends since the adoption of the latest MTP update, including congestion changes, trip pattern changes, and corridor specific changes.
- Updated future motor vehicle needs based on the new 2045 Horizon year and updated land use forecasts for the MPA.

PRIOR PLAN REVIEW – MOTOR VEHICLE NEEDS

DESCHUTES COUNTY TSP (DRAFT 2023)

According to the Deschutes County TSP, roadway repairs are and will continue to be monitored and accomplished as part of the County's ongoing maintenance programs. No roadway capacity deficiencies within the Bend MPA were identified under existing conditions.

The County does not have any designated freight routes that provide connections to local industrial and employment lands with the Bend MPA. A need was identified to designate County freight routes to serve key economic priority areas to supplement the ODOT freight system.

An outcome of the TSP is to identify key intersections where the roadway geometry and/or traffic control could be changed in the future to address known safety and/or anticipated capacity needs. Another goal is to prioritize strategic roadway corridors where vehicular capacity and/or changes to the roadway characteristics may be needed to support future growth and economic development in the region, enhance the safety of all users, and strengthen connections between areas of the County and other areas in Central Oregon.

Additionally, functional reclassification is a key intended outcome of the County TSP to improve consistency between the County, ODOT and incorporated communities. The County's functional classification system provides a system hierarchy based on the intended function of each type of roadway. Improving functional classification can help support future growth and economic development in the region as well as enhance the safety of all users and strengthen connections between areas of the County and to other areas in Central Oregon.

DESCHUTES COUNTY TSAP (2019)

Between 2012 and 2016, 174 reported crashes within unincorporated Deschutes County resulted in fatal or incapacitating injuries. According to the TSAP, the County experienced increasing crash frequency from 2012 to 2016. Four intersections identified as top sites for safety improvement were called out in the plan that were also within the Bend MPA. They were identified based on

equivalent property damage only performance measures. These intersection locations are described as follows:

- Ward Road and Bear Creek Road
- Ward Road and US 20
- US 20 and Old Bend Redmond Highway
- US 20 and O.B. Riley Road

A concept was developed for the Ward and Bear Creek intersection in the TSAP. This concept included the installation of rural two-way stop control treatments.

DESCHUTES COUNTY ITS PLAN (2020)

The Deschutes County ITS Plan explores travel time reliability throughout the region, including the Bend MPA. Travel time reliability refers to the consistency and predictability of travel durations between two points. It ensures that individuals can confidently plan their journeys as travel times remain stable over time. Factors like traffic conditions and effective incident management influence reliability. Reliable transportation systems contribute to smoother mobility, reduced uncertainty, and increased economic efficiency for travelers.

The US 20/US 92 Business/ SE 3rd Street corridor generally experiences worse travel time reliability than the Parkway (US 97). The worse reliability is due to the frequency of driveways and intersections, as well as the number of signalized intersections along that corridor in comparison to the Parkway's controlled access.

The Bend Parkway Study analyzed travel time reliability for the US 97 corridor through the City of Bend. It found that peak period travel time (4:30 – 5:30 p.m.) was unreliable on the US 97 corridor north of Empire Boulevard due to the congested nature of the peak periods at the at-grade signalized intersections, mainly Cooley Road and Robal Road.

US 97 south of Reed Market Road was also unreliable due to the at-grade intersection at Powers Road and recent construction projects such as repaving portions of US 97 in the southern MPA in 2021.

Traffic Signals

ODOT operates and maintains all 56 traffic signals in the Bend MPA. At the time of the most recent ITS Plan Update, ODOT was transitioning its traffic signal controllers to Advanced Traffic Control Technology using MaxTime for local controller programming and MaxView for system management.

Most of the traffic signals in Deschutes County have full emergency vehicle preemption capability. The system also can provide priority for transit vehicles.

ITS Systems

ODOT currently operates a Transportation Operations Center at the Region 4 Headquarters building. The center helps with incident, emergency, and traffic management as well as traveler information, winter operations, and maintenance operations.

There are 20 closed-circuit television cameras to monitor traffic in the Bend MPA; 17 are operated by ODOT and 3 by the City of Bend. Most of the cameras are located on US 97 and US 20.

ODOT operates and maintains two fixed Variable Message Signs in the MPA. The two are located on Highway 97 at the south end of Bend. There are also Portable Variable Message Signs in operation in the region.

ODOT currently operates 10 automatic traffic recorders (ATRs) in Deschutes County. Seven are located on US 97 and two are located on US 20. Four of those ATRs are located within the City of Bend as previously mentioned. Most of the recorders are in-pavement loops, but the Agency is planning to shift to radar camera technology.

The City of Bend operates five ATRs. Four are for the river crossings at Portland Avenue, Newport Avenue, Galveston Avenue, and Columbia Street. The fifth is at Franklin Avenue, west of the Bend Parkway and BNSF railroad undercrossing.

There is limited public agency-installed fiber optic infrastructure in Deschutes County, but there is a significant center-to-center fiber optic network due to a franchise agreement with TDS Telecom. At the time of the plan, regional agencies announced a partnership with Facebook that would construct a major fiber optic communications backbone along US 97 from La Pine to Bend to support its operations and provide access and dedicated fibers to ODOT. The project is ongoing. The conduit is currently being installed in the Bend MPA.

Overall Plan Needs

- Timely, accurate, and reliable traffic, transit, and other road conditions data collection to inform travelers of the latest conditions affecting their travel including those who are walking, biking, taking public transit, or driving.
- Need to connect and upgrade remaining older traffic signals.
- Ability to remotely manage and control traffic signals.
- A way to actively manage highway traffic on ramps, interchanges, and on the mainline, utilizing tools such as metering and variable speed limits where warranted.
- Better detection and coordination of highway and arterial operations during incidents that require response and cause travelers to divert.
- Accommodating repurposed travel lanes/roadway footprint to alternate uses.
- Need for a demand responsive system that maps and schedules pickups.
- Adoption of transit signal priority and transit corridors.
- Incorporation of arterial traffic and connected vehicle data to optimize transit service operations.
- A plan for future transit mobility hubs as well as places for EV charging infrastructure and overall grid evaluation for EV fleet operations.
- Data distribution to third-party services on street types and characteristics to provide smarter, context-sensitive routing recommendations.
- Increasing monitoring and reporting availability in parking lots, garages, and other parking areas and facilities. Curb management capabilities to balance the demand for parking, loading, and other curb uses. Sharing parking information with local drivers and regional traveler information systems for broader distribution.

- Upgrading to an automated system for towing to improve incident response time and reduce errors.
- Identification of which ITS devices are critical during major events like wildfires, and which may be susceptible to electrical outages during such events.
- Improving infrastructure monitoring to be proactive about needs for general maintenance.
- Understanding of winter maintenance, including monitoring and clearing operations for sidewalks and bicycle lanes.
- Better informing travelers about work zones and closures due to construction. Ensuring all workers are safe in the field if travel lanes remain open during construction.
- Defining common performance measures between partner agencies, common data standards for all data types, common data formats for sharing, and long-term data storage for the maintenance of a well-working data collection system.
- A way to collect and analyze the data to understand network performance, safety analysis, and future transportation planning needs.
- A centralized location or single access point to store, access, and process multi-sourced data.

BEND TRANSPORTATION SYSTEM PLAN

During the development of the Bend TSP, several key factors were determined to be influences on the motor vehicle system including:

- Tourism – Mt. Bachelor and Sunriver are both popular tourist destinations located near the City of Bend. Tourism traffic was a major contributor to the traffic congestion on Century Drive and throughout other areas of the city.
- In addition to tourism, from 2013 to 2018 motor vehicle travel increased by almost 20%, driven by housing and employment growth within the City of Bend.
- Regional Commuters – In 2018 approximately 49% of the employees that worked in Bend lived in the surrounding communities. This regional employment-based travel significantly increased traffic volumes throughout the study area during peak commute periods, especially along the US 97 corridor, which acts as a major connector between Bend and Redmond.
- Barriers to east-west connectivity – The Deschutes River, the US 97 Parkway, and the railroad crossings on Reed Market Road all serve as barriers or constraints to east-west connectivity within the City of Bend.
- Lack of connectivity in more rural areas – Rural areas within the Bend UGB often lack a mixed land use pattern, which results in residents needing to travel to other areas of Bend for employment, shopping, and services, often by car due to incomplete street networks.
- The effect of winter snow and ice, and summer wildfires on travel patterns – Every major corridor within the study area serves as an emergency access route. In particular, the City Fire Department has identified Skyliners Road, Cascade Lakes Highway (Century Drive), Brookswood Boulevard, and OB Riley Road as key evacuation routes.

Motor vehicle issues and needs identified in the plan generally included road safety, lack of cross-town travel, and overall congestion, consolidated into the following six themes, as summarized below (and identified on page 49 of the TSP):

Bend Parkway (US 97) Congestion and Safety

As previously mentioned, there is noticeable congestion on Bend Parkway (US 97) as this facility serves as a major entrance and exit for the city. Although City roadway projects currently in design/construction will provide some relief to this corridor, additional changes are likely still needed to address future travel demand and improve safety.

East-West Corridor Congestion

The TSP identified major congestion along east-west corridors as a critical issue. Physical and topographic challenges currently constrain east-west travel in the city for those walking, biking, riding transit, and driving. Barriers such as the Deschutes River, Bend Parkway (US 97), and BNSF Railway limit the location and extent of east-west streets. This creates heavy demand for travel along a few key corridors (e.g., Greenwood Avenue, Reed Market Road, Colorado Avenue/Arizona, Wilson Avenue, Empire Avenue, and Murphy Road), which can result in breakdowns of travel time reliability for motorists. Congestion on Reed Market Road impacts congestion on north-south routes in particular, 3rd Street and Bond Street/Brookswood Boulevard.

Since the adoption of the TSP, the previously mentioned Empire Avenue Extension has helped to improve east-west connectivity and has relieved some pressure on Butler Market Road. There have also been improvements to the Murphy Corridor from Parrell Road to 15th Street. These improvements were completed in Fall 2021 and included an overcrossing of the BNSF bridge as well as an extension of Murphy Road.

North-South Corridor Congestion

North-south congestion also exists due to some geographical barriers. Pilot Butte, the extensive canal system, the BNSF Railway, and existing neighborhood development patterns limit the location and extent of north-south streets, particularly east of US 97. These constraints create heavy demand for travel along NE/SE 3rd, NE/SE 8th/9th, NE/SE 15th, and NE/SE 27th Streets and are responsible for a lack of continuous routes for those walking, biking, or taking transit. Since the adoption of the TSP, the City has designed and/or constructed several new roundabouts along 15th Street to help with congestion and improve safety, but additional improvements are likely still needed to address north-south congestion in Bend.

Century Drive/NW 14th Street is one of the longest continuous north-south routes on the west side of the river. Congestion on this corridor is influenced by recreational and school traffic.

Safety

Several safety issues were identified in Appendix B of the TSP. Crash data was analyzed for the years 2011-2016 and key findings from the analysis include:

- In that period, there were 4,953 reported vehicle crashes, equating to over 826 crashes per year.
- Compared to similar-sized cities in Oregon, Bend had one of the lowest crashes per capita.

There were 18 identified high-frequency crash locations. In addition to these locations, nine segments on state facilities and 10 sites on non-state facilities were identified as part of the top 10% ODOT Safety Priority Index System locations. The Bend Transportation Safety Action Plan was

also developed around the same time and its findings were incorporated into the TSP to help address these issues.

Bend Parkway (US 97) is a key route identified by the TSP with motor vehicle safety needs. The Parkway acts as the main north-south route for the city and continues to be a primary route for those traveling within and through Bend. Since the adoption of the TSP, the North Corridor project has been underway to help fix these issues. The City also recently received funding for the Midtown Crossings Project, which will close the at-grade right-on access to US 97, one of the key safety issues along the Parkway.

Since the adoption of the TSP, several roundabouts have been constructed to help address safety issues. This includes a roundabout constructed in 2021 at the intersection of Colorado Avenue & Columbia Street and Simpson Avenue & Columbia Street.

Technology

ODOT Region 4 in Bend at the time of the TSP housed several intelligent transportation systems (ITS), including remote weather information systems, video detection cameras, closed circuit television cameras, and an oversized vehicle closure telephone system. The TSP identified the following ITS needs:

- The ability to automate, collect, and disseminate real-time traffic conditions information as well as remote, continuous access to real-time data.
- Updating and interconnecting available conduit inventory.
- Improving the lack of access to real-time traffic conditions to improve incident response, emergency vehicle access, and travel time reliability.
- Improving the lack of real-time traveler information at key decision points including travel time, weather information, and special event information.
- Increasing traffic signal timing enhancements such as signal coordination, transit signal priority, and signal transition during a railroad priority call, which are currently limited.
- Up-to-date Intelligent Transportation System (ITS) inventory including device types and locations and available conduit inventory.

More in-depth analysis of technology in the area was previously outlined in the Deschutes County ITS plan section.

Other issues

- Of the 67 intersections studied within the TSP process, 25 did not meet the current jurisdictional mobility targets at the time of analysis. 23 of these intersections were under ODOT jurisdiction, and two intersections were under the City of Bend jurisdiction.
- There were 11 at-grade rail crossings with automatic gates and eight grade-separated rail crossings within the City. These crossings can be a major source of motor vehicle traffic delay, particularly the crossing on Reed Market Road near 9th Street.

BEND TRANSPORTATION SAFETY ACTION PLAN

Between 2012 and 2016, 92 reported crashes within the Bend UGB resulted in fatal or incapacitating injuries. The plan identified 25 sites for safety improvement with similar methodology to what was used in the Deschutes County TSAP. Of those 25 intersections, four high-level concepts were developed for four sites identified through a prioritization screening process. The four concepts were:

- 3rd Street & Butler Market Road/Mount Washington Drive Area
- Highway 97 and Powers Road Area
- 3rd Street Area
- Purcell Boulevard/Pettigrew Road and Bear Creek Road.

ODOT REFINEMENT PLANS AND STUDIES

Many of the motor vehicle needs identified in the relevant ODOT refinement plans and studies are generally consistent with the needs discussed in the above sections. Given the growth in traffic demand in Bend and regional traffic growth, significant congestion is expected on US 20 and US 97 in Bend in the future, as identified in the US 97 Parkway Plan and the US 20 Bend Facility Plan. Several safety hotspots were also identified on US 97 and US 20, including the at-grade right-on/right-off access points on US 97.

RECENT MOTOR VEHICLE TRENDS

CONGESTION TRENDS

INRIX data was used to understand current congestion trends in the Bend MPA and compare 2023 conditions against the existing conditions evaluated in prior planning efforts. This data indicates that between 2018 (existing conditions for Parkway Study and Bend TSP) and 2023, the p.m. peak hour has consistently remained the most congested period. For both years, most of the congestion within the City of Bend occurred during the 4:00 to 5:00 p.m. peak hour.

The 2018 and 2023 peak congestion comparisons are shown in Figure 8: and Figure 9**Error! Reference source not found.**. The congestion measure presented is based on the relationship between the speed experienced on the roadway at the specific point of time in relation to the free flow speed for that section of the roadway. If the current speed is the same as the free flow speed, the segment is green and no significant congestion is experienced. Note that this analysis is missing data for local roads. The 2018 data set obtained from RITIS does not have the same granularity as that for 2023. Most major roadways in Bend are included in the 2023 data set, but not in the 2018 data set. However, many of the roadways missing in the 2018 data do not exhibit significant congestion in the a.m. or p.m. peak hour in 2023, so this gap in data is inconsequential to this comparative analysis.

Some key differences between the two years include:

- **US 97 North Corridor and US 20** – There is significantly increased congestion on US 20 (and parts of US 97) between 2023 and 2018. The increased congestion along the northern portions of US 97 and US 20 is mainly due to construction occurring in the area. Construction on this

segment of US 20 began in the winter of 2022 and is scheduled to be finished by the spring of 2024, and includes new roundabouts at Tumalo Road, Old Bend-Redmond Highway, Cooley Road, and Robal Road. Construction on US 97 began in the spring of 2023 and is scheduled to be finished in the winter of 2025. Both sections of construction are part of the Bend North Corridor Project which aims to realign US 97, improve intersections, create new ramp connections, and improve pedestrian and bicycle facilities along the corridor.

- **Empire Avenue/27th Street** – There is more congestion along 27th Street in 2023 when compared to 2018 in both the a.m. and p.m. peak hours. This is likely due to the completion of the Empire Avenue Extension project, which connected Empire Avenue and 27th Street at Butler Market Road. This project was completed in the fall of 2021 and provides a more direct path between northern and eastern Bend.
- **US 20/Greenwood Avenue east of 8th Street** – Between the two time periods, there was a decrease in congestion along the eastern portion of US 20. This could be in part due to the completion of the Empire Avenue Extension, which provides a more direct route between northern and eastern Bend. The City and the Oregon Department of Transportation (ODOT) are currently developing the US 20 Bend Facility Plan, which encompasses US 20 from 3rd Street to Powell Butte Highway and includes an updated existing condition needs analysis. Recommendations from this plan will be incorporated into the MTP update.

Some key similarities between the two years include:

- **US 97 North Corridor** – Major areas of congestion can be observed in both years along the northern parts of US 97 from Cooley Road to Empire Avenue.
- **Reed Market Road** – There are also similar trends in congestion along Reed Market Road throughout the study area, with congestion generally extending between Century Drive and 15th Street during the p.m. peak hour. Congestion on Reed Market Road also impacts congestion/delay on 3rd Street and Bond Street/Brookswood Boulevard.
- **US 20/Greenwood Avenue between 3rd Street and 8th Street** – There is consistent congestion around US 20/Greenwood Avenue between 3rd Street and 8th Street between 2018 and 2023.

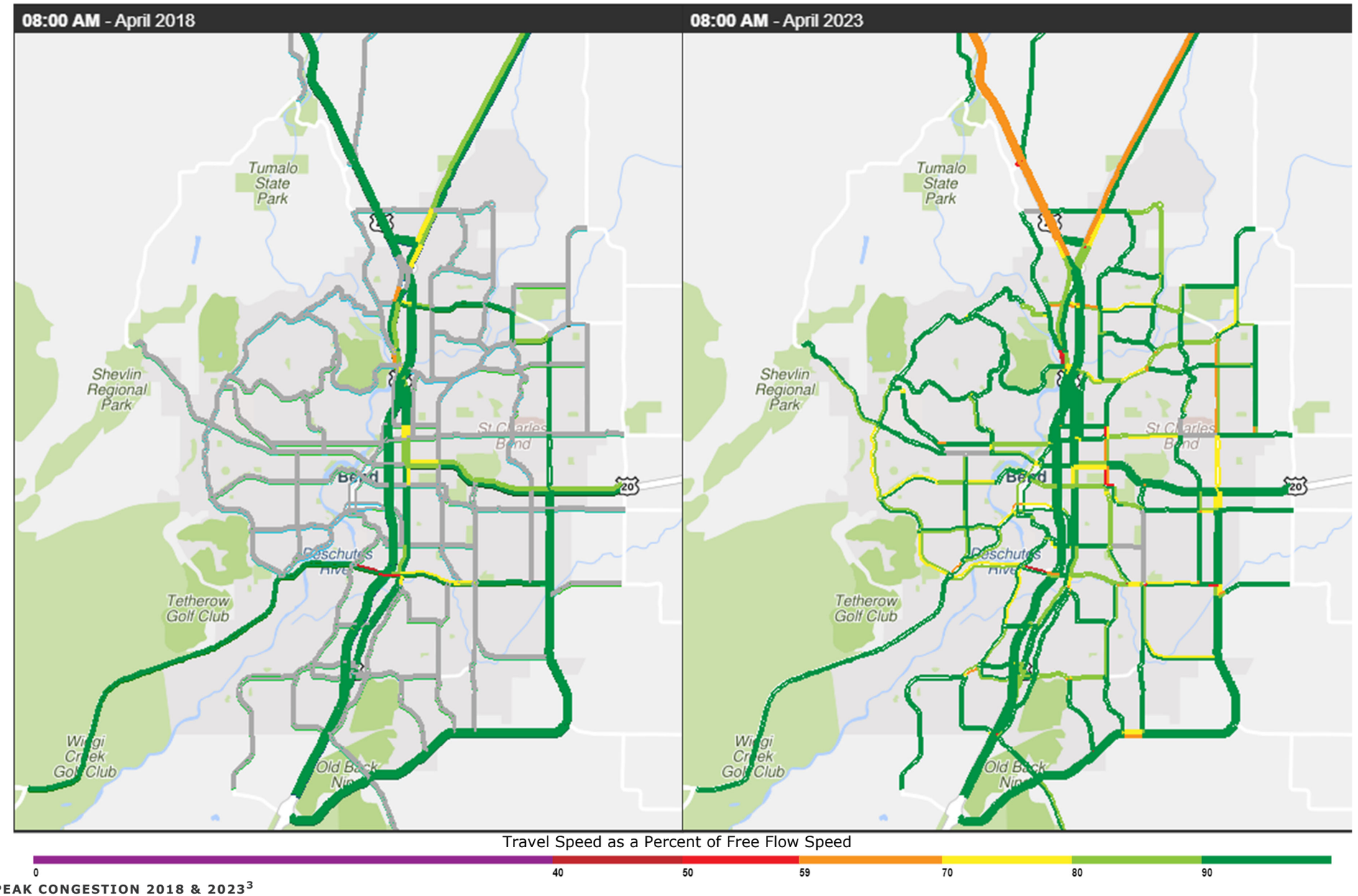


FIGURE 8: A.M. PEAK CONGESTION 2018 & 2023[3]

Source: Regional Integrated Transportation Information System Congestion Trend Map, using INRIX data

[3] Grey colored corridors represent streets with no data available.

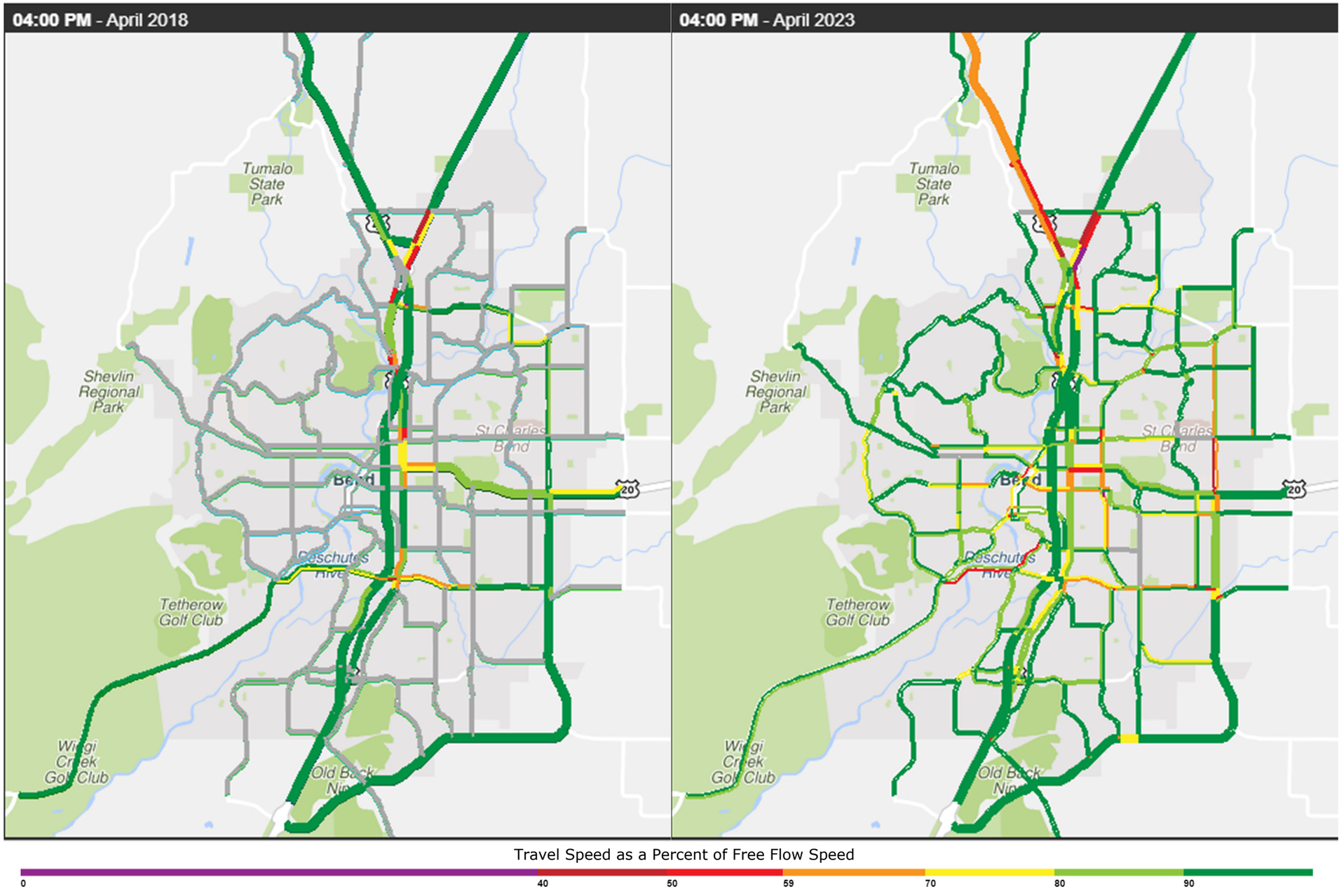


FIGURE 9: P.M. PEAK CONGESTION 2018 & 2023

Source: Regional Integrated Transportation System Congestion Trend Map

CORRIDOR-SPECIFIC TRENDS

In addition to trends in vehicle congestion, specific corridors were analyzed to understand their operation today in comparison to conditions during the last MTP adoption.

Empire Avenue

The Empire Avenue extension has had a significant impact on traffic trends in the area. This project was a 3,000-foot extension of Empire Avenue which now connects travelers directly from Purcell Boulevard to the intersection of 27th Street and Butler Market Road. In addition to the road extension, three new roundabouts were also added. Project construction was completed in October of 2021.

This project has led to a 30% increase in average traffic along the Empire Avenue Corridor between 2018 and 2022 and doubled traffic volume near the intersection with Purcell Blvd[4]. The new connection has decreased traffic on Butler Market Road.

US 97

There are four automatic traffic recorders in the City of Bend along US 97. Since 2018, there has been an increase in Annual Average Daily Traffic (AADT). 2020 saw a significant drop in AADT due to the COVID-19 pandemic, but AADT has since recovered to a little above pre-pandemic level as shown in Table 7 below.

TABLE 7: 2018 & 2022 AADT AT AUTOMATIC TRAFFIC RECORDERS ALONG US 97

LOCATION ID	NEAR	2018 AADT (VEHS)	2022 AADT (VEHS)	GROWTH
09007	South of Empire Ave	55,100	56,862	3%
09009	Revere Avenue Interchange	54,685	55,763	2%
09025	Pinebrook Boulevard	21,754	22,839	5%
09003	China Hat Road	26, 542	27,502	4%

SUMMARY OF RECENT TRANSPORTATION TRENDS COMPARISON

In general, many of the transportation trends from 2018 (the year of the last MTP update) remain the same today, with a few key exceptions. Key findings from the analysis of available data indicate:

- The population of Bend increased by nearly 15% between 2018 and 2022 (Table 1).

[4] Based on traffic counts obtained from Oregon Traffic Monitoring System for locations along the Empire corridor.

- Congestion trends along US 97, Reed Market Road, and US 20/Greenwood Avenue between 3rd Street and 8th Street have remained relatively similar between 2018 and 2023. US 97 traffic volumes have remained relatively consistent, with a slight increase in daily traffic volumes.
- Additional congestion is occurring on US 97 and US 20 on the northern end of Bend due to ongoing construction of the US 97 North Corridor project.
- Traffic volumes and congestion patterns along Empire Avenue/27th Street have changed due to the completion of the Empire Avenue extension project.

UPDATED FUTURE MOTOR VEHICLE NEEDS

To understand future system performance, the 2045 Committed scenario was compared to the 2019 Base scenario across the following motor vehicle system performance measures:

- **Demand to capacity (D/C) ratio** – The measure of peak hour congestion can be measured by the demand to capacity ratio which determines the ratio of vehicles over the capacity of a roadway. The travel demand model has the capacity of evaluating the overall flow of traffic over the length of a specified corridor. D/C ratios that are higher than 0.80 affect driving decisions due to the presence of other vehicles. A D/C ratio of 1.0 indicates significant congestion.
    - **Arterials over capacity** – Congestion on the roadway network is defined by a threshold of the D/C ratio. The number and percentage of arterial lane miles that operate with a D/C ratio greater than 1.0 are considered over capacity and congested.
- **Vehicle hours of delay** – Total hours of delay for all vehicles over the entire system within the MPA during the p.m. peak hour.
- **Vehicle miles traveled (VMT) per capita** – This measure evaluates the total daily vehicle miles traveled for household-based trips by light vehicles making a trip that starts and ends within the MPA, divided by the total population with the MPA.
    - **VMT on rural facilities** – This measure evaluates the total vehicle miles traveled by all vehicles on rural facilities (outside the UGB boundary, within one mile) during the PM peak hour and can be a measure of diversion on rural facilities due to congestion.
- **Diversion potential** -– Modeling the traffic shifts on collector roadways can serve as a proxy for diversion onto local streets. This can also serve as an indicator of increased traffic on roadways that were not designed for high volume traffic. This measure identifies the percentage of collector roads with an average daily traffic volume above 4,000 vehicles per day.
- **Corridor performance** – This measure highlights unreliable or unsafe corridors today where significantly more traffic demand is expected in the future.

DEMAND TO CAPACITY (D/C) RATIO

Figure 10 shows the forecasted demand to capacity (D/C) ratio on roadways within the MPA for the 2045 Committed scenario compared to the 2019 scenario. The D/C ratios are based on raw model outputs that serve as a general guide to identify needs and differ from the volume to capacity (v/c) ratios that are calculated using post-processed traffic volumes.

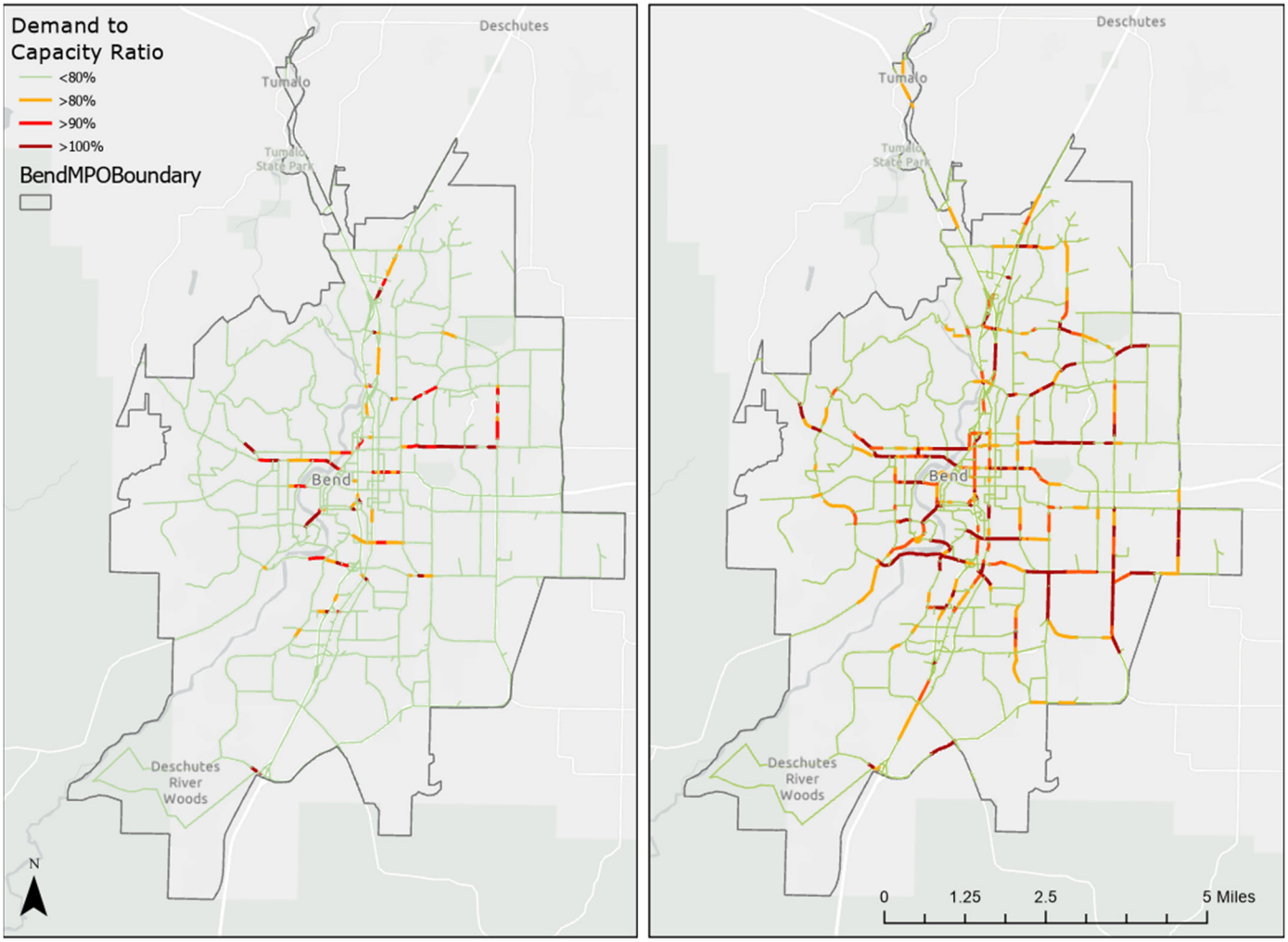


FIGURE 10. 2019 AND 2045 COMMITTED SCENARIO DEMAND TO CAPACITY RATIO

As shown, with only 5 years of funded projects included, the Committed Scenario transportation system does not have adequate roadway connectivity or capacity to serve expected future travel needs. The Committed Scenario involves the construction of only the projects within Table 3 and no other roadway improvements. The Committed Scenario shows similar roadways at capacity compared to the 2019 scenario with additional capacity issues along other sections. The most noticeable decrease in D/C between the two scenarios is along US 97 from Cooley Road to the US 20 interchange. This is due to the construction of the bypass road from Loco Road to Empire Avenue. Additionally, there is increased demand for roadways in the southeastern portion of the Bend MPA. This is due to the previously mentioned increase in employment and housing in the area. Overall, the increased population and jobs in the area will lead to increased strain on the roadway network.

Key corridors (arterials and collectors) with demand to capacity ratios exceeding 1.0 in the study in the 2045 Committed Scenario include the following:

- NE Butler Market Road

- NW Galveston Avenue
- NE Neff Road
- NW Portland Avenue
- NE Newport Avenue
- Powers Road
- SE Reed Market Road
- SE 15th Street
- 27th Street
- Ward Road
- SE Wilson Avenue

The motor vehicle capacity needs identified in the prior MTP update were based off a 2040 horizon year and included only a subset of the current Committed Project List. In addition, the newly developed 2045 land use forecasts reallocate growth based on current City zoning decisions and development patterns, which include higher density development than was previously assumed for the 2040 forecasts. The combined impact of these changes is reflected in the following summary of changes in motor vehicle needs between the prior and current MTP updates:

- **OB Riley Road** – The corridor capacity need identified in the prior MTP is reduced to a smaller bottleneck issue at Archie Briggs, due to lower land use growth assumptions in this area.
- **US 97** – North Corridor project resolves the US 97/Business 97 capacity issues between the MPA boundary and Empire Boulevard, removing these identified needs under Committed conditions.
- **Shevlin Park Road** – A new need identified east of Mt Washington Drive.
- **Neff Road** – A new need between 8th Street and 27th Street.
- **Hamby Road** – A new need from Stevens Road to Bear Creek Road, driven by Stevens Ranch and DSL growth.
- **Stevens Road** – A new need from Stevens Road to Bear Creek Road, driven by Stevens Ranch and the Stevens Road Tract.
- **Powers Road** – A new need between US 97 and Brookswood Boulevard.

Table 8 summarizes the total arterial lane miles with a D/C ratio greater than 1.0.

TABLE 8: DEMAND TO CAPACITY RATIO

SCENARIO	2019 BASE	2045 COMMITTED	% CHANGE
TOTAL LANE MILES	2.32	12.98	459%

With only the Committed scenario improvements in place, the arterial lane miles that are congested (D/C greater than 1.0) increase by a factor of more than five.

VEHICLE HOURS OF DELAY

Vehicle hour delay was calculated by looking at the difference in travel time when links are congested and not congested. The total delay time can be seen in Table 9 below.

TABLE 9: VEHICLE HOURS OF DELAY

ROADWAY JURISDICTION	2019 BASE VEHICLE HOURS OF DELAY	2045 COMMITTED VEHICLE HOURS OF DELAY	% CHANGE
CITY OF BEND FACILITIES	144	612	325%
ODOT FACILIITES	63	226	257%
DESCHUTES COUNTY FACILIITES	2.4	24	872%
TOTAL	210	832	311%

The most delay occurs on the City of Bend facilities, followed by ODOT facilities, and then County facilities. This is due to most roadways within the Bend MPA being under City jurisdiction. Between the two time periods, total peak hour delay tripled with the largest increase being seen on County facilities. An increase in delay time on County facilities could be due to the increased development near the edges of the Bend UGB, especially in the southeast corner.

VEHICLE MILES TRAVELED

Looking at vehicle miles traveled (VMT) per capita helps to understand how traffic increases are related to the increases in population and employment. VMT per capita is also used as a surrogate for emissions impacts, indicating progression towards a more environmentally sustainable transportation system. As previously noted, the increase in jobs and population in the area has led to an increase in demand for all modes of travel on the Bend MPA roadways, including demand for motor vehicles. Not only has there been an overall increase in demand, but there has also been an increase in the total number of miles traveled per household. This could be due to more individuals taking alternate routes that may be faster but also longer. Overall, VMT per capita is estimated to increase by almost 5% over the 2019 condition under the 2045 Committed condition, as shown in Table 10.

TABLE 10: VEHICLE MILES TRAVELLED (VMT) PER CAPITA

ROADWAYS	2019 BASE	2045 COMMITTED	% CHANGE
DAILY VMT PER CAPITA	6.89	7.22	4.7%

The VMT per capita calculation methodology was shifted to a household-based measure, rather than constrained to trips internal to the MPO as prior VMT per capita measure have been. This change in methodology aligns with the new ODOT Transportation Planning Rule (TPR) definition.

The VMT per capita increase shown in Table 10 includes increased commuter travel between Bend and Redmond, reflecting the inherent dependency between the two communities. Increased modal shift to transit and better system connectivity are two ways the MTP Project List can target reducing the VMT per capita measure.

Rural facilities are roadways within the Bend MPO boundary, but outside of the Bend UGB. Table 11 shows the change in vehicle volumes on rural facilities between the two models. The largest increases in VMT occurred near the eastern portion of the Bend MPO boundary along Hamby Road.

TABLE 11: VMT ON RURAL FACILITES

	2019 BASE	2045 COMMITTED	% CHANGE
PEAK HOUR VMT	34,360	54,973	60%

DIVERSION

The average daily traffic volume on collector facilities provides an indicator for risks of traffic diverting to lower classification roadways to avoid congestion. If the average daily traffic volume is greater than 4,000 vehicles on a collector roadway, individuals are more likely to divert to local roads to avoid congestion. Table 12 summarizes the collector lane miles across the MPA with modeled demand exceeding the 4,000 vehicles per day threshold.

TABLE 12: COLLECTOR ADT

SCENARIO	COLLECTOR LANE MILES	COLLECTOR LANE MILES >4,000 ADT	% LANE MILES
2019 BASE	48.9	3.3	7%
2045 COMMITTED	49.9	11.4	22%

In the 2019 base model, 7% of collectors experienced a daily volume greater than 4,000 vehicles; in the 2045 Committed scenario, this increases to 22%. Collectors that experienced these conditions include SE Wilson Avenue, NE Purcell Boulevard, Brosterhous Road, and NW Portland Avenue.

CORRIDOR PERFORMANCE

Road segments within the Bend MPA were assessed on their reliability based on the ODOT Planning Time Index[5]. A segment was *Highly* or *Extremely Unreliable* if the average travel speed is at least 50% below the posted speed limit. A segment is considered *Moderately Unreliable* if the average travel speed is between 25% to 50% below the posted speed and it is considered *Reliable* if the average travel speed is no less than 25% below the posted speed. The average travel speed by

[5] ODOT 2022 Statewide Congestion Overview, 4/12/2023

hour for the year 2022 was obtained from INRIX for all segments within the Bend MPA. Due to INRIX not reporting speed limits, the free flow speed experienced on the roadway segment was used to calculate congestion as opposed to the posted speed limit. The segments contained within Table 13 were determined to be unreliable based on the previously mentioned ODOT metric. The majority (52%) of the segments listed below are less than 1,000 feet in length due to how INRIX displays its data. Three segments are less than 500 feet, indicating that in general, there are only short stretches of roadways in Bend that are unreliable, although most of the segments are expected to experience more traffic in the future.

TABLE 13: PERCENT CHANGE IN DAILY VOLUME ON UNRELIABLE SEGMENTS

ROADWAYS	SEGMENT LENGTH (FT)	CROSS ROAD 1	CROSS ROAD 2	PERCENT CHANGE
OLD BEND REDMOND HIGHWAY	1,100	O.B. Riley Road	US 20	570%
NE BRINSON BLVD	1,000	NE 18th	NE Butler Market Road	94%
SE 9TH AVE	460	SE Reed Market Road	500 Feet North SE Reed Market Road	81%
US 20	980	NE Revere Ave	NE Olney Ave	62%
NW FRANKLIN AVE	1,320	NE Louisiana Ave	NW Bond Street	62%
ROBAL ROAD	800	Nels Anderson Road	NW Hunnell Road	60%
BROSTERHOUS ROAD	700	SE Hayes Ave	SE Parrell Road	50%
NW WALL STREET	1,300	NW Franklin Ave	NW Bond St	46%
NW BOND STREET	1,170	NW Franklin Ave	NW Greenwood Ave	46%
US 97	3,000	SW Wilson Ave	SE Division Street	42%
NE 9TH STREET	2,360	US 20	SE Glenwood Drive	38%
NE DIVISION STREET	1,100	US 20	NE Tweet Place	37%
US 97	1,500	NE Greenwood Ave	NE Franklin Ave	37%
REED MARKET RD	8,900	SW Bond Street	SE 15th Street	37%
NW COLORADO AVE	300	SW Industrial Way	NW Arizona Ave	34%
POWERS ROAD	900	US 97 NB Ramp	SE Parrell Road	31%

ROADWAYS	SEGMENT LENGTH (FT)	CROSS ROAD 1	CROSS ROAD 2	PERCENT CHANGE
NE BUTLER MARKET ROAD	700	NW Rippling River Court	US 97 NB	28%
SE AMERICAN LANE	400	American Loop	SE Reed Market Road	23%
NE 8TH STREET	700	NE Revere Ave	NE Penn Ave	22%
NE REVERE AVENUE	900	US 20	NE 5th Street	2%
SE 2ND STREET	785	SE Wilson Ave	SE Vine Lane	-13%
US 97	1,800	US 20 Interchange	Robal Road	-50%

The segment with the largest increase in traffic volume between the two time periods was along the Old Bend Redmond Highway. If traffic volumes increase on already unreliable segments, the congestion along those corridors will only increase and there will be an overall increase in total delay.

CHANGES AT KEY INTERSECTIONS

As previously mentioned in the Deschutes County TSAP and the Bend TSAP, intersections for prioritization of safety investments were identified. The intersections are shown in Figure 11 below. Without additional new investment, increases in traffic volumes on these corridors may lead to increased safety issues. The intersections with the highest increase in traffic volumes are US 20 and Cooley Road, and Bear Creek Road and Ward Road; however, the safety need at the US 20 and Cooley Road intersection has recently been addressed through a new roundabout, completed in 2023.

Overall, there was an approximate 60% increase in traffic volume near high-priority intersections. The largest percentage of increase was along minor arterials at approximately 110%, and the second largest was along the state highway system at 63%.

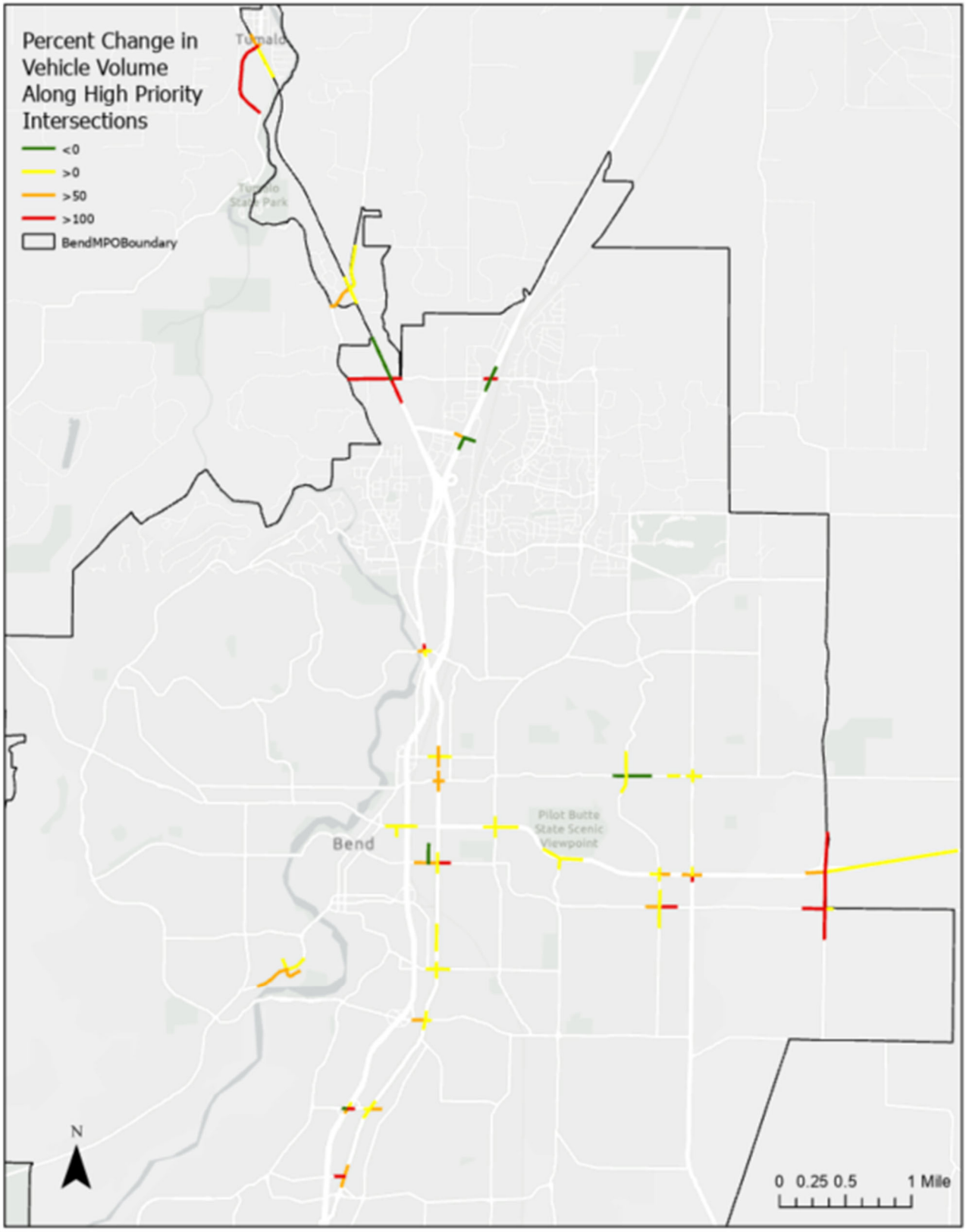


FIGURE 11: CHANGE IN VEHICLE VOLUME NEAR HIGH PRIORITY INTERSECTIONS

CAPACITY LIMITATIONS

Increased motor vehicle traffic in the region due to increased population and other factors will lead to increased congestion on more routes within the Bend MPA. Projects will need to be developed to address these future problems. However, capacity increasing of these roadways is constrained by the existing right of way, budget allocations, and impacts of the recently adopted Climate Friendly and Equitable Communities ruling as well as other factors. Regionally coordinated strategies are necessary to address these issues to lead to a higher likelihood of success at combatting congestion within the Bend MPA.

APPENDIX D: PRELIMINARY MTP PROJECT LIST EVALUATION MEMORANDUM

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PRELIMINARY MTP PROJECT LIST EVALUATION MEMORANDUM

DATE: February 26, 2024

TO: Bend MPO Technical Advisory Committee

FROM: Emily D'Antonio, Eileen Chai, Kayla Fleskes-Lane, PE & Aaron Berger, PE | DKS Associates

SUBJECT: Bend 2045 MTP Update: Draft MTP Project List Evaluation Memorandum Project #24068-000

INTRODUCTION

This memorandum documents the 2045 Draft MTP Project List evaluation and is intended to help the Technical Advisory Committee (TAC) determine whether:

- **Any new needs have been identified** that are not addressed or targeted by the 2045 Draft MTP Project List, which was developed based on previously documented needs.
- **Any current projects on the MTP list should be re-scoped** due to the changes in future needs compared to prior local planning studies.

Based on TAC discussion, existing projects may be flagged for potential re-scoping, or additional projects may be added to the 2045 Draft MTP Project List to create a Refined MTP Project List. New projects added to the MTP list will most likely be planning/corridor studies targeting newly identified needs. Capital projects to address these new needs would be the outcomes of the planning/corridor studies and would be first adopted in local plans, then added to the MTP Project List in subsequent MTP updates.

Projects included in the Refined 2045 MTP Project List will then be analyzed using the MTP evaluation criteria to help prioritize projects into phasing buckets to outline the timeframe within which each project is recommended for implementation. This phasing will then be paired with funding availability and feasibility to separate projects into financially constrained and aspirational lists.

This memorandum is divided into the following sections:

- **Summary of Findings** - Provides an overview of outcomes of the evaluation of the 2045 Draft MTP Project List, highlighting new or changing needs caused by the new horizon year (2045) and updates from the most recent local planning efforts.

- **Evaluation Methodology** – Description of tools and methods applied to evaluate the 2045 Draft MTP Project List against both previous and newly identified multi-modal transportation system needs for the MPA.
- **Active Transportation Evaluation and Findings** – Presents findings related to active transportation focused projects from the 2045 Draft MTP Project List and discusses any new or changing needs for people walking and biking.
- **Transit Evaluation and Findings** – Presents findings related to transit projects from the 2045 Draft MTP Project List and discusses any new or changing needs for people riding transit.
- **Motor Vehicle Evaluation and Findings** - Presents projects with a significant motor vehicle system enhancement component from the 2045 Draft MTP Project List and discusses any new or changing needs for people driving.
- **Attachments Summarizing the Draft MTP Project List** – Maps and tables presenting the 2045 Draft MTP Project List, separated into Active Transportation, Transit, and Motor Vehicle categories.

SUMMARY OF FINDINGS

The following list includes newly identified or changes to already identified Bend MPA transportation system needs based on the evaluation of the 2045 Draft MTP Project List:

- Only one project from a study completed since the adoption of the Bend TSP clearly impacts a designated Key Routes for Walking and Bicycling. This project is the **proposed new interchange connecting NE 18th Street to US 97** (Project 97.A in Attachment A). This new connection would attract more motor vehicle traffic to the portion of the NE 18th Street corridor designated as a Key Walking and Bicycling Route. The Key Routes project on 18th Street is recommended to be completed either before or in parallel with the NE 18th Street/US 97 interchange project.
- Community input on on-going projects such as the Olney Avenue Pedestrian and Bicyclist Improvements project indicates a **desire for higher levels of treatments for active transportation improvements** than was originally scoped for the Key Routes project identified in the Bend TSP. Cost estimates for the projects in this category that do not have a clearly defined scope should be re-considered during upcoming local planning efforts to better reflect community priorities.
- The 2045 Draft MTP Project List **does not provide sufficient transit coverage** to fully serve the new growth areas on the urban fringe of the Bend Metropolitan Planning Area (MPA). Many of the most critical motor vehicle needs, particularly needs related to east-west river crossings, cannot be fully resolved through new connections or corridor enhancements. Expanded transit service could provide relief to these congested corridors by shifting motor vehicle users to transit.
- **OB Riley Road** – The corridor capacity need identified in the prior local planning efforts consolidates to a smaller bottleneck issue at Archie Briggs due to lower land use growth assumptions in this area (e.g., Gopher Gulch). The multi-modal project identified for this corridor (Project C-3) should be considered for re-scoping during this MTP Update and subsequent City planning efforts.
- **Shevlin Park Road** – New traffic congestion need east of Skyline Ranch Road.

- **Neff Road** – Heightened congestion need between 8th Street and 27th Street, with potential of increasing neighborhood cut-through traffic. Considerations for addressing this congestion need include:
  - Widening the entire corridor is not a viable option, but intersection capacity spot improvements at locations like 8th Street/Neff Road will improve the corridor and reduce the risk of cut-through traffic on local streets
  - Upgrading the corridor to a Key Route for walking and biking will entice shifts to non-auto modes of travel
  - Travel Demand Management (TDM) programs partnering with the nearby large regional employers such as St Charles and Summit Health will encourage alternative modes of travel and can reduce the auto related congestion on the corridor
- **Hamby Road** – New traffic congestion need from Stevens Road to Bear Creek Road, driven by growth in the Stevens Ranch and Department of State Lands (DSL) areas.
- **Powers Road** – New congestion need between US 97 and Brookswood Boulevard.
- **East-West River Crossings** – This congestion issue was a key need identified in the City's TSP and was flagged for monitoring. Current travel demand model forecasts indicate that these crossings will experience traffic demand well beyond existing capacity, indicating a need to move forward with a study for new/enhanced river crossings.
- **27th Street** – This corridor was flagged for monitoring in the City's TSP, with the year 2040 analysis indicating a need for a five-lane cross section from Empire Boulevard to Ferguson Road. The 2045 Draft MTP Project List evaluation indicates that by the year 2045 Horizon, a five-lane cross section is only needed between St. Charles Hospital in the north and Reed Market Road in the south. The corridor-wide Average Daily Traffic (ADT) growth does indicate a need to improve the rural, two-lane, unimproved portions of 27th Street to three-lane, modernized cross sections with safe crossings to transit to enhance safety for all modes of travel.

EVALUATION METHODOLOGY

This section focuses on the following:

- **Methodology**
- **Analysis Tools and Performance Measures**
- **2045 Draft MTP Project List**

METHODOLOGY

Substantial planning efforts have already been conducted to develop the projects included in the 2045 Draft MTP Project List. However, all analysis used to develop, prioritize, and scope these projects has been based on a shorter planning horizon (2040 or earlier), including a separate set of land use assumptions. Therefore, the evaluation in this memorandum focuses primarily on the changes in future needs identified in the MTP Needs Memorandum and cross checks these changes against the 2045 Draft MTP Project List to identify any gaps or project re-scoping needs.

ANALYSIS TOOLS AND PERFORMANCE MEASURES

The primary analysis tool used to evaluate the 2045 Draft MTP Project List is the Bend-Redmond Model (BRM), a travel demand model developed and maintained by the ODOT Transportation Planning and Analysis Unit (TPAU), with support from the MPO and other local agencies. As discussed in the MTP Needs Memorandum, the BRM includes 2019 Base Year and 2045 Future Year land use scenarios. A 2045 Draft MTP Project List Scenario was developed using the same land use assumptions as the 2045 Committed Scenario. These assumptions are presented in the MTP Needs Memorandum. The 2045 Draft MTP Project List Scenario includes an updated roadway and transit network incorporating all active transportation, transit, and motor vehicle projects from the 2045 Draft MTP List that can be modeled within the structure of a trip-based travel demand model. The model results were used to provide quantitative measures throughout the MPA to determine whether projects were effectively addressing identified needs and to highlight new, increased, or decreased needs throughout the region.

The primary performance measures used to evaluate the effectiveness of the 2045 Draft MTP Project List are described by mode as follows:

- **Active Transportation**
  - ***Mode Split*** – percent change in share of all trips choosing bicycle and pedestrian modes, compared against 2019 and 2045 Committed conditions.
  - ***Change in Motor Vehicle Demand on Key Routes*** – increase/decrease in ADT on identified bicycle and pedestrian Key Routes compared against 2019 and 2045 Committed conditions.
- **Transit**
  - ***Mode Split*** – percent change in share of all trips choosing transit compared against 2019 and 2045 Committed conditions.
  - ***Transit Coverage (Households and Jobs within ¼ Mile of Transit Service)*** – Estimate of transit system coverage throughout the Bend MPA, compared against 2019 and 2045 Committed Conditions.
- **Motor Vehicles**
  - ***Demand to capacity (D/C) ratio*** – the ratio of peak hour vehicle demand over the capacity of a roadway, where a D/C >1.0 indicates severe levels of congestion. This measure is applied both at the corridor level and as a system measure summarized by roadway facility classification.
  - ***Vehicle hours of delay*** – Total hours of delay for all vehicles over the entire system within the MPA during the p.m. peak hour.
  - ***Vehicle miles traveled (VMT) per capita*** – Total daily vehicle miles traveled for household-based trips by light vehicles making a trip that starts/ends within the MPA, divided by the total population within the MPA.
  - ***Diversion potential*** – Total percentage of collector roads with an average daily traffic volume above 4,000 vehicles per day, indicating misuse of lower facility classes and risks of trip diversion onto local streets.

2045 DRAFT MTP PROJECT LIST

This memorandum breaks down the evaluation of the 2045 Draft MTP Project List into three modal focused sections: Active Transportation, Transit, and Motor Vehicle. There is significant modal overlap between many projects, particularly those that fall under the "Motor Vehicle" category as these usually include significant active transportation improvement elements. Each modal project list is further separated into "Connectivity" and "Corridor Enhancement" subcategories. Connectivity projects focus on new modal connections (e.g., new trails, new transit routes, or new roadways), while Corridor Enhancement projects focus on improvements to existing corridors (e.g., new bike lanes/sidewalks, decreased headways on existing transit lines, or added lanes). In addition, remaining projects are categorized as "Intersection" (intersection focused projects) and "Technology" (ITS projects), which do not strictly fall into any of other primary modal subcategories.

The 2045 Draft MTP Project List is mapped and summarized in attachments to this memorandum as follows:

- **Attachment A – Active Transportation**
  - ***Active Transportation Connectivity Projects***
  - ***Active Transportation Corridor Enhancement Projects***
- **Attachment B – Transit Projects**
  - ***Transit Connectivity Projects***
  - ***Transit Corridor Enhancement Projects***
- **Attachment C – Motor Vehicle Projects**
  - ***Motor Vehicle Connectivity Projects***
  - ***Motor Vehicle Enhancement Projects***
- **Attachment D – Intersection Projects**
- **Attachment E – Technology Projects**

ACTIVE TRANSPORTATION EVALUATION AND FINDINGS

This section presents the analysis and findings related to the Active Transportation needs and proposed projects within the Bend MPA, including:

- **Summary of Needs**
- **Evaluation Results**
- **New/Changing Active Transportation Needs**

SUMMARY OF NEEDS

As described in the MTP Needs Memorandum, bicycle and pedestrian system gaps and needs within the Bend MPA were identified through a series of local planning efforts. The Bend TSP identified Key Walking and Bicycling Routes throughout the City, many of which are expected to experience large increases in motor vehicle traffic by the year 2045. When enhanced, these Key Routes (shown in Figure 1) will address many of the most critical needs for people walking and biking within the City of Bend.

Beyond the Bend UGB, the on-going Deschutes County TSP Update has identified needs for dedicated bicycle facilities and complete sidewalks in Tumalo. From a more system-wide perspective, the County TSP noted that jurisdictional standards only require 3-to-5-foot shoulders, insufficient width to effectively serve bicycle travel. As the City of Bend continues to build out within the MPA, unincorporated Deschutes County roadway facilities brought into the urban area will become barriers and impedances to bicycle and pedestrian access to/from new growth areas.

ODOT planning efforts have identified critical gaps in the bicycle and pedestrian system at both the Baker/Knott and US 97 interchange and along US 97 north of the UGB at a potential future interchange connection to NE 18th Street.

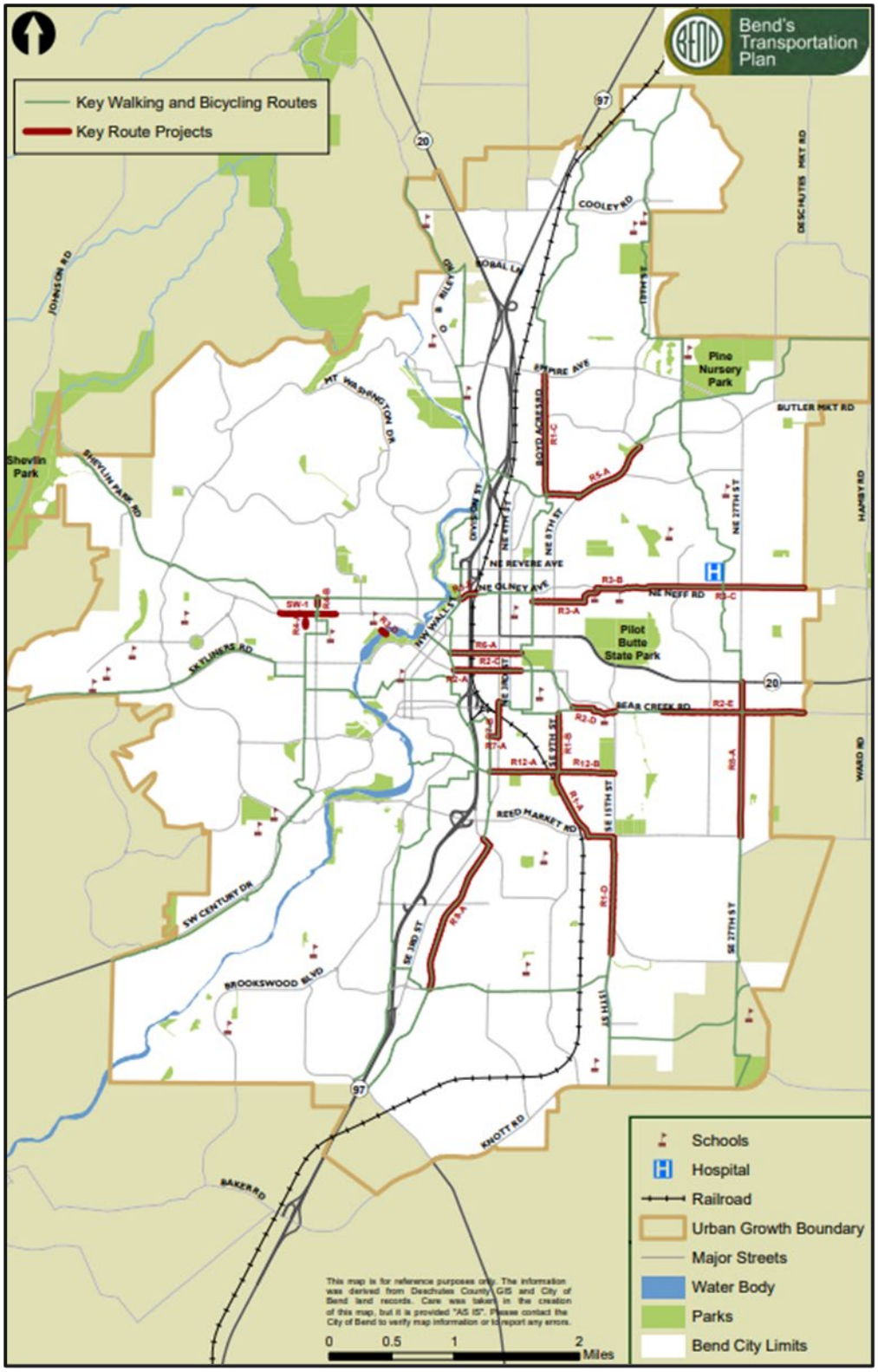

FIGURE 1: KEY ROUTES FOR WALKING AND BICYCLING

Source: Bend Transportation System Plan (2020), Figure 5-3b

EVALUATION RESULTS

The Active Transportation focused projects from the 2045 Draft MTP Project List are shown in Attachment A. These projects include the Key Routes projects from the Bend TSP. This section summarizes the key active transportation performance measures for the 2045 Draft MTP Project list, compared against the 2019 baseline and 2045 Committed conditions using the following performance measures:

- Mode Split
- Change in Motor Vehicle Demand on Key Routes

MODE SPLIT

The percentages of all person trips using walking and bicycle modes within the Bend MPA were calculated from the BRM. These percentages were based on trips that both begin and end within the Bend MPA. Table 1 documents these mode splits between the 2019 Base Year, the 2045 Committed, and the 2045 Draft MTP Project List.

TABLE 1: PERCENT WALKING AND BIKING TRIPS WITHIN THE BEND MPA

MODE	2019 BASE	2045 COMMITTED	2045 PROJECT LIST	% CHANGE BETWEEN COMMITTED AND PROJECT LIST
PEDESTRIAN	10.2%	11.9%	12.4%	4.8%
BICYCLE	3.4%	3.4%	3.5%	2.3%

Both biking and walking trips within the Bend MPA show limited changes between the 2045 Committed and 2045 Draft MTP Project List scenarios. These limited changes reflect the BRM active transportation modeling constraints, as the model has no direct sensitivity to quality of bicycle or pedestrian facilities. Projects impacting the estimated change in mode split are Active Transportation or multi-model connectivity projects and new roadways or trails/paths that create more direct routes for walking and biking between different land uses.

CHANGE IN MOTOR VEHICLE DEMAND ON KEY ROUTES

As discussed in the MTP Needs Memorandum, daily motor vehicle traffic volumes are expected to increase along most of the Key Routes for Walking and Bicycling throughout the MPA under the 2045 Committed condition. The 2045 Draft MTP Project List includes multiple projects that change the estimated 2045 daily motor vehicle traffic along these Key Routes when compared against the 2045 Committed condition. Figure 2 highlights this comparison, showing the change in daily motor vehicle traffic volume between the 2045 Committed scenario and the 2045 Draft MTP Project List scenario along the designated Key Routes.

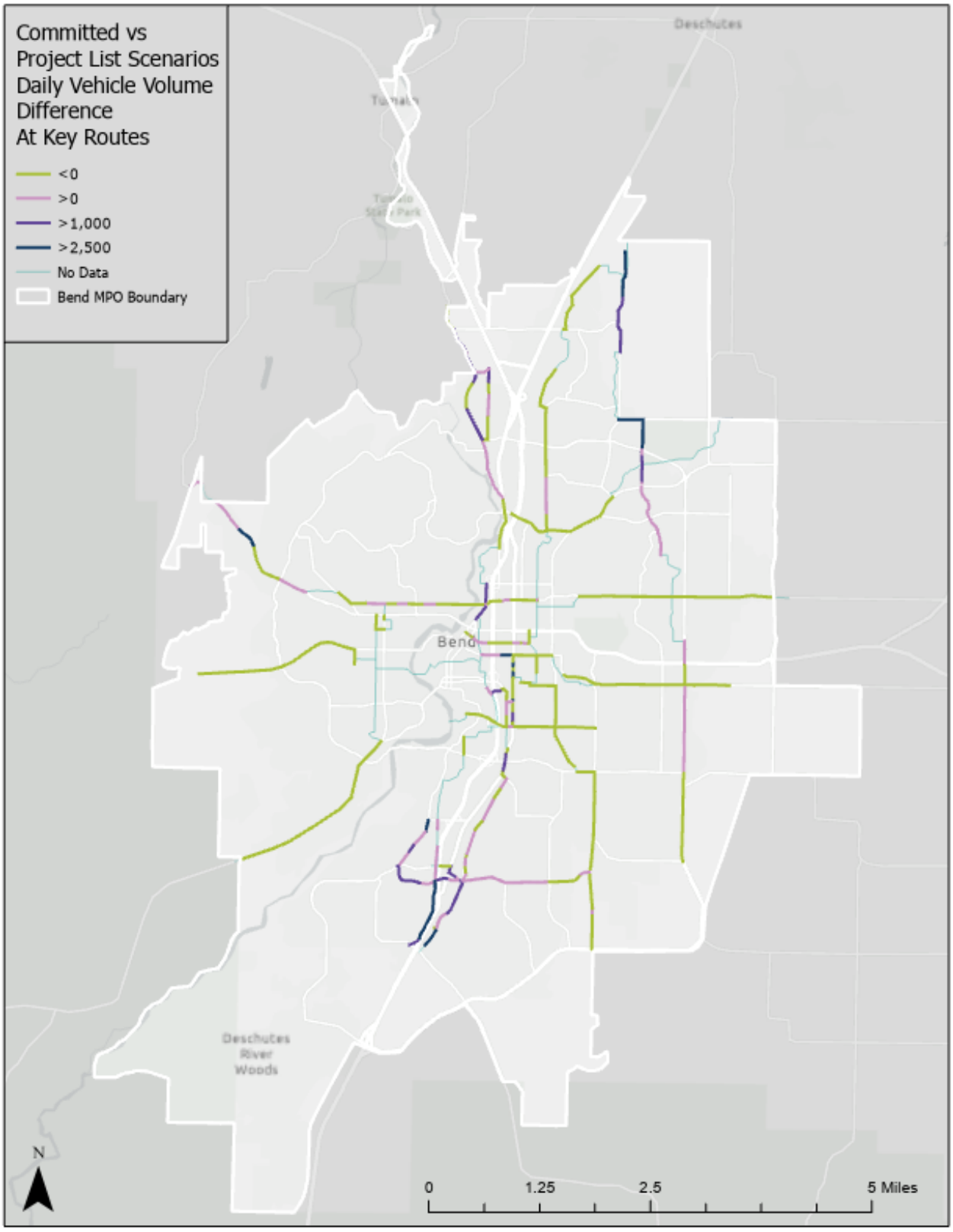

FIGURE 2: CHANGE IN DAILY VOLUME ALONG DESIGNATED KEY ROUTES BETWEEN COMMITTED AND PROJECT LIST SCENARIO

The most critical changes in daily motor vehicle traffic along Key Routes are summarized as follows:

- **Improved (Reduced Traffic)**
  - Skyliners Road (NW 17th St to NW Crossing Dr) – 19% reduction primarily due to the NW Crossing Extension (Project 202)
  - Shevlin Park Road (Mt Washington Dr to Skyline Ranch Rd) – 21% reduction due to new expansion area connections to the north (Projects 219 and 230)
  - Bear Creek Road (NE 15th St to Ward Rd) – 19% reduction due to new Stevens Road Re-alignment (Project C-65) and mode shifts driven by nearby transit route enhancements (Projects CET 6 and CET 7)
  - Hawthorne Ave (NW Harriman St to US 97) - 66% decrease due to closure of eastbound right turn onto US 97 at Hawthorne Ave (Project C2B)
  - SE 9th Street (SE Glenwood Dr to Reed Market Rd) – 11% decrease due to closure of 9th Street direct vehicle access onto Reed Market Rd as part of the Rail Crossing Improvement (Project C-44). Along this segment near Bend High, removal of the limited use left turn lane between Franklin and Glenwood Avenue could create space for bike lane separation, and this treatment is recommended for further consideration in the upcoming City of Bend TSP Update.
- **Degraded (Increased Traffic)**
  - NE Franklin Ave (NW Harriman St to NE 3rd St) – 60% increase due to closure of eastbound right turn onto US 97 at Hawthorne Ave (Project C2B). If the southbound right turn from the Parkway onto Hawthorne Avenue is ultimately closed due to the design of the new Hawthorne Pedestrian Overcrossing (Project 23494), additional traffic impacts may be experienced on this roadway segment. Potential treatments for this increase in traffic include crosswalk enhancements at the Franklin Ave/Harriman St intersection to limit left turns, which is recommended for consideration in the upcoming City of Bend TSP Update.
  - Parrell Rd (China Hat Rd to Murphy Rd) – 68% increase due to the closure of the China Hat Rd RI/RO access to US 97 as part of the China Hat/Ponderosa Overcrossing (Project C-58). The southern portions of the modernization project for Parrell Road (Project M-2) are recommended for prior or parallel implementation with Project C-58 to mitigate the effects of this traffic increase on active transportation and improve safety for all modes of travel on Parrell Road.
  - NE 18th St (NE Talus Pl to Egypt Dr) – 34% increase due to NE 18th St connection to new interchange at US 97 (Project 97.A).

NEW/CHANGING ACTIVE TRANSPORTATION NEEDS

From a high-level perspective, biking travel has been increasing in the Bend MPO area. E-bikes have been rapidly increasing in popularity, and this has reduced the effects of commute distance on mode choice. These changes to local bicycling behavior highlight the active transportation needs throughout the Bend MPO Area and represent an opportunity to for jurisdictions within the region to further encourage usage of non-auto modes of travel.

Based on the new 2045 horizon year system analysis results, the overall active transportation needs continue to align with the needs identified in prior planning efforts. The projects identified in

prior planning efforts align closely with the identified needs, and in many cases, multi-modal connectivity projects are effectively reducing vehicle travel on corridors designated as Key Routes for Walking and Bicycling. Only one project from a study completed since the completion of the Bend TSP clearly impacts a designated Key Route. This project is the proposed new interchange connecting NE 18th Street to US 97 (Project 97.A). This new connection would attract more traffic to the portion of the NE 18th Street corridor designated as a Key Walking and Bicycling Route. Project C-23 is intended to upgrade NE 18th Street to an urban arterial corridor, and this project is recommended to be linked to the NE 18th Street and US 97 Interchange (Project 97.A) with elements that incorporate upgrade NE 18th Street to a Key Route for walking and biking, mitigating the expected increase in motor vehicle traffic on this corridor.

Since the completion of the Bend TSP, community priorities have continued to focus on improving the active transportation system. While Key Routes address many of the most critical needs for people walking and biking within the City of Bend, public input on recent projects, particularly Key Routes for Walking and Biking project, have indicated that the community desires higher-quality, lower-stress facilities than what was initially assumed when scoping and budgeting the Key Route projects. For example, the on-going Olney Avenue Pedestrian and Bicyclist Improvements project conducted a detailed alternatives analysis. Through this analysis, only one of the three alternatives fit within the available project budget, while the higher cost, increased enhancement alternatives received more community support. Other Key Route project costs within the MTP should be evaluated to determine whether the proposed project budget continues to meet the intent of the Key Route. In addition, further study is needed to determine how increased traffic on Key Routes will impact LTS, particularly on key routes where the assumed solution is a buffered bike lane. This study would inform the upcoming Bend TSP Update and allow for more accurate scoping of Key Routes projects.

TRANSIT EVALUATION AND FINDINGS

This section presents the following analysis and findings related to the transit needs and proposed projects within the Bend MPA:

- **Summary of Needs**
- **Evaluation Results**
- **New/Changing Transit Needs**

SUMMARY OF NEEDS

As described in the MTP Needs Memorandum, prior local plans have identified the following key needs for transit within the Bend MPA:

- Expanded fixed route service, including reduced headways
- More service coverage and connections in Bend, especially the Old Mill and the NE and SE Bend and St. Charles area
- More direct connections to downtown from the east side.
- Expanded weekend service

- More frequent regional service, including connections to the airport
- Service to both existing and future developments in the outer growth areas of the Bend UGB
- More recreational service
- Additional buses
- Technology upgrades
- Better bicycle and pedestrian facilities near transit stops (such as bike parking, mobility hubs, safe crosswalks, and sidewalk infill).
- Improvement to PM peak hour transit travel time reliability on congested corridors, particularly the river crossings, US 20, US 97, and 27th Street

The projects in prior adopted plans are intended to address these needs, expanding transit access and reliability for all residents and employees within the Bend MPA.

EVALUATION RESULTS

The transit focused projects from the 2045 Draft MTP Project List are shown in Attachment B. This section summarizes key transit performance measures for 2045 Draft MTP Project list, compared against the 2019 baseline and 2045 Committed conditions, including:

- Mode Split
- Transit Coverage

MODE SPLIT

The percentages of all person-trips using transit within the Bend MPA were calculated from the BRM. These percentages were based off trips that both begin and end within the Bend MPA. Table 2 below documents these mode splits between the 2019 Base Year scenario, the 2045 Committed scenario, and the 2045 Draft MTP Project List scenario.

TABLE 2: PERCENT TRANSIT TRIPS WITHIN THE BEND MPA

MODE	2019 BASE	2045 COMMITTED	2045 PROJECT LIST	% CHANGE BETWEEN COMMITTED AND PROJECT LIST
TRANSIT DEMAND	0.14%	0.15%	0.59%	400%

As shown in Table 2, the CET service enhancements, travel demand management programs, and the addition of mobility hubs within the 2045 Draft MTP Project List scenario quadruple transit ridership. However, the overall percentage of transit trips compared against all person trips throughout the MPA remains extremely low, highlighting the opportunity to achieve greater benefit to the system by attracting more riders.

Some programmatic opportunities to increase travel in transit type modes beyond currently identified projects could include vanpool/carpool incentives for large area employers, targeting businesses along corridors identified to have increasing motor vehicle congestion. Some of these types of programs already exist, such as the Enterprise program, but targeted funding to increase

the reach of these programs is lacking. More refined funding sources for these programs is recommended as a consideration in the upcoming Bend TSP Update.

TRANSIT COVERAGE

The addition of new transit projects included in the 2045 Draft MTP Project List increases the coverage of transit service within the Bend MPA, allowing greater access to households and jobs, as listed in Table 3. The geographic transit coverage buffers plotted against the MPA housing and employment growth areas are shown in Figure 3 and Figure 4.

TABLE 3: PERCENT OF MPA HOUSEHOLDS AND JOBS WITHIN 0.25 MILES OF TRANSIT SERVICE

MODE	2019 BASE	2045 COMMITTED	2045 PROJECT LIST	% CHANGE BETWEEN COMMITTED AND PROJECT LIST
HOUSEHOLDS	49%	44%	50%	14%
JOBS	79%	55%	60%	9%

The number of households within a quarter mile of transit service or mobility hubs increased for the 2045 Draft MTP Project List due to a new fixed service route (Project CET-8). However, even with the new route, only 50% of households have walkable (0.25 miles or less) access to transit, similar to present day conditions. A substantial proportion of new residential growth within the Bend MPA is likely to be multi-family, high-density development, which is supportive of transit travel choices. But as shown in Figure 4, some of the largest residential growth areas, particularly in the southeast, fall outside the transit coverage area.

As shown in Figure 3, a substantial portion of the expected MPA job growth occurs outside of transit coverage, particularly the growth areas in the southeast and northeast. This results in only 60% of all MPA jobs falling within the 2045 Draft MTP Project List transit coverage area under future conditions. In addition, buses in the transit system are affected by motor vehicle congestion on many of the existing or planned routes, affecting travel times and reliability. Upcoming local plan updates (Deschutes County ITS Plan, CET Master Plan, Bend TSP Update) are recommended to consider ITS projects supporting transit signal priority. As a community, the Bend MPO Area does not have a transit culture. Developing a transit culture will require additional support, with Commute Options, incentives, direct marketing, and other strategies and tactics targeting transit ridership. The upcoming Bend TSP Update is recommended to consider identifying funding sources to support these types of strategies and tactics to increase transit ridership throughout the region.

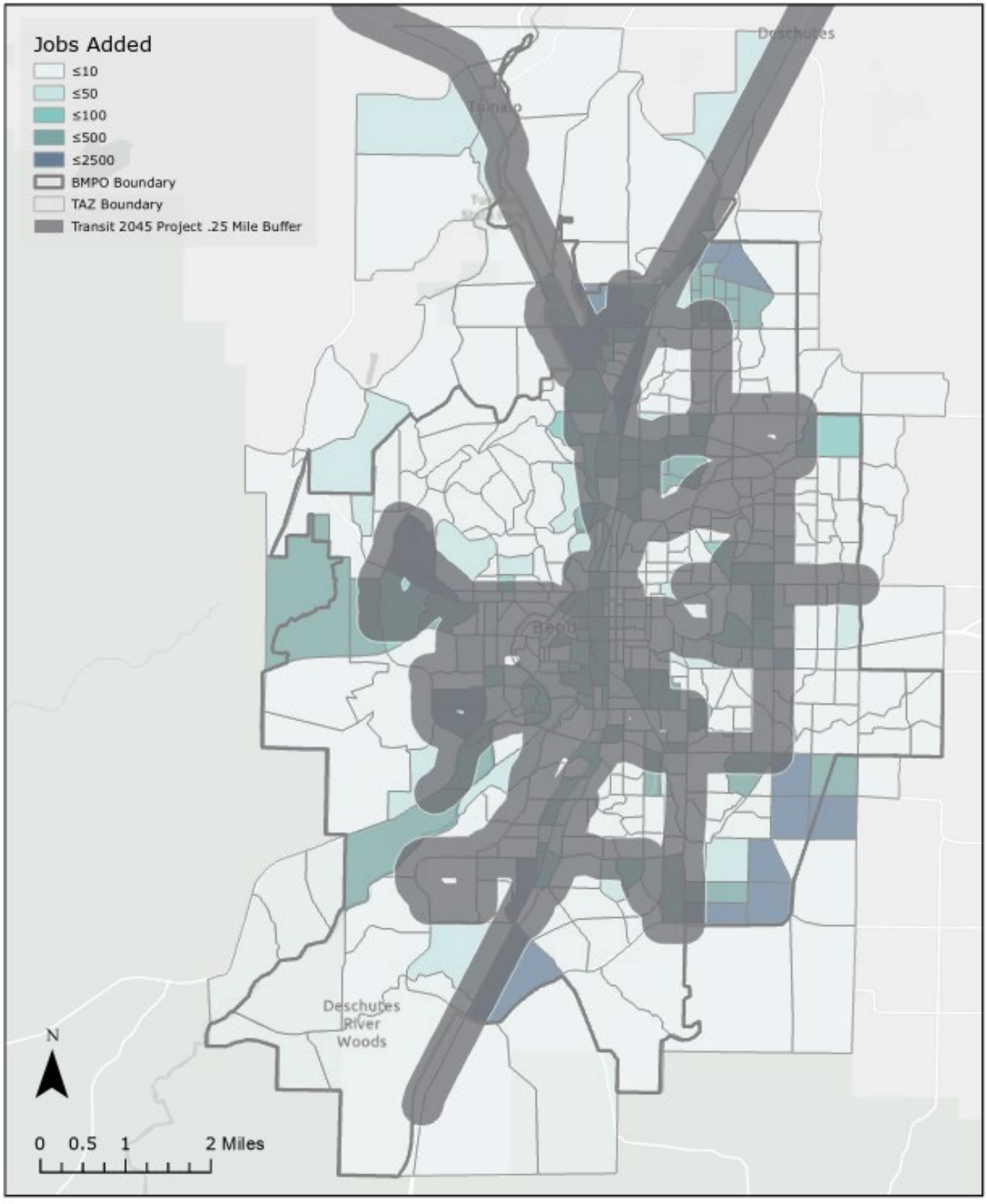

FIGURE 3. 2045 DRAFT MTP PROJECT LIST TRANSIT COVERAGE AND JOB GROWTH

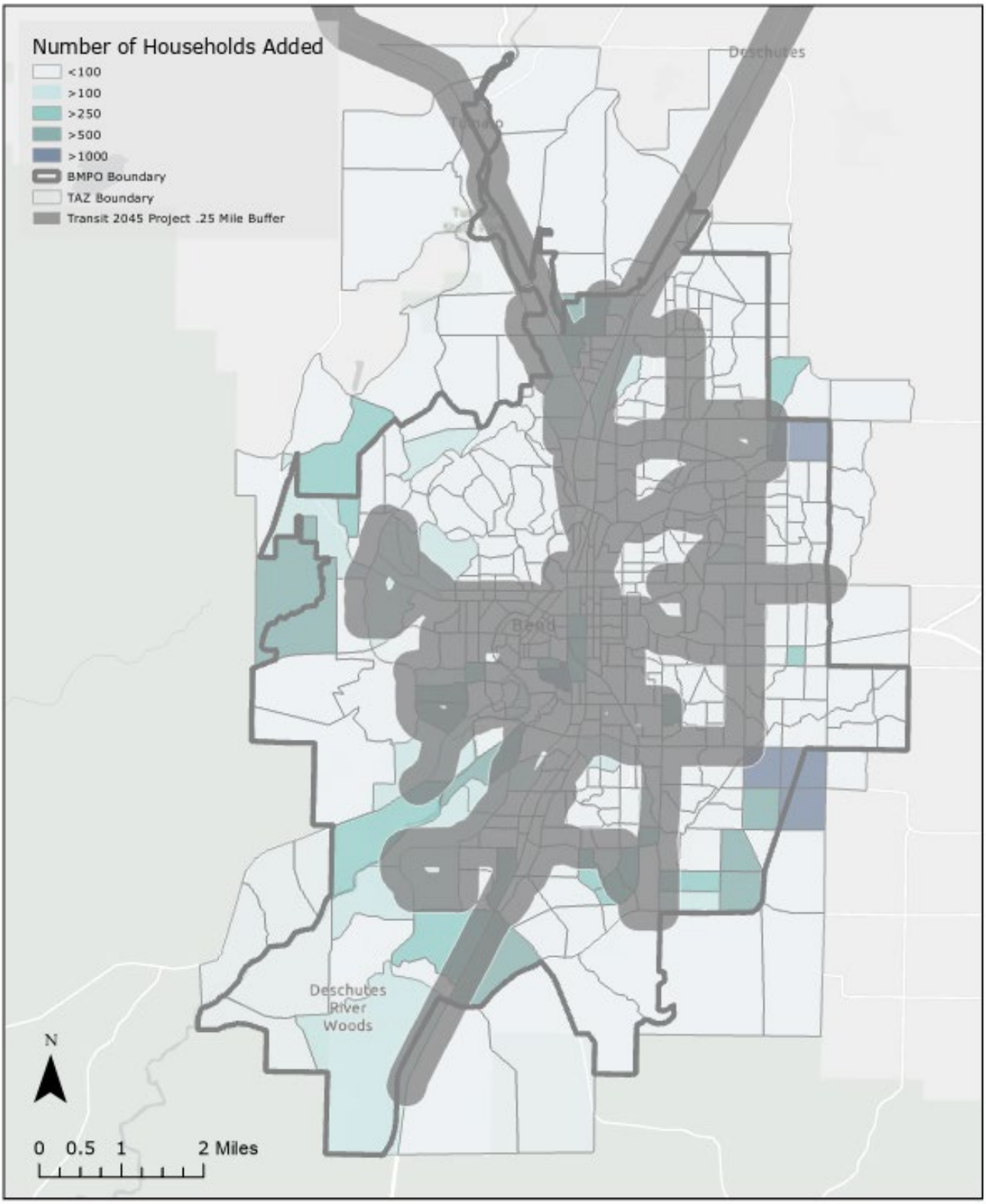

FIGURE 4. 2045 DRAFT MTP PROJECT LIST TRANSIT COVERAGE AND HOUSING GROWTH

NEW/CHANGING TRANSIT NEEDS

With the updated growth assumptions for the MPA expanding the planning horizon from 2040 to 2045, more high-density, transit-oriented growth is anticipated in the urban fringe areas of the Bend MPA. The 2045 Draft MTP Project List does not provide sufficient coverage to fully serve these new growth areas, limiting transit options for many areas across the MPA. Some of the most critical motor vehicle system needs, particularly needs related to east-west corridors, cannot be fully resolved through new connections or corridor enhancements. Expanded transit service has the potential to provide some relief to these congested corridors by shifting people from motor vehicles to transit.

MOTOR VEHICLE EVALUATION AND FINDINGS

This section presents the following analysis and findings related to the motor vehicle needs and proposed projects within the Bend MPA:

- **Summary of Needs**
- **Evaluation Results**
- **New/Changing Motor Vehicle Needs**

SUMMARY OF NEEDS

Several key needs for congestion mitigation were identified in the MTP Needs Memorandum, including the following:

- US 97
- East-west corridors
- North-south corridors
- Key intersection nodes between east-west and north-south corridors.

Under 2045 Committed conditions, the following corridors are forecasted to experience particularly elevated levels of congestion:

- NE Butler Market Road
- NW Galveston Ave
- NE Neff Road
- NW Portland Ave
- NE Newport Ave
- Powers Road
- SE Reed Market Road
- SE 15th Street
- 27th Street
- Ward Road
- SE Wilson Avenue

EVALUATION RESULTS

The motor vehicle/multi-modal focused projects from the 2045 Draft MTP Project List are shown in Attachment C (connectivity and corridor enhancement), Attachment D (intersections), and Attachment E (technology). This section summarizes the key motor vehicle performance measures for the 2045 Draft MTP Project List, compared against the 2019 baseline and 2045 Committed conditions, including:

- Corridor Congestion
- System Delay
- Vehicle Miles Traveled (VMT)
- Trip Diversion

CORRIDOR CONGESTION

The corridor levels of congestion throughout the Bend MPA were estimated using BRM model outputs, which were compiled in Demand to Capacity (D/C) ratios indicating capacity constraints throughout the system. Figure 5 compares the PM Peak Hour demand to capacity ratio results by corridor for the 2045 Draft MTP Project List and the 2045 Committed scenario.

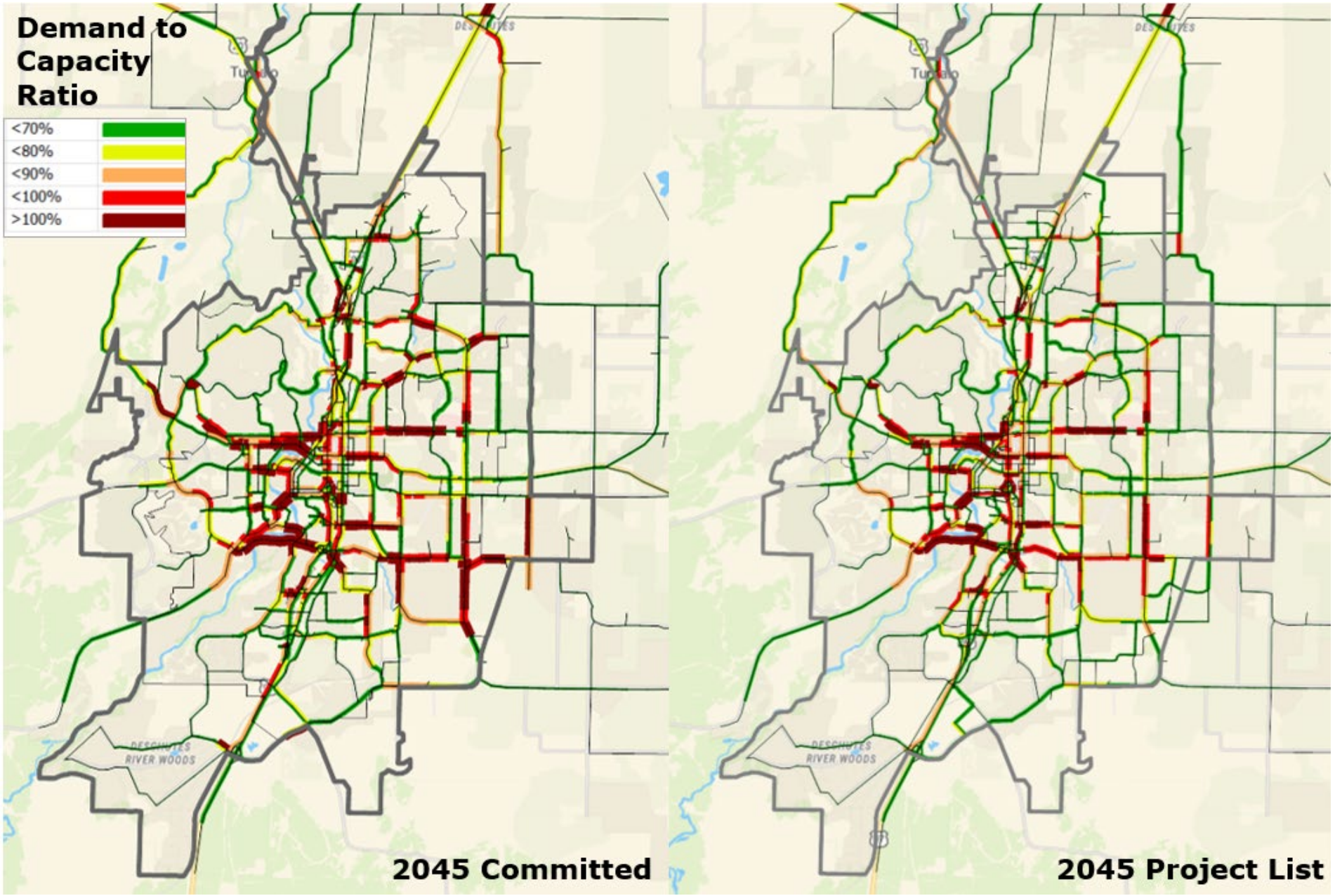

FIGURE 5: 2045 COMMITTED AND PROJECT LIST PM PEAK HOUR DEMAND/CAPACITY RATIOS

As shown in Figure 5, the 2045 Draft MTP Project List improves some of the congestion issues flagged in the MTP Needs Memorandum, including:

- US 97 Parkway - traffic operations improve, due mainly to restricted access (Projects C2A-C2H)
- North-south corridor – 27th Street improves south of Reed Market Road due to additional connectivity projects to the east
- Empire Boulevard/Butler Market Road – Improves due to Yeoman Road extension (Projects C-1 and C-76)

Congestion needs that remain include:

- All East-West river crossings
- Smaller portions of Butler Market Road
- NW Galveston Ave
- NE Neff Road
- NW Portland Ave
- NE Newport Ave
- Powers Road
- SE Reed Market Road
- SE 15th Street
- 27th Street
- Ward Road
- SE Wilson Avenue

Prior planning efforts have identified ramp metering on the Bend Parkway (US 97) as a key strategy to manage congestion on this critical statewide and regional connection through the City of Bend. To evaluate the congestion benefits/impacts of a ramp meter strategy on US 97, a separate BRM scenario was developed that included the 2045 Draft MTP Project List with ramp meters also modeled. The PM Peak Hour demand to capacity ratios for the ramp metering scenario are compared against the 2045 Draft MTP Project List results in Figure 6.

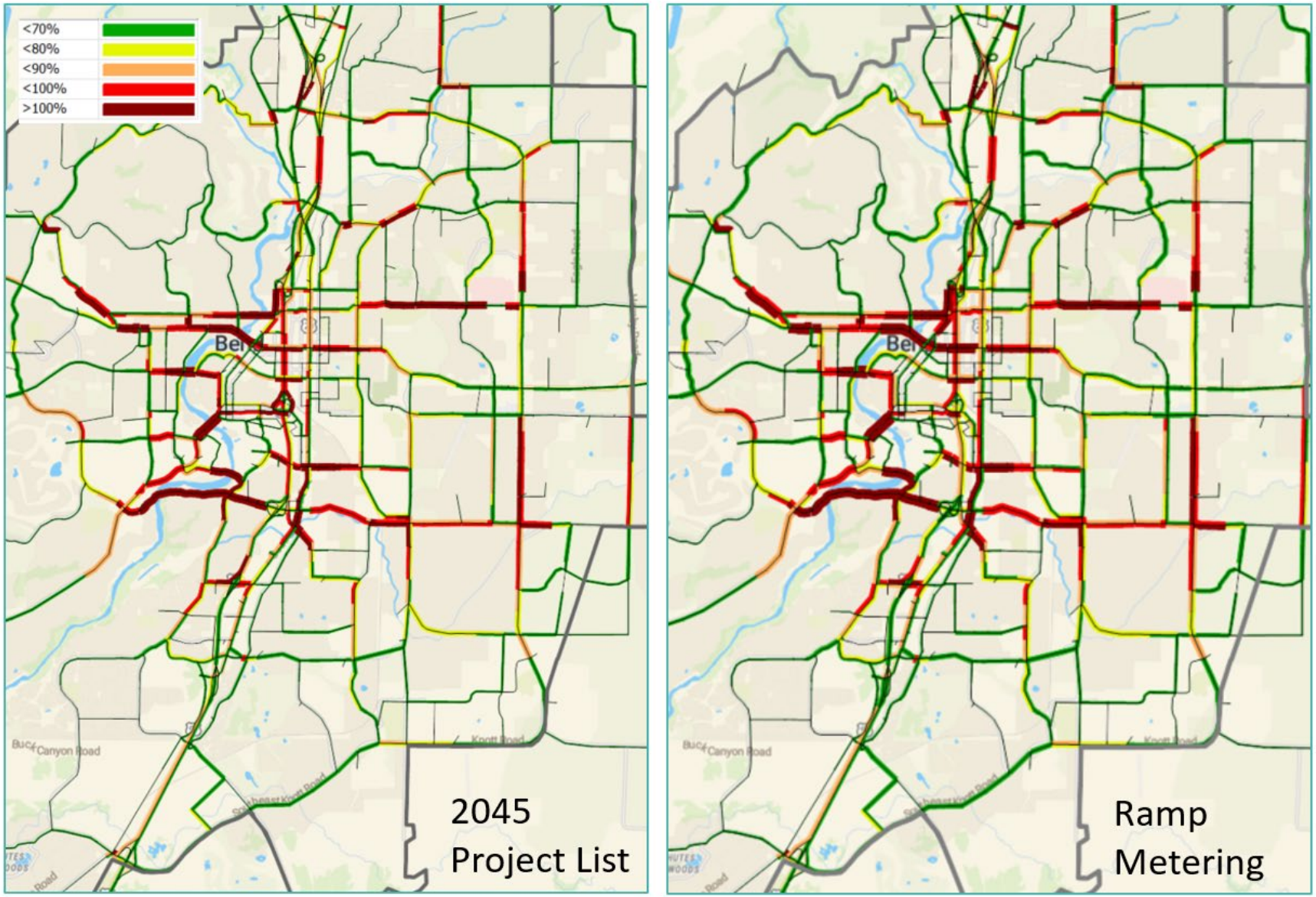

FIGURE 6: 2045 PM PEAK HOUR CONGESTION WITH/WITHOUT RAMP METERS

As shown in Figure 6, shifts in traffic from the ramp metering manage to keep the US 97 Parkway below capacity under 2045 conditions and improve traffic operations at the Colorado Interchange. Traffic congestion on 3rd Street increases as short trips are discouraged from using the Parkway due to ramp meter delay. In addition, traffic using the Colorado interchange shifts onto 3rd Street and Greenwood, increasing congestion between 3rd Street and Downtown Bend on this corridor. The remainder of the system operates very similar to conditions without ramp meters.

SYSTEM DELAY

The MPA area roadway system PM Peak Hour vehicle delay with the 2045 Draft MTP Project List is summarized in Table 4, and compared against 2019 and 2045 Committed conditions. The system delay is separated by facility jurisdiction (City of Bend, ODOT, Deschutes County).

TABLE 4: PM PEAK HOUR VEHICLE HOURS OF DELAY

ROADWAY JURISDICTION	2019 BASE	2045 COMMITTED	2045 PROJECT LIST	% CHANGE BETWEEN COMMITTED AND PROJECT LIST
CITY OF BEND FACILITIES	144	612	450	-26%
ODOT FACILITIES	63	226	180	-20%
DESCHUTES COUNTY FACILITIES	2	24	15	-38%
TOTAL	210	862	645	-25%

As listed in Table 4, the 2045 Draft MTP Project List scenario is expected to significantly decrease overall delay. The connectivity and corridor enhancement projects that add motor vehicle capacity and alternate routes to the system drive this delay reduction.

As noted in the Transit section, changes in mode split are not significant at a regional scale, and therefore do not significantly contribute to the reductions in delay across the MPO Area. Shifts away from motor vehicle modes could provide further improvements in system delay, but to realize these improvements, targeted funding to strategic programs would be needed. Therefore, all local plans supporting jurisdictions within the MPO Area are recommended to consider establishing strategic mode shift programs with dedicated funding sources, or designating funding sources and implementation plans for already identified but unfunded programs.

VEHICLE MILES TRAVELED (VMT)

Vehicle Miles Traveled (VMT) is a way to measure of total motor vehicle travel within the system. Normalized to the population within the MPA, this measure indicates trends in both number of vehicle trips and average trip length, measures which reflect both land use planning implications on travel and approximated future year motor vehicle emissions. Table 5 summarizes the daily VMT results for trips originating from households within the Bend MPA under 2019, 2045 Committed,

and 2045 Draft MTP Project List conditions. These VMT results are normalized by the Bend MPA population estimates to create VMT per capita.

TABLE 5: DAILY VMT RESULTS

MEASURE	2019 BASE	2045 COMMITTED	2045 PROJECT LIST	% CHANGE BETWEEN COMMITTED AND PROJECT LIST
DAILY VMT PER CAPITA	6.89	7.22	6.94	-4%

The VMT per capita results indicate that while the 2045 Draft MTP Project List does improve VMT over 2045 Committed conditions, compared against 2019 (approximation of present day) conditions, the future conditions show an increase of 0.7%. This increase occurs despite careful balancing of land use (housing and employment) in Bend MPA growth areas, enhancements to the transit system, and improvements to connectivity. Increased travel beyond the Bend MPA to/from Redmond is a likely factor counteracting reductions in VMT internal to Bend. The limited transit usage within the model provides an opportunity to reduce VMT per capita by targeting the vehicle trips per person portion of the measure, as increasing the transit mode share even to 3% of all trips would drop the VMT per capita well below 2019 levels. This important measure will be revisited in more detail during the Refined 2045 MTP Project List evaluation. Overall, the MTP does not set targets for regional mode split or VMT reduction, but rather reports this information to inform the local jurisdictions of the region's progress in these areas. Therefore, local jurisdictions are recommended to set their own targets for mode shift and VMT reduction both at the targeted corridor and system level in their upcoming local planning efforts.

TRIP DIVERSION

With congestion expected to continue to grow throughout the Bend MPA in the future, traffic may divert onto local streets in attempts to bypass system or corridor bottlenecks. To estimate the system-level risk of trip diversion, the percentage of collector roadways with Average Daily Traffic (ADT) of more than 4,000 was calculated from the BRM. Table 6 summarizes this measure for 2019, 2045 Committed, and 2045 Draft MTP Project List Conditions.

TABLE 6: TRIP DIVERSION POTENTIAL

MEASURE	2019 BASE	2045 COMMITTED	2045 PROJECT LIST	% CHANGE BETWEEN COMMITTED AND PROJECT LIST
DIVERSION POTENTIAL[A]	7%	23%	19%	-4%

[A] Measured as a percent of collector roads with an average daily traffic volume above 4,000 vehicles per day.

As listed in Table 6, the 2045 Draft MTP Project List reduces the risk of trip diversion over the 2045 Committed condition, but still more than doubles the amount of high-volume collector facilities compared to present day. Cut-through traffic already occurs adjacent to varies congested corridors and hot-spots throughout the Bend MPO Area, particularly during construction projects. Corridors of particular concern for increasing local roadway trip diversion include segments along the following roadways:

- Neff Road
- Brosterhous Road
- 15th Street
- Wilson Avenue
- Portland Avenue
- Newport Avenue
- Powers Road

The Bend TSP considered funding and staffing a program to manage cut-through traffic, and this program has been at least partially implemented to support the construction efforts related to the Bond projects. The continued traffic growth throughout the Bend MPO Area indicates a need to expand the implementation of this program to consider non-construction related cut-through traffic under current conditions.

NEW/CHANGING MOTOR VEHICLE NEEDS

The new horizon year of 2045 and changes to land use based on recent growth trends and local planning activities have both created new needs and changed the scope of previously identified motor vehicle system needs. The combined impact of these changes is reflected in the following summary of changes in motor vehicle system needs between the prior and current MTP updates:

- **OB Riley Road** – The corridor capacity need identified in the prior MTP is reduced to a smaller bottleneck issue at Archie Briggs, due to lower land use growth assumptions near this area (e.g., Gopher Gulch). The multi-modal project identified for this corridor (Project C-3) should be considered for re-scoping during this MTP and subsequent City planning efforts.
- **Shevlin Park Road** – New traffic congestion need east of Skyline Ranch Road.
- **Neff Road** – Heightened congestion need between 8th Street and 27th Street, with potential of increasing neighborhood cut-through.
- **Hamby Road** – New traffic congestion need from Stevens Road to Bear Creek Road, driven by growth in the Stevens Ranch and DSL areas.
- **Powers Road** – New congestion need between US 97 and Brookswood Boulevard
- **East West River Crossings** – This congestion issue was a key need identified in the City's TSP and was flagged for monitoring. Current travel demand model forecasts indicate that these crossings will experience traffic demand well beyond existing capacity, indicating a need to move forward with a study for new/enhanced river crossings. This study should include best practices/strategies to manage the existing river crossings as well, particularly given the topographic and right-of-way constraints affecting many of the bridges and connecting facilities.

- **27th Street** – This corridor was flagged for monitoring in the City's TSP, with the year 2040 analysis indicating a need for a five-lane cross section from Empire Boulevard to Ferguson Road. The 2045 Draft MTP Project List evaluation indicates that by the year 2045 Horizon, a five-lane cross section is only needed from near St. Charles Hospital in the north to Reed Market Road in the south.

ATTACHMENTS

CONTENTS

ATTACHMENT A: ACTIVE TRANSPORTATION PROJECTS

TABLE 7: ACTIVE TRANSPORTATION CONNECTIVITY PROJECTS

MAP ID	PROJECT DESCRIPTION	DRAFT COST ESTIMATE[1]
20714	US 97: Multi-Use Trail	$5,977,172
23494	Hawthorne Ave Pedestrian Bike and Overcrossing	$24,450,000
A36	Complete Sidewalk in Unincorporated Communities	$$$
BP-1	Sidewalks on 7th Street (Tumalo)	$300,000
BP-10	Sidewalks on 8th Street (Tumalo)	$400,000
BP-2	Sidewalks on 4th Street (Tumalo)	$300,000
BP-3	Sidewalks at 2nd and Cook (Tumalo)	$1,700,000
BP-6	Sidewalks on 5th Street (Tumalo)	$500,000
M-12	Olney Avenue Bike Lanes and Undercrossing	$1,820,000
M-15A	Greenwood Undercrossing Sidewalk Widening	$7,883,975
M-15C	Franklin Avenue Underpass	$46,880,530
M-20	Knott Canal Crossing	$700,000
M-9A	Franklin Avenue Underpass Shared Use Path	$6,799,000
M-9C	Greenwood Undercrossing Sidewalk Widening and Shared Use Path	$2,978,400
P10	DRT North Trailhead	$320,000
P11	DRT Kirkaldy to Putnam	$59,713
P13	DRT Galveston to Miller's Landing	$3,000,000
P14	DRT South UGB and Bike/ Pedestrian Bridge	$1,000,000 - $5,000,000
P35	Riley Ranch Nature Reserve Bike/ Pedestrian Bridge	$1,200,000
P41	Arnold Canal Trail	$534,000
P44	Discovery West Trail	$1,600,000
P45	Hansen Park Trailhead	$250,000 - $1,000,000
P47	High Desert Park Trail	$213,600
P49	North Unit Canal Trail	$512,200
P50	Pilot Butte Canal Trail	$164,100
P55	Hansen to Big Sky Park Trail	$1,000,000 - $5,000,000
P56	Manzanita Trail	$40,000
P57	Neff and Hamby Road Crossings	$1,000,000 - $5,000,000
P6	COHCT from Blakely Road to Hansen Park	$660,900
P61	Riley Ranch Nature Reserve Neighborhood Access	<$250,000
P64	Shevlin Park North to Tumalo Creek Bike/ Pedestrian Bridge	$250,000 - $1,000,000
P67	TransCanada Trail	$250,000 - $1,000,000
P69	DRT Connector to Shelvin Park	$67,900
P7	COCHT from Hansen Park to Eastgate Park	$147,700
P75	Powerline Trail	$250,000 - $1,000,000
P77	South DRT Buck Canyon Trailhead	$1,000,000 - $5,000,000
P78	Tumalo Creek Trail	$250,000 - $1,000,000
P8	COCHT from Eastgate Park to the Badlands	$250,000 - $1,000,000
P9	DRT Putnam to Riley Ranch Nature Reserve Bike/ Pedestrian Bridge	$155,000
R2-A	NW Franklin Ave: Harriman Ave to Railroad Undercrossing	$176,000
R2-B	Franklin Ave Underpass: Hill St to 1st St	See M-15C
P7	COHCT from Hansen Park to Eastgate Park	$147,700
P75	Powerline Trail	$250,000 - $1,000,000

MAP ID	PROJECT DESCRIPTION	DRAFT COST ESTIMATE[1]
P77	South Deschutes River Trail Buck Canyon Trailhead	$1,000,000 - $5,000,000
P78	Tumalo Creek Trail	$250,000 - $1,000,000
P8	COCHT from Eastgate Park to the Badlands	$250,000 - $1,000,000
P9	DRT Putnam to Riley Ranch Nature Reserve Bike/ Pedestrian Bridge	$155,000
R2-A	NW Franklin Ave: Harriman Ave to Railroad Undercrossing	$176,000

1. Costs are from prior plan years and do not reflect 2023 dollars

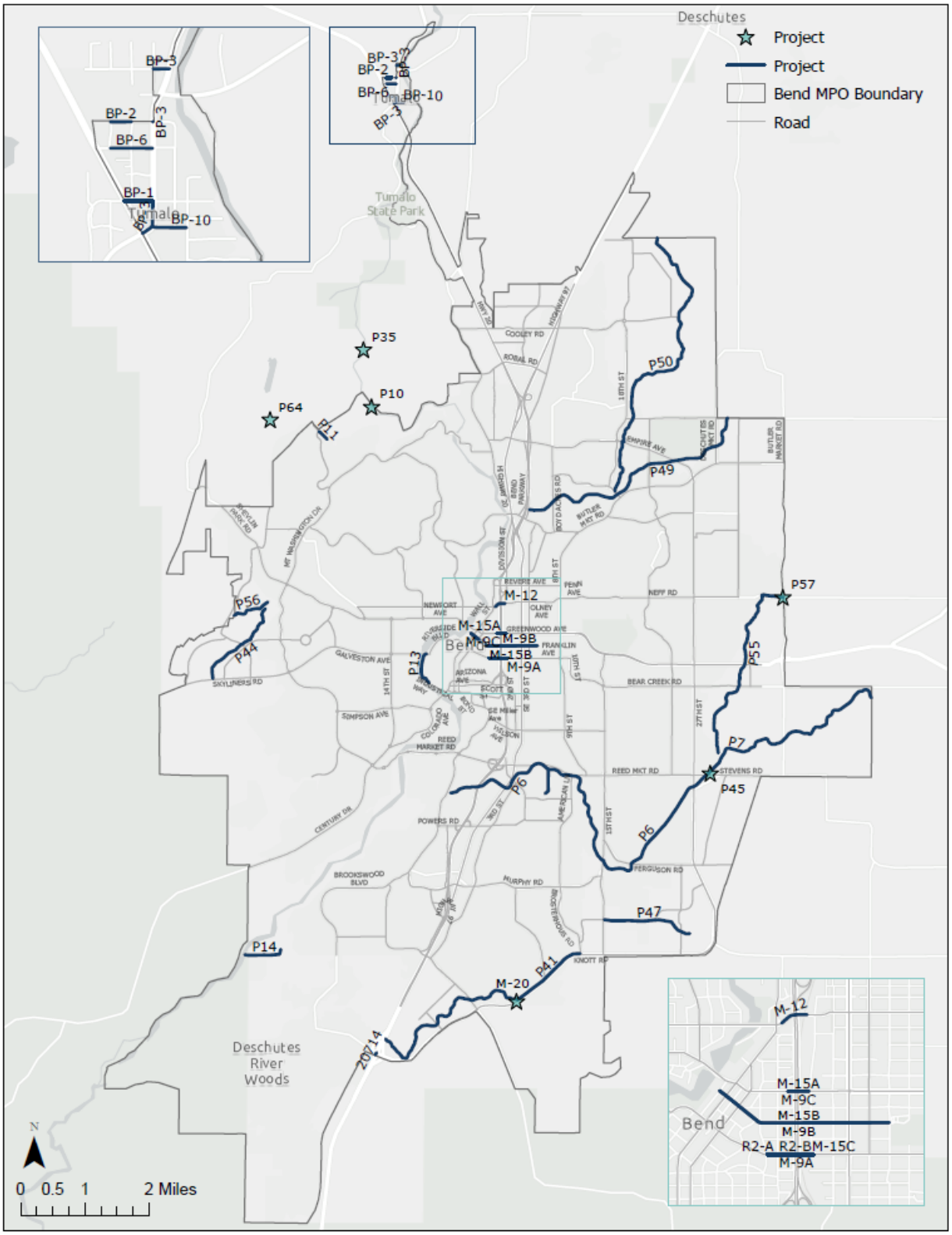

FIGURE 7. 2045 DRAFT MTP PROJECT LIST ACTIVE TRANSPORTATION CONNECTIVITY PROJECTS

TABLE 8: ACTIVE TRANSPORTATION CORRIDOR ENHANCEMENT PROJECTS

MAP ID	PROJECT DESCRIPTION	DRAFT COST[1]
20391	US 20: Empire-Greenwood Improvements	$2,034,000
21489	US 20 3rd St-15th St Improvements	$6,426,900
22442	Sisters and Bend ADA Improvements	$17,633,346
C4A	Cooley Road Improvements	$3,000,000
C4B	Butler Market Road Improvements	$200,000
C4G	Canal/ Garfield Undercrossing	$1,250,000
C4H	Badger/ Pinebrook Overcrossing	$5,000,000-10,000,000
C4I	Murphy Road Improvements	$5,000,000-10,000,000
C4L	Robal Road Improvements	$1,000,000
C4P	Wilson Avenue Improvements	$860,000
M-1	Galveston Avenue Corridor Improvements	$3,900,000
M-10	Drake Park Pedestrian Bridge Improvements	$1,275,000
M-11	Archie Briggs Road Trail Improvements	$500,000
M-14	Butler Market Road Sidewalk Improvements	$3,100,000
M-16	Revere Avenue/ 2nd Street Intersection Improvement	$210,000
M-17	Olney Avenue Railroad Crossing Improvements	$500,000
M-18	Eagle Road Functional Urban Upgrade	$14,500,000
M-19	Knott Road Urban Upgrade from China Hat Road to 15th Street	$15,600,000
M-2	Parrell Road Urban Upgrade from China Hat Road to Brosterhous Road	$29,100,000
M-21	SE 27th Street rural road upgrade from Stevens Road to Ferguson Road	$1,300,000
M-22	SE 27th Street rural road upgrade from Ferguson Rd to Diamondback Ln	$600,000
M-23	SE 27th Street rural road upgrade from Diamondback Lane to access road	$100,000
M-24	SE 27th Street rural road upgrade from access road to Knott Road	$1,300,000
M-25	Knott Road rural road upgrade from 15th Street to Raintree Court	$500,000
M-26	Knott Road rural road upgrade from Raintree Court to SE 27th Street	$5,500,000
M-27	Knott Road rural road upgrade south of China Hat Road	$300,000
M-29	Cooley Road rural road upgrade from O.B. Riley Road to US 20	$1,300,000
M-3	Olney Avenue/2nd Street intersection improvement	$210,000
M-30	Cooley Road rural road upgrade from US 20 to Hunnell Road	$1,100,000
M-31	Hunnell Road rural road upgrade from Cooley Road to Loco Road	$200,000
M-32	Yeoman Rd rural road upgrade from the western terminus to Deschutes Market Rd	$2,500,000
M-33	Deschutes Market Road rural road upgrade from Yeoman Road to Canal	$500,000

MAP ID	PROJECT DESCRIPTION	DRAFT COST[1]
M-34	Deschutes Market Rd rural road upgrade from Canal to Butler Market Rd	$400,000
M-36	Butler Market Road rural road upgrade from Eagle Road to Clyde Lane	$400,000
M-37	Butler Market Road rural road upgrade from Clyde Lane to Hamby Road	$1,100,000
M-38	Butler Market Rd rural road upgrade from Hamby Rd to Hamehook Rd	$1,100,000
M-39	Stevens Road rural road upgrade from Stevens realignment to Bend UGB	$1,900,000
M-4	Greenwood Avenue/2nd Street intersection improvement	$210,000
M-40	Clausen Drive rural road upgrade from Loco Road to Northern terminus	$200,000
M-41	China Hat Road rural road upgrade north of Knott Road	$200,000
M-42	China Hat Road Canal Bridge widening	$400,000
M-43	Deschutes Market Road canal bridge widening	$400,000
M-5	Franklin Avenue/2nd Street intersection improvement	$210,000
M-6	Franklin Avenue/4th Street intersection improvement	$210,000
M-7	Clay Avenue/3rd Street intersection improvement	$210,000
R10-A	O.B. Riley Road & Blakeley Road: North of Cooley Road to Knott Road	Cost captured in C-45, C-3, M-30.
R11-A	Murphy Road: Powers Road to 15th Street Shared Use Path	$2,179,000
R12-A	Wilson Ave: 2nd Street to SE 9th Street	Funded
R1-A	SE 9th St: Wilson Ave to Reed Market Rd	$1,155,000
R1-B	SE 9th St: Wilson Ave to Glenwood Ave	$3,000
R1-C	NE Boyd Acres Rd: Butler Market Rd to Empire Ave	$1,884,000
R1-D	SE 15th Street: Reed Mkt Rd to 300' south of King Hezekiah	$1,185,000
R2-C	Franklin Ave: 1st St to 5th St	$16,000
R2-D	Bear Creek SRTS: Larkspur Trail to Coyner Trail	$385,000
R2-E	Bear Creek Rd: Cessna Ave to east UGB	$2,700,000
R3-A	Norton Ave: NE 6th St to NE 12th St	$196,000
R3-B	Hillside Trail: Connects NE 12th to Neff Rd	$241,000
R3-C	Neff Rd: NE 12th to Big Sky Park	$3,634,000
R3-E	Olney Avenue: Wall Street to railroad	$421,000
R4-A	NW 15th St: Lexington Ave to Milwaukie Ave	$110,000
R4-B	NW 14th St: Ogden Ave to Portland Ave	$110,000
R5-A	Butler Market Rd: Brinson Blvd to NE 6th St	$1,962,000
R7-A	3rd St: Crosswalk btw RR and Wilson Ave	$215,000
R7-B	3rd St: Crosswalk btw RR and Franklin Ave	$215,000
R7-C	3rd St: Underpass	$210,000
R8-A	27th St: Hwy 20 to Reed Mkt Rd - Shared use path	$4,815,000
RMRP2	Reed Market Road/ Chamberlain Street Improvements	$250,000
RMRP6A	3rd Street/ Brosterhous Road Safety Improvements	$130,000

MAP ID	PROJECT DESCRIPTION	DRAFT COST[1]
US20 2	US 20/ NE 8th Street Improvements	$2,100,000

1. Costs are from prior plan years and do not reflect 2023 dollars

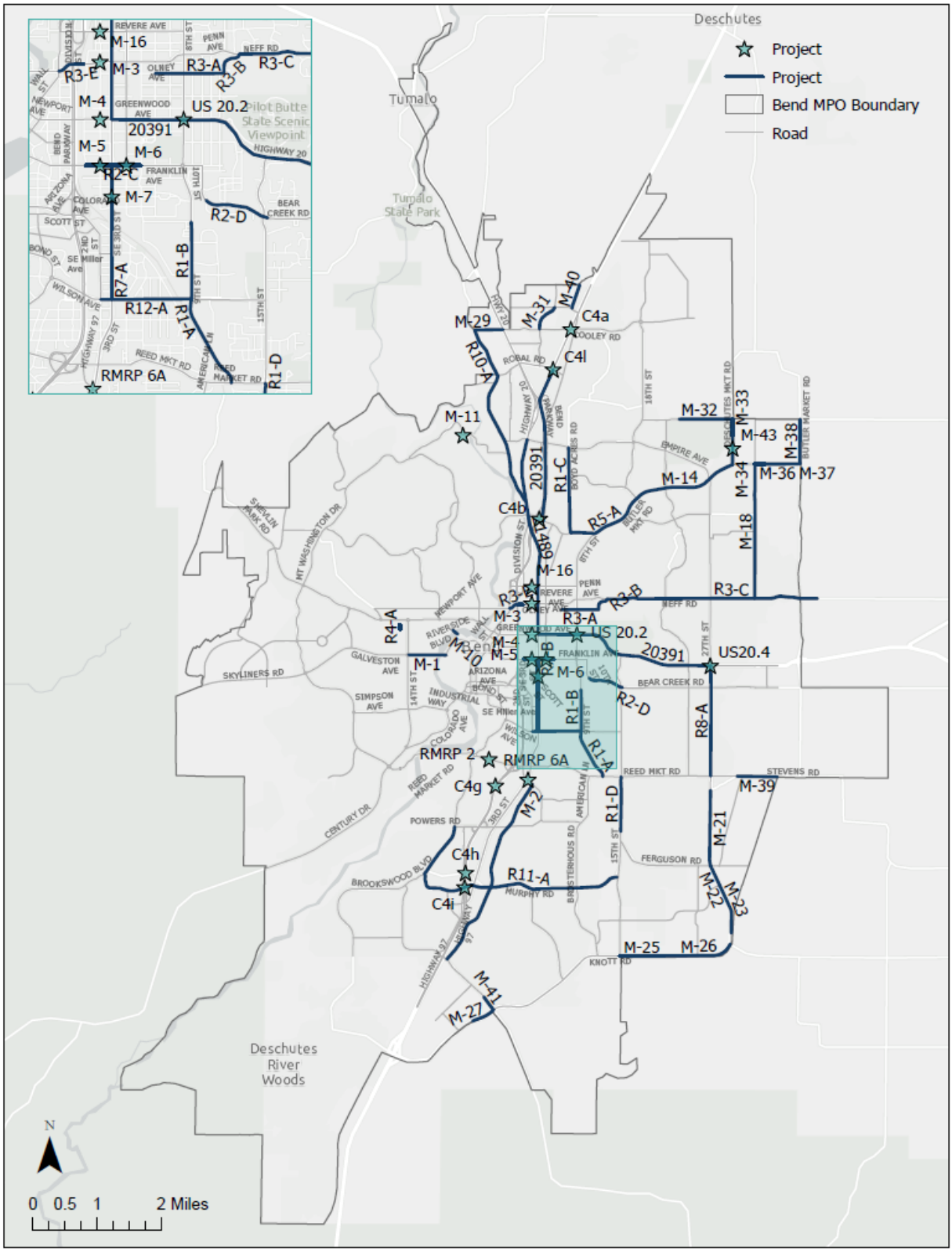

FIGURE 8. 2045 DRAFT MTP PROJECT LIST ACTIVE TRANSPORTATION CORRIDOR ENHANCEMENT PROJECTS

ATTACHMENT B: TRANSIT PROJECTS

TABLE 9. TRANSIT CONNECTIVITY PROJECTS

Cost Estimate: $7,500,000

MAP ID	PROJECT DESCRIPTION
MHND	North Downtown Mobility Hub
MHOMD	Old Mill District Mobility Hub
MHHS	Hawthorne Station Mobility Hub
MHEB	East Bend Mobility Hub
MHST	South 3rd Mobility Hub
MHNB	North Bend Mobility Hub
MHOSU	OSU Cascades Mobility Hub
MHCOC	Central Oregon Community College Mobility Hub

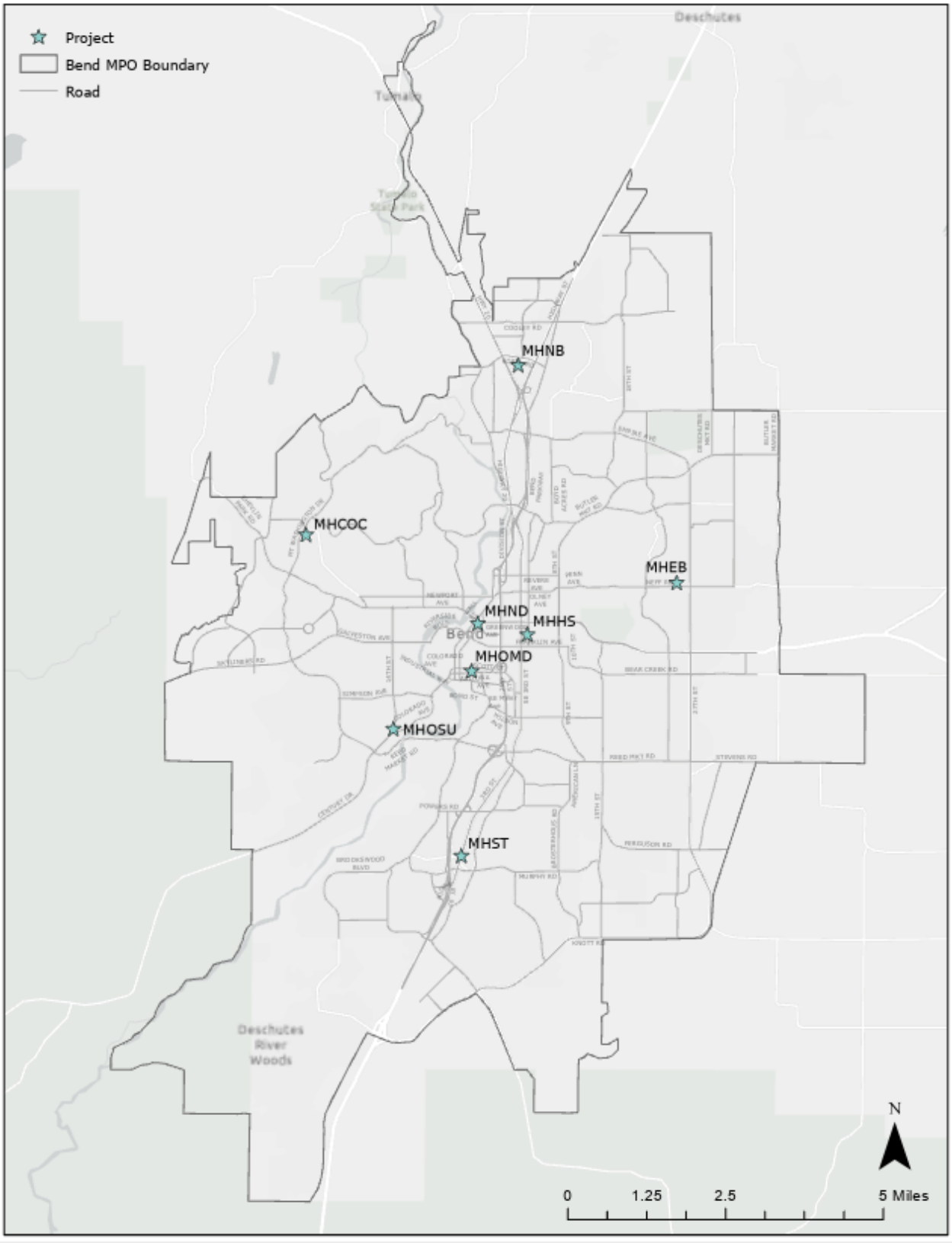

FIGURE 9. 2045 DRAFT MTP PROJECT LIST TRANSIT CONNECTIVITY PROJECTS

TABLE 10. TRANSIT SERVICE ENHANCEMENT PLAN 2045

2031-2040 Service Enhancement Cost: $24,582,000

MAP ID	PROJECT DESCRIPTION
CET 2	Bend Service Enhancement Route 2
CET 8	Bend Service Enhancement Route 8
CET 9	Bend Service Enhancement Route 9
CET 11	Bend Service Enhancement Route 11
CET 3	Bend Service Enhancement Route 3
CET 4	Bend Service Enhancement Route 4
CET 5	Bend Service Enhancement Route 5
CET 6	Bend Service Enhancement Route 6
CET 7	Bend Service Enhancement Route 7
000	Study for the Realignment of CET Routes to Service Mobility Hubs

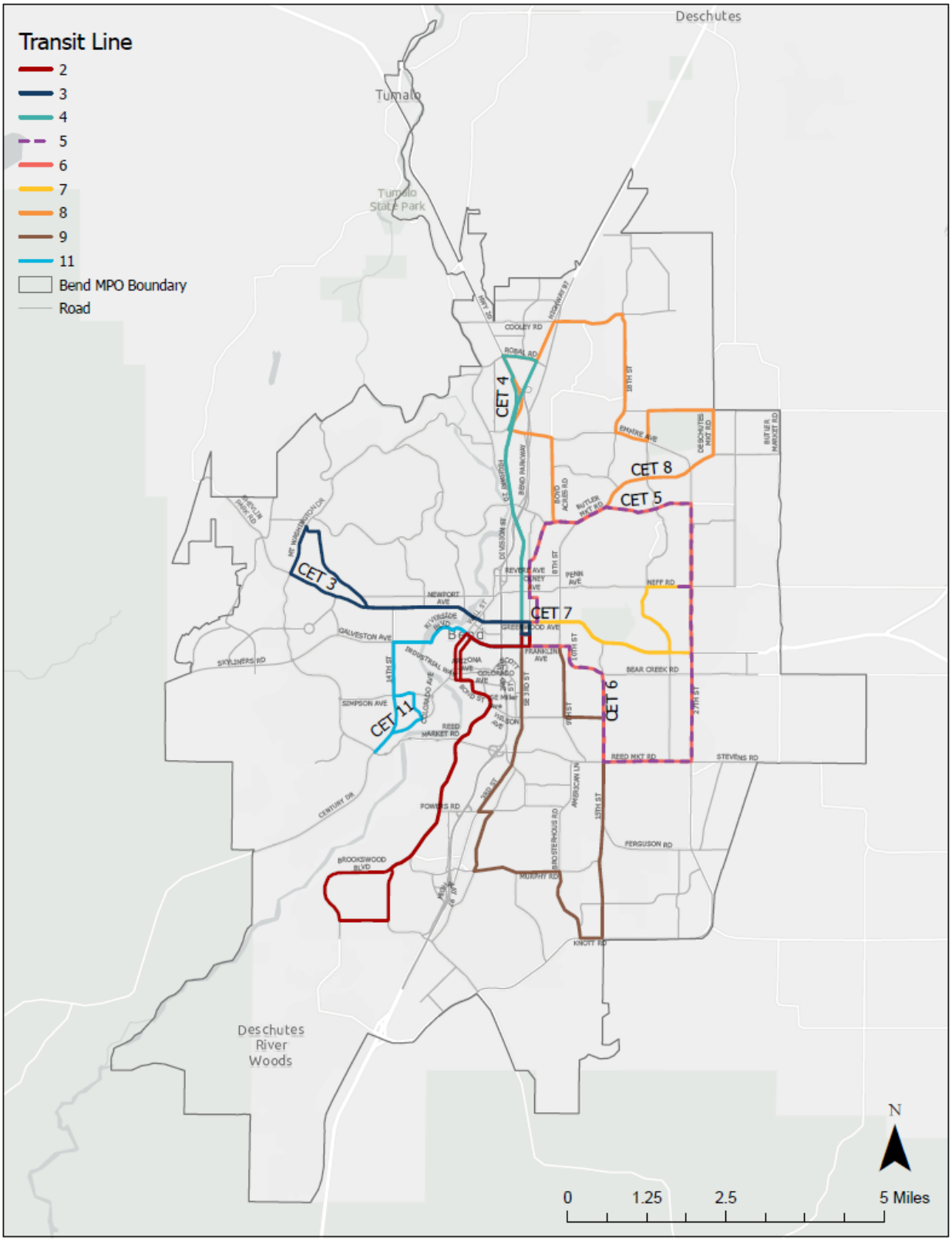

FIGURE 10. 2045 DRAFT MTP PROJECT LIST TRANSIT ROUTES

ATTACHMENT C: MOTOR VEHICLE PROJECTS

TABLE 11. MOTOR VEHICLE CONNECTIVITY PROJECTS

MAP ID	PROJECT DESCRIPTION	DRAFT COST[1]
201	New collector - Skyline Ranch Rd from Shelvin Park to NW Xing	Funded
202	Crossing Drive Extension	Funded
219	Skyline Ranch Road Shevlin UGB Expansion Area	$2,700,000
230	New Road Shelvin UGB Expansion	$2,300,000
C-1	Yeoman Road Extension	$5,000,000
C-2	Purcell Boulevard Extension	Funded
C-24	Sisemore Street Extension	$2,400,000
C-25	Brentwood Ave extension from Whitetail St to American Ln	$2,300,000
C-48	New North Frontage Road near Murphy Road	$5,400,000
C-49	New South Frontage Road near Murphy Road	$13,800,000
C-5A	Aune Street extension (East)	$5,500,000
C-5B	Aune Street Extension (West)	$8,500,000
C-50	Britta Street extension (north section)	$2,700,000
C-51	Britta Street extension (south section)	$1,000,000
C-58	Ponderosa Street / China Hat Road overcrossing	$15,000,000
C-64	US 97 Frontage Road (Ponderosa to Baker Road)	$6,550,000
C-65	Stevens Road realignment	$4,700,000
C-66	Hunnell Road extension	$2,400,000
C-69	New Road in the Elbow UGB expansion area	$4,000,000
C-72	New Road in the Thumb UGB expansion area	$4,300,000
C-73	New Road in the Thumb UGB expansion area	$2,500,000
C-74	Loco Road extension	$5,300,000
C-75	New Road in Triangle UGB expansion area	$2,500,000
C-76	Yeoman Road Extension	$10,900,000
C-78	Collector between US20 and Hunnell Rd	$4,000,000
C-80	Robal Road extension from US 20 to O.B. Riley	$2,900,000
CC-18	Cooley Road Extension	$2,900,000
C-71	New Collector road between Ferguson and Knott	$9,000,000
SEAP	Local Road between SE Caldera Drive and Knott Road	$2,100,000
C-70	Extension of SE Caldera Drive between SE 15th and SE 27th	$7,400,000
SRMP	Extension of Wilderness Way	$3,900,000
SRMP	Eubanks Street collector between SE Ferguson and SE Stevens	$5,300,000
SRMP	SE Ferguson Road Extension	$2,600,000
SRT	Extension of the SE Ward Road Alignment	

1. Costs are from prior plan years and do not reflect 2023 dollars

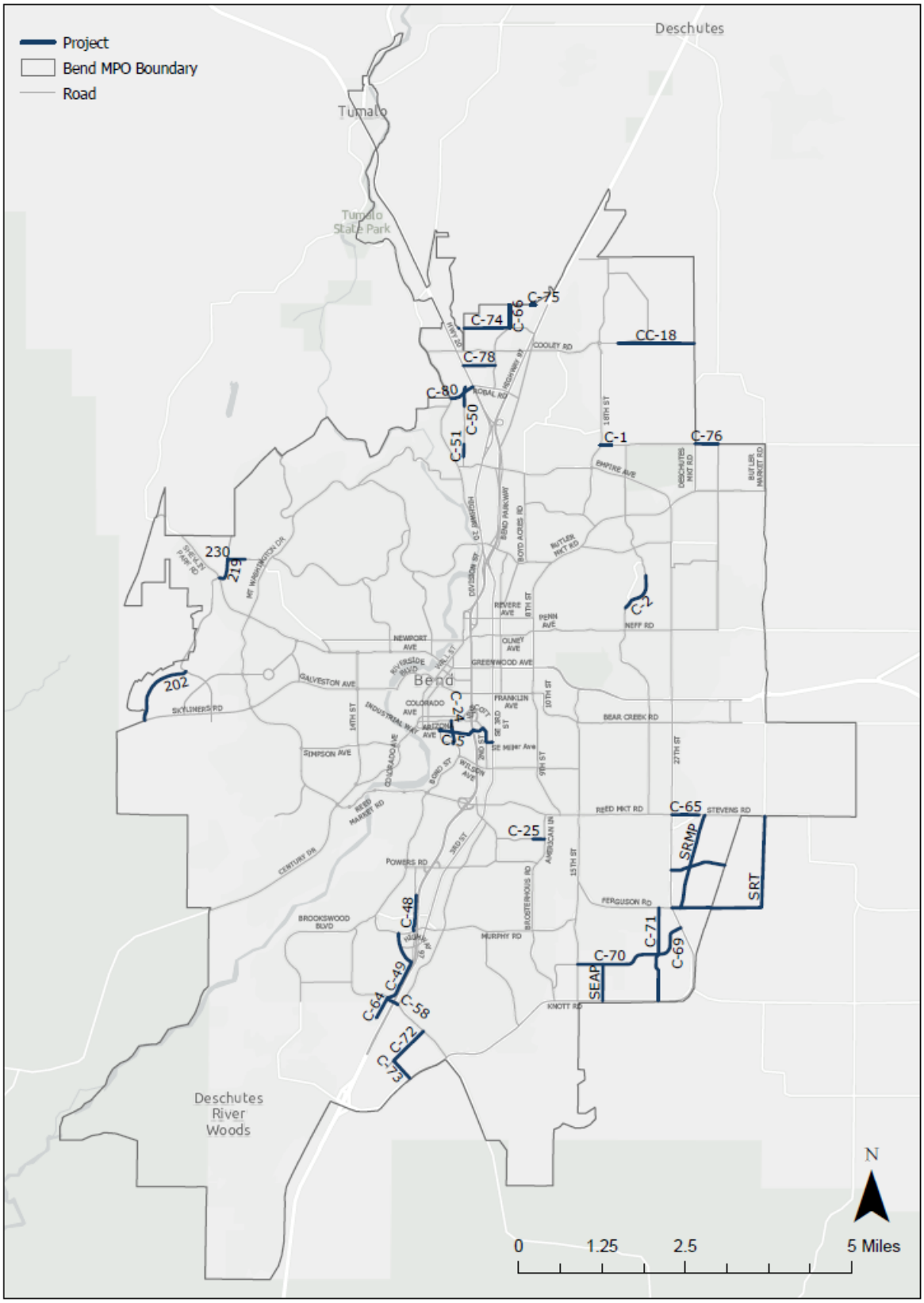

FIGURE 11. 2045 DRAFT MTP PROJECT LIST MOTOR VEHICLE CONNECTIVITY IMPROVEMENTS

TABLE 12. MOTOR VEHICLE CORRIDOR ENHANCEMENT PROJECTS

MAP ID	PROJECT DESCRIPTION	DRAFT COST[1]
20378	Archie Briggs Road (Deschutes River) Bridges	$5,851,540
21756	US 20: Central Oregon Hwy Culverts Corridor	$532,916
22774	NE Norton Ave (Bend)	$579,000
22776	US 97: Redmond-Bend Phase 2	$9,310,000
97.A	Tight Urban Diamond Interchange US 97 North Interchange	TBD[2]
97.B	Realignment of 18th Street Relative to Juniper Ridge	TBD[2]
B-19	Hamby Road Corridor Safety Improvements	$51,000,000
BR-10	Old Deschutes Road Pilot Butte Canal Bridge Replacement	$400,000
C-13	Empire Avenue widening near US 97 interchange	$10,000,000
C-18	US 97 ramps at Murphy Road	$10,000,000
C-23	18th Street arterial corridor upgrade from Cooley to Butler Market	$7,800,000
C-3	O.B. Riley Road Corridor upgrade from Hardy to Archie Briggs	$6,700,000
C-31	Safety improvements to Empire Boulevard/27th Street Corridor from Boyd Acres Road to Reed Market Road	$41,800,000
C3A	Southbound Deceleration Lane Modification at Hawthorne Avenue	$1,000,000
C3C	Extend Revere Avenue northbound on-ramp acceleration lane	$1,000,000- 3,000,000
C3D	Acceleration lane modification for Colorado northbound on-ramp	$3,000,000- 5,000,000
C-40	US 97 North parkway extension (Phase 2)	$30,000,000
C-41	Powers Road interchange	$20,000,000
C-43	15th Street corridor safety and capacity improvements	$16,800,000
C-44	Reed Market rail crossing implementation	$25,000,000
C5	US 97 Shoulder-width improvements	$2,000,000-10,000,000
C-52	Mervin Samples Road / Sherman Road Collector Corridor upgrade	$6,100,000
C-53	27th Street Arterial Corridor upgrade from Bear Creek to Ferguson	$8,600,000
C-54	3rd Street railroad undercrossing widening	$13,700,000
C-55	Country Club Road Urban Upgrade from Knott to Murphy	$10,900,000
C-56	Powers Road urban upgrades from 3rd Street to Parrell Road	$1,000,000
C-57	Powers Road urban upgrades from Brookswood to 3rd	$4,200,000
C-6	Colorado Avenue corridor capacity improvements	$21,000,000
C-9	Revere Avenue interchange improvements	$8,500,000
CC-28	Bailey Road Widen and Overlay	$1,300,000
CC-29	Bear Creek Road Widen and Overlay	$3,200,000
CC-30	Cinder Butte Road Widen and Overlay	$1,300,000
CC-5	Rickard Road Widening	$2,300,000

MAP ID	PROJECT DESCRIPTION	DRAFT COST[1]
F-7	China Hat Road Widen and Overlay	$900,000
I6	SE 3rd Corridor SE Cleveland Ave to SE Davis Ave Safety	
PHASE 1	US 97 Baker Interchange West Side Improvements	$14,800,000
PHASE 2	US 97 Baker Interchange Bridge and East Side Improvements	$23,200,000
RMRP1A	Reed Market Rd/ Brookswood Blvd Turn Lane Improvement Phase 1	$4,000,000
RMRP1B	Reed Market Rd/ Brookswood Blvd Turn Lane Improvement Phase 2	$700,000
RMRP3	Reed Market Road/ US 97 Southbound Ramps	$5,700,000
RMRP4A	US 97 Northbound Ramps/ Division Street: Traffic Signal	$4,000,000
RMRP4B	US 97 Northbound Ramps/ Division Street: Separate Northbound Entrance Ramp	$9,400,000
RMRP5	Reed Market Road/ 3rd Street protected intersection & turn lanes	$10,300,000
US20.3	US 20/ NE Purcell Boulevard Widening and Turn Lane Addition	
US20.4	US 20/ NE 27th Widening and Turn Lane Addition	
US20.5	US 20/ Hamby Road Right Turn Bypass lane addition	

1. Costs are from prior plan years and do not reflect 2023 dollars
2. Capital Cost Estimate not quantified in the Bend North Interchange Study Final Report

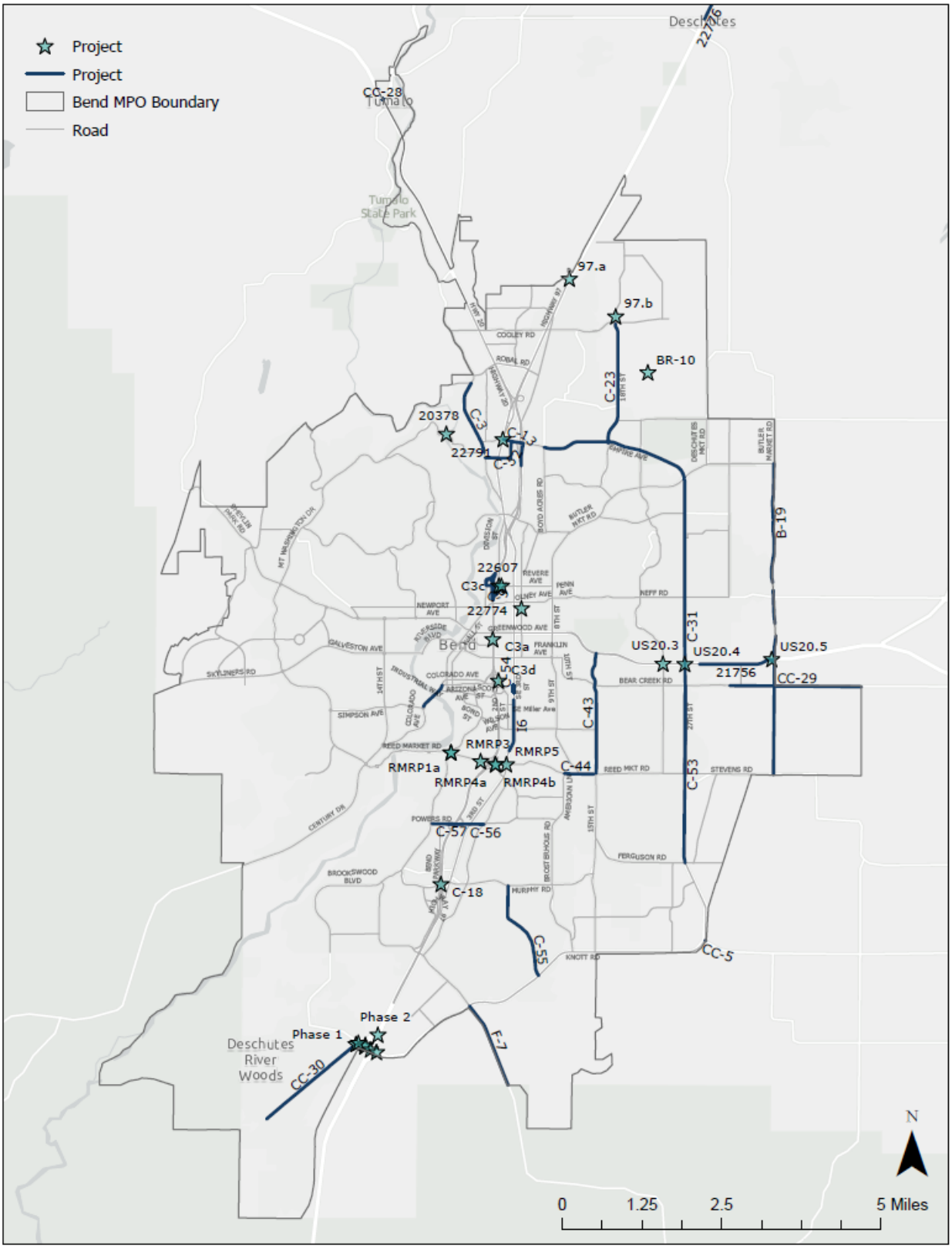

FIGURE 12. 2045 DRAFT MTP PROJECT LIST MOTOR VEHICLE CORRIDOR ENHANCEMENT PROJECTS

ATTACHMENT D: INTERSECTION PROJECTS

TABLE 13. INTERSECTION PROJECTS

MAP ID	PROJECT DESCRIPTION	DRAFT COST[1]
1TNPS	Neff/ Purcell Intersection Improvements	Funded
6B	3rd Street/ Brosterhous Road Protected Intersection	$5,000,000-$10,000,000
C-14	Reed Market /15th intersection improvements	$1,100,000
C-15	Olney Avenue/8th Street intersection improvement	$3,700,000
C-16	Revere Avenue/8th Street intersection improvement	$3,700,000
C-21	Butler Market Road/US 20/US 97 Improvement.	$6,180,000
C-22	3rd Street/Wilson Avenue intersection improvement	Funded
C-26	US 20 intersection safety and capacity improvements	Funded
C-27	Butler Market intersection improvements from US 97 to 27th	$7,000,000
C-28	Revere Avenue/4th Street intersection improvement	$3,700,000
C-29	Olney Avenue/4th Street intersection improvement	$3,700,000
C2A	Lafayette Avenue/ US 97 Improvements	$2,000,000
C2B	Close Hawthorne Avenue right turn onto Parkway	$1,000,000
C2C	Close Truman Avenue RIRO intersections with Parkway	$1,000,000
C2D	Close Reed Lane RIRO intersection with Parkway	$1,000,000
C2E	Close Badger Road RIRO intersections with Parkway	$1,000,000
C2F	Close Pinebrook Blvd RIRO intersections with Parkway	$1,000,000
C2H	Close Rocking Horse RIRO intersections with Parkway	$1,000,000
C-33	Country Club /Knott intersection improvement	$3,700,000
C-34	Ferguson Road/15th Street intersection improvement	$3,700,000
C-35	NE 27th /Wells Acres intersection improvement	$3,700,000
C-39	Brosterhous /Knott intersection improvement	$3,700,000
C-45	O.B. Riley/Empire intersection improvement	$1,900,000
C-46	4th /Butler Market intersection improvement	$3,700,000
C-59	Hawthorne /3rd Intersection improvement	$3,800,000
C-60	Century Drive/Skyline Ranch Road roundabout	$3,700,000
C-61	Mt. Washington Drive/Metolius Drive roundabout	$3,700,000
C-63	China Hat Road/Knott Road Intersection Improvement	$3,700,000

MAP ID	PROJECT DESCRIPTION	DRAFT COST[1]
C-7	Colorado/US 97 NB ramp intersection improvements	$4,300,000
C-79	Cooley Road/Hunnell Road Intersection Improvement	$3,700,000
C-8	Portland Avenue corridor project from College Way to Deschutes River	$17,700,000
CL-14	Cinder Butte Rd/ Cheyenne Rd intersection improvement	$200,000
CL-16	Cline Falls Hwy Cook Ave/Tumalo Rd intersection improvement	$1,800,000
CL-22	Baker Rd/ Brookswood Blvd intersection improvement	$1,400,000
S1	Butler Market & Hamby Intersection Improvement	TBD
S2	Butler Market Road & Hamehook Road	TBD
S-3	Pettigrew Road/Bear Creek Road safety improvement	$3,700,000
S-4	US 97/Powers Road interim improvements	$100,000
S-5	3rd/Miller intersection improvements and 3rd Street modifications study (Phase 1)	$100,000
S-6	3rd/Miller intersection improvements and 3rd Street modifications implementation (Phase 2)	$3,100,000
S-7	Empire Avenue/Jamison Street Turning Restrictions	$107,000

1. Costs are from prior plan years and do not reflect 2023 dollars

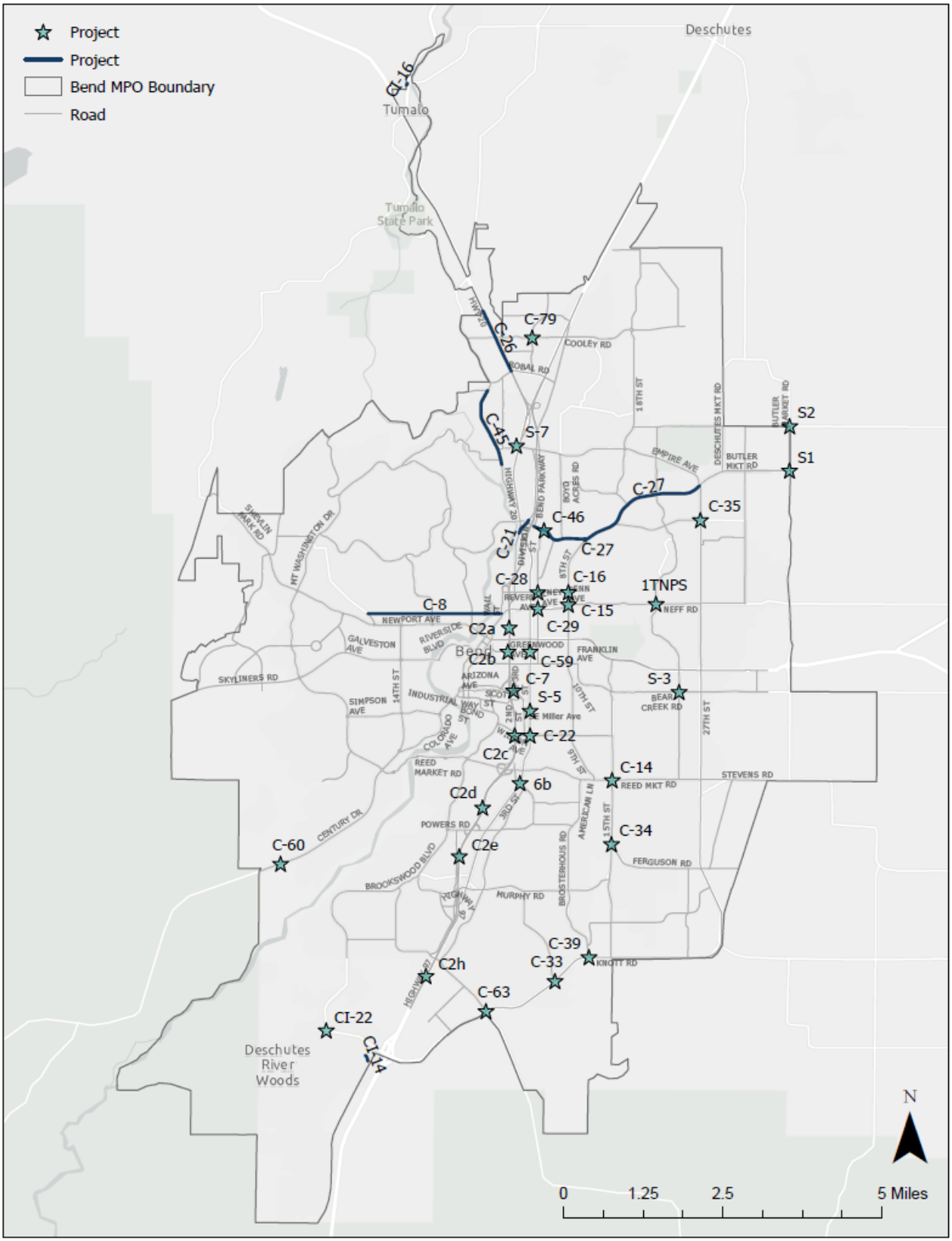

FIGURE 13. 2045 DRAFT MTP PROJECT LIST INTERSECTION PROJECTS

ATTACHMENT E: TECHNOLOGY PROJECTS

TABLE 14. TECHNOLOGY PROJECTS

MAP ID	PROJECT DESCRIPTION	DRAFT COST[1]
101	3rd Street Safe and Smart Corridor	$1,390,000
102	US 97 Safe and Smart Corridor	$1,121,000
104	Hwy 20/ Greenwood Ave Smart Corridor	$2,991,000
105	27th Street Safe and Smart Corridor	$2,242,000
108	Wall Street and Bond Street Fiber Communications	$1,334,000
109	Century Drive Safety and Efficiency Improvements	$3,201,000
111	Hwy 97 Active Traffic Management (ATM) and Integrated Corridor Management	$2,867,000
112	Revere Ave Fiber Communications	
113	Neff Road Fiber Communications	$350,000
114	Empire Ave Fiber Communications	$1,276,000
115	Purcell Blvd Fiber Communications	$335,000
501	OID CAD 911 BUS Upgrade	
503	Rapid Response Situational Awareness Capabilities Responder Video System	$100,000
701	Regional Data Warehouse	$500,000-$750,000
802	Congestion Warning System	$250,000
803	In-Vehicle Communications for SPaT/MAP and ODOT CV Portal Integration	$300,000
22739	US 97: I-84 to California Border	$5,809,000
22742	US 20: from US101 to the Idaho border	$8,971,000
22767	Driver Feedback Signs (Deschutes County)	$1,032,873
C1	US 97 Install ramp meters	$15,000,000
C10	US 97 Traveler information signing	$2,000-30,000
C-36	3rd Street/Franklin Avenue signal modification	$500,000
C-37	3rd Street/Powers Road signal modification	$500,000
C-38	3rd Street/Badger Road signal modification	$500,000
C6	US 97 Weather warning system	$5,000-450,000
C7	US 97 Variable speed signs	$50,000-500,000
C9	US 97 Enhanced signal operations at ramp terminals	$50,000-500,000
DC-EM-01A	Coordinated Emergency Response - Radio System Link	TBD
DC-EM-02	Coordinated Emergency Response - Radio System Link	TBD
DC-EM-07	Responder Video System	TBD
DC-MC-06	Automated Maintenance Logging System	TBD
DC-PP-03	Intersection Collision Avoidance	TBD
DC-PP-04	Wildlife Detection	TBD
DC-PP-05	Ambulance Hospital Information System	TBD
DC-TM-02A	Region 4 TOC to 3rd St RWIS	TBD
DC-TM-06	Downtown Bend Parking Management System	TBD
DC-TM-07B	Hwy 20/Greenwood Ave from 3rd St to 8th St	TBD

MAP ID	PROJECT DESCRIPTION	DRAFT COST[1]
DC-TM-07D	Hwy 20/Greenwood/Newport - Travel Time Performance Measurements	TBD
DC-TM-11D	VMS: The Dalles-California Highway NB at Cooley	TBD
DC-TM-13A	27th/Empire/Knott Safety and Efficiency Improvements Video Monitoring	TBD
DC-TM-13B	Northeast Ring: 27th to Empire	TBD
DC-TM-14	ODOT Region 4 TOC Upgrade	TBD
DC-TM-16	Hwy 20 (Bend to Sisters) Safety and Efficiency Improvements	TBD
DC-TM-19A	Advanced Rail Warning System - Reed Market Road	TBD
DC-TM-19B	Advanced Rail Warning System - Bend and Redmond locations	TBD
DC-TM-19C	Advanced Rail Warning System - Additional Bend and Redmond locations	TBD
DC-TM-19D	Advanced Rail Warning System - Message signs and in-vehicle communications	TBD
DC-TM-30	State Highway 372/Colorado-Arizona Couplet	TBD
DC-TM-31	VMS: McKenzie-Bend Highway westbound at Cooley	TBD
DC-TM-32	Communications to Remote Traffic Signals	TBD
DC-TM-34	Franklin Avenue: 3rd Street to Bond Street Fiber Optic	TBD
DC-TM-40	Count Stations - Bridges	TBD
DC-TM-41	Count Stations - City Outskirts	TBD

1. Costs are from prior plan years and do not reflect 2023 dollars

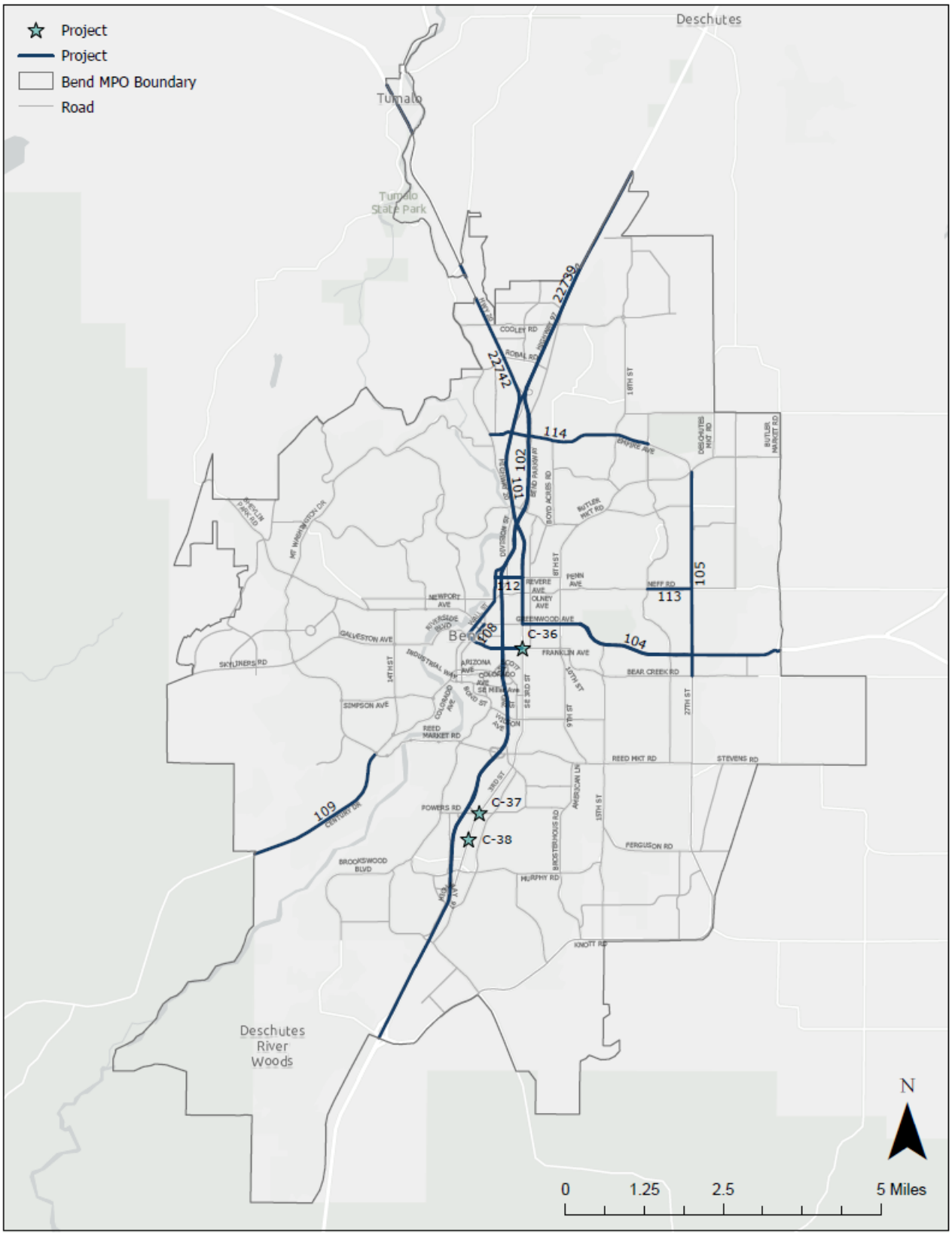

FIGURE 14. 2045 DRAFT MTP PROJECT LIST TECHNOLOGY PROJECTS

APPENDIX E: MTP REFINED SCENARIO EVALUATION MEMORANDUM

REFINED PROJECT LIST SCENARIO EVALUATION MEMORANDUM - DRAFT

DATE: March 25, 2024

TO: Bend MPO Technical Advisory Committee

FROM: Emily D'Antonio, Eileen Chai, Kayla Fleskes-Lane, PE & Aaron Berger, PE | DKS Associates

SUBJECT: Bend 2045 MTP Update: Refined Project List Scenario Evaluation Project #24068-000 Memorandum - DRAFT

INTRODUCTION

This memorandum serves as an update to the analysis documented in the *Draft MTP Project List Evaluation Memorandum*[1]. The Refined Project List Scenario incorporates TAC comments and refined modeling assumptions into three model scenarios (2019 Base Year, 2045 Committed and 2045 Refined Project List), which are discussed in detail later in the memorandum.

These scenarios help form an understanding of needs by the 2045 planning horizon and will help inform the prioritization of projects (documented in a future memorandum). Projects included in the Refined 2045 Project List will be analyzed using the MTP evaluation criteria to help prioritize projects into phasing buckets to outline the timeframe within which each project is recommended for implementation. This phasing will then be paired with funding availability and feasibility to separate projects into financially constrained and aspirational lists.

The ODOT Transportation Planning and Analysis Unit (TPAU) has been applying updates to the Bend-Redmond Model (BRM), including updates to cost of travel assumptions and refinements to the external station data. These model updates were incorporated into the 2019 (Base Year), 2045 No-Build (Committed), and 2045 Refined MTP Project List scenarios, and the updated model performance measures for these three scenarios are included in this memorandum.

This memorandum also includes updated cost estimates for the 2045 MTP Refined Project List. The cost estimates were escalated from their estimate source year to 2023 (present day) values. Cost estimates were also developed for newly identified projects and refined for projects recommended for re-scoping in the Preliminary MTP Project List Evaluation Memorandum.

[1] *Preliminary MTP Project List Evaluation Memorandum,* DKS Associates, February 26, 2024.

This memorandum is divided into the following sections:

- **Summary of Findings** - Provides an overview of outcomes of the evaluation of the 2045 Refined Project List compared to the 2045 Draft Project List.
- **Evaluation Methodology** – Description of refinement to the project list and modeling assumptions, cost estimate updates, and tools and performance measures to evaluate and compare the 2019 (Baseline), 2045 No-Build (Committed), and 2045 Refined MTP Project List scenarios.
- **Active Transportation Evaluation and Findings** – Presents findings related to active transportation focused projects from the 2045 Refined Project List and discusses any new or changing needs for people walking and biking.
- **Transit Evaluation and Findings** – Presents findings related to transit projects from the 2045 Refined Project List and discusses any new or changing needs for people riding transit.
- **Motor Vehicle Evaluation and Findings** - Presents projects with a significant motor vehicle system enhancement component from the 2045 Refined Project List and discusses any new or changing needs for people driving.
- **Attachments Summarizing the Draft Project List** – Maps and tables presenting the 2045 Draft Project List, separated into Active Transportation, Transit, and Motor Vehicle categories.

SUMMARY OF FINDINGS

The following summarizes key results from the 2045 Refined Project List Scenario compared to the 2045 Draft Project List Scenario:

- The Refined Project List Scenario results in more walking, biking, and transit trips due to the implementation of travel demand management programs for large employers (Project P-2; modeled by proxy through parking pricing), enhanced transit coverage in growth areas in Bend (Project CET 6, among others) and Key Walking and Bicycling Route projects.
- The Refined Project List Scenario better addresses congestion on Ward Road south of US 20 with the addition of a new project to upgrade to an urban corridor along Ward Road (Project New-1).
- The Refined Project List Scenario reduces motor vehicle demand (along with other model adjustments to trips and travel cost assumptions) resulting in a 2.5 percent lower daily VMT per capita when compared to the 2019 Baseline Scenario. Additional land use policy changes (e.g., to incorporate Climate-Friendly and Equitable Communities rulemaking) and investments in alternative modes would likely be required to further reduce daily VMT per capita.

The following list includes newly identified or changes to already identified Bend Metropolitan Planning Area (MPA) transportation system needs based on the evaluation of the 2045 Draft Project List scenario that were previously documented and are consistent in the 2045 Refined Project List scenario:

- Only one project from a study completed since the adoption of the Bend TSP clearly impacts a designated Key Routes for Walking and Bicycling. This project is the **proposed new interchange connecting NE 18th Street to US 97** (Project 97.A in Attachment C). This new connection would attract more motor vehicle traffic to the portion of the NE 18th Street corridor designated as a Key Walking and Bicycling Route. The Key Routes project on 18th Street is

recommended to be completed either before or in parallel with the NE 18th Street/US 97 interchange project.

- Community input on ongoing projects such as the Olney Avenue Pedestrian and Bicyclist Improvements project indicates a **desire for higher levels of treatments for active transportation improvements** than was originally scoped for the Key Routes project identified in the Bend TSP. Cost estimates for the projects in this category that do not have a clearly defined scope should be re-considered during upcoming local planning efforts to better reflect community priorities.
- The 2045 Draft Project List **does not provide sufficient transit coverage** to serve the new, dense growth areas on the urban fringe of the MPA. Many of the most critical motor vehicle needs, particularly needs related to east-west river crossings, cannot be fully resolved through new connections or corridor enhancements. Expanded transit service could provide relief to these congested corridors by shifting motor vehicle users to transit.
- **OB Riley Road** – The corridor capacity need that was identified in the prior local planning efforts consolidates to a smaller bottleneck issue at Archie Briggs due to lower land use growth assumptions in this area (e.g., Gopher Gulch). The multi-modal project identified for this corridor (Project C-3) should be considered for re-scoping during this MTP Update and subsequent City planning efforts.
- **Shevlin Park Road** – New traffic congestion issue east of Skyline Ranch Road.
- **Neff Road** – Heightened congestion issue between 8th Street and 27th Street, with the potential of increasing neighborhood cut-through traffic. Considerations for addressing this congestion issue include:
  - Widening the entire corridor is not a viable option, but intersection capacity spot improvements at locations like 8th Street/Neff Road will improve the corridor and reduce the risk of cut-through traffic on local streets.
  - Upgrading the corridor to a Key Route for walking and biking will entice shifts to non-auto modes of travel.
  - Travel Demand Management (TDM) programs partnering with nearby large regional employers such as St Charles and Summit Health will encourage alternative modes of travel and can reduce the auto related congestion on the corridor.
- **Hamby Road** – New traffic congestion issue from Stevens Road to Bear Creek Road, driven by growth in the Stevens Ranch and Department of State Lands (DSL) areas.
- **Powers Road** – New congestion issue between US 97 and Brookswood Boulevard.
- **East-West River Crossings** – This congestion issue was a key need identified in the City's TSP and was flagged for monitoring. Current travel demand model forecasts indicate that these crossings will experience traffic demand well beyond existing capacity, indicating a need to move forward with a study for new/enhanced river crossings.

27th Street – This corridor was flagged for monitoring in the City's TSP, with the year 2040 analysis indicating a need for a continuous five-lane cross section from Empire Boulevard to Ferguson Road. The 2045 Draft Project List evaluation indicates that by the year 2045 Horizon, an additional five-lane cross section is only needed between Bear Creek and Reed Market in the south. The corridor-wide Average Daily Traffic (ADT) growth does indicate a need to improve the rural, two-lane, unimproved portions of 27th Street to three-lane, modernized cross sections with safe crossings to transit to enhance safety for all modes of travel.

EVALUATION METHODOLOGY

This section focuses on the following:

- **Project List Refinement**
- **Cost Estimate Update**
- **Analysis Tools and Performance Measures**

PROJECT LIST REFINEMENT

Gaps or project re-scoping needs were identified through the analysis performed in the Draft Project List memo. Feedback from TAC members who reviewed that methodology was incorporated into the modifications of the Draft Project List Scenario to then create the Refined Project List Scenario outlined within this document. The Attachments section of this memo lists the Refined Project List Scenario projects and programs. Key changes to the project modeling assumptions include:

Modifications to the capacity along Ward Road are consistent with a new project to urbanize the facility.

- Minor modification to CET Route 8 to better serve land use growth in the Stevens Road Tract and Stevens Ranch Master Plan areas (east of 27th Street and south of Reed Market Road)
- Incorporation of TDM programs and policies (modeled by proxy though parking pricing assumptions in areas with major employers such as OSU Cascades, Juniper Ridge, and St. Charles Hospital).

This memorandum breaks down the evaluation of the 2045 Project List into three modal focused sections: Active Transportation, Transit, and Motor Vehicle. There is significant modal overlap between many projects, particularly those that fall under the "Motor Vehicle" category as these usually include significant active transportation improvement elements. However, projects are only listed under one category to prevent duplication. Each modal project list is further separated into "Connectivity" and "Corridor Enhancement" subcategories. Connectivity projects focus on new modal connections (e.g., new trails, new transit routes, or new roadways), while Corridor Enhancement projects focus on improvements to existing corridors (e.g., new bike lanes/sidewalks, decreased headways on existing transit lines, or added lanes). In addition, the remaining projects are categorized as "Intersection" (intersection focused projects) and "Technology" (ITS projects), which do not strictly fall into any of the other primary modal subcategories.

The 2045 Project List is mapped and summarized in attachments to this memorandum as follows:

- **Attachment A – Active Transportation**
  - ***Active Transportation Connectivity Projects***
  - ***Active Transportation Corridor Enhancement Projects***
- **Attachment B – Transit Projects**
  - ***Transit Connectivity Projects***
  - ***Transit Corridor Enhancement Projects***
- **Attachment C – Motor Vehicle Projects**

- ***Motor Vehicle Connectivity Projects***
- ***Motor Vehicle Enhancement Projects***

- **Attachment D – Intersection Projects**
- **Attachment E – Technology Projects**
- **Attachment F – Proposed Studies**
- **Attachment G – Proposed Plans and Programs**
- **Attachment H- Committed Project List**

COST ESTIMATE UPDATE

Project cost estimates were also reviewed and updated to reflect 2023 cost conditions based on the Engineering News-Record (ENR) 20-City Average Cost Indices. This index tracks material and labor costs and provides an industry standard approach to scaling estimated project costs over time based on changing market conditions. For example, based on this review and the ENR index, project costs developed in 2018 were increased by approximately 21 percent to reflect current conditions. While each project was adjusted based on the year the cost estimate was developed, this example adjustment factor reflects the high increase in project costs that have been realized over the last half decade. The updated MTP will need to consider these higher project cost estimates.

ANALYSIS TOOLS AND PERFORMANCE MEASURES

The Bend Redmond Model (BRM) which was used to evaluate the 2045 Draft Project List was also used to analyze the 2045 Refined Project List Scenario. As discussed in the *MTP Needs Memorandum*[2], the BRM includes 2019 Base Year and 2045 Future Year land use scenarios. The Refined Project List Scenario was developed using the same land use assumptions as the 2045 Committed Scenario. These assumptions are presented in the *MTP Needs Memorandum*. In addition to the project list refinements, several other model elements were updated in the 2019 Base Year, 2045 Committed, and 2045 Refined Project List Scenarios:

- Corrections to the transit coverage factor in the 2045 Refined Project List Scenario to reflect all transit route changes that were made.
- Updated demand to the external stations to reflect a new version of the Statewide Integrated Model (changed in the 2045 Refined Project List Scenario and 2045 Committed Project List Scenario).
- Changes to the intersection density variable within mobility hub areas to reflect a more walkable, bikeable, and transit-friendly area in the 2045 Refined Project List Scenario. This variable can impact mode choice more meaningfully.
- The cost of auto ownership value was updated to reflect new statewide assumptions around electric vehicle adoption (the change was made in the 2045 Refined Project List Scenario and the 2045 Committed Project List Scenario).

[2] *Existing and Future Needs Memorandum,* DKS Associates, December 27, 2023

- The transit cost was deflated to the appropriate base year, reducing the relative cost of transit (change in 2045 Refined Project List Scenario, 2045 Committed Project List Scenario and 2019 Base Year Scenario).

The model results were used to provide quantitative measures throughout the MPA to determine whether projects were effectively addressing identified needs and to highlight new, increased, or decreased needs throughout the region. The primary performance measures used to evaluate the effectiveness of the 2045 Refined Project List are the same measures previously reported for the *2045 Draft Project List Scenario Memo*[3].

ACTIVE TRANSPORTATION EVALUATION AND FINDINGS

This section presents the analysis and findings related to the Active Transportation needs and proposed projects within the Bend MPA, including:

- **Updated Evaluation Results**
- **New/Changing Active Transportation Needs**

UPDATED EVALUATION RESULTS

The Active Transportation focused projects from the 2045 Project List are shown in Attachment A. These projects include the Key Routes projects from the Bend TSP. This section summarizes the key active transportation performance measures for the 2045 Refined Project List, compared against the 2019 Baseline and 2045 Committed conditions using the following performance measures:

- Mode Split
- Change in Motor Vehicle Demand on Key Routes

MODE SPLIT

The percentages of all person trips using walking and bicycle modes within the Bend MPA were calculated from the BRM. These percentages were based on trips that both begin and end within the Bend MPA. Table 1 documents these mode splits between the 2019 Base Year, the 2045 Committed, and the 2045 Refined Project List Scenarios.

[3] *Preliminary MTP Project List Evaluation Memorandum,* DKS Associates, February 26, 2024.

TABLE 1: PERCENT WALKING AND BIKING TRIPS WITHIN THE BEND MPA

MODE	2019 BASE	2045 COMMITTED	2045 REFINED PROJECT LIST	% CHANGE BETWEEN COMMITTED AND REFINED PROJECT LIST
PEDESTRIAN	10%	12%	13%	9%
BICYCLE	3%	3%	4%	30%

The 2045 Refined Project List shows significant shifts towards walking and biking, with a 9 percent increase in walking mode share and nearly 30 percent increase in bike mode share compared to the 2045 Committed Scenario.

This is also a notable increase compared to the original 2045 Draft Project List Scenario, due in large part to the intersection density variable changes to better reflect the walkable and bikeable environment expected near mobility hubs. The BRM still has some limitations to capture sensitivity to walking and biking, with no direct way to capture the quality of bicycle or pedestrian facilities.

CHANGE IN MOTOR VEHICLE DEMAND ON KEY ROUTES

As discussed in the MTP Needs Memorandum, daily motor vehicle traffic volumes are expected to increase along most of the Key Routes for Walking and Bicycling throughout the MPA under the 2045 Committed condition. The 2045 Refined Project List includes multiple projects that change the estimated 2045 daily motor vehicle traffic along these Key Routes when compared against the 2045 Committed condition. Figure 2 highlights this comparison, showing the change in daily motor vehicle traffic volume between the 2045 Committed scenario and the 2045 Refined Project List scenario along the designated Key Routes.

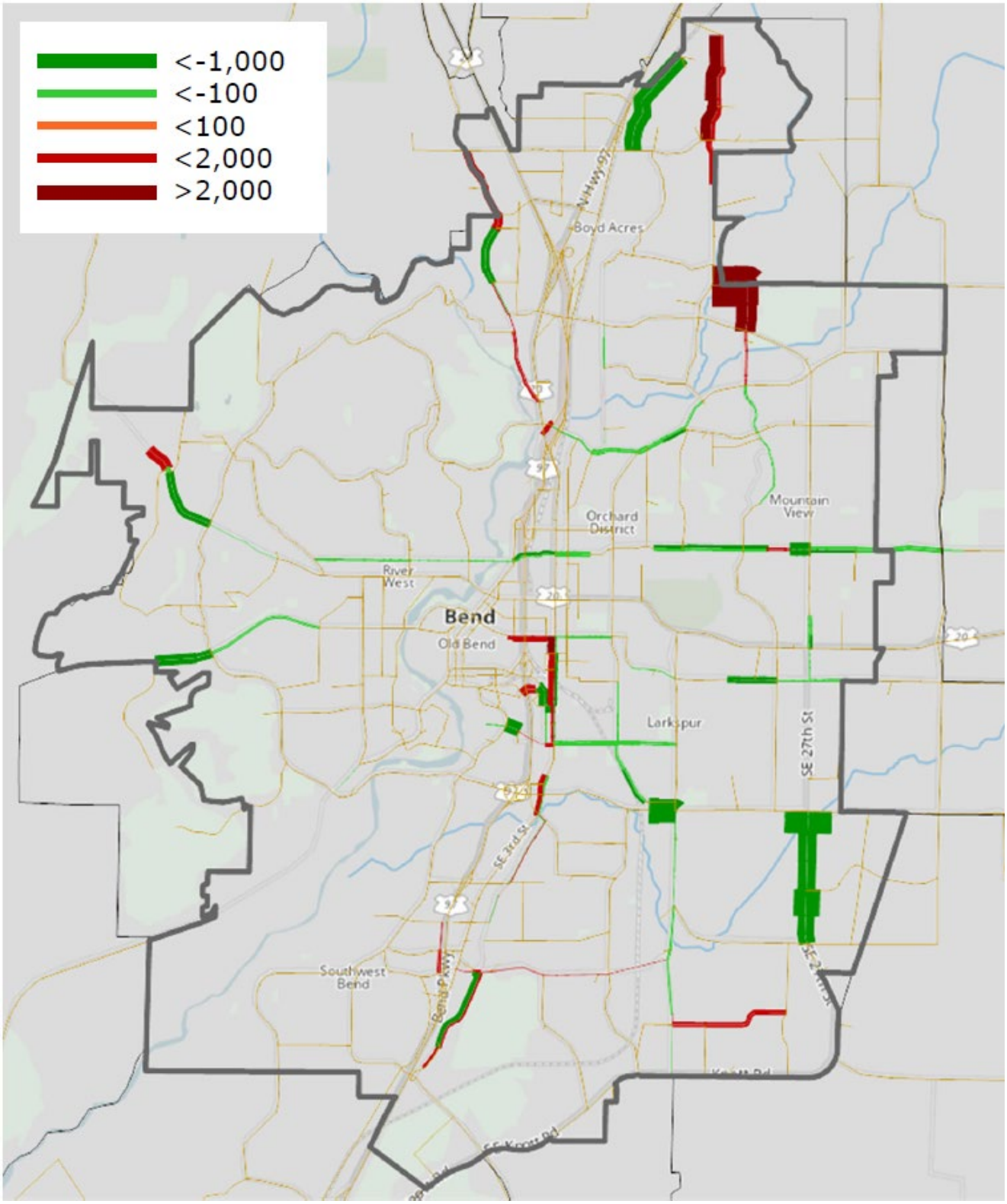

FIGURE 1: CHANGE IN DAILY VOLUME ALONG DESIGNATED KEY ROUTES BETWEEN COMMITTED AND REFINED PROJECT LIST SCENARIO

The most critical changes in daily motor vehicle traffic along Key Routes between the 2045 Committed and Refined Project List Scenarios are summarized as follows:

- **Improved (Reduced Traffic Volume, shown green/orange in Figure 1)**
  - Skyliners Road (NW 17th St to NW Crossing Dr) – 19% reduction primarily due to the NW Crossing Extension (Project 202).
  - Shevlin Park Road (Mt Washington Dr to Skyline Ranch Rd) – 21% reduction due to new expansion area connections to the north (Projects 219 and 230).
  - Bear Creek Road (NE 15th St to Ward Rd) – 18% reduction due to new Stevens Road Re-alignment (Project C-65) and mode shifts driven by nearby transit route enhancements (Projects CET 6 and CET 7).
  - Hawthorne Ave (NW Harriman St to US 97) - 78% decrease due to the closure of the eastbound right turn onto US 97 at Hawthorne Ave (Project C2B). If the southbound right turn from the Parkway onto Hawthorne Avenue is ultimately closed due to the design of the new Hawthorne Pedestrian Overcrossing (Project 23494), traffic volumes along Hawthorne Avenue west of US 97 would dramatically decrease.
  - SE 9th Street (SE Glenwood Dr to Reed Market Rd) – 9% decrease due to the closure of 9th Street direct vehicle access onto Reed Market Rd as part of the Rail Crossing Improvement (Project C-44). Along this segment near Bend High, the removal of the limited use left turn lane between Franklin Avenue and Glenwood Avenue could create space for bike lane separation, and this treatment is recommended for further consideration in the upcoming City of Bend TSP Update.
- **Degraded (Increased Traffic Volume, shown red in Figure 1)**
  - NE Franklin Ave (NW Harriman St to NE 3rd St) – 19% increase in demand due to the closure of the eastbound right turn onto US 97 at Hawthorne Ave (Project C2B). If the southbound right turn from the Parkway onto Hawthorne Avenue is ultimately closed due to the design of the new Hawthorne Pedestrian Overcrossing (Project 23494), additional traffic impacts may be experienced on this roadway segment. Potential treatments for this increase in traffic include crosswalk enhancements at the Franklin Ave/Harriman St intersection to limit left turns, which will be considered through the ongoing Midtown Crossings Project.
  - Parrell Rd (China Hat Rd to Murphy Rd) – 62% increase in NB demand due to the closure of the China Hat Rd RI/RO access to US 97 as part of the China Hat/Ponderosa Overcrossing (Project C-58). The southern portions of the modernization project for Parrell Road (Project M-2) are recommended for prior or parallel implementation with Project C-58 to mitigate the effects of this traffic increase on active transportation and improve safety for all modes of travel on Parrell Road.
  - NE 18th St (NE Talus Pl to Egypt Dr) – 26% increase due to NE 18th Street connection to the new interchange at US 97 (Project 97. A).
  - Yeoman Road – increase due to Yeoman Road extension to NE 18th Street, which adds a new motor vehicle connection to the existing pedestrian and bicyclist only path along the key route.

NEW/CHANGING ACTIVE TRANSPORTATION NEEDS

The 2045 Refined Project List Scenario showed a significant increase in walking and biking trips compared to the 2045 Committed Scenario and the previously documented 2045 Draft Project List Scenario. No other significant new needs were identified from the 2045 Refined Project List Scenario compared to the 2045 Draft Project List Scenario.

As previously documented for the 2045 Draft Project List Scenario, key active transportation needs in 2045 include:

- Only one project from a study completed since the adoption of the Bend TSP clearly impacts a designated Key Route for Walking and Bicycling. This project is the proposed new interchange connecting NE 18th Street to US 97 (Project 97.A & 97.B in Attachment C). This new connection would attract more motor vehicle traffic to the portion of the NE 18th Street corridor designated as a Key Walking and Bicycling Route. The Key Routes project on 18th Street is recommended to be completed either before or in parallel with the NE 18th Street/US 97 interchange project.
- Community input on on-going Key Walking and Bicycling Route projects (such as the Olney Avenue Pedestrian and Bicyclist Improvements project) indicates a desire for higher levels of treatments for active transportation improvements than was originally scoped for the Key Routes project identified in the Bend TSP. Cost estimates for the projects in this category that do not have a clearly defined scope should be re-considered during upcoming local planning efforts to better reflect community priorities. For the purposes of this MTP update, cost estimates have been escalated from the Bend TSP.
- E-bikes have been rapidly increasing in popularity, and this has reduced the effects of commute distance on mode choice. These changes to local bicycling behavior highlight the active transportation needs throughout the Bend MPA and represent an opportunity for jurisdictions within the region to further encourage usage of non-auto modes of travel.

TRANSIT EVALUATION AND FINDINGS

This section presents the following analysis and findings related to the transit needs and proposed projects within the Bend MPA:

- **Updated Evaluation Results**
- **New/Changing Transit Needs**

UPDATED EVALUATION RESULTS

The transit focused projects from the 2045 Refined Project List are shown in Attachment B. This section summarizes key transit performance measures for 2045 Refined Project list, compared against the 2019 Baseline and 2045 Committed conditions, including:

- Mode Split
- Transit Coverage

MODE SPLIT

The percentages of all person-trips using transit within the Bend MPA were calculated from the BRM. These percentages were based on trips that both begin and end within the Bend MPA. Table 2 below documents these mode splits between the 2019 Base Year, the 2045 Committed, and the 2045 Refined Project List scenarios.

TABLE 2: PERCENT TRANSIT TRIPS WITHIN THE BEND MPA

MODE	2019 BASE	2045 COMMITTED	2045 REFINED PROJECT LIST	% CHANGE BETWEEN BASE AND REFINED PROJECT LIST	% CHANGE BETWEEN COMMITTED AND REFINED PROJECT LIST
TRANSIT DEMAND	0.18%	0.15%	0.83%	352%	447%

As shown in Table 2, the overall percentage of transit trips compared against all person trips throughout the MPA remains extremely low, even with enhanced transit assumptions in the 2045 Refined Project List scenario. This highlights some of the limitations of the BRM for modeling transit usage but also additional opportunities to achieve greater benefit to the system by attracting more riders.

TRANSIT COVERAGE

Table 3 lists the percentage of households and jobs within 0.25 miles of transit service. The geographic transit coverage buffers compared against MPA housing and employment growth areas are shown in Figure 3 and Figure 4.

TABLE 3: PERCENT OF MPA HOUSEHOLDS AND JOBS WITHIN 0.25 MILES OF TRANSIT SERVICE

MODE	2019 BASE	2045 COMMITTED	2045 REFINED PROJECT LIST	% CHANGE BETWEEN BASE AND REFINED PROJECT LIST	% CHANGE BETWEEN COMMITTED AND REFINED PROJECT LIST
HOUSEHOLDS	55%	44%	52%	6%	33%
JOBS	69%	55%	66%	4%	30%

With significantly more transit coverage due to mobility hubs and new transit routes, the 2045 Refined Project List Scenario results in 30-33 percent more households and jobs within walking distance (0.25 miles) of transit. This is higher than previously reported for the 2045 Draft Project List Scenario due to the expansion of transit near the Stevens Road Area. Even with these transit changes, 48 percent of households and 34 percent of jobs are not within a walkable distance (0.25 miles or less) to transit. Note this analysis does not consider the quality of pedestrian facilities to access transit, which may also pose a barrier to transit access.

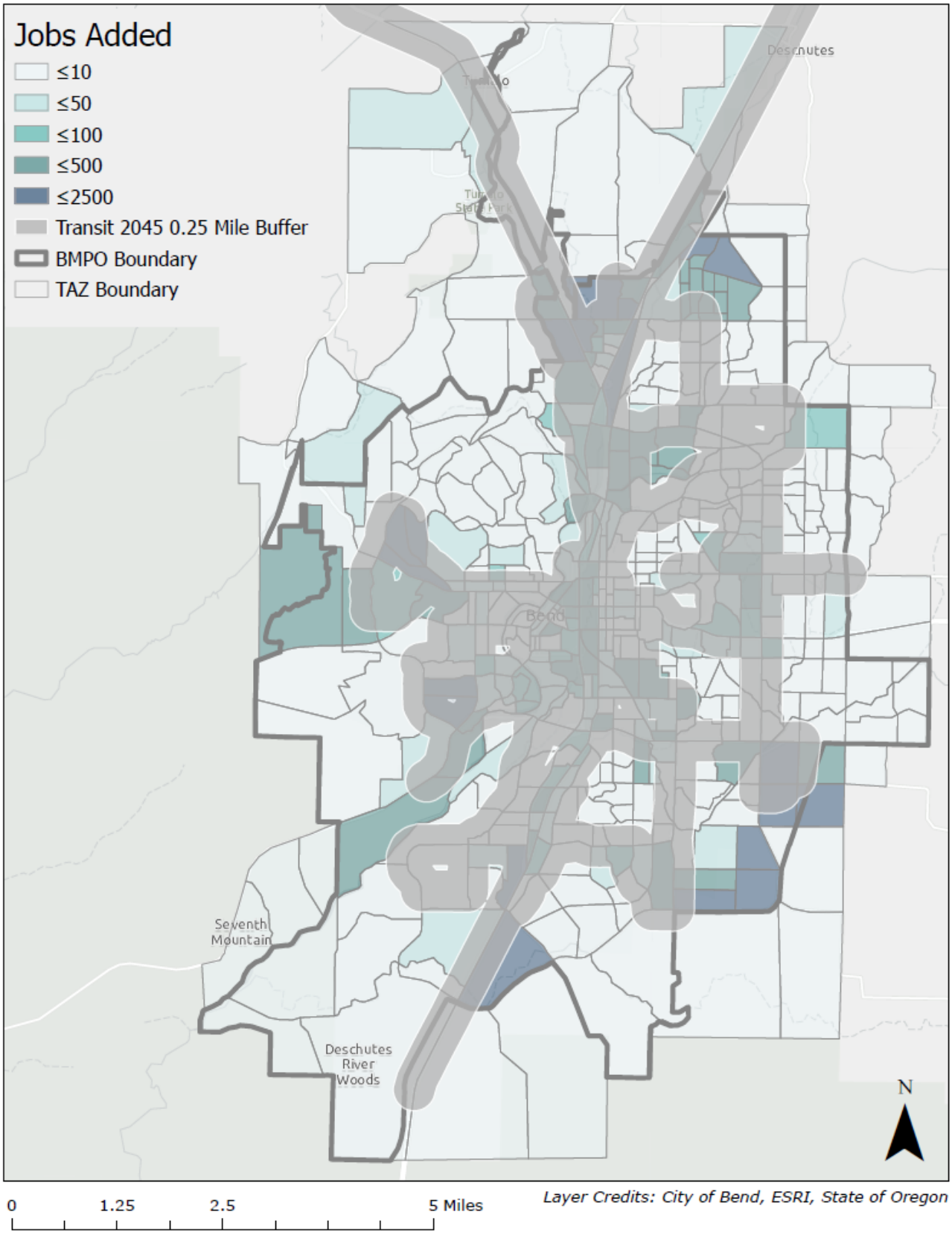

FIGURE 2. 2045 REFINED PROJECT LIST TRANSIT COVERAGE AND JOB GROWTH

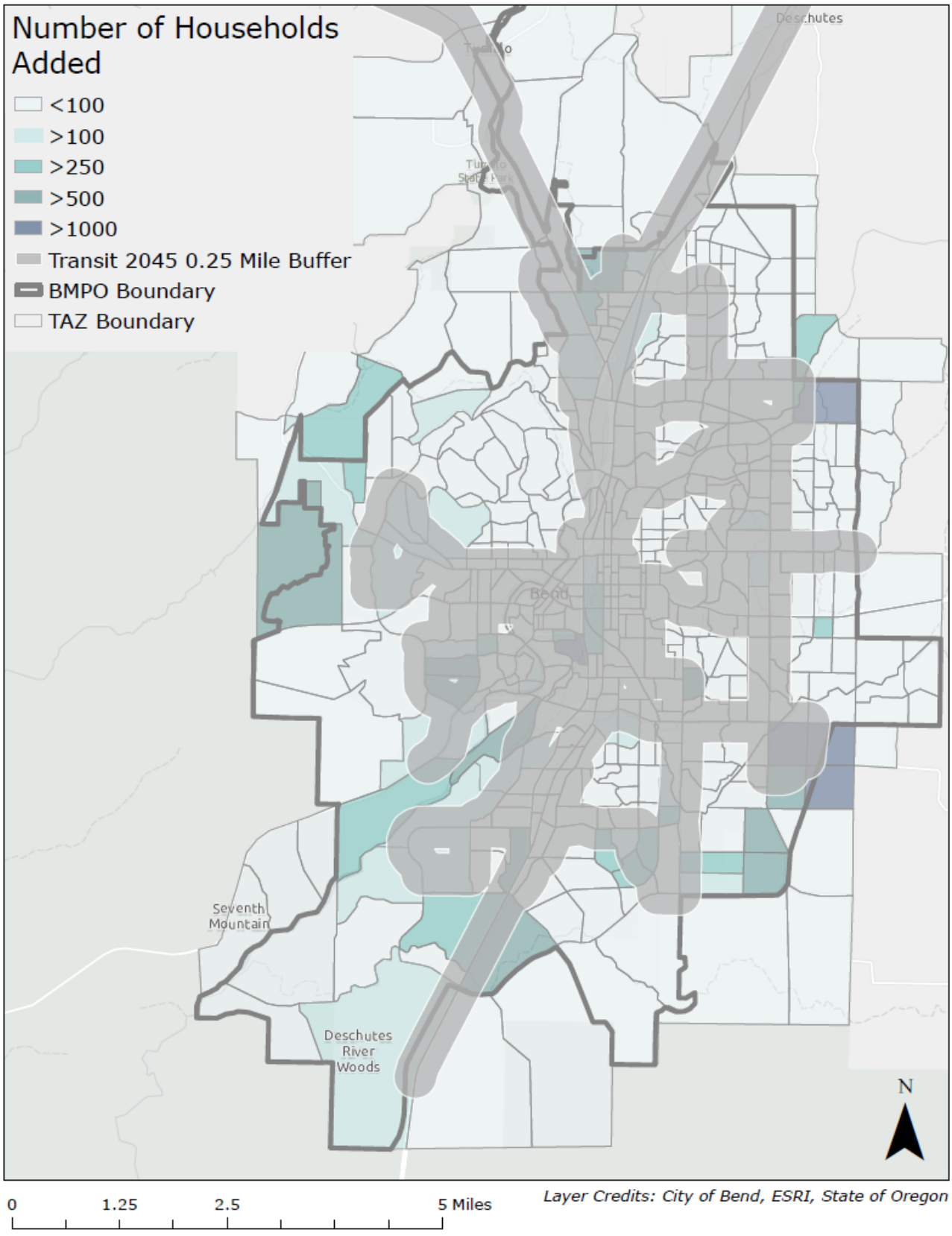

FIGURE 3. 2045 REFINED PROJECT LIST TRANSIT COVERAGE AND HOUSING GROWTH

NEW/CHANGING TRANSIT NEEDS

Compared to the 2045 Draft Project List Scenario, adjusting CET Route 6 (serving east Bend) in the model to better serve growth in Stevens Ranch and Stevens Road Tract, and travel demand management programs for major employers (modeled using parking pricing as a proxy), led to an over 400% increase in the percentage of transit trips in the 2045 Refined Project List Scenario. The refinement of the transit projects included in the 2045 Refined Project List also increases the number of households and jobs within walking distance (0.25 miles) of a transit route.

As previously documented for the 2045 Draft Project List Scenario, key transit needs in 2045 include:

- The 2045 Draft MTP Project List does not provide sufficient transit coverage to fully serve the new growth areas on the urban fringe of the Bend Metropolitan Planning Area (MPA). Many of the most critical motor vehicle needs, particularly needs related to east-west river crossings, cannot be fully resolved through new connections or corridor enhancements. Expanded transit service could provide relief to these congested corridors by shifting motor vehicle users to transit.
- Some programmatic opportunities to increase travel in transit type modes beyond currently identified projects could include vanpool/carpool incentives for large area employers, targeting businesses along corridors identified to have increasing motor vehicle congestion. Some of these types of programs already exist, such as the Enterprise program, but targeted funding to increase the reach of these programs is lacking. More refined funding sources for these programs are recommended as a consideration in the upcoming Bend TSP Update.
- In addition, buses in the transit system are affected by motor vehicle congestion on many of the existing or planned routes, affecting travel times and reliability. Future local plan updates (Deschutes County ITS Plan, CET Master Plan, Bend TSP Update) are recommended to consider ITS projects supporting transit signal priority.
- As a community, the Bend MPA does not have a transit culture. Developing a transit culture will require additional support, with Commute Options, incentives, direct marketing, and other strategies and tactics targeting transit ridership. The upcoming Bend TSP Update is recommended to consider identifying funding sources to support these types of strategies and tactics to increase transit ridership throughout the region.

MOTOR VEHICLE EVALUATION AND FINDINGS

This section presents the following analysis and findings related to the motor vehicle needs and proposed projects within the Bend MPA:

- **Updated Evaluation Results**
- **New/Changing Motor Vehicle Needs**

UPDATED EVALUATION RESULTS

The motor vehicle/multi-modal focused projects from the 2045 Refined Project List are shown in Attachment C (connectivity and corridor enhancement), Attachment D (intersections), and Attachment E (technology). This section summarizes the key motor vehicle performance measures

for the 2045 Refined Project List, compared against the 2019 Base, 2045 Committed and 2045 Draft Project List Scenarios, including:

- Corridor Congestion
- System Delay
- Vehicle Miles Traveled (VMT)
- Trip Diversion

CORRIDOR CONGESTION

The levels of corridor congestion throughout the Bend MPA were estimated using BRM model outputs, which were summarized as Demand to Capacity (D/C) ratios indicating capacity constraints throughout the system. Figure 5 compares the PM Peak Hour D/C ratio results by corridor for the 2045 Refined Project List and the 2045 Committed scenario.

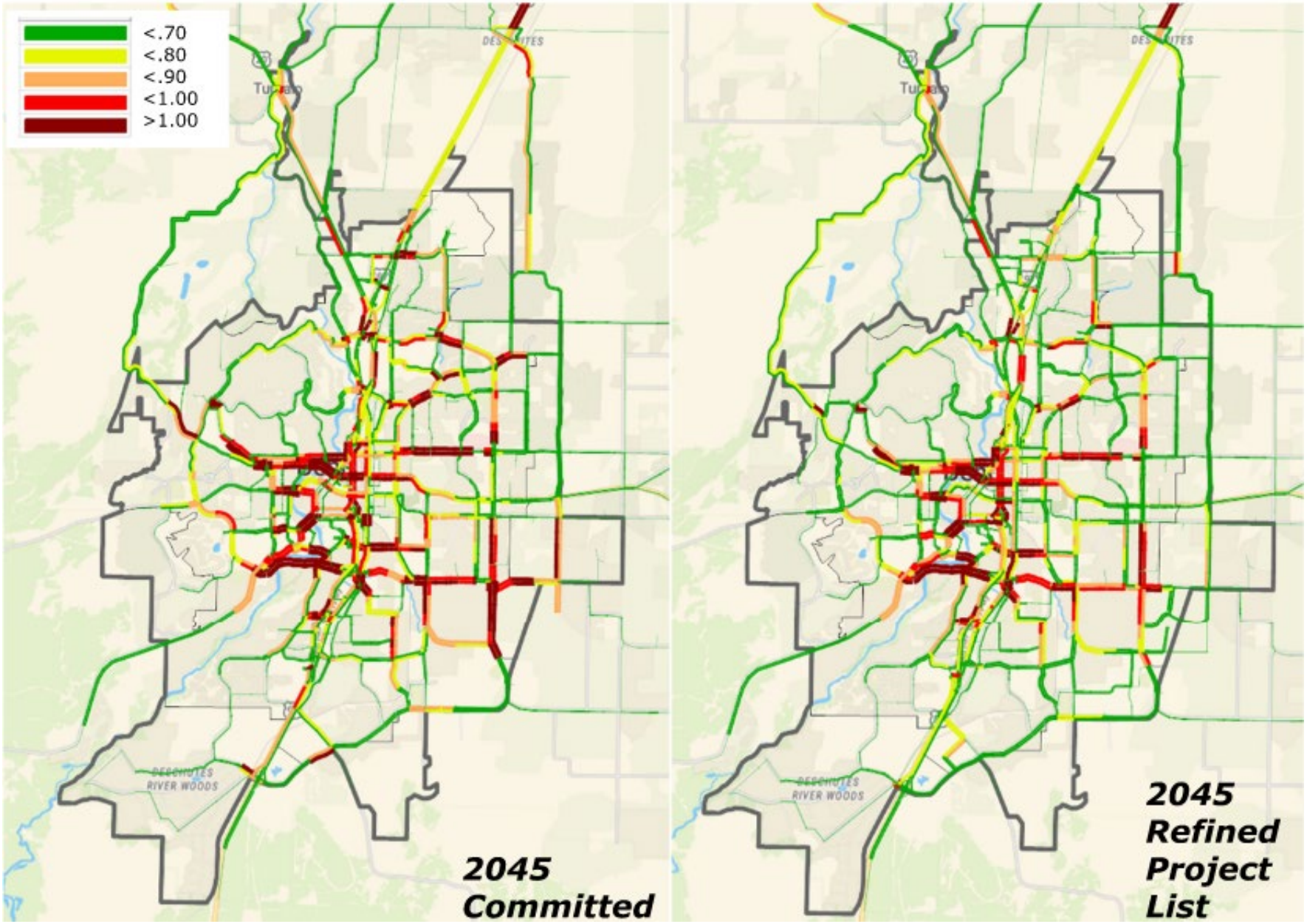

FIGURE 4: 2045 COMMITTED AND REFINED PROJECT LIST PM PEAK HOUR DEMAND/CAPACITY RATIOS

As shown in Figure 5 (with the darkest red symbolizing demand exceeding capacity), the 2045 Refined Project List Scenario improves some of the congestion issues flagged in the MTP Needs Memorandum[4] (similar to the 2045 Draft Project List Scenario), including:

- US 97 Parkway - traffic operations improve, due mainly to restricted access (Projects C2A-C2H) and parallel routes that provide new direct connections to US 97, like the 18th Street extension (Project 97.b)
- North-south corridors – 27th Street improves south of Reed Market Road due to additional connectivity projects to the east and enhanced transit access.
- Empire Boulevard/Butler Market Road – Improves due to Yeoman Road extension (Projects C-1 and C-76)

While the 2045 Refined Project List addressed congestion better than the 2045 Committed Project List (through a handful of new connectivity projects and increased mode shift to active transportation and transit), congestion issues that remain include:

- All East-West river crossings
- East-West corridors, including:
  - NW Galveston Ave
  - NW Portland Ave
  - NE Neff Road
  - NE Newport Ave
  - SE Reed Market Road
  - SE Wilson Avenue
  - Smaller portions of Butler Market Road
  - Powers Road
- North-South corridors including:
  - SE 15th Street
  - 27th Street

In a change from the 2045 Draft Project List, the 2045 Refined Project List Scenario better addresses congestion on Ward Road south of US 20 with the addition of a new project to upgrade Ward Road to an urban corridor.

SYSTEM DELAY

The MPA area roadway system PM Peak Hour vehicle delay with the 2045 Refined Project List is summarized in Table 4, and compared against 2019 and 2045 Committed conditions. The system delay is separated by facility jurisdiction (City of Bend, ODOT, Deschutes County).

[4] (DKS Associates 2023)

TABLE 4: PM PEAK HOUR VEHICLE HOURS OF DELAY

ROADWAY JURISDICTION	2019 BASE	2045 COMMITTED	2045 REFINED PROJECT LIST	% CHANGE BETWEEN BASE AND REFINED PROJECT LIST	% CHANGE BETWEEN COMMITTED AND REFINED PROJECT LIST
CITY OF BEND FACILITIES	283	1,248	867	206%	-31%
ODOT FACILITIES	114	445	336	196%	-25%
DESCHUTES COUNTY FACILITIES	7	38	16	125%	-57%
TOTAL	404	1,731	1,219	202%	-30%

As listed in Table 4, the 2045 Refined Project List Scenario is expected to significantly decrease overall delay on roadways within the MPA compared to the 2045 Committed Scenario. The connectivity and corridor enhancement projects that add alternate routes to the system and motor vehicle capacity drive this delay reduction. As noted in the *Active Transportation* and *Transit* sections above, changes in mode split are relatively minimal but do help contribute to the reductions in delay across the MPA.

VEHICLE MILES TRAVELED (VMT)

Vehicle Miles Traveled (VMT) is a measure of total motor vehicle travel within the system. Normalized to the population within the MPA, this measure indicates trends in both the number of vehicle trips and average trip length, measures which reflect both land use planning implications on travel and approximated future year motor vehicle emissions. Table 5 summarizes the daily VMT results for trips originating from households within the Bend MPA under 2019, 2045 Committed, and 2045 Refined Project List conditions.

TABLE 5: DAILY VMT PER CAPITA RESULTS

MEASURE	2019 BASE	2045 COMMITTED	2045 REFINED PROJECT LIST	% CHANGE BETWEEN BASE AND REFINED PROJECT LIST	% CHANGE BETWEEN COMMITTED AND REFINED PROJECT LIST
DAILY VMT PER CAPITA	6.89	7.26	6.72	-2.5%	-7.4%

The 2045 Refined Project List significantly improves VMT per capita over the 2045 Committed Scenario (7.4 percent reduction). Additionally, this is a minor decrease relative to 2019 Base Year conditions (2.5 percent reduction). This shift occurs due to careful balancing of land use (housing

and employment) in Bend MPA growth areas, enhancements to the transit system, and improvements to connectivity.

TRIP DIVERSION

With congestion expected to continue to grow throughout the Bend MPA in the future, traffic may divert onto local streets in attempts to bypass system or corridor bottlenecks. To estimate the system-level risk of trip diversion, the percentage of collector roadways with Average Daily Traffic (ADT) of more than 4,000 was calculated from the BRM. Table 6 summarizes this measure for 2019, 2045 Committed, and 2045 Refined Project List conditions.

TABLE 6: TRIP DIVERSION POTENTIAL

MEASURE	2019 BASE	2045 COMMITTED	2045 REFINED PROJECT LIST	% CHANGE BETWEEN BASE AND REFINED PROJECT LIST	% CHANGE BETWEEN COMMITTED AND PROJECT LIST
DIVERSION POTENTIAL [A]	7%	22%	18%	136%	-22%

[A] Measured as a percentage of collector roads with an average daily traffic volume above 4,000 vehicles per day.

As listed in Table 6, the 2045 Refined Project List reduces the risk of trip diversion over the 2045 Committed condition, but still more than doubles the amount of high-volume collector facilities compared to the present day. Cut-through traffic already occurs adjacent to various congested corridors and hot spots throughout the Bend MPA.

NEW/CHANGING MOTOR VEHICLE NEEDS

Compared to the 2045 Draft Project List Scenario, the 2045 Refined Project List Scenario included a modernization of Ward Road south of US 20 (Project New-1), which addressed congestion issues in the area. In addition, a reduction in motor vehicle demand along with other model changes resulted in a lower daily VMT per capita when compared to the 2019 Baseline Scenario (2.5 percent reduction), although additional land use changes and investments in alternative modes would likely be required to further reduce daily VMT per capita and meet the state's climate goals.

As previously documented for the 2045 Draft Project List Scenario, the new horizon year of 2045 and changes to land use based on recent growth trends and local planning activities have both created new needs and changed the scope of previously identified motor vehicle system needs. The combined impact of these changes is reflected in the following summary of changes in motor vehicle system needs between the prior and current MTP updates:

- **East West River Crossings** – This congestion issue was a key need identified in the City's TSP and was flagged for monitoring. Current travel demand model forecasts indicate that these crossings will experience traffic demand well beyond existing capacity, indicating a need to move forward with a study for new/enhanced river crossings. This study should include best practices/strategies to manage the existing river crossings as well, particularly given the topographic and right-of-way constraints affecting many of the bridges and connecting facilities.

- **27th Street** – This corridor was flagged for monitoring in the City's TSP, with the year 2040 analysis indicating a need for a five-lane cross section from Empire Boulevard to Ferguson Road. The 2045 Draft Project List evaluation indicates that by the year 2045 Horizon, a five-lane cross section extension is likely only needed from Bear Creek Road to Reed Market Road.
- **Shevlin Park Road** – A new traffic congestion issue east of Skyline Ranch Road.
- **Neff Road** – Heightened congestion issue between 8th Street and 27th Street, with the potential of increasing neighborhood cut-through.
- **Hamby Road** – New traffic congestion issue from Stevens Road to Bear Creek Road, caused in part by growth in the Stevens Ranch and DSL areas.
- **Powers Road** – New congestion issue between US 97 and Brookswood Boulevard.

In addition, key system motor vehicle needs in 2045 previously documented for the 2045 Draft Project List Scenario include:

- Shifts away from motor vehicle modes could provide further improvements in system delay, but to realize these improvements, targeted funding to strategic programs would be needed. Therefore, all local plans supporting jurisdictions within the MPA are recommended to consider establishing strategic mode shift programs with dedicated funding sources or designating funding sources and implementation plans for already identified but unfunded programs.
- The Bend TSP considered funding and staffing a program to manage cut-through traffic, and this program has been at least partially implemented to support the construction efforts related to the G.O. Bond projects. The continued traffic growth throughout the Bend MPA indicates a need to expand the implementation of this program to consider non-construction related cut-through traffic under current conditions.

ATTACHMENTS

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ATTACHMENT A: ACTIVE TRANSPORTATION PROJECTS

TABLE 7: ACTIVE TRANSPORTATION CONNECTIVITY PROJECTS

MAP ID	PROJECT DESCRIPTION	COST ESTIMATE[1]
20714	US 97: Multi-Use Trail	$5,977,000
23494	Hawthorne Ave Pedestrian Bike and Overcrossing	$24,450,000
BP-1	Sidewalks on 7th Street (Tumalo)	$325,000
BP-10	Sidewalks on 8th Street (Tumalo)	$433,000
BP-2	Sidewalks on 4th Street (Tumalo)	$325,000
BP-3	Sidewalks at 2nd and Cook (Tumalo)	$1,841,000
BP-6	Sidewalks on 5th Street (Tumalo)	$541,000
M-12	Olney Avenue Bike Lanes and Undercrossing	$2,116,000
M-15A	Greenwood Undercrossing Sidewalk Widening	$8,087,000
M-15C	Franklin Avenue Underpass	$48,089,000
M-20	Knott Canal Crossing	$846,000
M-9A	Franklin Avenue Underpass Shared Use Path	$6,974,000
M-9C	Greenwood Undercrossing Sidewalk Widening and Shared Use Path	$3,055,000
P10	DRT North Trailhead	$320,000
P11	DRT Kirkaldy to Putnam	$72,000
P13	DRT Galveston to Miller's Landing	$3,077,000
P14	DRT South UGB and Bike/ Pedestrian Bridge	$3,625,000
P35	Riley Ranch Nature Reserve Bike/ Pedestrian Bridge	$1,200,000
P41	Arnold Canal Trail	$645,000
P44	Discovery West Trail	$1,600,000
P45	Hansen Park Trailhead	$755,000
P47	High Desert Park Trail	$258,000
P49	North Unit Canal Trail	$512,000
P50	Pilot Butte Canal Trail	$198,000
P55	Hansen to Big Sky Park Trail	$3,625,000
P56	Manzanita Trail	$48,000
P57	Neff and Hamby Road Crossings	$3,625,000
P6	COHCT from Blakely Road to Hansen Park	$798,000
P61	Riley Ranch Nature Reserve Neighborhood Access	$151,000
P64	Shevlin Park North to Tumalo Creek Bike/ Pedestrian Bridge	$755,000
P67	TransCanada Trail	$755,000
P69	DRT Connector to Shelvin Park	$82,000
P7	COCHT from Hansen Park to Eastgate Park	$178,000
P75	Powerline Trail	$755,000
P77	South DRT Buck Canyon Trailhead	$3,625,000
P78	Tumalo Creek Trail	$755,000
P8	COCHT from Eastgate Park to the Badlands	$755,000
P9	DRT Putnam to Riley Ranch Nature Reserve Bike/ Pedestrian Bridge	$155,000
R2-A	NW Franklin Ave: Harriman Ave to Railroad Undercrossing	$205,000

1. All costs are in 2023 dollars. Costs from prior plan years were adjusted to 2023 dollars.

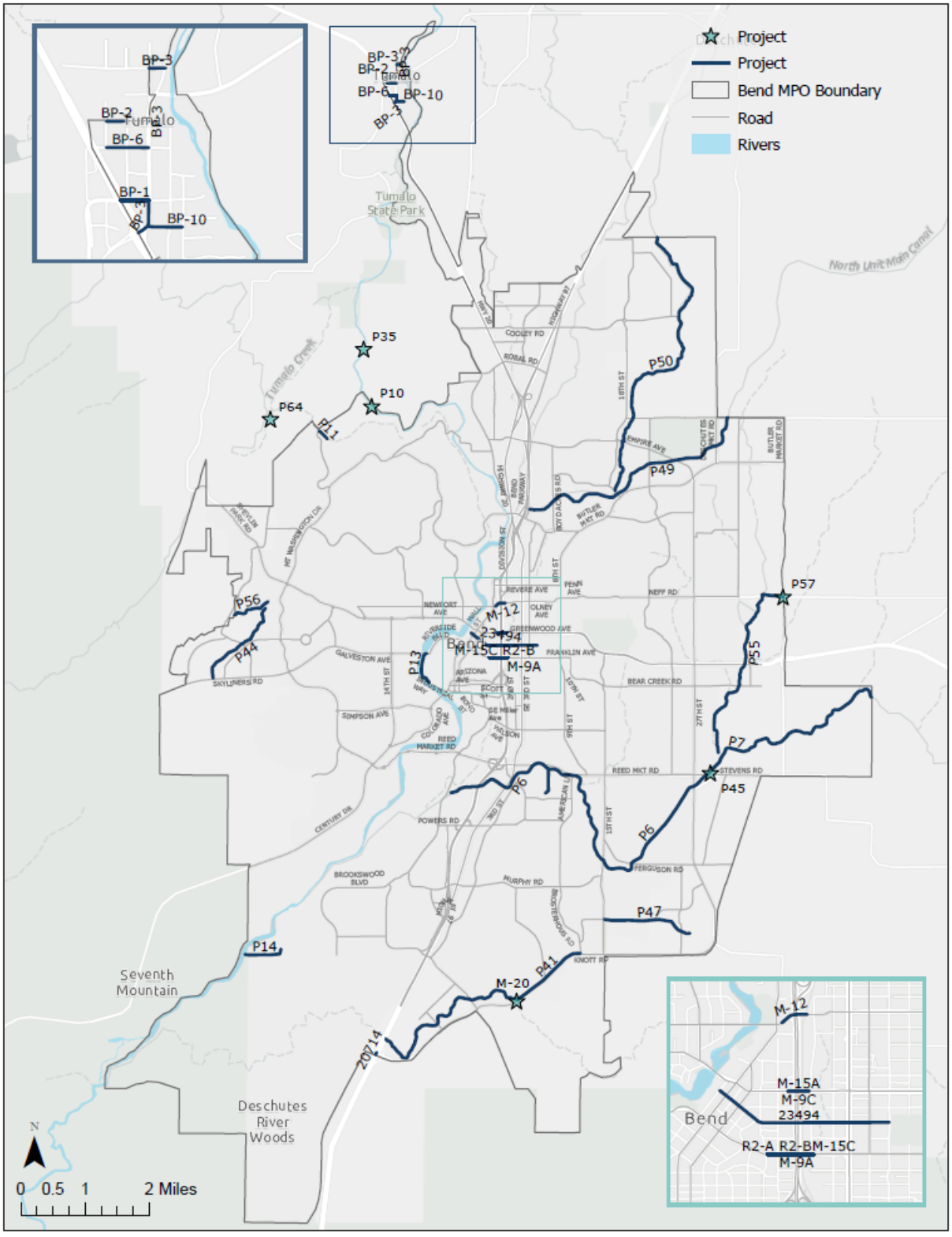

FIGURE 5. 2045 REFINED PROJECT LIST ACTIVE TRANSPORTATION CONNECTIVITY PROJECTS

TABLE 8: ACTIVE TRANSPORTATION CORRIDOR ENHANCEMENT PROJECTS

MAP ID	PROJECT DESCRIPTION	COST ESTIMATE[1]
20391	US 20: Empire-Greenwood Improvements	$2,034,000
21489	US 20 3rd St-15th St Improvements	$6,427,000
22442	Sisters and Bend ADA Improvements	$17,633,000
C4A	Cooley Road Improvements	$3,487,000
C4B	Butler Market Road Improvements	$232,000
C4G	Canal/ Garfield Undercrossing	$1,453,000
C4H	Badger/ Pinebrook Overcrossing	$8,718,000
C4I	Murphy Road Improvements	$8,718,000
C4L	Robal Road Improvements	$1,162,000
C4P	Wilson Avenue Improvements	$1,000,000
M-1	Galveston Avenue Corridor Improvements	$4,712,000
M-10	Drake Park Pedestrian Bridge Improvements	$1,482,000
M-11	Archie Briggs Road Trail Improvements	$581,000
M-14	Butler Market Road Sidewalk Improvements	$3,745,000
M-16	Revere Avenue/ 2nd Street Intersection Improvement	$244,000
M-17	Olney Avenue Railroad Crossing Improvements	$604,000
M-18	Eagle Road Functional Urban Upgrade	$16,856,000
M-19	Knott Road Urban Upgrade from China Hat Road to 15th Street	$18,134,000
M-2	Parrell Road Urban Upgrade from China Hat Road to Brosterhous Road	$33,828,000
M-21	SE 27th Street rural road upgrade from Stevens Road to Ferguson Road	$1,668,000
M-22	SE 27th Street rural road upgrade from Ferguson Rd to Diamondback Ln	$770,000
M-23	SE 27th Street rural road upgrade from Diamondback Lane to access road	$128,000
M-24	SE 27th Street rural road upgrade from access road to Knott Road	$1,668,000
M-25	Knott Road rural road upgrade from 15th Street to Raintree Court	$642,000
M-26	Knott Road rural road upgrade from Raintree Court to SE 27th Street	$7,059,000
M-27	Knott Road rural road upgrade south of China Hat Road	$385,000
M-29	Cooley Road rural road upgrade from O.B. Riley Road to US 20	$1,668,000
M-3	Olney Avenue/2nd Street intersection improvement	$244,000
M-30	Cooley Road rural road upgrade to urban standards from US 20 to Hunnell Road	$1,279,000
M-31	Hunnell Road rural road upgrade to urban standards from Cooley Road to Loco Road	$232,000
M-32	Yeoman Rd rural road upgrade from the western terminus to Deschutes Market Rd	$3,209,000
M-33	Deschutes Market Road rural road upgrade from Yeoman Road to Canal	$642,000

MAP ID	PROJECT DESCRIPTION	COST ESTIMATE[1]
M-34	Deschutes Market Rd urban road upgrade from Canal to Butler Market Rd	$513,000
M-36	Butler Market Road rural road upgrade from Eagle Road to Clyde Lane	$513,000
M-37	Butler Market Road rural road upgrade from Clyde Lane to Hamby Road	$1,412,000
M-38	Butler Market Rd rural road upgrade from Hamby Rd to Hamehook Rd	$1,412,000
M-39	Stevens Road urban road upgrade from Stevens realignment to Bend UGB	$2,439,000
M-4	Greenwood Avenue/2nd Street intersection improvement	$244,000
M-40	Clausen Drive rural road upgrade from Loco Road to Northern terminus	$257,000
M-41	China Hat Road urban road upgrade north of Knott Road	$257,000
M-42	China Hat Road Canal Bridge widening	$483,000
M-43	Deschutes Market Road canal bridge widening	$513,000
M-5	Franklin Avenue/2nd Street intersection improvement	$244,000
M-6	Franklin Avenue/4th Street intersection improvement	$244,000
M-7	Clay Avenue/3rd Street intersection improvement	$244,000
R11-A	Murphy Road: Parrell Road to 15th Street Shared Use Path	$2,533,000
R12-A	Wilson Ave: 2nd Street to SE 9th Street	$2,533,000
R1-A	SE 9th St: Wilson Ave to Reed Market Rd	$1,343,000
R1-B	SE 9th St: Wilson Ave to Glenwood Ave	$3,000
R1-C	NE Boyd Acres Rd: Butler Market Rd to Empire Ave	$2,190,000
R1-D	SE 15th Street: Reed Mkt Rd to 300’ south of King Hezekiah	$1,378,000
R2-C	Franklin Ave: 1st St to 5th St	$19,000
R2-D	Bear Creek SRTS: Larkspur Trail to Coyner Trail	$448,000
R3-A	Norton Ave: NE 6th St to NE 12th St	$228,000
R3-B	Hillside Trail: Connects NE 12th to Neff Rd	$280,000
R3-C	Neff Rd: NE 12th to Big Sky Park	$4,224,000
R3-E	Olney Avenue: Wall Street to railroad	$489,000
R4-A	NW 15th St: Lexington Ave to Milwaukie Ave	$128,000
R4-B	NW 14th St: Ogden Ave to Portland Ave	$128,000
R5-A	Butler Market Rd: Brinson Blvd to NE 6th St	$2,281,000
R7-A	3rd St: Crosswalk btw RR and Wilson Ave	$250,000
R7-B	3rd St: Crosswalk btw RR and Franklin Ave	$250,000
R7-C	3rd St: Underpass	$244,000
R8-A	27th St: Hwy 20 to Reed Mkt Rd - Shared use path	$5,597,000
RMRP2	Reed Market Road/ Chamberlain Street Improvements	$250,000
RMRP6A	3rd Street/ Brosterhous Road Safety Improvements	$130,000
US20.2	US 20/ NE 8th Street Improvements	$2,100,000

1. All costs are in 2023 dollars. Costs from prior plan years were adjusted to 2023 dollars.

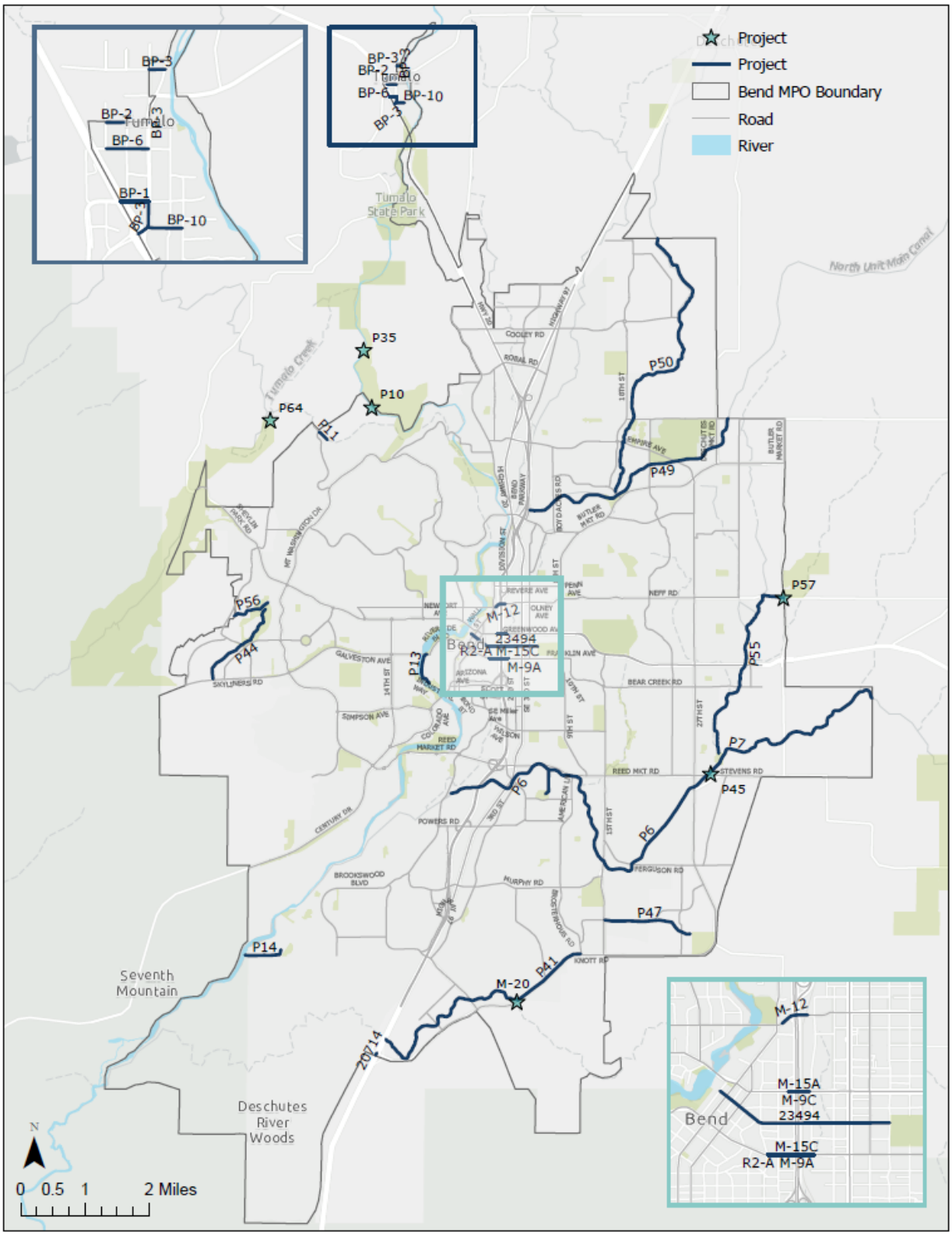

FIGURE 6. 2045 REFINED PROJECT LIST ACTIVE TRANSPORTATION CORRIDOR ENHANCEMENT PROJECTS

ATTACHMENT B: TRANSIT PROJECTS

TABLE 9. TRANSIT CONNECTIVITY PROJECTS

Cost Estimate: $8.7 Million

MAP ID	PROJECT DESCRIPTION
MHND	North Downtown Mobility Hub
MHOMD	Old Mill District Mobility Hub
MHHS	Hawthorne Station Mobility Hub
MHEB	East Bend Mobility Hub
MHST	South 3rd Mobility Hub
MHNB	North Bend Mobility Hub
MHOSU	OSU Cascades Mobility Hub
MHCOC	Central Oregon Community College Mobility Hub

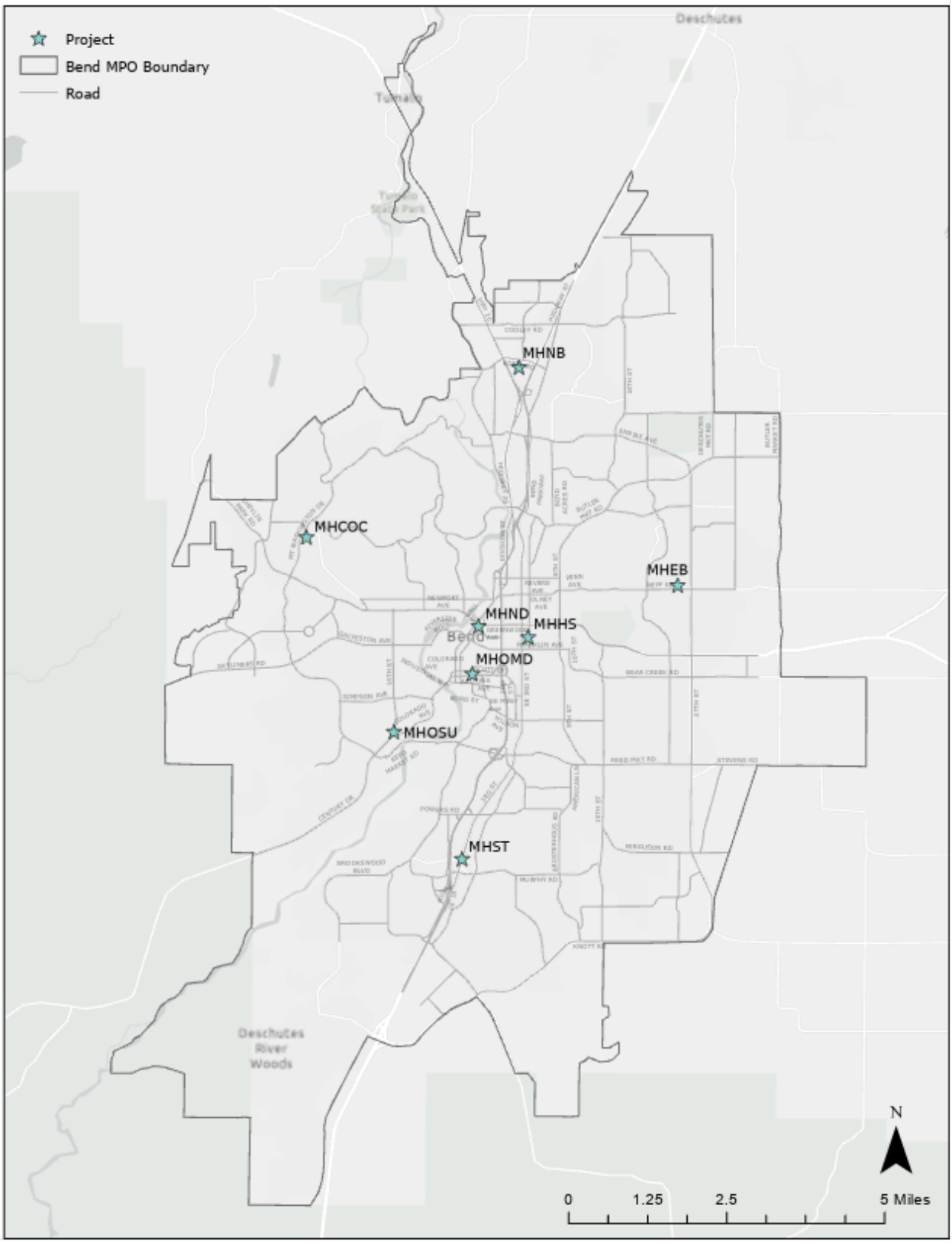

FIGURE 7. 2045 REFINED PROJECT LIST TRANSIT CONNECTIVITY PROJECTS

TABLE 10. TRANSIT SERVICE ENHANCEMENT PLAN 2045

2031-2040 Service Enhancement Cost: $24,582,000

MAP ID	PROJECT DESCRIPTION
CET 2	Bend Service Enhancement Route 2
CET 8	Bend Service Enhancement Route 8
CET 9	Bend Service Enhancement Route 9
CET 11	Bend Service Enhancement Route 11
CET 3	Bend Service Enhancement Route 3
CET 4	Bend Service Enhancement Route 4
CET 5	Bend Service Enhancement Route 5
CET 6	Bend Service Enhancement Route 6
CET 7	Bend Service Enhancement Route 7
000	Study for the Realignment of CET Routes to Service Mobility Hubs

TABLE 11. CET FUNDING PLAN BY QUALIFIED ENTITY[A]

BEND LOCAL SERVICE	EXISTING	SHORT-TERM	MID-TERM
FIXED-ROUTE	$2,290,000	$3,795,000	$9,163,000
DIAL-A-RIDE	$1,141,000	$1,554,000	$2,373,000
DAR/ MICROTRANSIT	$0	$725,000	$218,000

A. Obtained from Table 42 from the Cascades East Transit 2040 Transit Development Plan (2020)

TABLE 12. SYSTEMWIDE FUNDING PLAN[B]

PHASE NAME	EXISTING	NEAR TERM	SHORT-TERM	MID-TERM	LONG-TERM
PLAN YEARS	2019-2020	2020-2021	2022-2025	2026-2030	2031-2040
SERVICE COSTS-EXISTING/ MAINTAIN	$6,431,000	$6,984,000	$8,673,000	$11,298,000	$18,856,000
SERVICE COSTS-ENHANCEMENTS	$0	$1,684,000	$3,334,000	$10,173,000	$24,582,000
CAPTIAL/ MATCH REQUIREMENT	$0	$752,000	$814,000	$899,000	$1,096,000

B. Obtained from Table 41 from the Cascades East Transit 2040 Transit Development Plan (2020)

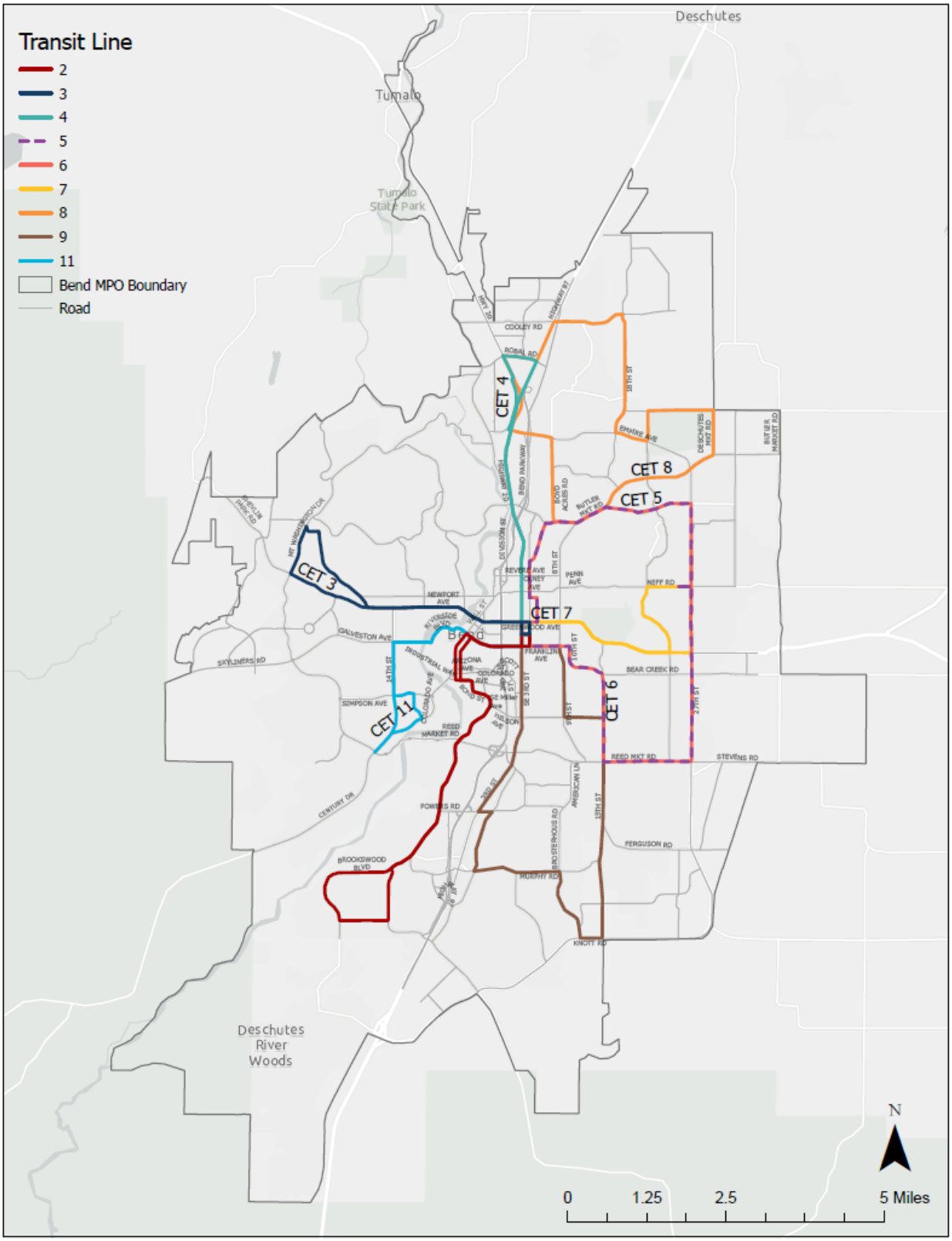

FIGURE 8. 2045 DRAFT PROJECT LIST TRANSIT ROUTES

ATTACHMENT C: MOTOR VEHICLE PROJECTS

TABLE 13. MOTOR VEHICLE CONNECTIVITY PROJECTS

MAP ID	PROJECT DESCRIPTION	COST ESTIMATE[1]
201	New collector - Skyline Ranch Rd from Shelvin Park to NW Xing	Funded
202	Crossing Drive Extension	Funded
219	Skyline Ranch Road Shevlin UGB Expansion Area	$3,465,000
230	New Road Shelvin UGB Expansion	$2,952,000
C-1	Yeoman Road Extension	$6,417,000
C-2	Purcell Boulevard Extension	$2,937,000
C-24	Sisemore Street Extension	$2,790,000
C-25	Brentwood Ave extension from Whitetail St to American Ln	$2,779,000
C-48	New North Frontage Road near Murphy Road	$6,931,000
C-49	New South Frontage Road near Murphy Road	$17,712,000
C-50	Britta Street extension (north section)	$3,465,000
C-51	Britta Street extension (south section)	$1,283,000
C-58	Ponderosa Street / China Hat Road overcrossing	$17,437,000
C-5A	Aune Street extension (East)	$6,394,000
C-5B	Aune Street Extension (West)	$9,881,000
C-64	US 97 Frontage Road (Ponderosa to Baker Road)	$7,614,000
C-65	Stevens Road realignment	$56,496,000
C-66	Hunnell Road extension	$3,080,000
C-69	New Road in the Elbow UGB expansion area	$5,134,000
C-72	New Road in the Thumb UGB expansion area	$5,519,000
C-73	New Road in the Thumb UGB expansion area	$3,209,000
C-74	Loco Road extension	$6,802,000
C-75	New Road in Triangle UGB expansion area	$3,209,000
C-76	Yeoman Road Extension	$13,990,000
C-78	Collector between US20 and Hunnell Rd	$4,650,000
C-80	Robal Road extension from US 20 to O.B. Riley	$3,371,000
CC-18	Cooley Road Extension	$3,140,000
C-71	New Collector road between Ferguson and Knott	$11,551,000
SEAP	Local Road between SE Caldera Drive and Knott Road	$2,695,000
C-70	Extension of SE Caldera Drive between SE 15th and SE 27th	$9,498,000
SRMP	Extension of Wilderness Way	$4,223,000
SRMP	Eubanks Street collector between SE Ferguson and SE Stevens	$5,739,000
SRMP	SE Ferguson Road Extension	$2,815,000
SRT	Extension of the SE Ward Road Alignment from Reed Market Rd to Ferguson Rd	TBD

1. All costs are in 2023 dollars. Costs from prior plan years were adjusted to 2023 dollars.

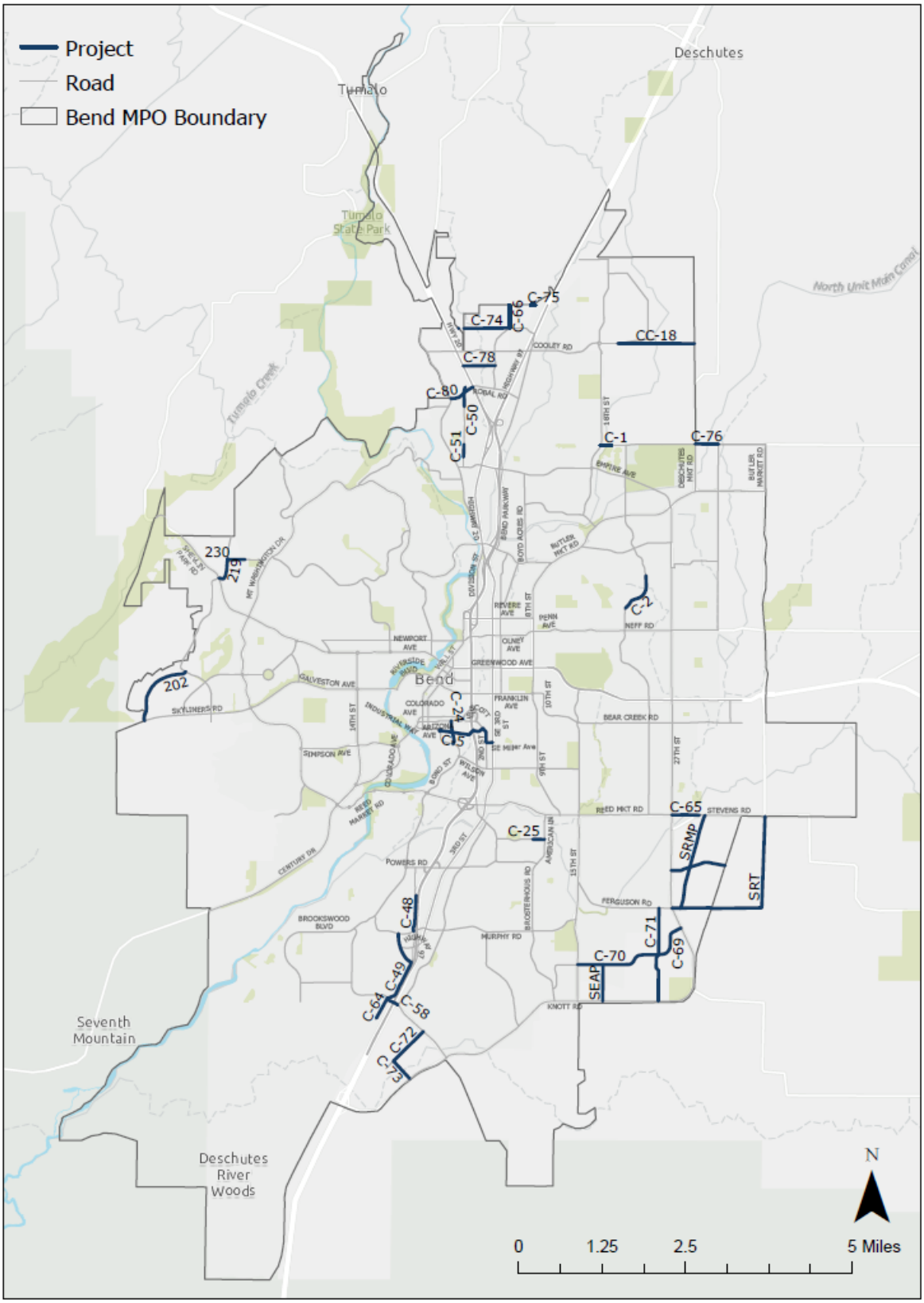

FIGURE 9. 2045 REFINED PROJECT LIST MOTOR VEHICLE CONNECTIVITY IMPROVEMENTS

TABLE 14. MOTOR VEHICLE CORRIDOR ENHANCEMENT PROJECTS

MAP ID	PROJECT DESCRIPTION	COST ESTIMATE[1]
20378	Archie Briggs Road (Deschutes River) Bridges	$5,852,000
21756	US 20: Central Oregon Hwy Culverts Corridor	$533,000
22607	Revere Ave Rail Crossing (Bend)	$500,000
22774	NE Norton Ave (Bend)	$579,000
22776	US 97: Redmond-Bend Phase 2	$9,309,000
22791	US 20: (3rd Street) at Empire (Planning and Design Only)	$250,000
97.A	Tight Urban Diamond Interchange US 97 North Interchange	$81,212,000
97.B	Realignment of 18th Street Relative to Juniper Ridge	-
B-19	Hamby Road Corridor Safety Improvements	$65,456,000 [3]
BR-10	Old Deschutes Road Pilot Butte Canal Bridge Replacement	$433,000
C-13	Empire Avenue widening near US 97 interchange	$11,625,000
C-18	US 97 ramps at Murphy Road	$12,835,000
C-23	18th Street arterial corridor upgrade from Cooley to Butler Market	$9,424,000
C-3	O.B. Riley Road Corridor upgrade from Hardy to Archie Briggs	$8,599,000 [4]
C-31	Safety improvements to Empire Boulevard/27th Street Corridor from Boyd Acres Road to Reed Market Road	$48,591,000
C3A	Southbound Deceleration Lane Modification at Hawthorne Avenue	$1,162,000
C3C	Extend Revere Avenue northbound on-ramp acceleration lane	$2,325,000
C3D	Acceleration lane modification for Colorado northbound on-ramp	$4,650,000
C-40	US 97 North parkway extension (Phase 2)	$34,874,000
C-41	Powers Road interchange	$23,249,000
C-43	15th Street corridor safety and capacity improvements	$19,529,000
C-44	Reed Market rail crossing implementation	$29,062,000
C5	US 97 Shoulder-width improvements	$6,975,000
C-52	Mervin Samples Road / Sherman Road Collector Corridor upgrade	$7,829,000
C-53	27th Street Arterial Corridor upgrade from Bear Creek to Ferguson	$10,390,000
C-54	3rd Street railroad undercrossing widening	$15,926,000
C-55	Country Club Road Urban Upgrade from Knott to Murphy	$12,671,000
C-56	Powers Road urban upgrades from 3rd Street to Parrell Road	$1,208,000
C-57	Powers Road urban upgrades from Brookswood to 3rd	$5,074,000
C-6	Colorado Avenue corridor capacity improvements from Simpson Ave to Arizona Avenue	$24,412,000
C-9	Revere Avenue interchange improvements at Wall Street/ Revere Avenue intersection	$9,881,000
CC-28	Bailey Road Widen and Overlay from US 20 to Tumalo Reservoir Rd	$1,408,000
CC-29	Bear Creek Road Widen and Overlay from City Limits to US 20	$3,465,000
CC-30	Cinder Butte Road Widen and Overlay from Baker Rd to Minnetonka Lane	$1,408,000
CC-5	Rickard Road Widening from Knott Road to Bozeman Trail	$2,491,000
F-7	China Hat Road Widen and Overlay from Knott Road to one mile south of Knott Road at the Deschutes National Forest Boundary	$975,000
I6	SE 3rd Corridor SE Cleveland Ave to SE Davis Ave Safety	-
NEW-1	Ward Road Upgrade- US 20 to Stevens Road	$15,300,000
PHASE 1	US 97 Baker Interchange West Side Improvements	$15,182,000
PHASE 2	US 97 Baker Interchange Bridge and East Side Improvements	$23,798,000

MAP ID	PROJECT DESCRIPTION	COST ESTIMATE[1]
RMRP1A	Reed Market Rd/ Brookswood Blvd Turn Lane Improvement Phase 1	$4,000,000
RMRP1B	Reed Market Rd/ Brookswood Blvd Turn Lane Improvement Phase 2	$700,000
RMRP3	Reed Market Road/ US 97 Southbound Ramps	$5,700,000
RMRP4A	Reed Market Road/ US 97 Northbound Ramps/ Division Street: Traffic Signal	$4,000,000
RMRP4B	Reed Market Road/ US 97 Northbound Ramps/ Division Street: Separate Northbound Entrance Ramp	$9,400,000
RMRP5	Reed Market Road/ 3rd Street protected intersection & turn lanes	$10,300,000
US20.3	US 20/ NE Purcell Boulevard Widening and Turn Lane Addition	$800,000
US20.4	US 20/ NE 27th Widening and Turn Lane Addition	$800,000
US20.5	US 20/ Hamby Road Right Turn Bypass lane addition	$800,000

1. All costs are in 2023 dollars. Costs from prior plan years were adjusted to 2023 dollars.
2. Capital Cost Estimate not quantified in the Bend North Interchange Study Final Report
3. Project cost estimate will be re-evaluated to ensure no duplicate cost with New-1 and to remove projects that have already occurred (e.g., US 20/Hamby Road roundabout).
4. Project cost estimate will be re-evaluated to focus on pedestrian and bicyclist improvements only (no new roadwy capacity).

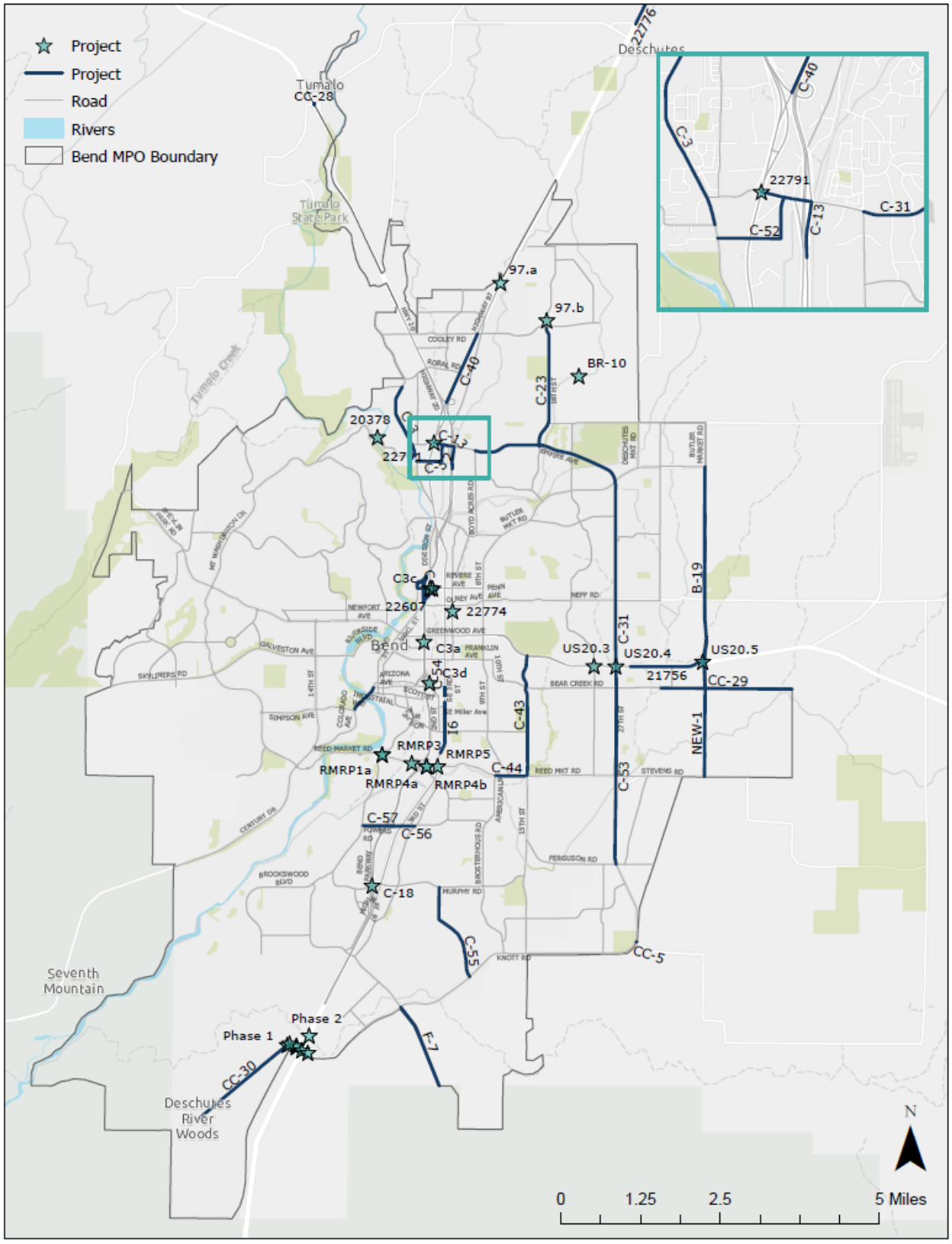

FIGURE 10. 2045 REFINED PROJECT LIST MOTOR VEHICLE CORRIDOR ENHANCEMENT PROJECTS

ATTACHMENT D: INTERSECTION PROJECTS

TABLE 15. INTERSECTION PROJECTS

MAP ID	PROJECT DESCRIPTION	COST ESTIMATE[1]
C-14	Reed Market /15th intersection improvements	$1,279,000
C-15	Olney Avenue/8th Street intersection improvement	$4,301,000
C-16	Revere Avenue/8th Street intersection improvement	$4,301,000
C-21	Butler Market Road/US 20/US 97 Improvement.	$7,184,000
C-22	3rd Street/Wilson Avenue intersection improvement	$6,041,000
C-27	Butler Market intersection improvements from US 97 to 27th	$8,137,000
C-28	Revere Avenue/4th Street intersection improvement	$4,301,000
C-29	Olney Avenue/4th Street intersection improvement	$4,301,000
C2A	Lafayette Avenue/ US 97 Improvements	$2,325,000
C2B	Close Hawthorne Avenue right turn onto Parkway	$1,162,000
C2C	Close Truman Avenue RIRO intersections with Parkway	$1,162,000
C2D	Close Reed Lane RIRO intersection with Parkway	$1,162,000
C2E	Close Badger Road RIRO intersections with Parkway	$1,162,000
C2F	Close Pinebrook Blvd RIRO intersections with Parkway	$1,162,000
C2H	Close Rocking Horse RIRO intersections with Parkway	$1,162,000
C-33	Country Club /Knott intersection improvement	$4,301,000
C-34	Ferguson Road/15th Street intersection improvement	$4,301,000
C-35	NE 27th /Wells Acres intersection improvement	$4,301,000
C-39	Brosterhous /Knott intersection improvement	$4,301,000
C-45	O.B. Riley/Empire intersection improvement	$2,439,000
C-46	4th /Butler Market intersection improvement	$4,470,000
C-59	Hawthorne /3rd Intersection improvement	$4,417,000
C-60	Century Drive/Skyline Ranch Road roundabout	$4,301,000
C-61	Mt. Washington Drive/Metolius Drive roundabout	$4,301,000
C-63	China Hat Road/Knott Road Intersection Improvement	$4,301,000
C-7	Colorado/US 97 NB ramp intersection improvements	$4,999,000
C-79	Cooley Road/Hunnell Road Intersection Improvement	$4,301,000
C-8	Portland Avenue corridor project from College Way to Deschutes River	$20,576,000
CL-14	Cinder Butte Rd/ Cheyenne Rd intersection improvement	$217,000
CL-16	Cline Falls Hwy Cook Ave/Tumalo Rd intersection improvement	$1,949,000
CL-22	Baker Rd/ Brookswood Blvd intersection improvement	$1,516,000
RMRP6B	3rd Street/ Brosterhous Road Protected Intersection	$750,000
S-3	Pettigrew Road/Bear Creek Road safety improvement	$4,749,000
S-4	US 97/Powers Road interim improvements	$128,000

MAP ID	PROJECT DESCRIPTION	COST ESTIMATE[1]
S-5	3rd/Miller intersection improvements and 3rd Street modifications study (Phase 1)	$128,000
S-6	3rd/Miller intersection improvements and 3rd Street modifications implementation (Phase 2)	$3,979,000
S-7	Empire Avenue/Jamison Street Turning Restrictions	$129,000

1. All costs are in 2023 dollars. Costs from prior plan years were adjusted to 2023 dollars.

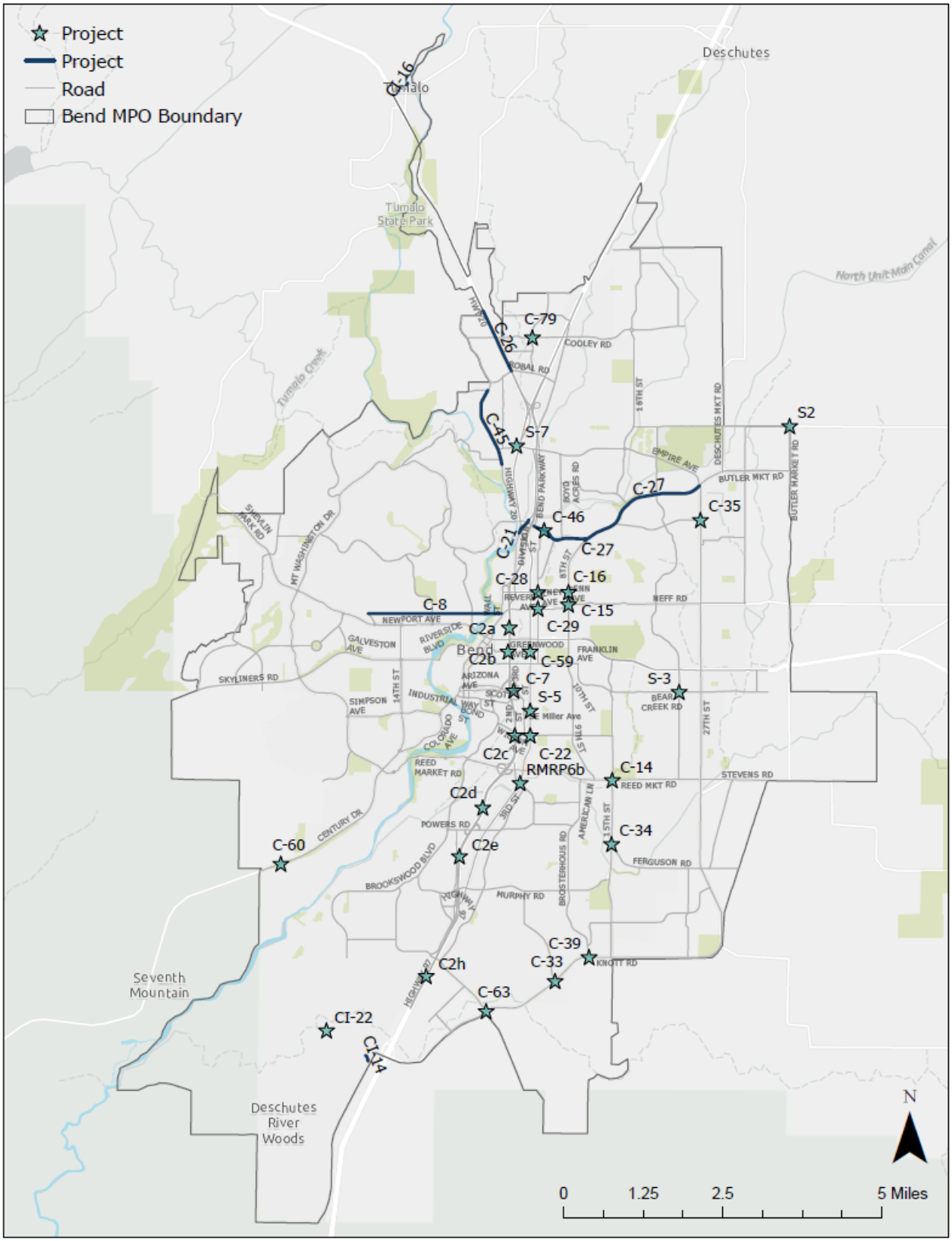

FIGURE 11. 2045 REFINED PROJECT LIST INTERSECTION PROJECTS

ATTACHMENT E: TECHNOLOGY PROJECTS

TABLE 16. TECHNOLOGY PROJECTS

MAP ID	PROJECT DESCRIPTION	COST ESTIMATE[1]
101	3rd Street Safe and Smart Corridor	$1,651,000
102	US 97 Safe and Smart Corridor	$1,331,000
104	Hwy 20/ Greenwood Ave Smart Corridor	$3,552,000
105	27th Street Safe and Smart Corridor	$2,662,000
108	Wall Street and Bond Street Fiber Communications	$1,584,000
109	Century Drive Safety and Efficiency Improvements	$3,801,000
111	Hwy 97 Active Traffic Management (ATM) and Integrated Corridor Management	$3,405,000
112	Revere Ave Fiber Communications	-
113	Neff Road Fiber Communications	$416,000
114	Empire Ave Fiber Communications	$1,515,000
115	Purcell Blvd Fiber Communications	$398,000
203	Deploy Video Traffic Counting Stations at Bottleneck Locations	$534,000
501	OID CAD 911 BUS Upgrade	statewide initiative
503	Rapid Response Situational Awareness Capabilities Responder Video System	$119,000
701	Regional Data Warehouse	$742,000
802	Congestion Warning System	$297,000
803	In-Vehicle Communications for SPaT/MAP and ODOT CV Portal Integration	$356,000
22739	US 97: I-84 to California Border	$5,809,000
22742	US 20: from US101 to the Idaho border	$8,971,000
22767	Driver Feedback Signs (Deschutes County)	$1,033,000
C1	US 97 Install ramp meters	$17,437,000
C10	US 97 Traveler information signing	$19,000
C-36	3rd Street/Franklin Avenue signal modification	$604,000
C-37	3rd Street/Powers Road signal modification	$604,000
C-38	3rd Street/Badger Road signal modification	$604,000
C6	US 97 Weather warning system	$264,000
C7	US 97 Variable speed signs	$320,000
C9	US 97 Enhanced signal operations at ramp terminals	$320,000

1. All costs are in 2023 dollars. Costs from prior plan years were adjusted to 2023 dollars.

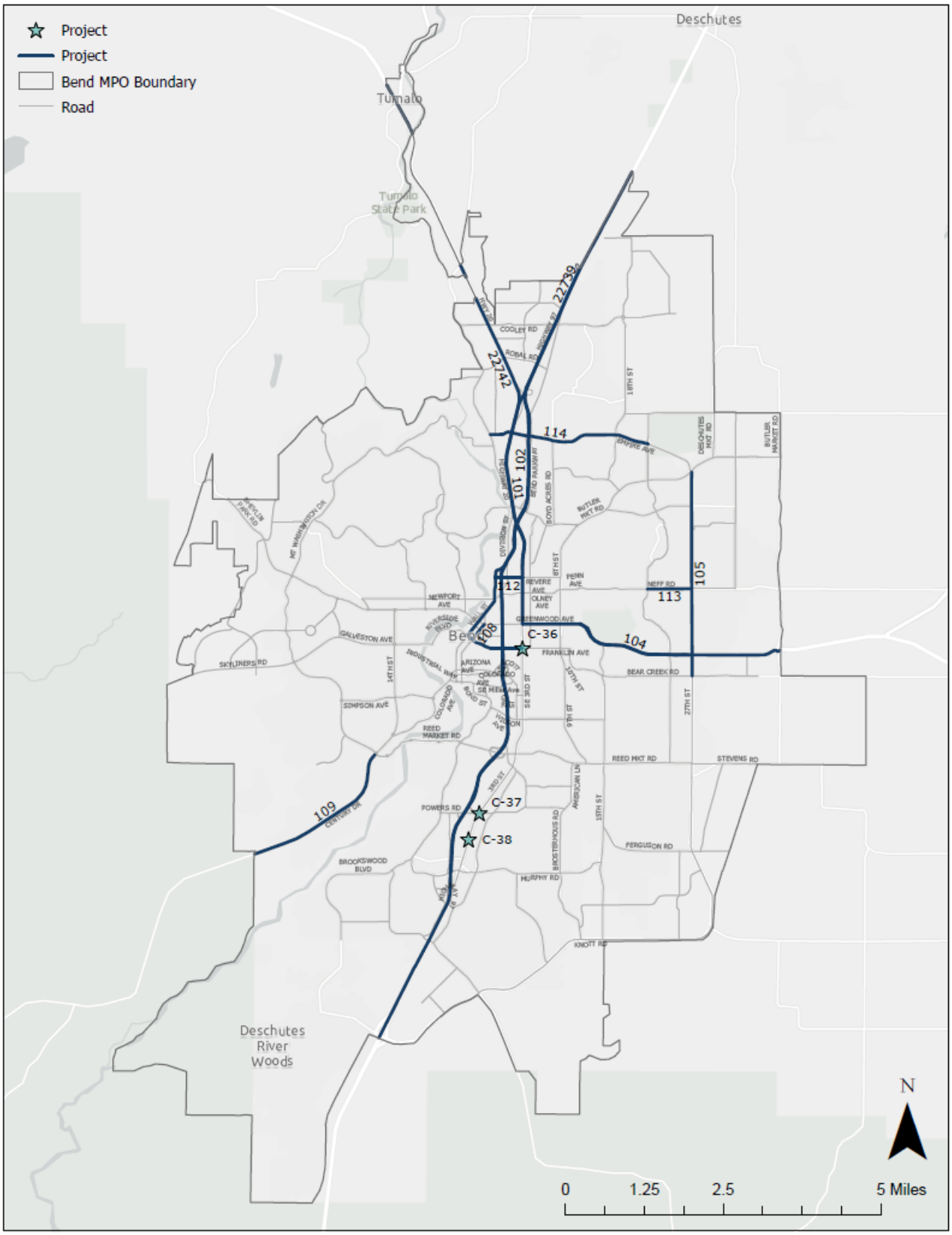

FIGURE 12. 2045 REFINED PROJECT LIST TECHNOLOGY PROJECTS

ATTACHMENT F: PROPOSED STUDIES

TABLE 17. PROPOSED STUDIES

PROJECT ID	STUDY DESCRIPTION	COST ESTIMATE[1]
2.16	Review Priorities for eliminating at-grade railroad crossings	-
3.10	Conduct a comprehensive assessment of CET's marketing and branding and develop action plan.	-
4.5	Evaluate a mechanism to formalize developer contributions to funding for transit infrastructure	-
97.D	North Interchange Refinement Study – US 97 Type, Size, and Location Study of the structure of the interchange. Location of access roads serving properties and circulation study on the west side of US 97.	$400,000
C-17	Powers Road/US 97 preliminary engineering and ROW acquisition for interchange	$7,556,000
C-4	Study for southern river crossing	$581,000
M4	Colorado Avenue improvement to NB ramps intersection (Study)	$250,000
NEW-1	"Z" Study – Refinement Plan for Revere Avenue/Wall Street Corridor from Division Street to Olney Avenue	$500,000
NEW-2	Key Route Cross Section Elements Review and Cost Estimate Update Study	$200,000
NEW-3	TSP Programs Funding Plan (identify funding for programmatic solutions)	$200,000

1. All costs are in 2023 dollars. Costs from prior plan years were adjusted to 2023 dollars.

ATTACHMENT G: PROPOSED PLANS AND PROGRAMS

TABLE 18. PROPOSED PLANS AND PROGRAMS

PROJECT ID	PROGRAM AND PLAN DESCRIPTION	COST ESTIMATE[1]
A1-A55	Bend TSAP Safety Outreach and Educational Action Items[2]	-
1.1	Ensure that local funding for Bend Dial-A-Ride service is maintained beyond the City of Bend's current funding commitment.	-
1.2	Acquire low-floor buses as part of new/replacement vehicle purchases and prioritize on routes with high levels of wheelchair boardings and/or ridership.	$92,997,000
1.3	Assess balance between fixed-route and Dial-A-Ride services on a periodic basis, based on available financial resources and as fixed-route service is enhanced in the future	-
2.1	Develop bike parking facilities, preferably covered, at secondary hub locations and other outlying stop locations	-
2.15	Secure funding for an implement pedestrian access corridors from Bear Creek Road to Greenwood Ave to support implementation of Route 7	-
2.2	Ensure that local funding for fixed-route transit is maintained beyond the City of Bend's funding commitment.	-
2.3	Renegotiate terms of the bulk ticket discount program with COCC, with the aim of developing a group pass program.	-
2.4	Adopt Transit Stop Enhancement Plan standards	$2,992,000
2.5	Develop specifications for new/replacement CET vehicles that modernize the fleet in order to be more appealing and attractive to a broad range of users and align vehicle capacity to passenger demand/needs on each route.	-
2.6	Develop a program of transit-supportive capital improvements	-
2.7	Develop a sidewalk repair and infill program	-
3.1	Pilot Test CET Service to DRW	-
3.11	Review / update CET marketing materials on a regular basis	-
3.4	Promote vanpools to dispersed employment sites	-
3.7	Build upon the "open" transit data published in Google Transit	-
3.8	Develop capabilities for targeted communication with customers (CET)	-
4.1	Adopt a Primary Transit Corridors Policy (City led process)	-
4.2	Develop a transit overlay zoning ordinance and adopt it around primary transit corridors and/or major transit nodes (e.g., Hawthorne Station)	$50,000
4.3	Require review of transit service needs as part of the development review process (City led)	$50,000
4.4	Coordinate public facility master plans (e.g., sewer, water, etc.) with priorities/opportunities for intensifying land use along primary transit corridors	-
201	Multi-Agency regional Operations Center	$1,162,000
203	City of Bend Traffic Data Collection	$523,000
204	Special Event Management System (Deschutes County Fairgrounds and Expo Center and Hayden Homes Amphitheater)	$232,000
305	Flex Park-and-Ride lots for special events	$116,000
308	Transit Signal Priority	$349,000
404	Traveler Information System Enhancements for Construction and Detour info	$349,000
502	Provide Traffic Management System Information at EOCs	$291,000

PROJECT ID	PROGRAM AND PLAN DESCRIPTION	COST ESTIMATE[1]
506	Scenario Planning for Tri-County evacuations, emergencies, and incidents	$232,000
601	Smart Work Zone Management and Safety Monitoring Systems	$232,000
602	Regional Work Zone and Winter Maintenance information sharing system	$349,000
603	Implement an ODOT Maintenance Decision Support System	$872,000
804	Automated Speed Enforcement Pilot	$291,000
C11	US 97 Roadside traveler information dissemination	-
C-19	Traffic Signal Coordination Improvements along Signalized Corridors	-
C8	US 97 Incident management	-
P-1	Address ongoing maintenance needs for new capital projects identified within the City of Bend TSP	N/A / $17,437,000 [3]
P-2	TDM Program for major employers and institutions	$232,000/$3,487,000 [3]
P-4	Bicycle Program – On-going implementation of the Bicycle Low Stress Network Plan	$232,000/$1,162,000 [3]
P-5	Pedestrian Program – On-going implementation of the Pedestrian Low Stress Network Plan	$232,000/$23,249,000 [3]
P-7	Parking pricing and management in downtown Bend	$1,162,000/ TBD [3]
P-9	Transportation Equity Program to address equity in funding and implementation of transportation projects	N/A /$3,487,000 [3]

1. All costs are in 2023 dollars. Costs from prior plan years were adjusted to 2023 dollars. For programs with two values, the first cost is the initial cost and the second cost is the subsequent annual cost.
2. See Bend Area Transportation Safety Action Plan Table 9
3. Cost represents escalaed initial setup costs / estimated annual program costs between 2024-2045.

ATTACHMENT H: COMMITTED PROJECT LIST

TABLE 19. COMMITTED PROJECT LIST

PROJECT ID	PROJECT NAME	PROJECT DESCRIPTION	FUNDING SOURCE
1TNPS	Neff/ Purcell Boulevard	Intersection Capacity and Safety Improvements	Bend CIP
20378	Archie Briggs Road Bridges	Replace bridge with one that meets current standards	Federal
20714	US 97: Multi-Use Trail	Bend to Lava Butte Multi-Use Path	Federal
21756	US 20: Central Oregon Hwy Culverts Corridor	Design right-of-way and utility relocation for a future culvert replacement and repair	Federal
22739	US 97: I-84 to California Border	Install National Electric Vehicle Infrastructure	Federal
22742	US 20: From US101 to the Idaho Border	Install National Electric Vehicle Infrastructure	Federal
22767	Driver Feedback Signs	Install two speed feedback signs on each of the following roads: Alfalfa Market Rd, Burgess Rd, Cline Falls Hwy, Day Rd, Old Bend-Redmond Hwy, Powell Butte Hwy, South Canal Blvd and South Century Dr.	Federal
22774	NE Norton Ave	Installation of bike boulevard along NE Norton Avenue from 4th Street to 12th Street	Federal
22791	US 20: (3rd Street) at Empire	Replace the Traffic signals at the intersection of US 20 at Empire Avenue (planning and design only)	Federal
B-20	US 20 and Cook Avenue	Intersection safety and capacity Improvements	Federal and County
B-21	US 20 and Old Bend-Redmond Highway	Intersection safety and capacity improvements	Federal and County
C-2	Purcell Blvd Extension	Purcell Boulevard extension from Full Moon Drive to Jackson Avenue	City CIP
C-5	Aune Road Extension	Aune Road extension from Bond Street to 3rd Street	GO Bond
C-18	US 97 NB On Ramp and SB Off Ramp	Northbound and southbound ramp improvements at Murphy Road	GO Bond
C-22	3rd and Wilson Avenue	Intersection improvements	GO Bond
C-26	US 20 Intersection Safety	Intersection improvements at US 20 and Robal Road and the roadways in the vicinity	Federal, ODOT, City
C-40	US 97 North Pkwy Extension (Phase 2)	Improvements in the US 97 Bend North Corridor Project	Federal, ODOT, City
CET 8	Bend Service Enhancement Plan	Enhancement to Route 8	Federal and ODOT
M-4	Greenwood Avenue and 2nd Street	Intersection improvements	ARTS
23494	Hawthorne Ave Pedestrian and Bike Overcrossing	Shared Use Path between NE 1st and NE 5th Street	ODOT and City

PROJECT ID	PROJECT NAME	PROJECT DESCRIPTION	FUNDING SOURCE
R2-E	Bear Creek Rd: Cessna Ave to east UGB	Shared Use Path adjacent to roadway	GO Bond
R7-A	Railroad and Wilson Ave	3rd Street crosswalk between railroad and Wilson Ave	GO Bond
R7-B	Railroad and Franklin Ave	3rd Street crosswalk between railroad and Franklin Ave	GO Bond
R7-C	Underpass	3rd Street underpass of railroad	GO Bond
R12-A	Wilson Ave Improvements	Pedestrian and bicycle improvements from 2nd Street to SE 9th Street	GO Bond
RMRP 1A	Reed Market Road and Brookswood Boulevard and Bond Street	Turn lane improvements	City CIP
RMRP 2	Reed Market Road and Chamberlain Street	Pedestrian improvements	GO Bond
RMRP 6A	3rd Street and Brosterhous Road	Striping and lighting improvements	City CIP

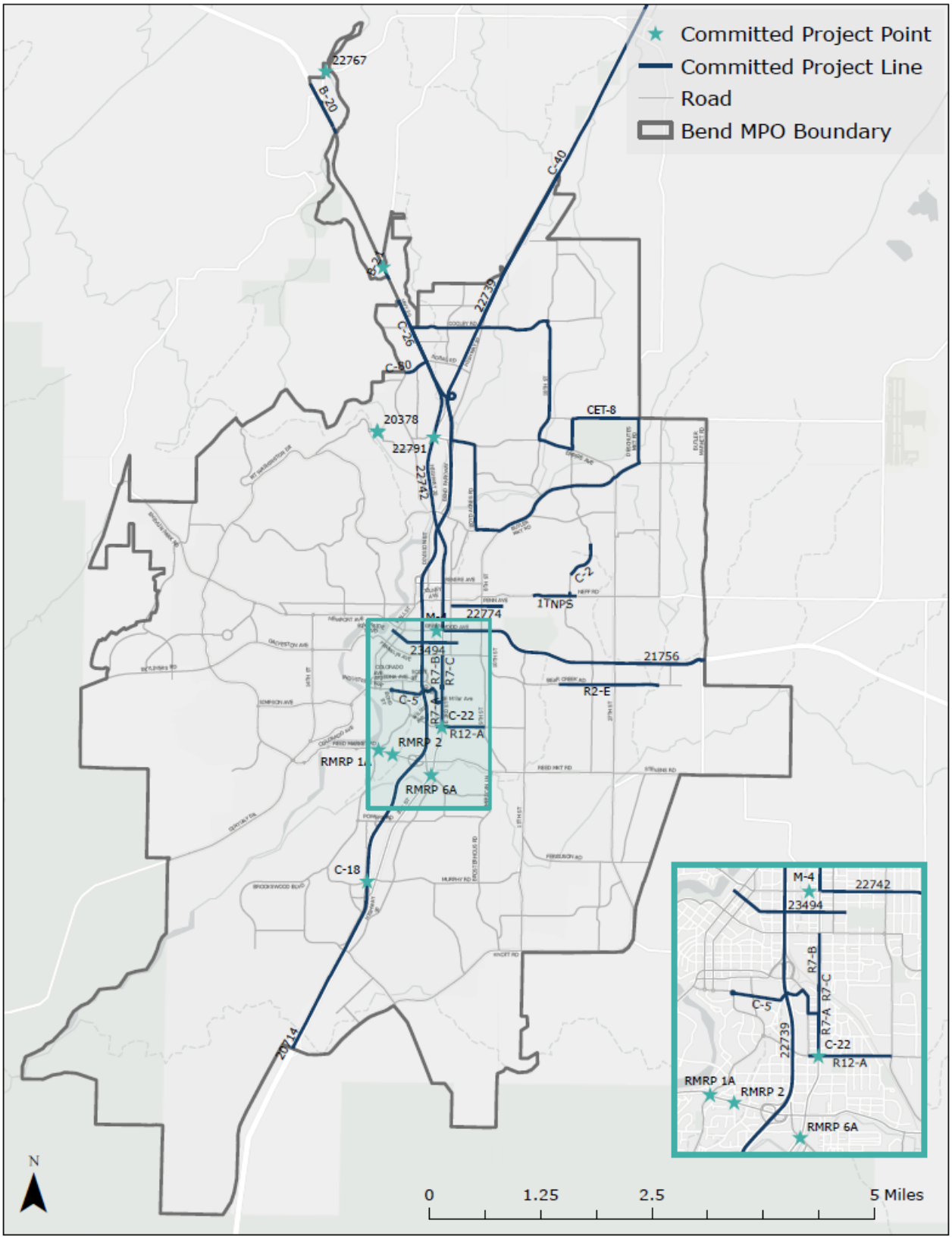

FIGURE 13. COMMITTED PROJECT LIST

APPENDIX F: MTP FINANCIALLY CONSTRAINED LIST AND PRIORITIZATION MEMORANDUM

MTP FINANCIALLY CONSTRAINED PROJECT LIST AND PRIORITIZATION MEMORANDUM

DATE: June 13, 2024

TO: Aaron Berger, PE | DKS Associates
Kayla Fleskes, PE | DKS Associates

FROM: Tyler Deke | Bend MPO
Andrea Napoli | Bend MPO

SUBJECT: Bend MTP Update Project #24068-000

This memorandum summarizes the process used to compile and prioritize the Financially Constrained Project List. The memorandum first focuses on the process used to select the Financially Constrained portions of the MTP Project and summarizes the performance of these projects. The memorandum then outlines the project prioritization process and outcome, separating the Financially Constrained Project List into Near, Medium, and Long-Term implementation projections.

FINANCIALLY CONSTRAINED PROJECT LIST

This section includes:

- Funding Summary – Revenue forecast process and outcomes
- MTP Financially Constrained Project List and Selection Process – The list of projects included on the MTP Financially Constrained Project List and the selection process used to develop the list

FUNDING PROJECTION SUMMARY

The funding projections for the MPO were estimated by jurisdiction: City, County, and State/Federal. The categories of capital revenue and forecast methodology for each jurisdiction are summarized as follows:

- **City**
  - Transportation System Development Charges (TSDC) – TSDC average annual revenue and population growth rate
  - Franchise Fees – City budget and population growth
  - General Obligation (GO) Bond – City finance staff input
  - Traffic Impact Fee (TIF)/Urban Renewal – Urban Renewal plan and City staff input
  - Private Contributions, Other – City staff input

- Surface Transportation Block Grant (STBG) allocations (State funding allocated to the City) – ODOT Long-Range Revenue Tables; estimated City share

- **County – Funding methodology based on proportion County TSP projects within the MPO boundary**
  - County SDCs
  - Secure Rural Schools (SRS), Payment in Lieu of Taxes (PILT), Federal Lands Access Program (FLAP) to County (State and Federal funding sources)
  - SHF County allocation (State funding source)
  - STBG allocation to County (State funding source)
- **State**
  - State funding programs (State Highway Fund, etc.) – Historical averages
  - Federal funding programs (National Highway Performance Program, Highway Safety Improvement Program, etc.) – Historical averages
  - Major project grants, earmarks, etc. – Known projects + estimated future based on historical awards and trends

Note that the City of Bend recently passed a Transportation Utility Fee update, effective July 1, 2024, that will provide most of the City's Operations and Maintenance funds for the next 20 years. As this funding source is not focused on capital improvements it is not included in this analysis of financially constrained improvements, although portions of this funding could conceivably be used to support walking and biking system infill projects. In addition, the added operations and maintenance costs of projects that expand or significantly modify the existing system should be considered during subsequent local plan updates.

In addition, the capital funding sources were separated into the following three usage categories:

- Flexible – No specific eligibility limitations, use determined by agency
- Limited – Eligibility limited by law
- Committed – Project list is set and cannot vary

Table 1 summarizes the capital funding sources by usage, eligibility, and estimated revenue.

TABLE 1: FUNDING SOURCE USAGE, ELIGIBILITY, AND AMOUNT

JURISIDICTION	FUNDING SOURCE	USAGE	ELIGIBILITY	20-YEAR REVENUE
CITY	TSDC	Limited	SDC project list	$200.5 M
	Franchise Fees	Flexible	City allocates	$56.1 M
	GO Bonds	Committed	Must be used on bond project list	$190 M
	TIF/Urban Renewal	Limited	TIF project list	$56.5 M

JURISIDICTION	FUNDING SOURCE	USAGE	ELIGIBILITY	20-YEAR REVENUE
	Private Contributions	Limited	Associated with specific development impacts	$4.2 M
	SHF City allocation	Flexible	City allocates	
	MPO STBG/SHF allocation to City	Flexible	MPO allocates	$6.0 M
COUNTY	County SDCs	Limited	SDC project list	$20.1 M
	SHF County allocations	Flexible	County allocates	
	MPO STBG/SHF allocations to County	Flexible	MPO allocates	
	SRS, PILT, FLAP	Flexible	County allocates	
STATE (ODOT) & FEDERAL	State Funding programs	Flexible	OTC allocates	$6.1 M
	Federal funding programs	Limited	Eligibility varies by program	$50.9 M
	Major project grants, earmarks, etc.	Limited	Project-specific once secured, eligibility varies	$62.2 M
			TOTAL REVENUE FORECAST (2025-2045)	**$654.5 M**

MTP FINANCIALLY CONSTRAINED PROJECT LIST AND SELECTION PROCESS

The full MTP Financially Constrained Project List is mapped and summarized in attachments to this memorandum as follows:

- **Attachment A – Financially Constrained Active Transportation**
  - ***Financially Constrained Active Transportation Connectivity Projects***
  - ***Financially Constrained Active Transportation Corridor Enhancement Projects***
- **Attachment B – Financially Constrained Transit Projects**
  - ***Financially Constrained Transit Connectivity Projects***
  - ***Financially Constrained Transit Corridor Enhancement Projects***
- **Attachment C – Financially Constrained Motor Vehicle Projects**
  - ***Financially Constrained Motor Vehicle Connectivity Projects***
  - ***Financially Constrained Motor Vehicle Enhancement Projects***
- **Attachment D – Financially Constrained Intersection Projects**
- **Attachment E – Financially Constrained Technology Projects**

- **Attachment F – Financially Constrained Studies**
- **Attachment G – Financially Constrained Plans and Programs**

The selection of projects to the MTP Finanically Constrained list followed a simple process for each jurisdiction.

CITY OF BEND

All projects from the Bend GO Bond list were included in the Financially Constrained Project List, as the GO Bond is a committed funding source.

To allocate the estimated level of TSDC funding to projects planned for the City of Bend through the year 2045, all projects from the City of Bend TSDC list classified as Near-Term and Mid-Term were first added to the Financially Constrained List. Note that these projects are not all 100% funded by TSDCs, therefore these projects are anticipated to also be covered by flexible City funds (Franchise Fees, etc.), limited funds such as Urban Renewal (for projects within designated urban renewal areas), and ODOT funds (for projects on ODOT facilities). In addition, all TSDC Expansion Area Projects were added to the MTP Financially Constrained List. These projects are funded through a combination of TSDC and developer exactions and would be constructed by 2045 if the housing and employment development projections included in this MTP update are realized (i.e., infrastructure required for development). To allocate the remainder of the anticipated TSDC funding, four Long-Term TSDC projects with the highest TSDC percentages (96-100%) were added to the list:

- **C-51** – Britta Street Extension (south section)
- **2** – Pettigrew Road rural upgrade from Bear Creek Rd to Reed Market Rd
- **C-63** – China Hat Road/Knott Road Intersection Improvement
- **14-35** – Bike and pedestrian sidewalk and/or bike lane infill projects (Long-Term)

All other Expansion Area projects (non-TSDC) were added to the MTP Financially Constrained Project list. These projects would be needed to support the forecasted 2045 growth and would be funded/constructed by developers.

All CET capital projects were added to the MTP Financially Constrained Project List, based on the community and local plan priorities.

The remaining estimated revenue was then assigned to the following project:

- **C-7** – Colorado Avenue/US 97 northbound ramp intersection safety and capacity improvements

This particular project addresses a current safety need and aligns with community priorities.

DESCHUTES COUNTY

All projects from the Deschutes County TSP project list within the MPO boundary were added to the MTP Financially Constrained Project List, as the total cost of these projects aligned with the projected County revenue apportioned to the Bend MPO region.

ODOT

The GO Bond and TSDC project list include multiple projects on ODOT facilities, including the bulk of the projects recommended in the US 97 Parkway Plan. In addition, all projects from the ODOT STIP were included as "Committed" projects. Programs from the Deschutes County ITS plan with a defined capital cost were also added to the MTP Financially Constrained Project List.

MPO

All studies either recommended in the Bend TSP, the US 97 Parkway Plan, or through the planning process for this MTP update were added to the MTP Financially Constrained Project List.

FINANCIALLY CONSTRAINED SCENARIO RESULTS

The Financially Constrained Project List was evaluated using the Bend-Redmond Model (BRM) to determine key system performance measures for year 2045 conditions. The results of this scenario are summarized in the following sections.

ACTIVE TRANSPORTATION EVALUATION AND FINDINGS

The percentages of all person trips using walking and bicycle modes within the Bend MPA were calculated from the BRM. These percentages were based on trips that both begin and end within the Bend MPA. Table 2 documents these mode splits between the 2019 Base Year, the 2045 Committed, and the 2045 Financially Constrained Scenarios.

TABLE 2: PERCENT WALKING AND BIKING TRIPS WITHIN THE BEND MPA

MODE	2019 BASE	2045 COMMITTED	2045 FINANCIALLY CONSTRAINED PROJECT LIST
PEDESTRIAN	10.2%	11.8%	12.7%
BICYCLE	3.4%	3.4%	4.3%

The 2045 Financially Constrained Project List shows shifts towards walking and biking. While these increases in active transportation mode usage over the entire system are not large, larger changes occur in areas with connections to particular land use/density urban forms combined with robust active transportation facilities.

As discussed in the MTP Needs Memorandum, daily motor vehicle traffic volumes are expected to increase along most of the Key Routes for Walking and Bicycling throughout the MPA under the 2045 Committed condition. The 2045 Financially Constrained Project List includes multiple projects that change the estimated 2045 daily motor vehicle traffic along these Key Routes when compared against the 2045 Committed condition. Figure 1 highlights this comparison, showing the change in daily motor vehicle traffic volume between the 2045 Committed scenario and the 2045 Financially Constrained Project List scenario along the designated Key Routes.

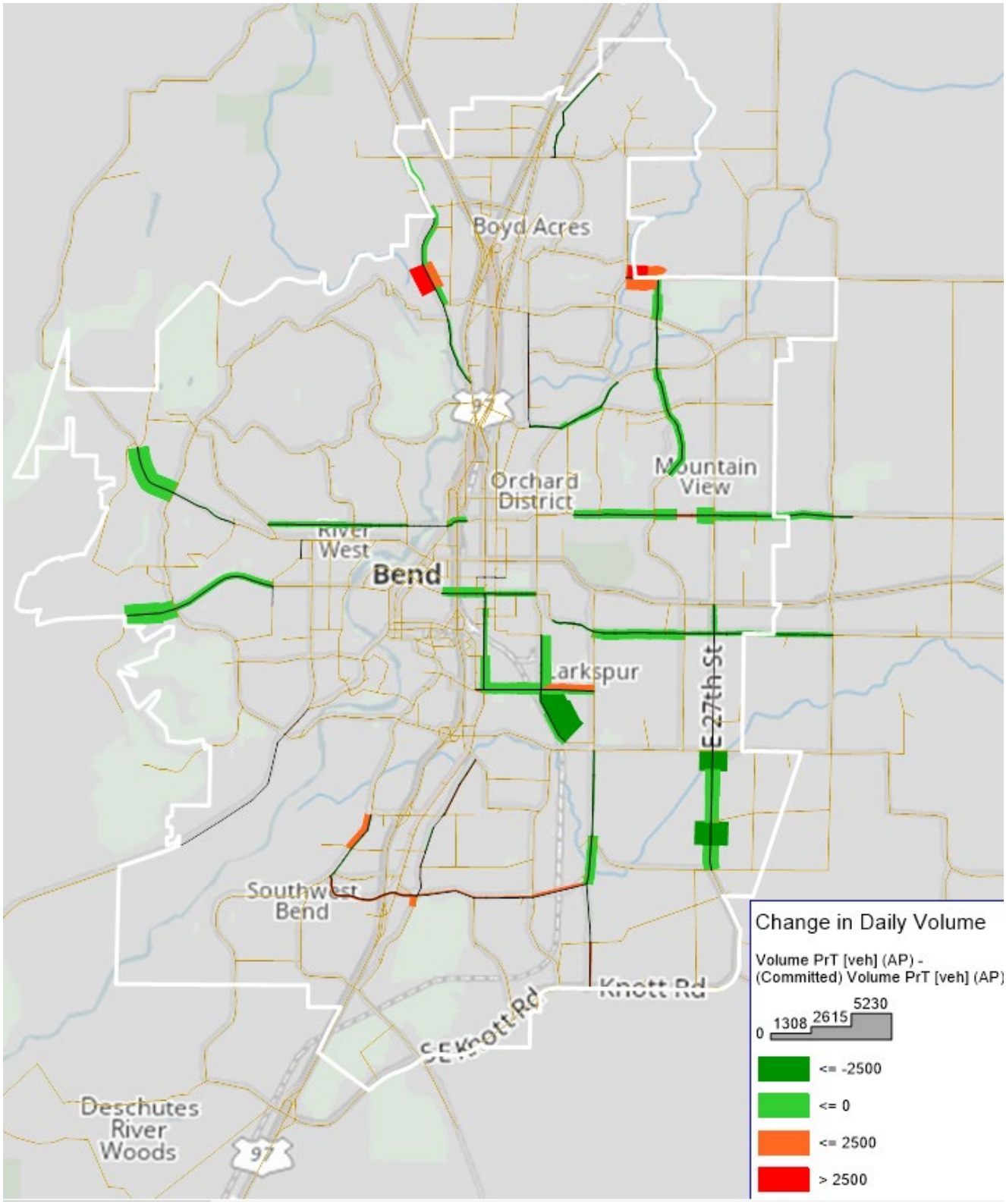

FIGURE 1: CHANGE IN DAILY VOLUME ALONG DESIGNATED KEY ROUTES BETWEEN COMMITTED AND FINANCIALLY CONSTRAINED PROJECT LIST SCENARIO

The most critical changes in daily motor vehicle traffic along Key Routes between the 2045 Committed and Financially Constrained Project List Scenarios are summarized as follows:

- **Improved (Reduced Traffic Volume, shown green/orange in Figure 1)**
  - Skyliners Road
  - Shevlin Park Road
  - Bear Creek Road
  - Hawthorne Ave
  - SE 9th Street.
- **Degraded (Increased Traffic Volume, shown red in Figure 1)**
  - Yeoman Road – increase due to Yeoman Road extension to NE 18th Street, which adds a new motor vehicle connection to the existing pedestrian and bicyclist only path along the key route.

TRANSIT EVALUATION AND FINDINGS

The percentages of all person-trips using transit within the Bend MPA were calculated from the BRM. These percentages were based on trips that both begin and end within the Bend MPA. Table 3 below documents these mode splits between the 2019 Base Year, the 2045 Committed, and the 2045 Financially Constrained Project List scenarios.

TABLE 3: PERCENT TRANSIT TRIPS WITHIN THE BEND MPA

MODE	2019 BASE	2045 COMMITTED	2045 FINANCIALLY CONSTRAINED PROJECT LIST
TRANSIT DEMAND	0.18%	0.20%	1.2%

As shown in Table 3, the overall percentage of transit trips compared against all person trips throughout the MPA remains low, even with enhanced transit assumptions in the 2045 Financially Constrained Project List scenario. This highlights additional opportunities to achieve greater benefit to the system by attracting more riders.

Table 4 lists the percentage of households and jobs within 0.25 miles of transit service.

TABLE 4: PERCENT OF MPA HOUSEHOLDS AND JOBS WITHIN 0.25 MILES OF TRANSIT SERVICE

MODE	2019 BASE	2045 COMMITTED	2045 FINANCIALLY CONSTRAINED PROJECT LIST	% CHANGE BETWEEN BASE & FINANCIALLY CONSTRAINED PROJECT LIST	% CHANGE BETWEEN COMMITTED & FINANCIALLY CONSTRAINED PROJECT LIST
HOUSEHOLDS	55%	44%	53%	-4%	20%
JOBS	69%	55%	74%	7%	35%

With significantly more transit coverage due to mobility hubs and new transit routes, the 2045 Financially Constrained Project List Scenario results in more households and jobs within walking distance (0.25 miles) of transit. Note this analysis does not consider the quality of pedestrian facilities to access transit, which may also pose a barrier to transit access.

MOTOR VEHICLE EVALUATION AND FINDINGS

The levels of corridor congestion throughout the Bend MPA were estimated using BRM model outputs, which were summarized as Demand to Capacity (D/C) ratios indicating capacity constraints throughout the system. Figure 2 compares the average weekday PM Peak Hour D/C ratio results by corridor for the 2045 Financially Constrained Project List and the 2045 Committed scenario.

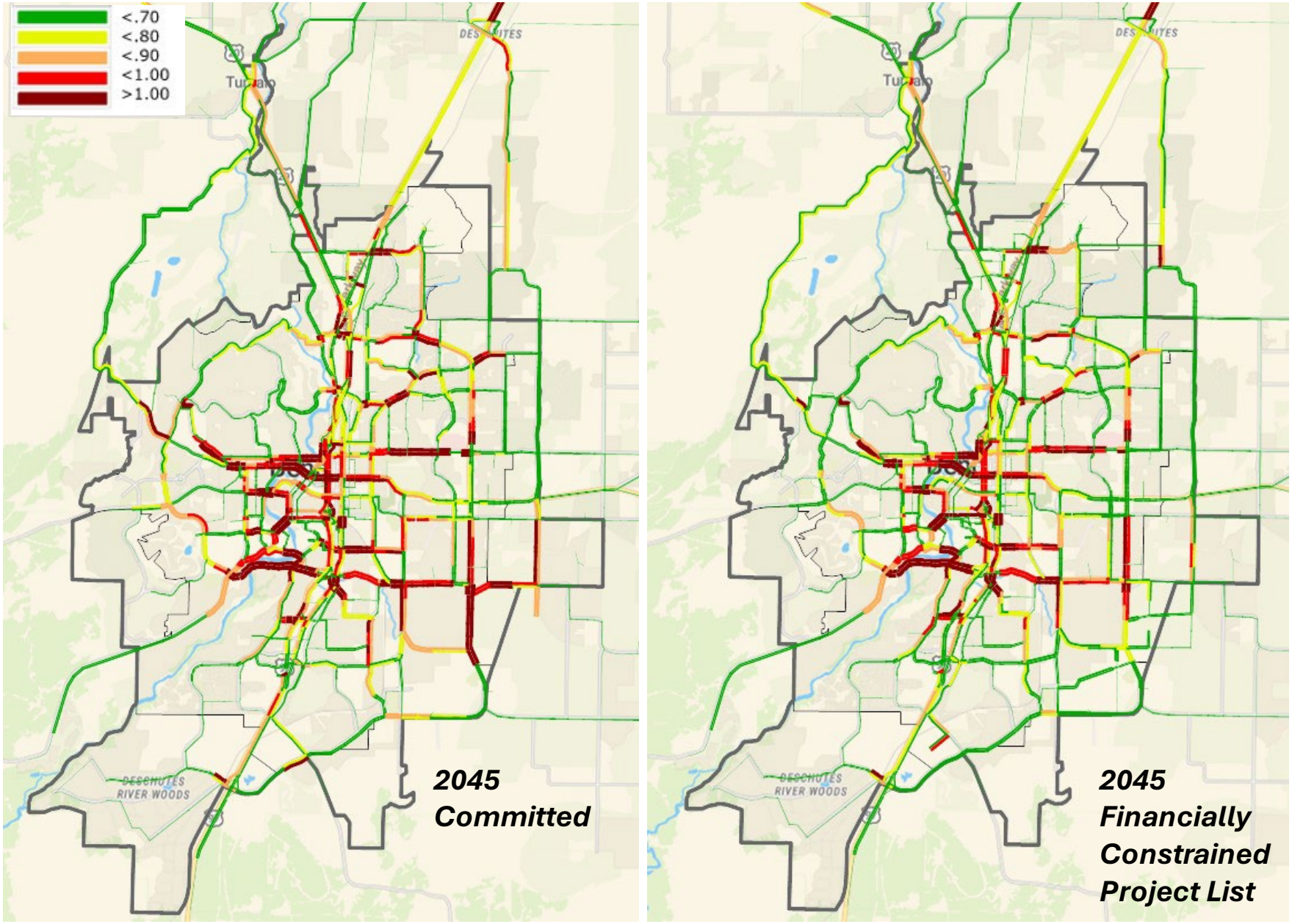

FIGURE 2: 2045 COMMITTED AND FINANCIALLY CONSTRAINED PROJECT LIST PM PEAK HOUR DEMAND/CAPACITY RATIOS

As shown in Figure 2 (with the darkest red symbolizing demand exceeding capacity), the 2045 Financially Constrained Project List Scenario improves some of the congestion issues flagged in the MTP Needs Memorandum[1], including:

- US 97 Parkway - traffic operations improve, due mainly to restricted access (Projects C2A-C2H) and parallel routes that provide new direct connections to US 97, like the 18th Street extension (Project 97.b)
- North-south corridors – 27th Street improves south of Reed Market Road due to additional connectivity projects to the east and enhanced transit access.
- Empire Boulevard/Butler Market Road – Improves due to Yeoman Road extension (Projects C-1 and C-76)

While the 2045 Financially Constrained Project List addressed congestion better than the 2045 Committed Project List (through a handful of new connectivity projects and increased mode shift to active transportation and transit), congestion issues that remain include:

- All East-West river crossings
- East-West corridors, including:
  - NW Galveston Ave
  - NW Portland Ave
  - NE Neff Road
  - NE Newport Ave
  - SE Reed Market Road
  - SE Wilson Avenue
  - Smaller portions of Butler Market Road
  - Powers Road
- North-South corridors including:
  - SE 15th Street
  - 27th Street
  - Ward Roady

The MPA area roadway system PM Peak Hour vehicle delay with the 2045 Financially Constrained Project List is summarized in Table 5, and compared against 2019 and 2045 Committed conditions. The system delay is separated by facility jurisdiction (City of Bend, ODOT, Deschutes County).

[1] (DKS Associates 2023)

TABLE 5: PM PEAK HOUR VEHICLE HOURS OF DELAY

ROADWAY JURISDICTION	2019 BASE	2045 COMMITTED	2045 FINANCIALLY CONSTRAINED PROJECT LIST	% CHANGE BETWEEN BASE & FINANCIALLY CONSTRAINED PROJECT LIST	% CHANGE BETWEEN COMMITTED & FINANCIALLY CONSTRAINED PROJECT LIST
CITY OF BEND FACILITIES	581	2,132	1,613	178%	-24%
ODOT FACILITIES	157	496	411	163%	-17%
DESCHUTES COUNTY FACILITIES	11	68	46	325%	-31%
TOTAL	**749**	**2,696**	**2,053**	**177%**	**-23%**

As listed in Table 5, the 2045 Financially Constrained Project List Scenario is expected to decrease overall delay on roadways within the MPA compared to the 2045 Committed Scenario. The connectivity and corridor enhancement projects that add alternate routes to the system and motor vehicle capacity drive this delay reduction. As noted in the *Active Transportation* and *Transit* sections above, changes in mode split are relatively minimal but do combine to help contribute to the reductions in delay across the MPA.

Vehicle Miles Traveled (VMT) is a measure of total motor vehicle travel within the system. Normalized to the population within the MPA, this measure indicates trends in both the number of vehicle trips and average trip length, measures which reflect both land use planning implications on travel and approximated future year motor vehicle emissions. Table 6 summarizes the daily VMT results for trips originating from households within the Bend MPA under 2019, 2045 Committed, and 2045 Financially Constrained Project List conditions.

TABLE 6: DAILY VMT PER CAPITA RESULTS

MEASURE	2019 BASE	2045 COMMITTED	2045 FINANCIALLY CONSTRAINED PROJECT LIST	% CHANGE BETWEEN BASE & FINANCIALLY CONSTRAINED PROJECT LIST	% CHANGE BETWEEN COMMITTED & FINANCIALLY CONSTRAINED PROJECT LIST
DAILY VMT PER CAPITA	6.89	7.26	6.73	-2.4%	-7.4%

The 2045 Financially Constrained Project List significantly improves VMT per capita over the 2045 Committed Scenario (7.4 percent reduction). Additionally, this is a minor decrease relative to 2019 Base Year conditions (2.4 percent reduction). This shift occurs due to careful balancing of land use

(housing and employment) in Bend MPA growth areas, enhancements to the transit system, and improvements to connectivity.

With congestion expected to continue to grow throughout the Bend MPA in the future, traffic may divert onto local streets in attempts to bypass system or corridor bottlenecks. To estimate the system-level risk of trip diversion, the percentage of collector roadways with Average Daily Traffic (ADT) of more than 4,000 was calculated from the BRM. Table 7 summarizes this measure for 2019, 2045 Committed, and 2045 Refined Project List conditions.

TABLE 7: TRIP DIVERSION POTENTIAL

MEASURE	2019 BASE	2045 COMMITTED	2045 FINANCIALLY CONSTRAINED PROJECT LIST	% CHANGE BETWEEN BASE & FINANCIALLY CONSTRAINED PROJECT LIST	% CHANGE BETWEEN COMMITTED & FINANCIALLY CONSTRAINED PROJECT LIST
DIVERSION POTENTIAL [A]	7%	22%	21%	200%	-5%

[A] Measured as a percentage of collector roads with an average daily traffic volume above 4,000 vehicles per day.

As listed in Table 7, the 2045 Financially Constrained Project List reduces the risk of trip diversion over the 2045 Committed condition.

CFA SENSITIVITY SCENARIO

To better understand future work program needs and "future proof" this MTP by considering potential impacts of Climate Friendly Areas within the MPO, the Climate Friendly Area (CFA) Sensitivity Scenario was developed to support the prioritization of projects with the MTP Financially Constrained Project List. This scenario was intended to act as "what-if" reflection of potential changes in development patterns resulting from the new Climate Friendly rule-making implementation process currently in development across the States MPO areas. This scenario took the 2045 MPO area housing and employment projects and based on input from the City of Bend Growth Management Department, reallocated growth from expansion areas on the periphery of the city into locations likely to be designated as CFAs in the future. This re-distribution of future growth is shown in Figure 3 and Figure 4, comparing the MTP 2045 Land Use against the CFA Sensitivity Scenario.

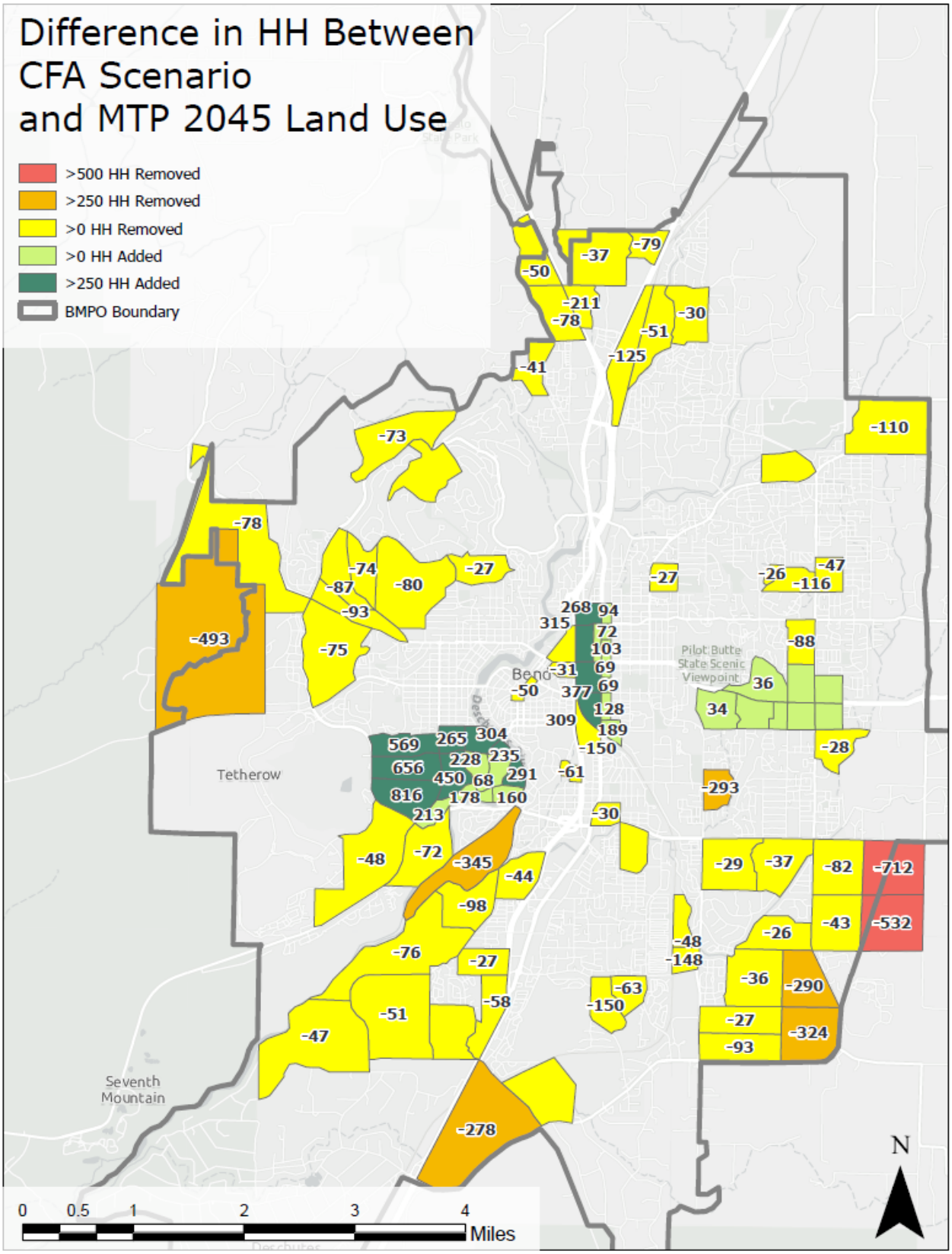

FIGURE 3. CHANGE IN HOUSEHOLDS BY TAZ BETWEEN CFA SCENARIO AND MTP 2045 LAND USE

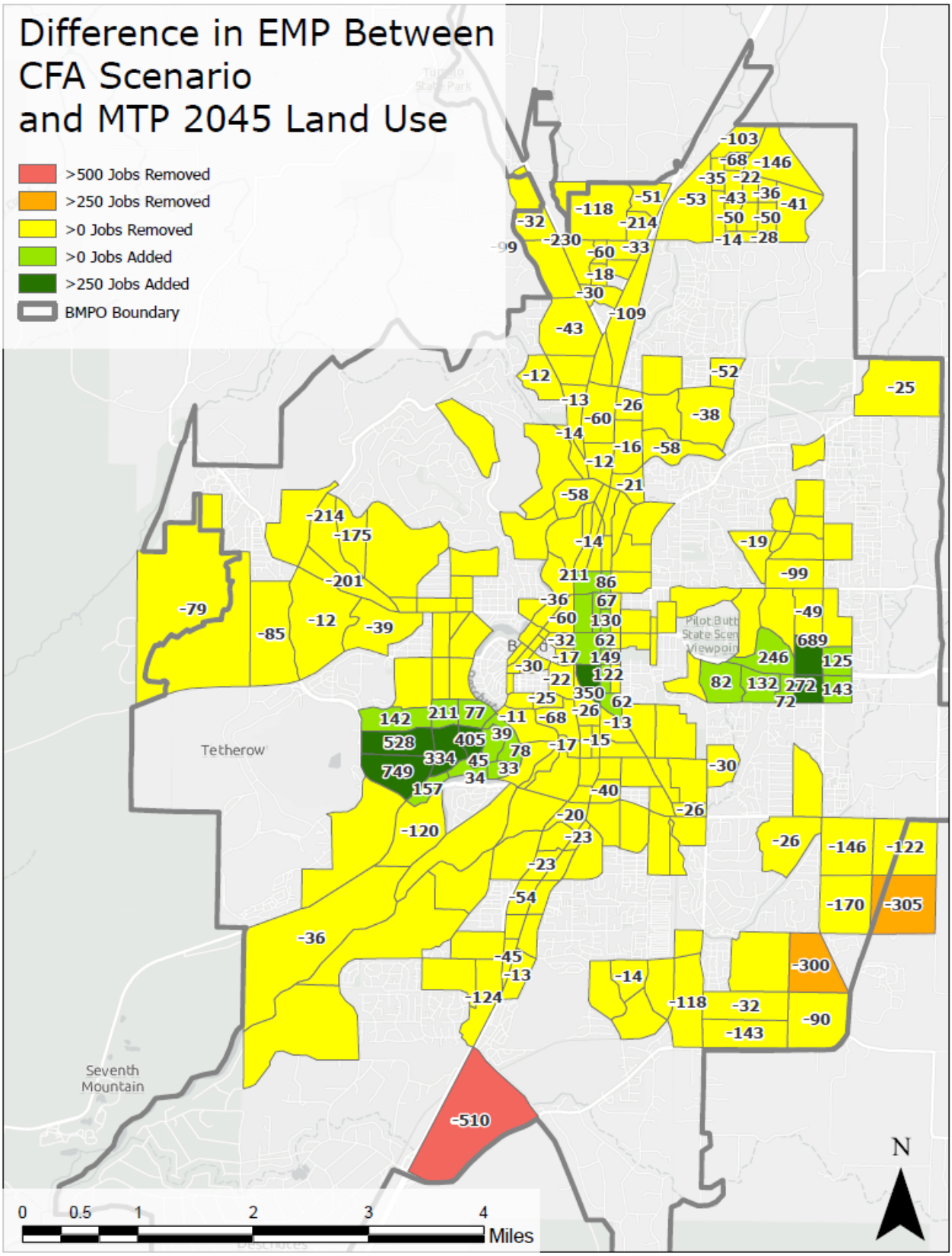

FIGURE 4. CHANGE IN JOBS BY TAZ BETWEEN CFA SCENARIO AND MTP 2045 LAND USE

As shown in Figure 3 and Figure 4, the re-allocated growth shifts primarily to the 3rd Street corridor, along Greenwood (US 20), and the Central Westside Areas. Growth decreases primarily in the Shevlin Park Area, OB Riley/North Triangle, Thumb, SE Area, and Stevens Ranch areas.

CFA Sensitivity land use scenario was then run through the Bend-Redmond Model (BRM) with the MTP Project List network, and the resulting weekday PM peak hour volumes are compared against the MTP Project List model run in Figure 5.

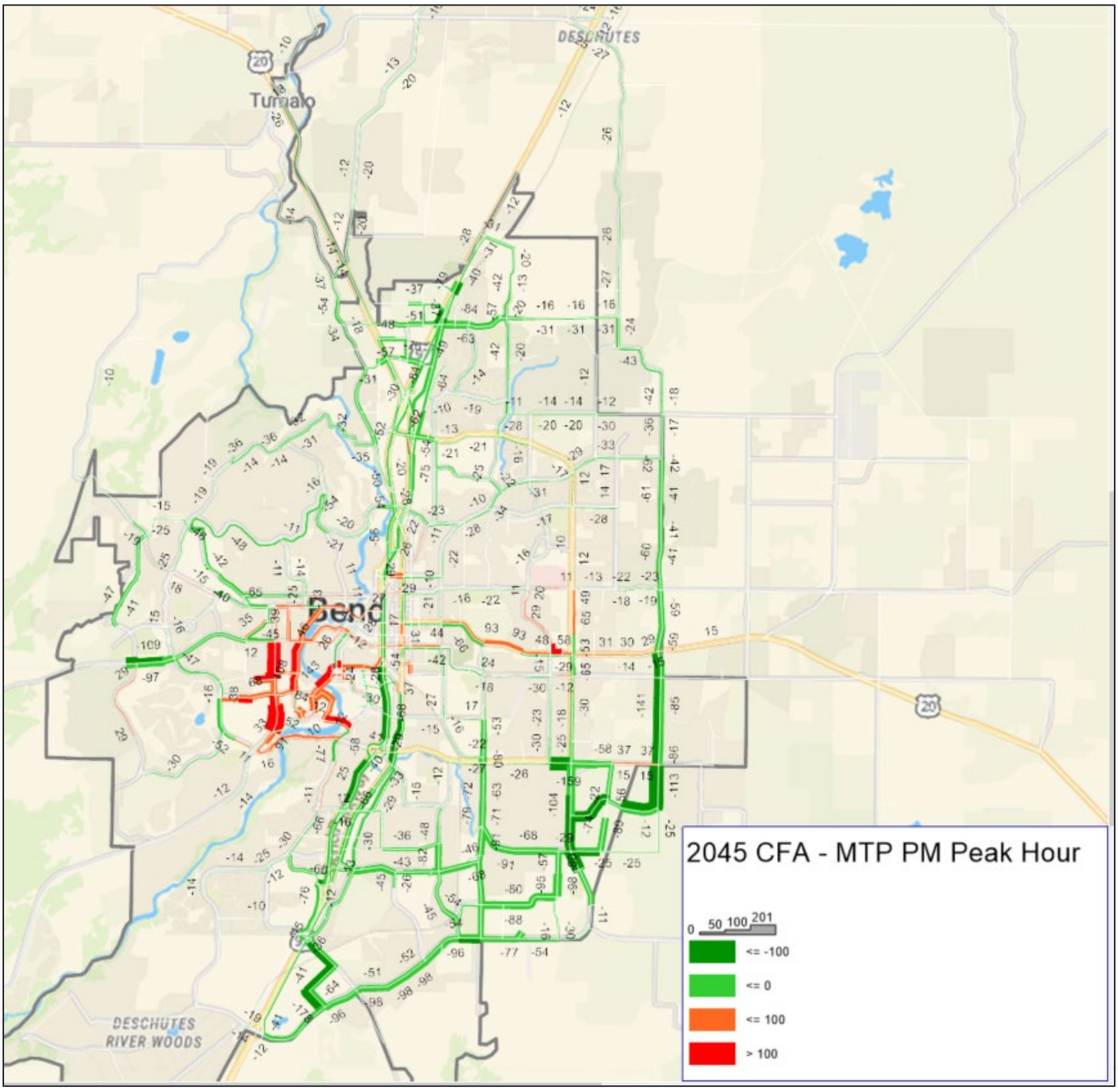

FIGURE 5. YEAR 2045 PM PEAK HOUR VOLUMES CFA SCENARIO - MTP PROJECT LIST

As shown in Figure 5, the CFA Sensitivity Scenario significantly changes traffic volumes on the following corridors:

- Increased Traffic
  - Greenwood (US 20)
  - South/Central River Crossings (Reed Market, Columbia, Colorado, Newport, Portland)
  - Arterials and collectors within the Central Westside
- Decreased Traffic
  - Hamby Road
  - 27th Street (with a few exceptions)
  - 15th Street
  - US 97
  - 3rd Street (with a few exceptions)
  - Cooley Road
  - Robal Road
  - OB Riley Road
  - Murphy Road
  - Knott Road
  - Collectors in the Thumb, SE Area, and Stevens Ranch Area

These results were expected and align with the land use reallocation into the anticipated CFAs. In addition, the CFA Sensitivity decreased VMT per capita over the MTP Project List Scenario by 5%, and increased transit mode share by 18%, walking by 10%, and biking by 4%.

PROJECT PRIORITIZATION

This section includes the project prioritization methodology and the prioritized MTP Financially Constrained Project List.

PRIORITIZATION METHODOLOGY

The project prioritization methodology combined funding timing projections and prior local plan prioritization outcomes to separate the MTP Financially Constrained Project List into Near, Mid, and Long-Term categories.

FUNDING TIMING SUMMARY

The project revenue sources were estimated by year, separated into the Near-Term (0-5 years), Mid-Term (5-10 years), and Long-Term (10-21 years). The total revenue projections for these categories are summarized as follows:

- Near-Term – $274.7 M
- Mid-Term – $133.7 M

- Long-Term – $254.1 M

Note that these totals do not fully capture the developer exactions/development constructed projects in expansion areas throughout the MPO region.

PRIORITIZATION PROCESS

The MTP Financially Constrained Project List prioritization process followed four distinct steps. The first step considered information collected during the first round of public engagement, confirming the existing prioritization of projects in the Bend TSP, as safety and connectivity for all road users continued to be the top two transportation priorities from the public. Projects were placed in prioritization categories using the following tiered process:

1. Initial prioritization (based on local plans)
2. Project type (emphasizing safety and active transportation)
3. Outputs from the travel demand model outputs from a Climate Friendly Areas (CFA) year 2045 land use scenario

PRIORITIZED PROJECT LIST

This section summarizes the prioritization of the MTP Financially Constrained Project List by timing category: Near-Term (0-5 years), Mid-Term (5-10 years), and Long-Term (10-21 years)

NEAR-TERM PROJECT LIST (0-5 YEARS)

The Near-Term Projects include all GO Bond projects either currently under design, indicated as Near-Term by the Bond program timeline, or classified as Short/ Near-Term in the Bend TSP with the following exceptions:

- **C-18** - US 97 northbound on ramp and southbound off ramp at Murphy Road: This project is not yet on the ODOT STIP and was therefore determined to be likely to shift to the Mid-Term timeframe for construction
- **M-2** - Parrell Road Urban Upgrade from China Hat Road to Brosterhous Road: This project is not yet under design, and with the no development imminent in the "Thumb" area was determined to be more likely to be constructed in the Mid-Term timeframe
- **RMRP3** - Reed Market Road/ US 97 Southbound Ramps: This project was identified as a Long-Term need in the Reed Market Refinement Study and was therefore pushed out to Mid-Term to better align the need with the Bond funding timing

The Near-Term list also included all TSDC Near-Term projects with the exception of project **C4i** – Active Transportation Improvements at the US 97 Murphy Road Crossing. This project overlaps with project **C-18**, which is included as a Mid-Term project, and is not yet on the ODOT STIP.

The following studies were included in the Near-Term List:

- **C-4** – Study for River Crossings: Added based on the needs identified on the Deschutes River bridges in the 2045 MTP Project List, which indicated continued growing congestion. The CFA Sensitivity Scenario showed further potential traffic increases on the bridges as well.

- **M4** – Colorado Avenue Improvement to SB Ramp Intersection Study: Identified existing need without a defined project
- **New-1** – Z Study: Need identified by the MTP TAC
- **New-2** – Key Route Conceptual Design Study: Need identified through the public outreach from the Key Routes projects and verified during the MTP public outreach
- **New-3** – Program Funding Plan: Need identified by MPO TAC and Policy Board
- **New-4** – Deschutes River Woods South Interchange Study: Need identified by MPO TAC

The Near-Term list also includes all Deschutes County TSP projects within the MPO classified as Near-Term, all projects from the ODOT STIP, and all projects from the CET Master Plan classified as either short/Mid-Term or with target implantation dates in 2024.

The full breakdown of the Short-Term projects within the MTP Financially Constrained Project List is outlined in the tables and figures in Attachments A through G.

MEDIUM-TERM PROJECT LIST (5-10 YEARS)

The Mid-Term project list includes the remaining GO Bond projects not included in the Near-Term list. The Mid-Term list also includes the following five TSDC Mid-Term projects:

- **14-35** - Bike and pedestrian sidewalk and/or bike lane infill projects (50% assumed Mid-Term, 50% assumed Long-Term): Partially included in the Mid-Term list due to priority based on bicycle and pedestrian infrastructure by the community during the MTP public outreach
- **US20.4** - US 20/ NE 27th Widening and Turn Lane Addition: This location has existing needs and showed increased traffic in the CFA Sensitivity Scenario
- **C-24** - Sizemore Street extension: The CFA Sensitivity showed increased traffic in this area
- **C-36** - 3rd Street/Franklin Avenue signal modification: The CFA Sensitivity showed increased traffic at this intersection, heightening the need for improved safety for all modes
- **C4g** - Active transportation crossing improvements: Canal/Garfield undercrossing: Bike-ped focused project that aligns with community priorities

The Mid-Term list also includes all Deschutes County TSP projects within the MPO classified as Mid-Term.

The full breakdown of the Mid-Term projects within the MTP Financially Constrained Project List is outlined in the tables and figures in Attachments A through G.

LONG-TERM PROJECT LIST (10-21 YEARS)

The Long-Term project list includes all the remaining non-Expansion Area projects from the MTP Financially Constrained Project List. The full breakdown of the Long-Term projects within the MTP Financially Constrained Project List is outlined in the tables and figures in Attachments A through G.

DEVELOPMENT DRIVEN PROJECT LIST

The Development Driven Project list includes all TSDC Expansion and Bend TSP Expansion Area Projects as these projects were all assumed to be needed to serve the projected 2045 housing and

employment growth with the MPO. The full breakdown of the Development Driven projects within the MTP Financially Constrained Project List is outlined in the tables and figures in Attachments A through G.

ASPIRATIONAL PROJECT LIST

All projects not included on the Financially Constrained Project List create the Aspirational Project List. This includes 104 capital projects with an estimated capital cost of $670 million, and an additional 6 programs with capital cost elements exceeding a total of $100 million. The breakdown of total Aspirational project cost by category is shown in Table 8.

TABLE 8: ASPIRATIONAL PROJECT COST SUMMARY

CATEGORY	TOTAL UNFUNDED (ASPIRATIONAL) PROJECT COST
ACTIVE TRANSPORTATION - CONNECTIVITY	$85,000,000
ACTIVE TRANSPORTATION – CORRIDOR ENHANCEMENT	$80,000,000
MOTOR VEHICLE – CONNECTIVITY	$105,000,000
MOTOR VEHICLE – CORRIDOR ENHANCEMENT	$320,000,000
INTERSECTION	$39,000,000
TECHNOLOGY	$39,000,000
PROGRAMS	$102,000,000
TOTAL UNFUNDED	**$770,000,000**

These projects may still be considered in upcoming local plans, and as new revenue sources are identified these may be added to the MTP Financially Constrained Project List in the future. The Aspirational project list tables and figures are included in Attachment F.

ATTACHMENTS

CONTENTS

ATTACHMENT A: FINANCIALLY CONSTRAINED ACTIVE TRANSPORTATION PROJECTS

TABLE 9: FINANCIALLY CONSTRAINED ACTIVE TRANSPORTATION CONNECTIVITY PROJECTS

MAP ID	PROJECT DESCRIPTION	COST ESTIMATE[1]	MTP PRIORITIZATION
NEW	Bicycle Greenways Project	$2,343,000	Near-Term (0-5 Years)
M-12	Olney Avenue protected bicycle lanes and Parkway undercrossing	$2,116,000	
M-9A	Midtown Bicycle & Pedestrian Crossings: Franklin Avenue Underpass Shared Use Path	$6,974,000	
M-9C	Midtown Bicycle & Pedestrian Crossings: Greenwood Undercrossing Sidewalk Widening Shared Use Path	$3,055,000	
R2-A	NW Franklin Ave: Harriman Ave to RR undercrossing	$205,000	
20714	US 97: Multi-Use Trail (Baker Rd - Lava Butte)	$5,977,000	
23494	Hawthorne Ave Pedestrian & Bicyclist Overcrossing (Bend)	$30,150,000	
BP-1	7th Street (Tumalo) Sidewalks	$325,000	
BP-2	4th Street (Tumalo) Sidewalks	$325,000	
BP-3	2nd/Cook Sidewalks (SRTS-Tumalo)	$1,841,000	Mid-Term (5-10 Years)
BP-6	5th Street (Tumalo) Sidewalks	$541,000	
BP-10	8th Street (Tumalo) Sidewalks	$433,000	Long-Term (10+ years)

1. All costs are in 2023 dollars. Costs from prior plan years were adjusted to 2023 dollars.

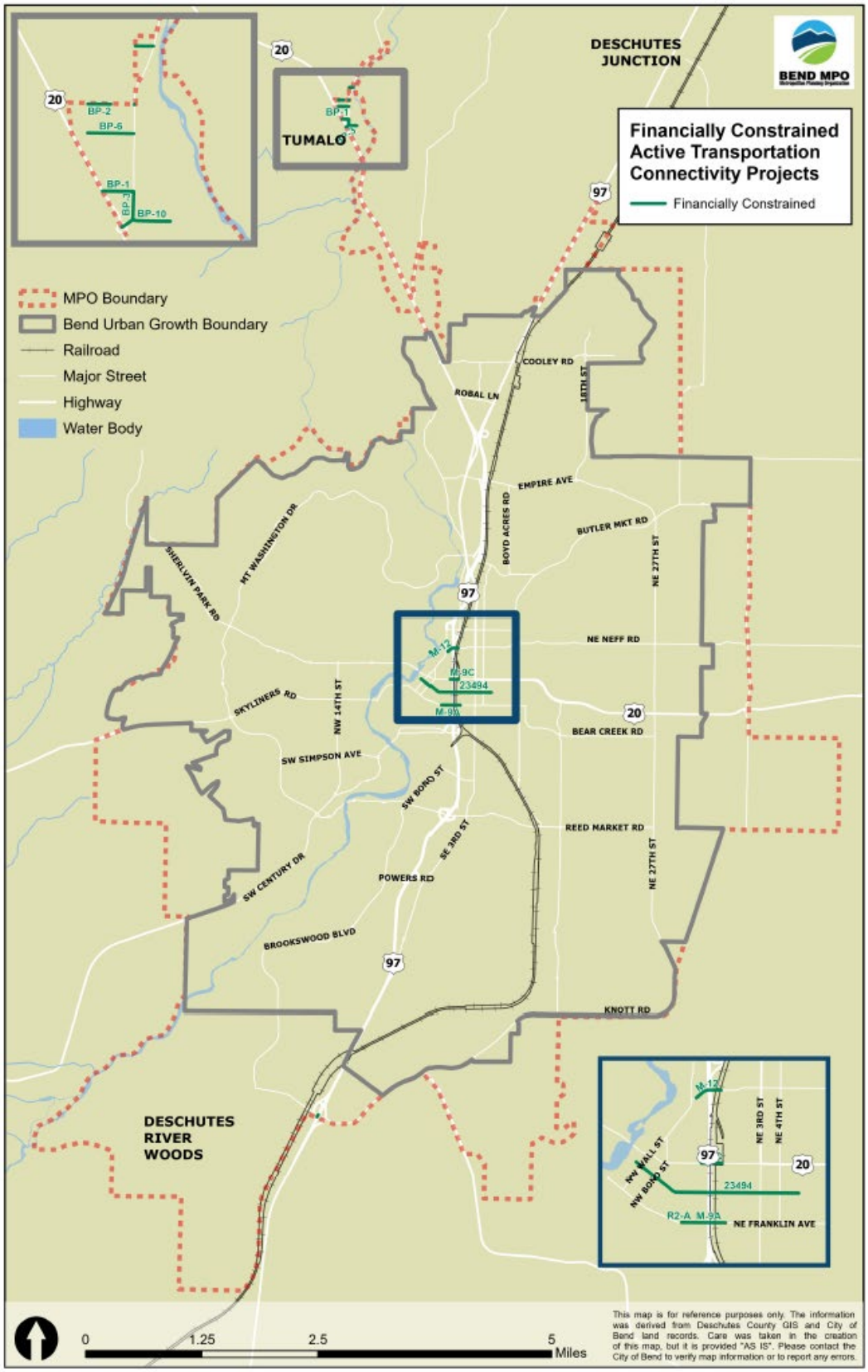

FIGURE 6. 2045 REFINED PROJECT LIST ACTIVE TRANSPORTATION CONNECTIVITY PROJECTS

TABLE 10: FINANCIALLY CONSTRAINED ACTIVE TRANSPORTATION CORRIDOR ENHANCEMENT PROJECTS

MAP ID	PROJECT DESCRIPTION	COST ESTIMATE[1]	MTP PRIORITIZATION
R2-E	Bear Creek Rd: Cessna Ave to east UGB	$3,139,000	Near-Term (0-5 Years)
M-17	Olney Avenue Railroad Crossing Improvements	$604,000	
NEW	Neighborhood Street Safety Program	$8,000,000	
NEW	Portland Avenue Corridor Improvements (interim)	$3,500,000	
3	Chase Road rural upgrade - from Purcell to Matthew Street	$388,000	
13	Bear Creek Road Rural upgrade - Dantili Road to UGB Boundary	$1,666,000	
14-35	Bike and pedestrian sidewalk and/or bike lane infill projects - Near Term	$643,000	
M-1	Galveston Avenue corridor improvements	$4,712,000	
M-10	Improve Drake Park pedestrian bridge across the Deschutes River	$1,482,000	
M-11	Archie Briggs Road trail crossing improvement design	$581,000	
M-14	Butler Market Road Sidewalk Improvements	$3,745,000	
M-3	Olney Avenue/2nd Street intersection improvement	$244,000	
M-4	Greenwood Avenue/2nd Street intersection improvement	$244,000	
M-5	Franklin Avenue/2nd Street intersection improvement	$244,000	
M-6	Franklin Avenue/4th Street intersection improvement	$244,000	
M-7	Clay Avenue/3rd Street intersection improvement	$244,000	
R12-A	Wilson Ave: 2nd Street to SE 9th Street	$2,533,000	
R1-A	SE 9th St: Wilson Ave to Reed Market Rd	$1,343,000	
R1-B	SE 9th St: Wilson Ave to Glenwood Ave	$3,000	
R1-C	NE Boyd Acres Rd: Butler Market Rd to Empire Ave	$2,190,000	
R1-D	SE 15th Street: Reed Mkt Rd to 300' south of King Hezekiah	$1,378,000	
R2-C	Franklin Ave: 1st St to 5th St	$191,000	
R2-D	Bear Creek SRTS: Larkspur Trail to Coyner Trail	$448,000	
R3-A	Norton Ave: NE 6th St to NE 12th St	$228,000	
R3-B	Hillside Trail: Connects NE 12th to Neff Rd	$280,000	
R3-C	Neff Rd: NE 12th to Big Sky Park	$4,224,000	
R3-E	Olney Avenue: Wall Street to railroad	$489,000	
R4-A	NW 15th St: Lexington Ave to Milwaukie Ave	$128,000	
R4-B	NW 14th St: Ogden Ave to Portland Ave	$128,000	
R5-A	Butler Market Rd: Brinson Blvd to NE 6th St	$2,281,000	
R7-A	3rd St: Crosswalk btw RR and Wilson Ave	$250,000	
R7-B	3rd St: Crosswalk btw RR and Franklin Ave	$250,000	
R7-C	3rd St: Underpass	$244,000	
R8-A	27th St: Hwy 20 to Reed Mkt Rd - Shared use path	$5,597,000	
RMRP2	Reed Market Road/ Chamberlain Street Ped improvements	$250,000	
C4B	Active transportation crossing improvements: Butler Market Road	$232,000	
C4L	Active transportation crossing improvements: Robal Road	$1,162,000	
14-35	Bike and pedestrian sidewalk and/or bike lane infill projects - Mid Term	$27,257,000	Mid-Term (5-10 Years)
C4G	Active transportation crossing improvements: Canal/Garfield undercrossing	$1,453,000	
M-2	Parrell Road Urban Upgrade from China Hat Road to Brosterhous Road	$33,828,000	
C4I	Active transportation crossing improvements: Murphy Road	$8,718,000	

MAP ID	PROJECT DESCRIPTION	COST ESTIMATE[1]	MTP PRIORITIZATION
2	Pettigrew Road rural upgrade - from Bear Creek Rd to Reed Market Rd	$7,737,000	Long-Term (10+ years)
C4P	Active transportation crossing improvements: Wilson Avenue	$1,000,000	
14-35	Bike and pedestrian sidewalk and/or bike lane infill projects - Long Term	$21,196,000	
1	Brosterhous Road Rural upgrade - from 3rd St to American Lane	$7,261,000	
C4H	Active transportation crossing improvements: Badger/Pinebrook Overcrossing	$8,718,000	
M-30	Cooley Road rural road upgrade from US 20 to Hunnell Road	$4,417,000	Development Driven
M-39	Stevens Road rural road upgrade from Stevens realignment to Bend UGB boundary	$2,439,000	
M-41	China Hat Road rural road upgrade north of Knott Road	$3,209,000	
M-29	Cooley Road rural road upgrade from O.B. Riley Road to US 20	$1,668,000	
M-31	Hunnell Road rural road upgrade from Cooley Road to Loco Road	$2,906,000	
M-32	Yeoman Road rural road upgrade from western terminus to Deschutes Market Road	$3,209,000	
M-33	Deschutes Market Road rural road upgrade from Yeoman Road to canal	$642,000	
M-34	Deschutes Market Road rural road upgrade from canal to Butler Market Road	$513,000	
M-36	Butler Market Road rural road upgrade from Eagle Road to Clyde Lane	$513,000	
M-37	Butler Market Road rural road upgrade from Clyde Lane to Hamby Road	$1,412,000	
M-38	Butler Market Road rural road upgrade from Hamby Road to Hamehook Road	$1,412,000	
M-40	Clausen Drive rural road upgrade from Loco Road to northern terminus	$257,000	
M-42	China Hat Road canal bridge widening	$483,000	
M-43	Deschutes Market Road canal bridge widening	$513,000	

1. All costs are in 2023 dollars. Costs from prior plan years were adjusted to 2023 dollars.

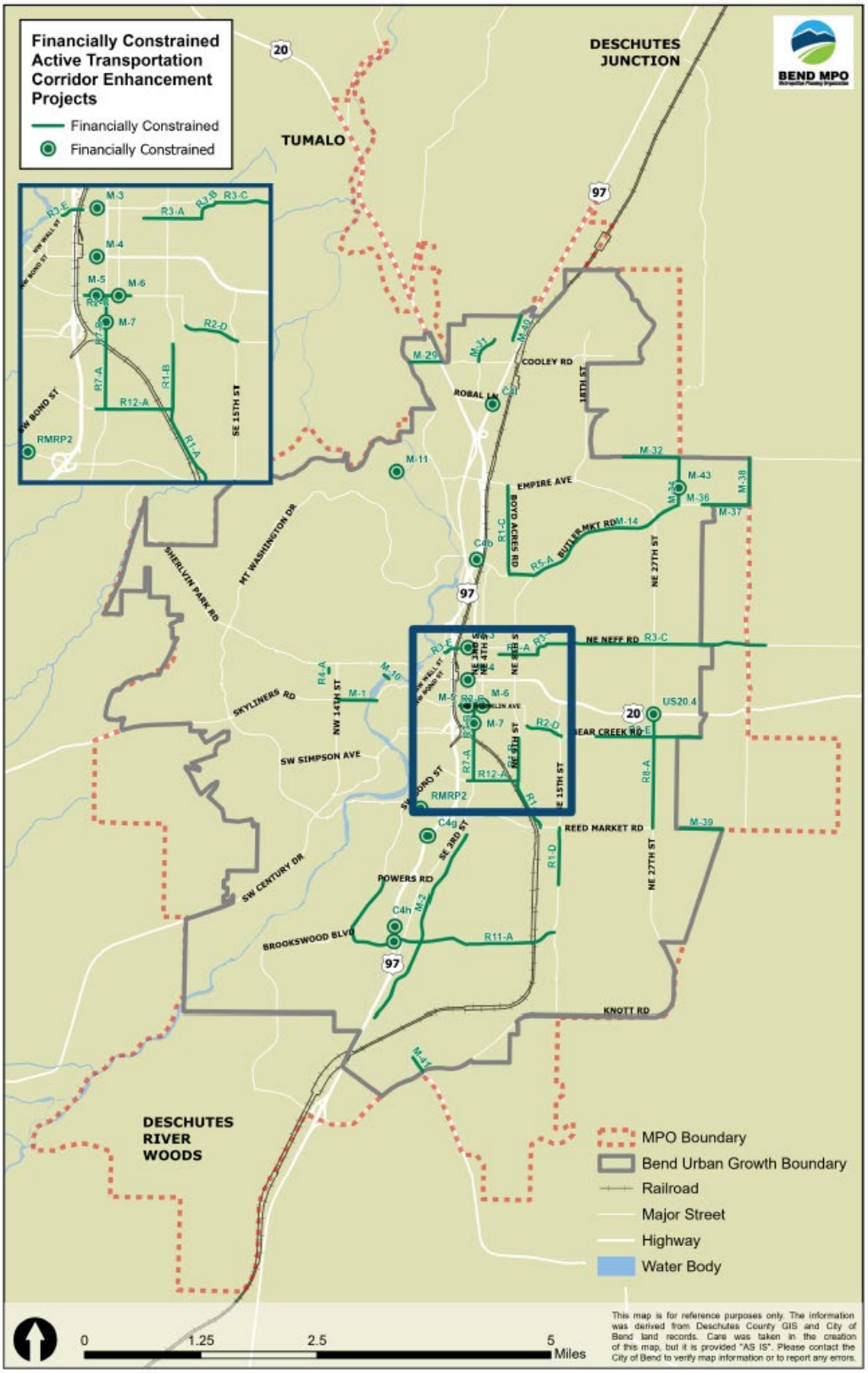

FIGURE 7. FINANCIALLY CONSTRAINED PROJECT LIST ACTIVE TRANSPORTATION CORRIDOR ENHANCEMENT PROJECTS

ATTACHMENT B: FINANCIALLY CONSTRAINED TRANSIT PROJECTS

TABLE 11: FINANCIALLY CONSTRAINED TRANSIT CONNECTIVITY PROJECTS

MAP ID	PROJECT DESCRIPTION	COST ESTIMATE[1]	MTP PRIORITIZATION
NEW	Enhanced Access to Transit	$8,000,000	Near-Term (0-5 Years)
MHCOC	Central Oregon Community College Mobility Hub	$1,090,000	
MHEB	East Bend Mobility Hub	$1,090,000	
MH ND	North Downtown Mobility Hub	$1,090,000	
MHOSU	OSU Cascades Mobility Hub	$1,090,000	
MHHS	Hawthorne Station Mobility Hub	$1,090,000	Long-Term (10+ years)
MHNB	North Bend Mobility Hub	$1,090,000	
MHOMD	Old Mill District Mobility Hub	$1,090,000	
MHST	South 3rd Mobility Hub	$1,090,000	

1. All costs are in 2023 dollars. Costs from prior plan years were adjusted to 2023 dollars.

TABLE 12: FINANCIALLY CONSTRAINED TRANSIT SERVICE ENHANCEMENT PLAN

MAP ID	PROJECT DESCRIPTION	COST ESTIMATE[1]	MTP PRIORITIZATION
CET 7	Bend Service Enhancement Route 7	$985,000	Near-Term (0-5 Years)
CET 11	Bend Service Enhancement Route 11	$985,000	
CET 3	Bend Service Enhancement Route 3	$985,000	
CET 4	Bend Service Enhancement Route 4	$985,000	
CET 5	Bend Service Enhancement Route 5	$985,000	
CET 6	Bend Service Enhancement Route 6	$985,000	
CET 2	Bend Service Enhancement Plan: Route 2	$985,000	
CET 8	Bend Service Enhancement Plan: Route 8	$985,000	

1. All costs are in 2023 dollars. Costs from prior plan years were adjusted to 2023 dollars.

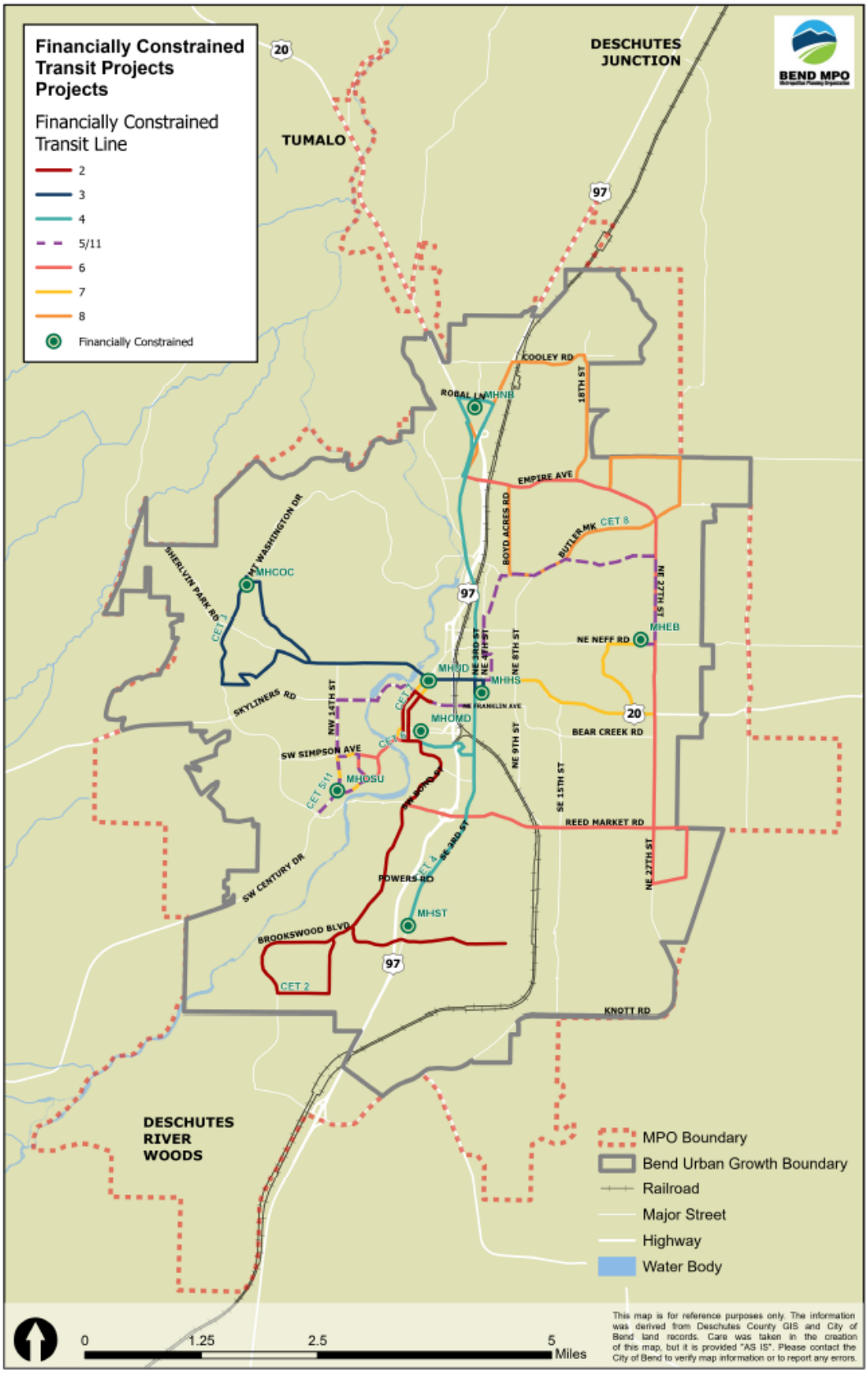

FIGURE 8. FINANCIALLY CONSTRAINED PROJECT LIST TRANSIT PROJECTS

ATTACHMENT C: FINANCIALLY CONSTRAINED MOTOR VEHICLE PROJECTS

TABLE 13. FINANCIALLY CONSTRAINED MOTOR VEHICLE CONNECTIVITY PROJECTS

MAP ID	PROJECT DESCRIPTION	COST ESTIMATE[1]	MTP PRIORITIZATION
C-5A	Aune Street Extension (East)	$6,394,000	Near-Term (0-5 Years)
C-5B	Aune Street Extension (West)	$9,881,000	
C-1	Yeoman Road extension from 18th Street to western terminus	$6,417,000	
11	Ferguson Road - 27th Street to UGB Boundary	$722,000	
C-24	Sisemore Street extension	$2,790,000	Mid-Term (5-10 Years)
C-51	Britta Street extension (south section)	$1,283,000	Long-Term (10+ years)
CC-18	Cooley Road Extension from UGB to Deschutes Market Road	$3,140,000	
201	New collector - Skyline Ranch Road from Shelvin Park to NW Xing	$2,779,000	Development Driven
202	Crossing Drive Extension	$6,931,000	
C-65	Stevens Road realignment	$56,496,000	
C-66	Hunnell Road extension	$3,080,000	
C-69	New Road in the Elbow UGB expansion area	$5,134,000	
C-72	New Road in the Thumb UGB expansion area	$5,519,000	
C-73	New Road in the Thumb UGB expansion area	$3,209,000	
C-74	Loco Road extension from Hunnel Rd to west UGB	$6,802,000	
C-75	New Road in Triangle UGB expansion area	$3,209,000	
C-76	Yeoman Road extension from Deschutes Market Road to Hamehook Road	$13,990,000	
C-80	Robal Road extension from US 20 to O.B. Riley	$3,371,000	
219	Skyline Ranch Road Shevlin UGB Expansion Area	$3,465,000	
230	New Road Shelvin UGB Expansion	$2,952,000	
SRMP	Extension of Wilderness Way from 27th St to east UGB	$4,223,000	
SRMP	Eubanks Street Connections north-south collector between SE Ferguson and SE stevens	$5,739,000	
SEAP	New North-South Collector road between Ferguson and Knott	$11,551,000	
SEAP	Local Framework Road between SE Caldera Drive and Knott Road	$2,695,000	
SEAP	Extension of SE Caldera Drive between SE 15th and SE 27th	$9,498,000	
C-78	Collector between US20 and Hunell Rd	$4,650,000	
M-35	Butler Market Road extension - new 3 lane arterial from Eagle Road to Butler Market Road	$893,000	
SRT	Extension of the SE Ward Road Alignment from Reed Market to Ferguson	$12,193,000	

1. All costs are in 2023 dollars. Costs from prior plan years were adjusted to 2023 dollars.

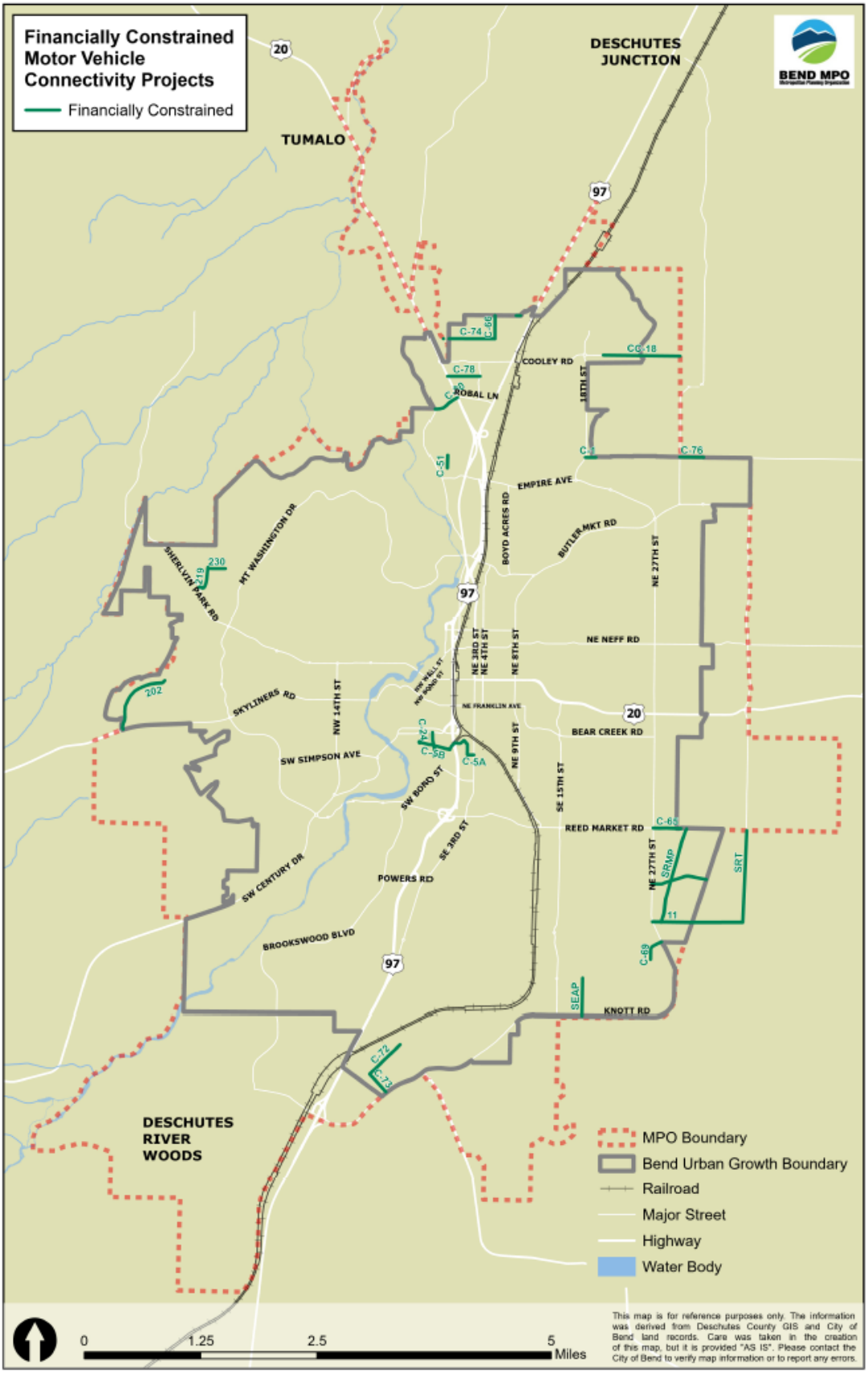

FIGURE 9. FINANCIALLY CONSTRAINED PROJECT LIST MOTOR VEHICLE CONNECTIVITY IMPROVEMENTS

TABLE 14. FINANCIALLY CONSTRAINED MOTOR VEHICLE CORRIDOR ENHANCEMENT PROJECTS

MAP ID	PROJECT DESCRIPTION	COST ESTIMATE[1]	MTP PRIORITIZATION
C-6	Colorado Avenue corridor capacity improvements from Simpson Avenue to Arizona Avenue – Phase 1	$8,137,000	Near-Term (0-5 Years)
RMRP5	Reed Market Road/ 3rd Street protected intersection & turn lanes	$10,300,000	
C-3	O.B. Riley Road Arterial Corridor sidewalk infill from Hardy Road south to Archie Briggs Road	$3,400,000	
22774	NE Norton Ave (Bend)	$579,000	
20378	Archie Briggs Road (Deschutes River) Bridges	$5,852,000	
22791	US20: (3rd Street) at Empire (Planning and Design Only)	$250,000	
RMRP4A	Reed Market Road/ US 97 Northbound Ramps/ Division Street: Traffic Signal	$4,000,000	
I6	SE 3rd Corridor SE Cleveland Ave to SE Davis Ave Safety	$178,000	
C-13	Empire Avenue widening to five lanes near US 97 interchange, widening at northbound off ramp, and install traffic signal at southbound ramp	$11,625,000	Mid-Term (5-10 Years)
C-18	US 97 northbound on ramp and southbound off ramp at Murphy Road, bridge widening and NB/SB ramp construction	$12,835,000	
US20.4	US 20/ NE 27th Widening and Turn Lane Addition	$800,000	
RMRP1B	Reed Market Road/ Brookswood Boulevard/ Bond Street Turn Lane Improvement	$700,000	
C-44	Reed Market rail crossing implementation	$29,062,000	
CC-5	Rickard Road Widening	$2,491,000	
RMRP3	Reed Market Road/ US 97 Southbound Ramps	$5,700,000	
C-41	Powers Road interchange	$23,249,000	Long-Term (10+ years)
C-23	18th Street arterial corridor upgrade from Cooley Road to Butler Market Road	$9,424,000	
CC-28	Bailey Road Widen & Overlay	$1,408,000	
CC-29	Bear Creek Widen & Overlay from City limits to US 20	$3,465,000	
CC-30	Cinder Butte Road Widen and Overlay	$1,408,000	
BR-10	Old Deschutes Road Pilot Butte Canal Bridge Replacement	$433,000	
C3C	Extend Revere Avenue northbound on-ramp acceleration lane	$2,325,000	
C3D	Extend acceleration lane for Colorado Avenue northbound on-ramp	$4,650,000	
C5	US 97 Shoulder-width improvements at strategic locations in corridor	$6,975,000	

1. All costs are in 2023 dollars. Costs from prior plan years were adjusted to 2023 dollars.

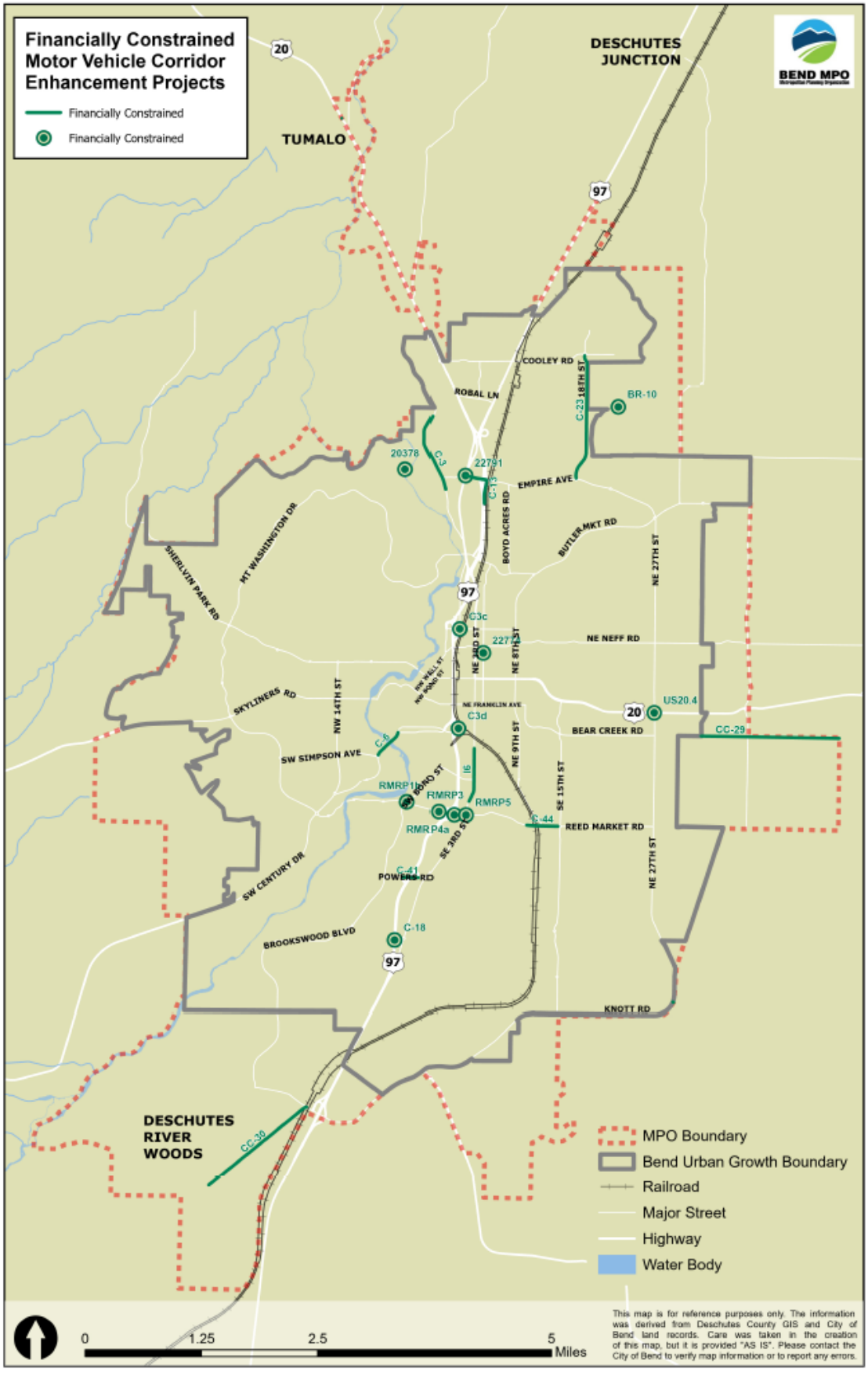

FIGURE 10. FINANCIALLY CONSTRAINED PROJECT LIST MOTOR VEHICLE CORRIDOR ENHANCEMENT PROJECTS

ATTACHMENT D: FINANCIALLY CONSTRAINED INTERSECTION PROJECTS

TABLE 15. FINANCIALLY CONSTRAINED INTERSECTION PROJECTS

MAP ID	PROJECT DESCRIPTION	COST ESTIMATE[1]	MTP PRIORITIZATION
5	27th Street and Conners intersection reconfiguration	$4,263,000	Near-Term (0-5 Years)
6	Brosterhous Road and Chase Road intersection reconfiguration	$4,263,000	
7	Bond St and Industrial Way intersection reconfiguration	$4,263,000	
9	27th Street/Reed Market Road intersection reconfiguration	$4,263,000	
12	Division St/Aune St/Scalehouse Loop intersection reconfiguration	$4,263,000	
C-14	Reed Market Road/15th Street intersection safety and capacity improvements	$1,279,000	
C-15	Olney Avenue/8th Street intersection improvement	$4,301,000	
C-16	Revere Avenue/8th Street intersection improvement	$4,301,000	
C-21	Butler Market Road/US 20/US 97 Improvement.	$7,184,000	
C-22	3rd Street/Wilson Avenue intersection improvement	$6,041,000	
S-3	Pettigrew Road/Bear Creek Road long term safety improvement	$4,749,000	
S-5	3rd Street/Miller Avenue intersection improvements and 3rd Street modifications study (Phase 1)	$128,000	
S-6	3rd Street/Miller Avenue intersection improvements and 3rd Street modifications implementation (Phase 2)	$3,979,000	
C2A	Close Lafayette Avenue right turn onto Parkway and extend the deceleration lane for the right turn off the Parkway	$2,325,000	
C2B	Close Hawthorne Avenue right turn onto Parkway	$1,162,000	
C2C	Close Truman Avenue RIRO intersections with Parkway	$1,162,000	
C2D	Close Reed Lane RIRO intersection with Parkway	$1,162,000	
C2E	Close Badger Road RIRO intersections with Parkway	$1,162,000	
C2F	Close Pinebrook Boulevard RIRO intersections with Parkway	$1,162,000	
10	27th and Ferguson Roundabout	$4,263,000	
C-45	O.B. Riley Road/Empire Road intersection safety and capacity improvement	$3,500,000	Mid-Term (5-10 Years)
C-28	Revere Avenue/4th Street intersection improvement	$4,301,000	
C-29	Olney Avenue/4th Street intersection improvement	$4,301,000	
C-34	Ferguson Road/15th Street intersection improvement	$4,301,000	
CL-14	Cinder Butte Rd/ Cheyenne Rd	$217,000	
CL-16	Cline Falls Hwy Cook Ave/Tumalo Rd	$1,949,000	
C-27	Butler Market Road intersection safety and capacity improvements from US 97 to 27th Street (Includes roundabouts or traffic signals at 4th Street, Brinson Boulevard, and Purcell Boulevard. Wells Acres Road roundabout is a separate project.)	$8,137,000	Long-Term (10+ years)
C-7	Colorado Avenue/US 97 northbound ramp intersection safety and capacity improvements	$4,999,000	
C-63	China Hat Road/Knott Road Intersection Improvement	$4,301,000	
CL-22	Baker Rd Brookswood Blvd	$1,516,000	
C2H	Close Rocking Horse Road RIRO intersections with Parkway	$1,162,000	
C-33	Country Club Road/Knott Road intersection improvement	$4,301,000	
C-35	NE 27th Street/Wells Acres Road intersection improvement	$4,301,000	
C-39	Brosterhous Road/Knott Road intersection improvement	$4,301,000	
C-79	Cooley Road/Hunnell Road Intersection Improvement	$4,301,000	Development Driven

1. All costs are in 2023 dollars. Costs from prior plan years were adjusted to 2023 dollars.

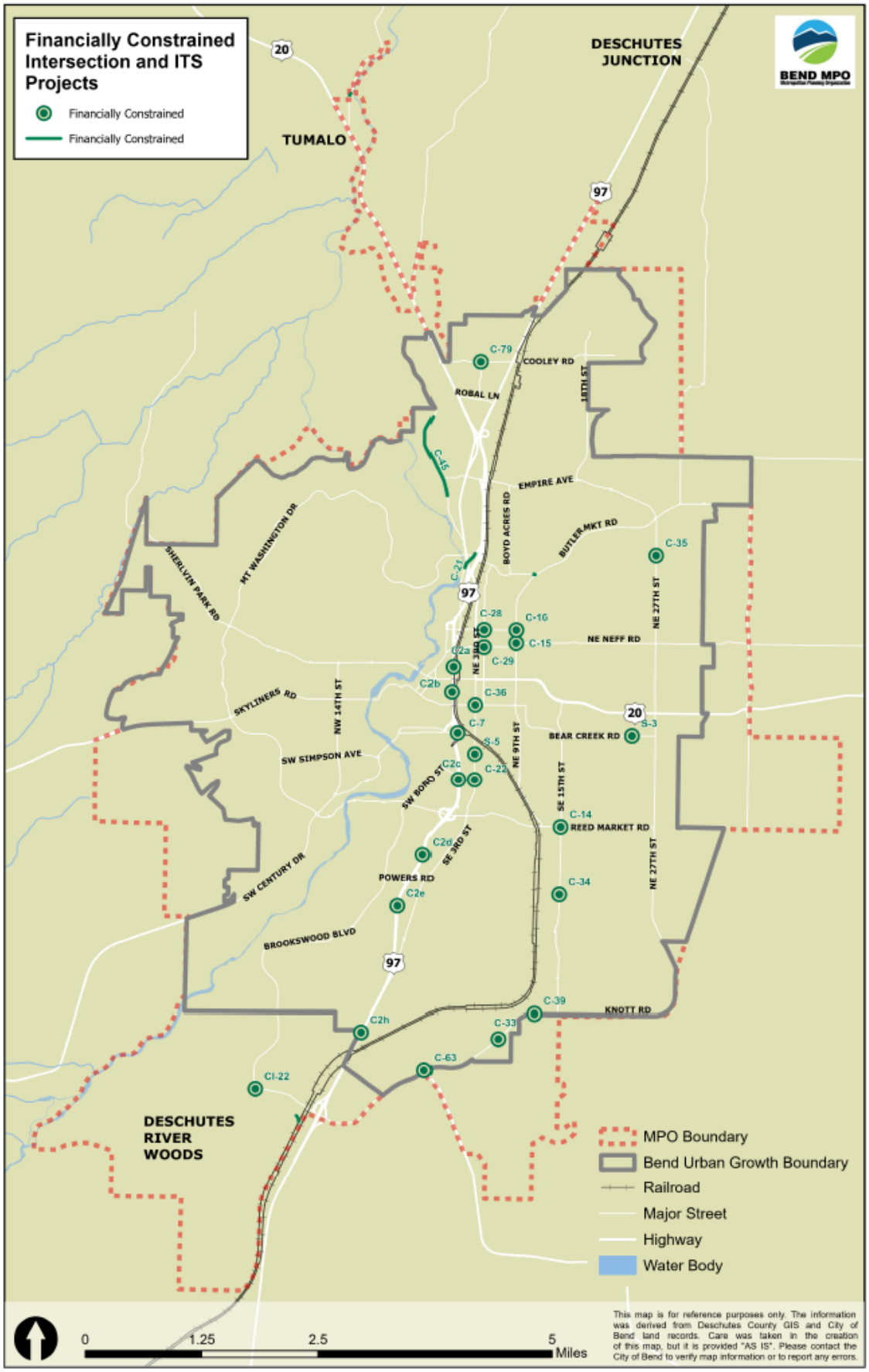

FIGURE 11. FINANCIALLY CONSTRAINED PROJECT LIST INTERSECTION PROJECTS

ATTACHMENT E: FINANCIALLY CONSTRAINED TECHNOLOGY PROJECTS

TABLE 16. FINANCIALLY CONSTRAINED TECHNOLOGY PROJECTS

MAP ID	PROJECT DESCRIPTION	COST ESTIMATE[1]	MTP PRIORITIZATION
NEW	Intelligent Transportation Systems	$5,000,000	Near-Term (0-5 Years)
C10	US 97 Traveler information signing	$19,000	
C9	US 97 Enhanced signal operations at ramp terminals	$320,000	
C-36	3rd Street/Franklin Avenue signal modification	$604,000	Mid-Term (5-10 Years)
C1	US 97 Install ramp meters	$17,437,000	Long-Term (10+ years)
C6	US 97 Weather warning system	$264,000	
C7	US 97 Variable speed signs	$320,000	

1. All costs are in 2023 dollars. Costs from prior plan years were adjusted to 2023 dollars.

ATTACHMENT F: FINANCIALLY CONSTRAINED PROPOSED STUDIES

TABLE 17. PROPOSED STUDIES

PROJECT ID	STUDY DESCRIPTION	COST ESTIMATE[1]	MTP PRIORITIZATION
C-4	Study for river crossings	$581,000	Near-Term (0-5 Years)
M4	Colorado Avenue improvement to SB ramp intersection (Study)	$250,000	
NEW-1	Z Study	$500,000	
NEW-2	Key Route Conceptual Design Study	$200,000	
NEW-3	Program Funding Plan (identify funding for Bend TSP programmatic solutions)	$200,000	
NEW-4	Deschutes River Woods South Interchange Study	$500,000	

1. All costs are in 2023 dollars. Costs from prior plan years were adjusted to 2023 dollars.

ATTACHMENT G: FINANCIALLY CONSTRAINED PROPOSED PLANS AND PROGRAMS

TABLE 18: FINANCIALLY CONSTRAINED PROGRAMS (CAPITAL FUNDING)

PROJECT ID	PROGRAM AND PLAN DESCRIPTION	COST ESTIMATE[1]	MTP PRIORITIZATION
203	City of Bend Traffic Data Collection	$523,000	Long-Term (10+ years)
204	Special Event Management System (Deschutes County Fairgrounds and Expo Center and Hayden Homes Amphitheater)	$232,000	
305	Flex Park-and-Ride lots for special events	$116,000	
308	Transit Signal Priority	$349,000	
404	Traveler Information System Enhancements for Construction and Detour info	$349,000	
502	Provide Traffic Management System Information at EOCs	$291,000	
506	Scenario Planning for Tri-County evacuations, emergencies, and incidents	$232,000	
601	Smart Work Zone Management and Safety Monitoring Systems	$232,000	
602	Regional Work Zone and Winter Maintenance information sharing system	$349,000	
603	Implement a Maintenance Decision Support System	$872,000	
804	Automated Speed Enforcement Pilot	$291,000	

1. All costs are in 2023 dollars. Costs from prior plan years were adjusted to 2023 dollars.

ATTACHMENT H: ASPIRATIONAL PROJECT LIST

TABLE 19: ASPIRATIONAL ACTIVE TRANSPORTATION CONNECTIVITY PROJECTS

PROJECT ID	PROJECT DESCRIPTION	COST ESTIMATE
P69	DRT CONNECTOR TO SHEVLIN PARK	$82,000
P75	POWERLINE TRAIL	$755,000
P77	SOUTH DESCHUTES RIVER TRAIL (DRT) BUCK CANYON TRAILHEAD	$3,625,000
P78	Tumalo Creek Trail	$755,000
M-20	Knott Canal Crossing	$846,000
P55	HANSEN TO BIG SKY PARK TRAIL	$3,625,000
P56	MANZANITA TRAIL	$48,000
P57	NEFF AND HAMBY RD. CROSSINGS	$3,625,000
P61	RILEY RANCH NATURE RESERVE NEIGHBORHOOD ACCESS	$151,000
P64	SHEVLIN PARK NORTH - TUMALO CREEK BIKE/PEDESTRIAN BRIDGE	$755,000
P67	TRANSCANADA TRAIL	$755,000
M-15A	Midtown Bicycle & Pedestrian Crossings: Greenwood Undercrossing Sidewalk Widening	$8,087,000
M-15C	Midtown Bicycle & Pedestrian Crossings: Franklin Avenue Underpass	$48,089,000
P10	DRT NORTH TRAILHEAD TO SERVE NEW DENSITY	$320,000
P11	DRT KIRKALDY TO PUTNAM	$72,000
P13	DRT GALVESTON TO MILLER'S LANDING	$3,077,000
P14	DRT SOUTH URBAN GROWTH BOUNDARY (UGB) & BIKE/PEDESTRIAN BRIDGE	$3,625,000
P35	RILEY RANCH NATURE RESERVE BIKE/PEDESTRIAN BRIDGE	$1,200,000
P41	ARNOLD CANAL TRAIL AND TRAILHEAD DEVELOPMENT WITH POTENTIAL OFF-LEASH DOG TRAIL	$645,000
P44	DISCOVERY WEST TRAIL	$1,600,000
P45	HANSEN PARK TRAILHEAD	$755,000
P47	HIGH DESERT PARK TRAILS	$258,000
P49	NORTH UNIT CANAL TRAIL	$512,000
P50	PILOT BUTTE CANAL TRAIL	$198,000
P6	CENTRAL OREGON HISTORIC CANAL TRAIL FROM BLAKELY ROAD TO HANSEN PARK	$798,000
P7	CENTRAL OREGON HISTORIC CANAL TRAIL FROM HANSEN PARK TO EASTGATE PARK	$178,000
P8	CENTRAL OREGON HISTORIC CANAL TRAIL FROM EASTGATE PARK TO THE BADLANDS	$755,000
P9	DRT PUTNAM TO RILEY RANCH NATURE RESERVE BIKE/PEDESTRIAN BRIDGE	$155,000

TABLE 20: ASPIRATIONAL ACTIVE TRANSPORTATION CORRIDOR ENHANCEMENT PROJECTS

PROJECT ID	PROJECT DESCRIPTION	COST ESTIMATE
M-18	Eagle Road Functional Urban Upgrade	$16,856,000
M-19	Knott Road Urban Upgrade from China Hat Road to 15th Street	$18,134,000
M-21	SE 27th Street rural road upgrade from Reed Market Road to Ferguson Road	$3,560,000
M-22	SE 27th Street rural road upgrade from Ferguson Road to Diamondback Lane	$770,000
M-23	SE 27th Street rural road upgrade from Diamondback Lane to access road	$128,000
M-24	SE 27th Street rural road upgrade from access road to Knott Road	$1,668,000
M-25	Knott Road rural road upgrade from 15th Street to Raintree Court	$642,000
M-26	Knott Road rural road upgrade from Raintree Court to SE 27th Street	$7,059,000
M-27	Knott Road rural road upgrade south of China Hat Road	$385,000

PROJECT ID	PROJECT DESCRIPTION	COST ESTIMATE
US20.2	US 20/ NE 8th Street Pedestrian, Bicycle and Transit Improvements	$2,100,000
M-16	Revere Avenue/2nd Street Intersection improvement	$244,000
R11-A	Murphy Road: Powers Road to 15th Street Shared Use Path	$2,533,000
20391	US 20: Empire- Greenwood (3rd St, Bend)	$2,034,000
21489	US20: 3rd St- 15th St (Greenwood, Bend)	$6,427,000
22442	Sisters and Bend Curb Ramps	$17,633,000
RMRP6A	3rd Street/ Brosterhous Road: Striping and lighting	$130,000

TABLE 21. ASPIRATIONAL MOTOR VEHICLE CONNECTIVITY PROJECTS

PROJECT ID	PROJECT DESCRIPTION	COST ESTIMATE
C-58	Ponderosa Street / China Hat Road overcrossing	$17,437,000
C-48	New North Frontage Road near Murphy Road	$6,931,000
C-49	New South Frontage Road near Murphy Road	$17,712,000
C-50	Britta Street extension (north section)	$3,465,000
C-2	Purcell Boulevard extension From Full Moon Drive to Jackson Avenue	$2,937,000
C-64	US 97 Frontage Road (Ponderosa to Baker Road)	$7,614,000
C-25	Brentwood Avenue extension from Whitetail St to American Lane	$2,779,000
S-6	Deschutes River Woods South US 97 Interchange	$46,453,000

TABLE 22. ASPIRATIONAL MOTOR VEHICLE CORRIDOR ENHANCEMENT PROJECTS

PROJECT ID	PROJECT DESCRIPTION	COST ESTIMATE
B-19	Hamby Road Corridor Safety Improvements from Stevens Rd to Butler Market Rd	$29,000,000
C-54	3rd Street railroad undercrossing widening	$15,926,000
C-40	US 97 North parkway extension (Phase 2)	$34,874,000
C-43	15th Street corridor safety and capacity improvements from US 20 to Reed Market - Includes roundabout at Wilson	$15,228,000
C-6B	Colorado Avenue corridor capacity improvements from Simpson Avenue to Arizona Avenue - Phase 2	$16,274,000
C-52	Mervin Sampels Road / Sherman Road Collector Corridor upgrade	$7,829,000
C-53	27th Street Arterial Corridor upgrade from Bear Creek Road to Ferguson Road	$10,390,000
PHASE 1	US 97 Baker Interchange West Side Improvements	$15,182,000
PHASE 2	US 97 Baker Interchange Bridge and East Side Improvements	$23,798,000
F-7	China Hat Road Widen and Overlay	$975,000
C-55	Country Club Road Urban Upgrade from Knott Road to Murphy Road	$12,671,000
C-56	Powers Road urban upgrades from 3rd Street to Parrell Road	$1,208,000
C-57	Powers Road urban upgrades from Brookswood Boulevard to 3rd Street	$5,074,000
US20.3	US 20/ NE Purcell Boulevard Widening and Turn Lane Addition	$800,000
US20.5	US 20/ Hamby Road Right Turn Bypass lane addition	$800,000
RMRP4B	Reed Market Road/ US 97 Northbound Ramps/ Division Street: Separate Northbound Entrance Ramp	$9,400,000
C-9	Revere Avenue interchange improvements	$9,881,000
21756	US 20: Central Oregon Hwy Culverts Corridor	$533,000
22607	Revere Ave Rail Crossing (Bend) - Study	$500,000
22776	US 97: Redmond-Bend Phase 2	$9,309,000
RMRP1A	Reed Market Road/ Brookswood Boulevard/ Bond Street Turn Lane Improvement	$4,000,000
97.A	Tight Urban Diamond Interchange US 97 North Interchange	$81,212,000
NEW-1	Ward Road Upgrade - US 20 to Stevens Road	$15,300,000

TABLE 23. ASPIRATIONAL INTERSECTION PROJECTS

PROJECT ID	PROJECT DESCRIPTION	COST ESTIMATE
C-59	Hawthorne Avenue/3rd Street Intersection improvement	$4,417,000
C-60	Century Drive/Skyline Ranch Road roundabout	$4,301,000
C-61	Mt. Washington Drive/Metolius Drive roundabout	$4,301,000
S-7	Empire Avenue/Jamison Street Turning Restrictions	$129,000
RMRP6B	3rd Street/ Brosterhous Road Protected Intersection	$750,000
C-46	4th Street/Butler Market Road intersection improvement	$4,470,000
C-8	Portland Avenue corridor project from College Way to Deschutes River; assumes two intersection improvements	$20,576,000
S-4	US 97/Powers Road interim improvements identified by TSAP	$128,000

TABLE 24. ASPIRATIONAL TECHNOLOGY PROJECTS

PROJECT ID	PROJECT DESCRIPTION	COST ESTIMATE
102	US 97 Safe and Smart Corridor	$1,331,000
104	Hwy 20/ Greenwood Ave Smart Corridor	$3,552,000
105	27th Street Safe and Smart Corridor	$2,662,000
108	Wall Street and Bond Street Fiber Communications	$1,584,000
109	Century Drive Safety and Efficiency Improvements	$3,801,000
111	Hwy 97 Active Traffic Management (ATM) and Integrated Corridor Management	$3,405,000
112	Revere Ave Fiber Communications	-
203	Deploy video traffic counting stations at bottleneck locations to monitor traffic and collect traffic volume data.	$534,000
701	Regional Data Warehouse	$742,000
802	Congestion Warning System	$297,000
C-37	3rd Street/Powers Road signal modification	$604,000
C-38	3rd Street/Badger Road signal modification	$604,000
22767	Driver Feedback Signs (Deschutes County)	$1,033,000
22739	US 97: I-84 to California Border	$5,809,000
22742	US 20: from US101 to the Idaho border	$8,971,000
101	3rd Street Safe and Smart Corridor	$1,651,000
113	Neff Road Fiber Communications	$416,000
114	Empire Ave Fiber Communications	$1,515,000
115	Purcell Blvd Fiber Communications	$398,000
501	OID CAD 911 BUS Upgrade	$0
503	Rapid Response Situational Awareness Capabilities Responder Video System	$119,000

TABLE 25: ASPIRATIONAL PROGRAMS (CAPITAL FUNDING)

PROJECT ID	PROGRAM AND PLAN DESCRIPTION	COST ESTIMATE
1.2	Acquire low-floor buses as part of new/replacement vehicle purchases and prioritize on routes with high levels of wheelchair boardings and/or ridership.	$92,997,000
2.4	Adopt bus stop amenity design standards, e.g., based on PTP Figure 8-4	$2,992,000
201	Multi-Agency regional Operations Center	$1,162,000
P-2	TDM Program for major employers and institutions - Initial Study	$232,000
P-2	TDM Program for major employers and institutions - Annual Implementation Cost	$3,487,000
P-7	Parking pricing and management in downtown Bend - Equipment Purchase	$1,162,000

APPENDIX G: FUNDING DATA

MTP Funding Assumptions and Data Summary

REVENUE ESTIMATES FOR CAPITAL IMPROVEMENTS

This section summarizes funding sources and estimated revenues available for (or limited to) transportation capital improvements from the City of Bend, Deschutes County, Bend Parks and Recreation District (BPRD, for trails), and state / federal funding programs and allocations.

CITY OF BEND

The City of Bend owns and maintains most of the roadway network in the BMPO. Thus, the City plays a critical role in funding new capital projects in the BMPO. The City's available and committed funding sources for transportation capital improvements include:

- Transportation System Development Charges (TSDCs)
- Water and Sewer Franchise Fees
- A recent General Obligation (GO) Bond
- Tax Increment Financing (TIF) / Urban Renewal
- Surface Transportation Block Grant (STBG) allocations to City
- Private Contributions and other / miscellaneous

The assumptions and revenue estimates for each of these sources are provided below.

TRANSPORTATION SYSTEM DEVELOPMENT CHARGES (TSDCS)

Overview

TSDCs are impact fees paid by new development within the City based on the development's estimated impacts on the transportation system. Rates are set by a methodology and vary based on the use and characteristics of the development.

Limitations on use of funds

Revenues are used to fund growth-related, capacity-increasing capital improvements that are on an adopted TSDC project list, as prioritized by the City Council.

Projection assumptions

While SDC revenues can be volatile based on development activity, the overall trend is influenced by the pace of growth. In addition, the City typically adjusts TSDC rates on an annual basis to account for construction cost escalation. The forecast of TSDC revenue assumes that, on average, revenues will grow from the most recent available year based on forecast population growth combined with forecast rate adjustments based on historic trends in construction cost escalation.

Revenue estimates

The total amount over the forecast period is estimated at about $284 million in YOE dollars and $184.5 million in 2023 dollars.

Figure 1: TSDCs, Historical Revenue for FY 2019-2022

FY	TSDC Revenue
2022-23	$7,002,100
2021-22	$7,561,683
2020-21	$8,244,701
2019-20	$8,897,746

Figure 2: TSDC Revenue Forecast, FY 2025-2045

FYE	2023 $	YOE
2025	$7,223,871	$7,708,592
2026	$7,362,150	$8,115,298
2027	$7,502,820	$8,543,461
2028	$7,646,191	$8,994,215
2029	$7,792,568	$9,468,750
2030	$7,941,620	$9,968,321
2031	$8,093,668	$10,494,250

FYE	2023 $	YOE
2032	$8,248,415	$11,047,927
2033	$8,406,199	$11,630,816
2034	$8,566,752	$12,244,459
2035	$8,730,428	$12,890,477
2036	$8,897,573	$13,570,579
2037	$9,067,955	$14,286,563
2038	$9,241,366	$15,040,322
2039	$9,418,184	$15,833,850
2040	$9,598,229	$16,669,245
2041	$9,781,892	$17,548,715
2042	$9,969,019	$18,474,586
2043	$10,159,478	$19,449,305
2044	$10,353,687	$20,475,451
2045	$10,551,538	$21,555,737
Total	**$184,553,603**	**$284,010,920**

WATER AND SEWER FRANCHISE FEES

Overview

A charge on revenue generated by water and sewer franchises within the City of Bend.

Limitations on use of funds

The majority of revenues are currently used for transportation capital expenditures, but this funding allocation is determined by City Council through the biennial budget process.

Projection assumptions

The projection assumes 75% of collected water/sewer franchise fees are allocated to capital, with an annual expected growth rate of 3% based on information from City of Bend staff and the City of Bend Biennial 2023-2025 budget.

Revenue estimates

The total revenue collected is estimated to be approximately $56 million in 2023 dollars over the forecast period, mostly keeping pace with inflation but declining slightly in real dollars over time as the assumed rate of growth is slightly below the assumed inflation rate.

Figure 3: Water and Sewer Franchise Fee Revenue Forecast, FY 2025 - 2045

FYE	2023 $	YOE
2025	$2,747,727	$2,932,100
2026	$2,739,783	$3,020,063
2027	$2,731,769	$3,110,665
2028	$2,723,782	$3,203,985
2029	$2,715,912	$3,300,104
2030	$2,708,021	$3,399,108
2031	$2,700,201	$3,501,081
2032	$2,692,335	$3,606,113
2033	$2,684,516	$3,714,297
2034	$2,676,643	$3,825,725
2035	$2,668,809	$3,940,497
2036	$2,661,102	$4,058,712
2037	$2,653,427	$4,180,473
2038	$2,645,707	$4,305,888
2039	$2,638,035	$4,435,064
2040	$2,630,343	$4,568,116
2041	$2,622,720	$4,705,160
2042	$2,615,106	$4,846,315
2043	$2,607,451	$4,991,704
2044	$2,599,846	$5,141,455
2045	$2,592,246	$5,295,699
Total	**$56,055,479**	**$84,082,324**

GENERAL OBLIGATION (GO) BONDS

Overview

GO Bonds are debt issued for infrastructure improvements. The GO bond, which requires a public vote, is paid for by increased property taxes over the life of the bond, which typically last for 20 to 30 years for transportation projects.

Limitations on use of funds

Funds must be used for capital projects identified in a project list linked to the bond. Although not a legal requirement, because the tool requires a public vote, projects are often selected that will resonate with voters city-wide.

Projection assumptions

The City of Bend has a history of successfully passing GO bonds to pay for transportation projects, including in 2012 and again in 2020. The 2013 bond projects are complete, though the debt is still being paid off; 2020 bond projects are still being funded and built. This projection includes only the estimated funding remaining under the 2020 GO bond authorization; it does not assume additional GO bonds in future years.

Revenue estimates

Of the 2020 GO bonds, roughly $149 million remains for identified projects through 2030.

Figure 4: Allocated GO Bond Revenue, FY 2025 - 2045

FYE	2023 $	YOE
2025	$25,817,637	$27,550,000
2026	$22,507,484	$24,810,000
2027	$26,587,336	$30,275,000
2028	$26,698,121	$31,405,000
2029	$14,236,236	$17,298,450
2030	$13,781,429	$17,298,450
2031	$0	$0
2032	$0	$0
2033	$0	$0

FYE	2023 $	YOE
2034	$0	$0
2035	$0	$0
2036	$0	$0
2037	$0	$0
2038	$0	$0
2039	$0	$0
2040	$0	$0
2041	$0	$0
2042	$0	$0
2043	$0	$0
2044	$0	$0
2045	$0	$0
Total	**$129,628,244**	**$148,636,900**

TAX INCREMENT FINANCING (TIF) / URBAN RENEWAL

Overview

A tool that allocates a percentage of property tax revenues from growth in assessed value inside an urban renewal area (URA) for investment in eligible capital projects.

Limitations on use of funds

Eligible projects must be located within the URA boundary, be identified in the URA plan (though the project list can be amended), and contribute to the alleviation of blight within the URA.

Projection assumptions

The City of Bend has three existing URAs: Juniper Ridge, Murphy Crossing, and the Core Area. Each of these include expected funding for transportation projects. Estimated funding allocations to transportation from each area (amounts and timing) are based on input from the City's Urban Renewal staff and the adopted URA plans, though the amounts and timing are uncertain, as they depend on growth in property values within the URA.

- **Juniper Ridge:** Estimated at up to $13 million contribution (in 2023 dollars) to transportation before 2036 based on City staff assessment of the urban renewal plan for the area and recent TIF projections. $3.5 million was assumed to be spent in FYE 2025 based on a near-term project (Cooley Road/Talus Road) based on information provided by staff. The remainder was split between 2031 and 2036 so that it would be fully expended by 2036, but staff indicated the timing of future expenditures is dependent on development.

- **Murphy Crossing:** Estimated at up to $6 million contribution (in 2023 dollars) to transportation before 2036 based on City staff assessment of the urban renewal plan for the area and recent TIF projections. Of this, $750,000 in FYE 2027 and 2028 is allocated to US97 frontage road improvements. The remainder was split between 2031 and 2036 so that it would be fully expended by 2036, but staff indicated the timing of future expenditures is unknown.

- **Core Area:** Estimated total allocations to Transportation and Streetscape projects from the Core Area are over $38 million through 2043:

  – Transportation: $14,237,308

  – Streetscape: $24,223,985

  The City has allocated $8 million to Core Area transportation projects in the current CIP (Franklin Corridor, streetscape improvements to Franklin, and Hawthorne Crossing), $7 million of which is estimated to be spent between FYE 2025 and FYE 2028:

  – FYE 2025: $3.5M ($2.5M Franklin Corridor Improvements, $1M Street scape improvements Franklin Ave)

  – FYE 2026: $1M (Streetscape Improvements Franklin Ave)

  – FYE 2027: $1.5M (Hawthorne Crossing)

  – FYE 2028: $1.5M (Hawthorne Crossing)

  The remaining amount estimated to be available for transportation projects in the Core Area was distributed through the remainder of the urban renewal plan horizon based on the average annual amount dedicated to transportation projects in the early years of the plan (roughly $2 million per year).

- Staff indicated estimates are in 2023 dollars, except for Core Area contributions through FYE 2026.

Revenue estimates

The total funding from urban renewal for transportation is estimated at roughly $56 million in 2023 dollars.

Figure 5: Urban Renewal Areas Forecast, FY 2025-2045

FYE	Juniper Ridge (2023 $)	Murphy Crossing (2023 $)	Core Area (2023 $)	UR Total (2023 $)	Juniper Ridge (YOE)	Murphy Crossing (YOE)	Core Area (YOE)	UR Total (YOE)
2025	$3,500,000		$3,279,918	$6,779,918	$3,734,850		$3,500,000	$7,234,850
2026			$907,194	$907,194			$1,000,000	$1,000,000
2027		$750,000	$1,500,000	$2,250,000		$854,025	$1,708,050	$2,562,075
2028		$750,000	$1,500,000	$2,250,000		$882,225	$1,764,450	$2,646,675
2029			$2,000,000	$2,000,000			$2,430,200	$2,430,200
2030			$2,000,000	$2,000,000			$2,510,400	$2,510,400
2031	$4,750,000	$2,250,000	$2,000,000	$9,000,000	$6,158,850	$2,917,350	$2,593,200	$11,669,400
2032			$2,000,000	$2,000,000			$2,678,800	$2,678,800
2033			$2,000,000	$2,000,000			$2,767,200	$2,767,200
2034			$2,000,000	$2,000,000			$2,858,600	$2,858,600
2035			$2,000,000	$2,000,000			$2,953,000	$2,953,000
2036	$4,750,000	$2,250,000	$2,000,000	$9,000,000	$7,244,700	$3,431,700	$3,050,400	$13,726,800
2037			$2,000,000	$2,000,000			$3,151,000	$3,151,000
2038			$2,000,000	$2,000,000			$3,255,000	$3,255,000
2039			$2,000,000	$2,000,000			$3,362,400	$3,362,400
2040			$2,000,000	$2,000,000			$3,473,400	$3,473,400
2041			$2,000,000	$2,000,000			$3,588,000	$3,588,000
2042			$2,000,000	$2,000,000			$3,706,400	$3,706,400
2043			$2,000,000	$2,000,000			$3,828,800	$3,828,800
2044								
2045								
Total	**$13,000,000**	**$6,000,000**	**$37,187,112**	**$56,187,112**	**$17,138,400**	**$8,085,300**	**$54,179,300**	**$79,403,000**

PRIVATE CONTRIBUTIONS

Overview

Developers are sometimes required to contribute funds to or build non-creditable transportation improvements based on the proportional impact of the development on a specific facility that is not covered by SDCs.

Limitations on use of funds

Funds must be applied to projects that were the basis for the required contributions. Contributions from private development are received in the Transportation Construction fund and held in reserves until an eligible project begins.

Projection assumptions

These contributions fluctuate significantly over time, but the City has received an average of $200,000 dollars annually over the last four years. Conversations with City staff indicate that this $200,000 per year funding level should be assumed to increase over time with inflation, resulting in a similar amount of revenue for future years in 2023 dollars. Note that this funding level appears to be conservative based on a review of historical revenue amounts.

Revenue estimates

These contributions are estimated to total $4.2 million in 2023 dollars over the forecast period.

SURFACE TRANSPORTATION BLOCK GRANT (STBG) ALLOCATIONS TO CITY

Overview

The STBG program is a major federal transportation program that provides flexible funds for transportation projects at the state and local level. Funds are allocated to states and cities based on a formula.

Limitations on use of funds

Funds may be used to preserve and improve the conditions and performance of any Federal-aid highway, bridge, and tunnel projects; on any public road, pedestrian, and bicycle infrastructure; and on transit capital projects (including intercity bus terminals). Certain other types of projects

are also eligible under the Bipartisan Infrastructure Law (BIL)'s updates to the program, including electric vehicle (EV) charging infrastructure, wildlife crossings, projects to increase the resilience of the transportation system, bus rapid transit projects, and projects to enhance travel and tourism.[1]

Projection assumptions

STBG allocations are in flux—allocations to the BMPO/City of Bend are expected to decrease relative to historic amounts between 2023 and 2027. Beyond 2027, the BMPO anticipates receiving a set annual amount of funding from STBG via the State Highway Trust fund (estimated at $1,379,000 annually), resulting in declining buying power and lower revenue in future years in 2023 dollars. In addition, the allocation of this share between capital and O&M may shift given the City's recent approval of a Transportation Utility Fee, as discussed in the O&M section. The BMPO has not yet determined how to adjust to these funding changes, but provided the following assumptions for how this revenue would be allocated, based on the average splits from STBG funding historically:

- 46.0% to City of Bend Streets for maintenance and preservation (this share is captured in the O&M section—see page 30)
- 29.8% to projects awarded MPO funding (captured in these projections of capital funding)
- 24.4% to stay with the MPO for planning and staffing (excluded from both O&M and capital funding projections)

Revenue estimates

STBG allocations assumed to be available for capital amount to approximately $5.9 million over the forecast period.

Figure 6: STBG Allocation to City for Capital, FY 2025-2045

FYE	STBG Allocation to City (2023 $)	Share for Capital (2023 $)	Share for Capital (YOE)
2025	$1,379,000	$385,102	$410,942
2026	$1,379,000	$372,804	$410,942
2027	$1,379,000	$360,887	$410,942
2028	$1,379,000	$349,351	$410,942

[1] Federal Highway Administration website, Bipartisan Infrastructure Law Fact Sheets: Surface Transportation Block Grant (STBG). Updated as of October 26, 2022. https://www.fhwa.dot.gov/bipartisan-infrastructure-law/stbg.cfm

FYE	STBG Allocation to City (2023 $)	Share for Capital (2023 $)	Share for Capital (YOE)
2029	$1,379,000	$338,196	$410,942
2030	$1,379,000	$327,392	$410,942
2031	$1,379,000	$316,938	$410,942
2032	$1,379,000	$306,811	$410,942
2033	$1,379,000	$297,009	$410,942
2034	$1,379,000	$287,513	$410,942
2035	$1,379,000	$278,322	$410,942
2036	$1,379,000	$269,435	$410,942
2037	$1,379,000	$260,833	$410,942
2038	$1,379,000	$252,499	$410,942
2039	$1,379,000	$244,434	$410,942
2040	$1,379,000	$236,622	$410,942
2041	$1,379,000	$229,065	$410,942
2042	$1,379,000	$221,747	$410,942
2043	$1,379,000	$214,658	$410,942
2044	$1,379,000	$207,798	$410,942
2045	$1,379,000	$201,156	$410,942
Total	**$28,959,000**	**$5,958,572**	**$8,629,782**

MISCELLANEOUS

Smaller revenue sources include investment income, sale of capital assets, interfund transfers, loan repayments, and other miscellaneous sources. Because of the fluctuations in this kind of revenue, the revenue projections do not include any estimates of this kind of revenue.

DESCHUTES COUNTY

Overview

Deschutes County is responsible for building and maintaining an extensive roadway network. According to the County's 2023 TSP, the County's transportation capital funding comes from the following sources:

- County Transportation SDCs
- Secure Rural Schools (SRS), Payment in Lieu of Taxes (PILT), Federal Lands Access Program (FLAP) to County
- State Highway Fund (SHF) County allocations
- STBG allocations to County

However, for purposes of estimating revenue for the BMPO, the specific sources are less relevant than the amount the County is likely to spend on capital projects specifically within the BMPO boundary. The vast majority of the County road network is in unincorporated areas of the County. Only a small portion of the BMPO is in unincorporated Deschutes County, with the bulk of the BMPO located within the city limits of Bend.

Limitations on use of funds

Only a small fraction of the County's transportation expenditures occur within the BMPO, and those expenditures are focused on the unincorporated areas of the BMPO, which are generally located east and south of the City of Bend.

Projection assumptions

The Deschutes County budget does not show a distinction between expenditures in the BMPO and expenditures elsewhere in the County. The total estimated county expenditures on capital projects within the BMPO boundary is based on the location of planned County projects relative to the boundary. County staff confirmed capital projects occurring within BMPO boundaries in the present Deschutes Capital Improvement Plan (CIP). Because construction timing is uncertain, for purposes of converting these expenditures to YOE dollars and forecasting over time, the total estimated cost of all projects was spread linearly over the portion of the planning period for the MTP that overlaps with the planning period of the County's TSP (2025–2040).

Revenue estimates

The County is estimated to spend roughly $20.1 million (in 2023 dollars) of County-controlled transportation funds on capital projects within the BMPO over the planning period, based on the projects listed in Figure 8.

Figure 7: Deschutes County TSP cost estimates for projects in the MPO

Project Name	Estimated Cost (2023 $)	Priority
2nd/Cook Sidewalks (Tumalo)	$1,700,000	Medium
4th Sidewalks (Tumalo)	$300,000	High
5th Sidewalks (Tumalo)	$500,000	Medium
Cooley (UGB -Deschutes Market)	$2,900,000	Low
7th Street (Tumalo)	$300,000	High
10th Street (Tumalo)	$400,000	Low
Bailey US 20 to Tumalo Reservoir Rd.	$1,300,000	Low
Baker Rd. at Brookswood	$1,400,000	Low
Baker Rd. at Cinder Butte	$1,200,000	Medium
Bear Creek Rd.: City Limits to US 20	$3,200,000	Low
China Hat: Knott to Deschutes NF Boundary	$900,000	Low
Cinder Butte at Cheyenne	$200,000	Medium
Cinder Butte: Baker to Minnetonka	$1,300,000	Low
Cline Falls Hwy. at Cook Ave//Tumalo Rd.	$1,800,000	Medium
Old Deschutes Rd. at Pilot Butte Canal	$400,000	Low
Rickard Rd.: Knott/27th to Bozeman Trail	$2,300,000	Medium
Total	**$20,100,000**	

Figure 8. Projected County Capital Expenditures in BMPO

Year	Amount (2023 $)	Amount (YOE $)
2025	$1,256,250	$1,340,544
2026	$1,256,250	$1,384,764
2027	$1,256,250	$1,430,492
2028	$1,256,250	$1,477,727

Year	Amount (2023 $)	Amount (YOE $)
2029	$1,256,250	$1,526,469
2030	$1,256,250	$1,576,845
2031	$1,256,250	$1,628,854
2032	$1,256,250	$1,682,621
2033	$1,256,250	$1,738,148
2034	$1,256,250	$1,795,558
2035	$1,256,250	$1,854,853
2036	$1,256,250	$1,916,033
2037	$1,256,250	$1,979,222
2038	$1,256,250	$2,044,547
2039	$1,256,250	$2,112,008
2040	$1,256,250	$2,181,729
2041		
2042		
2043		
2044		
2045		
Total	**$20,100,000**	**$27,670,414**

BEND PARKS AND RECREATION DISTRICT (BPRD)

PARK AND TRAIL SDCS

Overview

The Bend Parks and Recreation Department collects SDCs on new development to fund park and trail projects needed to support growth.

Limitations on use of funds

Similar to the City's TSDC, Parks and Trails SDCs must be used to fund growth-related, capacity-increasing capital improvements that are on an adopted SDC project list. Because these SDCs are for parks and trails, the only transportation facilities that they can be applied to are trail projects.

Projection assumptions

Parks and Trails SDC revenue varies widely from year to year based on development activity. Revenue averaged approximately $8 million per year from FYE 2014–2023.[2] This revenue funds a mix of parks and trails projects that can vary over time depending on the District's needs and priorities. The current SDC project list, which covers 2019-2028, includes roughly $7.8 million in trails projects[3] out of a project list that totals roughly $72.5 million.[4] While the revenue collection will continue to be variable from year to year, this revenue source is expected to continue and will generally grow with population growth rates on average. SDC rates are also subject to change, but annual increases in the rate are not assumed. The share of revenue spent on trails is also uncertain over time, but for purposes of this analysis, the relative share of spending on trails compared to parks and other projects is assumed to remain roughly constant over time (roughly 10.8 percent).

Revenue estimates

Figure 9: BPRD SDC Revenue Forecast for Trail Projects, FY 2025 - 2045

FYE	2023 $	YOE
2025	$862,788	$808,536
2026	$877,516	$796,078
2027	$892,496	$783,785
2028	$907,731	$771,683
2029	$923,226	$759,795
2030	$938,986	$748,077
2031	$955,015	$736,553
2032	$971,317	$725,188
2033	$987,898	$714,005

[2] Per email communication with BPRD staff
[3] Per email communication with BPRD staff; excludes trail improvements inside parks.
[4] Bend Parks and Recreation District, "Methodology Report: Parks System Development Charges," prepared by Galardi Rothstein Group, March 21, 2019.

FYE	2023 $	YOE
2034	$1,004,761	$702,975
2035	$1,021,913	$692,119
2036	$1,039,357	$681,456
2037	$1,057,099	$670,961
2038	$1,075,144	$660,611
2039	$1,093,497	$650,427
2040	$1,112,164	$640,389
2041	$1,131,149	$630,518
2042	$1,150,458	$620,795
2043	$1,170,096	$611,208
2044	$1,190,070	$601,775
2045	$1,210,385	$592,484
Total	**$21,573,069**	**$14,599,417**

STATE AND FEDERAL

The State of Oregon provides substantial funding for transportation, administered through the Oregon Department of Transportation (ODOT). Some State funding for transportation is allocated to local jurisdictions to be spent by cities and counties on transportation projects. These allocations to local jurisdictions are captured under the subsections of this chapter for the City of Bend and Deschutes County, and these pass-through revenues are not captured here, to avoid double counting. Instead, this section reflects only those State revenues that are spent directly by the State on transportation projects. These projects are typically captured in ODOT's Statewide Transportation Improvement Program (STIP). The STIP is Oregon's four-year transportation capital improvement program. This program identifies which projects and programs will be funded over the four-year program period. Projects at all jurisdiction levels are included in the program: Federal, state, county, and city.

STATE HIGHWAY FUND: MODERNIZATION PROGRAM

Overview

The State Highway Fund (SHF) is composed of several major funding sources: Motor Vehicle Registration and Title Fees, Driver License Fees, Motor Vehicle Fuel Taxes, and Weight-Mile Tax. The SHF funds are apportioned to ODOT, Counties and Cities.

Limitations on use of funds

State law (ORS 366.507) requires ODOT to allocate a certain share of SHF revenues to "modernization" projects on or off the state highway system. These projects are selected by the Oregon Transportation Commission (OTC), and are intended to increase highway safety and support economic development.

Projection assumptions

ODOT uses an agreed upon formula to allocate modernization revenues to each of the five ODOT regions across the State. The formula is based on population, vehicle miles traveled (VMT), ton miles traveled, vehicle registrations, and revenue estimates. The BMPO is located in Region 4. Region 4 receives about 9.9% of the State's revenues.

There is no agreed upon formula for how Region 4 allocates ODOT revenue for modernization projects in different municipalities within the Region. Instead, it is a political process, where local representatives meet with ODOT Region 4 staff to discuss modernization needs. Funding decisions are ultimately made by the three Area Commissions on Transportation (ACTs) within Region 4. Through discussions with staff from ODOT Region 4 and the BMPO, it was decided that the same formula (population, VMT, etc.) could be used to estimate the likely allocation of funds between Region 4 counties. The analysis assumes that 50% of funding for projects in Deschutes County would likely be allocated to projects in the BMPO, as the BMPO area has a little more than 50% of the total County population. Based on these assumptions, it is estimated that the BMPO would receive a 1.93% share of future State revenue for modernization.

However, based on the terms of a 2017 Settlement Agreement between ODOT and the Association of Oregon Center for Independent Living (AOCIL), a disability rights advocacy organization, ODOT has committed to a major investment in upgrading existing facilities on the state highway system to provide curb ramps and pedestrian signals that meet the needs of those with disabilities.[5] These investments will consume most or all of the available modernization funds for some time. Until all bonds are sold to pay for these projects, it will be difficult to know how long to assume modernization funds will be needed for repayment,

[5] ODOT 2021 Annual Settlement Agreement FAQs - May 23, 2022.

but ODOT staff estimate at least 10 years. As a result, no funding is assumed for other modernization projects in the BMPO for the next 10 years.

Revenue estimates

Figure 10 shows these revenue forecasts, which amount to $0 through 2035 and just over $6 million in 2023 dollars over the remaining forecast period.

Figure 10: SHF Modernization Fund Distributions, FY 2025-2045

FYE	SHF for Modernization (2023 $)	BMPO Share (2023 $)	SHF for Modernization (YOE)	BMPO Share (YOE)
2025	$52,250,714	$0	$55,756,737	$0
2026	$50,650,118	$0	$55,831,625	$0
2027	$55,629,725	$0	$63,345,568	$0
2028	$53,644,965	$0	$63,102,572	$0
2029	$51,305,783	$0	$62,341,657	$0
2030	$49,045,755	$0	$61,562,232	$0
2031	$47,018,113	$0	$60,963,685	$0
2032	$45,278,025	$0	$60,645,387	$0
2033	$43,369,966	$0	$60,006,685	$0
2034	$41,521,657	$0	$59,346,905	$0
2035	$39,732,715	$0	$58,665,353	$0
2036	$38,002,432	$740,194	$57,961,310	$1,128,945
2037	$36,327,536	$707,572	$57,234,033	$1,114,779
2038	$34,705,226	$675,973	$56,482,756	$1,100,146
2039	$33,135,074	$645,390	$55,706,687	$1,085,030
2040	$31,614,561	$615,774	$54,905,008	$1,069,415
2041	$30,143,185	$587,116	$54,076,873	$1,053,285
2042	$28,718,654	$559,369	$53,221,410	$1,036,623
2043	$27,338,966	$532,496	$52,337,716	$1,019,411
2044	$26,003,672	$506,488	$51,424,861	$1,001,631
2045	$24,710,892	$481,308	$50,481,881	$983,264

Total	**$840,147,734**	**$6,051,680**	**$1,205,400,941**	**$10,592,529**

FEDERAL FUNDING PROGRAMS

Overview

To avoid double-counting STIP expenditures funded by the SHF, STBG, local match contributions, or other funding streams that are already accounted for elsewhere, this analysis isolates specific federal funding programs that have historically accounted for a share of funding for STIP projects in the BMPO. This includes the National Highway Performance Program (NHPP) and Highway Safety Improvement Program (HSIP).

Limitations on use of funds

Each program has its own eligibility criteria.

Projection assumptions

Funding amounts and sources were identified from a report provided by ODOT that lists funding amounts for projects within the Bend MPO for years 2017-2027. This list was filtered for relevant project types that correspond to the types of projects that would be included in the MTP, and the federal funding amounts were isolated. Dollar values from prior years were converted to 2023 dollars. While the funding amounts over time are highly variable, over a 10-year period, the BMPO received roughly $24 million (in 2023 dollars) of federal funding as shown in Figure 11. This excludes earmarks, which are addressed in the next section.

Figure 11: Federal funding for BMPO STIP projects in relevant project categories, 2017-2027

Year	Highway Safety Improvement Program	National Highway Performance Program	Other	Total	Converted to 2023 $
2018			$242,271	$242,271	$286,542
2020		$1,041,122		$1,041,122	$1,151,429
2021		$10,978,716		$10,978,716	$11,740,686
2022		$717,840		$717,840	$742,337

Year	Highway Safety Improvement Program	National Highway Performance Program	Other	Total	Converted to 2023 $
2023		$49,352		$49,352	$49,352
2024		$4,571,848	$4,264,562	$8,836,410	$8,554,124
2025	$481,543	$420,322	$0	$901,865	$845,155
2026	$968,962		$0	$968,962	$879,036
Total	**$1,450,505**	**$17,779,199**	**$4,506,833**	**$23,736,537**	**$24,248,661**

This analysis assumes a similar annual average amount (in 2023 dollars) of federal funding during the course of the planning period.

Revenue estimates

The annual estimated contribution is forecasted to be $2.4 million as seen in Figure 12, with a total of $50.9 million over the forecast period in 2023 dollars. We assumed this amount would keep pace with inflation, contributing $76.6 million in YOE dollars over the forecast period.

Figure 12: Forecasted funding from federal programs, FY 2025 - 2045

FYE	2023 $	YOE
2025	$2,424,866	$2,587,575
2026	$2,424,866	$2,672,930
2027	$2,424,866	$2,761,195
2028	$2,424,866	$2,852,370
2029	$2,424,866	$2,946,455
2030	$2,424,866	$3,043,692
2031	$2,424,866	$3,144,081
2032	$2,424,866	$3,247,866
2033	$2,424,866	$3,355,045
2034	$2,424,866	$3,465,861
2035	$2,424,866	$3,580,315

FYE	2023 $	YOE
2036	$2,424,866	$3,698,406
2037	$2,424,866	$3,820,377
2038	$2,424,866	$3,946,470
2039	$2,424,866	$4,076,685
2040	$2,424,866	$4,211,265
2041	$2,424,866	$4,350,210
2042	$2,424,866	$4,493,762
2043	$2,424,866	$4,642,164
2044	$2,424,866	$4,795,415
2045	$2,424,866	$4,953,759
Total	**$50,922,188**	**$76,645,895**

MAJOR PROJECT GRANTS, EARMARKS, ETC.

Overview

The state legislature sometimes makes specific funding allocations to major projects as part of a supplemental transportation funding package. This type of project-specific, legislatively-directed funding is sometimes referred to as an "earmark."

There are also major federal competitive grant programs that fund larger projects. These tend to change over time based on federal legislation. Current programs include:

- INFRA: the Nationally Significant Multimodal Freight & Highway Projects program
- RAISE: the Rebuilding American Infrastructure with Sustainability and Equity discretionary grant program

Limitations on use of funds

These funds are typically awarded to specific major projects of regional, statewide, or national significance.

Projection assumptions

The Hawthorne Bridge project was awarded roughly $5 million in state lottery bonds as part of Oregon House Bill (HB) 5030 passed in 2023 and received $18.6 million through a RAISE grant. The RAISE grant is accounted for in the projection since funding is estimated to be available in 2026.

In addition, based on the strong history of discretionary funding for major projects in the BMPO through earmarks and major project grants, this analysis projects additional revenue from similar discretionary funding opportunities during the planning horizon based on historic trends, with some adjustments (discussed further below). Figure 13 shows the history of earmarks and major federal grants for projects in the BMPO.

Figure 13: Historical Federal and State Grants and Earmarks, 2003 - 2026

Funding Entity	Funding Source	Year	Amount	Project
State	Oregon Transportation Investment Act (OTIA) III—increased vehicle registration and title transaction fees	2003	$4,600,000	Newport Avenue bridge replacement
State	OTIA III—increased vehicle registration and title transaction fees	2003	$15,000,000	US97/Cooley Rd interchange
State	HB2001—multiple vehicle-related fee increases	2009	$25,000,000	US97/Murphy Rd area improvements
State	HB2017—increases in gas tax, vehicle registration fees, and payroll taxes; new tax on new car sales	2017	$50,000,000	US97 North Corridor improvements
FHWA	INFRA grant	2019	$60,400,000	US97 North Corridor improvements
Federal Railroad Admin	Consolidated Rail Infrastructure and Safety Improvements (CRISI) Program	2024	$1,000,000	Reed Market Rd Rail Overcrossing
State	HB5030 – lottery bonds	2023-2025	$5,000,000	Hawthorne bike/ped bridge
FHWA	RAISE grant	2026	$18,600,000	Hawthorne bike/ped bridge

Over a little more than 20 years, the BMPO received eight allocations of discretionary funding for major projects. The revenue projection conservatively assumes the BMPO will receive a total of four grants within the planning horizon (21 years). The grant amounts historically have been larger than is likely going forward. The estimated average grant

amount is conservatively assumed at 60% of the historical average based on input from BMPO and ODOT staff.

Revenue estimates

Figure 14 shows the committed funding (in 2026) and estimated future amounts.

Figure 14: Forecasted Federal and State Grants and Earmarks, FYE 2025 - 2045

FYE	2023 $	YOE
2025		$0
2026	$16,859,403	$18,584,120
2027	$0	$0
2028	$0	$0
2029	$0	$0
2030	$0	$0
2031	$18,399,962	$23,857,391
2032	$0	$0
2033	$0	$0
2034	$0	$0
2035	$0	$0
2036	$15,642,140	$23,857,391
2037	$0	$0
2038	$0	$0
2039	$0	$0
2040	$0	$0
2041	$13,298,434	$23,857,391
2042	$0	$0
2043	$0	$0
2044	$0	$0
2045	$0	$0
Total	**$64,199,939**	**$90,156,294**

O&M REVENUES

CITY OF BEND

The City of Bend owns and maintains most of the roadway network in the BMPO. Thus, the City of Bend has primary responsibility for funding transportation operations and maintenance in the BMPO. The City's available and committed funding sources for transportation operations and maintenance include:

- State Highway Fund allocations
- General Fund allocations
- Garbage franchise fees
- A newly-adopted Transportation Utility Fee
- Surface Transportation Block Grant funding

The assumptions and revenue estimates for each of these sources are provided below.

STATE HIGHWAY FUND: CITY ALLOCATION

Overview

The City of Bend receives an annual allocation from the State Highway Fund that is proportional to the City's population.

Limitations on Use

SHF allocations are flexible, but the City of Bend has historically directed these revenues to its Streets & Operations Fund for O&M.

Projection assumptions

Total SHF revenue is forecast by ODOT in the agency's Long-Range Revenue tables, along with estimates of the share that will be allocated to the state, counties, and cities based on required splits based in statute. The City of Bend's share of the overall City allocation pool is estimated based on Bend's current population as a share of the population in all cities in Oregon, according to the most recent available population estimates from Portland State

University (PSU). Given that Bend has been growing much faster than other cities in the state, assuming the same share of City SHF funding over the planning horizon is a conservative estimate.

Revenue estimates

SHF revenues are estimated at slightly over $8 million in 2025, and are projected to increase over time in constant 2023 dollars, as shown in Figure 16.

Figure 15. Allocation of projected State Highway Fund revenues to the City of Bend, FYE 2025 to 2045

FYE	2023 $	YOE $
2025	$8,067,859	$8,893,201
2026	$8,342,095	$9,195,491
2027	$8,349,917	$9,508,050
2028	$8,357,753	$9,831,225
2029	$8,365,877	$10,165,377
2030	$8,373,868	$10,510,879
2031	$8,382,011	$10,868,115
2032	$8,389,940	$11,237,485
2033	$8,397,947	$11,619,399
2034	$8,405,713	$12,014,285
2035	$8,413,533	$12,422,581
2036	$8,421,678	$12,844,744
2037	$8,429,859	$13,281,243
2038	$8,437,829	$13,732,566
2039	$8,445,881	$14,199,215
2040	$8,453,797	$14,681,710
2041	$8,461,867	$15,180,590
2042	$8,469,895	$15,696,410
2043	$8,477,719	$16,229,745
2044	$8,485,634	$16,781,190
2045	$8,493,494	$17,351,359

Total	**$168,356,307**	**$257,351,659**

GENERAL FUND

Overview

General Fund (GF) dollars are flexible and may be used for many purposes, including a wide range of non-transportation purposes. The City of Bend allocates a portion of its flexible General Fund resources to transportation O&M expenditures.

Limitations on use of funds

The allocation of these revenues to transportation and to specific transportation expenditures is determined by City Council each biennium through the budget process.

Projection assumptions

The current GF allocation of 8% is considered unsustainable. Therefore, over the forecast period, with the implementation of the Transportation Utility Fee (TUF) (see below), the General Fund subsidy to O&M expenses is expected to be held constant at $3 million annually in YOE dollars.

Revenue estimates

Figure 16: General Fund Allocation Forecast

FYE	2023 $	YOE
2025	$2,811,358	$3,000,000
2026	$2,721,582	$3,000,000
2027	$2,634,583	$3,000,000
2028	$2,550,370	$3,000,000
2029	$2,468,933	$3,000,000
2030	$2,390,057	$3,000,000
2031	$2,313,744	$3,000,000
2032	$2,239,809	$3,000,000
2033	$2,168,257	$3,000,000
2034	$2,098,930	$3,000,000

2035	$2,031,832	$3,000,000
2036	$1,966,955	$3,000,000
2037	$1,904,157	$3,000,000
2038	$1,843,318	$3,000,000
2039	$1,784,440	$3,000,000
2040	$1,727,414	$3,000,000
2041	$1,672,241	$3,000,000
2042	$1,618,821	$3,000,000
2043	$1,567,071	$3,000,000
2044	$1,516,990	$3,000,000
2045	$1,468,501	$3,000,000
Total	**$49,265,819**	**$68,956,750**

GARBAGE FRANCHISE FEES

Overview

Garbage franchise fees are a charge on revenue generated by garbage waste franchises that operate within the City of Bend.

Limitations on use of funds

All revenues are used by the City for operations, maintenance and preservation, though this is at the City's discretion.

Projection assumptions

Rates were raised 12 percent in 2023 and expected to grow annually at 3 percent, not quite keeping pace with inflation. The average annual contribution is expected to be approximately $1.2 million in 2023 dollars.

Revenue estimates

Figure 17: Garbage Franchise Fees Forecast, FY 2024-2045

FYE	2023 $	YOE
2025	$1,328,507	$1,417,650
2026	$1,324,666	$1,460,180
2027	$1,320,791	$1,503,985
2028	$1,316,930	$1,549,104
2029	$1,313,124	$1,595,578
2030	$1,309,309	$1,643,445
2031	$1,305,528	$1,692,748
2032	$1,301,725	$1,743,531
2033	$1,297,945	$1,795,837
2034	$1,294,138	$1,849,712
2035	$1,290,351	$1,905,203
2036	$1,286,624	$1,962,359
2037	$1,282,913	$2,021,230
2038	$1,279,181	$2,081,867
2039	$1,275,472	$2,144,323
2040	$1,271,752	$2,208,653
2041	$1,268,067	$2,274,912
2042	$1,264,386	$2,343,159
2043	$1,260,684	$2,413,454
2044	$1,257,007	$2,485,858
2045	$1,253,333	$2,560,434
Total	**$28,474,797**	**$42,070,870**

TRANSPORTATION UTILITY FEE (TUF)

Overview

A TUF applies the same concept as water and sewer utility fees to collect revenues for transportation projects. Fees are assessed to all businesses and households in the jurisdiction.

Limitations on use of funds

Funds are restricted to the City's Transportation and Mobility Department. The City of Bend has stated that it will use the funds for operations and maintenance of the City transportation system, such as "pavement restoration, street preservation, signs, striping, sidewalk and other concrete work, bicycle and multi-modal system enhancement, street sweeping and cleaning, winter operations such as snow removal and implementation of programs identified in the Transportation System Plan."[6]

Projection assumptions

The City is phasing in the TUF, and has set revenue targets for the first three years at $5 million for FY 2024-2025, $10 million for FY 2025-2026, and $15 million for 2026-2027.[7] Whether and how TUF rates will be adjusted going forward once fully phased in is not yet clear. For purposes of this analysis, rates are assumed to adjust with inflation, and revenues are assumed to grow with overall population growth.

Revenue estimates

Figure 18: TUF Projected Revenue for O&M, FY 2025-2045

FYE	2023 $	YOE
2025	$4,685,596	$5,000,000
2026	$9,071,940	$10,000,000
2027	$13,172,916	$15,000,000
2028	$13,397,521	$15,759,504
2029	$13,626,421	$16,557,464
2030	$13,859,009	$17,395,828
2031	$14,095,821	$18,276,641
2032	$14,336,310	$19,202,053
2033	$14,581,037	$20,174,322
2034	$14,829,511	$21,195,820

[6] City of Bend website, "Transportation Fee," https://www.bendoregon.gov/services/utility-billing/rates-and-charges/transportation-fee. Accessed July 2024.
[7] City of Bend website, "Transportation Fee," https://www.bendoregon.gov/services/utility-billing/rates-and-charges/transportation-fee. Accessed July 2024.

FYE	2023 $	YOE
2035	$15,082,317	$22,269,041
2036	$15,340,023	$23,396,602
2037	$15,602,194	$24,581,256
2038	$15,868,445	$25,825,894
2039	$16,139,395	$27,133,552
2040	$16,414,706	$28,507,421
2041	$16,695,013	$29,950,854
2042	$16,980,020	$31,467,373
2043	$17,269,473	$33,060,679
2044	$17,564,047	$34,734,660
2045	$17,863,528	$36,493,401
Total	**$301,789,647**	**$470,982,365**

SURFACE TRANSPORTATION BLOCK GRANT (STBG) ALLOCATIONS TO CITY

Overview

As described above, STBG allocations are a major federal transportation program that provides flexible funds for transportation projects at the state and local level.

Limitations on use of funds

Funds may be used to preserve and improve the conditions and performance of any Federal-aid highway, bridge, and tunnel projects and on any public road, pedestrian, and bicycle infrastructure. The MPO has historically provided the majority of STBG funds to the City of Bend to improve the Pavement Condition Index to an acceptable level.

Projection assumptions

As noted in the capital section on STBG (see page 10), the City of Bend is expected to receive a constant $1,379,000 per year (in 2023 dollars) from the STBG program going forward, of which approximately 46 percent is estimated to be allocated to O&M—roughly

$594,000 per year. This amount will decline over time in 2023 dollars over the course of the forecast period.

Revenue estimates

Figure 19: STBG Allocations to City of Bend for O&M, FY 2025-2045

FY	STBG Allocation to City	Share for O&M (2023 $)	Share for O&M (YOE)
2025	$1,379,000	$594,452	$634,340
2026	$1,379,000	$575,469	$634,340
2027	$1,379,000	$557,074	$634,340
2028	$1,379,000	$539,267	$634,340
2029	$1,379,000	$522,048	$634,340
2030	$1,379,000	$505,370	$634,340
2031	$1,379,000	$489,233	$634,340
2032	$1,379,000	$473,600	$634,340
2033	$1,379,000	$458,471	$634,340
2034	$1,379,000	$443,812	$634,340
2035	$1,379,000	$429,624	$634,340
2036	$1,379,000	$415,906	$634,340
2037	$1,379,000	$402,628	$634,340
2038	$1,379,000	$389,763	$634,340
2039	$1,379,000	$377,314	$634,340
2040	$1,379,000	$365,256	$634,340
2041	$1,379,000	$353,590	$634,340
2042	$1,379,000	$342,294	$634,340
2043	$1,379,000	$331,352	$634,340
2044	$1,379,000	$320,763	$634,340
2045	$1,379,000	$310,510	$634,340
Total	**$28,959,000**	**$9,197,795**	**$13,321,140**

COUNTY

Overview

The County has multiple funding sources for O&M, but for purposes of estimating O&M revenue for the BMPO, the specific sources are less relevant than the amount the County is likely to spend specifically within the BMPO boundary.

Limitations on use of funds

As noted previously, the vast majority of the County road network is in unincorporated areas of the County. Only a small portion of the BMPO is in unincorporated Deschutes County, with the bulk of the BMPO located within the city limits of Bend.

Projection assumptions

To estimate County expenditures on operations and maintenance within the BMPO, the analysis assumes a share of the County's total transportation O&M budget based on the share of total lane miles of County-owned roads in the BMPO. In total, according to County staff, the County owns 137.4 lane miles within the BMPO, which represents 8% of the county's total road mileage.

Based on historical budget information for Deschutes County transportation operations, maintenance and administration, annual average expenditures (excluding beginning working capital) averaged $25.6 million between 2021 and 2024. This amount was assumed to grow with inflation, keeping a constant annual amount in 2023 dollars.

Revenue estimates

Based on the total County O&M budget and the 8% of County roads located in the BMPO, the County is estimated to spend an average of $2.1 million per year on O&M in the BMPO.

Figure 20: Estimated O&M expenditure on Deschutes County roads in BMPO, FY 2025–2045

FYE	2023 $	YOE
2025	$2,622,449	$2,798,415
2026	$2,622,449	$2,890,726
2027	$2,622,449	$2,986,183
2028	$2,622,449	$3,084,787

FYE	2023 $	YOE
2029	$2,622,449	$3,186,538
2030	$2,622,449	$3,291,698
2031	$2,622,449	$3,400,268
2032	$2,622,449	$3,512,508
2033	$2,622,449	$3,628,421
2034	$2,622,449	$3,748,267
2035	$2,622,449	$3,872,046
2036	$2,622,449	$3,999,759
2037	$2,622,449	$4,131,669
2038	$2,622,449	$4,268,036
2039	$2,622,449	$4,408,861
2040	$2,622,449	$4,554,407
2041	$2,622,449	$4,704,674
2042	$2,622,449	$4,859,923
2043	$2,622,449	$5,020,417
2044	$2,622,449	$5,186,155
2045	$2,622,449	$5,357,401
Total	**$55,071,432**	**$82,891,159**

STATE AND FEDERAL

STATE HIGHWAY FUND: OPERATIONS, MAINTENANCE, AND PROGRAMS

Overview

The State of Oregon is responsible for operations and maintenance of state highways. In addition to the Modernization component discussed in the Capital section (see page 16), the SHF is used for operations and maintenance.

Limitations on use of funds

Fund uses included with OM&P include preservation, maintenance, traditional operations, central services (i.e., administration), safety, ITS, and Bridge programs, as well as non-modernization related debt service, and a few other smaller programs. State policy generally requires operations and maintenance to be fully funded, before spending resources on capital projects. However, given the high costs for operations and maintenance and the relatively low level of revenues, this policy would result in virtually no resources available for capital projects statewide. Thus, ORS 366.507 requires that a certain portion of revenues be set aside to fund debt service and modernization projects, regardless of whether State highway funds are sufficient to cover all operations and maintenance needs. This often results in a gap for non-modernization highway uses.

Projection assumptions

ODOT does not track state expenditures on operations and maintenance at the local level; this analysis does not include a specific forecast for State expenditures on operations and maintenance of state highways within the BMPO. However, the State's ability to fully fund its OM&P costs in the BMPO is likely comparable to its ability to fund those costs statewide. ODOT provides long-range projections of OM&P revenues and costs statewide, which serve as the basis for estimating the adequacy of funding for OM&P from the State.

Revenue estimates

Figure 20 shows projected trends in:

- **Total State Highway Fund revenue available to the state**, including funds available to the state under current law, new revenues assumed from future legislative action based on past trends, and Federal Highway funds available to the state
- The total **amount reserved for Modernization and debt service (DS)** under ORS 366.507 plus debt service on prior projects and amounts obligated to federal modernization projects
- **Non-modernization state needs**, including Pavement Preservation, Maintenance, Safety Construction, Traditional Operations, ITS, Bridge, Central Services (Hwy. Portion), and Other
- The **funding gap for State non-modernization needs**, and the share of State non-modernization needs that is funded

Overall, based on the projected trends, only about 60 percent of non-modernization funding needs on the State system are expected to be funded in the near-term, though the

assumed additional revenue over time would close the gap such that the non-modernization needs would be roughly 84 percent funded by 2045.

Figure 21. Projected annual funding, needs, and funding gap for ODOT non-modernization highway uses, FYE 2025 to 2045, millions (YOE $)

Fiscal Year	State Share of Statewide Highway User Fee Revenue Under Current Law	Assumed New Revenue Available for O,M&P	Federal Highway Funds Available to State	Total Highway Funds Available to State	Non-Modernization State Needs	Total reserved for DS & Modernization	Non-modernization gap	Non-modernization % funded
2025	838.7	0.0	610.8	1,449.6	2,034.5	261.5	-846.4	**58%**
2026	866.0	27.6	616.9	1,510.6	2,097.3	240.5	-827.2	**61%**
2027	894.2	55.7	538.1	1,488.1	2,171.1	211.8	-894.9	**59%**
2028	923.3	89.4	555.9	1,568.6	2,251.9	198.7	-882.0	**61%**
2029	953.3	121.4	574.2	1,649.0	2,329.9	180.1	-861.0	**63%**
2030	984.4	149.8	593.2	1,727.4	2,402.7	182.3	-857.5	**64%**
2031	1,016.4	182.3	612.8	1,811.5	2,477.8	185.4	-851.8	**66%**
2032	1,049.5	215.8	628.8	1,894.1	2,555.5	188.1	-849.5	**67%**
2033	1,083.6	250.4	649.5	1,983.6	2,629.6	190.8	-836.8	**68%**
2034	1,118.9	286.1	671.0	2,076.0	2,712.5	193.3	-829.8	**69%**
2035	1,155.3	323.0	693.1	2,171.4	2,798.1	195.9	-822.6	**71%**
2036	1,192.9	361.0	716.0	2,269.9	2,886.5	207.7	-824.3	**71%**
2037	1,231.7	400.3	739.6	2,371.6	2,977.9	210.6	-816.8	**73%**
2038	1,271.8	440.8	764.0	2,476.6	3,072.3	213.6	-809.2	**74%**
2039	1,313.2	482.7	789.2	2,585.1	3,110.6	216.7	-742.2	**76%**
2040	1,355.9	525.8	815.3	2,697.0	3,152.2	192.6	-647.8	**79%**
2041	1,400.1	570.4	842.2	2,812.6	3,256.2	195.9	-639.5	**80%**
2042	1,445.6	616.4	870.0	2,932.0	3,363.7	199.3	-631.0	**81%**
2043	1,492.7	663.9	898.7	3,055.2	3,474.7	202.8	-622.3	**82%**
2044	1,541.2	712.9	928.3	3,182.5	3,589.4	194.3	-601.2	**83%**
2045	1,591.4	763.5	959.0	3,313.9	3,707.8	198.1	-592.0	**84%**

Source: ODOT Long-Range Revenue Tables

TRANSIT FUNDING

OVERVIEW

Cascades East Transit (CET) is Oregon's largest non-transit district transit provider, and provides transportation services for people across the three Central Oregon counties of Deschutes, Jefferson, and Crook and for the Confederated Tribes of the Warm Springs. CET is administered by the Central Oregon Intergovernmental Council (COIC). Fixed-route transit was first established in the City of Bend in 2007. In addition to serving the City of Bend, CET provides regional transit services, connecting all of the cities in Central Oregon, including Madras, Sisters, Redmond, Prineville, La Pine and the Confederated Tribes of the Warm Springs. CET also operates seasonal recreation-based services including Ride the River, Lava Butte shuttle, Mt. Bachelor Ski Resort shuttle and summer Transit to Trails shuttle. In addition, paratransit (curb-to-burb) service is available to persons with disabilities and low-income seniors within Bend city limits.

CET relies on various revenue sources including federal grants, service contracts, state funding, local contributions, fares, one-time revenues, and advertising. While these sources fluctuate annually, the core funding comes from federal and state grants, service contracts, local city funding, and fare revenue, which are outlined below. CET's budget is divided into two geographies: The "urban" service area includes transit service within the BMPO, and the "rural" service area includes transit service elsewhere in CET's tri-county service area.

PROJECTION ASSUMPTIONS

Revenue estimates are based on the CET 2040 Master Plan.

Oregon HB 2017 created the Statewide Transportation Improvement Fund (STIF) to provide stable, long-term funding for public transportation services throughout Oregon. State and local funding is expected to remain stable due to the STIF. Fare and contract revenues are projected to increase with expanded services and population growth. CET's projections assume the following:

- 1.0% annual growth rate for non-STIF funding, including:
  - No growth in state and local funds
  - Annual growth of 3 percent in Bend fare revenues

- Increases of 2-5% in other fare and contract revenues.

Uncertainty remains due to the COVID-19 pandemic's impact on STIF revenue sources.

In addition to the existing funding sources, the future funding scenario that CET staff indicated is most appropriate to rely on for purposes of long-range revenue forecasting includes becoming a transit district with taxing authority, potentially levying a property tax based on assessed property values. The CET 2040 Master Plan forecasts revenue from this source through 2040, assuming a property tax rate of two tenths of one percent (0.02%) and an annual growth rate of 5.0% (a 3% annual increase in assessed property values and a 2% annual increase in growth).

REVENUE ESTIMATES

Figure 20 shows the revenue estimates for Scenario C2—the future funding scenario that CET staff indicated is most appropriate to rely on for purposes of long-range revenue forecasting—from the 2040 CET Transit Master Plan.

Figure 22. CET Revenue Estimates: Existing + STIF + 0.02% Property Tax (Within Incorporated Areas)

Fiscal Years (examples)	2024-2025	2029-2030	2039-2040
Estimated Revenues	$15,427,578	$17,986,054	$24,960,900

APPENDIX H: CONSULTATION TRACKER

Appendix H – Consultation Tracker

In developing metropolitan transportation plans and TIPs, the MPO should consult with agencies and officials responsible for other planning activities within the MPA that are affected by transportation (including State and local planned growth, economic development, tourism, natural disaster risk reduction, environmental protection, airport operations, or freight movements) or coordinate its planning process (to the maximum extent practicable) with such planning activities. In addition, the MPO shall develop the metropolitan transportation plans and TIPs with due consideration of other related planning activities within the metropolitan area, and the process shall provide for the design and delivery of transportation services within the area that are provided by:

(1) Recipients of assistance under title 49 U.S.C. Chapter 53;

(2) Governmental agencies and non-profit organizations (including representatives of the agencies and organizations) that receive Federal assistance from a source other than the U.S. Department of Transportation to provide non-emergency transportation services; and

(3) Recipients of assistance under 23 U.S.C. 201-204.

(c) When the MPA includes Indian Tribal lands, the MPO shall appropriately involve the Indian Tribal government(s) in the development of the metropolitan transportation plan and the TIP.

(d) When the MPA includes Federal public lands, the MPO shall appropriately involve the Federal land management agencies in the development of the metropolitan transportation plan and the TIP.

(e) MPOs shall, to the extent practicable, develop a documented process(es) that outlines roles, responsibilities, and key decision points for consulting with other governments and agencies, as defined in paragraphs (b), (c), and (d) of this section, which may be included in the agreement(s) developed under § 450.314.

Chapter / Section	Topic	Contact	Details	Communication 2023-2024	Notes
Emergency Planning	emergency buses	Andrea Breault, CET	update of contingency plan info	email	received info needed
Emergency Planning	Emerg. routes and plans	Ashley Volz and Hayley Riach at Deschutes Co. , Sgt Garibay after	Asked for updates to 2019 info	Email 12.19.23, 12.26.23	Set time for phone call
Emergency Planning	ODOT plans	David Amiton	2019 info still current?	Email 12.19.23	referred me to Christina
		Christina LeClerc	Provided update to 2019 info	email 12.20.23	received info needed
Emergency Planning	City Emerg Mgmt Dept	Carrie Karl	New position, new department. She described what her position is currently doing and plans for future.	email 1.4.24, Teams meeting 1.22.24	received info needed
Emergency Planning	Emerg. routes and plans	Sgt Nathan Garibay, Emergency Services Manager	Recent efforts of Deschutes Co. re evacuation routes, other emergency planning	Phone call 1.12.24	received info needed
Env Considerations	Water quality	Drexell Barnes & Lori Faha COB Utilities	Lori coordinating updates to WQ plan section.	emails jan/feb 2024	responsive
Env Considerations	Wildlife crossings	Jennifer Lanzarotta ODOT and Cidney Bowman ODOT	updated collision data and crossing projects info	emails 1.26.24	received info needed
Env Considerations, BLM	Archeo Sensitve Lands	Kurt Hunt, Archaeologist, Deschutes Office BLM	Asked for updates to 2019 info	email 2.29.24 (to 2019 contact) and phone call w him on 3.5.24	received info needed

Tribal Consult	Tribal Outreach	Based on proceedures in BMPO tribal consult document			
		Klamath Tribes	Letters,emails, calls	Mar-23	no response.
		Burns-Paiute Tribe	Letters,emails, calls	Mar-23	no response.
		Warm Springs Tribes	Letters,emails, calls	Mar-23	no response.
		Klamath Tribes	Letter to tribal council	Dec. 2023	no response.
		Warm Springs Tribes	Letter to tribal council	Dec. 2023	no response.
		Burns-Paiute Tribe	Letter to tribal council	Dec. 2023	no response.
		Klamath Tribes, Staff	on email list for PB meetings	Since March 2023	no response.
Dechutes NF	Involvement	holly.jewkes@usda.gov	how can we involve you?	email 1.26.24	no response.
		kevin.larkin@usda.gov	how can we involve you?	email 1.26.24	no response.
		ian.reid2@usda.gov	how can we involve you?	email 1.26.24	no response.
		rithy.bein@usda.gov	correct contacts?	email 3.1.24	no response.
		amanda.warnerthorpe@usda.gov	correct contacts? TWIG rep	email 3.1.24	3.1.24 Responded saying to send her the project lists w map and she would make sure review deadline would be met.
		amanda.warnerthorpe@usda.gov	Sent Draft Project List for FS comment.	email 4.12.24	Included other FS staff, no response.
		amanda.warnerthorpe@usda.gov	Followed up for comments from April email.	email 5.20.24	no response.
Env Cons, Fish Passage	Rvw fish passage map w MTP project list overlay	sara.c.gregory@odfw.oregon.gov (541)464-2155 and charles.m.barr@odfw.oregon.gov (503) 947-6228	sent project lists and FP map w project overlays and asked for comments by 8.2	email 7.29.24, response from Mac Barr 7.30.24 & 7.31.24	From Mac Barr, ODFW: Thanks for including ODFW on this notification. As you may know, projects that involve road(or path) stream crossings where native migratory fish are present in the stream will require ODFW fish passage approval for the installation of a new culvert or bridge or other potential artificial obstruction. This also applies to the removal or modification of existing structures. Please contact Jerry George (CCed here) to confirm the presence of native migratory fish at such locations. Do to the presence of Redband Trout in the Deschutes River, all of the potential projects that involve new crossings or modification of existing crossings of the Deschutes should be reviewed by ODFW for fish passage approval. As further follow up to my email yesterday, it looks like the following projects may have nexus with fish passage and need fish passage approval. These appear to be projects that may install new or modify or repair crossings over the Deschutes, where native migratory fish (redband trout) are present: BikePed: BP-3, M-10, & M-1, Vehicle: C-6

Env Cons, Water Resources	Rvw water resources map w MTP project list overlay	Drexell Barnes and Lori Faha at COB Utilities	sent project lists and WR map w project overlays and asked for comments by 7.26	email 7.19.24, response from her on 7.24.24	Response from Lori Faha, COB: Thanks for the maps, that was very helpful. (I am adding Elisabeth O'Keefe onto this string in case you have more specific stormwater regulatory program related questions). Here's some comments about potential water resources issues/requirements for a few of these projects: ALL listed projects will need to comply with Title 16 of Bend Municipal Code which identifies requirements for managing stormwater/drainage and preventing eroded sediment and potential pollutants from entering drainage systems and potentially surface waters and/or groundwater. The requirements include erosion control requirements during the construction phase and permanent stormwater management facilities that include pre-treatment elements such as swales, sedimentation manholes, and other measures in the City Engineering Standards and the Central Oregon Stormwater Manual. Projects that are located across or adjacent to the river (or potentially irrigation canals) may also require permits from state and federal agencies related to protecting and mitigating impacts to water and natural resources. These agencies can include the OR Division of State Lands, OR DEQ, US Army Corps of Engrs, and others. These projects are also likely to trigger City Waterway Overlay Zone protective requirements (Development Code 2.7.600). Specific projects that are likely to have direct potential impact to the Deschutes River and therefore trigger ALL of the above requirements: Vehicle Project C-6 (Colorado) Bike/Ped Projects M1 (Galveston), M10 (Drake Park pedestrian bridge) Note: It is not clear on the maps which projects may cross irrigation canals (except for a few where the word "canal" is specifically included in the title such as M-34).

Env Cons, Wildlife Habitat	Rvw wildlif habitat map w MTP project list overlay	Jennifer Lanzarotta and Cidney Bowman at ODOT, and to Sara Gregory ODFW	sent project lists and WH map w project overlays and asked for comments by 7.26.	email to Cidney and Jennifer 7.22.24, they deferred and forwarded it on to Sara that same day. I resent to just Sara on 7.29. Called Sara, but it was another ODFW staff VM. Asked if they could call me back.	Sara Gregory called on 8/2 saying she would pass this on to other staff. No response from other ODFW staff.
Env Cons, Wildlife Habitat	Rvw wildlif habitat map w MTP project list overlay	Charles Barr, ODFW	Since he responded re fish passage, I asked if another wildlife staff could be contacted for comment since Sara hasn't responded to multiple emails and ph call.	email 8.1.24	

APPENDIX I: PUBLIC AND AGENCY COMMENT LOG ON DRAFT MTP

(TO BE INCLUDED IN FINAL DRAFT MTP)

APPENDIX J: FEDERAL REQUIREMENTS OVERVIEW

Appendix J: Federal Requirements Overview

The following federal regulations detail requirements of metropolitan transportation plans (MTPs) also known as Regional Transportation Plans. Where applicable, comments on how the plan meets the guidelines are included.

450.306 Scope of the metropolitan transportation planning process.

(a) To accomplish the objectives in § 450.300 and § 450.306(b), metropolitan planning organizations designated under § 450.310, in cooperation with the State and public transportation operators, shall develop long-range transportation plans and TIPs through a performance-driven, outcome-based approach to planning for metropolitan areas of the State.

This MTP update included the development of alternate future scenarios that were in line with federal, state, and local adopted targets. The preferred scenario the Policy Board adopted strives to address safety and congestion reduction through shifting trips to bicycle and transit modes. Details can be found in Appendix E: Refined Project List Scenario Evaluation Memorandum.

(b) The metropolitan transportation planning proce2024ss shall be continuous, cooperative, and comprehensive, and provide for consideration and implementation of projects, strategies, and services that will address the following 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; and

(10) Enhance travel and tourism.

These elements are captured in BMPO's goals and policies, identified in Chapter 2.

(i) Consideration of the planning factors in paragraph (b) of this section shall be reflected, as appropriate, in the metropolitan transportation planning process. The

degree of consideration and The State asset management plan for the NHS, as defined in 23 U.S.C. 119(e) and the Transit Asset Management Plan, as discussed in 49 U.S.C. 5326;

(ii) Applicable portions of the HSIP, including the SHSP, as specified in 23 U.S.C. 148;

(iii) The Public Transportation Agency Safety Plan in 49 U.S.C. 5329(d);

(iv) Other safety and security planning and review processes, plans, and programs, as appropriate;

(v) The Congestion Mitigation and Air Quality Improvement Program performance plan in 23

U.S.C. 149(l), as applicable;

(vi) Appropriate (metropolitan) portions of the State Freight Plan (MAP-21 section 1118);

(vii) The congestion management process, as defined in 23 CFR 450.322, if applicable; and

(viii) Other State transportation plans and transportation processes required as part of a performance-based program.

BMPO has opted to support the specific measures and targets established by ODOT (Safety, Infrastructure Condition, System Reliability) and Cascades East Transit (CET) (Transit Asset Mgmt, Transit Safety), as well as GHG Emissions. Bend MPO staff coordinate with CET and ODOT to meet federal reporting requirements.

(c) The failure to consider any factor specified in paragraph (b) or (d) of this section shall not be reviewable by any court under title 23 U.S.C., 49 U.S.C. Chapter 53, subchapter II of title 5, U.S.C. Chapter 5, or title 5 U.S.C. Chapter 7 in any matter affecting a metropolitan transportation plan, TIP, a project or strategy, or the certification of a metropolitan transportation planning process.

Noted.

(d) An MPO shall carry out the metropolitan transportation planning process in coordination with the statewide transportation planning process required by 23 U.S.C. 135 and 49 U.S.C. 5304.

BMPO collaborated closely with Oregon Department of Transportation staff during the development of this plan update.

(e) The metropolitan transportation planning process shall (to the maximum extent practicable) be consistent with the development of applicable regional intelligent transportation systems (ITS) architectures, as defined in 23 CFR part 940.

This plan update incorporated the 2020 Deschutes County ITS Plan.

(f) Preparation of the coordinated public transit-human services transportation plan, as required by 49 U.S.C. 5310, should be coordinated and consistent with the metropolitan transportation planning process.

Noted. The Central Oregon Coordinated Public Transit Human Services Transportation Plan (2018) is scheduled to be updated beginning fall of 2024.

(i) In an urbanized area not designated as a TMA that is an air quality attainment area, the MPO(s) may propose and submit to the FHWA and the FTA for approval a procedure for developing an abbreviated metropolitan transportation plan and TIP. In developing proposed simplified planning procedures, consideration shall be given to whether the abbreviated metropolitan transportation plan and TIP will achieve the purposes of 23 U.S.C. 134, 49 U.S.C. 5303, and this part, taking into account the complexity of the transportation problems in the area. The MPO shall develop simplified procedures in cooperation with the State(s) and public transportation operator(s).

Noted.

§ 450.324 Development and content of the metropolitan transportation plan.

(a) The metropolitan transportation planning process shall include the development of a transportation plan addressing no less than a 20-year planning horizon as of the effective date. In formulating the transportation plan, the MPO shall consider factors described in § 450.306 as the factors relate to a minimum 20-year forecast period. In nonattainment and maintenance areas, the effective date of the transportation plan shall be the date of a conformity determination issued by the FHWA and the FTA. In attainment areas, the effective date of the transportation plan shall be its date of adoption by the MPO.

The MTP horizon year is 2045.

(b) The transportation plan shall include both long-range and short-range strategies/actions that provide for the development of an integrated multimodal transportation system (including accessible pedestrian walkways and bicycle transportation facilities) to facilitate the safe and efficient movement of people and goods in addressing current and future transportation demand.

Chapter 5 identifies both operational and transit strategies to insure an integrated system over the planning period.

(c) The MPO shall review and update the transportation plan at least every 4 years in air quality nonattainment and maintenance areas and at least every 5 years in attainment areas to confirm the transportation plan's validity and consistency with current and forecasted transportation and land use conditions and trends and to extend the forecast period to at least a 20-year planning horizon. In addition, the MPO may revise the transportation plan at any time using the procedures in this section without a requirement to extend the horizon year. The MPO shall approve the transportation plan (and any revisions) and submit it for information purposes to the Governor. Copies of any updated or revised transportation plans must be provided to the FHWA and the FTA.

The MTP was last adopted in September 2019. The target adoption date for the 2045 Plan is September 2024. This is within five years, which is in line with this requirement as the Bend area is within attainment.

(d) In metropolitan areas that are in nonattainment for ozone or carbon monoxide, the MPO shall coordinate the development of the metropolitan transportation plan with the process for developing transportation control measures (TCMs) in a State Implementation Plan (SIP).

Not applicable

(e) The MPO, the State(s), and the public transportation operator(s) shall validate data used in preparing other existing modal plans for providing input to the transportation plan. In updating the transportation plan, the MPO shall base the update on the latest available estimates and assumptions for population, land use, travel, employment, congestion, and economic activity. The MPO shall approve transportation plan contents and supporting analyses produced by a transportation plan update.

The existing 2010 base year model scenario was used as the starting point to develop the 2019 model scenario. Staff reviewed approved land use developments and land use master plans approved between 2010 and 2019. Staff also reviewed the City of Bend and City of Redmond Comprehensive Plans, 2014-2019 ACS data and employment data from the Oregon Employment Department (OED). These combined data sets were used to develop the 2019 land use data sets. Collected traffic volume data from 2017-2019 were used for the validation process. The 2045 model scenario was built off the existing 2040 model scenario. Future population projections were provided by the Portland State University's Population Research Center (PSU PRC), which produces Oregon's official population forecasts. Staff reviewed approved land use developments and land use master plans approved between 2019 and 2023. Future employment numbers are related to population growth. The travel model has assumed a mostly consistent ratio of employment to population. The Economic Opportunity Analysis documents prepared by the City of Bend and City of Redmond were used to allocate future employment to the model employment categories. The Bend and Redmond comprehensive plans were used to spatially allocate the employment data.

(f) The metropolitan transportation plan shall, at a minimum, include:

All requirements of section (f) are identified in Chapter 1, Introduction under "The Bend MPO Metropolitan Transportation Plan (MTP)."

(1) The current and projected transportation demand of persons and goods in the metropolitan planning area over the period of the transportation plan;

(2) Existing and proposed transportation facilities (including major roadways, public transportation facilities, intercity bus facilities, multimodal and intermodal facilities, nonmotorized transportation facilities (e.g., pedestrian walkways and bicycle facilities), and intermodal connectors) that should function as an integrated metropolitan transportation system, giving emphasis to those facilities that serve important national and regional transportation functions over the period of the transportation plan.

(3) A description of the performance measures and performance targets used in

assessing the performance of the transportation system in accordance with § 450.306(d).

(4) A system performance report and subsequent updates evaluating the condition and performance of the transportation system with respect to the performance targets described in § 450.306(d), including -

(i) Progress achieved by the metropolitan planning organization in meeting the performance targets in comparison with system performance recorded in previous reports, including baseline data; and

(ii) For metropolitan planning organizations that voluntarily elect to develop multiple scenarios, an analysis of how the preferred scenario has improved the conditions and performance of the transportation system and how changes in local policies and investments have impacted the costs necessary to achieve the identified performance targets.

(5) Operational and management strategies to improve the performance of existing transportation facilities to relieve vehicular congestion and maximize the safety and mobility of people and goods;

(6) Consideration of the results of the congestion management process in TMAs that meet the requirements of this subpart, including the identification of SOV projects that result from a congestion management process in TMAs that are nonattainment for ozone or carbon monoxide.

(7) Assessment of capital investment and other strategies to preserve the existing and projected future metropolitan transportation infrastructure, provide for multimodal capacity increases based on regional priorities and needs, and reduce the vulnerability of the existing transportation infrastructure to natural disasters. The metropolitan transportation plan may consider projects and strategies that address areas or corridors where current or projected congestion threatens the efficient functioning of key elements of the metropolitan area's transportation system.

(8) Transportation and transit enhancement activities, including consideration of the role that intercity buses may play in reducing congestion, pollution, and energy consumption in a cost- effective manner and strategies and investments that preserve and enhance intercity bus systems, including systems that are privately owned and operated, and including transportation alternatives, as defined in 23 U.S.C. 101(a), and associated transit improvements, as described in 49 U.S.C. 5302(a), as appropriate;

(9) Design concept and design scope descriptions of all existing and proposed transportation facilities in sufficient detail, regardless of funding source, in nonattainment and maintenance areas for conformity determinations under the EPA's transportation conformity regulations (40 CFR part 93, subpart A). In all areas (regardless of air quality designation), all proposed improvements shall be described in sufficient detail to develop cost estimates;

(10) A discussion of types of potential environmental mitigation activities 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 metropolitan transportation plan. The discussion may focus on policies, programs, or strategies, rather

than at the project level. The MPO shall develop the discussion in consultation with applicable Federal, State, and Tribal land management, wildlife, and regulatory agencies. The MPO may establish reasonable timeframes for performing this consultation;

(11) A financial plan that demonstrates how the adopted transportation plan can be implemented.

(i) For purposes of transportation system operations and maintenance, the financial plan shall contain system-level estimates of costs and revenue sources that are reasonably expected to be available to adequately operate and maintain the Federal-aid highways (as defined by 23 U.S.C. 101(a)(5)) and public transportation (as defined by title 49 U.S.C. Chapter 53).

(ii) For the purpose of developing the metropolitan transportation plan, the MPO(s), public transportation operator(s), and State shall cooperatively develop estimates of funds that will be available to support metropolitan transportation plan implementation, as required under § 450.314(a). All necessary financial resources from public and private sources that are reasonably expected to be made available to carry out the transportation plan shall be identified.

(iii) The financial plan shall include recommendations on any additional financing strategies to fund projects and programs included in the metropolitan transportation plan. In the case of new funding sources, strategies for ensuring their availability shall be identified. The financial plan may include an assessment of the appropriateness of innovative finance techniques (for example, tolling, pricing, bonding, public private partnerships, or other strategies) as revenue sources for projects in the plan.

(iv) In developing the financial plan, the MPO shall take into account all projects and strategies proposed for funding under title 23 U.S.C., title 49 U.S.C. Chapter 53 or with other Federal funds; State assistance; local sources; and private participation. Revenue and cost estimates that support the metropolitan transportation plan must use an inflation rate(s) to reflect "year of expenditure

dollars," based on reasonable financial principles and information, developed cooperatively by the MPO, State(s), and public transportation operator(s).

(v) For the outer years of the metropolitan transportation plan (*i.e.,* beyond the first 10 years), the financial plan may reflect aggregate cost ranges/cost bands, as long as the future funding source(s) is reasonably expected to be available to support the projected cost ranges/cost bands.

(vi) For nonattainment and maintenance areas, the financial plan shall address the specific financial strategies required to ensure the implementation of TCMs in the applicable SIP.

(vii) For illustrative purposes, the financial plan may include additional projects that would be included in the adopted transportation plan if additional resources beyond those identified in the financial plan were to become available.

(viii) In cases that the FHWA and the FTA find a metropolitan transportation plan to be fiscally constrained and a revenue source is subsequently removed or substantially reduced (*i.e.,* by legislative or administrative actions), the FHWA and the FTA will not

withdraw the original determination of fiscal constraint; however, in such cases, the FHWA and the FTA will not act on an updated or amended metropolitan transportation plan that does not reflect the changed revenue situation.

(12) Pedestrian walkway and bicycle transportation facilities in accordance with 23 U.S.C. 217(g).

(g) The MPO shall consult, as appropriate, 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. The consultation shall involve, as appropriate:

(1) Comparison of transportation plans with State conservation plans or maps, if available; or

(2) Comparison of transportation plans to inventories of natural or historic resources, if available.

The development of Appendix C: Environmental Considerations included consultation with state, federal, and local agencies. Documentation of consultation efforts can be found in Appendix H: Consultation Tracker.

(h) The metropolitan transportation plan should integrate the priorities, goals, countermeasures, strategies, or projects for the metropolitan planning area contained in the HSIP, including the SHSP required under 23 U.S.C. 148, the Public Transportation Agency Safety Plan required under 49 U.S.C. 5329(d), or an Interim Agency Safety Plan in accordance with 49 CFR part 659, as in effect until completion of the Public Transportation Agency Safety Plan, and may incorporate or reference applicable emergency relief and disaster preparedness plans and strategies and policies that support homeland security, as appropriate, to safeguard the personal security of all motorized and non- motorized users.

BMPO tracks and reports on transit safety performance measures and targets for Cascades East Transit. Details can be found in Chapter 7: Performance Measures.

(i) An MPO may, while fitting the needs and complexity of its community, voluntarily elect to develop multiple scenarios for consideration as part of the development of the metropolitan transportation plan.

(1) An MPO that chooses to develop multiple scenarios under this paragraph (i) is encouraged to consider:

(i) Potential regional investment strategies for the planning horizon;

(ii) Assumed distribution of population and employment;

(iii) A scenario that, to the maximum extent practicable, maintains baseline conditions for the performance areas identified in § 450.306(d) and measures established under 23 CFR part 490;

(iv) A scenario that improves the baseline conditions for as many of the performance measures identified in § 450.306(d) as possible;

(v) Revenue constrained scenarios based on the total revenues expected to be

available over the forecast period of the plan; and

(vi) Estimated costs and potential revenues available to support each scenario.

(2) In addition to the performance areas identified in 23 U.S.C. 150(c), 49 U.S.C. 5326(c), and 5329(d), and the measures established under 23 CFR part 490, MPOs may evaluate scenarios developed under this paragraph using locally developed measures.

The Bend MPO has opted to support the specific measures and targets established by ODOT and Cascades East Transit (CET). Bend MPO staff coordinate with CET and ODOT to meet federal reporting requirements. Specific to the safety performance measures, the Bend MPO finalized a Transportation Safety Action Plan (TSAP) for the Bend area in 2019, which this MTP draws from. Performance measures used to evaluate the MTP Project List include mode split, change in motor vehicle demand on bike/ped Key Routes, transit coverage, demand to capacity ratio, vehicle hours of delay, and diversion potential.

(j) The MPO shall provide individuals, affected public agencies, representatives of public transportation employees, public ports, freight shippers, providers of freight transportation services, private providers of transportation (including intercity bus operators, employer-based commuting programs, such as carpool program, vanpool program, transit benefit program, parking cashout program, shuttle program, or telework program), representatives of users of public transportation, representatives of users of pedestrian walkways and bicycle transportation facilities, representatives of the disabled, and other interested parties with a reasonable opportunity to comment on the transportation plan using the participation plan developed under § 450.316(a).

BMPO published the draft MTP for review for more than 21-days, which is in line with our public participation plan. From August 16th, 2024 through September 20th, 2024 the draft was available for comment. The draft, along with a link to an online open house, were posted on BMPO's website, distributed through email lists, Facebook posts and public meetings – along with sharing at an in-person public event. In addition to the virtual open house, people were invited to Technical Advisory Committee and Policy Board meetings for August and September 2024.

(k) The MPO shall publish or otherwise make readily available the metropolitan transportation plan for public review, including (to the maximum extent practicable) in electronically accessible formats and means, such as the World Wide Web.

BMPO published the draft MTP on BMPO's website for public comment from August 16th, 2024 to September 20th, 2024. A link to the online open house was also available, including comment submittal.

(l) A State or MPO is not required to select any project from the illustrative list of additional projects included in the financial plan under paragraph (f)(11) of this section.

(m) In nonattainment and maintenance areas for transportation-related pollutants, the MPO, as well as the FHWA and the FTA, must make a conformity determination on any updated or amended transportation plan in accordance with the Clean Air Act and the EPA transportation conformity regulations (40 CFR part 93, subpart A). A 12-month conformity

lapse grace period will be implemented when an area misses an applicable deadline, in accordance with the Clean Air Act and the transportation conformity regulations (40 CFR part 93, subpart A). At the end of this 12-month grace period, the existing conformity determination will lapse. During a conformity lapse, MPOs can prepare an interim metropolitan transportation plan as a basis for advancing projects that are eligible to proceed under a conformity lapse. An interim metropolitan transportation plan consisting of eligible projects from, or consistent with, the most recent conforming transportation plan and TIP may proceed immediately without revisiting the requirements of this section, subject to interagency consultation defined in 40 CFR part 93, subpart A. An interim metropolitan transportation plan containing eligible projects that are not from, or consistent with, the most recent conforming transportation plan and TIP must meet all the requirements of this section.

Not applicable.