

CASCADES EAST TRANSIT (CET) 2040 TRANSIT MASTER PLAN 2020

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The contents of this document do not necessarily reflect views or policies of the State of Oregon.

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- Transit Infrastructure Guide
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EXECUTIVE SUMMARY

The 2040 Cascades East Transit (CET) Transit Master Plan (TMP) is the first TMP for CET and is a framework for providing transit and related services to Central Oregon for the next 20 years. It will be used by CET to identify new services, further policy discussions, inform how Statewide Transportation Improvement Funds (STIF) transit funds are spent, and monitor future funding needs and opportunities.

The TMP identifies near-term (2025), mid-term (2030), and long-term (2040) transit service enhancements that help meet the vision and goals for transit in the region established through the TMP process.

This document aims to synthesize and update the existing Central Oregon Regional Transit Master Plan (2013) and the Bend Metropolitan Planning Organization's (MPO) Public Transit Plan and Transit Corridor Land Use Assessment (2013).

The TMP process applied robust community engagement to identify each community's needs. CET has opportunities to enhance transit services with the STIF transit funds but still faces future funding challenges. The TMP addresses this and other potential future funding scenarios.

This document is organized by nine chapters and summarizes the related material:

- ▶ **Chapter 1 – TMP Context**

This chapter summarizes the TMP purpose; history of transit in the community; CET's budget and funding at the start of the TMP process; other Central Oregon transit providers; and regional and local plans in CET's service area with existing policy frameworks

that support developing a single Transit Master Plan.

- ▶ **Chapter 2 – Stakeholder Involvement**

This chapter summarizes the public involvement framework of the TMP development process (e.g. project website, passenger and driver surveys, and in-person and virtual open houses) and the TMP project committees (Project Management Team, Regional and Local Advisory Committees, and Project Steering Committee).

- ▶ **Chapter 3 – Vision and Goals**

This chapter provides the TMP vision, goals, and objectives developed among the project committees to guide this plan and CET moving forward.

- ▶ **Chapter 4 – Baseline Conditions**

This chapter summarizes the baseline conditions that served as a foundation for identifying transit needs throughout Central Oregon, including evaluating demographics, CET's current transportation services and capital inventory, trip purpose and travel demand within and between communities, land use and population densities, and bicycle and pedestrian access to transit.

- ▶ **Chapter 5 – Needs Assessment**

This chapter summarizes the current and future transit needs identified through analyses and public engagement for CET's transit service, capital, programs, and operations, as well as needs based on population and employment densities, and airport needs.

- ▶ **Chapter 6 – Service Alternatives Analysis**

This chapter summarizes the service alternatives analysis completed based on the needs assessment to develop the

TMP, including strategies for transit service strategies, first-last mile solutions, fixed-route services, transit-underserved areas, and the location for Hawthorne Station.

▶ **Chapter 7 – Financial Assessment**

This chapter summarizes the financial assessment completed for the TMP, including funding level assumptions, existing funding source assumptions, potential future funding sources, future funding scenarios, and cost assumptions.

▶ **Chapter 8 – Transit Master Plan**

This chapter summarizes the transit service and capital plans, including Community Connector services

(modifications to existing services and new services); Bend local service (mobility hubs, primary transit network, and modifications to existing services); Redmond local service; local service in smaller communities; recreational services; transit vehicles, facilities, and technology; safety best practices; and transit asset management.

▶ **Chapter 9 – Implementation**

This chapter summarizes the implementation plan for the transit service and capital plans, transit-supportive strategies (comprehensive plan integration and development code implementation), and the TMP update schedule.



- 1.1 TRANSIT MASTER PLAN PURPOSE
- 1.2 HISTORY OF TRANSIT IN THE COMMUNITY
- 1.3 TRANSIT PROVIDER BUDGET & FUNDING
- 1.4 OTHER CENTRAL OREGON TRANSIT PROVIDERS
- 1.5 PLANNING PRECEDENT

1.0 TMP CONTEXT



1.1 TRANSIT MASTER PLAN PURPOSE

The 2040 Cascades East Transit (CET) Transit Master Plan (TMP) is a framework for providing transit and related services to Central Oregon for the next 20 years. It will be used by CET to identify new services, further policy discussions, inform how Statewide Transportation Improvement Funds (STIF) transit funds are spent, and monitor future funding needs and opportunities. The TMP identifies near-term (2025), mid-term (2030), and long-term (2040) transit service enhancements that help meet the vision and goals for transit in the region established through the TMP process.

This is the first Transit Master Plan for CET, which aims to synthesize and update the existing Central Oregon Regional Transit Master Plan (2013) and the Bend Metropolitan Planning Organization's (MPO) Public Transit Plan and Transit Corridor Land Use Assessment (2013).

The TMP used a robust community engagement process to identify each community's needs. CET has opportunities to enhance transit services with the STIF transit funds but still faces future funding challenges. The TMP addresses this and other potential future funding scenarios.

1.2 HISTORY OF TRANSIT IN THE COMMUNITY

In 1972, the Central Oregon Intergovernmental Council (COIC) was designated a Council of Governments organized under ORS 190. They provide services to the counties and cities within Crook, Deschutes and Jefferson counties. COIC employs more than 100 people and services including employment and training, alternative high school education, business loans, transportation, and community and economic development.

A 17-member board governs COIC, with representatives from each of the member governments: the counties of Crook, Deschutes, and Jefferson, and the cities of Bend, Culver, Madras, Metolius, Prineville, Redmond, La Pine, Sisters, and Confederated Tribes of Warm Springs. Seven members representing the interests of the private business sector, workforce development, and education also serve on the COIC Board.

Cascades East Transit (CET) is operated by COIC. COIC's Regional Public Transit Advisory

Committee (RPTAC) is the primary body that reviews current transit service, makes recommendations for future transit service, and hears citizens' comments and concerns about transit service.

CET provides four distinct year-round services: fixed-route bus service in Bend, Community Connector bus service (intercity bus and one deviated fixed-route service) covering the entire CET service area, demand-responsive service in Bend, and demand-responsive service in rural areas. The demand-responsive service within Bend is offered to disabled individuals as well as low-income senior citizens who do not live near CET fixed-route bus service. Demand-responsive service outside of Bend and within established service boundaries is open to the general public. In addition to these year-round services, CET also provides various seasonal recreational shuttles to attractions in Central Oregon.

CET's mission is to "always exceed expectations of riders with courteous and friendly customer

service representatives, transit operators, and staff."

1.3 TRANSIT PROVIDER BUDGET & FUNDING

The CET service area, illustrated in Figure 1, is funded by a mixture of revenue sources including federal funds, local funds, service contracts, state funds, local fares, advertising and occasional one-time revenues. These funding sources fluctuate year-by-year. Figure 2 and Figure 3 summarize CET's rural system

and Bend system revenue sources (for both capital and operations), respectively for 2018 and show trends for 2014 to 2018. Note that the revenue sources in the following figures do not reflect the new Statewide Transportation Improvement Fund (STIF), which rolled out after 2018.

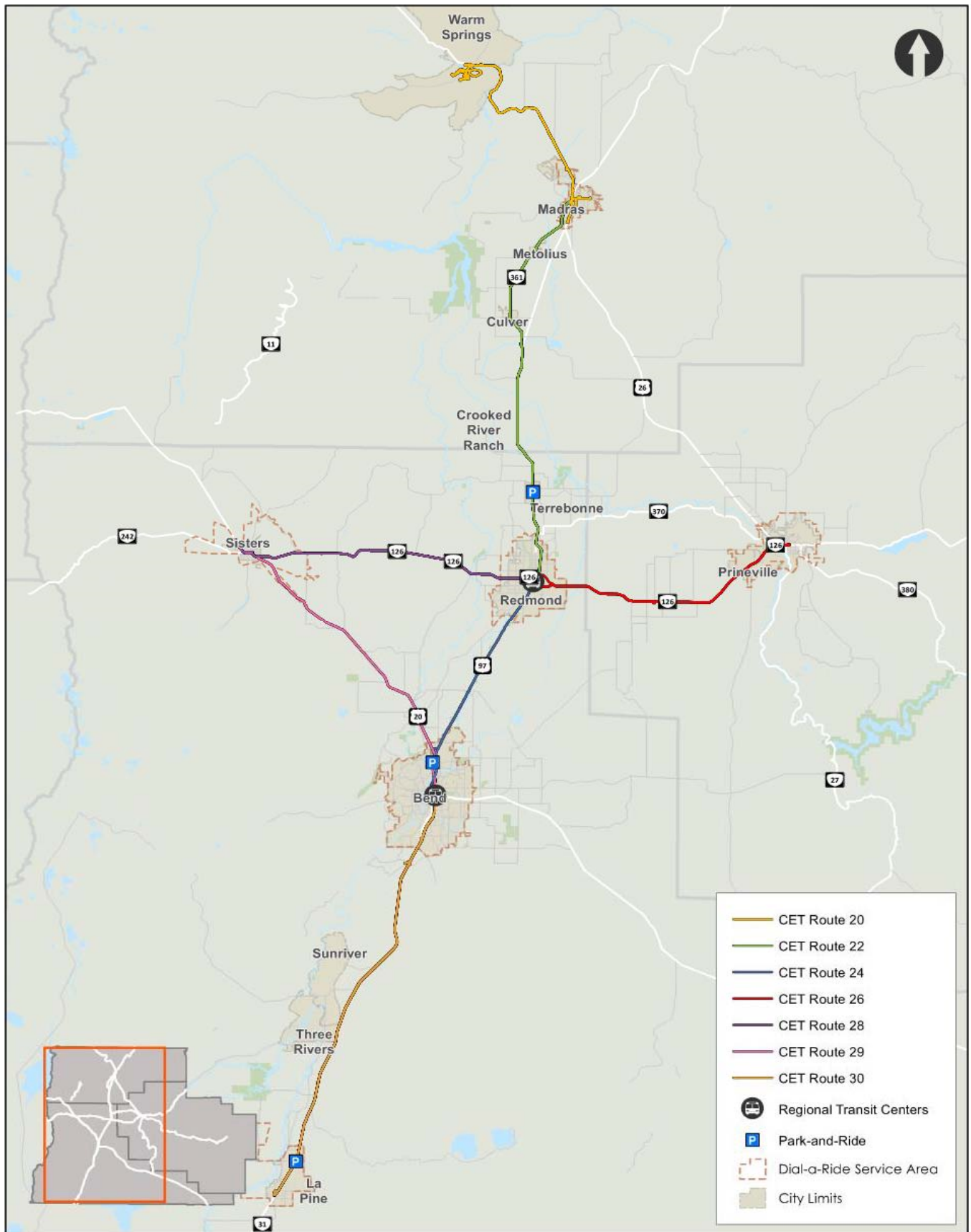


Figure 1: CET Service Area

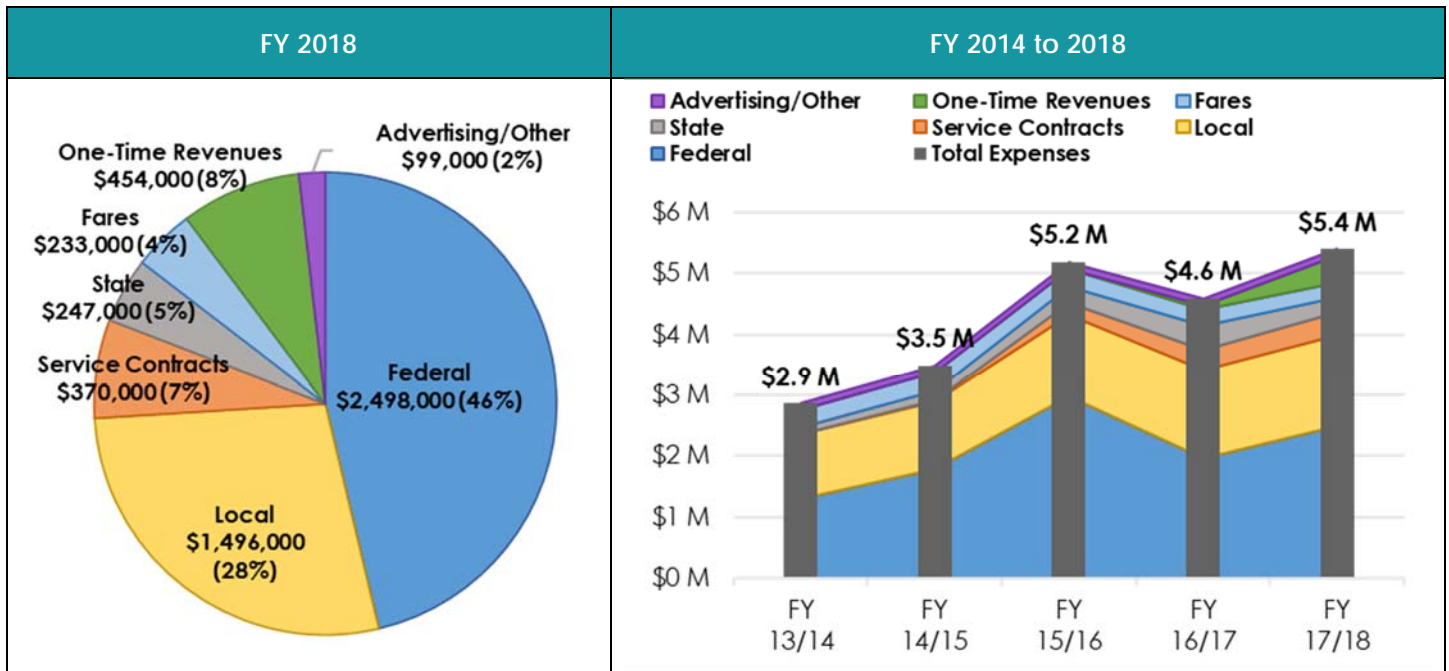


Figure 2: Rural System Revenues (Operating and Capital)

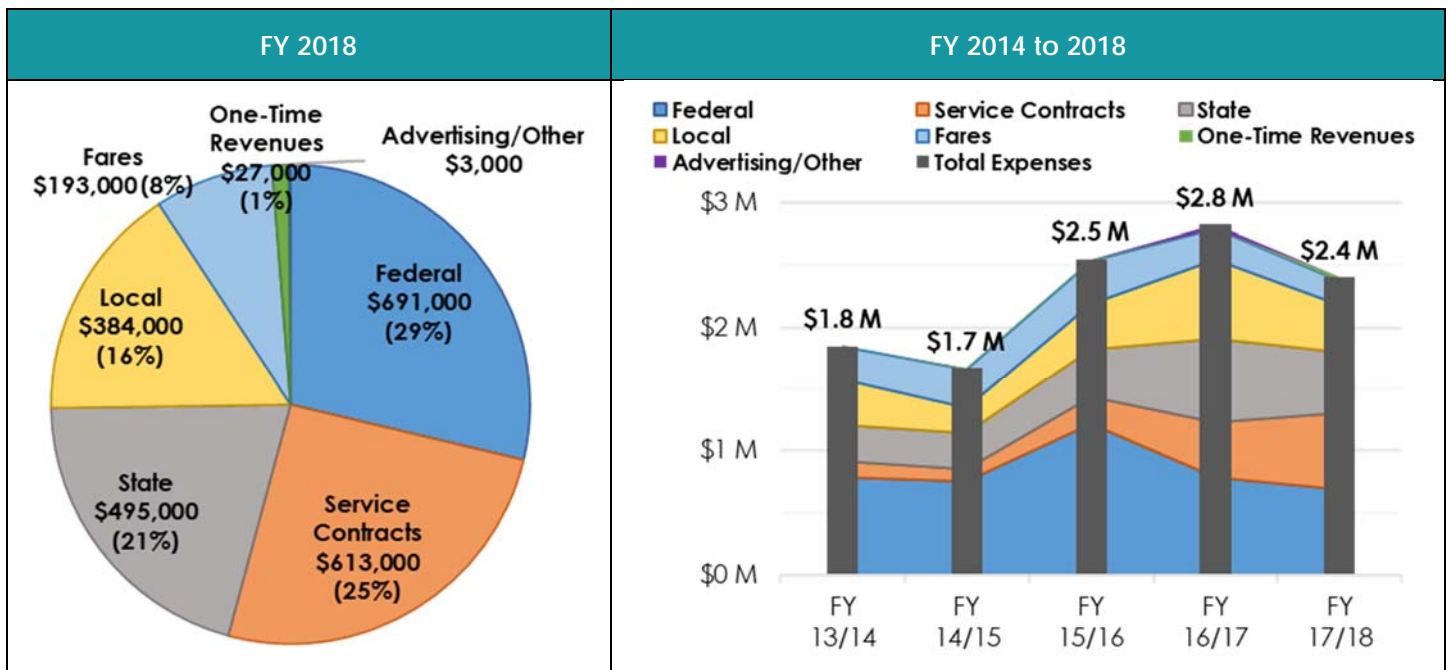


Figure 3: Bend System Revenues (Operating and Capital)

As shown, a majority of CET’s funding are from federal and local sources.

CET also administers the STIF funding from the four regional “Qualified Entities” and is also the provider of services that will be funded by STIF.

The Qualified Entities include the Confederated Tribes of the Warm Springs, Crook County, Deschutes County, and Jefferson County. STIF funds are included in the funding projections for CET and are discussed in later chapters.

1.4 OTHER CENTRAL OREGON TRANSIT PROVIDERS

This section describes public transportation services offered within the CET service area that are provided by other operators that connect with or are independent of CET services. Services that connect with CET’s network are summarized in Table 1 and described further in the following pages.

These services allow for regional and statewide travel and are located within ¼ to ½ mile of one or more CET bus stops. The *Existing Conditions Memo*, included in the Technical Appendix, provides details on departure and arrival times and locations as well as transit service and time gaps between the described services and CET services.

AMTRAK THRUWAY

The Amtrak Thruway is a daily Amtrak shuttle service operated by Pacific Crest Buslines that connects riders between the Redmond Airport and the Chemult Amtrak Station where they can board the Coast Starlight train. The route includes three other stops in Bend, Sun River, and La Pine, with two trips per day in each direction. The schedule is impacted by possible delays in train arrivals and departures in Chemult.

Table 1: Other Transportation Services

Connecting Service	Service Description	Connecting Service Stops within ¼ Mile	Connecting Service Stops within ½ Mile
Amtrak Thruway (Operated by Pacific Crest Buslines)	Intercity bus service connecting Redmond Airport, Bend, Sunriver, La Pine, and Chemult Amtrak Station	Hawthorne Station (Bend) Riverhouse Resort (Bend)	Hawthorne Station (Bend) Riverhouse Resort (Bend) Shell (La Pine)
Central Oregon Breeze	Intercity bus service between Central Oregon communities and Portland-area destinations	Circle K & Chevron (Bend) Circle K (Madras)	Circle K & Chevron (Bend) Circle K (Madras)
Cog Wild Shuttles	Shuttle service supporting mountain bike tours	Cog Wild (Bend) Angeline’s Bakery (Sisters)	Cog Wild (Bend) Angeline’s Bakery (Sisters)
Eastern POINT	Intercity bus service connecting Bend to Ontario with 9 stops in between	Hawthorne Station (Bend)	Hawthorne Station (Bend)
Mt. Hood Teleporter	Shuttle service connecting Bend, Redmond, and Sisters to Salem and Portland-area destinations	Hawthorne Station (Bend) Ski Inn (Sisters)	Hawthorne Station (Bend) Ski Inn (Sisters)
Pacific Crest Lines	Intercity bus service between Bend and the Greyhound and Amtrak stations in Eugene	Hawthorne Station (Bend) Ski Inn (Sisters)	Hawthorne Station (Bend) Ski Inn (Sisters)
People Mover (Grant County)	Bus service connecting Bend, Redmond, and Prineville to Prairie City, John Day, Mount Vernon, Dayville, and Mitchell	Hawthorne Station (Bend) McDonalds (Prineville)	Hawthorne Station (Bend) McDonalds (Prineville)

CENTRAL OREGON BREEZE

Central Oregon Breeze (The Breeze) is a shuttle service that connects riders between Bend, other Central Oregon communities, and the Portland Metro Area. Some of The Breeze stops require that reservations are made 24 hours in advance or are considered “flag stops.”

COG WILD SHUTTLES

Cog Wild Shuttle service connects mountain bikers to the mountain biking trails in Central Oregon, including areas such as Swampy Lakes Sno-Park, Wanoga Sno-Park, Dutchman Flat, and Mt. Bachelor Bike Park. The shuttle offers rides from its headquarters at 255 SW Century Drive in Bend to these locations, with six departures throughout the day beginning at 7:30 a.m. Two of CET’s Bend routes, Routes 10 and 11, include bus stops near Cog Wild’s headquarters to provide a connection to their shuttle service. With the exception of a few service and time gaps, Routes 10 and 11 connect mountain bike riders to each departure time.

EASTERN POINT

The Eastern POINT provides daily bus service between Bend and Ontario that makes nine stops in communities along the route, including Burns and Vale. The bus makes one trip per day in each direction departing from and arriving at Bend’s transit hub, Hawthorne Station, in the early afternoon.

SHUTTLE OREGON

Shuttle Oregon is another shuttle service between Bend and Portland that includes a network of taxis, airport shuttles, and trailers. This service takes a different route than The Breeze in that it connects with Sisters and Salem en route to and from Portland. This shuttle service includes two stops within CET’s

service area: Hawthorne Station and 450 East Cascade Avenue in Sisters.

PACIFIC CREST BUS LINES

This daily bus service provides a connection for riders between Bend and Eugene, with stops at Hawthorne Station, Eugene Greyhound, and Eugene Amtrak. This bus arrives and departs Hawthorne Station in the afternoon daily.

PEOPLE MOVER – GRANT COUNTY

The Grant County People Mover is a shuttle service that provides connections to several Central Oregon communities, including some within the CET service area (i.e., Bend, Redmond, and Prineville). People Mover offers two routes from Bend: one to Prairie City and the other to Monument. Both provide intermittent stops in Redmond and Prineville. These connections have set routes and cannot deviate with the exception of hospital and doctor appointments.

The Bend to Prairie City route operates Monday, Wednesday, and Friday and stops in Prineville, Redmond, and Bend. The Bend to Monument route operates on Wednesdays and Fridays, requires reservations, and stops in the same locations.

OTHER TRANSPORTATION SERVICES

Other public transportation services available in Central Oregon include the following:

- ▶ Central Oregon Community College (COCC) Shuttle - Provides free circulator service on campus and to/from the NW College Way/NW Shevlin Park Road.
- ▶ OSU-Cascades - Offers car-sharing (Zipcar), bike-sharing, and carpooling. CET fixed-route buses serve the campus; students receive free passes. Pilot implementation of flexible transit service

connecting to COCC and other destinations as provided in 2019.

- ▶ Commute Options for Central Oregon - Transportation Demand Management (TDM) program that coordinates vanpool programs (offered by Enterprise and V-Ride), carpool ride-matching,

park-and-ride lot development and marketing, and a transportation options rewards program in Region 4.

- ▶ Charter buses
- ▶ Taxi cabs and town cars
- ▶ Transportation Network Companies (Uber and Lyft)

1.5 PLANNING PRECEDENT

Many regional and local plans in the areas served by CET have an existing policy framework that supports the development of a single Transit Master Plan and helps identify priorities to be funded through STIF funding. The policy framework established in this TMP (Chapter 3) sets the stage for policy and development code language recommendations for the local jurisdictions served by CET and are provided in Chapter 9 of this plan. The *Planning Precedent Memo* in the Technical Appendix provides the full overview of the documents that make up the planning precedent for this plan. The following provides a summary of the key planning precedent documents that were reviewed for this plan.

REGIONAL PLANS

A review of regional plans included the following:

- ▶ Central Oregon Regional Transit Master Plan (2013)
- ▶ Central Oregon Strategic Transportation Options Plan (2013)
- ▶ Regional Coordinated Human Services Transportation Plan (2018)
- ▶ Bend MPO 2040 Metropolitan Transportation Plan (2014)
- ▶ Bend MPO Public Transit Plan and Transit Corridor Land Use Assessment (2013)

CENTRAL OREGON REGIONAL TRANSIT MASTER PLAN (2013)

This is CET's long-range plan and is intended to be coordinated with other transit planning in the region, namely Bend MPO's Public Transit Plan (PTP). Policy direction emphasizes coordination with other agencies and focusing resources in areas with the highest densities and transit demand.

CENTRAL OREGON STRATEGIC TRANSPORTATION OPTIONS PLAN (2013)

This planning process sought to determine the optimal combination of transportation investments, including transit and other single occupant vehicle (SOV) alternatives, to meet transportation demand through 2030. The plan analyzes vanpool, inter-city bus, commuter rail, and pricing for eight corridors in region.

REGIONAL COORDINATED HUMAN SERVICES TRANSPORTATION PLAN (2018)

This plan is the most recent of the regional plans and the first of its kind in Central Oregon. It is required in order for the counties and Confederated Tribes of Warm Springs (CTWS) to receive federal funds. The plan aims to improve transportation services for protected populations, including seniors, people with disabilities, and people with low incomes.

BEND MPO 2040 METROPOLITAN TRANSPORTATION PLAN (2014)

This plan satisfies federal and state requirements and is currently being updated in conjunction with the Bend TSP. The MTP sets transit-related and transit-supportive goals and policies and refers to the PTP, RTMP, and COTOP for projects.

BEND MPO PUBLIC TRANSIT PLAN AND TRANSIT CORRIDOR LAND USE ASSESSMENT (2013)

This plan, referred to as the PTP, is designed to be a component of the Bend MPO's MTP, the City of Bend's Comprehensive Plan, and the City of Bend's TSP. It is a key regional plan for providing policy- and project-level guidance and establishes a "Complete Transit System" concept to improve transit service in Bend, better meet the needs of "transit dependent" riders, and make transit attractive for "choice" riders.

LOCAL PLANS

Local plans were reviewed for the following jurisdictions in the CET service area: Crook County, Deschutes County, Jefferson County, Bend, La Pine, Redmond, Madras, Prineville, Sisters, and Warm Springs.

CROOK COUNTY

The County's 2017 TSP has a strong set of transit-related objectives and establishes a few high priority transit-specific projects as well as pedestrian projects that will improve connections to transit. In the long term, the County would support fixed route or flex route service in Prineville as needed.

Transit-related policies from the Transportation Element of the County's Comprehensive Plan are relatively old (2003) but the County may

use these policies in conjunction with TSP objectives when evaluating transportation investments and land use proposals.

DESCHUTES COUNTY

The County's TSP is moving into an update, but current policies emphasize coordination of rideshare/transit services and serving the transportation disadvantaged. The TSP references COIC's RTMP and Bend MPO's PTP for recommended projects and identifies improved recreation access as a need. The Transportation Element of the County's Comprehensive Plan was replaced by a reference to the County's TSP.

JEFFERSON COUNTY

The County is in the midst of updating its 2007 TSP, which currently includes a few transit-supportive objectives and strategies with a focus on senior, low-income, and disabled community members. The TSP defers to the County's Coordinated Human Services Transportation Plan as its Public Transportation Plan. The County's Comprehensive Plan does not provide additional transit-related or -supportive policies.

BEND

The Bend TSP is currently being updated, moving into adoption, and includes objectives that support increasing ridership, ensuring equitable and appropriate transportation options, and minimizing environmental impacts. Several Comprehensive Plan policies promote development that can be readily served by transit. Transit-specific policies commit the City to support the public transportation system, focus resources on high ridership corridors, and consider public and private transportation resources.

The City's 2016 Integrated Land Use and Transportation Plan (ILUTP) policies focus on designated transit corridors. Additional land use measures and infrastructure improvements, including concepts such as "mobility hubs," should be prioritized along transit corridors. ILUTP transit strategies reference recommendations in the Bend MPO's PTP, long-term increases in service hours and frequencies, and converting some routes into quasi-bus rapid transit (BRT) service.

LA PINE

The City's TSP evaluation criteria for projects include access provided to regional transit. The City's Comprehensive Plan policies commit to increasing transit access by potentially collaborating with private sector services that provide inter- and intra-city commute options, complementing publicly provided services. Recommended transit-related projects address park-and-ride lots, including bicycle and pedestrian connections, and additional service between La Pine and Bend.

MADRAS

Multiple Madras TSP objectives support regional transit and makes recommendations about "potential" transit projects including Community Connector service improvements. The TSP also refers to the need for increased inter-city connections such as between Madras and Prineville, as well as transit-supportive improvements including more protected pedestrian crossings. Existing City Comprehensive Plan policies do not address transit.

PRINEVILLE

The City's TSP includes goals and objectives that address transportation options for all

system users and impacts of transportation projects on minority and low-income populations. Recommended projects relocate the park-and-ride lot and introduce local flex route service. Transportation policies in the City's 2007 Comprehensive Plan more specifically address transit, including possible shuttle buses for major employers, private inter- and intra-city transit services for commuters, and roadway facilities that accommodate transit.

REDMOND

Redmond's TSP Update that is moving into adoption includes goals that emphasize transportation options for senior, disabled, and low-income community members as well as considers Key Transit Corridors that provide north-south and east-west connectivity within the city. Transportation policies in the City's Comprehensive Plan (2001) focus on transit corridors and affordable housing near transit and other services. Transportation policies also address improved pedestrian and bicycle connections to transit.

A 2009 Transit Master Plan (TMP) prepared for Redmond studied the feasibility of fixed route service, provided a conceptual service plan, and discussed the balancing of coverage and productivity service models in planning transit in the city. The plan also provides implementation guidance for transit stop connections, transit stop location/design, ADA accessibility, and park-and-ride facilities.

SISTERS

Policies in the City's TSP emphasize transportation options for local and regional trips as a matter of equity and reducing reliance on SOV travel. The TSP's Transit Plan calls for further study and coordination

regarding regional transit, particularly between Sisters and popular locations the city does not connect to. Comprehensive Plan policies address collaboration with jurisdictions in the region to provide inter-city transportation and with Central Oregon Commute Options to implement Commute Options programming.

WARM SPRINGS

Objectives of the Warm Springs Transportation Plan emphasize maintaining funding and

coordinating with regional transit service providers. The plan identifies transit service needs including: more midday service; more access to on-reservation services for young families; improved service to key destinations in Warm Springs for protected populations (e.g., CTWS Senior Center); and generally improved access to destinations in cities such as Bend and Portland as well as access to smaller communities in the greater region including Simnasho and Government Camp.



- 2.1 PUBLIC INVOLVEMENT FRAMEWORK
- 2.2 PROJECT COMMITTEES

2.0 STAKEHOLDER INVOLVEMENT



2.1 PUBLIC INVOLVEMENT FRAMEWORK

The project management team (PMT) began work on this Transit Master Plan and its supporting memos and activities in October 2018. A summary of outreach activities conducted from January 2019 through June 2020 is provided below. For each outreach activity, a range of advertising and marketing efforts were completed to gain participation including mailed newsletters, email notifications, social media announcements, and radio announcements.

PROJECT WEBSITE

The project website (<http://cettransitplan.com/>) houses information that allowed the general public and the advisory committees to stay informed about the project. Background documents, meeting materials, and finalized technical memos were provided on the website, along with the latest news about upcoming events.

PASSENGER SURVEY

Between May and June 2019, CET administered a passenger survey to better understand the state of the existing transit system from the rider perspective. The fixed-route system in Bend and the regional Community Connector system were surveyed. A total of 413 valid surveys were collected, 277 surveys from the Bend fixed-routes and 136 surveys from the Community Connector. Passengers were asked about the time they boarded the bus, the purpose of their trip, how frequently they use transit, how many years they have been riding CET, if they transfer between routes, how they access transit, how they pay for their fares, their alternatives to using transit, their perceptions of the current service, their improvement priorities, and their

demographics. The survey responses were used to identify transit needs and demand and to inform the development of service alternatives in Chapter 6 of this plan. Detailed passenger survey results can be found in the *Needs Memo* in the Technical Appendix.

DRIVER SURVEY

Between May and June 2019, CET administered an operator survey to better understand the state of the existing transit system from the operations perspective. Operators who drive for dial-a-ride, Bend fixed-route, and Community Connector services were surveyed. Twenty-six operators participated (4 dial-a-ride, 9 fixed-route, 4 Community Connector, 6 all, 3 other, and 1 did not specify).

Operators were asked about how many years they have worked for CET, if they were full or part-time, what routes they typically drive, what routes are difficult to navigate, what routes are difficult to keep on schedule, the suggestions they hear from passengers, destinations that CET should serve, capital, infrastructure, or technology needs, the difficulty of conducting certain aspects of their jobs, how well the scheduling and breaks work, how well the dispatch system works, and their top suggestion to improve CET services.

The survey responses were used to identify transit needs and demand and to inform the development of service alternatives in Chapter 6 of this plan. Detailed operator survey results can be found in the *Needs Memo* in the Technical Appendix.

IN-PERSON AND VIRTUAL OPEN HOUSES

There were two sets of open houses conducted through the development of the TMP to gather input from the public.

Virtual Open House #1 was available online from January 7th through February 3rd, 2019. The corresponding in-person open houses occurred between January 15th and 29th, 2019 at locations in Deschutes County, Jefferson county, Redmond, Warm Springs, Crook County, and Bend to represent the six jurisdictions within CET's service area. The open house activities sought input on transit needs and priorities for CET. As part of the first set of open house meetings (in-person and virtual), a survey was conducted to better understand community member's desires for improvements to transit services. The detailed

summary of the survey and first set of open house activities can be found in the *Needs Memo* in the Technical Appendix.

Virtual Open House #2 was available online from February 3rd through March 3rd, 2020. The corresponding in-person open houses occurred between March 12th and 21st, 2019 at locations in Deschutes County, Jefferson county, Redmond, Warm Springs, Crook County, and Bend to represent the six jurisdictions within CET's service area. The second virtual and in-person open house provided the public the opportunity to review potential new routes and comment on their priorities for the system. A survey was also conducted to understand community priorities for different service enhancement types.

2.2 PROJECT COMMITTEES

In addition to the Project Management Team (PMT), one regional technical advisory committee (TAC) made up of seven local TAC's and one project steering committee (PSC) were formed to provide technical and local expertise to the project. The advisory and project steering committees were made up of City, County, and State transportation staff who know the area and are familiar with the type of technical analysis and planning work being completed through this project. These committees also included representatives from different community institutions and the general public.

These committees reviewed each of the draft memos, met to discuss them and make recommendations, and guided the next steps for the PMT. The following describes the key meeting topics at each project milestone:

- ▶ The first set of meetings was with the Regional TAC followed by the PSC and covered existing conditions of the transit system and existing measures, policies, demographics, and the draft vision, goals, and objectives of the TMP.
- ▶ The second set of meetings was with the Local TAC's and focused on discussing the short-term transit needs within each community to develop projects for the first round of STIF funding.
- ▶ The third set of meetings was with the Bend Local TAC followed by the PSC and focused on the needs within Bend.
- ▶ The fourth set of meetings was with the Regional TAC followed by the PSC and focused on the transit needs as well as transit-supportive development strategies throughout CET's service area.

- ▶ The fifth set of meetings was with the Local TAC's followed by the PSC and reviewed the draft service and capital plans developed as a result of the identified transit needs.
- ▶ The sixth set of meetings was with each of the Local Agencies followed by the PSC and focused on the draft TMP and the recommended local agency implementation plans.

Meeting summaries for the committee meetings can be found in the Technical Appendix.



- 3.1 TRANSIT VISION
- 3.2 TRANSIT GOALS

3.0 VISION & GOALS



3.1 TRANSIT VISION

The following vision statement was developed based on information included in existing planning documents, the intention of Cascades East Transit, and with input from the TAC and PSC. This vision statement guides this plan and CET moving forward.

VISION STATEMENT

Provide public transportation choices for all users that are safe, accessible, and efficient to support communities with a balanced transportation network needed for mobility, equity, and economic growth.

3.2 TRANSIT GOALS

Five goal areas and associated objectives were developed to support the adopted vision statement:

GOAL I: INTEGRATION

Develop and maintain a public transportation system that is well integrated with community partners, planning documents, and partner agencies.

Objectives:

- ▶ Coordinate with partner agencies to establish transit supportive corridors and a higher density and level of pedestrian-oriented development standards within ¼ mile of existing and planned transit stops.
- ▶ Encourage and participate in the development of community plan policies, model codes, and design incentives that promote transit supportive development patterns.
- ▶ Partner with communities and private developers to develop model projects on primary corridors and at community transit hubs.
- ▶ Strengthen coordination with other agencies and community partners to continually improve the safety, accessibility, and efficiency of transit service.
- ▶ Ensure regional transit services are coordinated with local and other inter-city transit service providers, including measures such as regular meetings, collaborating with Commute Options (regarding ridesharing for major employers), and other employer transportation programs, co-submitting grant applications, and consideration of joint operations/funding of cross-jurisdictional services.
- ▶ Establish a structure for ongoing coordination between public transportation providers and health and human service providers.
- ▶ Develop a balanced regional system structure that supports and integrates various transit services, such as primary transit corridors, micro-transit, mobility hubs, and park-and-ride facilities.

GOAL II: CONVENIENT AND ATTRACTIVE SERVICES

Provide convenient and attractive public transportation choices for users throughout Central Oregon both within and between communities.

Objectives:

- ▶ Based on analysis and community input, expand or provide fixed route and flex route services in larger urban communities such as Redmond and Bend as needed. Define urban transit levels of service (frequency, times, and stops) and service areas. Continue and potentially expand demand-response services, such as providing vouchers for Transportation Networking Companies (TNCs) and taxis and establishing more park-and-ride facilities as needed.
- ▶ Based on analysis and community input, improve services in smaller communities and rural areas with measures such as expanding CET Community Connector services (frequency, times, and stops), increasing service areas, continuing and potentially expanding demand-response services, providing vouchers for Transportation Networking Companies (TNCs), and establishing more park-and-ride facilities as needed.
- ▶ Based on analysis and community input, maintain and/or expand Community Connector services that connect the communities of Central Oregon.

GOAL III: EASY, COMFORTABLE, AND SAFE RIDING

Make riding easy, comfortable, and safe with improved stop amenities and information about how to ride readily available to residents, employees, and visitors.

Objectives:

- ▶ Implement transit stop design guidelines to provide functional and appealing amenities at transit stops appropriate for current and future use.
- ▶ Support Transportation Demand Management (TDM) efforts that address ridesharing programs, park-and-ride facility development, and more effective (e.g., personalized) outreach regarding existing transportation options.
- ▶ Address cultural and language barriers to using transit including consulting with Limited English Proficiency (LEP) populations to improve CET outreach and materials.
- ▶ Continue to improve ease of access/use of CET services for all customers, including centralized and accessible service information.
- ▶ Continue to improve marketing and access for visitors/tourists.
- ▶ Address technological barriers to using transit, including electronic fare systems, mobile applications, and real-time information.

GOAL IV: TIME AND COST COMPETITIVE TRANSIT OPTIONS

Enhance transit options to provide a time and cost competitive alternative to traveling by automobile and increase transit ridership while reducing automobile dependency.

Objectives:

- ▶ Support, market, and track a regional transportation pass program that enlists employers, schools, institutions, and communities in a regional effort to increase transit travel and reduce auto dependency.
- ▶ Coordinate with partner agencies and organizations to assess and improve pedestrian and bicycle connections and access to transit corridors and stops, including encouraging the completion of pedestrian and bicycle system gaps, implementing enhanced road crossings, and providing secure bicycle parking.
- ▶ Support initiatives that promote under-utilized transit/non-SOV services such as vanpooling (ridesharing) that require limited operation and capital resources.
- ▶ In partnership with other transit planning in the region, explore expansion of services, including additional routes, frequency, and days of service, as needed and resources allow.
- ▶ Coordinate with human services providers to understand and meet the needs of transportation disadvantaged populations, including subsidized fare pricing.

GOAL V: EMERGING TECHNOLOGIES

Evaluate emerging technologies and transit service models and how they might be used to support transportation options in Central Oregon.

Objectives:

- ▶ Monitor emerging technologies and transit service models and how relevant advancements might support the vision and goals of CET.
- ▶ Work with partner agencies to evaluate mobility as a service.
- ▶ Explore the viability of transit/mobility hubs (access to transit, bike share, car share, etc.) at key gateways and activity centers. Assist development of regional and local transit/mobility hubs with guidelines and conceptual locations in each community.
- ▶ Develop one user-friendly platform to access all CET services and information such as fare purchase and storage, route maps and stop locations, schedules, and real-time arrival information.



- 4.1 DEMOGRAPHICS
- 4.2 CURRENT TRANSPORTATION SERVICES
- 4.3 CAPITAL INVENTORY
- 4.4 TRIP PURPOSE AND TRAVEL DEMAND
- 4.5 LAND USE AND POPULATION AND EMPLOYMENT DENSITIES
- 4.6 BICYCLE AND PEDESTRIAN ACCESS TO TRANSIT

4.0 BASELINE CONDITIONS



4.1 DEMOGRAPHICS

The following section provides a regional demographic analysis within the CET service area of transportation-disadvantaged population densities. Many of the higher transportation-disadvantaged population densities within CET's service area overlap. The full demographic analysis is included in the *Existing Conditions Memo attachments*, included in the Technical Appendix. Additional analysis was completed for the Bend and Redmond areas as covered in later chapters.

HOUSEHOLDS IN POVERTY

Figure 4 shows that the densest concentrations of households with incomes below 200 percent of the federal poverty level are in the following locations:

- ▶ Southwest Redmond
- ▶ South Central Bend
- ▶ Southwest Prineville

ELDERLY POPULATION

The densest concentrations of elderly populations are in the following locations:

- ▶ Southwest Redmond
- ▶ East Bend
- ▶ Southwest Prineville

YOUTH POPULATION

The densest concentrations of youth populations are in the following locations:

- ▶ Southwest Redmond
- ▶ Northeast Bend
- ▶ South Central Bend
- ▶ Northwest Bend
- ▶ Southwest Prineville

MINORITY POPULATION

The densest concentrations of minority populations are in the following locations:

- ▶ Northwest Madras
- ▶ Southwest Redmond
- ▶ Northeast Bend
- ▶ West Bend
- ▶ Most of central Prineville

DISABLED POPULATION

The densest concentrations of disabled populations are in the following locations:

- ▶ Southwest Redmond
- ▶ Northeast Bend
- ▶ South Central Bend
- ▶ Southwest Prineville

HOUSEHOLDS WITHOUT A VEHICLE

The densest concentrations of households without a vehicle are in the following locations:

- ▶ Southwest Redmond
- ▶ Northeast Bend
- ▶ South Central Bend

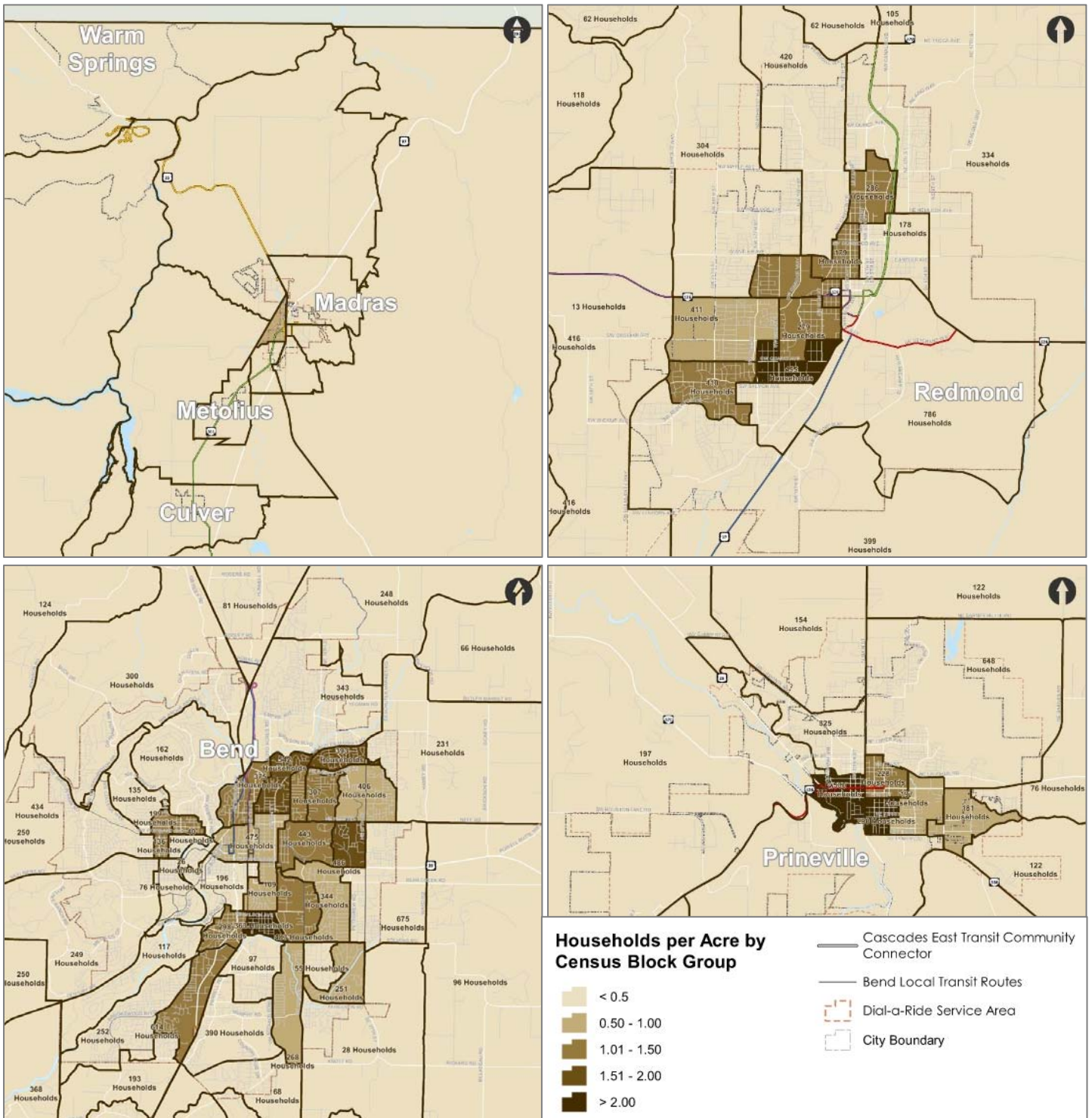


Figure 4: Households in Poverty

4.2 CURRENT TRANSPORTATION SERVICES

CET operates four distinct services: fixed-route service in Bend, intercity service between communities of CET’s service area (Community Connector), demand-responsive service in Bend, and demand-responsive service in rural areas.

BEND FIXED-ROUTES

CET operates nine fixed bus routes throughout Bend, show in Figure 5, that operate Monday

through Saturday within Fare Zone 1 and connect to the central Hawthorne Station for route transfers; Saturday services are limited. Route 10 only operates Monday through Friday. Information about fixed-route services in Bend is available using a Trip Planner tool with bus schedules and a Transit Track tool with real-time bus location and arrival time information. Table 2 summarizes key service areas, hours, and headways.

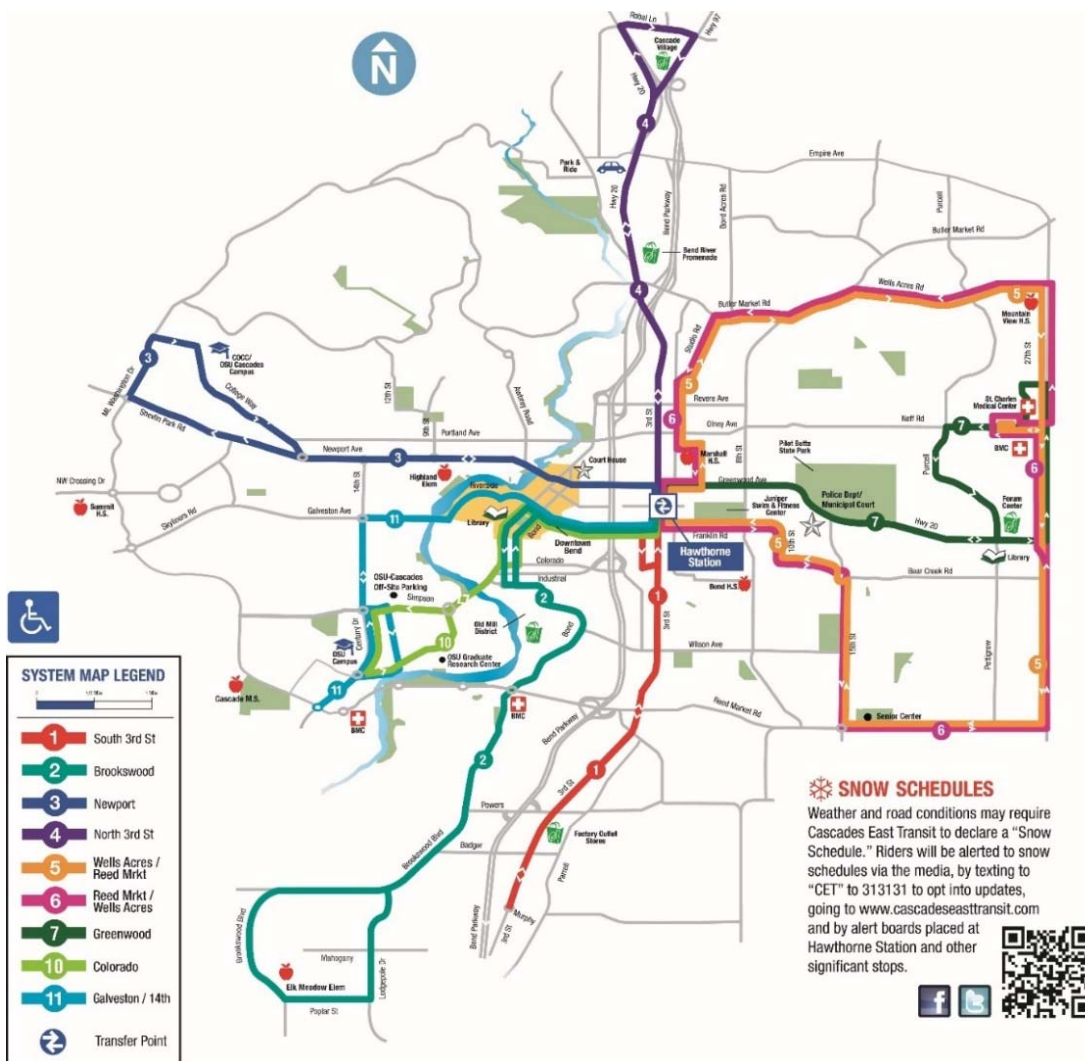


Figure 5: Bend Fixed Route Services

Table 2: Bend Fixed Route Service Summary

Fixed Route	Key Destinations			Hours ¹	Headway ²
1 – South 3rd St	▶ Factory Outlet Stores			6am – 7pm	30 min
2 – Brookwood	▶ Downtown Bend	▶ Old Mill District	▶ Elk Meadow Elementary	6am – 7pm	45 min
3 – Newport	▶ Deschutes County Court House	▶ Highland Elementary	▶ COCC/OSU Cascades Campus	6am – 7pm	30 min
4 – North 3rd St	▶ Bend River Promenade	▶ Cascade Village		6am – 7pm	45 min
5 – Well Acres	▶ Marshall H.S. ▶ Mountain View H.S. ▶ Work Source ▶ Senior Center	▶ St. Charles Med. Center ▶ Forum Shopping Center	▶ Bend Memorial Clinic ▶ Juniper Swim & Fitness Center	6am – 7pm	45 min
6 – Reed Market	▶ Marshall H.S. ▶ Mountain View H.S. ▶ Senior Center	▶ Forum Shopping Center ▶ Work Source ▶ Bend Mem'l Clinic	▶ St. Charles Med. Center ▶ Juniper Swim & Fitness Center	6am – 7pm	45 min
7 – Greenwood	▶ Pilot Butte State Park ▶ Police Dept. & Municipal Court	▶ Forum Shopping Center ▶ East Bend Library ▶ Work Source	▶ Bend Memorial Clinic ▶ St. Charles Med. Center	6am – 7pm	30 min
10 – Colorado	▶ Downtown Bend ▶ Downtown Bend Library	▶ OSU-Cascades Off-Site Parking ▶ OSU Campus	▶ OSU Graduate Research Center	6:30am – 6:30pm	60 min
11 – Galveston	▶ Downtown Bend ▶ OSU Campus	▶ OSU-Cascades Off-Site Parking		6am – 7pm	60 min

¹ Hours listed represent general Monday to Friday service. Saturday service is limited and generally operates between 8am and 5pm.

² Headways listed represent Monday to Friday service. Headways for Saturday service are generally 60 minutes for all routes.

RIDERSHIP AND PRODUCTIVITY

Ridership, revenue hours, and productivity for Bend fixed-routes are shown in Figure 6, and highlights include:

- ▶ **Routes 1, 4, 7, and 3** have the highest ridership and productivity.
- ▶ **Routes 5, 6, and 10 and 11** are moderately productive.

Route 1: South 3rd Street

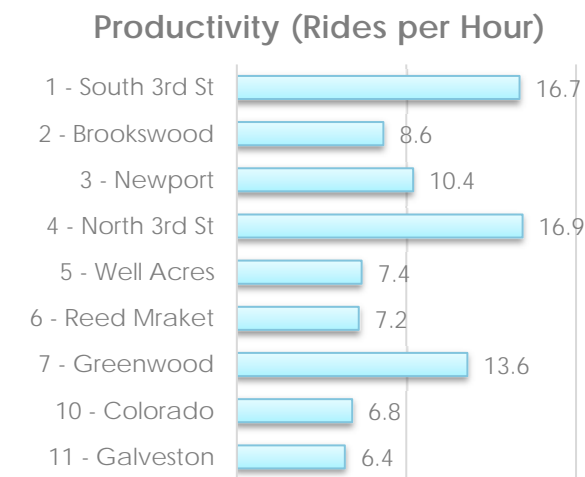
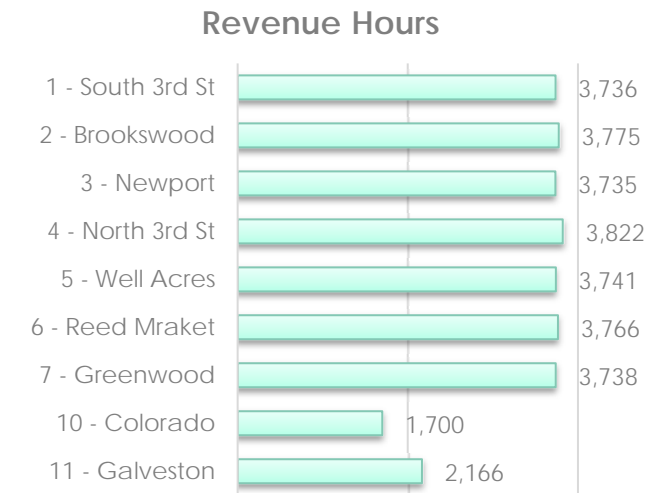
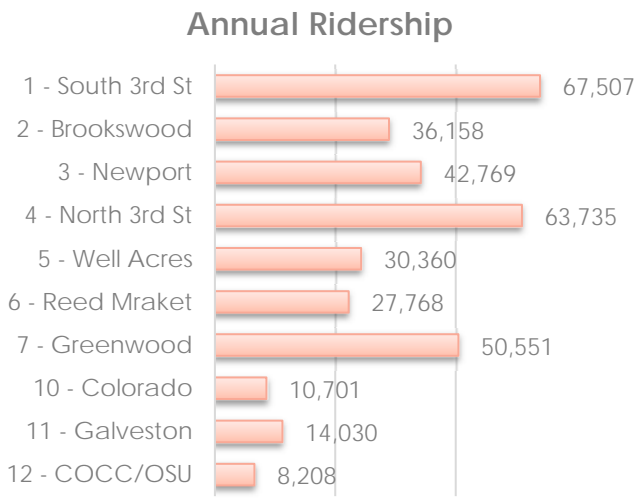
- ▶ Consistent ridership all day; strongest during midday and evening
- ▶ Midday, afternoon, and evening trips tend to run late

Route 2: Brookwood

- ▶ Moderate ridership midday and afternoon, but relatively low during morning and evening
- ▶ Morning, midday, and afternoon trips tend to run late
- ▶ 45-min headway may make timed transfers more challenging

Route 3: Newport

- ▶ Ridership is strong at all times of day, except early evening
- ▶ Generally runs on-time and even early



Route 4: North 3rd Street

- ▶ Ridership is strong at all times of day
- ▶ Runs late at all times of day except morning

Route 5: Wells Acres/Reed Market

- ▶ Ridership is only moderately strong
- ▶ Tends to run late in the afternoon, but runs early on some trips
- ▶ 45-min headway may make timed transfers more challenging

Route 6: Reed Market/Wells Acres

- ▶ Ridership is only moderately strong
- ▶ Tends to run late in the afternoon, but runs early on some trips
- ▶ 45-min headway may make timed transfers more challenging

Route 7: Greenwood

- ▶ Ridership is strong during all time periods
- ▶ Tends to run late in the afternoon

Route 10: Colorado

- ▶ Ridership is only moderate, and very low on the final evening trip
- ▶ Tends to run early

Route 11: Galveston/14th

- ▶ Ridership is only moderate
- ▶ Some midday and afternoon trips run late, but service runs early at other times

Figure 6: Bend Fixed Route Productivity

COMMUNITY CONNECTOR ROUTES

CET operates seven Community Connector fixed routes that connect riders between Bend, Redmond, Culver, La Pine, Madras, Metolius, Prineville, Sisters, and Warm Springs, shown in Figure 7. This service is open to the general public and operates Monday through Friday. Table 3 summarizes the routes' key service areas, hours, trips per day, and fare zones.

Note: Community Connector Route 20 includes deviated fixed-route service within Madras and Warm Springs. The deviated route serves fixed stops at specific times and allows for deviations up to 3/4 of a mile from those stops. To take advantage of deviations, passengers are required to schedule a pick-up or drop-off one day in advance.

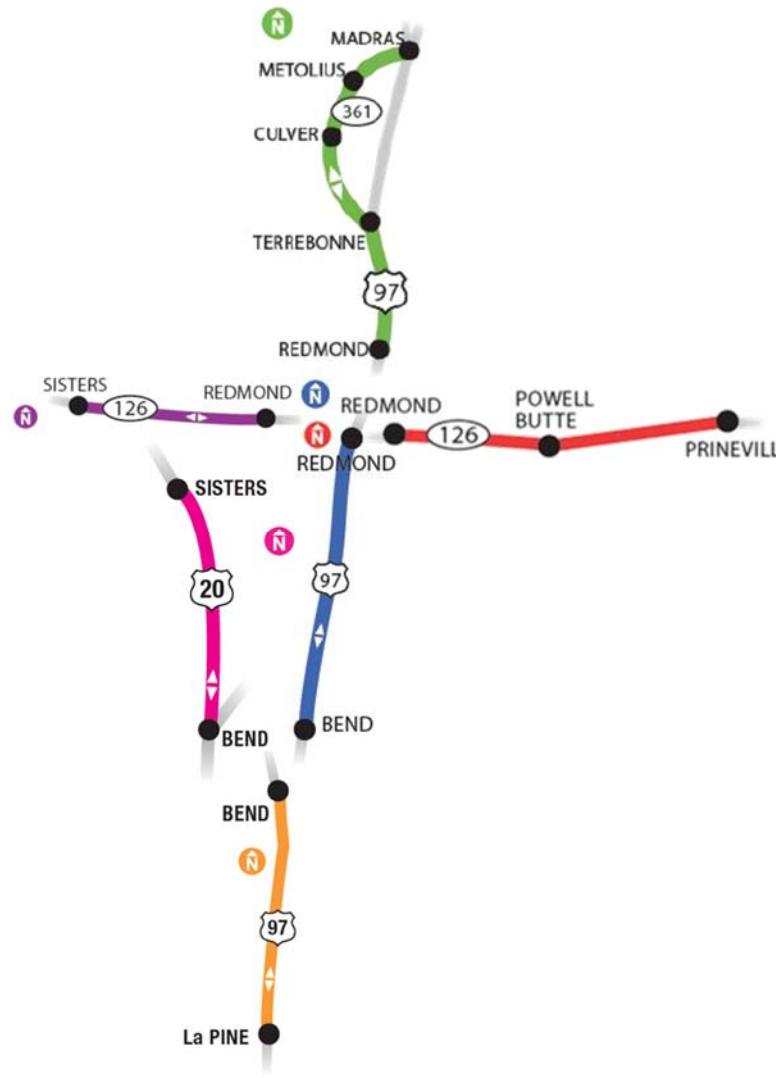


Figure 7: Community Connector Routes

Table 3: Community Connector Route Service Summary

Fixed Route	Key Destinations		Hours ¹	Trips per Day		Fare Zone ²
				NB/EB	SB/WB	
22 – Madras-Redmond	<ul style="list-style-type: none"> ▶ Redmond Transit Center ▶ Terrebonne Park & Ride ▶ Culver 	<ul style="list-style-type: none"> ▶ Metolius City Hall ▶ Madras DMV & Work Source 	5:30am – 6pm	5	6	2 & 3
24 – Redmond-Bend	<ul style="list-style-type: none"> ▶ Bend Hawthorne Station ▶ Cascade Village ▶ Redmond Transit Hub 		6am – 7pm	9	9	1 & 2
26 – Prineville-Redmond	<ul style="list-style-type: none"> ▶ Redmond Transit Center ▶ Powell Butte School ▶ Crook County Library 	<ul style="list-style-type: none"> ▶ Stryker Park ▶ Prineville 	6am – 6pm	5	5	2 & 3
28 – Sisters-Redmond	<ul style="list-style-type: none"> ▶ Redmond Transit Center ▶ Cloverdale Fire Station ▶ Sisters 		6am – 2:30pm	3	3	2 & 3
29 – Sisters-Bend	<ul style="list-style-type: none"> ▶ Bend Hawthorne Station ▶ Sisters 		6:30am – 5pm	3	3	1 & 3
30 – Bend-La Pine	<ul style="list-style-type: none"> ▶ Bend Hawthorne Station ▶ Bend Walmart ▶ Deschutes River Woods 	<ul style="list-style-type: none"> ▶ La Pine ▶ Wickiup Junction 	6:30am – 6:30 pm	4	3	1 & 3
Deviated Route	Key Destinations		Hours ¹	Trips per Day		Fare Zone ²
20 – Warm Springs-Madras	<ul style="list-style-type: none"> ▶ Bi-Mart ▶ Madras High School ▶ DMV ▶ COCC ▶ St. Charles Hospital ▶ Safeway ▶ Indian Head Casino ▶ Vocational Rehab 	<ul style="list-style-type: none"> ▶ Community Counseling ▶ Senior Center ▶ Warm Springs Market ▶ Community Center ▶ Tribal Administration ▶ Indian Health Service/Early Childhood Education 	6am – 7pm	6	6	3 & 4

RIDERSHIP AND PRODUCTIVITY

Ridership, revenue hours, and productivity for all Community Connector routes in 2017 are shown in Figure 8.

Route 20: Warm Springs/Madras

- ▶ Intercity and deviated fixed-route portions all reasonably productive.
- ▶ Ridership is strongest from Warm Springs to Madras (morning) and from Madras to Warm Springs (afternoon). Deviated

route ridership in Warm Springs moderately strong and consistent all day.

- ▶ Ridership lowest on mid/late morning trip, including on Madras deviated route, but strong on Warm Springs deviated route.
- ▶ On-time performance likely affected by deviated fixed-route.
- ▶ Bi-directional stops added in 2018 at Plateau Travel Plaza in Madras and

Vocational Rehabilitation Center stop removed in Warm Springs (facility relocated).

Route 22: Redmond/Madras

- ▶ Second highest ridership among other Community Connector routes.
- ▶ Highest productivity among Community Connector routes.
- ▶ Boardings unexpectedly very high on early morning trip to Redmond and 2:30 pm trip to Madras.

Route 24: Redmond/Bend

- ▶ Carried the most riders and offers the most service among Community Connector routes.
- ▶ Highest productivity among Community Connector routes.
- ▶ Boardings relatively low on some later morning/early afternoon trips and last two trips of the day
- ▶ Boardings high (and may exceed capacity) on first trip to Bend and 2:23 pm trip to Redmond
- ▶ Afternoon trips, particularly to Redmond, tend to run late

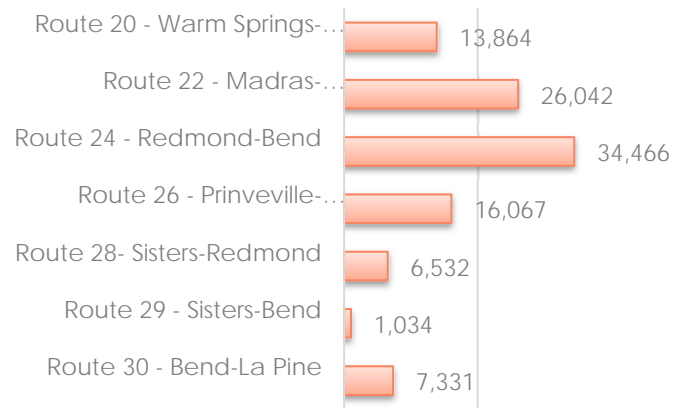
Route 26: Redmond/Prineville

- ▶ Moderately strong ridership and productivity but decreases since 2015
- ▶ Two of three afternoon trips to Prineville run late

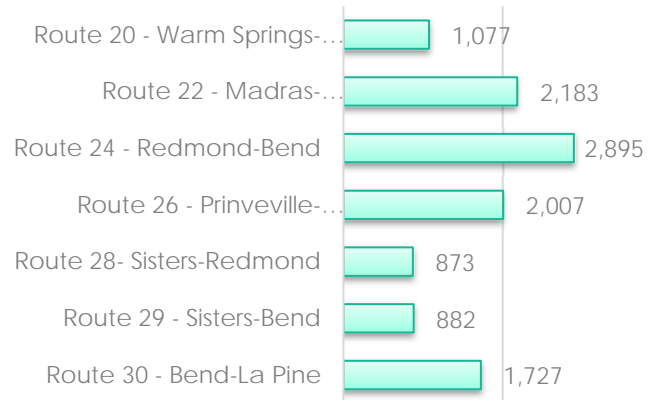
Route 28: Sisters/Redmond

- ▶ Route utilization has improved since 2016
- ▶ 7:55 am and 3:12 pm trips to Redmond tend to run late
- ▶ Imbalance in ridership patterns on this route (e.g., more people going to Sisters than Redmond).

Annual Ridership



Revenue Hours



Productivity (Rides per Hour)

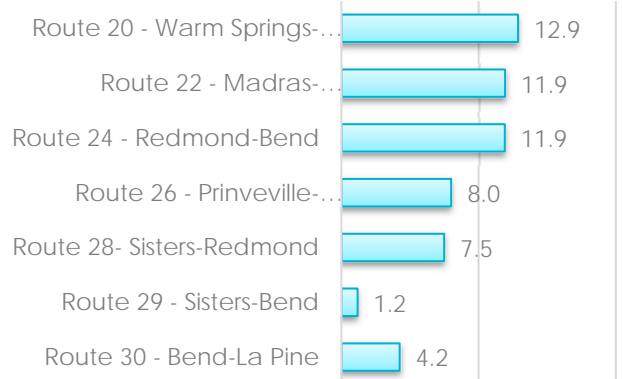


Figure 8: Community Connector Service Productivity

Route 29: Sisters/Bend

- ▶ Began operation on February 6, 2017, to eliminate transfer to Route 28, and carried 1,034 total riders. Productivity has been very low.
- ▶ Ridership is extremely low.
- ▶ 3:45 pm trip to Sisters tends to run late, which may relate to 4:18 trip to Bend running late.

Route 30: La Pine/Bend

- ▶ Second lowest productivity among Community Connector routes with declining riders.
- ▶ Afternoon trips to La Pine run late.

BEND DIAL-A-RIDE

Demand-responsive services within Bend are a complementary paratransit service to the fixed-route system required by the Americans with Disabilities Act (ADA). Bend Dial-A-Ride is a ride-share operation for disabled individuals as well as low-income senior citizens who do not live near CET fixed-route bus service. It operates seven days a week (excluding major holidays) within its service area of Bend's city limits during the following times and days:

- ▶ Monday to Friday: 6:00 a.m. to 7:30 p.m.
- ▶ Saturday: 7:30 a.m. to 5:30 p.m.
- ▶ Sunday: 8:30 a.m. to 3:15 p.m.

Those desiring to utilize Bend's Dial-A-Ride transit service are required to complete an application provided on CET's website to secure eligibility. Eligible individuals schedule rides based on availability the day prior to or up to 14 days in advance of needing service. The service includes some flexibility for trips to medical appointments.

RIDERSHIP AND PRODUCTIVITY

Figure 9 provides ridership, revenue hours, and productivity for demand-responsive service in Bend for 2014-2017, and highlights include:

- ▶ Ridership on demand-responsive service in Bend has declined by 12,740 between 2014 and 2017. Capacity may be constrained by the number of available vehicles.
- ▶ Despite declining ridership, revenue hours have increased each year, peaking at more than 15,000 in 2017.
- ▶ The diverging trends in ridership and revenue hours have caused productivity to drop to a low of 2.5 rides per hour in 2017.

SERVICE CHARACTERISTICS

Service characteristics highlights include:

- ▶ 27,544 trips were taken in 2018, representing 572 unique riders
- ▶ 74 percent were classified as ADA/Disability trips. Low-income seniors accounted for 8 percent of trips.
- ▶ 25 percent of riders used a mobility device
- ▶ 45 percent of rides were provided "on-time"

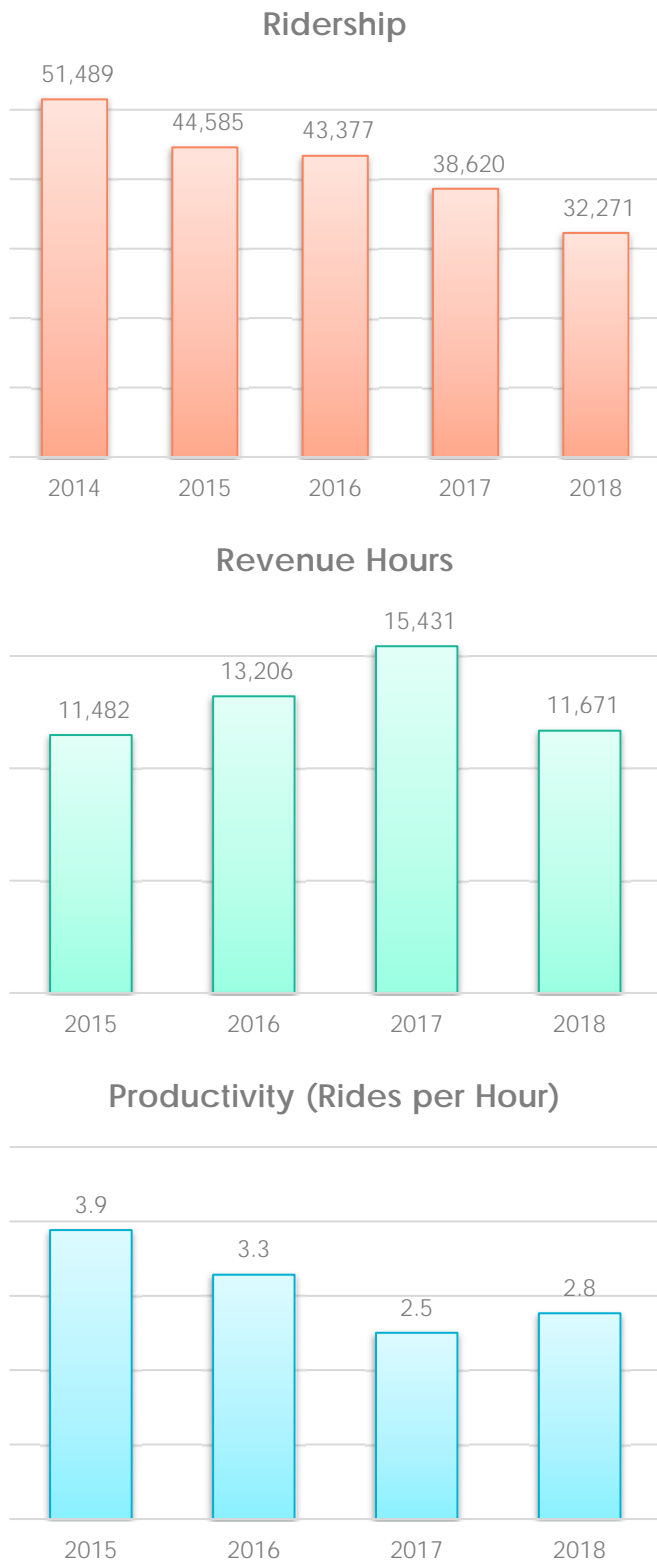


Figure 9: Bend Dial-A-Ride Productivity

RIDERSHIP PATTERNS

Figure 10 shows the most common trip patterns aggregated by zone, showing only those origin/destination zone pairs with 5 or more trips per week. The majority of trips are between locations in downtown Bend and locations in east Bend; relatively few trips begin or end on Bend’s west side.

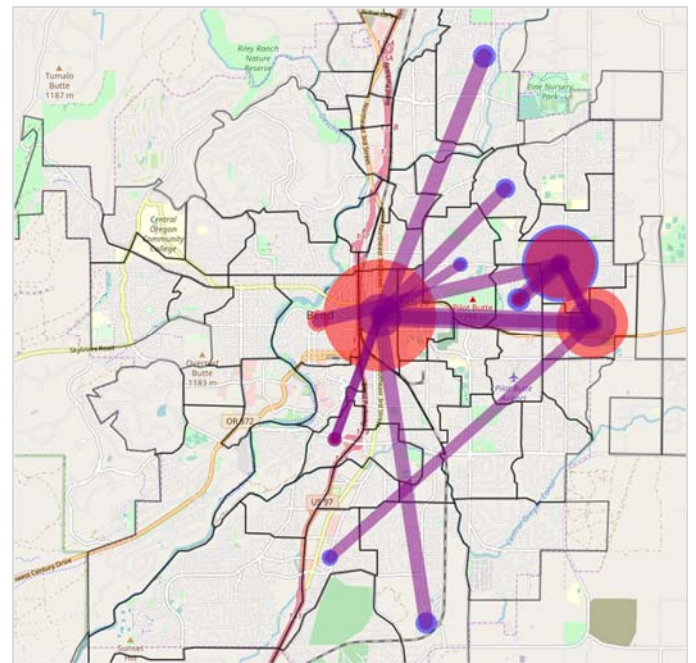


Figure 10: Bend Dial-A-Ride Trip Patterns

RURAL DIAL-A-RIDE

Rural Dial-A-Ride service is offered within La Pine, Redmond, Sisters, Prineville, Madras, and Warm Springs. This service is open to the general public and does not have any eligibility requirements. Riders must call the day before service is needed to reserve a ride. Ride times are scheduled based on availability. Memo 1 (Existing Conditions) includes maps of the Rural Dial-A-Ride service areas.

RIDERSHIP AND PRODUCTIVITY

Figure 11 provides ridership, revenue hours, and productivity for 2017. Productivity in all communities is within the general range of what is acceptable for demand-response service. Highlights include:

- ▶ Ridership in Redmond accounted for over half of all rural local bus boardings during less than half of all revenue hours. Productivity is the highest of all communities.
- ▶ Prineville and Madras each accounted for more than 7,000 boardings, with productivity of close to four boardings per revenue hour.
- ▶ Ridership in Sisters was the lowest of all communities, but service is only provided one day per week and productivity is comparable to the Madras and Prineville services.
- ▶ Rural Dial-A-Ride service in La Pine has the lowest productivity.
- ▶ Warm Springs ridership is the second highest among these services.

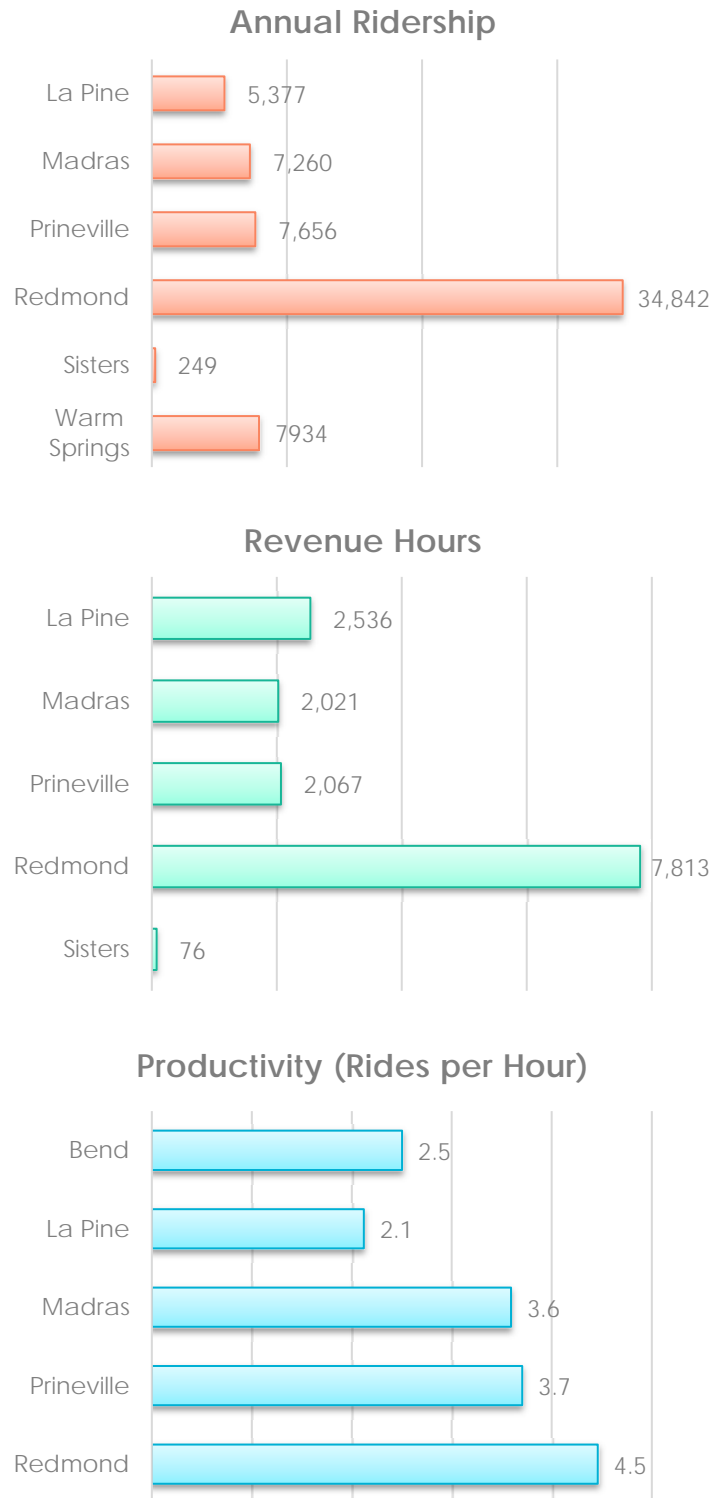


Figure 11: Rural Dial-A-Ride Productivity

SERVICE CHARACTERISTICS

Service characteristics highlights include:

- ▶ Redmond shows the highest demand for local bus service, with more than 22,000 rides in 2018, well over half of the rural local bus total ridership. Madras and Prineville each account for approximately 16 percent of remaining trips.
- ▶ A total of 1,309 unique riders (customers) used rural local bus service in 2018, taking 37,910 trips. Each customer rode 29 times on average.
- ▶ Average trip length ranges from 10 minutes in Madras, to nearly 20 minutes in Warm Springs.
- ▶ 71 percent of trips were self-pay, while 27 percent of trips were Medicaid-funded or trips provided through contracts from the state of Oregon and an affordable housing provider. 19 percent of riders used mobility devices.
- ▶ 45 percent of trips were on time. More trips were late than those that arrived early.

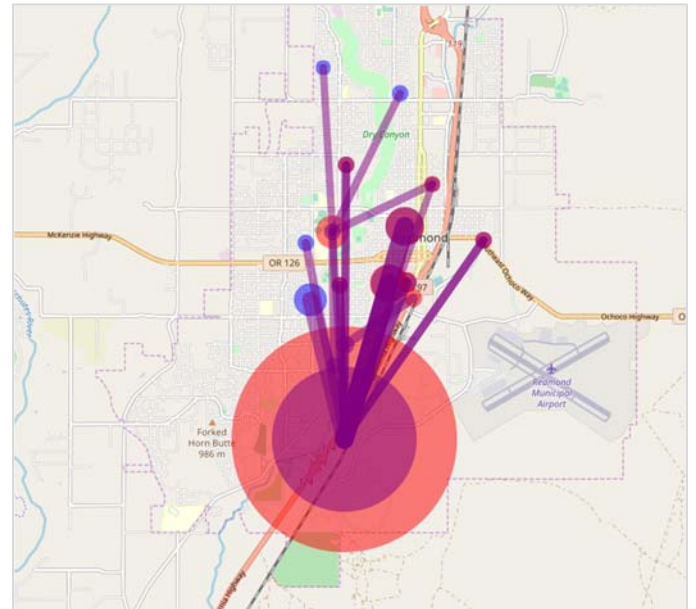


Figure 12: Redmond Dial-A-Ride Trip Patterns

Prineville

Figure 13 shows travel patterns in the city of Prineville. Key locations include the Stryker Park bus stop where passengers can transfer to Community Connector service to Redmond, and the Senior Center.

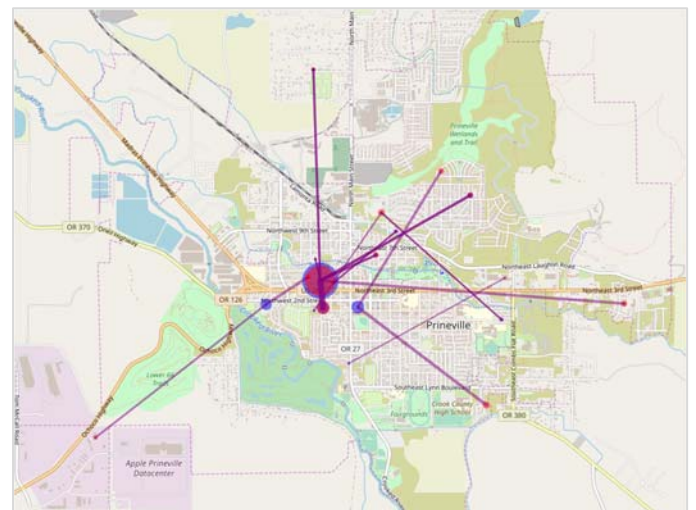


Figure 13: Prineville Dial-A-Ride Trip Patterns

RIDERSHIP PATTERNS

The following figures show ridership patterns. The line weights represent relative number of trips between general areas, not specific origins and destinations.

Redmond

Figure 12 shows major demand-responsive service travel patterns in the city of Redmond. Travel is predominantly north-south.

Sisters

Figure 14 shows travel patterns on rural local bus service in Sisters where the highest-demand location is the Senior Center.

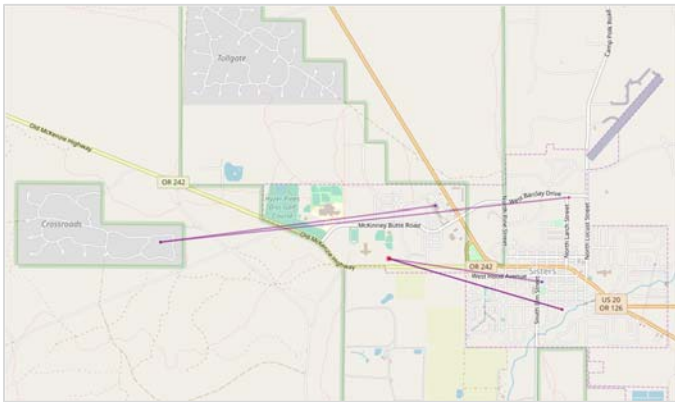


Figure 14: Sisters Dial-A-Ride Trip Patterns

Madras

Figure 15 shows the primary travel patterns in the city of Madras, which are distributed across the city.

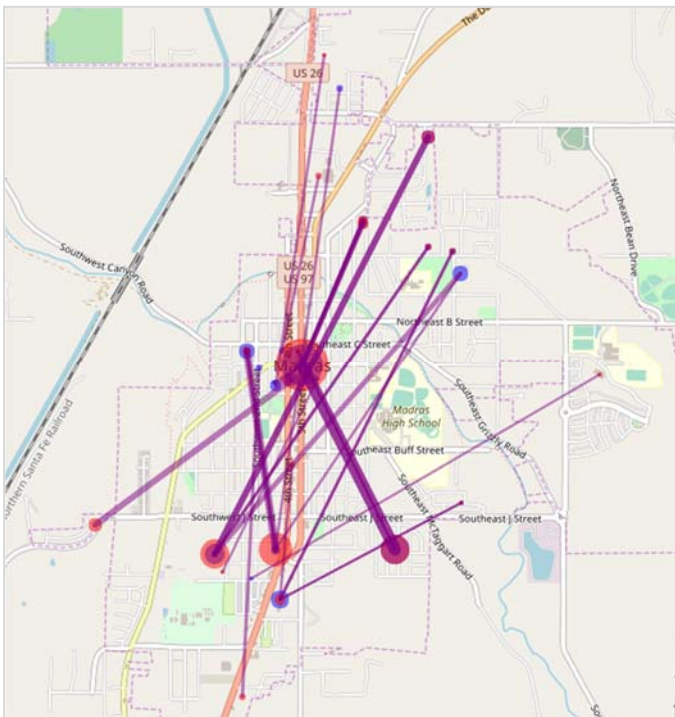


Figure 15: Madras Dial-A-Ride Trip Patterns

La Pine

Figure 16 shows common trip patterns in the city of La Pine. Locations most frequently served include Ray’s Food Place, Prairie House Assisted Living, and Holy Redeemer Church.

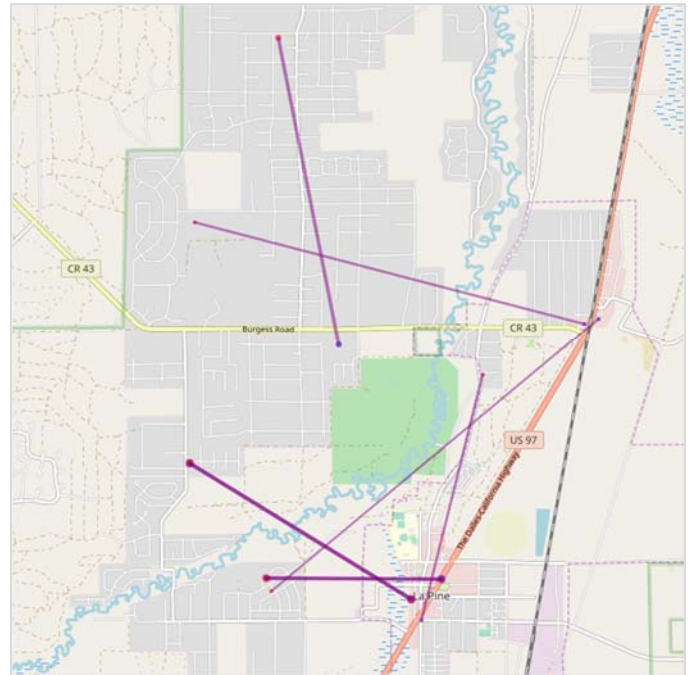


Figure 16: La Pine Dial-A-Ride Trip Patterns

RECREATIONAL SHUTTLES

CET offers a variety of recreational shuttle services that are open to local residents and visitors and provide a connection to outdoor attractions in Bend.

RIDE THE RIVER

Floating the Deschutes River is a popular Bend activity during the summer season. The Ride the River shuttle helps minimize the need for riders to park vehicles within Drake Park. Figure 17 illustrates the Ride the River shuttle route and stops. The shuttle currently operates from mid-June to Labor Day, Monday through Sunday, 11:00 a.m. to 6:00 p.m., and unlimited rides with the purchase of a wristband. Friday through Sunday, the shuttles will run at 15- to

20-minute headways between 1:30 p.m. and 6:30 p.m.



Figure 17: Ride the River

MT. BACHELOR WINTER SHUTTLE

CET offers a shuttle service in the winter season from Bend to Mt. Bachelor, CET Route 18, that stops at Hawthorne Station, Mt. Bachelor Park-and-Ride, Meissner SnoPark, and Mt. Bachelor's West Village Lodge. Figure 18 illustrates the Mt. Bachelor shuttle route and stops. The shuttle operates Monday to Thursday from 6:40 a.m. to 5:30 p.m. and Friday and Saturday from 6:40 a.m. to 6:30 p.m., making multiple trips. Riders can purchase shuttle tickets at Mt. Bachelor's Guest Services, at Safeway on Century Drive, or from the bus driver using exact change.



Figure 18: Mt. Bachelor Winter Shuttle

LAVA BUTTE

As the newest recreational service offered, the Lava Butte shuttle is a seasonal service that transports riders to the top of Lava Butte for mountain-top views of Central Oregon. The service operates from Memorial Day to Labor Day, from the Lava Butte visitor center to the summit between 10:00 a.m. to 4:00 p.m., with the last descent from the summit at 4:40 p.m.

RIDERSHIP AND PRODUCTIVITY

Figure 19 provides ridership, revenue hours, and productivity for 2017.

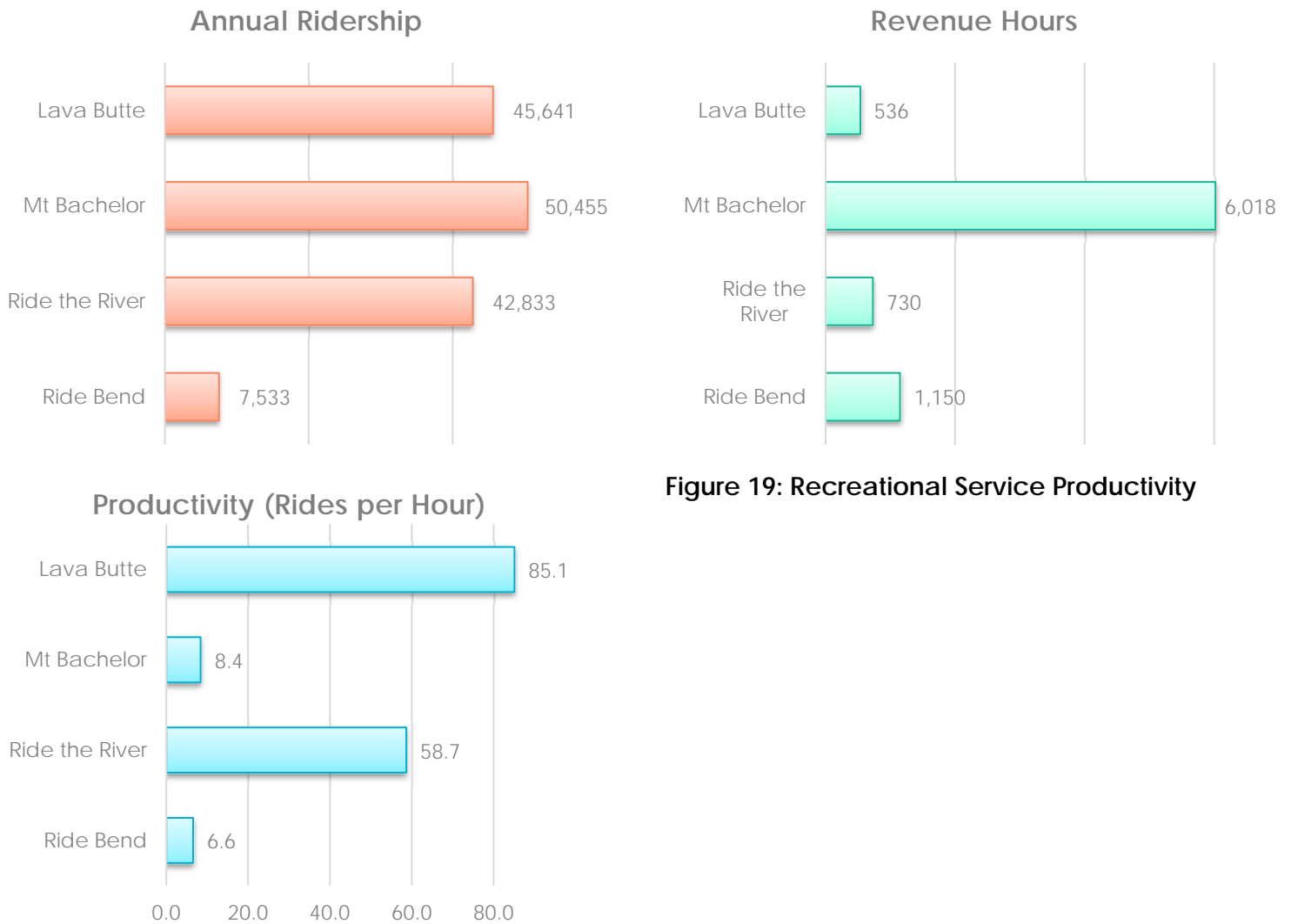


Figure 19: Recreational Service Productivity

4.3 CAPITAL INVENTORY

A inventory of CET’s current capital includes their capital fleet, non-revenue fleet, bus stops and amenities, operations and maintenance facilities, transit-supportive technologies, and park-and-ride lots. The full inventory is included in the *Existing Conditions Memo* in the Technical Appendix.

EXISTING CAPITAL FLEET INVENTORY

CET operates 70 transit vehicles of varying size, capacity, and intended service. Vehicles range from 30-foot heavy-duty transit buses to

small buses and specialized vans, having accessibility and bike features, and used for Community Connector routes, fixed-routes, dial-a-ride, and Deschutes National Forest access routes. Some transit vehicles are nearly brand new while others have outlived their useful life in either age or mileage. Table 4 summarizes the inventory of CET’s fleet of revenue vehicles. Eleven of these vehicles are partially or fully eligible for replacement.

Table 4: CET Fleet Inventory

Vehicle Type ¹ (#)	Service	Seating Capacity	Propulsion	Condition	Accessibility Features	Bike Rack
25-30' Light-Duty Transit Bus (31)	<ul style="list-style-type: none"> ▶ Fixed-Route ▶ Community Connector ▶ Dial-A-Ride 	9 to 22	Unleaded	<ul style="list-style-type: none"> ▶ New ▶ Excellent ▶ Good 	<ul style="list-style-type: none"> ▶ Wheelchair Capable (34" W x 70" H; 800 lbs.) ▶ Drop Down Chains 	<ul style="list-style-type: none"> ▶ Yes (22) ▶ No (3) ▶ Unknown (6)
30' Heavy-Duty Transit Bus (11)	<ul style="list-style-type: none"> ▶ Fixed-Route ▶ Community Connector ▶ Deschutes National Forest 	27 to 38	Diesel	<ul style="list-style-type: none"> ▶ Excellent ▶ Good 	<ul style="list-style-type: none"> ▶ Wheelchair Capable (34" W x 70" H; 800 lbs.) ▶ Drop Down Chains 	<ul style="list-style-type: none"> ▶ Yes (5) ▶ No (6)
30' Medium-Duty Transit Bus (5)	<ul style="list-style-type: none"> ▶ Community Connector ▶ Dial-A-Ride 	22 to 29	<ul style="list-style-type: none"> ▶ Diesel ▶ Unleaded 	<ul style="list-style-type: none"> ▶ Excellent ▶ Good ▶ Fair 	<ul style="list-style-type: none"> ▶ Wheelchair Capable (34" W x 70" H; 800 lbs.) ▶ Drop Down Chains 	Yes
Small Bus & Specialized Van (9)	<ul style="list-style-type: none"> ▶ Dial-A-Ride 	5 to 14	Unleaded	<ul style="list-style-type: none"> ▶ Excellent ▶ Good 	<ul style="list-style-type: none"> ▶ Wheelchair Capable (34" W x 70" H; 800 lbs.) ▶ Drop Down Chains (6) 	<ul style="list-style-type: none"> ▶ Yes (6) ▶ Unknown (3)
Undefined (14)	<ul style="list-style-type: none"> ▶ Fixed-Route ▶ Community Connector ▶ Deschutes National Forest 	34 to 38	Diesel	Excellent	<ul style="list-style-type: none"> ▶ Wheelchair Capable (34" W x 70" H; 800 lbs.) ▶ Drop Down Chains 	Yes

¹Federal Transit Administration (FTA) Categories

NON-REVENUE FLEET INVENTORY

For operational uses outside of transit service provision, CET owns and maintains six non-revenue transit vehicles, where two are located in Bend and four are located in Redmond. Operational uses may include bus stop inventory, maintenance, or installation; site visits; or responding to stalled buses.

BUS STOPS AND AMENITIES

The *Existing Conditions Memo* attachments in the Technical Appendix show the bus stop locations for all of CET's fixed-route services. Along CET's nine fixed routes in Bend, bus stops include amenities such as landing pads compliant with ADA standards, curb ramps, benches, trash receptacles, shelters, Braille signs, and schedule holders, which are summarized in Table 5 (expressed as percentages by route).

Table 5: Transit Stop Amenities

Route (# of Stops)	ADA Pad	Benches	Trash Receptacles	Shelters	Braille Signs	Schedule Holders
1 (20)	90%	10%	95%	15%	90%	100%
2 (36)	83%	11%	47%	14%	83%	100%
3 (22)	91%	45%	50%	9%	82%	100%
4 (22)	77%	9%	68%	18%	91%	91%
5 (43)	53%	21%	26%	7%	53%	53%
6 (40)	73%	13%	40%	10%	60%	73%
7 (31)	97%	16%	45%	16%	45%	94%
10 (14)	79%	7%	21%	7%	43%	100%
11 (25)	44%	12%	20%	4%	48%	52%

In addition to these bus stops, CET operates two primary transit stations: the Redmond Transit Hub and Bend’s Hawthorne Station, where all Bend fixed-routes and Community Connector routes to Bend intersect.

Hawthorne Station operates from 6:30 a.m. to 6:00 p.m., Monday to Friday, and from 10:00 a.m. to 2:00 p.m. on Saturday and Sunday. Hawthorne Station has an indoor waiting area, restrooms, and shelters. The new Redmond Transit Hub is a regional hub for the Madras-Redmond, Prineville-Redmond, Sisters-Redmond, and Bend-Redmond routes. This facility provides parking, restrooms, secured bicycle parking, wayfinding signs, security cameras, and lighting. It also includes shelters that can accommodate numerous

passengers, access for 9 buses at one time, and a bike lane routed between parking stalls and the bus loading area.

OPERATIONS AND MAINTENANCE FACILITIES

Table 5 summarizes the functions of CET’s operations and maintenance facilities. Vehicles are stored in multiple facilities throughout the service area (including city and county facilities) to reduce daily deadhead mileage when buses begin and end service. CET maintains the vehicles it operates as well as many of the vehicles for which it contracts out operations. Redmond Public Works maintains the vehicles used in Community Connector and Rural Dial-A-Ride operations.

Table 6: Operations and Maintenance Facilities

Facility	Description
La Pine (51340 US 97)	Includes driver’s office and storage for 3 vehicles. Shared with Deschutes County Sheriff’s Office.
Bear Creek Office (1250 NE Bear Creek Road in Bend)	Includes CET administration office, paratransit administration office, maintenance garage, and storage for 40 vehicles. A secure facility owned by COIC.
Redmond Office (343 E Antler Avenue)	Includes CET dispatch office, CET administration office, Cascades East Ride Center, maintenance garage, and storage for 18 vehicles. A secure facility owned by COIC.
Prineville Office (2321 NE 3 rd Street)	Includes driver’s office and storage for 2 vehicles. Shared with Oregon Department of Education.
Madras Office (281 SW 3 rd Street)	Includes driver’s office and storage for 3 vehicles. Shared with COIC WorkForce and Department of Motor Vehicles.

TRANSIT-SUPPORTIVE TECHNOLOGIES

The CET web site provides a trip planning interface that is integrated with Google Transit. TransitApp is a web interface and smart phone app that is available via the CET web site. TransitApp indicates the real-time location and anticipated arrival time of CET fixed-route buses, as shown in Figure 20.

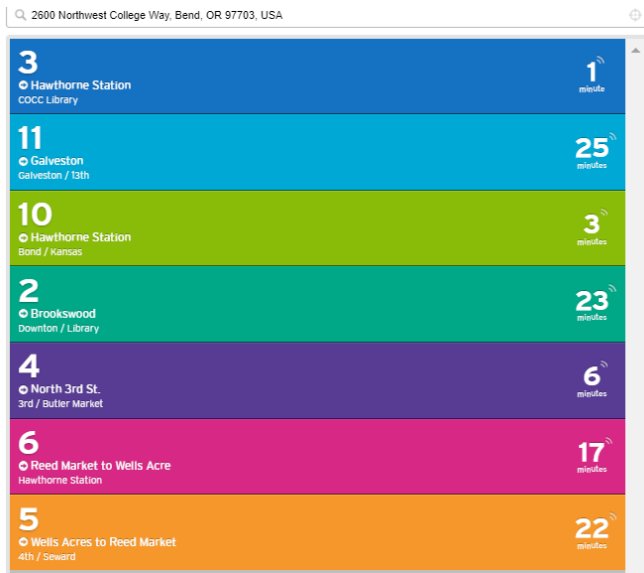


Figure 20: TransitApp Display of Bus Arrival Times

CET uses RouteMatch computer-assisted scheduling and dispatching software to coordinate and manage demand-responsive transit services.

PARK AND RIDE LOTS

The location of park-and-ride lots in the service area are described in Table 7. Of the 26 lots, five are formal – those that are ADA-accessible and officially designated by a government or agency as park-and-ride lots – and the remaining are informal – not designated. The formal park-and-ride lot locations and sizes are reported in ODOT’s 2017 *Park & Ride Directory*; these sites are located in Sunriver, Bend, La Pine, and Sisters.

Table 7: Central Oregon Park-and-Ride Lots

Name	Location	Type	Parking Spaces	
			Available	Used ¹
Sunriver Marketplace Park-and-Ride (carpooling only)	18160 Cottonwood Rd in Sunriver	Formal	6	17-83%
Mount Bachelor Park-and-Ride	SW Simpson and Columbia in Bend	Formal	200	>5% during ski season
ODOT Park-and-Ride	63055 N Hwy 97 in Bend ²	Formal	10	13-63%
La Pine Park-and-Ride	17000 Burgess Rd in La Pine	Formal	25	>40%
Sisters PumpHouse Park-and-Ride	464 E Washington Ave in Sisters ³	Formal	6	17-83%
Powell Butte Park-and-Ride	Powell Butte Hwy and E Hwy 20 in Bend	Informal	8	13-63%
Prineville Park-and-Ride	305 NW Madras Hwy in Prineville	Informal	12	42-83%
Shoulder	US 97 and Vandever Rd in South Deschutes County	Informal	N/A	N/A
Shoulder	US 97 and State Rec Rd in South Deschutes County	Informal	N/A	N/A
Walmart	20120 Pinebrook Blvd in Bend	Informal	N/A	N/A
Culver City Hall	200 First Ave in Culver	Informal	N/A	N/A
Riverwoods Country Store	19745 Galen Baker Rd in Deschutes River Woods	Informal	N/A	N/A
Commercial Store	53750 Hwy 97 in La Pine	Informal	N/A	N/A
Jefferson County Fairgrounds	430 SW Fairgrounds Rd in Madras	Informal	N/A	N/A
Across from Madras Fire Department	4th and J St in Madras	Informal	N/A	N/A
Safeway	80 NE Cedar St in Madras	Informal	N/A	N/A
DMV/ WorkSource	249 SW 3rd St in Madras	Informal	N/A	N/A
Metolius Market	3777 SW Culver Hwy in Metolius	Informal	N/A	N/A
Powell Butte Post Office	16052 OR 126 in Powell Butte	Informal	N/A	N/A
Powell Butte Church	13720 OR 126 in Powell Butte	Informal	N/A	N/A
Prineville City Hall	387 NE 3rd St in Prineville	Informal	N/A	N/A
Downtown Redmond Transit Center	827 SW Deschutes Ave in Redmond	Informal	N/A	N/A
COCC/ WorkSource	2158 SE College Loop in Redmond	Informal	N/A	N/A
Safeway	1705 US 97 in Redmond	Informal	N/A	N/A
Walmart	300 NW Oak Tree Ln in Redmond	Informal	N/A	N/A
Warm Springs Tribal Admin/ Wellness Center	1270 Kot-Num Rd	Informal	N/A	N/A

¹ Calculated from *ODOT Region 4 Park and Ride Lot Plan* (January 2014)

² The address of this lot in the *ODOT Region 4 Park and Ride Lot Plan* is 20340 Empire Blvd in Bend.

³ The address of this lot in the *ODOT Region 4 Park and Ride Lot Plan* is 591 E Hwy 20 in Sisters.

4.4 TRIP PURPOSE AND TRAVEL DEMAND

This section provides insight into potential transit needs within, to, and from the Bend MPO area based on vehicular travel demand within Bend, Redmond, and throughout Central Oregon. The full analysis is included in *Supplemental Bend Needs Memo* in the Technical Appendix.

ORIGIN – DESTINATION STUDY

Bend's current and future travel patterns were examined using vehicle trip information from the Bend MPO region travel demand model. Note: projected transit trips reflect existing routes only.

TRAVEL DEMAND WITHIN BEND

Vehicle trip patterns within Bend were produced based on trip start and end data within Transportation Analysis Zones (TAZs). Larger TAZ groups, 32 in total, were formed based on similar land uses, areas that comprised the same general location, and natural and built environmental factors. The following TAZ groups generate the most trips:

- ▶ Medical Center
- ▶ Downtown Bend
- ▶ Retail/Commercial Corridors along US 20-3rd Street
- ▶ Oregon State University (OSU)-Cascades
- ▶ Juniper Ridge

TRAVEL DEMAND BETWEEN BEND AND REDMOND

The Bend-Redmond model projects that the 2010 total weekday trips between the cities will grow 65 percent by 2040 (13,600 to 22,500). As a result, vehicle travel patterns were evaluated between the two cities to identify intercity and local service needs.

Bend

Figure 21 shows the density of trips to each TAZ in Bend from Redmond, demonstrating:

- ▶ In 2010, intercity trips with Redmond are most concentrated in the Cascade Village area, various places along 3rd Street north of Downtown, Downtown Bend, Old Mill, Central Oregon Community College (COCC), and the medical center.
- ▶ In 2040, these trips remain relatively unchanged, except for an increase in trips to the TAZ that includes the OSU-Cascades campus.

Redmond

Figure 22 shows the density of trips to each TAZ in Redmond from Bend, demonstrating:

- ▶ Intercity trips with Bend are concentrated in Redmond along US 97 and near the airport but are also widely distributed throughout Redmond.

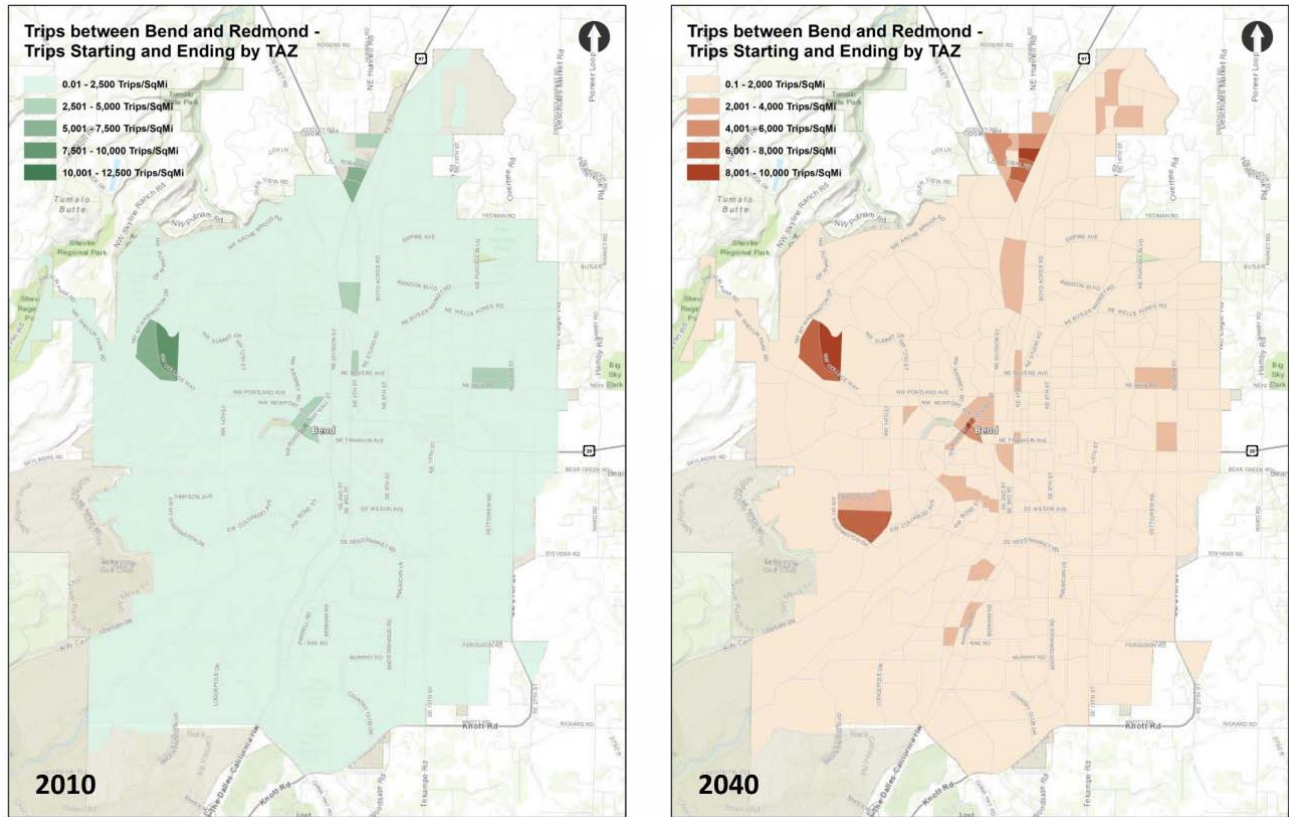


Figure 21: Density of Trips to Each TAZ in Bend from Redmond

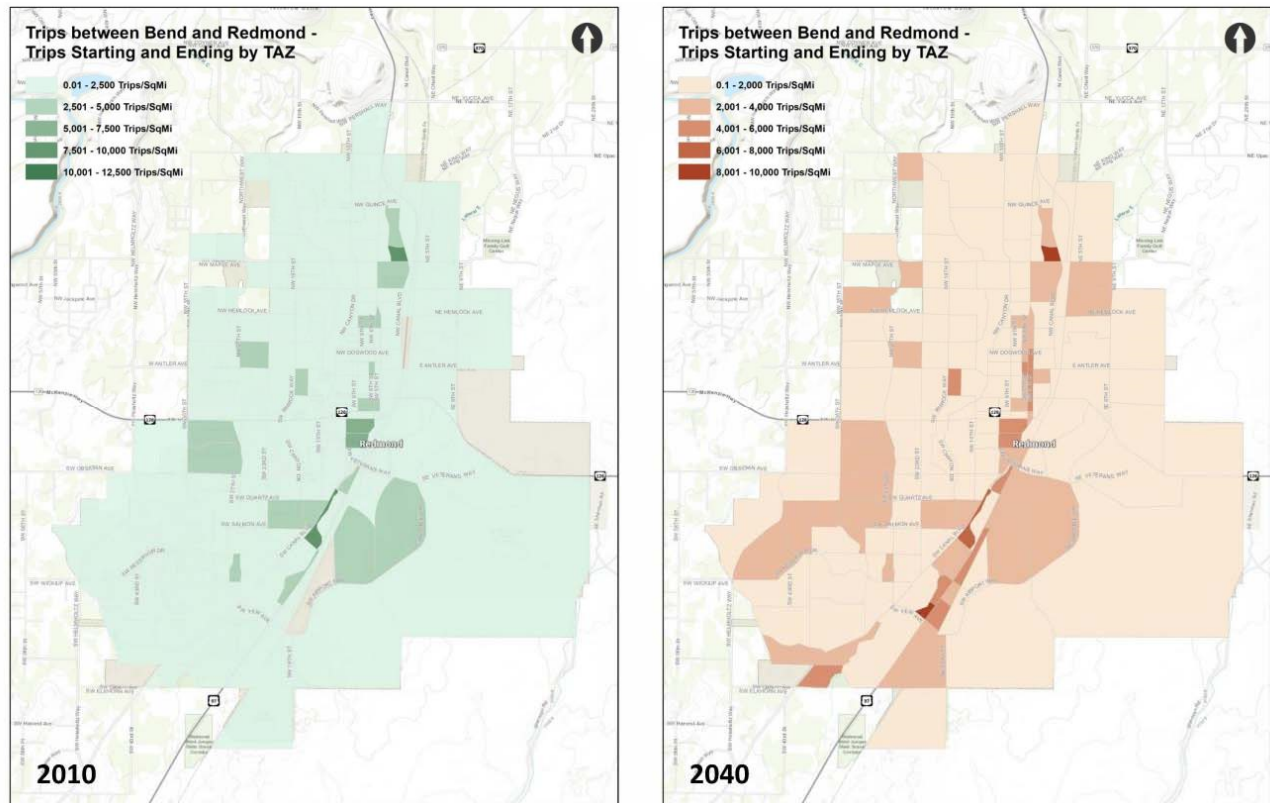


Figure 22: Density of Trips to Each TAZ in Redmond from Bend

TRAVEL DEMAND BETWEEN CENTRAL OREGON CITIES AND BEND/REDMOND

Between 2010 and 2040, the Bend-Redmond model predicts that intercity trips to the model area will grow by 45 percent (45,310 to 65,991 trips per day). Trips are assigned to locations along major roadways entering the model area shown as blue dots in Figure 23. These trips could be from immediate cities outside of the model area (e.g. Madras, Sisters, and La Pine) but could also be from cities at greater distances (e.g. Salem and Portland).

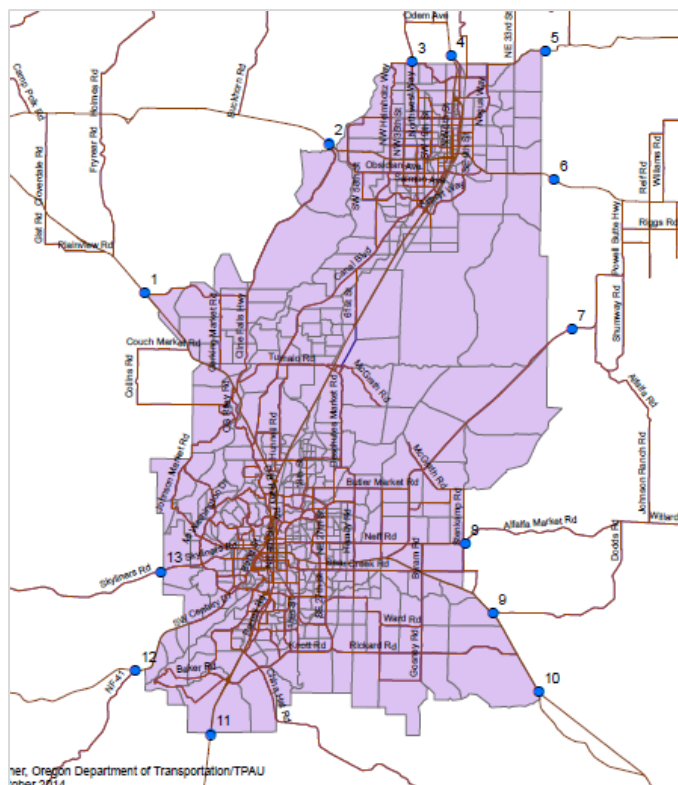


Figure 23: Travel Demand Model Area

The four directions that generate the most intercity trips to the Bend-Redmond model area are La Pine/Sunriver, Warm Springs/Madras, Prineville, and Sisters, summarized in Table 8.

The following summarizes the travel patterns between Central Oregon cities and Bend/Redmond:

- ▶ Generally, the TAZs that receive the most intercity trips are either along the primary highway corridors in Bend and Redmond or larger residential areas.
- ▶ In 2010, each location generates over 3,500 daily trips to Bend. In 2040, the number increases to 5,100. Of note, Warm Springs / Madras direction generates a comparable number of trips to Bend as to Redmond in 2040.
- ▶ Prineville generates a comparable number of trips to Bend as to Redmond in 2010 and 2040.
- ▶ The model estimates very few trips from the LaPine/Sun River direction to Redmond in 2010 and 2040.

Table 8: Projected Intercity Trip Growth

Direction of Travel	2010		2040	
	Bend	Redmond	Bend	Redmond
La Pine / Sunriver	9,009	353	11,567	653
Warm Springs / Madras	4,806	7,051	7,326	8,195
Prineville	3,591	4,734	5,147	6,124
Sisters	5,029	2,700	7,424	3,870

TRAVEL DEMAND FOR THE REDMOND MUNICIPAL AIRPORT

This section provides Redmond Municipal Airport (RDM) airport arrival and departure statistics as well as airport employee information.

ARRIVALS AND DEPARTURES

The number of passengers entering and exiting the airport were analyzed using available travel data for a Monday in May 2019 to represent typical weekday travel patterns. According to RDM, 38,528 passengers departed the airport in May 2019. Passenger entries and exits are illustrated in Figure 24. As shown, combined entries and exits peak at 6:00 a.m., 11:00 a.m., and 3:00 p.m. Arrivals and departures both peak in July and August and reach their lowest count in January and February.

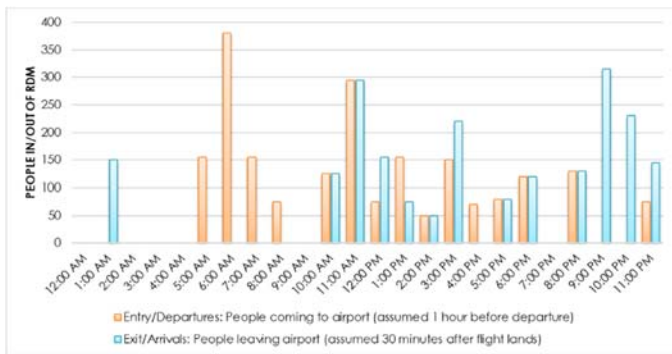


Figure 24: RDM Passenger Entries and Exits

Traffic in and out of RDM increases annually, and in recent years, has grown at

approximately 12.1 percent per year. The Redmond Airport provided data on passengers utilizing RDM and from where they travel, illustrated in Figure 25.

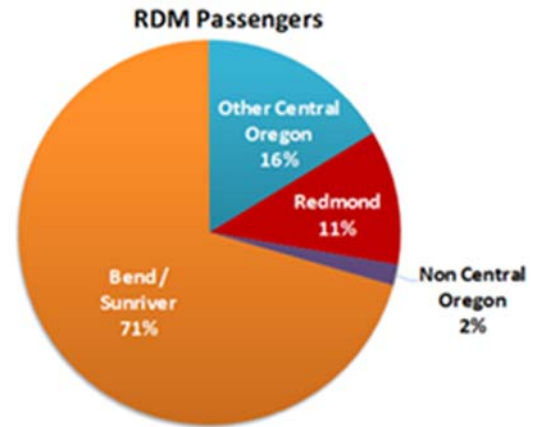


Figure 25: RDM Passenger Destinations

As shown, a majority of passengers served at RDM travel between the airport and the Bend/Sunriver area. In contrast, the Bend MPO travel demand model shows that the majority of vehicle trips move between Redmond and RDM, likely illustrating RDM employees who reside in Redmond.

AIRPORT EMPLOYEES

Redmond Municipal Airport hosts 16 employers that employ 370 staff – not including airfield staff (e.g. FBO and flight school staff) – that work around the clock. Given this does not include airfield staff, the number of employees is greater than the 370 staff working at the airport.

4.5 LAND USE AND POPULATION AND EMPLOYMENT DENSITIES

This section summarizes regional growth projections, house and job locations, and existing mode splits, as well as future population and employment densities within Bend and Redmond and current access to transit within Bend. The full analysis is included

in the *Existing Conditions Memo* and the *Bend Supplemental Needs Memo* in the Technical Appendix.

CENTRAL OREGON GROWTH PROJECTIONS

According to Portland State University’s Population Research Center, Table 9 summarizes the 2018 and 2040 forecasted population for the counties and cities served by CET. Bend MPO’s Bend-Redmond Travel Demand Model projects employment in the region to increase 115 percent between 2010 and 2040.

Table 9: Forecast Population

Service Area	2018	2040	Growth
Deschutes County	187,621	289,225	101,604
Bend UGB	91,373	153,696	62,323
La Pine UGB	1,833	3,386	1,553
Redmond UGB	29,364	48,575	19,211
Sisters UGB	2,691	4,867	2,176
Outside UGB Area	62,360	78,702	16,342
Crook County	22,519	29,571	7,052
Prineville UGB	11,915	16,299	4,384
Outside UGB Area	10,603	13,272	2,669
Jefferson County	23,447	28,145	4,698
Culver UGB	1,440	1,850	410
Madras UGB	7,163	9,035	1,872
Metolius UGB	1,076	1,328	251
Outside UGB Area	13,767	15,932	2,165

REGIONAL HOUSING AND JOB LOCATIONS

From COIC’s 2018 Coordinated Plan, Table 10 generally summarizes the highest concentrations of jobs and housing as well as cities drawing the highest number of commuters within Central Oregon.

EXISTING MODE SPLIT

Based on the 2017 American Community Survey (ACS), Table 11 summarizes the reported mode split, or primary mode of transportation, for work trips by county for workers 16 and older. Deschutes County has

the highest transit mode split, Jefferson County has the highest carpool mode split, and Crook County has the highest walk mode split.

FUTURE POPULATION AND EMPLOYMENT DENSITIES FOR BEND AND REDMOND

This section describes appropriate transit types for varying land uses in conjunction with population and employment densities within Bend and Redmond. In addition to vehicle trip data, Bend MPO’s travel demand model includes forecasted population and employment based on county- and city-level forecasts prepared by the State of Oregon and PSU’s Population Research Center.

TRANSIT MARKET LAND USE GUIDELINES

Public transportation service is generally designed to be compatible with the surrounding land use context and intensity of development, which is often measured using population and employment densities. Transit services can be categorized like so:

- ▶ **Local service** provides connections within communities, generally with relatively closely spaced stops. Local services can be designed to achieve productivity or coverage or a mix.
- ▶ **Regional/intercity service** connect cities, serving relatively few major stops at key activity or employment centers and connecting to local service with each city. Intercity frequency is based on market size and can be scaled to meet demand.

Figure 24 summarizes the transit types that are appropriate by land use.

Table 10: Concentration Areas for Jobs and Housing and Commuters

Areas with Densest Concentrations of Workforce Residencies	Areas with Densest Concentrations of Job Locations	Locations with Greatest Number of Commuters	Locations with Highest Increase in Commuters
<ul style="list-style-type: none"> ▶ Northeast and southwest Madras ▶ Southwest Metolius ▶ West Culver ▶ West Prineville ▶ West Redmond ▶ Northeast Bend ▶ Three Rivers 	<ul style="list-style-type: none"> ▶ Central, southwest, northeast, and north Bend ▶ Central and southeast Redmond ▶ Downtown Sisters ▶ Downtown Madras ▶ Downtown Prineville 	<ul style="list-style-type: none"> ▶ Bend to Sunriver ▶ Deschutes River Woods to Bend ▶ Bend to Redmond ▶ Redmond to Bend ▶ Prineville to Bend 	<ul style="list-style-type: none"> ▶ Bend to Sunriver ▶ Madras to Bend ▶ Three Rivers to Sunriver ▶ Culver to Madras ▶ Bend to Eagle Crest

Table 11: Mode Split by County

County	Mode						
	Drive Alone	Carpool	Bus	Bicycle	Walk	Other	Work at Home
Crook	77%	11.0%	0.0%	0.3%	4.0%	0.9%	6.5%
Deschutes	75%	9.3%	0.4%	1.8%	2.7%	0.8%	10.4%
Jefferson	75%	14.8%	0.1%	0.6%	2.9%	0.6%	6.0%

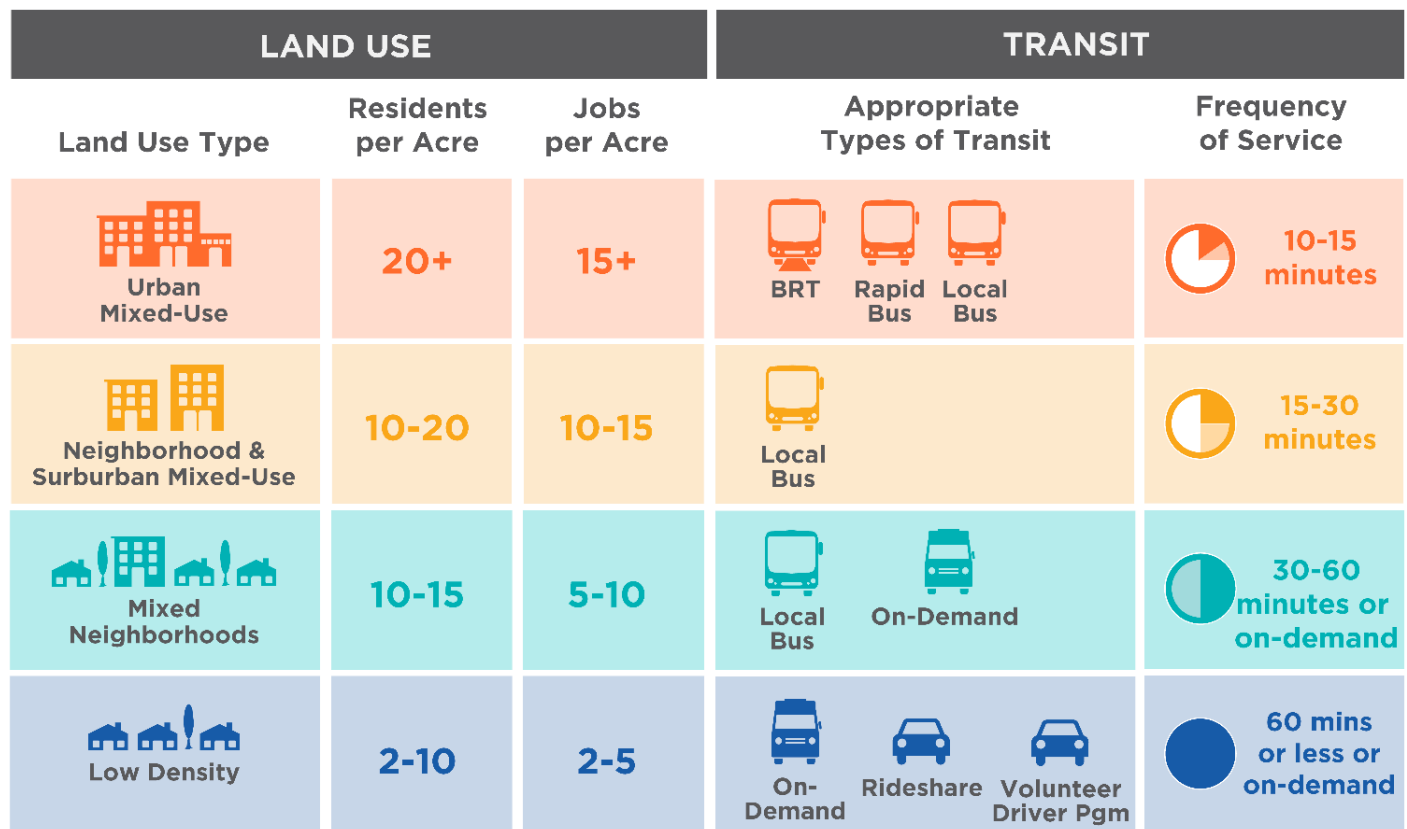


Figure 26: Transit Types by Land Use Type

BEND POPULATION AND EMPLOYMENT DENSITIES

This section summarizes the population and employment densities in Bend.

Bend Population Density

The City of Bend’s population is forecast to reach 125,000 people by the year 2040 – a 65 percent increase – within current city limits.¹ Population within the Bend Urban Growth Boundary (UGB) is projected to increase to nearly 145,000 people – by 87 percent.² Figure 27 shows the population

density throughout Bend in the years 2010 and 2040.

Where Bend Workers Live

Based on Longitudinal Employer-Household Dynamics (LEHD) data compiled by the U.S. Census, Figure 28 shows home locations for people working in Bend (left) and outside Bend (right). Most home locations are within a quarter mile of existing transit service and most Bend residents work in Bend (67 percent) as shown in Table 12.

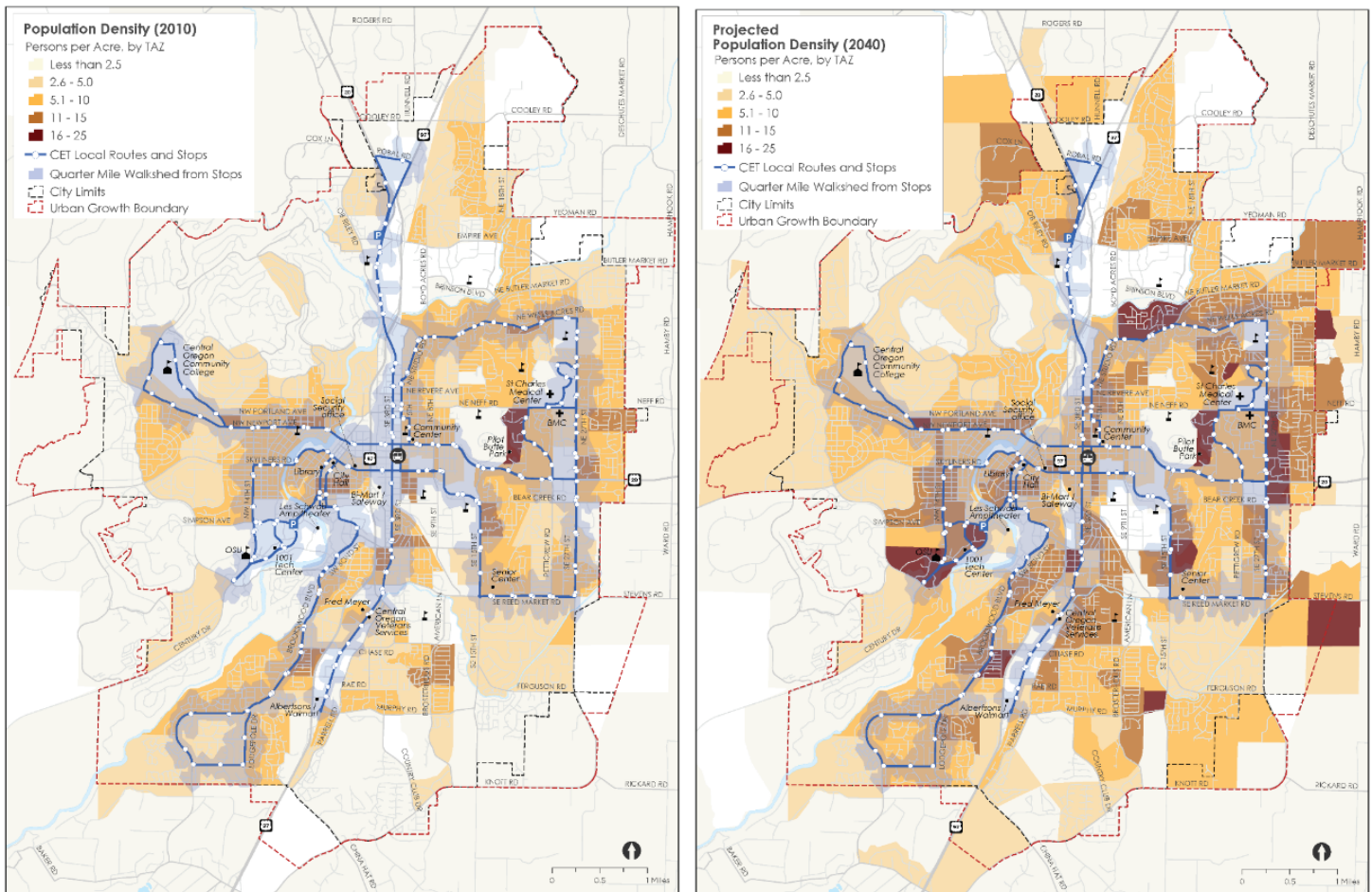


Figure 27: Population Density

¹ Bend MPO (Population data by TAZ)

² Portland State University Population Research Center, Deschutes County Coordinated Population Forecast, 2015-2065

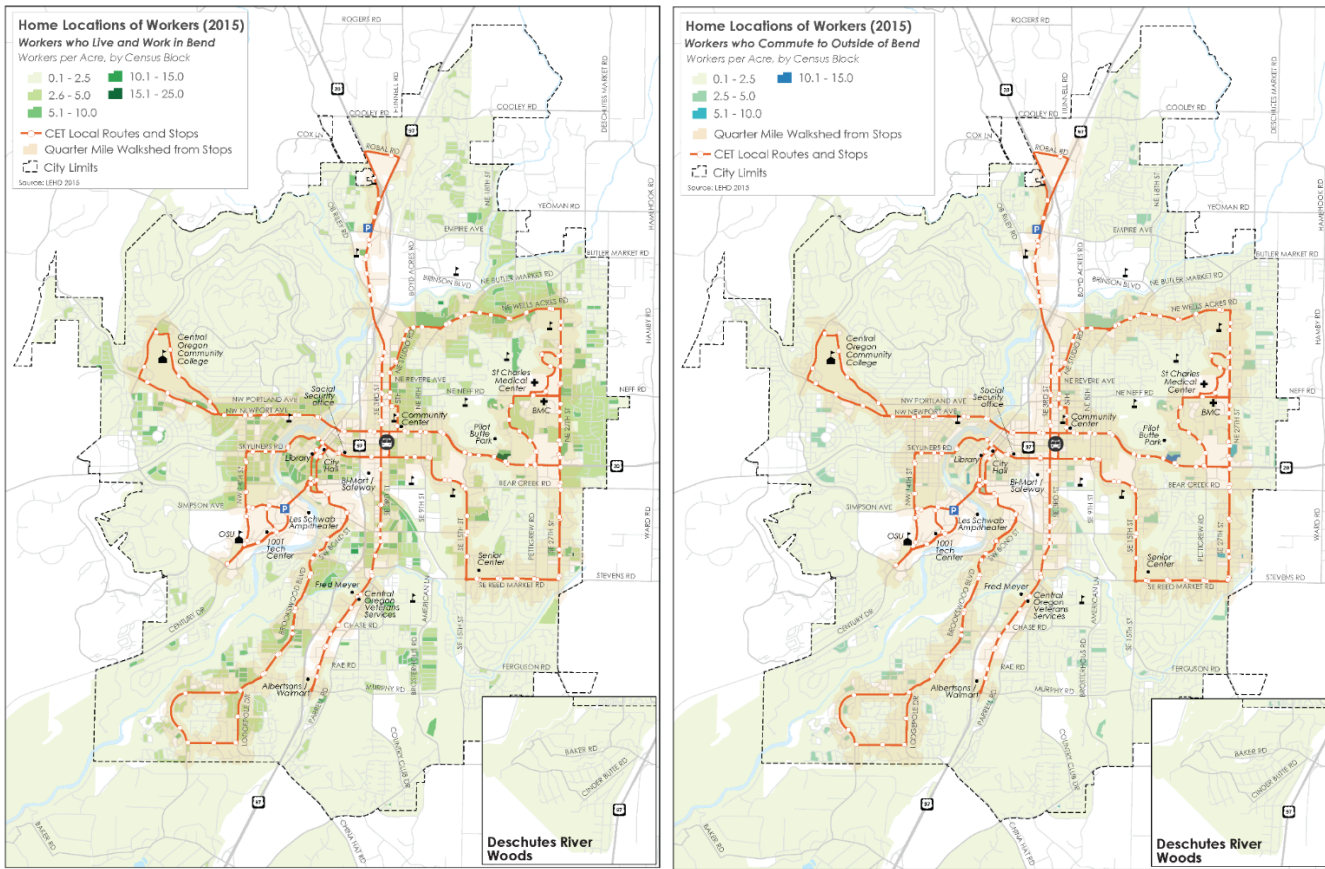


Figure 28: Density of Bend Workers by Home Location

Table 12: Bend Residents Work Location

Work Location	Persons	Share of Total Workers
Bend	24,974	67.0%
Redmond	1,890	5.1%
Portland	1,195	3.2%
Salem	497	1.3%
Eugene	448	1.2%
Sunriver CDP	376	1.0%
Prineville	305	0.8%
Sisters	238	0.6%
Medford	236	0.6%
Tigard	219	0.6%
All Other Places	6,870	18.4%

Source: U.S. Census Bureau, 2015

Bend Employment Density

Employment in Bend is forecasted to increase about 80 percent between 2010 to 2040 (from 40,000 to over 70,000 jobs). Bend’s share of regional employment is forecasted to decrease 10 percentage points to about 65 percent. Figure 29 illustrates employment densities in Bend for 2010 (left) and 2040 (right).

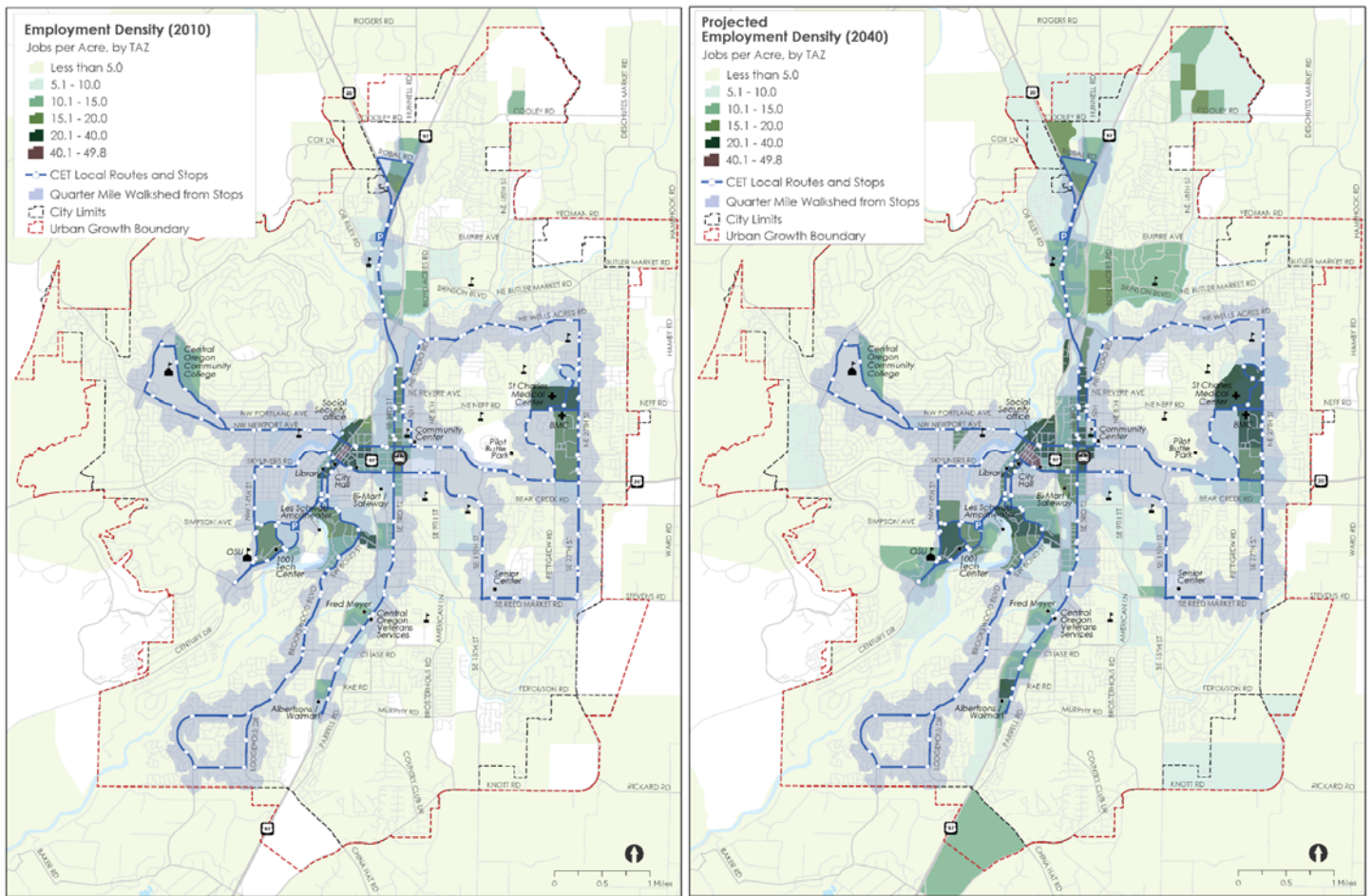


Figure 29: Bend Employment Density

The moderately (or higher) dense employment areas in 2010, which are forecasted to densify by 2040, include:

- ▶ Downtown Bend
- ▶ Central District along 3rd Street
- ▶ St. Charles Medical Center area
- ▶ Oregon State University (OSU) Cascades
- ▶ Central Oregon Community College (COCC)
- ▶ Old Mill District

Other emerging employment areas include:

- ▶ Southern Bend along US 97
- ▶ North-central Bend between NE Butler Market Road and Empire Avenue

- ▶ Northern Bend in the US 97/US 20 triangle (central Boyd Acres District)
- ▶ Juniper Ridge area in northeast Bend, north of Cooley Road

Bend Work Commute Patterns

The densest employment areas in Bend are COCC, Downtown, Old Mill District, St. Charles Medical Center, OSU-Cascades, and along 3rd Street. Figure 30 shows work locations for people who commute into Bend from outside the city (by any mode). Table 13 summarizes where Bend’s workforce resides.

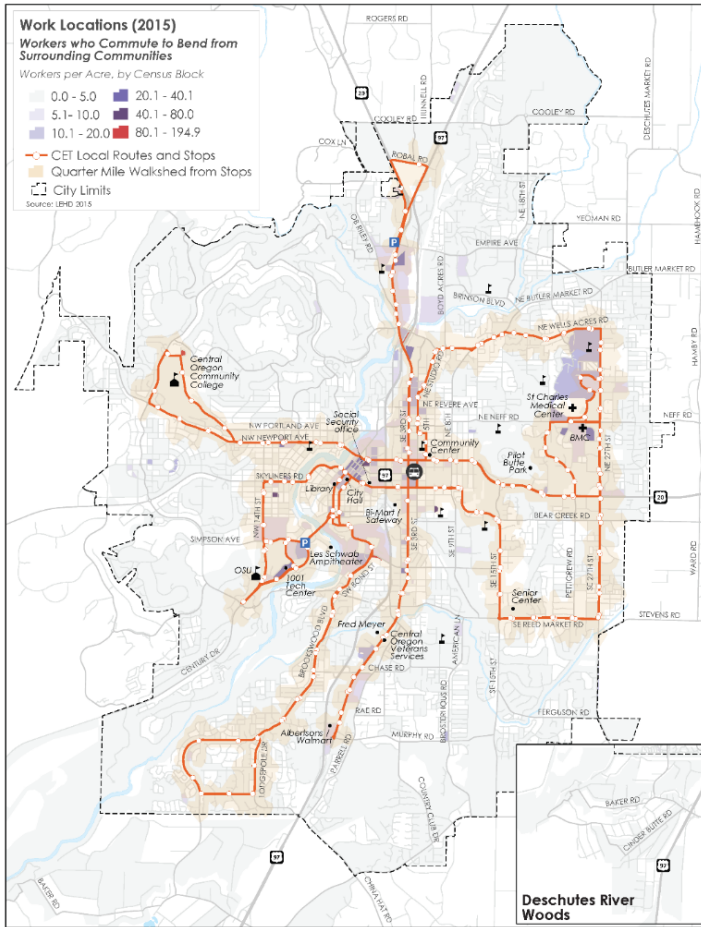


Figure 30: Work Locations in Bend for Non-Bend Residents

Table 13: Non-Bend Home Locations for Bend Employees

Home Location	Persons	Share of Total Workers
Bend	24,974	53.1%
Redmond	3,392	7.2%
Deschutes River Woods	1,561	3.3%
Portland	692	1.5%
Prineville	556	1.2%
Eugene	418	0.9%
Three Rivers	285	0.6%
Madras	242	0.5%
Salem	232	0.5%
Eagle Crest	222	0.5%
All Other Places	14,476	30.8%

Source: U.S. Census Bureau, 2015

Commute Start Times

From the 2017 ACS, key observations of start times for regional, Bend, and Redmond work commuters include:

- ▶ The largest share of early commuters leaves between 6 a.m. and 7 a.m.
- ▶ The highest share of commuters leaves between 7 a.m. and 9 a.m.
- ▶ A larger share of La Pine and Metolius residents leave prior to 6 a.m. (small sample size).

The following origins have the top number of commuters leaving during early and late hours of the day:

- ▶ Between 5 and 6 a.m.
 - ▶ Bend
 - ▶ Redmond
 - ▶ Deschutes River Woods
 - ▶ Prineville
- ▶ Between 4 p.m. and 12 a.m.
 - ▶ Bend
 - ▶ Redmond
 - ▶ Deschutes River Woods
 - ▶ Prineville

REDMOND POPULATION AND EMPLOYMENT DENSITIES

This section summarizes the population and employment densities in Redmond.

Redmond Population Density

Figure 31 shows the population density for Redmond in 2010 and projected in 2040. Moderate or higher residential density is an indicator of an adequate concentration of population to support reasonably frequent fixed-route transit service. According to Figure 31, such population densities range from 10 to 15 residents per acre for mixed neighborhoods and 10 to 20 residents per acre for neighborhoods and suburban mixed-use.

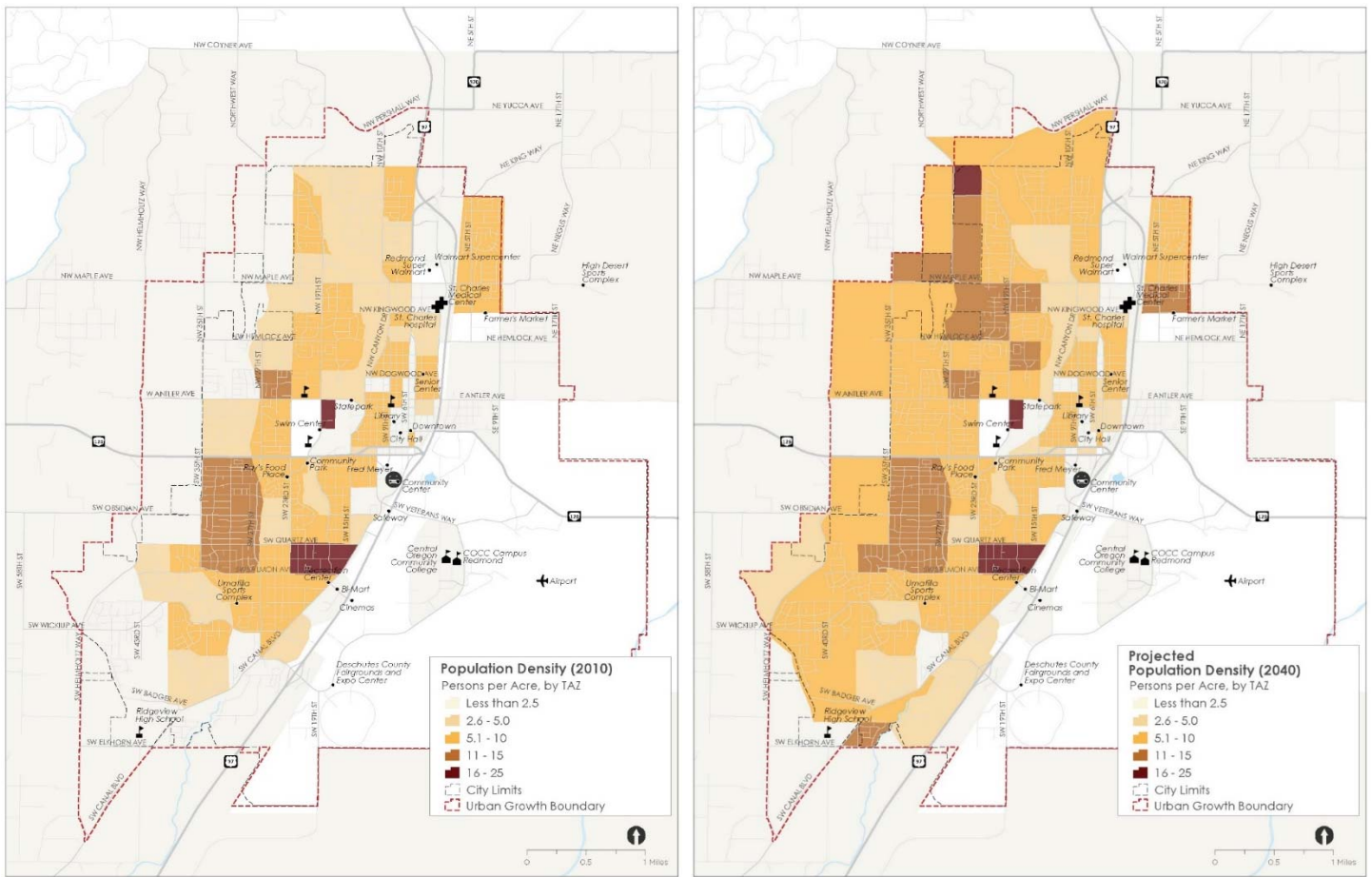


Figure 31: Redmond Population Density

Redmond Employment Density

Figure 32 illustrates projected 2040 employment densities in Redmond. Moderate or higher population density is an indicator of an adequate concentration of jobs to support reasonably frequent fixed-route transit service.

According to Figure 32, such employment densities range from 5 to 10 jobs per acre for mixed neighborhoods and 10 to 15 jobs per acre for neighborhoods and suburban mixed-use.

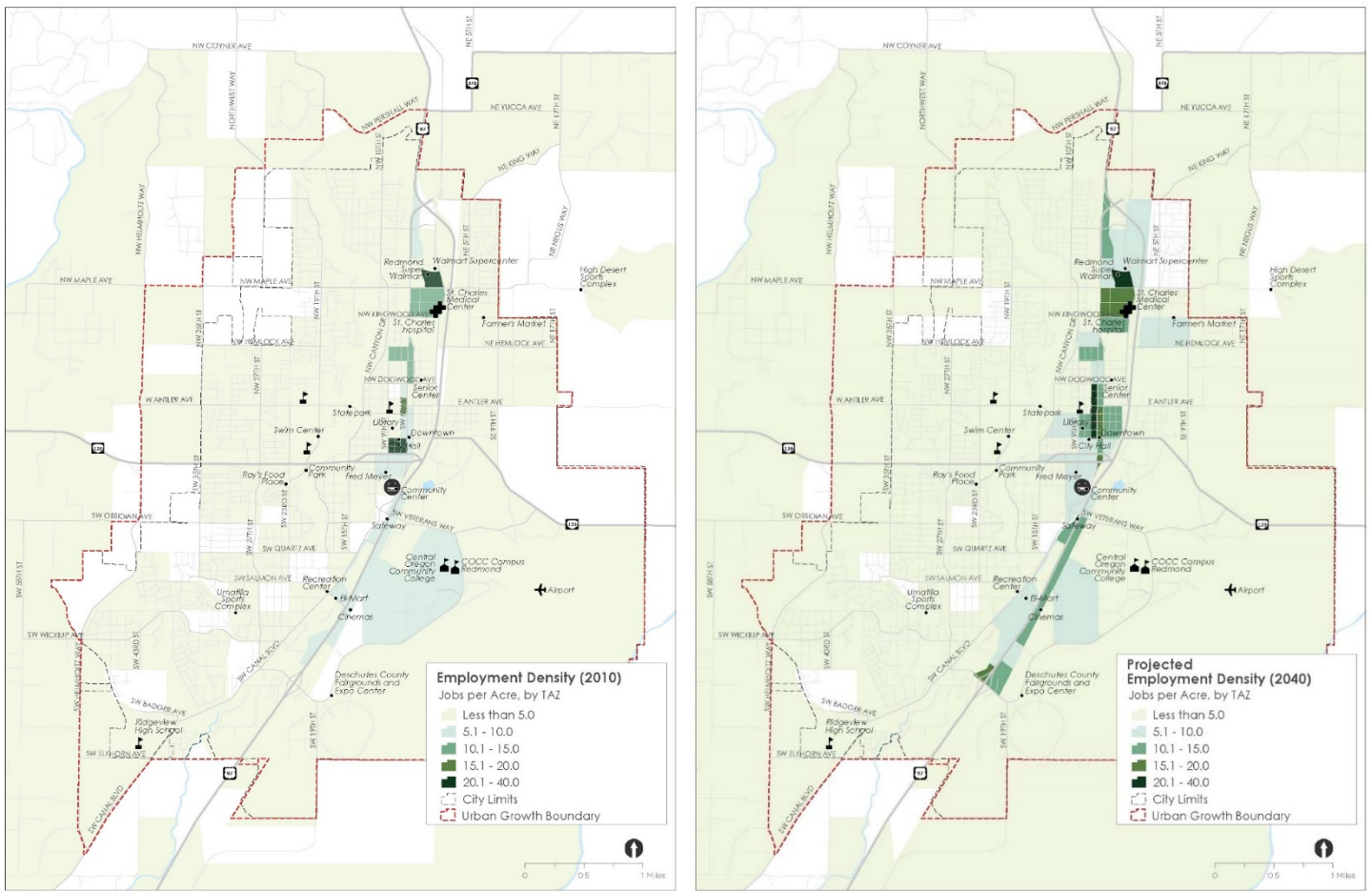


Figure 32: Redmond Employment Density

4.6 BICYCLE AND PEDESTRIAN ACCESS TO TRANSIT

This section summarizes the bicycle and pedestrian infrastructure of Bend’s existing network relative to access to transit and jobs. Research generally shows that people are willing to walk ¼ mile (approximately 10 minutes) to ½ mile to access a bus.

BICYCLE FACILITIES

Figure 33 illustrates low-stress network (LSN) streets and projects identified by the current Bend TSP Update. These streets and projects serve as a foundation for determining the

bicycle facility needs for providing access to CET’s existing fixed-route service within Bend.

PEDESTRIAN FACILITIES

Figure 34 illustrates sidewalks along major streets and illustrates where sidewalks exist either on one side of the roadway or not at all. These existing sidewalk maps show pedestrian facility needs within CET bus stop walksheds within.

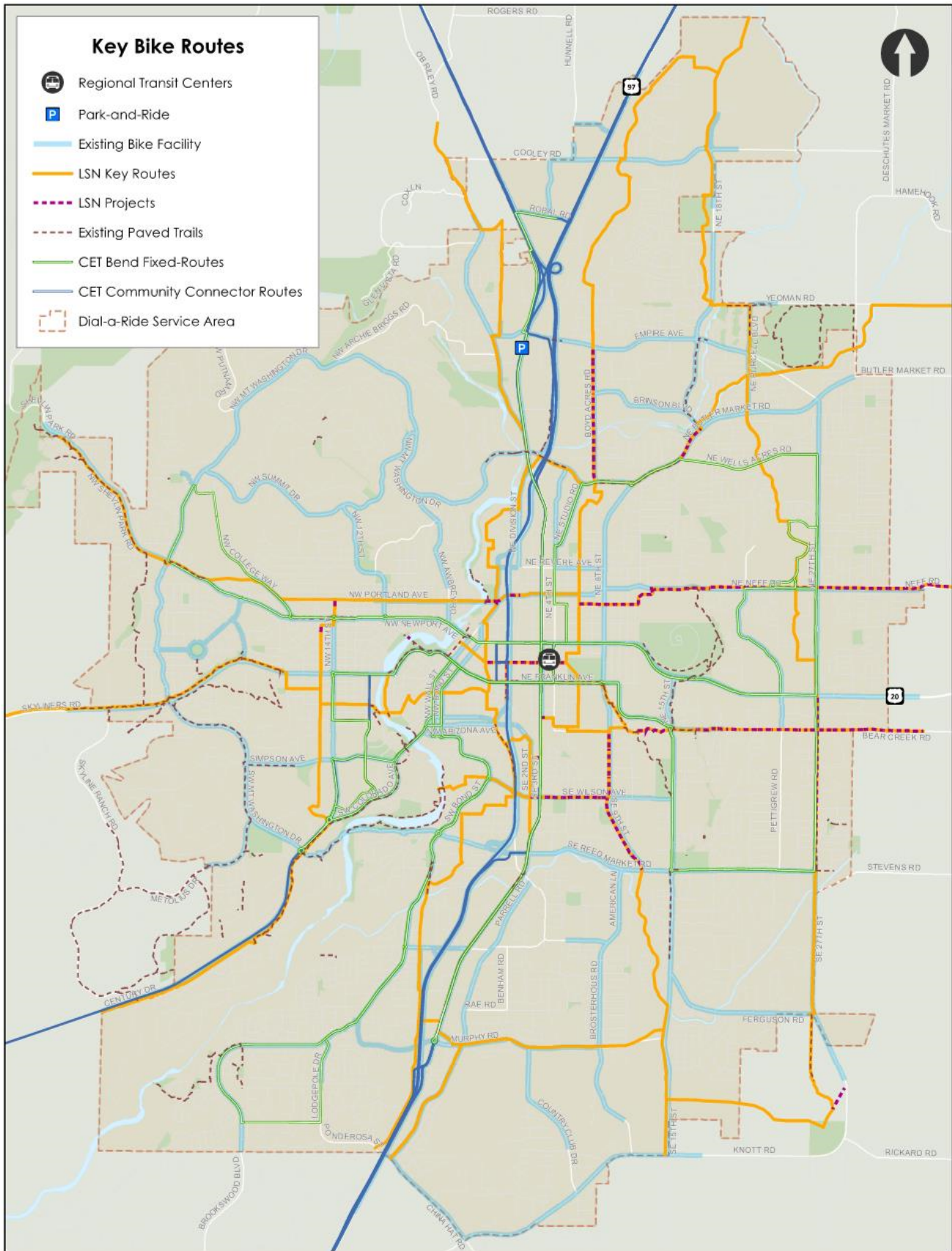


Figure 33: Bend Key Bike Routes

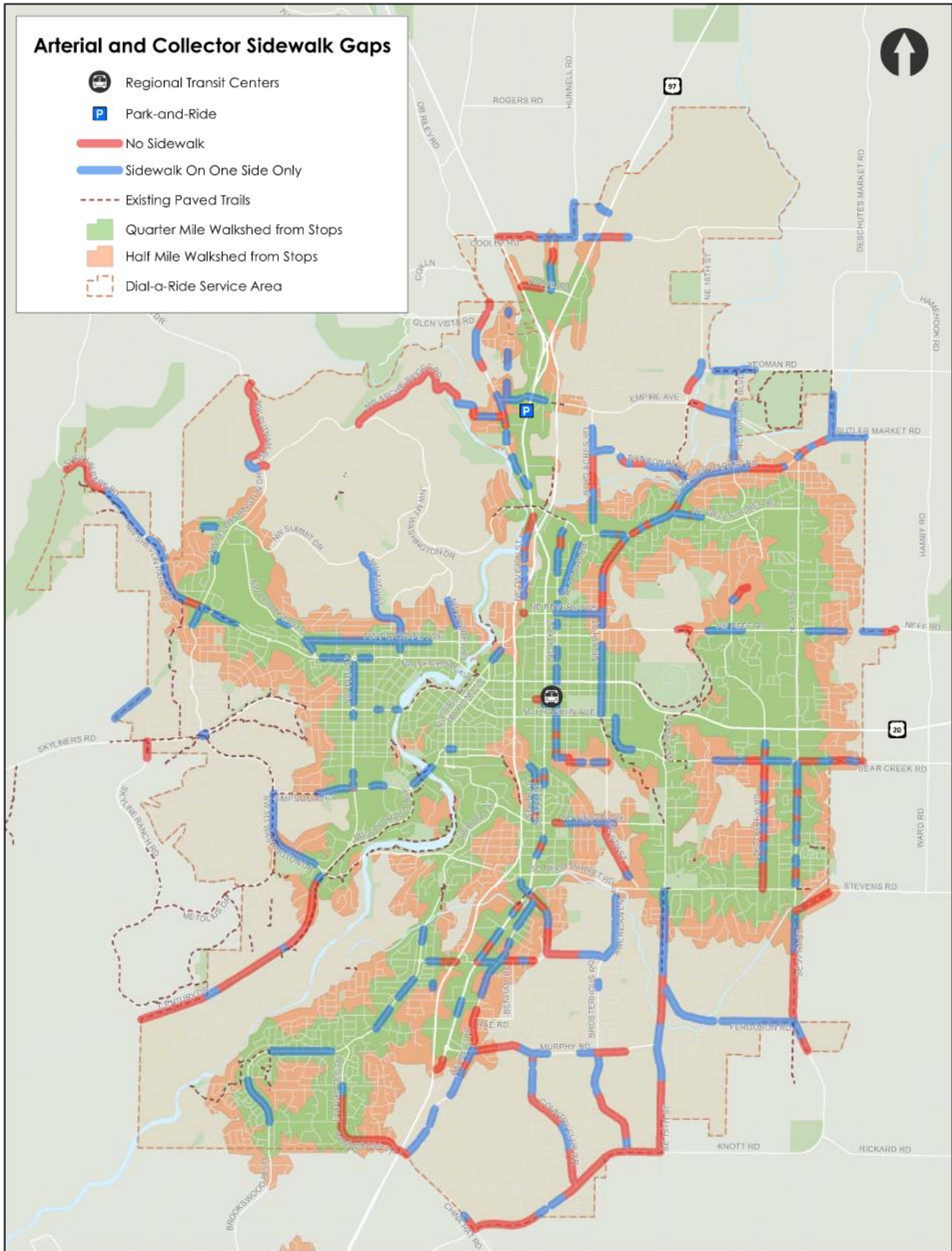


Figure 34: Bend Arterial and Collector Sidewalk Gaps



- 5.1 CURRENT TRANSIT NEEDS
- 5.2 FUTURE TRANSIT NEEDS

5.0 NEEDS ASSESSMENT



5.1 CURRENT TRANSIT NEEDS

This section summarizes the current needs associated with transit service, capital, programs, and operations; needs associated with serving dense areas of jobs and housing; and current needs of the airport.

CURRENT TRANSIT SERVICE NEEDS

The following summarizes the current transit service needs identified for Bend fixed-routes, Community Connector Routes, Dial-A-Ride, local service in rural communities, and recreation.

BEND FIXED-ROUTES

The following transit service needs were identified for Bend fixed-routes:

- ▶ More frequent routes (North and South 3rd Street and Greenwood Avenue)
- ▶ More service coverage in Bend (NE and SE Bend and St. Charles area)
- ▶ More direct connections to downtown from the eastside
- ▶ Reduced dependence on transfers
- ▶ Limited Sunday service
- ▶ Early evening service
- ▶ 30-minute headway Saturday service on select routes
- ▶ Extended Saturday service hours
- ▶ Vanpools to dispersed employment sites

COMMUNITY CONNECTOR ROUTES

The following transit service needs were identified for Community Connector routes:

- ▶ More frequent routes (Bend-Redmond especially)
- ▶ Service between Warm Springs and Government Camp
- ▶ Saturday service
- ▶ Later evening trips

- ▶ Increased frequency of weekday trips
- ▶ Interlining Routes 24 and 26
- ▶ Service to COCC and RDM

RURAL COMMUNITY LOCAL SERVICE

The following transit service needs were identified for rural communities within CET's service area:

- ▶ Fixed-route/deviated route service in Prineville and Redmond
- ▶ Expanded DAR coverage in La Pine, Prineville, Redmond, and Sisters
- ▶ Local circulating service in Sisters, La Pine, Madras, Prineville

DIAL-A-RIDE

The following transit service needs were identified for demand-responsive services in Bend and the rural communities within CET's service area, which are provided within either city limits or UGB's:

- ▶ **Bend Dial-A-Ride:** increased ridership for through increased productivity. CET needs to allow more rides per hour through improved scheduling technology. This can evolve into microtransit service and likely increase demand over time.
- ▶ **Rural Dial-A-Ride:** expanded service boundaries given many residents of rural cities needing service do not live within city limits, which reflect current service boundaries. Larger boundaries may decrease service efficiency. As service operates more like microtransit, demand will increase, and more productive areas can convert to flex-routes.

RECREATIONAL SERVICES

With Bend's growing popularity for recreational and outdoor activities for residents and visitors alike, the following locations have been identified for which CET should expand its recreational services (depending on partnerships, available funding, and vehicle capacity):

- ▶ Sunriver (year-round)
- ▶ Black Butte Ranch (year-round)
- ▶ High Desert Museum (year-round)
- ▶ OSU Cascades (year-round)
- ▶ Smith Rock (summer)
- ▶ Popular Central Oregon sno-parks (winter)

CURRENT TRANSIT CAPITAL NEEDS

This section summarizes the current transit capital needs identified for vehicles, infrastructure, and technology.

VEHICLE NEEDS

The following needs were identified for CET's vehicle fleet:

- ▶ Low-floor vehicles prioritized for routes with high levels of wheelchair boardings
- ▶ Additional peak buses for Routes 1, 4, 7, and short route to downtown Bend (possibly Route 3)
- ▶ Maintenance of existing vehicle fleet
- ▶ Additional buses to support near-term service enhancements

INFRASTRUCTURE NEEDS

The following infrastructure needs were identified for CET's service and service area:

- ▶ Fare payment configuration to create additional fare payment options
- ▶ Better signage and maps

- ▶ 3rd Street speed and reliability and access improvements
- ▶ Hawthorne Station access and safety improvements
- ▶ Maintenance of existing facilities including transit stops, shelters, signage, etc.
- ▶ Warm Springs transit hub

TECHNOLOGY NEEDS

The following technology needs were identified on transit routes, buses, at stops and transit centers, and online:

- ▶ Transit Signal Priority (TSP) for all corridors on the primary transit network in Bend, especially for routes with schedule adherence issues (e.g. Route 4: North 3rd Street), as well as routes traveled by the Community Connector routes.
- ▶ 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

CURRENT TRANSIT PROGRAM NEEDS

The following transit programs needs were identified to increase ridership for various users as well as to promote maintenance of CET's infrastructure:

- ▶ Low-income and senior fare subsidy and/or student fare pass programs

- ▶ Pilot program to subsidize evening TNC trips
- ▶ Travel training and promotion
- ▶ Transit-supportive capital improvements program (e.g. bus stop amenities, trash and shelter maintenance at stops, accessibility, bicycle/pedestrian access/crossings, new/improved radios, etc.)

CURRENT TRANSIT OPERATIONS NEEDS

The following transit operations needs were identified to improve the overall operations of CET's service:

- ▶ Training programs for CET drivers, COIC staff, and dispatch on how best to handle difficult rider behavior
- ▶ Updated driver scheduling to incorporate breaks
- ▶ Enhanced coordination between drivers and dispatch
- ▶ Hawthorne Station operational improvements

NEEDS BASED ON POPULATION DENSITY

This section summarizes potential service needs based on existing population densities in Bend and Redmond.

BEND POPULATION

Moderate or higher residential density is an indicator of an adequate concentration of population to support reasonably frequent fixed-route transit service. Such areas in Bend include:

- ▶ North of Greenwood Road, east of Pilot Butte
- ▶ Along NE 27th Avenue
- ▶ Downtown and Old (Central) Bend
- ▶ Western Bend along Newport Avenue

Population forecasts suggest increased densities in these areas plus the following:

- ▶ East Bend (Mountain View neighborhood)
- ▶ Near NE Butler Market Road (Orchard District)
- ▶ Southwest Bend
- ▶ Old Farm/southeast Bend districts

REDMOND POPULATION

Areas in Redmond reflecting future residential that may adequately support reasonably frequent fixed-route transit service include:

- ▶ East of Ridgeview High School, north of SW Elkhorn Ave and east of SW Canal Blvd
- ▶ OR 126, SW Salmon Ave, SW 35th St, and SW 27th St
- ▶ SW Quartz Ave, SW Salmon Ave, SW 23rd St, and SW Canal Blvd
- ▶ South of W Antler Ave and east of NW 23rd St
- ▶ NW Elm Ave, W Antler Ave, NW 27th St, and NW 23rd St
- ▶ NW Hemlock Ave, NW Elm Ave, NW 19th St, and the canal
- ▶ NW Maple Ave, NW Hemlock Ave, NW 27th st, and NW 19th St/NW Rimrock Dr
- ▶ NE Negus Way, NE Kingwood Ave, US 97, and NE 9th St
- ▶ Northern city limits, NW Maple Ave, NW 35th St/Northwest Way, and NW 22nd St

NEEDS BASED ON EMPLOYMENT DENSITY

This section summarizes the potential service needs based on existing employment density and commute patterns for Bend and Redmond.

BEND EMPLOYMENT

Commuter Needs

The following needs were identified through analyzing the commute patterns within Bend, traveling away from Bend, and traveling to Bend:

- ▶ Well-timed transfers or single-seat transit rides and improved walking access to transit
- ▶ Efficient connections to Hawthorne Station (or another Community Connector stop) at convenient times
- ▶ Interlined (single-seat) or well-timed local connections from Community Connector routes at convenient times

Employment Centers

Table 14 presents guidelines for employment center types based on density and employment characteristics for different employment centers in Bend.

Table 14: Employment Center Types

Area Type	Description	Density Guideline at Activity Centers (jobs/acre)
Tier 1 – Anchor	Highest daytime work population and consistent customer volumes	20+ jobs
Tier 2 – Major	High work population, and/or significant customer volumes	10 – 20 jobs
Tier 3 - Local	Moderate trip generator; fewer jobs (senior center, event venue)	5-10 jobs

Figure 35 illustrates areas in Bend identified as employment centers based on job density thresholds in Table 14.

Downtown Bend and St. Charles Medical Center stand out as employment anchors, both today and in the future. Several other major employment centers today include the following:

- ▶ Old Mill
- ▶ Central Westside
- ▶ Central Eastside

These areas along with the Forum Shopping Center are forecasted to grow through 2040, although the most significant growth areas are forecasted to be:

- ▶ Cascade Village
- ▶ Juniper Ridge
- ▶ Along Empire Avenue
- ▶ Far south US 97

Other local employment areas include the COCC and OSU campuses, where the student population (commuter or residential) would be an additional indicator of transit demand. These current and emerging employment centers indicate where expanded and improved public transportation service is likely needed in the future.

Transit-Underserved Areas

CET provides good transit coverage in many parts of the City of Bend, offering important mobility to major population and employment centers. Figure 36 illustrates areas of Bend that are underserved by existing transit services (e.g. beyond an approximately ¼ to ½ mile walk of a transit stop), showing population and employment density 2010 and 2040.

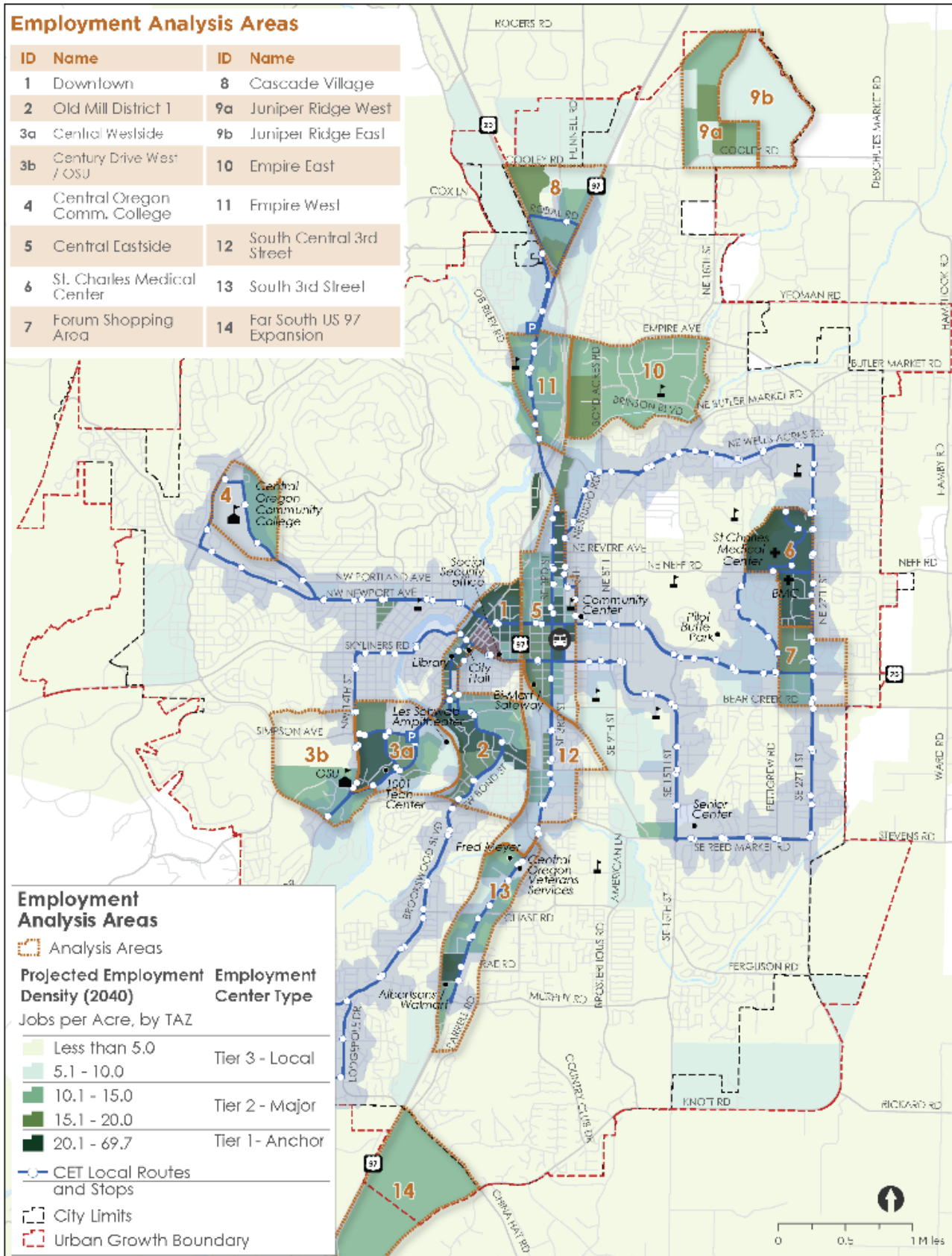


Figure 35: Bend Employment Centers

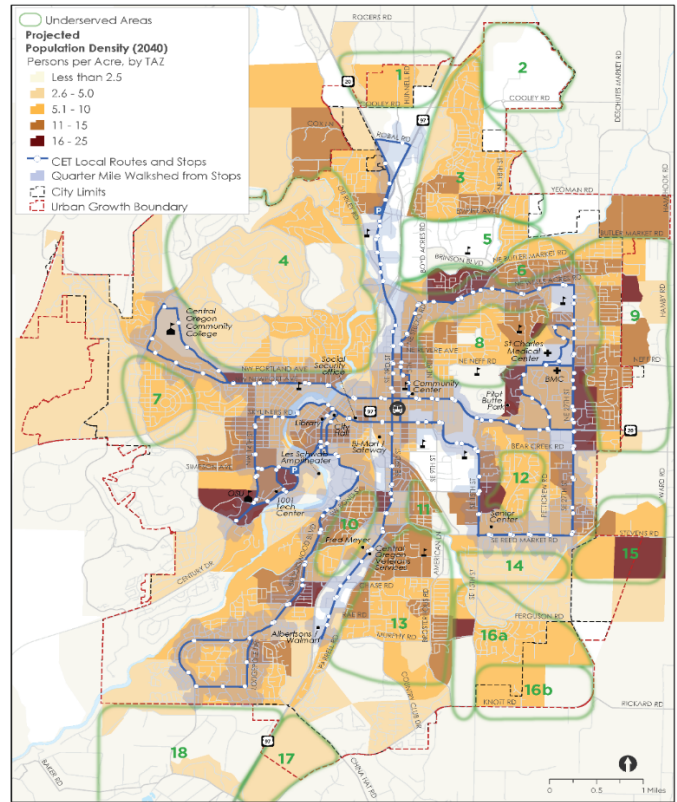
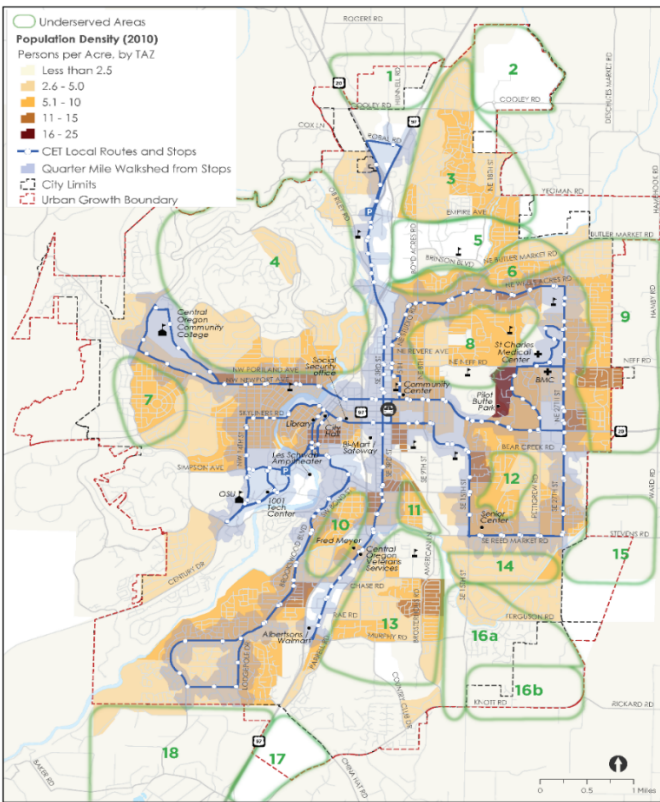


Figure 36: Bend Underserved Housing Areas

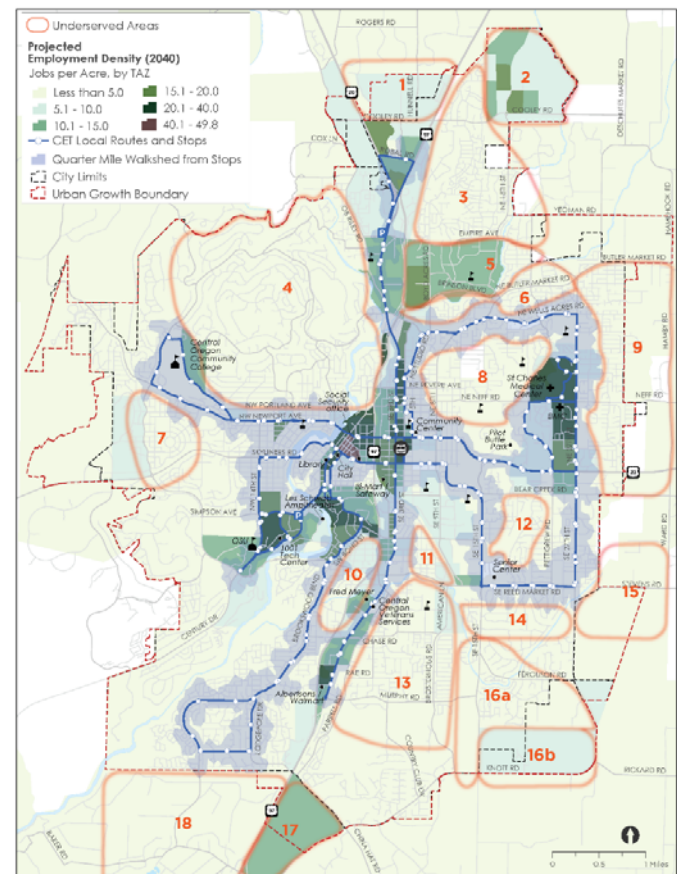
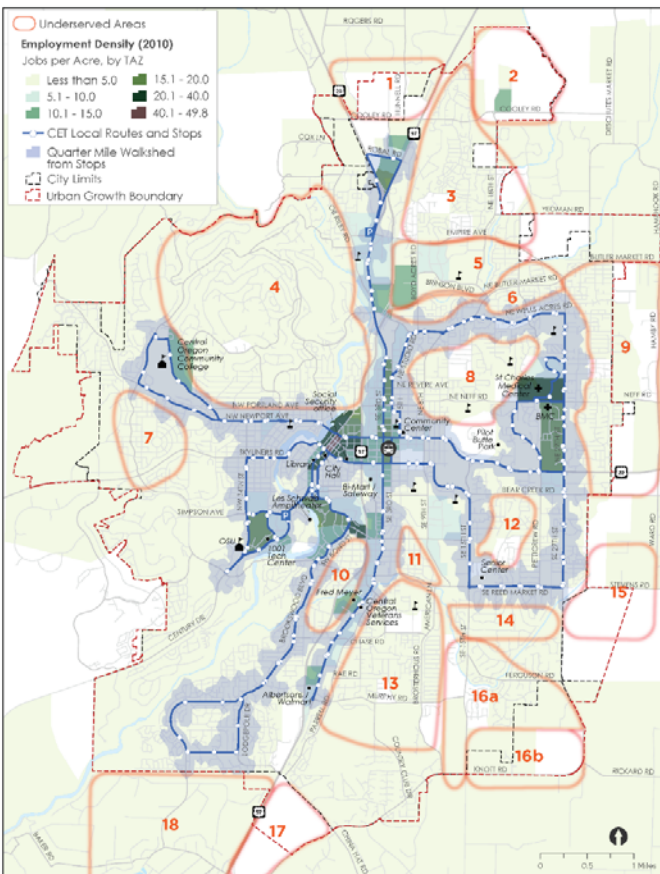


Figure 37: Bend Underserved Employment Areas

The following needs are identified within these transit-underserved areas:

- ▶ **Areas just beyond existing bus stop access:** An improved active transportation network may provide a safer and more comfortable walk to transit especially with added micromobility options (e.g. electric scooters, bike-share, etc).
- ▶ **Low density development areas:** some low-density development areas today and into the future unable to support fixed-route transit services have a need for emerging transportation service and technology models (e.g. micromobility and accessible demand response services).
- ▶ **Future development areas:** several areas beyond existing transit services expected to see significant development in the future should be planned in ways that more easily facilitate future transit service expansion.

REDMOND EMPLOYMENT

Areas in Redmond reflecting future employment density that may adequately support reasonably frequent fixed-route service include:

- ▶ US 97, north of SW Yew Ave to just north of SW Odem Medo Way
- ▶ East side of US 97 from SW Odem Medo Way to just north of SW Veterans Way
- ▶ SE Airport Way, US 97, SW 13th St, and SW 6th St
- ▶ West side of US 97 from SE Pumice Ave to SW Veterans Way

- ▶ SW Veterans Way, SW Evergreen Ave, SW 9th St, and US 97
- ▶ Southern half of Downtown Redmond
- ▶ NW Dogwood Ave, NW Jackpine Ave, NW Canyon Dr, and NW 5th St
- ▶ NW Jackpine Ave, NE King Way, NW 6th St, and US 97
- ▶ NE Hemlock Ave, NE Kilnwood Pl, US 97, and SE 9th St

AIRPORT TRANSIT NEEDS

The following needs were identified for RDM based on passenger entries and exits and the existing and future travel demand within CET's service area:

- ▶ New fixed route connection between Hawthorne Station in Bend, the Redmond Transit Hub in Redmond, and RDM. Serving 6:00 a.m. and 11:00 a.m. flight departures and 11:00 a.m. and 3:00 p.m. arrivals (all other peak times served by dial-a-ride transit). Supported by circulating Community Connector throughout Redmond between flight departures and arrivals.
- ▶ New stop added to the Community Connector Route 24 (Redmond-Bend). Leave Redmond Transit Hub at 5:00 a.m. and final arrival to Redmond Transit Hub at 9:02 p.m.

5.2 FUTURE TRANSIT NEEDS

The following summarized anticipated future transit service and capital needs.

FUTURE TRANSIT SERVICE NEEDS

This section summarizes future needs identified for public transportation connections, transit stops, transit centers, park-and-rides, and other infrastructure within the CET service area. As the transit system expands, the overall system will need increased maintenance and operational support including vehicle, facility, and technology maintenance, as well as additional operations staff.

DESCHUTES COUNTY

The future public transportation needs for Deschutes County, in addition to the current transit service needs identified previously, specifically identified through public outreach are summarized herein.

Bend Fixed-Routes

The following future needs were identified for Bend fixed-routes:

- ▶ Increased frequency for all routes
- ▶ More service coverage for SW, NW, and downtown Bend; 3rd Street; OSU-Cascades; and Century/14th Street
- ▶ More direct connections to Old Mill
- ▶ Improved bus on-time arrival/reliability
- ▶ New/enhanced services to transit-underserved areas

Sisters Local Services

Vanpools to dispersed employment sites was identified as a future need within Sisters.

Community Connector Routes

The following future needs were identified for the Community Connector routes serving Deschutes County:

- ▶ Early morning and afternoon service to airport
- ▶ Service to Sunriver
- ▶ Service to Deschutes River Woods
- ▶ New Prineville-Redmond-Bend route

Dial-A-Ride

The following future needs were identified for Dial-A-Ride services within Deschutes County:

- ▶ Expanded coverage to County boundary
- ▶ Early evening and extended Saturday service in Bend
- ▶ Late evening service in La Pine

Pilot Programs

The following programs were identified as future needs within Deschutes County:

- ▶ Student transportation for regional Schools
- ▶ System Development Charges (SDC's) for congested streets
- ▶ Free Dial-A-Ride bus fare for seniors

JEFFERSON COUNTY

The future public transportation needs for Jefferson County, in addition to the current transit service needs identified previously, specifically identified through public outreach are summarized herein.

Madras

The following future needs were identified for Madras:

- ▶ Expanded flex-route service
- ▶ New fixed-route/deviated-route service

Community Connector

The following future needs were identified for the Community Connector routes serving Jefferson County:

- ▶ More service coverage
- ▶ On-demand shopper/medical shuttle service

Dial-A-Ride

Expanding coverage to include Crooked River Ranch, Metolius, and Culver was identified as a future need for Dial-A-Ride services within Jefferson County.

CROOK COUNTY

The future public transportation needs for Crook County, in addition to the current transit service needs identified previously, specifically identified through public outreach are summarized herein.

Prineville

The following future needs were identified for Prineville:

- ▶ New fixed-route/deviated-route service
- ▶ Vanpools to dispersed employment sites

Community Connector

The following future needs were identified for the Community Connector routes serving Crook County:

- ▶ New route between Prineville and Bend
- ▶ New Route between Madras and Prineville

Dial-A-Ride

Expanding coverage to include Juniper Canyon was identified as a future need for Dial-A-Ride services within Crook County.

FUTURE TRANSIT CAPITAL NEEDS

This section summarizes future needs identified for public transportation capital to support CET service and its service area.

DESCHUTES COUNTY

The future capital needs for Deschutes County, in addition to the current capital needs identified previously, specifically identified through public outreach include:

- ▶ New Route 24 stops at the airport and west of US 97
- ▶ New Route 22 stop at the Hospital, Walmart, Downtown Redmond, Senior Center, and the Swim Center
- ▶ New stops at the foodbank and Forest Services parking lot in Sisters; the Corner Store in La Pine; and for new Sunriver service
- ▶ New transit hub northwest of Downtown Sisters and in Korpine area of Bend

JEFFERSON COUNTY

The future capital needs for Jefferson County, in addition to the current capital needs identified previously, specifically identified through public outreach include:

- ▶ New Route 22 stops in Crooked River Ranch, at the Future Health and Wellness Campus in Madras, Smith Rock State Park, Downtown Madras (between A & B and 4th and 5th)
- ▶ New Route 20 stops between G and H and C and D Streets
- ▶ New transit hubs in Madras, Metolius, and Culver

CROOK COUNTY

The future capital needs for Crook County, in addition to the current capital needs identified

previously, specifically identified through public outreach include:

- ▶ Common deviated fixed-route stop in Prineville within walking distance for all riders/requests
- ▶ New Route 26 stops in Juniper Canyon area, at City Hall, the Hospital, Bi-Mart/Rays, and Stryker Park
- ▶ New transit hub

SYSTEMWIDE

The future systemwide capital needs, in addition to the current capital needs identified previously, specifically identified through public outreach are summarized herein.

Bus Stops

- ▶ Visitor kiosks
- ▶ Bus stop amenities, crossings, and safety improvements
- ▶ Mobility hubs
- ▶ Bus stop maintenance (including snow removal)
- ▶ Bus pullouts (City ownership and planning)

Bus Fare

- ▶ Waived bus fare for additional riders assisting primary riders (who cannot ride alone)

Vehicles

- ▶ Energy efficient and right-sized buses
- ▶ Enhanced bus radios
- ▶ Increase capacity/availability of seats on Community Connector buses
- ▶ Improve wheelchair equipment on buses
- ▶ Wifi on buses
- ▶ Real-time arrival displays on buses
- ▶ Additional buses to support long-term service increases

- ▶ Vehicle maintenance facilities adequate for future vehicle needs

Programs

- ▶ Transit marketing for CET services
- ▶ Transit education on the cost tradeoffs between single occupancy vehicle transportation and transit
- ▶ Coordination with existing services leaving/driving through Central Oregon

Streets

- ▶ Enhanced pedestrian and bicycle connections to transit stops (City, County, and State ownership and planning)



- 6.1 TRANSIT SERVICE STRATEGIES
- 6.2 FIRST-LAST MILE STRATEGIES
- 6.3 FIXED-ROUTE SERVICE STRATEGIES
- 6.4 STRATEGIES FOR TRANSIT-UNDERSERVED AREAS
- 6.5 TRANSIT CENTER LOCATION STRATEGIES

6.0 SERVICE ALTERNATIVES ANALYSIS

6.1 TRANSIT SERVICE STRATEGIES

This section summarizes the potential transportation services that may provide relevant solutions to the needs throughout CET's service area.

LOCAL FIXED ROUTE TRANSIT SERVICE

This service is relevant for areas with average population densities above 10 people per acre or average employment density above five jobs per acre (combined population and employment densities can also be considered).

DEVIATED FIXED-ROUTE (OR FLEX-ROUTE) SERVICE

This service is relevant for lower-density areas that do not meet fixed-route service guidelines, or that may be just beyond existing fixed routes, such that occasional route deviations may provide sufficient mobility to certain areas. This service type can also include **shared-ride shuttles**, such as regularly scheduled trips between transit stops/stations and significant employment areas at key times of the day or trips with a demand-responsive element to major shopping and medical centers to help people meet non-work transportation needs on selected days/times. New technology and service models may make it possible to expand the availability of services in this category.

RURAL DIAL-A-RIDE (LOCAL PUBLIC BUS)

This service is open to the general public, as CET currently operates in small cities outside of Bend, including Redmond, Prineville, Sisters, Madras, and La Pine. Local public bus service does not have eligibility requirements. Riders must call at least a day ahead to schedule a

ride, and ride times are scheduled based on availability.

ADA PARATRANSIT (BEND DIAL-A-RIDE OR RIDE ASSIST)

This is a required service that CET operates subject to the Americans with Disabilities Act (ADA). The ADA recognizes that some people with disabilities will not be able to utilize fixed route services, even ones that have wheelchair lifts, and requires that equivalent transit options be available to these individuals as to the general public. At a minimum, ADA Paratransit is required to run during the same hours of operation and within $\frac{3}{4}$ mile on any side of a fixed route. ADA paratransit requires an advanced reservation, provides door-to-door wheelchair-accessible service, and is only intended for eligible passengers.

MICROTRANSIT/ON-DEMAND SERVICE

This is a relatively new service delivery model that is a middle ground between taxis and public transit. Passengers generally request rides through a smartphone app, or sometimes via a phone call, the provider's scheduling software optimizes vehicle routing in real-time to serve passengers most efficiently, and passengers are notified when the vehicle will pick up. The design of microtransit services varies and may include point-to-point service within a defined area, flex routes with dynamic scheduling for deviations, or service that feeds into existing fixed route transit at scheduled connections.

COMMUNITY CONNECTOR

This is a network of fixed routes that connects riders between Bend, Redmond, Culver, La Pine, Madras, Metolius, Prineville, Sisters, and

Warm Springs, and can be considered an intercity bus service. The Federal Transit Administration (FTA) formally calls it Commuter Bus service. Community Connector is open to the general public and operates Monday through Friday. The deviated fixed-route service offered on Community Connector Route 20 (within Madras and Warm Springs) can be replicated for other Community Connector routes and cities.

SHOPPING/MEDICAL SHUTTLE

This is a public transit service designed to serve regular trips to key local or regional activity centers such as commercial districts, grocery stores, or medical facilities. These routes may be the only regular or fixed-route service available within the area or times that they operate; outside of areas where there is ADA Paratransit service, they must operate as a deviated service. These routes generally carry

more passengers per vehicle hour than a purely demand-responsive service.

RECREATIONAL SERVICES

This service includes several specialized or seasonal shuttles that CET currently operates, which provide a connection to outdoor attractions in and around Bend. Some are fare-free.

MICROMOBILITY

This service includes shared active transportation vehicles such as scooters and bicycles, possibly with electric assist motors; this service type may be considered for low density areas within 1 mile of a fixed route stop or development centers to increase the access area.

Table 15 summarizes the existing and proposed future services that are considered transit solutions for the areas CET serves.

Table 15: Potential Transit Services

Local Service Area	Fixed-Route	ADA Paratransit	Dial-A-Ride	Flex-Route	Micro-transit	Community Connector	Rural Shopping / Medical Shuttle
Deschutes County							
Bend	Existing	Existing	Existing	-	Potential	Existing: 24, 28, 30	-
Redmond	Future	Future	Existing	-	Potential	Existing: 22, 24, 26, 29	-
Sisters	-	-	Existing	Potential	-	Existing: 28, 29	Potential
La Pine	-	-	Existing	Potential	-	Existing: 30	Potential
Sunriver	-	-	-	Potential	-	Future	Potential
Deschutes River Woods	-	-	-	-	-	Existing: 30	Potential
Jefferson County							
Madras	-	-	Existing	Future	-	Existing: 22	-
Metolius	-	-	-	Potential	-	Existing: 22	Potential
Culver	-	-	-	Potential	-	Existing: 22	Potential
Terrebonne	-	-	-	-	-	Existing: 22	Potential
Crooked River Ranch			-	-	-	-	Potential
Crook County							
Prineville	-	-	Existing	Future	-	Existing: 26	-
Powell Butte	-	-	-	-	-	Existing: 26	Potential
Juniper Canyon			-	-		-	Potential
Confederated Tribes of Warm Springs							
Warm Springs	-	-	-	Existing	-	Existing: 20	-

6.2 FIRST-LAST MILE STRATEGIES

First-last mile strategies refer to services, programs, and facilities aimed at increasing access to transit – primarily by walking and biking. This section summarizes the first and last mile access to transit options considered for CET’s service area.

MOBILITY HUBS

These are places that provide connections between different types of transportation options, often including transit, micromobility, and on-demand services. Mobility hubs may be co-located with transit centers, secondary transit hubs, or places where routes intersect to facilitate easy transfers. Additional mobility options presented at these hubs expand access to transit, and hubs typically include physical and digital information that makes access to these services seamless and easy-to-navigate.

- ▶ **Transit Centers** are the primary locations where bus routes converge, and buses can layover between trips.

- ▶ **Secondary Transit Hubs** may provide additional transfer and layover locations outside of the main transit center.
- ▶ **Major transit stops** provide a higher level of amenities at major stop locations.
- ▶ **Park and ride facilities** may be co-located with transit centers and secondary hubs and allow passengers to access transit by motor vehicle, be dropped off, or access shared rides (carpools or vanpools) to local or regional worksites. Park and rides may be located at public facilities or may be established through a cooperative agreement with a private landowner.

Table 16 identifies different types of transit centers and mobility hubs, including characteristic and exemplified locations within CET’s service area where they may be applicable.

Table 16: Types of Transit Centers and Mobility Hubs

Type	Example Locations	Context (Transit and Land Use)	Mobility Services	Technology Features
Transit Center	<ul style="list-style-type: none"> ▶ Hawthorne Station (or future replacement in central eastside) ▶ Redmond Transit Center 	<ul style="list-style-type: none"> ▶ Central transit hub with multiple local and Community Connector routes 	<ul style="list-style-type: none"> ▶ Context-sensitive park-and-ride ▶ Drop-off area ▶ Car sharing ▶ Micromobility ▶ Short-term and long-term/secure bike parking 	<ul style="list-style-type: none"> ▶ Real-time information ▶ Off-board fare payment
Secondary Transit Hub (Bend)	<ul style="list-style-type: none"> ▶ Cascade Village (North) ▶ Walmart (South) ▶ OSU (West) ▶ St. Charles (East) ▶ South Downtown Bend/Old Mill (vicinity of Colorado / Arizona); North Downtown (vicinity of Newport and Wall/Bond) 	<ul style="list-style-type: none"> ▶ Major activity center with 2+ connecting routes ▶ Potential Community Connector stop 	<ul style="list-style-type: none"> ▶ Context-sensitive park-and-ride ▶ Drop-off area ▶ Car sharing ▶ Micromobility ▶ Short-term and long-term/secure bike parking 	<ul style="list-style-type: none"> ▶ Real-time information ▶ Off-board fare payment
Secondary Hub / Small-Scale Transit Center (Regional)	<ul style="list-style-type: none"> ▶ Sisters (northwest of downtown) ▶ Madras ▶ Metolius ▶ Culver ▶ Warm Springs ▶ Prineville (near Thriftway or Rays) 			
Major Activity Center	<ul style="list-style-type: none"> ▶ North Downtown Bend (vicinity of Newport/Hawthorne) ▶ COCC ▶ Forum Shopping Center ▶ Major employment areas 	<ul style="list-style-type: none"> ▶ High ridership stop 	<ul style="list-style-type: none"> ▶ Micromobility ▶ Short-term and/or long-term/secure bike parking 	<ul style="list-style-type: none"> ▶ Real-time information ▶ Off-board fare payment
Local Neighborhood	<ul style="list-style-type: none"> ▶ Local route terminus ▶ Neighborhood stop (fixed-route or deviated route) 	<ul style="list-style-type: none"> ▶ Low-to-medium density residential land uses ▶ Can be employed with micromobility where urban form limits transit access 	<ul style="list-style-type: none"> ▶ Drop-off area ▶ Micromobility ▶ Bike parking (basic rack) 	<ul style="list-style-type: none"> ▶ Real-time information
Local stops	<ul style="list-style-type: none"> ▶ Typical stop 		<ul style="list-style-type: none"> ▶ Bike parking (basic rack) 	
Park-and-ride lots (major or minor)	<ul style="list-style-type: none"> ▶ ODOT P&R ▶ Mt. Bachelor 	<ul style="list-style-type: none"> ▶ City edge for unstructured parking ▶ Structured parking opportunities in central city, dense mixed-use development areas 	<ul style="list-style-type: none"> ▶ Micromobility ▶ Bike parking ▶ Drop off area 	<ul style="list-style-type: none"> ▶ Real-time information

APPLICATION OF MICROTRANSIT

Microtransit could be considered as an alternative to fixed-route transit service for lower-density areas (e.g., less than 2 to 10 residents and/or 2 to 5 jobs per acre) or lower demand times of day (such as late evenings, or outside of peak commute time in lower-density areas).

APPLICATION OF MICROMOBILITY

Micromobility could be considered for low density areas within one mile of a fixed route stop (including a neighborhood mobility hub) to increase the access area for a transit route.

LOW STRESS ACTIVE TRANSPORTATION NETWORKS

These networks are critical to providing access to public transportation services. In some areas that are served by existing routes, there are areas beyond a typical ¼ to ½ mile walking distance of a transit stop where improved pedestrian and bicycle connections can expand access to existing transit stops. Improving walking and biking routes along and across roadways around bus stops makes it safer and more comfortable to access transit.

6.3 FIXED-ROUTE SERVICE STRATEGIES

This section summarizes the primary transit network strategies evaluated within Bend, as well as fixed-route frequency and enhanced transit service corridors.

PRIMARY TRANSIT CORRIDORS

The concept of primary transit corridors identifies the roadway segments that are most significant for transit. These corridors are not bus routes or a service plan, but a policy tool to help the City of Bend and CET manage and coordinate land use, public infrastructure, and transit service provision. Primary transit corridors are a mechanism to coordinate transit and land use to achieve land use characteristics that can support a high level of transit service (e.g., as frequent as every 15 minutes) along Bend’s most important arterial transit corridors by:

- ▶ Securing a commitment from the transit provider (CET)
- ▶ Influencing the City’s zoning and development policies

- ▶ Coordinate with City engineers and planners about where street rights-of-way should be designed and managed
- ▶ Coordinating with City, ODOT, or other vested partners
- ▶ Encouraging dense and/or transit-intensive land uses to locate on primary corridors

The primary transit corridors evaluated within Bend are included in the *Bend Supplement – First-Mile/Last Mile Memo* in the Technical Appendix and are defined in Chapter 8 of this TMP. Candidate corridors were evaluated against future population and employment density and low-income population density (based on a 200 percent of poverty definition). Based on these evaluations, various routing options that could provide more direct travel for Bend residents and workers were identified and evaluated for their productivity at different transit frequencies (such as 15-minute peak/30-minute off-peak versus 20-minute peak/40-minute peak).

ENHANCED TRANSIT SERVICE CORRIDORS

The transit corridors on the primary transit network streets that are forecast to be most productive in the future were considered for designation as higher order transit streets such as enhanced transit corridors.

Enhanced transit corridors may have lower headways, system improvements such as transit signal priority and/or bus-only lanes at intersections, real-time arrival information at key stops/mobility hubs, off-board fare payment systems, and front and rear loading.

6.4 STRATEGIES FOR TRANSIT-UNDERSERVED AREAS

This section summarizes the strategies evaluated to bring service to the transit-underserved areas of Bend. Table 17 summarizes these areas underserved by existing transit services, showing 2010 and 2040 population and employment density, and relevant potential solutions for these areas.

As an underserved area, northeast Bend was selected for evaluating alternative mobility strategies to serve selected underserved areas. Options for serving this area included:

- ▶ **Fixed-route extension.** A potential route along Boyd Acres Road was used as a representative example. It could extend existing CET service that ends at Cascade Village, connecting to the central transit center and downtown Bend. A route could also connect to future service to the St. Charles Medical Center/Forum Shopping Center area using along Empire Avenue and NE 27th Street along a new street connecting these roadways. Mobility hubs and micromobility could be employed at selected locations to increase transit access, depending on the street network and land use. An illustration is provided in Figure 38, showing a ¼ mile area around the conceptual route.

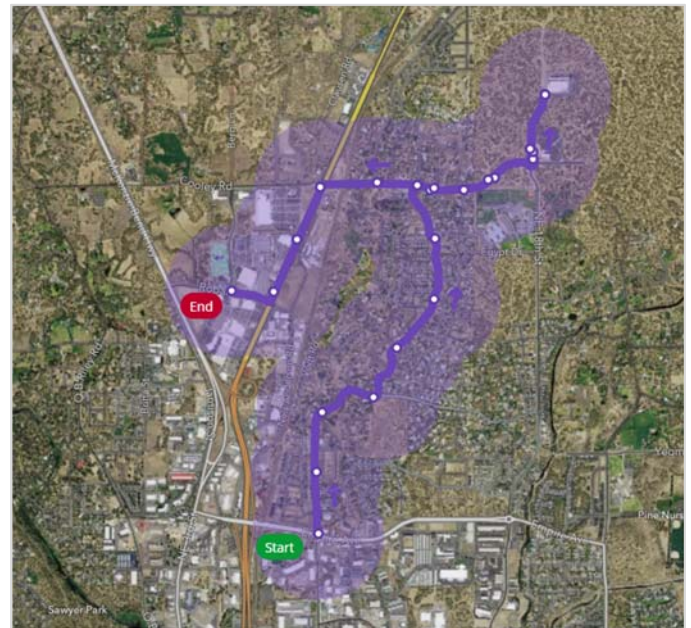


Figure 38: Example Fixed-Route Extension

Table 17: Types of Transit Centers and Mobility Hubs

#	Potential Service Area	Description	Population Density		Employment Density		Potential Services					
			2010	2040	2010	2040	Fixed Route		Deviated fixed-route (flex-route) or Shuttle		Micro-mobility	Low stress active transport
							Assessment	Time Frame	Assessment	Time Frame		
1	North Triangle	Low density future growth	0.4	5.6	0.1	4.7	✓	Future	✓	Future	✓	-
2	Juniper Ridge	Emerging employment	0.0	0.1	0.8	9.8	✓	Future	✓	Current	✓ with FR ext.	-
3	North of Empire (Boyd Acres)	Moderate density residential	4.7	7.6	0.2	0.4	✓	Future	✓	Current	✓	✓
4	Northwest	Low density population	2.5	3.8	0.2	0.3		N/A	✓	Current	✓	-
5	South of Empire	Emerging employment area	1.4	1.4	4.6	11.1	✓	Future	✓	Current	✓	✓
6	Northeast Butler Market Rd	Moderate residential beyond existing fixed route	8.0	10.6	0.2	1.1	-	N/A	-	N/A	✓	✓
7	Northwest Crossing	Moderate residential	5.7	8.1	0.3	1.2	✓	Current	✓	Current	✓	-
8	Neff Road, north of Pilot Butte	Moderate residential beyond existing fixed route	5.7	8.0	0.4	0.7	✓	Current	✓	Current	✓	✓
9	East of 27th	Future residential	3.6	6.6	0.2	0.4	-	N/A	✓	Future	✓	-
10	West of Bond / Brookwood	Moderate residential beyond existing fixed route	6.8	9.9	1.6	3.1	-	N/A	-	N/A	✓	✓
11	Kiwanis Park	Moderate residential beyond existing fixed route	6.2	7.8	1.4	2.0	-	N/A	✓	Current	✓	✓
12	Larkspur	Moderate residential beyond fixed route	5.8	9.3	0.0	0.4	-	N/A	✓	Current	✓	✓
13	Old Farm (Murphy / Brosterhous)	Moderate residential	4.0	8.0	0.6	1.0	✓	Current	✓	Current	✓ with FR ext.	-
14	South of Reed Market	Low residential beyond fixed route	4.1	5.0	0.1	0.3	-	N/A	✓	Current	✓	✓
15	Stevens Road	Future residential area	0.2	9.6	0.0	1.3	✓	Future	✓	Future	✓	-
16a	South 15th Street – North zones	Future residential or mixed-use area	1.4	6.4	0.1	1.0	✓	Future	✓	Future	✓	✓
16b	South 15th Street – South zones	Future employment area	0.3	4.5	0.0	7.3	✓	Future	✓	Future	✓	✓
17	South US 97	Future employment area	0.0	3.5	0.0	10.2	✓	Future	✓	Future	✓	✓
18	Deschutes River Woods	Low density residential area	1.3	1.7	0.1	0.1	-	N/A	✓	Current	✓	-

- ▶ **Fixed-route extension with deviations.** This option is similar to above but could include a deviation off the route. This would increase travel time for all riders but would provide additional stops serving more people. An illustration is provided in Figure 39, showing a ¼ mile area around the conceptual route.



Figure 39: Example Fixed-Route Extension With Deviations

- ▶ **Microtransit or a shuttle** connecting to the central transit center and/or secondary transit hubs; in this case, Cascade Village was assumed. This service could operate during peak hours only or all day; all-day service was assumed. An illustration is provided in Figure 40, using a ½ mile area around a conceptual route to show the potential service area.

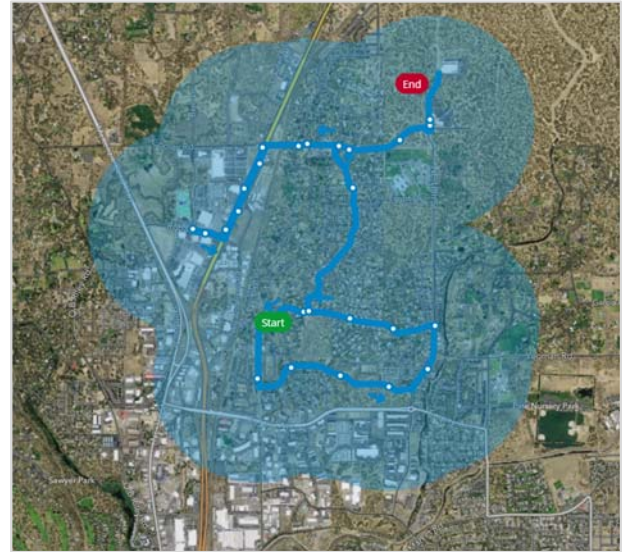


Figure 40: Example Microtransit or Shuttle

- ▶ **Bicycle/pedestrian connectivity enhancements** that would improve access to existing or extended routes include:
 - ▶ The option illustrated in Figure 41 shows a ¼ mile distance from these routes, representing a typical walk to/from a bus stop.



Figure 41: Example Bike/Ped Connectivity Enhancements

- ▶ The option shown in Figure 42 represents an increased access distance to bus stops, e.g., using enhanced bike/ped connections, mobility hubs, and micromobility.

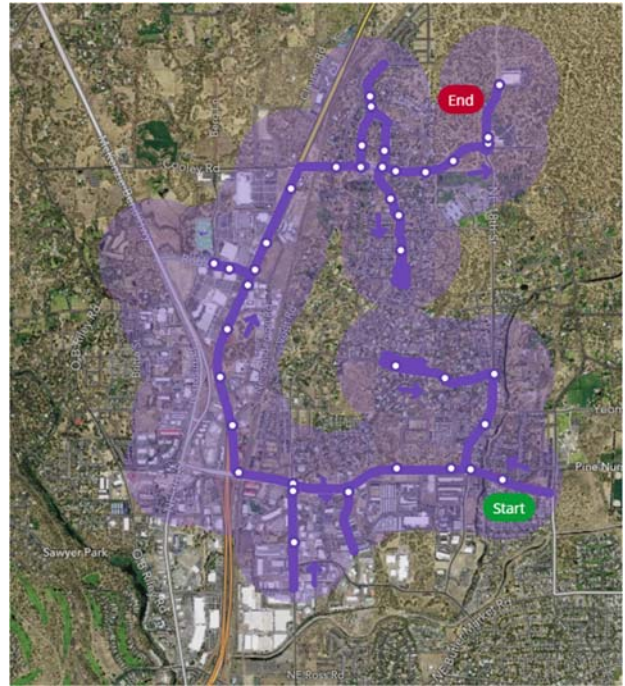


Figure 42: Example Bike/Ped Connectivity + Micromobility Enhancements

6.5 TRANSIT CENTER LOCATION STRATEGIES

Hawthorne Station is a relatively new facility owned by COIC that serves local, Community Connector, and longer-distance intercity services and is an effective hub for routes serving Bend's eastside. However, it has disadvantages including:

- ▶ Beyond comfortable walking distance to downtown destinations and lacks significant transit demand generators in close proximity.
- ▶ Adjacent street environment along 3rd Street is not particularly pedestrian-friendly or conducive to walking.
- ▶ Congestion on 3rd Street can delay transit vehicles and 4th Street is narrow and not optimal for transit vehicles.
- ▶ Capacity to support future expansion is limited.

For these reasons, two conceptual options to replace Hawthorne Station were considered:

- ▶ **Option 1:** Relocate the transit center, maintaining an eastside location (assume vicinity of Hawthorne Ave between Bend Parkway and 3rd Street/US 97 Business, ideally in conjunction with a Hawthorne Avenue bike/pedestrian crossing of the Bend Parkway as proposed in the Bend Transportation System Plan (TSP).
- ▶ **Option 2:** A westside transit center in close proximity to downtown and/or the Old Mill District; generally, in the vicinity of Colorado/Arizona between Bend Parkway and the Bond/Wall couplet. One or more mobility hubs in the central eastside could be created to facilitate transfers between routes. Table 18

provides a qualitative assessment of these options.

As described in the Service Plan and Capital Plan in section 8, a hybrid scenario is planned that includes the Bend system becoming multi-centric. This includes developing secondary transit hubs in the north downtown and south downtown and in the near-term, modifying several Community Connector Routes to connect to one or more future westside mobility hub. As more routes transition to serving downtown, Hawthorne Station can be

deemphasized and some stops at the station moved to 3rd street. With 3rd Street identified as an Enhanced Transit Corridor, a transit center will continue to be needed on 3rd Street in the vicinity of Hawthorne Avenue; however, additional routes will be able to have transfers downtown once Aune Street is extended to 3rd Street by the City of Bend. More details on the phasing of these mobility hubs are described in Chapter 9.

Table 18: Hawthorne Station Conceptual Options Comparison

Area / Corridor	Primary Network?	Option 1: Relocate Transit Center - Maintain Eastside Location	Option 2: Relocate Transit Center to a Westside Location
Local Fixed-Routes			
1 – South 3 rd St	Yes	▶ Does not provide direct access to downtown area	▶ Could provide direct access to downtown area
2 – Brookwood	Yes (north of Old Mill)	▶ Currently routed through downtown (no change from today)	▶ Would require a transfer to access eastside destinations beyond the central eastside (similar to today).
3 – Newport	Yes	▶ Currently routed through north end of downtown (no change from today)	▶ Would require a transfer to access eastside destinations beyond the central eastside (similar to today).
4 – North 3 rd St	Yes	▶ Does not provide direct access to downtown area (no change from today)	▶ Could provide direct access to downtown area
5 – Well Acres	No	▶ Does not provide direct access to downtown area (no change from today)	▶ Could provide direct access to downtown area
6 – Reed Market	No	▶ Does not provide direct access to downtown area (no change from today)	▶ Could provide direct access to downtown area
7 – Greenwood	Yes	▶ Does not provide direct access to downtown area (no change from today)	▶ Could provide direct access to downtown area
10 – Colorado	Yes (Downtown and OSU)	▶ Currently routed through downtown (no change from today)	▶ Would require a transfer to access eastside destinations beyond the central eastside (similar to today).
11 – Galveston	Yes (Downtown and OSU)	▶ Currently routed through downtown (no change from today)	▶ Would require a transfer to access eastside destinations beyond the central eastside (similar to today).
Community Connector			
North: Redmond (24), Madras (22), Prineville (26), Sisters (28/29), Warm Springs (20)		▶ Does not provide direct access to downtown area	▶ Would provide more direct access to downtown destinations.
South: La Pine (30)		▶ Does not provide direct access to downtown area	▶ Would provide more direct access to downtown destinations.



- 7.1 FUNDING LEVEL ASSUMPTIONS
- 7.2 EXISTING FUNDING SOURCE ASSUMPTIONS
- 7.3 POTENTIAL FUTURE FUNDING SOURCES
- 7.4 FUTURE FUNDING SCENARIOS
- 7.5 COST ASSUMPTIONS

7.0 FINANCIAL ASSESSMENT

7.1 FUNDING LEVEL ASSUMPTIONS

Funding levels and phasing are summarized by general timeframe and based on the best available current data trends and assumptions; however, revenue projections, project priorities, economic trends, and development patterns can shift over time and result in shifts to funding levels and phasing. The planned phasing and funding levels are as follows:

- ▶ **Existing 0-1 Years** (FY 2019, includes initial implementation of STIF)
- ▶ **Near-term: 1-2 Years** (FY 2020-2021, includes STIF)
- ▶ **Short-term: 3-5 Years** (FY 2022-23 and FY 2023-24, includes STIF)
- ▶ **Mid-Term: 6-10 Years** (Potential sources in addition to STIF)
- ▶ **Long-Term: 11-20 Years** (unconstrained financially)

7.2 EXISTING FUNDING SOURCE ASSUMPTIONS

CET currently has a mix of revenue sources including federal, service contracts, state, local, fares, one-time revenues, and advertising/other. These funding sources fluctuate year-by-year, although a solid base is provided through federal and state grants, service contracts, local funding from cities, and fare revenue. State and local funding is anticipated to be stagnant due to the new STIF funding, however, fares and contract services revenue are anticipated to increase as services are increased and the population grows. Based on this, an annual growth rate of 1.0 percent on non-STIF funding was assumed for future years (0 percent growth on state and local funds and 2-5 percent increases in fare and contract revenues) and is shown for each sub-system in Table 19.

CET is administering the STIF funding from the four regional "Qualified Entities" and is also the primary provider of services that will be funded by STIF. The Qualified Entities include the Confederated Tribes of the Warm Springs, Crook County, Deschutes County, and Jefferson County. Currently, projections for the STIF revenue have been provided by the Oregon Department of Transportation (ODOT) through the 2023 fiscal year. The projections are steady for the Confederated Tribes of Warm Springs and vary for the counties with 4 percent annual growth rates assumed after 2021 based on projected increases in the payroll.

It is important to note that the COVID-19 pandemic of 2020 brings with it unknown future impacts to STIF revenues sources making their projection uncertain.

Table 19: Funding Projections

Funding Source	Sub-System or Qualified Entity	Sample Fiscal Year			
		2019-2020	2024-2025	2029-2030	2039-2040
Total Existing Revenue	Bend System	\$3,544,090	\$3,724,874	\$3,914,880	\$4,324,463
	Rural System	\$2,287,650	\$2,404,343	\$2,526,989	\$2,791,368
STIF	Confederated Tribes of the Warm Springs	\$100,000	\$100,000	\$100,000	\$100,000
	Crook County	\$223,000	\$313,664	\$381,620	\$564,891
	Deschutes County	\$3,049,000	\$4,327,482	\$5,265,043	\$7,793,550
	Jefferson County	\$222,000	\$314,746	\$382,936	\$566,839
TOTAL		\$9,425,740	\$11,185,109	\$12,571,468	\$16,141,111

FARE REVENUE

CET should further explore the impact of a potential fare-free system or zone such as Bend. Bend fare revenues are currently approximately \$260,000 annually which is projected to be approximately \$500,000 annually by 2040 assuming 3 percent annual

growth. Fare-free transit has the potential to increase ridership which could increase some formula funds or help CET qualify for new funding sources such as STIC (Small Transit Intensive Community); however, fare-free programs can also increase demand and costs on paratransit services and reduce contract service revenue making the potential revenue loss much greater.

7.3 POTENTIAL FUTURE FUNDING SOURCES

CET can pursue several additional funding sources if additional funding was desired such as a property tax, employer-based payroll tax, or transit utility fee. The property tax and employer-based payroll tax are discussed below as examples of the range of funding that could be generated by these approaches. Table 20 summarizes the projected growth for these potential funding sources for the 20-year planning horizon.

PROPERTY TAX

CET could pursue becoming a transit district with taxing authority and establish a property

tax, similar to other transit providers in the state. A property tax would provide a determined percentage per \$1,000 of assessed property value, such as two tenths of one percent. Table 20 shows three tax rates and two potential tax area bases explored to estimate revenue that CET could see with a property tax. For all six projections, an annual growth rate of 5.0 percent was assumed for future years which includes the allowed 3 percent annual increase in the assessed property values and assumes a 2 percent annual increase for growth.

EMPLOYER-BASED PAYROLL TAX

Another potential future funding source is an employer-borne payroll tax through an Oregon Revised Statutes legislative change equal to

one tenth of one percent. A tax of that amount would be equivalent to the employee-borne tax funding the STIF.

Table 20: Potential Funding Sources and Levels

Potential Future Funding Source	Variation	Fiscal Year			
		2019-2020	2024-2025	2029-2030	2039-2040
Property Tax	0.05% within Counties	\$14,979,349	\$19,117,867	\$24,399,781	\$39,744,673
	0.05% within Incorporated Areas	\$8,310,214	\$10,606,173	\$13,536,463	\$22,049,472
	0.03% within Counties	\$8,987,610	\$11,470,720	\$14,639,869	\$23,846,804
	0.03% within Incorporated Areas	\$4,986,128	\$6,363,704	\$8,121,878	\$13,229,683
	0.02% within Counties	\$5,991,740	\$7,647,147	\$9,759,913	\$15,897,869
	0.02% within Incorporated Areas	\$3,324,086	\$4,242,469	\$5,414,585	\$8,819,789
Employer-based Payroll Tax	N/A	\$3,594,000	\$5,055,891	\$6,129,599	\$9,025,280

7.4 FUTURE FUNDING SCENARIOS

Several future funding scenarios are presented in Table 21. Each scenario uses the existing funding source projections as a base, then

adds new funding sources to estimate projected funding.

Table 21: Future Funding Scenarios

ID	Funding Scenario	Variation	Fiscal Year			
			2019-2020	2024-2025	2029-2030	2039-2040
A	Existing Revenue Sources (excluding STIF)	Includes Both Sub-systems	\$5,831,740	\$6,129,217	\$6,441,869	\$7,115,831
B	Existing Revenue Sources (including STIF)	N/A	\$9,425,740	\$11,185,109	\$12,571,468	\$16,141,111
C1	Existing + STIF + 0.02% Property Tax	Within Counties	-	\$18,832,255	\$22,331,381	\$32,038,980
C2		Within Incorporated Areas	-	\$15,427,578	\$17,986,054	\$24,960,900
D	Existing + STIF + Employer-based Payroll Tax	N/A	-	\$16,241,000	\$18,701,068	\$25,166,391
D1	Existing + STIF + Property Tax + Payroll Tax	0.02% Property Tax Within Counties	-	\$23,888,147	\$28,460,980	\$41,064,260
D2		0.02% Property Tax Within Incorporated Areas	-	\$20,483,469	\$24,115,653	\$33,986,180

7.5 COST ASSUMPTIONS

The following unit cost assumptions were used in estimating service operating costs, based on projections coordinated with CET’s fiscal department. The “Existing” time frame reflects CET’s current costs for FY 2020 (2019-2021) for each service type that CET operates, based on the November 2019 Management Report, which pre-dates new service launched based

on the STIF Plans completed by each qualified entity for FY 2019- FY 2021. Subsequent average cost increases of 5 percent annually are assumed. The bottom row of the table provides the median operating cost per hour for peer agencies, escalated for inflation using the same assumptions as for CET costs.

Table 22: Hourly Unit Cost Assumptions

Sub-System	Existing ¹	Near-Term ²	Short-Term ²	Mid-Term ²	Long-Term ²
	2019-2020	2020-2021	2024-2025	2029-2030	2039-2040
Bend Dial-A-Ride	\$74.15	\$81	\$101	\$132	\$220
Bend Fixed-Route	\$75.18	\$82	\$102	\$133	\$223
Rural Dial-A-Ride	\$87.14	\$94	\$116	\$151	\$251
Rural Community Connector	\$95.34	\$103	\$128	\$166	\$277
Rural Route 20	\$79.26	\$86	\$107	\$139	\$231
Microtransit ³	\$74.00	\$77	\$93	\$116	\$177
Peer Median ⁴	\$91	\$101	\$123	\$156	\$256

Notes: 1. Existing costs for 2019. 2. An additional approximately \$2 per revenue hour was added to the 2019 Existing cost to account for vacant positions. This cost was subsequently increased by 5% annually. 3. Microtransit cost estimated based on an average of the following two potential approaches: (a) CET provides service in-house. (b) CET contracts service on a revenue hour basis. (c) A third potential model is to contract service on a fee per ride provided, but is not directly reflected in the cost assumptions. A 4% annual cost escalation is assumed. 4. A peer median cost of \$85.40 for peer agencies in FY 2017 was identified in Memo #1, and escalated by the 4% annually. 2. Costs for subsequent time frames reflect assumed 3% annual cost increases.



- 8.1 TRANSIT SERVICE PLAN
- 8.2 TRANSIT CAPITAL PLAN

8.0 TRANSIT MASTER PLAN



8.1 TRANSIT SERVICE PLAN

This section describes the preferred transit service plan determined through public outreach, stakeholder input, and direction provided by the TMP advisory committees. More details are provided in the *Service Plan Memo* in the Technical Appendix. Chapter 9 describes the timeframe for when these services should be implemented and the funding requirements to do so.

COMMUNITY CONNECTOR SERVICE

The services planned for the Community Connector includes modifications to existing routes as well as new routes added.

MODIFICATIONS TO EXISTING SERVICES

Each section below highlights proposed changes to routing, service levels, and stops. Addition of stops should be monitored for each route to ensure compliance with the FTA 'commuter bus' designation due to the requirement to provide complimentary ADA paratransit for a traditional fixed-route bus.

Route 20: Warm Springs-Madras

Modifications to Route 20 for service between Warm Springs and Madras include improving connection to the Central Oregon Breeze; adding weekend service; and adding morning and evening trips.

Route 22: Madras-Redmond

Modifications to Route 22 for service between Madras and Redmond include adding a stop near the St. Charles Medical Center/Walmart area in Redmond; increasing peak period trip frequency and adding an evening trip; adding midday service via a shopping/medical shuttle trip; increasing local circulation via local Dial-

A-Ride and/or Community Connector vehicles; providing service to Crooked River Ranch and Juniper Canyon via shopper/medical shuttles; and adding weekend service.

Route 24: Redmond-Bend

Modifications to Route 24 for service between Redmond and Bend include re-routing within Bend to provide more direct service as illustrated in Figure 43; increasing service frequency all day and adding an evening trip; improving connections with local service in Redmond in coordination with a potential transition to flex/fixed-route service; and adding weekend service.

Route 26: Prineville-Redmond

Modifications to Route 26 for service between Prineville and Redmond include re-routing to serve the Redmond Airport and COCC shown in Figure 44; interlining with Route 24 for a one-seat ride to Bend; increasing peak period trip frequency and adding an evening trip; adding midday service as a shopping/medical shuttle trip; increasing local circulation in Prineville via local Dial-A-Ride and/or Community Connector vehicles; and adding weekend service.

Route 28: Sisters-Redmond

Modifications to Route 28 for service between Sisters and Redmond include improving local stop branding and amenities within Sisters; increasing local circulation in Sisters via the Community Connector; and determining if smaller communities along route need service (e.g. Eagle Crest).

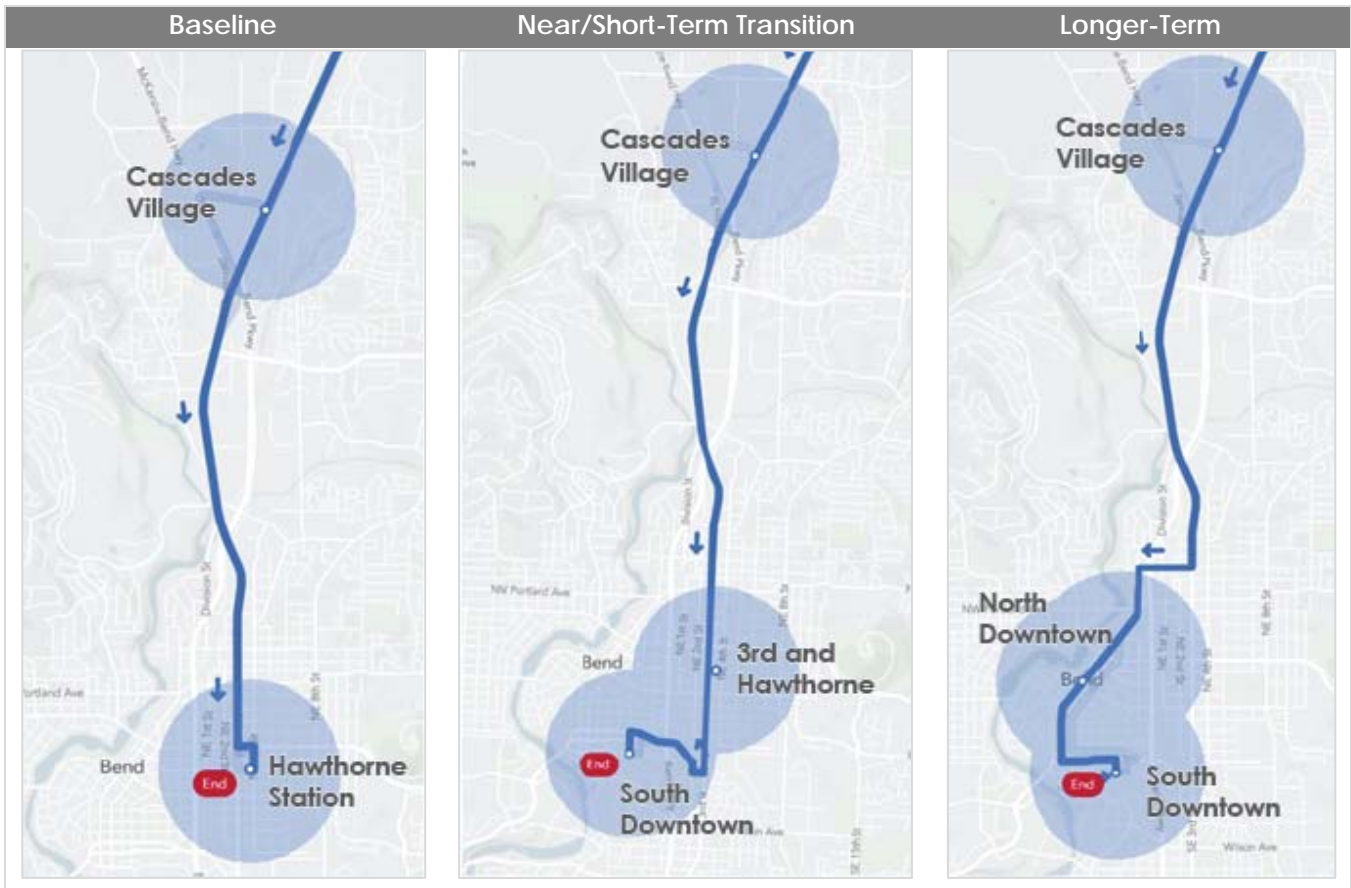


Figure 43: Route 24 Redmond-Bend Modifications

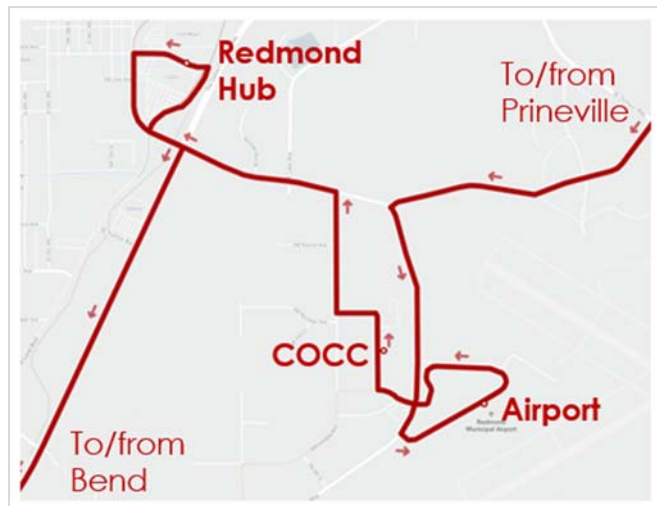


Figure 44: Route 26 Prineville-Redmond Modifications

Route 29: Sisters-Bend

Modifications to Route 29 for service between Sisters and Bend include improving local stop branding and amenities within Sisters; providing

a stop at Tumalo and Cascade Village in Bend; re-routing within Bend, like Route 24, to provide more direct service (see Figure 43); increasing local circulation in Sisters via the Community Connector; and adding weekend service.

Route 30: La Pine-Bend

Modifications to Route 30 for service between La Pine and Bend include identifying an improved/more efficient stop for Deschutes River Woods (e.g. Riverwoods Country Store) or alternative way to serve Deschutes River Woods; re-routing within Bend to provide more direct service to downtown as illustrated in Figure 45; re-routing to serve Sunriver as described in Figure 45; increasing frequency of weekday trips; adding a flex-route in La Pine; adding midday service via a

shopping/medical shuttle trip; adding weekend service; and adding service to the

High Desert Museum and Lava Lands Visitor Center (potentially seasonally based).

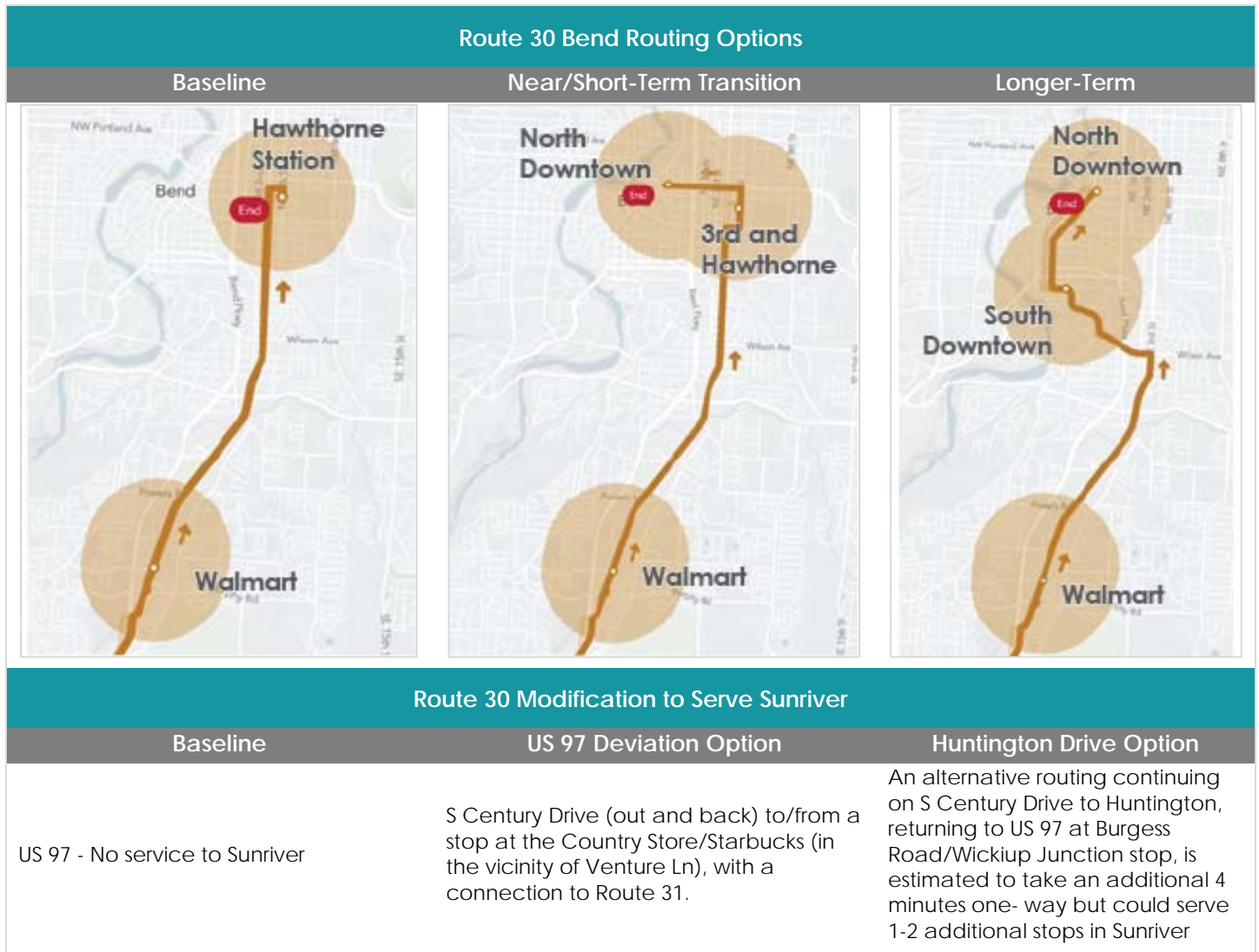


Figure 45: Route 30 Routing Options in Bend and Sunriver

NEW SERVICES

This section describes new Community Connector services planned across the CET service area.

Route 19: Warm Springs Employment Center Service

A new Route 19 provides service between Warm Springs and regional employment along US 26 (e.g. Government Camp and ski resorts). This route can connect with future expanded

transit options around Mt. Hood. Phasing options are described in Chapter 9.

Redmond Airport Service

New service to the Redmond Airport includes modifying Route 26 between the Redmond Hub and a Redmond Airport mobility hub – including a stop at Redmond COCC – and supplementing Route 24 by a local route connection between the Redmond Hub and Redmond Airport, serving early morning

departures and afternoon arrivals (see Figure 24).

Route 31: Sunriver Service

A new Route 31 provides service between La Pine and Sunriver, connecting employees to jobs in Sunriver, with stops at the Sunriver Starbucks and La Pine Fire Station on Huntington. An alternative to this route is to modify Route 30. Either service could support tourism opportunities.

Shopping/Medical Shuttle Service

New shopping/medical shuttle services blend features of demand-responsive services and the Community Connector routes and should be implemented in the following communities as a midday service on existing routes:

- ▶ Sisters – Bend
- ▶ Madras – Redmond (including Culver and Metolius)
- ▶ Prineville – Redmond (including Juniper Canyon)
- ▶ La Pine – Bend (including Sunriver)

These new shopper/medical shuttles can provide service to new markets:

- ▶ Crooked River Ranch
- ▶ Juniper Canyon
- ▶ Deschutes River Woods
- ▶ Warm Springs; Simnasho and other outlying communities

BEND LOCAL SERVICE

The services planned for Bend includes the implementation of mobility hubs, modifications to existing routes, and addition of new routes.

MOBILITY HUBS

As described in previous sections, mobility hubs are places designed to facilitate convenient, safe, and accessible connections to and between multimodal mobility services like public transportation. Mobility hubs can include a variety of infrastructure and mobility service elements and are adaptable to a range of transit facilities. The plan for Bend local services is to transition the hub-and-spoke fixed-route system to a more multi-centric model, which will be supported by the various mobility hubs illustrated in Figure 46.

In doing so, the emphasis on Hawthorne Station being a major transit center will be minimized over time. More details on the phasing of these mobility hubs are described in Chapter 9. Table 23 describes the Bend fixed-route changes and additions to provide more direct connections to the westside. Further, Figure 47 and Figure 48 illustrate the near- to short-term and mid- to long-term phasing of Bend fixed-routes.

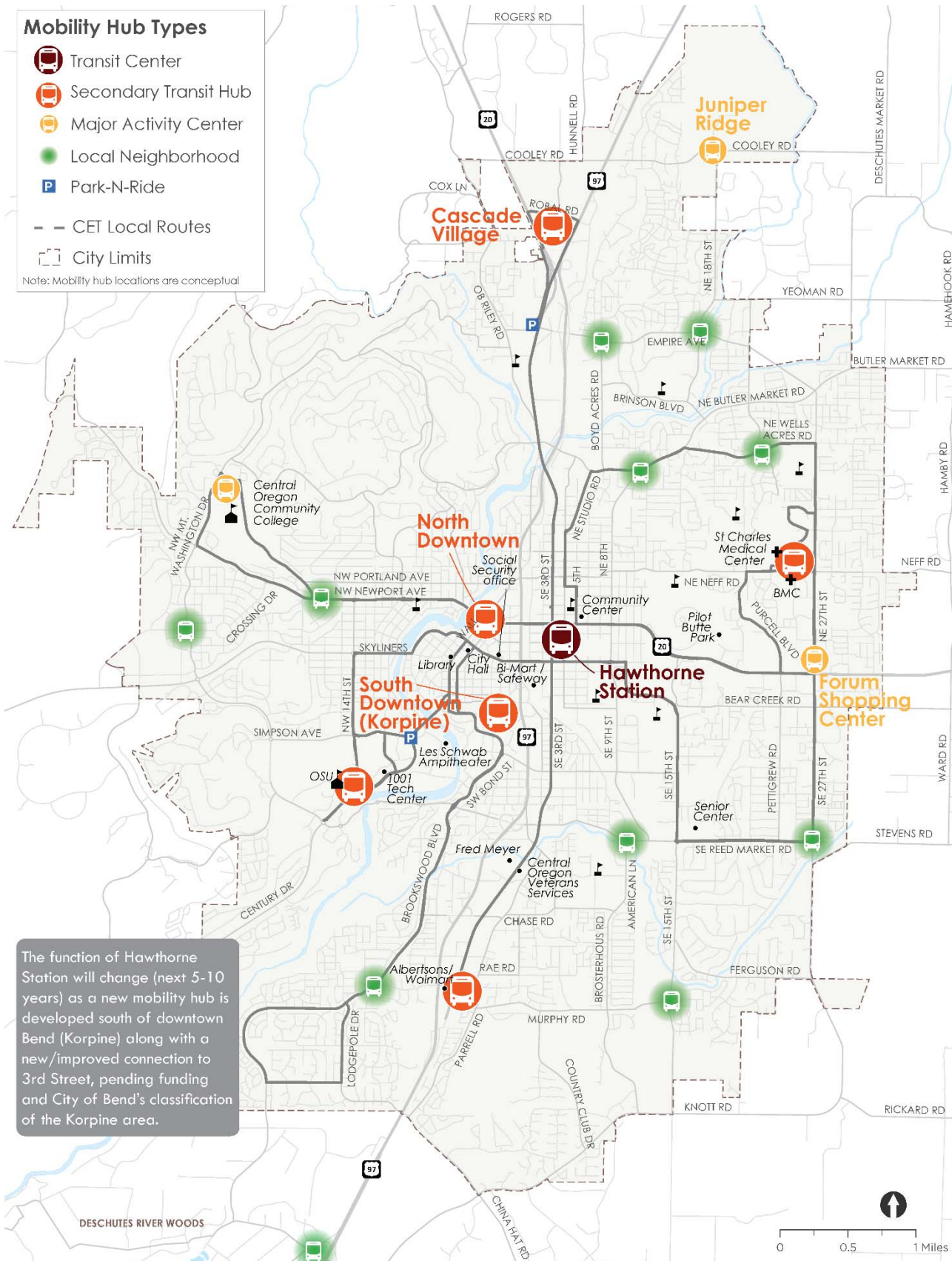


Figure 46: Planned Mobility Hubs

Table 23: Planned Bend Fixed Route Modifications

Area / Corridor	Primary Network?	Baseline	Near/Short-Term Transition w/Continued Service to Eastside	Medium/Long-Term (No Service to 3 rd & Hawthorne Required)	Other Changes Considered in Service Plan
1 – South 3 rd St	Yes	<ul style="list-style-type: none"> ▶ Does not provide direct access to downtown 	<ul style="list-style-type: none"> ▶ Serve 3rd & Hawthorne then loop through downtown on Franklin/Newport; or ▶ Interline with Route 4, no connection to downtown (this option is assumed) 	<ul style="list-style-type: none"> ▶ Connect to south downtown hub using Aune, and potentially north downtown hub. Does not serve 3rd north of Aune; or ▶ Interline with Route 4, single out-and-back stop at south downtown mobility hub in vicinity of Hawthorne and Aune (this option is assumed) 	
2 – Brookwood	Yes (north of Old Mill)	<ul style="list-style-type: none"> ▶ Currently routed through south downtown to Hawthorne Station 	<ul style="list-style-type: none"> ▶ No change 	<ul style="list-style-type: none"> ▶ Reroute to north downtown hub via downtown; no connection to eastside 	<ul style="list-style-type: none"> ▶ Possible extension to SE Bend along Murphy Rd (with increased frequency, alternate with Brookwood loop)
3 – Newport	Yes	<ul style="list-style-type: none"> ▶ Currently routed through north end of downtown between COCC and Hawthorne Station 	<ul style="list-style-type: none"> ▶ No change 	<ul style="list-style-type: none"> ▶ Reroute to south downtown hub; no connection to eastside 	<ul style="list-style-type: none"> ▶ Possible route change to serve NW Crossing (with increased frequency and change in cycle time to 40 or 45 minutes)
4 – North 3 rd St	Yes	<ul style="list-style-type: none"> ▶ Does not provide direct access to downtown 	<ul style="list-style-type: none"> ▶ Serve 3rd & Hawthorne then loop through downtown using Franklin/Newport; or ▶ Interline with Route 4, no connection to downtown (this option is assumed) 	<ul style="list-style-type: none"> ▶ Reroute to serve south downtown using Aune; or ▶ Interline with Route 1, single stop at south downtown mobility hub in vicinity of Hawthorne and Aune (this option is assumed) ▶ Either option could continue to serve 3rd & Hawthorne 	<ul style="list-style-type: none"> ▶ Possible extension to Juniper Ridge (selected trips)
5 – Well Acres	No	<ul style="list-style-type: none"> ▶ Does not provide direct access to downtown 	<ul style="list-style-type: none"> ▶ Extend to downtown via 3rd & Hawthorne and interlining with Route 11 	<ul style="list-style-type: none"> ▶ Same as near-term 	<ul style="list-style-type: none"> ▶ Split routes 5 and 6
6 – Reed Market	No	<ul style="list-style-type: none"> ▶ Does not provide direct access to downtown 	<ul style="list-style-type: none"> ▶ Serve 3rd & Hawthorne then loop through downtown using Franklin/Newport 	<ul style="list-style-type: none"> ▶ Extend to south downtown and OSU via Reed Market (service along SE 15th eliminated; SE 15th would be served by another route) 	<ul style="list-style-type: none"> ▶ Extension to Cascade Village via NE 27th and Empire (once connection is built)
7 – Greenwood	Yes	<ul style="list-style-type: none"> ▶ Does not provide direct access to downtown 	<ul style="list-style-type: none"> ▶ Extend to south downtown via Hawthorne Station and Newport; or ▶ Extend to OSU; Route 10 eliminated (assumed) 	<ul style="list-style-type: none"> ▶ Extend to OSU; Route 10 eliminated (assumed) 	
10 – Colorado	Yes (Downtown and OSU)	<ul style="list-style-type: none"> ▶ Currently routed through downtown on Franklin 	<ul style="list-style-type: none"> ▶ No change; or ▶ Eliminate with Route 7 extension to OSU (assumed) 	<ul style="list-style-type: none"> ▶ Eliminate with Route 7 extension to OSU 	
11 – Galveston	Yes (Downtown and OSU)	<ul style="list-style-type: none"> ▶ Currently routed through downtown on Franklin 	<ul style="list-style-type: none"> ▶ Interline with Route 5 	<ul style="list-style-type: none"> ▶ 	
New – Southeast	No	<ul style="list-style-type: none"> ▶ N/A 	<ul style="list-style-type: none"> ▶ N/A 	<ul style="list-style-type: none"> ▶ Possible interline with Route 3? 	<ul style="list-style-type: none"> ▶ New service on SE American/Brosterhous/15th
New – Northeast	No	<ul style="list-style-type: none"> ▶ N/A 	<ul style="list-style-type: none"> ▶ N/A 	<ul style="list-style-type: none"> ▶ Possible interline with Route 2 	<ul style="list-style-type: none"> ▶ New service on NE 8th/Boyd Acres; could potentially serve Juniper Ridge as well

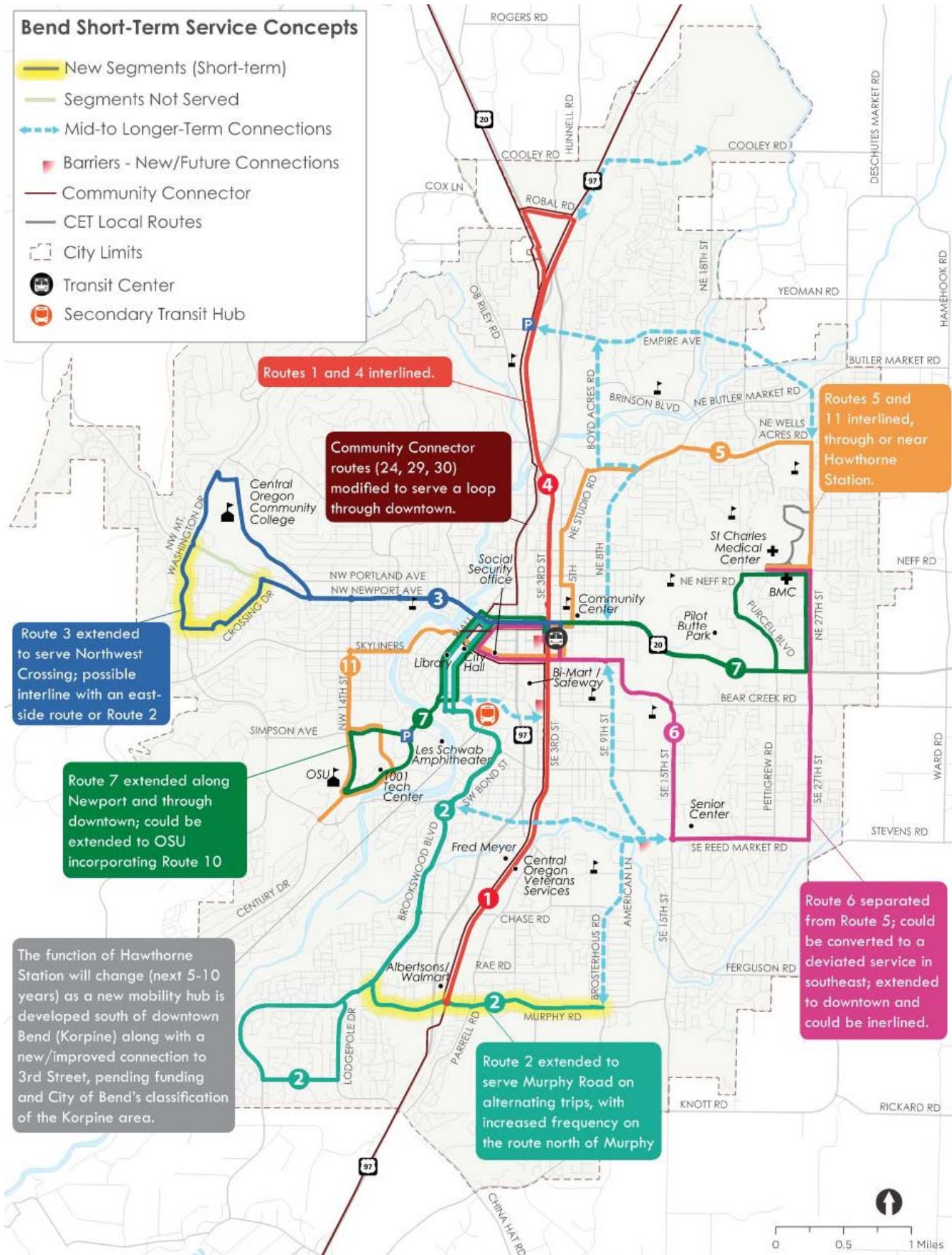


Figure 47: Bend Short-Term Service Plan

PRIMARY TRANSIT NETWORK

The concept of primary transit corridors identifies the roadway segments in Bend that are most significant for transit. These corridors are not bus routes or a service plan, but a policy tool to help the City of Bend and CET manage and coordinate land use, public infrastructure, and transit service provision. Primary transit corridors are a mechanism to coordinate transit and land use to achieve land use characteristics that can support a high level of transit service (e.g., as frequent as every 15 minutes) along Bend's most important arterial transit corridors by:

- ▶ Securing a commitment from the transit provider (CET)
- ▶ Influencing the City's zoning and development policies
- ▶ Providing direction to City and/or ODOT engineers and planners about where street rights-of-way should be designed and managed
- ▶ Coordinating with City, ODOT, or other vested partners
- ▶ Encouraging dense and/or transit-intensive land uses to locate on primary corridors

Figure 49 illustrates the recommended Primary Transit Network corridor designations, based on

thresholds for density of population and employment required to support frequent transit service as well as system considerations for the transit network in Bend. Corridor segments are defined as follows:

- ▶ **Definite:** highest land use density and ridership potential for frequent service
- ▶ **Candidate:** more moderate land use density and current or future potential for moderately frequent service

Future service areas may be considered for either fixed-route or other service models.

Table 24 summarizes Primary Transit Network corridor characteristics (densities) and designations. Population and employment density is based on a quarter-mile straight-line distance around the corridors.

Transit-oriented development strategies discussed in Chapter 9 identify policies that the City of Bend and other local agencies in CET's service area can implement to encourage transit-supportive densities and urban form along planned Primary Transit Corridors.

MODIFICATIONS TO EXISTING SERVICES

This section describes changes to existing routes and new routes, building upon the proposed changes to provide more direct connections to downtown.

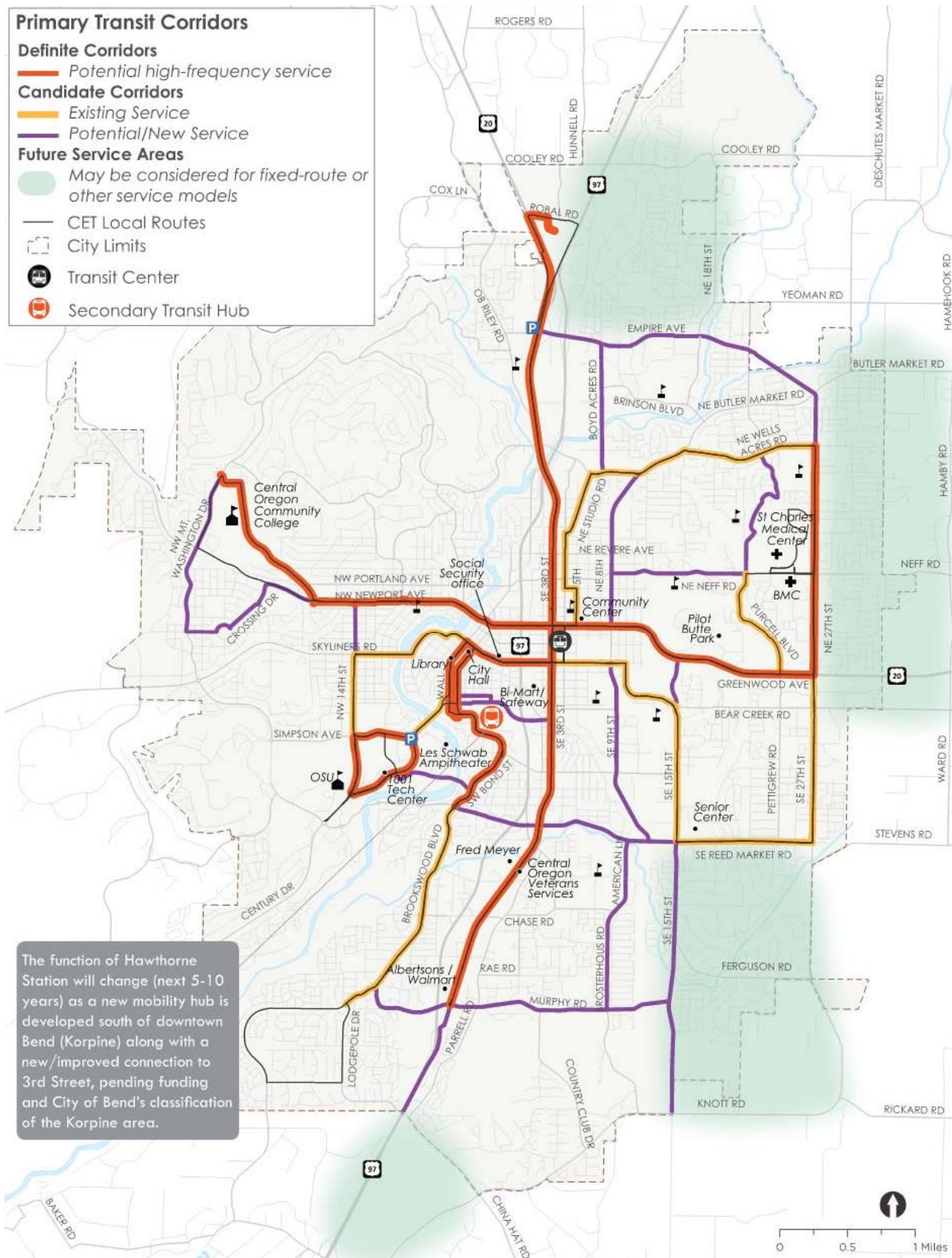


Figure 49: Bend Primary Transit Network

Table 24: Bend Primary Transit Network Corridor Characteristics

Definite Corridors	Population Density		Low-Income Population Density ²	Employment Density ³		Combined Population and Employment Density	
	2010	2040	2017	2010	2040	2010	2040
Franklin Avenue	3.5	7.5	1.2	11.4	16.3	15.0	23.8
OSU Area (Simpson/Century/Colorado)	0.9	10.8	0.4	6.0	10.9	6.9	21.7
Wall/Bond Streets	3.8	6.3	1.1	9.7	14.3	13.4	20.6
Greenwood Avenue	3.7	7.0	1.8	7.5	10.2	11.3	17.1
27th Street	4.8	8.8	1.5	4.5	6.6	9.3	15.4
Newport Avenue	5.7	7.9	1.5	5.2	7.1	10.8	15.0
South 3rd Street	3.8	7.0	1.9	4.5	6.9	8.3	13.9
North 3rd Street	1.6	4.2	0.9	6.0	9.4	7.6	13.6
Franklin Avenue	3.5	7.5	1.2	11.4	16.3	15.0	23.8

Sources: [1 & 3] Bend MPO projections and [2] American Community Survey, 2013-2017 5-Year Average

Routes 1/4: South and North 3rd Street

Third Street is proposed as a bus priority corridor in the Bend TSP. This option would support this designation by providing a continuous route along Third.

The modifications planned for these fixed-routes are to combine (or interline) them in the short-term, increasing frequency to 15-20 minutes during peak periods and then all day as resources allow.

In the mid-term, continue increasing frequency, provide a connection to downtown and a new mobility hub in the Kor-Pine area (via a new Aune Street connection), and extend Route 4 to serve Cooley Road and Juniper Ridge (see Figure 50).

In the long-term, extend service further south as appropriate based on land use.

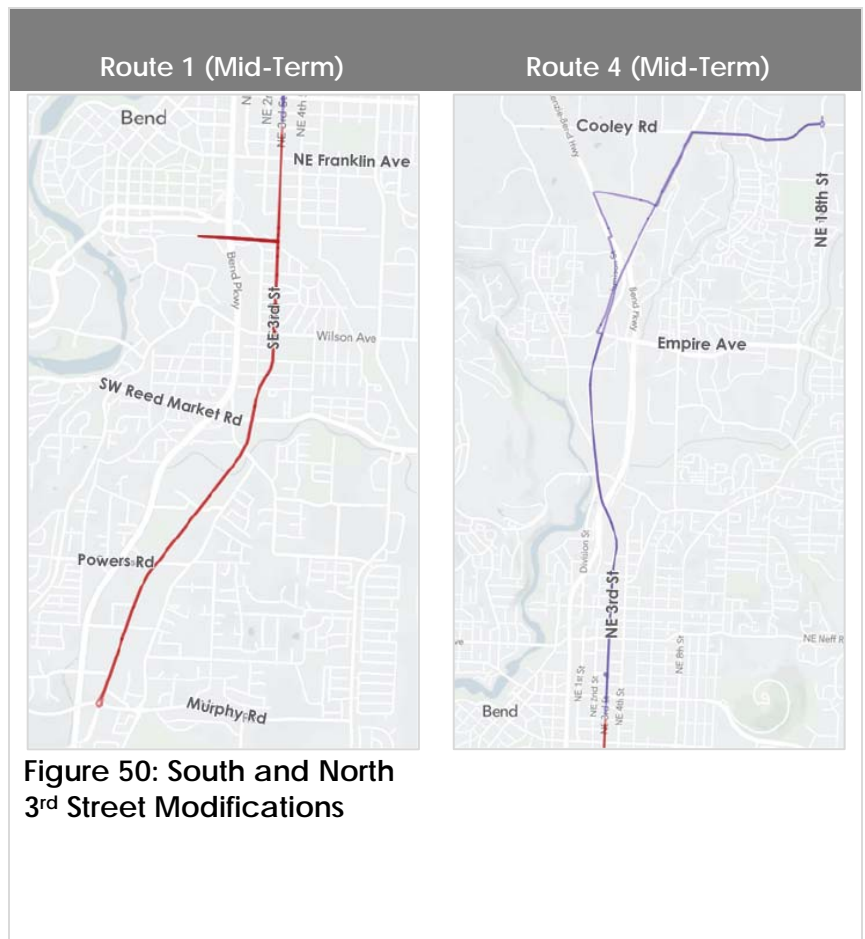


Figure 50: South and North 3rd Street Modifications

Routes 7/10: Greenwood and Colorado to OSU

Route 7 provides direct east-west service along Greenwood Road, serving St. Charles Medical Center and the Forum Shopping Center, but requires a transfer to connect to downtown.

The modifications planned for these routes include extending Route 7 to downtown via Newport Avenue in the near-term, circulating through downtown to include Franklin Avenue and the Arizona/Colorado couplet, and increasing frequency to 15-20 minutes during peak periods and then all day as resources allow.

In the short-term, combine Route 7 and 10, increasing frequency to OSU (see Figure 51).

In the long-term, continue increasing frequency as warranted based on demand and resources.

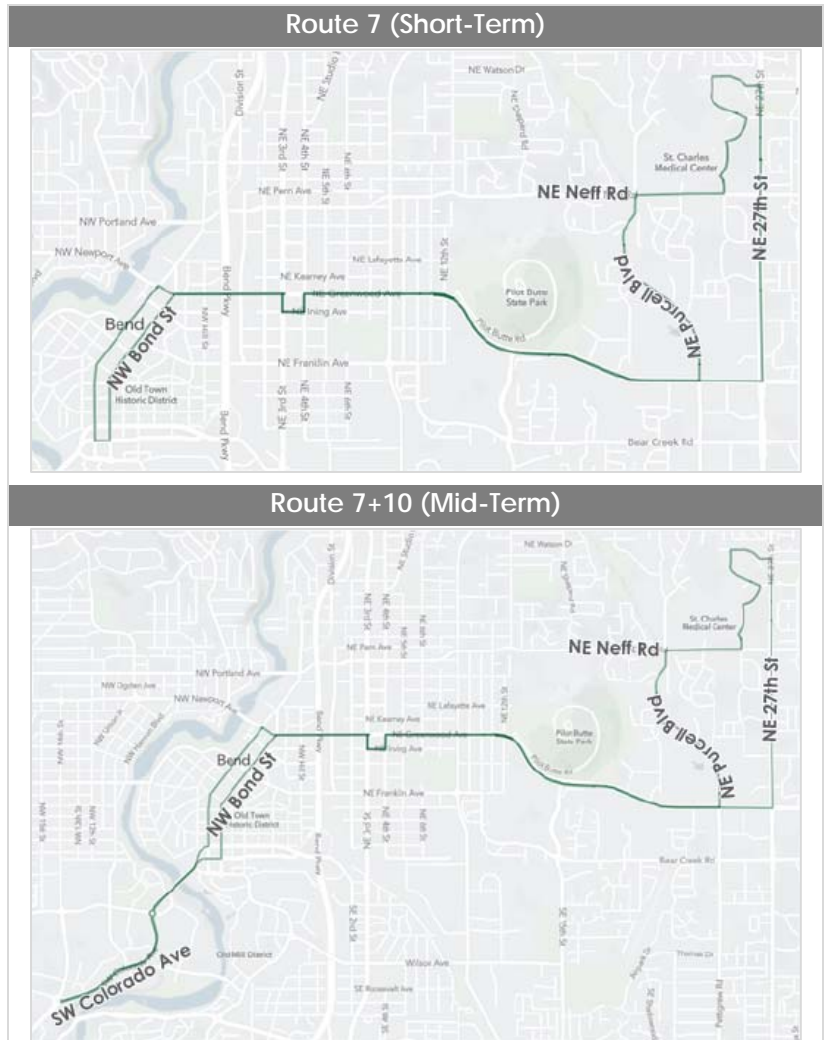


Figure 51: Greenwood and Colorado Modifications to OSU

Route 2: Brookwood

The modifications planned for this route in the short- to mid-term include increasing frequency to 15-20 minutes during peak periods and then all day as resources allow, extending to SE Bend along Murphy Road to SE 15th Street on alternating trips or along Brosterhaus (need to identify turnaround loop), and re-routing to the north downtown hub (see Figure 52).

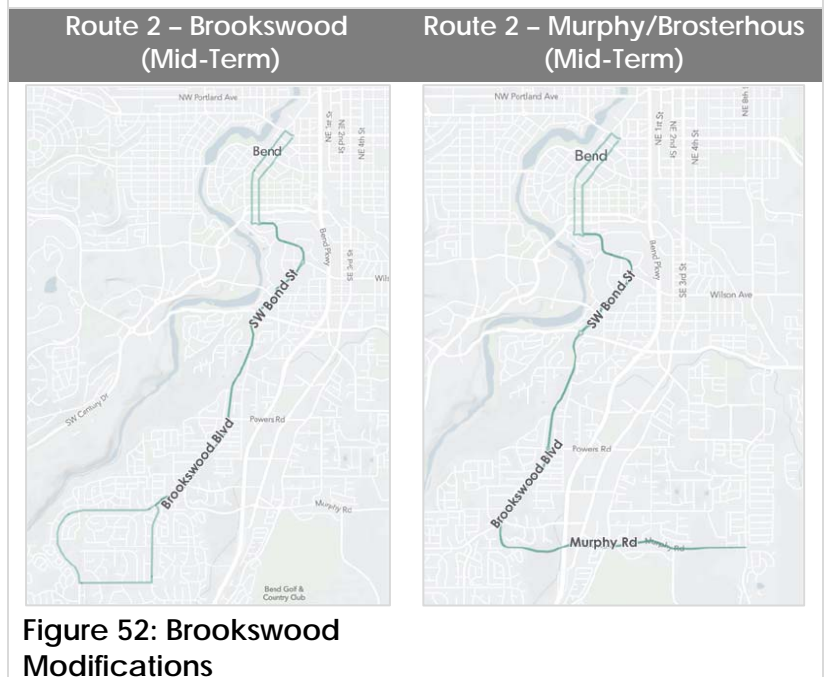


Figure 52: Brookwood Modifications

Route 3: Newport

The modifications planned for this route in the short- to mid-term include increasing frequency to 15-20 minutes during peak periods and then all day as resources allow.

Further, extend this route to serve NW Crossing and Summit High School (not possible with a 30-minute cycle time); increasing frequency benefits COCC students and staff.

Other modifications include interlining with Route 2 to provide a direct connection through downtown and Old Mill District and from southwest and southeast Bend to COCC.

Future interlining with new northeast and southeast routes is possible (see Figure 53).

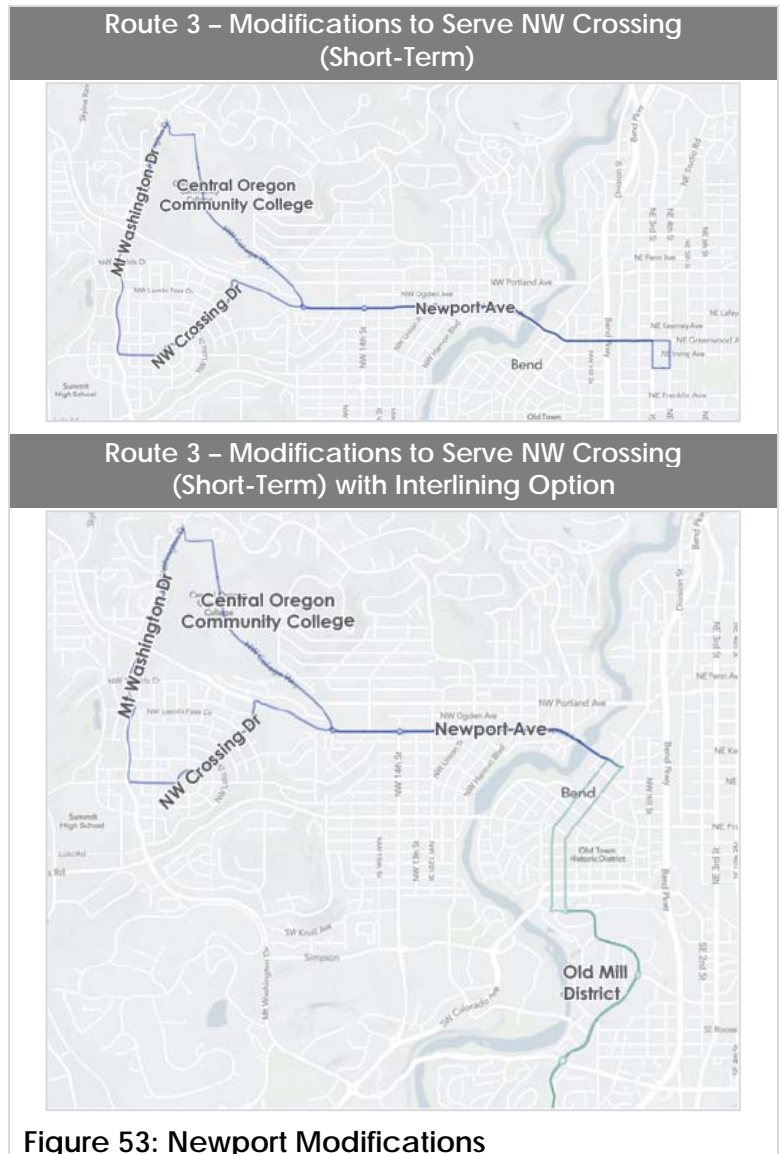


Figure 53: Newport Modifications

Routes 5/11: Wells Acres and Galveston/14th to OSU

Modifications planned for this route include interlining them in the short-term to provide a more direct connection from the eastside to downtown.

In the mid-term, increase frequency to 20-30 minutes during peak periods and then all day.

In the long-term, extend Route 5 east of NE 27th Street as schedules allow (see Figure 54).

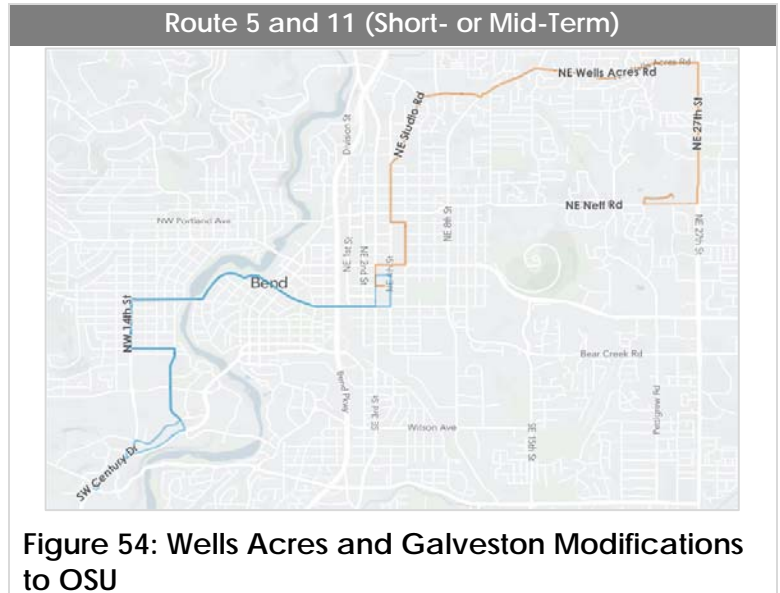


Figure 54: Wells Acres and Galveston Modifications to OSU

Route 6: Reed Market

The modifications planned for this route include decoupling from Route 5 in the near- to short-term, allowing Route 5 to be interlined with Route 11, and developing a short-term Route 6 concept that loops to downtown and deviates from its eastern section.

In the mid- to long-term, restructure Route 6 to provide continuous connection on Reed Market Road and to downtown and OSU (barriers caused by the at-grade rail crossing with Reed Market Road).

Further, extend Route 6 to serve a future connection of NE 27th Avenue and Empire Avenue, connecting to Cascade Village and potentially service mobility hubs along Empire Avenue with one or two deviations (see Figure 55).

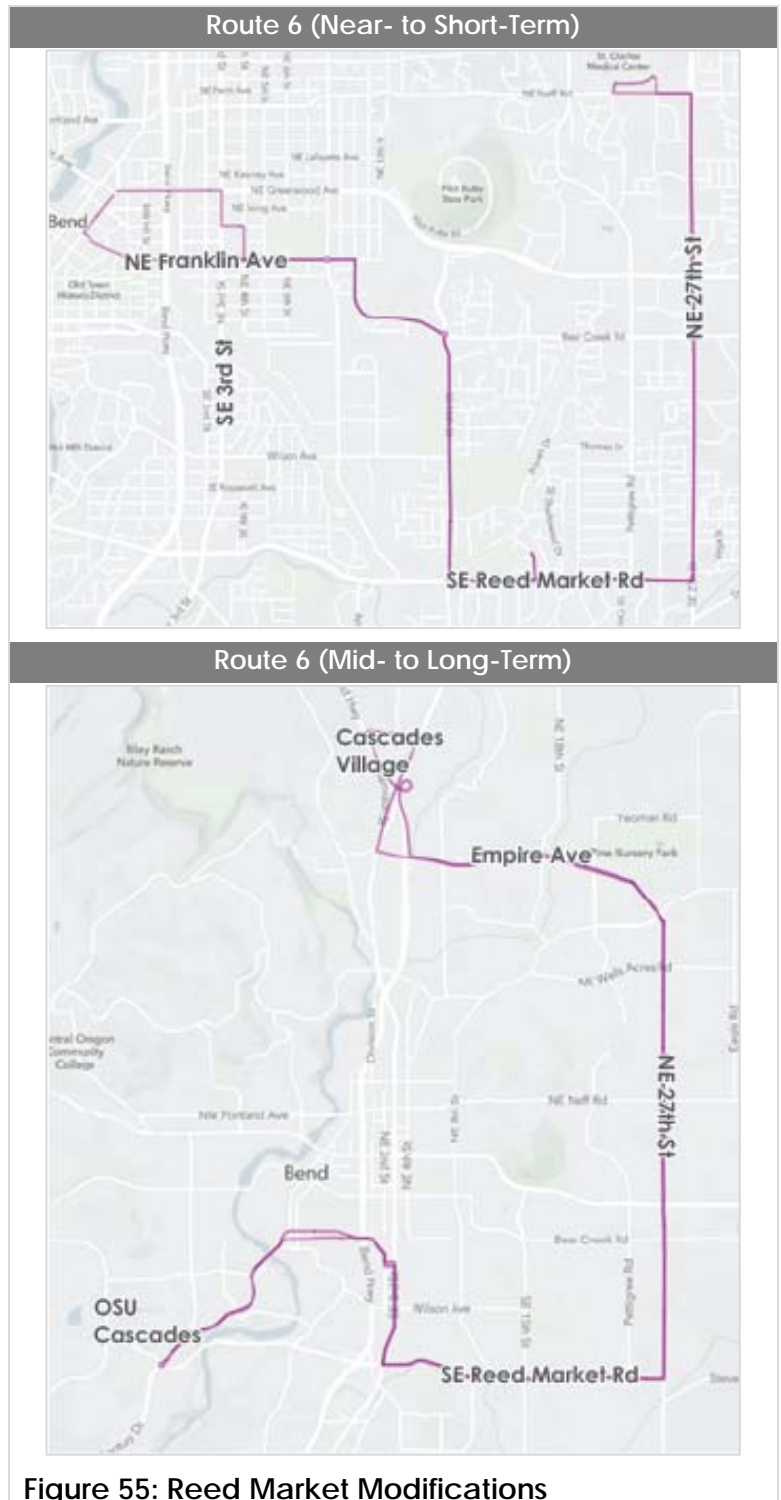


Figure 55: Reed Market Modifications

Route 8: Service to NE Bend

This new service connects northeast Bend to the primary transit network and is warranted by demand in the near- to mid-term, utilizing Route 4 to serve Juniper Ridge. It initiates a microtransit pilot to test demand and build understanding of desired travel patterns for a potential new fixed-route.

In the mid- to long-term, provide a new route connecting northeast Bend to NE 8th Street and Boyd Acres Road, serving Cascade Village and/or Juniper Ridge as well as downtown and Hawthorne Station, and eliminating the need for Route 4 (see Figure 56).

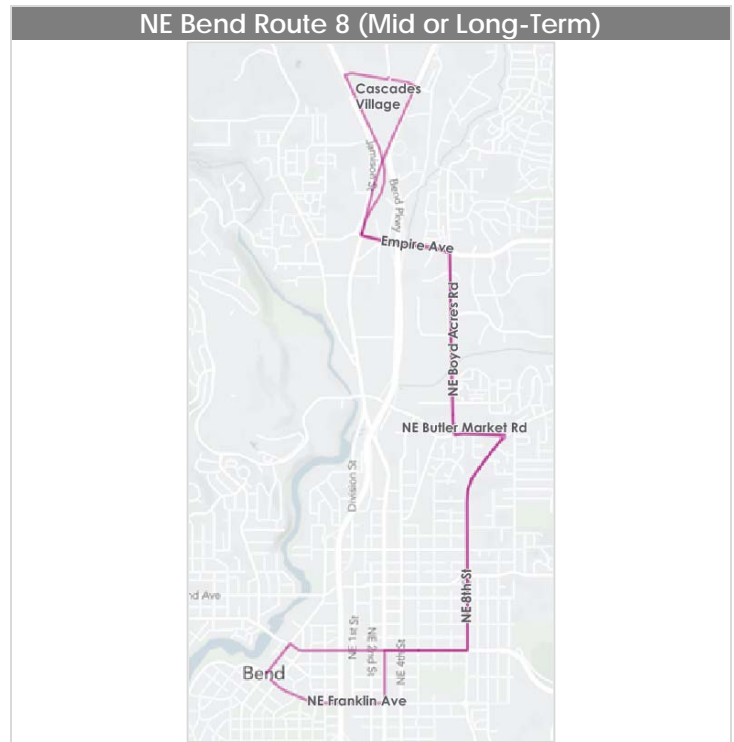


Figure 56: NE Bend Service

Route 9: Service to SE Bend

This new service connects southeast Bend to the primary transit network and utilizes existing routes in the near- to mid-term along Murphy and/or Brosterhous Road. It initiates a microtransit pilot to test demand and build understanding of desired travel patterns for a potential new fixed-route.

In the mid- to long-term, provide a new route to connect developing population and employment in southeast bend, including a new high school, to the transit network, eliminating the need for existing routes (barriers caused by the at-grade rail crossing with Reed Market Road).



Figure 57: SE Send Service

Evening Service Enhancements

The near- to mid-term enhancements planned for evening service include extending hours of operation to 8 or 9 p.m. for fixed-routes and

ADA Paratransit (coordinated with later service on the Community Connector system). Further, develop and expand a microtransit pilot program to provide later evening connections

when demand does not warrant fixed-route service on core and/or all routes (after 8 or 9 p.m.).

REDMOND LOCAL SERVICE

CET and the City of Redmond conducted a study following this TMP to determine a direction for local service in Redmond. Therefore, the local services planned for Redmond are high-level to identify general resource requirements (number of routes and coverage).

The following service enhancements are considered for the local service model in Redmond, illustrated in Figure 58; Chapter 9 further details the implementation timeframe:

- ▶ **Dial-A-Ride** service (existing) maximizes coverage but requires advance reservations and is at capacity.

- ▶ **Deviated fixed-routes** maintain a high level of coverage by allowing deviations along a route, enable trips without advance reservations, and increase system capacity, but can be challenging to schedule depending on the number of deviations allowed, and deviations can increase travel times.
- ▶ **Fixed-routes** can enable more frequent and direct service at regularly scheduled times, but reduce coverage.
- ▶ **A hybrid of fixed- and deviated-route service**, e.g., north-south and east-west spine served by higher-frequency core fixed-routes that are fed by connecting deviated routes, could balance tradeoffs between a purely fixed-route or deviated-route system depending on the land use context.

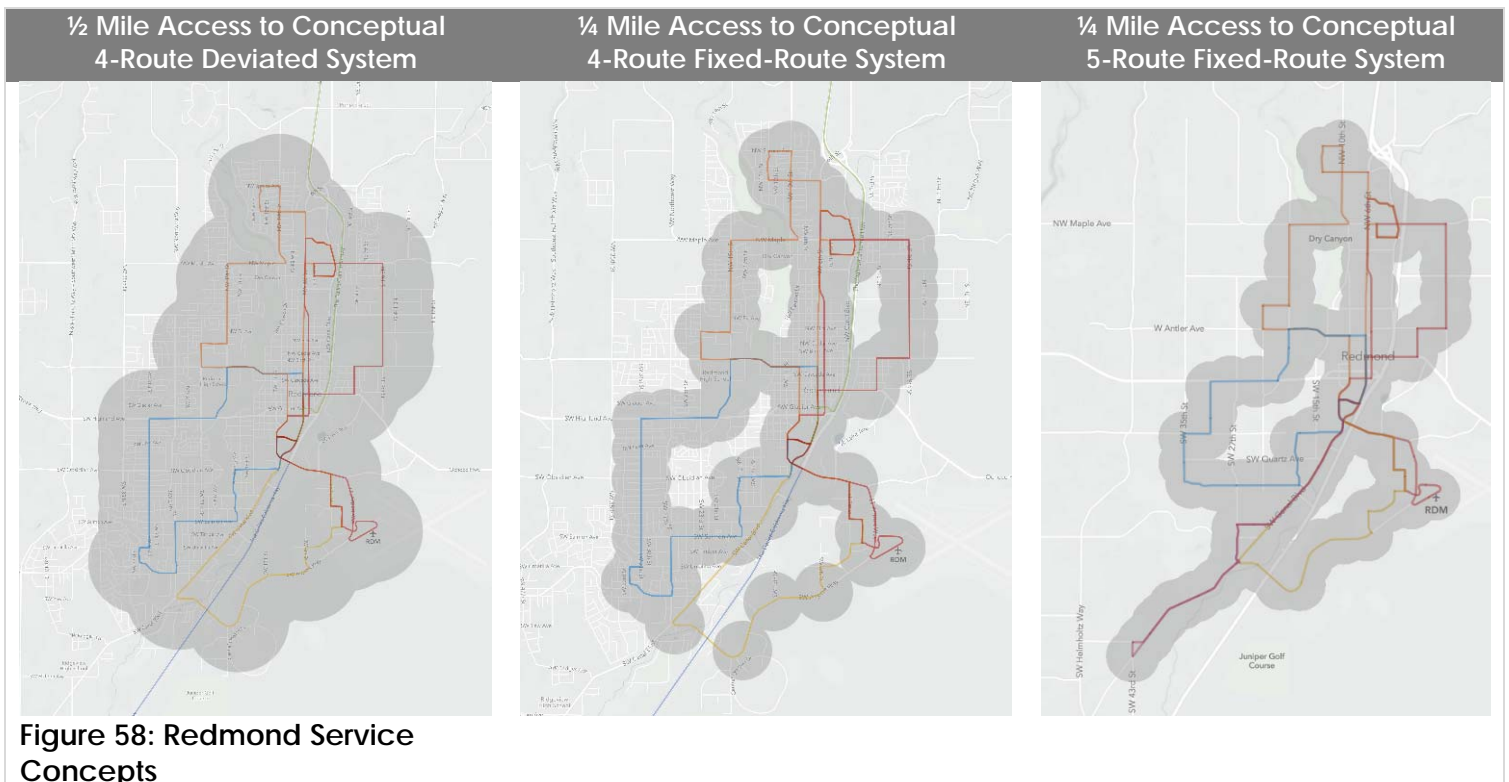


Figure 58: Redmond Service Concepts

CET staff have been working with the City of Redmond on initial route planning for deviated-routes that could be implemented in the near- to short-term. Figure 59 illustrates the two conceptual routes and a ¾-mile deviation zone around these routes.

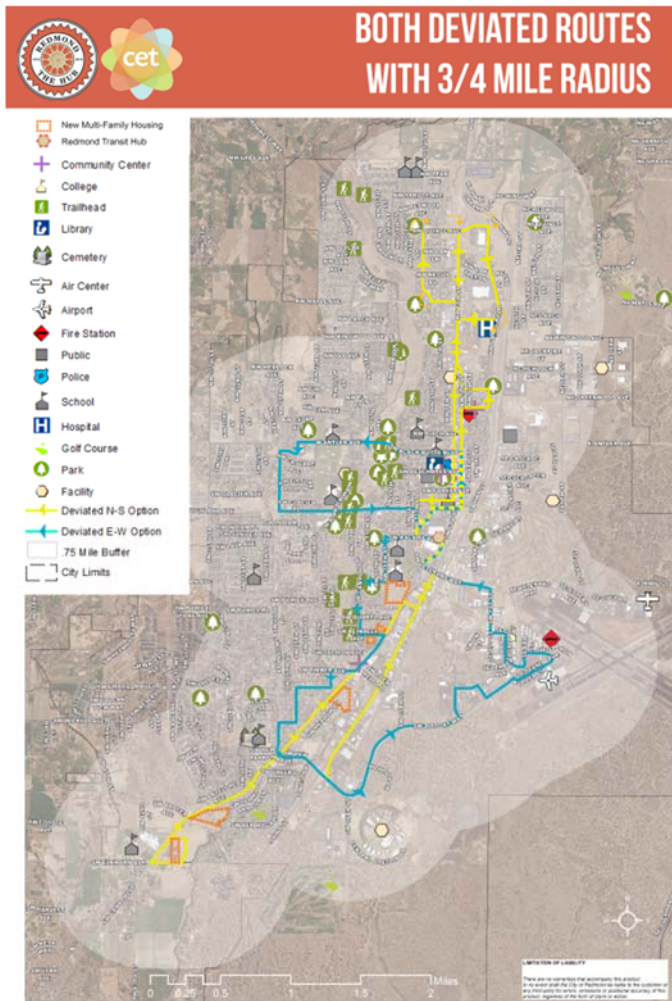


Figure 59: Redmond Service Concepts

LOCAL SERVICE IN SMALLER COMMUNITIES

CET has traditionally provided local service only within city limits or UGB’s. This section describes the local service planned in smaller communities including services like shopper/medical shuttles to meet the needs outside of these boundaries. The phasing of these services is described in Chapter 9.

LA PINE

The local services planned for La Pine are to maintain the existing Dial-A-Ride service; introduce a flex-route operated by a Dial-A-Ride or Route 30 vehicle (utilizing existing Dial-A-Ride patterns for route design); and add a late morning/midday shopper/medical shuttle to Bend two to three days per week as part of Route 30 (service could expand to five days per week based on demand).

SUNRIVER

The local services planned for Sunriver are to provide connections from La Pine and Bend as part of Routes 30 and 31, but not to circulate within Sunriver.

SISTERS

The local services planned for Sisters are to maintain existing Dial-A-Ride service, but expand operations to two days per week; introduce a flex-route operated by Route 28 and/or Route 29 vehicles (utilizing existing Dial-A-Ride patterns for route design); and replace the existing Dial-A-Ride service with a late morning/midday shopper/medical shuttle to Bend or Redmond two to three days per week as part of Route 29 (service could expand to five days per week based on demand).

To complement these local transit services, a small-scale transit center/mobility hub is planned for Sisters northeast of downtown, which is described in the next major section of this chapter.

MADRAS

The local services planned for Madras are to maintain the existing Dial-A-Ride and flex-route (as part of Route 20) services; increase flex-route trips operated by a Dial-A-Ride or Route 22 vehicle; and add a late morning/midday

shopper/medical shuttle to Redmond (also serving Metolius and Culver) two to three days per week as part of Route 22 (service could expand to five days per week based on demand).

To complement these local transit services, a small-scale transit center/mobility hub is planned for Madras adjacent to the future health and wellness campus, which is described in the next major section of this chapter.

METOLIUS & CULVER

The local services planned for Metolius and Culver are to add a late morning/midday shopper/medical shuttle to Redmond two to three days per week as part of Route 22 and service could expand to five days per week based on demand.

To complement these local transit services, a small-scale transit center/mobility hub is planned for both Metolius and Culver, which are described in the next major section of this chapter.

WARM SPRINGS

The local services planned for Warm Springs are to develop a local mobility hub for the Central Oregon Breeze and Routes 20 and 19 to utilize; add a morning and evening trip on Route 20 (including a local flex-route within Warm Springs); provide Saturday service on Route 20 (including a local flex-route within Warm Springs); and provide a shopper/medical shuttle one to two days per week serving Simnasho, Kah-Nee-Ta, Wolfe Point, Seekseequa, Sunnyside, and other outlying communities.

CROOKED RIVER RANCH

The local services planned for Crooked River Ranch are to add a morning/midday shopper/medical shuttle to Redmond one to two days per week.

PRINEVILLE

The local services planned for Prineville are to introduce a flex-route operated by a Dial-A-Ride or Route 26 vehicle and add a late morning/midday shopper/medical shuttle to Redmond two to three days per week as part of Route 26.

To complement these local transit services, a small-scale transit center/mobility hub is planned for Prineville near the Thriftway or Rays, which is described in the next major section of this chapter.

JUNIPER CANYON

The local services planned for Juniper Canyon are to add a late morning/midday shopper/medical shuttle to Prineville one to two days per week and could operate as a flex-route within Juniper Canyon, potentially coordinated with the shopper/medical shuttle service in Prineville.

DESCHUTES RIVER WOODS

The local services planned for Deschutes River Woods are to add a late morning/midday shopper/medical shuttle to Bend multiple times a day, two to three days per week (increasing trips and operations to five days per week based on demand and funding). This service can operate as a flex-route within Deschutes River Woods. Proximity to Bend also lends to operating this service as microtransit and using the van fleet serving parts of Bend.

RECREATIONAL SERVICES

With Bend's growing popularity for recreational and outdoor activities for residents and visitors alike, CET will continue to expand its recreational services based on available opportunities, vehicle capacity, and partner support.

The following locations were identified as potential needs and opportunities for seeking out or evaluating partnerships (some of these locations could be served by Community Connector Routes and use a combination of

the funding types currently supporting recreational services).

- ▶ Sunriver (year-round)
- ▶ Black Butte Ranch (year-round)
- ▶ High Desert Museum (year-round to/from Bend and/or Sunriver)
- ▶ Lava Lands Visitor Center (seasonal to/from Bend and/or Sunriver)
- ▶ Smith Rock (summer)
- ▶ Mt Bachelor (winter and/or summer)
- ▶ Popular Central Oregon sno-parks (winter)

8.2 TRANSIT CAPITAL PLAN

This section describes the transit capital investments planned for the preferred transit service plan described in the previous section. More details are provided in *Capital Plan* Memo within the Technical Appendix. Chapter 9 describes the timeframe for when these capital investments should be implemented and the funding requirements to do so. The transit capital plan also includes safety best practices that can be implemented to improve safety culture for CET.

TRANSIT VEHICLES

The capital investment plan for transit vehicles is to expand CET's current fleet – including routine vehicle replacements – as summarized in Table 25; the cost estimates in Table 25 are base values and do not account for inflation. This plan is to replace existing vehicles with their current size as well as to right size vehicles as CET carries out the Transit Service Plan. Details on the financial requirements are detailed in Chapter 9.

When replacing existing and purchasing new vehicles, CET should consider the following amenities:

- ▶ Low-floor vehicles for routes with high levels of wheelchair boardings and improved wheelchair equipment
- ▶ Alternative fuel propulsion (energy efficient buses)
- ▶ Enhanced communication equipment (e.g. bus radios)
- ▶ Wifi equipped
- ▶ Real-time arrival displays on buses

Table 25: Fleet Replacement Plan

Service/Bus Type	Short Term (2025)	Midterm (2030)	Long Term (2040)
Bend Fixed-Route	13	17	25
Redmond Fixed-Route	3	2	6
Community Connector	19	7	24
Recreation	6	2	6
Bend Dial-A-Ride/Microtransit	17	28	39
Rural Dial-A-Ride	19	20	45
Average Annual Cost	\$4.0M		
Average Annual Cash Match (15%)	\$598K		
Total Cost	\$80M		

TRANSIT FACILITIES

The capital plan for transit facilities includes investing in existing and new transit stops, transit centers/mobility hubs, and maintenance centers. Details on the financial requirements are detailed in Chapter 9.

TRANSIT STOPS

CET currently maintains 284 transit stops along its fixed-routes (within Bend and along Community Connector routes) with varying amenities. The condition of Bend fixed-route transit stops is summarized in the *Capital Plan Memo*. The enhanced and added transit routes from the Service Plan expand CET’s transit stops by 124 facilities. The plan for enhancing existing transit stops and constructing new ones according to their service is summarized in Table 26; the cost estimates in Table 26 are base values and do not account for inflation. CET’s Transit Infrastructure Guide included in the Technical

Appendix includes guidance for transit stop design.

These investments should also incorporate the following transit stop amenities where appropriate:

- ▶ Real-time arrival displays on shelters
- ▶ Improved maps
- ▶ Improved signage
- ▶ Visitor kiosks
- ▶ Crossing and safety improvements

Table 26: Transit Stop Enhancement Plan

Service	Existing Transit Stops	New Transit Stops
Bend Fixed-Route	253	98
Community Connector	31	26
Redmond Fixed-Route	-	100
Madras Flex-Route	-	10
Prineville Flex-Route	-	10
Average Annual Cost	\$197K	
Average Annual Cash Match (15%)	\$30K	
Total Cost	\$3.9M	

Low stress active transportation networks are critical to providing access to public transportation services. In some areas that are served by existing routes, there are areas beyond a typical ¼ to ½ mile walking distance of a transit stop where improved pedestrian and bicycle connections can expand access to existing transit stops.

Improving walking and biking routes along and cross roadways around bus stops makes it safer and more comfortable to access transit. These walking and biking routes were identified and prioritized based on walksheds of existing bus

stops through the *Bend Supplement Memo* included in the Technical Appendix. CET should coordinate with local partners to prioritize and improve the pedestrian and bicycle access on these routes.

TRANSIT CENTERS/MOBILITY HUBS

To facilitate convenient, safe, and accessible travel options and transfers between modes, Table 27 and Table 28 summarize the capital plan for transit centers/mobility hubs throughout CET’s service area; the cost estimates in these tables are base values and do not account for inflation. Mobility hubs can include a variety of infrastructure and mobility service elements and are adaptable to a range of transit facilities.

Table 27: Transit Center Plan

Location	Small-Scale Transit Center	Large-Scale Transit Center
Bend (Hawthorne Station)	-	1
Sisters (Northwest of Downtown)	1	-
Madras	1	-
Metolius	1	-
Culver	1	-
Warm Springs	1	-
Prineville (Thriftway or Rays)	1	-
Average Annual Cost	\$450K	
Average Annual Cash Match (15%)	\$68K	
Total Cost	\$9M	

Table 28: Mobility Hub Plan

Location	Local Neighborhood Stop	Major Activity Center	Secondary Transit Hub
Bend	11	3	6
Redmond		1	
Average Annual Cost	\$427K		
Average Annual Cash Match (15%)	\$64K		
Total Cost	\$8.5M		

MAINTENANCE CENTERS

Maintenance facilities enable CET to maintain its transit vehicles to maximize their useful life as well as to store its vehicles when not in use. As CET expands its services as outlined in the Transit Service Plan, the current maintenance facilities will need to be expanded order to support the following storage and operations needs in these locations:

- ▶ Bend
 - ▶ storage for 21 additional vehicles
 - ▶ increased maintenance facilities
- ▶ Redmond
 - ▶ storage for 14 additional vehicles
 - ▶ increased maintenance facilities
- ▶ Madras: storage for 2 vehicles (assumes one spare)
- ▶ Warm Springs: storage for 3 additional vehicles (assumes one spare)
- ▶ Prineville: storage for 2 vehicles (assumes one spare)

TRANSIT TECHNOLOGY

This section summarizes the transit technology needed to support and enhance CET transit services and the rider experience.

TRANSIT SIGNAL PRIORITY

Transit Signal Priority is a general term for a set of operational improvements that use signal controller technology to reduce the wait time for buses at traffic signals by holding the green time and reducing the red time when a bus is detected. CET should coordinate with ODOT throughout this TMP to provide transit signal priority in the following cities and along associated corridors:

- ▶ Bend: 3rd Street/US 97 BUS, Greenwood/Highway 20, Downtown, and Reed Market Road (when more services are introduced to this corridor)
- ▶ Redmond: US 97, OR 126, and Downtown (when local services are introduced to Redmond)
- ▶ Madras: US 97
- ▶ La Pine: US 97

OTHER TECHNOLOGY INVESTMENTS

The following additional technology investments are also needed to complement CET's transit services:

- ▶ One app/platform for fare payment and trip planning that:
 - ▶ Operates regionally
 - ▶ Provides estimated arrival and departure information in real-time
 - ▶ Works for all modes (e.g. bike share, fixed-route, DAR, etc.)
 - ▶ Coordinated with identified mobility hubs
 - ▶ User friendly for older, younger, and/or disabled populations (e.g.

real-time text message updates to accommodate standard cell phones)

- ▶ Fare payment configuration to create additional fare payment options on buses
- ▶ Upgrade and/or replace computer aided dispatch/AVL software and equipment

SAFETY BEST PRACTICES

A safe and secure transit system plays an important role in operating a public transportation service and is the result of several critical pieces: safety of operators and passengers inside transit vehicles; safety of passengers waiting at transit stops; and safety of pedestrians and bicyclists accessing transit stops. Additionally, CET will adhere to all state and local health guidelines outlined for public transit agencies during national emergencies, such as a pandemic.

IN TRANSIT VEHICLES

The deployment of security measures on transit vehicles may prevent violent incidences from occurring for either operators or passengers. Examples of security countermeasures include:

- ▶ Security staffing on board conveyance
- ▶ Visible surveillance systems
- ▶ Screening
- ▶ Physical barriers (compartment barriers or shielding)
- ▶ Public address system and signage

In addition to preventing violence on board, the safety of operators and passengers can also be positively influenced by regular preventive maintenance of vehicles. Routine maintenance checks by a certified technician at specified intervals can help maintenance

departments anticipate repairs and prevent mechanical failures that could result in transit vehicle crashes or other unsafe conditions.

AT BUS STOPS

To the extent practical, CET should consider bus stop or shelter placement and security taking the following factors into consideration:

- ▶ Place bus stops in visible locations, in view of shop owners, managers, employees, guards, or caretakers where possible
- ▶ Place bus stops away from the vicinity of liquor stores, bars, and taverns
- ▶ Work with local police to prevent physical incivilities (trash, graffiti, abandoned buildings, disrepair, unkempt lots) and social incivilities (rowdy behavior, drug dealing, public drunkenness, prostitution, and panhandling) to reduce crime and create a stronger perception of safety at and around bus stops.

AT MOBILITY HUBS/PARK-AND-RIDES

Mobility hubs and park-and-ride facilities should be well-lit and be free of barriers immediately adjacent to transit loading areas. Bus stop signs and street furniture, as well as other passenger amenities, should not interfere with transit loading, patron queueing, or pedestrian access. Pedestrian facilities must be designed to meet ADA requirements. At a minimum, pedestrian spaces should be provided with wheelchair ramps and curb cuts, detectable warning strips at curb ramps, and a barrier-free path between handicap parking spaces and the transit terminal. Additional amenities such as Braille signage and audible signals should be considered as aids to visually impaired patrons.

Individual access and service modes should be organized within the park-and-ride facility to minimize conflicts and to maximize the efficiency of the various operations. This is achieved by providing separate access driveways for transit and non-transit modes and providing separate access for short-term waiting/kiss-and-ride activities. The following location priorities are suggested in terms of proximity to the express transit line served by the facility:

- ▶ Bus loading-unloading
- ▶ Taxi loading-unloading (may mix with buses or cars)
- ▶ Handicapped, bicycle, and motorcycle parking
- ▶ Passenger drop-off and pick-up
- ▶ Short-term parking
- ▶ Long-term parking

Pedestrian paths within park-and-ride lots should be continuous, unobstructed, and clearly distinguishable; good visibility is essential, and conflicts between pedestrians and motor vehicles and buses should be minimized. Pedestrian pathways should generally allow for direct travel between the point of entry into the facility and the transit boarding area. This allows pedestrians to use the aisles between parking stalls to walk directly to the boarding area. Alternatively, raised pedestrian pathways between facing stall rows can provide direct access to the boarding area and are preferable, where they can be provided.

Pedestrian paths that cross vehicle routes should provide maximum visibility. This can be achieved by either varying the pavement medium or by raising the pedestrian path above the driving surface. In the latter approach, the pedestrian path can be used

as an enlarged traffic bump, raising the pedestrian above the paved surface and providing a traffic-calming device as well.

CET could also sponsor travel training to educate riders on safe driving, bicycling, and walking practices at park-and-rides to decrease the likelihood of unsafe movements. This training could be in the form of public service announcements on the bus, at the park-and-ride, or in the media.

TRANSIT ASSET MANAGEMENT

Transit asset management (TAM) is a comprehensive process of purchasing, operating, maintaining, and replacing transit capital assets (e.g. rolling stock, infrastructure, equipment, and facilities) over their useful life. The goal of this process is to promote safe, reliable, and cost-effective transit service.

COIC is a Tier II provider by these definitions and is likely to remain a Tier II provider for the life of this TMP. ODOT's Rail and Public Transit Division has developed a *Tier II Transit Asset Management Group Plan* for all Tier II providers in Oregon per FTA requirements. This group plan includes COIC, which oversees CET.

COIC, along with all other participants in this plan, are only able to participate in one group plan and have unified targets set by ODOT.

COIC has the choice to opt out of this group plan – through written notice to ODOT – and CET develop may its own TAM plan with ODOT's guidance. If COIC chooses to opt out and CET develops its own TAM plan, the plan must include the following components, per the FTA:

- ▶ An inventory of capital assets
- ▶ A condition assessment of the inventoried assets
- ▶ A description of analytical processes or decision-support tools used to estimate capital investment needs over time
- ▶ A project-based prioritization of investments.

CET should refer to ODOT's *Tier II Transit Asset Management Group Plan* for guidance on (1) asset inventory, (2) condition assessments (including assessment tools), (3) decision support tools, and (4) investment prioritization.



- 9.1 IMPLEMENTATION PLAN
- 9.2 TRANSIT-SUPPORTIVE STRATEGIES
- 9.3 TMP UPDATE SCHEDULE

9.0 IMPLEMENTATION

9.1 IMPLEMENTATION PLAN

This section describes the strategies for COIC and the local agencies they serve to implement the transit services and capital plans described in Chapter 8, as well as the overall transit goals and objectives for the region, summarized in Chapter 1. This section provides implementation recommendations, including phased actions and prioritization, responsible entities, and funding options.

TRANSIT SERVICE IMPLEMENTATION

The transit service implementation strategy is for services through 2040 and is organized by location and timeframe. The locations begin with Community Connector routes (as they are multi-jurisdictional) and follow with the Qualified Entities, per STIF – Deschutes, Jefferson, and Crook counties, and the Confederated Tribes of Warm Springs. Transit service implementation by location is phased like so:

- ▶ Near-Term: 1-2 Years
- ▶ Short-Term: 3-5 Years
- ▶ Mid-Term: 6-10 Years
- ▶ Long-Term: 11-20 Years

The costs associated with these services are provided in the Funding Strategy section.

COMMUNITY CONNECTOR

Table 29 details the service implementation strategy for existing and new Community Connector routes.

DESCHUTES COUNTY

Table 30 and Table 31 detail the service implementation strategies for the communities within Deschutes County and the fixed-route system within Bend (including existing and new routes). The service enhancements to Community Connector Routes 22, 24, 25, 26, 28, 29, 30, 31, and 32 (see Table 29) provide added benefit to Deschutes County communities.

JEFFERSON COUNTY

Table 32 details the service implementation strategy for communities within Jefferson County. The service enhancements to Community Connector Routes 22 and 25 (see Table 29) provide added benefit to Jefferson County communities.

CROOK COUNTY

Table 33 details the service implementation strategy for communities within Crook County. The service enhancements to Community Connector Route 26 (see Table 29) provide added benefit to Crook County communities.

CONFEDERATED TRIBES OF WARM SPRINGS

Table 34 details the service implementation strategy for the Confederated Tribes of Warm Springs. The service enhancements to Community Connector Routes 19 and 20 (see Table 29) provide added benefit to the Warm Springs community.

Table 29: Community Connector Route Service Enhancement Plan

Plan Phase Funding Level	Existing/Near-Term Existing + STIF FY19-21	Short-Term STIF FY22-23, FY23-24	Mid-Term STIF + Additional Sources	Long-Term STIF + Additional Sources
Route 20 (Warm Springs – Redmond)	<ul style="list-style-type: none"> Maintain existing weekday service (6 daily trips) Add Saturday service (3 trips) 	<ul style="list-style-type: none"> Add 1 additional trips, likely evening (7 daily trips) Rural shopper/medical shuttle (1-day per week) 	<ul style="list-style-type: none"> Add 1 additional trips (evening and/or morning) 8 weekday and 3 Saturday trips Rural shopper/medical shuttle (2 days per week) 	<ul style="list-style-type: none"> 8 weekday and 3 Saturday trips Add Sunday service (3 trips) Rural shopper/medical shuttle (2 days per week)
Route “19” (Warm Springs Employment Service)	<ul style="list-style-type: none"> New Seasonal Service, Wed-Sun, 3 trips per day, 4 months per year 	<ul style="list-style-type: none"> Maintain seasonal service 	<ul style="list-style-type: none"> Maintain seasonal service 	<ul style="list-style-type: none"> 7 days per week, 3 daily trips
Route 22 (Madras - Redmond)	<ul style="list-style-type: none"> Add 1 peak trip (6 total) Add midday shopper/ medical shuttle trip (5 days) Add 3 Saturday trips Add 1 evening trip 	<ul style="list-style-type: none"> 7 weekday, 3 Saturday trips Midday shopper/ medical shuttle (5 days) 	<ul style="list-style-type: none"> 8 weekday, 3 Saturday trips) Midday shopper/ medical shuttle (5 days) 	<ul style="list-style-type: none"> 8 weekday, 3 Saturday trips Midday shopper/ medical shuttle (5 days) Add Sunday service (3 trips)
Route 24 (Redmond-Bend)	<ul style="list-style-type: none"> Add 1 midday trip (10 total) Add 1 evening trip Add 5 Saturday trips 	<ul style="list-style-type: none"> Add 1 midday, 1 evening trip (12 weekday, 5 Saturday trips) 	<ul style="list-style-type: none"> Add 1 midday trip (13 weekday, 5 Saturday trips) 	<ul style="list-style-type: none"> 13 weekday, 5 Saturday trips Add Sunday service (5 trips)
Route “25” (Crooked River Ranch – Terrebonne/ Redmond)	<ul style="list-style-type: none"> New midday shopper/ medical shuttle (1 day) 	<ul style="list-style-type: none"> Midday shopper/ medical shuttle (1 day) 	<ul style="list-style-type: none"> Expand shopper/ medical shuttle to 2 days per week 	<ul style="list-style-type: none"> Midday shopper/ medical shuttle (2 days)
Route 26 (Prineville- Redmond)	<ul style="list-style-type: none"> Add 1 peak weekday trips, interline service with Route 24, serving Redmond Airport and COCC (6 total) Add midday shopper/ medical shuttle trip (5 days) Add 3 Saturday trips 	<ul style="list-style-type: none"> Add 1 peak weekday trip (7 weekday, 3 Saturday trips) Midday shopper/ medical shuttle (5 days) 	<ul style="list-style-type: none"> Add 1 evening trip (8 weekday, 3 Saturday trips) Midday shopper/ medical shuttle (5 days) 	<ul style="list-style-type: none"> 8 weekday, 3 Saturday trips Midday shopper/ medical shuttle (5 days) Add Sunday service (3 trips)
Route 28 (Sisters – Redmond)	<ul style="list-style-type: none"> Maintain existing service (3 trips) Add flex route in Sisters 	<ul style="list-style-type: none"> 3 weekday trips with local flex route 	<ul style="list-style-type: none"> 3 weekday trips with local flex route 	<ul style="list-style-type: none"> 3 weekday trips with local flex route
Route 29 (Sisters – Bend)	<ul style="list-style-type: none"> Maintain existing weekday service (3 trips) Add flex route in Sisters Add Saturday service (3 trips) Add midday shopper/ medical shuttle trip (2 days) 	<ul style="list-style-type: none"> 3 weekday and 3 Saturday trips with local flex route Midday shopper/ medical shuttle (2 days) 	<ul style="list-style-type: none"> 3 weekday and 3 Saturday trips with local flex route Expand midday shopper/ medical shuttle to 3 days per week 	<ul style="list-style-type: none"> 3 weekday and 3 Saturday trips with local flex route Midday shopper/ medical shuttle (3 days) Add Sunday service (3 trips)

Plan Phase Funding Level	Existing/Near-Term Existing + STIF FY19-21	Short-Term STIF FY22-23, FY23-24	Mid-Term STIF + Additional Sources	Long-Term STIF + Additional Sources
Route 30 (La Pine – Bend)	<ul style="list-style-type: none"> Maintain existing weekday service (4 trips) Add flex route in La Pine Add Saturday service (3 trips) Add midday shopper/ medical shuttle trip (3 days) 	<ul style="list-style-type: none"> 4 weekday and 3 Saturday trips with local flex route Serve Sunriver and/or High Desert Museum Midday shopper/ medical shuttle (3 days) 	<ul style="list-style-type: none"> 4 weekday and 3 Saturday trips with local flex route Midday shopper/ medical shuttle (3 days) 	<ul style="list-style-type: none"> 4 weekday and 3 Saturday trips with local flex route Midday shopper/ medical shuttle (3 days) Add Sunday service (3 trips)
Route “31” (La Pine – Sunriver)	<ul style="list-style-type: none"> New service, seasonal 	<ul style="list-style-type: none"> Maintain service; potential enhancement to connect to recreational/employment sites 	<ul style="list-style-type: none"> Maintain/enhance service 	<ul style="list-style-type: none"> Enhance service to year-round
Route “32” (Deschutes River Woods)	<ul style="list-style-type: none"> N/A 	<ul style="list-style-type: none"> Add shopper/ medical shuttle (microtransit), 3 days per week 	<ul style="list-style-type: none"> Shopper/ medical shuttle (microtransit), additional trips based on demand, 5 days per week 	<ul style="list-style-type: none"> Shopper/ medical shuttle (microtransit), additional trips based on demand, (5 days)

Table 30: Deschutes County Service Enhancement Plan

Plan Phase Funding Level	Existing/Near-Term Existing+ STIF FY19-21	Short-Term STIF FY22-23, FY23-24	Mid-Term STIF + Additional Sources	Long-Term STIF + Additional Sources
Bend	<p>Fixed-Route, Dial-A-Ride/ADA</p> <ul style="list-style-type: none"> Weekday 6 am – 7:30 pm, 30/45 min headways Saturday 7:30 am – 5:30 pm, at up to 30 min headways 	<p>Fixed-Route, Dial-A-Ride/ADA</p> <ul style="list-style-type: none"> Weekday 6 am – 7:30 pm, up to 15/20 min peak headways on core routes (1, 4, and 7, with 7 extended to downtown/Old Mill and/or OSU) Deviated Fixed Route pilot projects serving NE, SE, and Evening Saturday 7:30 am –5:30 pm 	<p>Fixed-Route, Dial-A-Ride/ADA</p> <ul style="list-style-type: none"> Weekday 6 am – 9 pm Evening Service on Core Routes/DAR to 9 pm Saturday extended to 7:00 am – 7:00 pm Sunday DAR Only 8:30 am – 3:15 pm Transition NE/SE Deviated Fixed Route to fixed-route Evening Microtransit to approx. 11 pm 	<p>Fixed-Route, Dial-A-Ride/ADA</p> <ul style="list-style-type: none"> Weekday 6 am – 9 pm Evening Service on Core Routes/DAR to 9 pm Saturday 7:00 am – 7:00 pm Sunday 8:00 am – 6:00 pm Evening Microtransit to approx. 11 pm
Redmond¹	<p>Dial-A-Ride</p> <ul style="list-style-type: none"> 6:30 am – 6:00 pm <p>Add deviated circulator route</p> <p>Add limited Saturday service (e.g., circulator route)</p>	<p>Add deviated Fixed-Route Service, 2 routes</p> <ul style="list-style-type: none"> Weekday 6:30 am – 6:00 pm Saturday circulator route 	<p>Fixed-Route, ADA, Limited Dial-A-Ride (or hybrid of fixed-route and deviated-routes)</p> <ul style="list-style-type: none"> Weekday 6:30 am – 6:00 pm Saturday 7:00 am – 6:00 pm Evening Microtransit 	<p>Fixed-Route, ADA, Limited Dial-A-Ride (or hybrid of fixed-route and deviated-routes)</p> <ul style="list-style-type: none"> Weekday 6:30 am – 6:00 pm Saturday 7:00 am – 6:00 pm Sunday 8:00 am – 6:00 pm Evening Microtransit

Plan Phase	Existing/Near-Term	Short-Term	Mid-Term	Long-Term
Funding Level	Existing+ STIF FY19-21	STIF FY22-23, FY23-24	STIF + Additional Sources	STIF + Additional Sources
La Pine	Dial-A-Ride • 6 am – 6 pm	Dial-A-Ride/Flex-Route • 6 am – 6 pm Saturday limited circulation as part of Route 30 flex-route Expand service boundaries to meet rural need	Dial-A-Ride/Flex-Route • 6 am – 6 pm Saturday limited circulation as part of Route 30 flex-route	Dial-A-Ride/Flex-Route • 6 am – 6 pm Saturday limited circulation as part of Route 30 flex-route
Sisters	Dial-A-Ride • Tuesday only 9-10 am, 1-2 pm) • Add 2nd day of service	Dial-A-Ride • 2 days, limited hours Route 29/30 flex-route Saturday limited circulation as part of Route 29 flex-route Expand service boundaries to meet rural need	Dial-A-Ride • 2 days, limited hours Route 29/30 flex-route Saturday limited circulation as part of Route 29 flex-route	Dial-A-Ride • 2 days, limited hours Route 29/30 flex-route Saturday and Sunday limited circulation as part of Route 29 flex-route

¹Preliminary assumptions for Redmond service; to be determined based on local transit study.

Table 31: Bend Service Enhancement Plan

Plan Phase	Existing/Near-Term	Short-Term	Mid-Term	Long-Term
Funding Level	Existing+ STIF FY19-21	STIF FY22-23, FY23-24	STIF + Additional Sources	STIF + Additional Sources
Route 1 (South 3 rd St)	30 min headway ¹	• Interlined with Route 4, 15-20 min peak headway	• Interlined with Route 4, 15-20 min all-day headway	• Add Sunday Service
Route 2 (Brookwood)	45 min headway ¹	• 45 min headway	• Approx. 20 min headway, alternating trips to Murphy/Brosterhus and Brookwood	• Add Sunday Service
Route 3 (Newport)	30 min headway ¹	• 30 min headway	• Approx. 20 min all-day headway, serves NW Crossing	• Add Sunday Service
Route 4 (North 3 rd St)	30 min headway ¹	• Interlined with Route 1, 15-20 min peak headway	• Interlined with Route 1, 15-20 min all-day headway • Extended to serve Cooley Road / Juniper Ridge	• Add Sunday Service
Route 5 (Wells Acres)	45 min headway ¹	• Interlined with Route 11	• Interlined with Route 11, 20-30 min peak headway	• Add Sunday Service
Route 6 (Reed Market)	45 min headway ¹	• Split from Route 5, redesign to serve downtown and/or provide deviated service	• Extend to Cascade Village via NE 27 th and/or to downtown/OSU via Reed Market	• Add Sunday Service
Route 7 (Greenwood)	30 min headway ¹	• Extend to downtown, 15-20 min peak headway, then to	• Combined with Route 10, connects eastside to	• Add Sunday Service

Plan Phase	Existing/Near-Term	Short-Term	Mid-Term	Long-Term
Funding Level	Existing+ STIF FY19-21	STIF FY22-23, FY23-24	STIF + Additional Sources	STIF + Additional Sources
		OSU (incorporating Route 10) in short or mid-term	downtown/OSU, 15-20 min all-day headway	
Route 8 (NE – New)	N/A	<ul style="list-style-type: none"> Initiate microtransit pilot if resources permit 	<ul style="list-style-type: none"> Approx 45 min headway route 	<ul style="list-style-type: none"> Add Sunday Service
Route 9 (SE – New)	N/A	<ul style="list-style-type: none"> Initiate microtransit pilot (assumed) or service via Route 2 	<ul style="list-style-type: none"> Approx 45 min headway route 	<ul style="list-style-type: none"> Add Sunday Service
Route 10 (Colorado)	60 min headway ¹	<ul style="list-style-type: none"> Folded into Route 7 when Routes 5 and 11 are interlined and Route 7 is extended to OSU (Short or Mid-Term) 	<ul style="list-style-type: none"> Folded into Route 7 	<ul style="list-style-type: none"> N/A
Route 11 (Galveston)	60 min headway ¹	<ul style="list-style-type: none"> Interlined with Route 5 	<ul style="list-style-type: none"> Interlined with Route 5, 20-30 min peak headway 	<ul style="list-style-type: none"> Add Sunday Service

¹Short-term changes that are part of FY 2019-2021 STIF plan can be phased in starting in the near-term.

Table 32: Jefferson County Service Enhancement Plan

Plan Phase	Existing/Near-Term	Short-Term	Mid-Term	Long-Term
Funding Level	Existing+ STIF FY19-21	STIF FY22-23, FY23-24	STIF + Additional Sources	STIF + Additional Sources
Madras	Dial-A-Ride <ul style="list-style-type: none"> 7:30 am – 5:30 pm Flex-Route as part of Route 20	Dial-A-Ride/Flex-Route <ul style="list-style-type: none"> 7:30 am – 5:30 pm Early evening and Saturday limited circulation as part of Route 20/22 flex-routes	Dial-A-Ride/Flex-Route <ul style="list-style-type: none"> 7:30 am – 5:30 pm Early evening and Saturday limited circulation as part of Route 20/22 flex-routes	Dial-A-Ride/Flex-Route <ul style="list-style-type: none"> 7:30 am – 5:30 pm Early evening, Saturday, and Sunday limited circulation as part of Route 20/22 flex-routes

Table 33: Crook County Service Enhancement Plan

Plan Phase	Existing/Near-Term	Short-Term	Mid-Term	Long-Term
Funding Level	Existing+ STIF FY19-21	STIF FY22-23, FY23-24	STIF + Additional Sources	STIF + Additional Sources
Prineville	Dial-A-Ride <ul style="list-style-type: none"> 7:30 am – 5:30 pm 	Dial-A-Ride/Flex-Route <ul style="list-style-type: none"> 7:30 am – 5:30 pm Evening and Saturday limited circulation as part of Route 26 flex-route	Dial-A-Ride/Flex-Route <ul style="list-style-type: none"> 7:30 am – 5:30 pm Evening and Saturday limited circulation as part of Route 26 flex-route	Dial-A-Ride/Flex-Route <ul style="list-style-type: none"> 7:30 am – 5:30 pm Evening, Saturday, and Sunday limited circulation as part of Route 26 flex-route

Table 34: Warm Springs Service Enhancement Plan

Plan Phase	Existing/Near-Term	Short-Term	Mid-Term	Long-Term
Funding Level	Existing+ STIF FY19-21	STIF FY22-23, FY23-24	STIF + Additional Sources	STIF + Additional Sources
Warm Springs	Flex-Route (part of Route 20) <ul style="list-style-type: none"> • 6 am – 7 pm (6 trips) Add flex-route as part of 3 Saturday Route 20 trips	Flex-Route (part of Route 20) <ul style="list-style-type: none"> • 6 am – 7 pm (7 trips) 3 Saturday Route 20 flex-route trips	Flex-Route (part of Route 20) <ul style="list-style-type: none"> • 6 am – 7 pm (8 trips) 3 Saturday Route 20 flex-route trip	Flex-Route (part of Route 20) <ul style="list-style-type: none"> • 6 am – 7 pm (8 trips) 3 Saturday and Sunday Route 20 flex-route trip

TRANSIT CAPITAL IMPLEMENTATION

The capital implementation strategy is for supporting transit services through 2040 and organized by transit fleet and transit facilities. Transit capital implementation is phased like so:

- ▶ Short-Term: by 2025
- ▶ Mid-Term: by 2030
- ▶ Long-Term: by 2040

The costs associated with these capital investments provided in the Funding Strategy section.

TRANSIT VEHICLE PROCUREMENT

Table 35 summarizes the transit vehicle procurement schedule that would support existing and new CET services, including the purchase of new vehicles and replacing old ones. The number of vehicles projected to be needed by timeframe are detailed by service type and ODOT vehicle categories (detailed in Capital Plan Memo).

Table 35: Transit Vehicle Procurement Schedule

Service	ODOT Vehicle Category (or Similar)	Short-Term (2025)	Mid-Term (2030)	Long-Term (2040)
Bend Fixed-Route	A	7	10	12
	B	6	7	13
Redmond Fixed-Route	B	3	2	6
Community Connector	A	2	-	2
	B	13	3	14
	C/D	4	4	8
Recreation	B	6	2	6
Bend Dial-A-Ride/Microtransit	C/D	13	26	31
	E1	4	2	8
Rural Dial-A-Ride	C/D	19	20	45

TRANSIT FACILITY DEVELOPMENT

This section summarizes the transit stops, transit centers/mobility hubs, and vehicle maintenance and storage facilities needed to support both existing and new CET services.

Transit Stops

Table 36 summarizes the transit stop enhancement and construction timeframes for CET’s existing stops (approximately 280) and new stops (approximately 240) to support transit services through 2040. CET should coordinate with agencies, partners, and private developers to develop these transit stops per CET’s Transit Infrastructure Guide included in the Technical Appendix includes transit stop design guidance.

Table 36: Transit Stop Enhancement Schedule

Service	Transit Stops	Short-Term (2025)	Mid-Term (2030)	Long-Term (2040)
Bend Fixed-Route	Existing	63	63	127
	New		98	
Community Connector	Existing	8	8	15
	New	7	7	12
Redmond Fixed-Route	New	50	50	-
Madras Flex-Route	New	5	5	-
Prineville Flex-Route	New	5	5	-

Transit Centers/Mobility Hubs

To develop a more multi-centric service model into 2040, this section summarizes the transit centers and mobility hubs of varying size and function for CET to implement into its system. More details on these facilities, including their functions, are found in the *Service Plan Memo*. Table 37 provides a specific implementation plan for a westside transit center/mobility hub in Bend, Table 38 summarizes the

implementation of other various mobility hubs within Bend, and Table 39 provides the implementation plan for mobility hubs in local communities outside of Bend. CET should coordinate with agencies, partners, and

private developers to identify specific locations and available lands to implement these mobility hubs.

Table 37: Westside Mobility Hub Implementation Plan

Phase	Implementation Steps
Short-Term (2025)	<ul style="list-style-type: none"> ▶ Identify North Downtown and South Downtown (Korpine) Secondary Transit Hub/Mobility Hub locations ▶ Modify Community Connector Routes 24, 29, and 30 to connect to one or more future westside mobility hubs. Some eastside stops could be eliminated but a stop at Hawthorne Station, or adjacent stops on 3rd Street at Hawthorne, would still be required as not all Bend routes can connect in downtown.
Mid- to Long-Term (2030-2040)	<ul style="list-style-type: none"> ▶ Mobility hubs are in place in both north and south downtown ▶ Aune Street (or other) connection between 3rd Street and south downtown is available (as identified in the Bend Transportation System Plan (TSP) update). ▶ All Community Connector routes redesigned to provide a stop on the westside.

Table 38: Bend Mobility Hub Implementation Plan

Region	Mid-Term (2030)	Long-Term (2040)
North/Northeast	<ul style="list-style-type: none"> ▶ Cascade Village Secondary Transit Hub ▶ St. Charles Secondary Transit Hub ▶ Local Neighborhood Mobility Hub: NE Wells Acres Road 	<ul style="list-style-type: none"> ▶ Juniper Ridge Major Activity Center ▶ Local Neighborhood Mobility Hubs: Boyd Acres Road, Empire Avenue
Northwest/West	<ul style="list-style-type: none"> ▶ Central Oregon Community College Major Activity Center ▶ Local Neighborhood Mobility Hub: NW Newport Avenue 	<ul style="list-style-type: none"> ▶ Local Neighborhood Mobility Hub: NW Mt. Washington Drive
East/Southeast	<ul style="list-style-type: none"> ▶ Local Neighborhood Mobility Hub: Reed Market Road 	<ul style="list-style-type: none"> ▶ Forum Shopping Center Major Activity Center ▶ Local Neighborhood Mobility Hubs: American Lane, SE 15th Street
Southwest/South	<ul style="list-style-type: none"> ▶ OSU-Cascades Secondary Transit Hub ▶ Albertsons/Walmart Secondary Transit Hub ▶ Local Neighborhood Mobility Hub: Brookwood Boulevard 	<ul style="list-style-type: none"> ▶ Local Neighborhood Mobility Hub: Deschutes River Woods

Table 39: Regional Mobility Hub Implementation Plan

Community	Short-Term (2025)	Mid-Term (2030)	Long-Term (2040)
Sisters		Small-scale transit center northwest of Downtown	
Redmond	Redmond Airport (Major Activity Center)		
Madras		Small-scale transit center adjacent future health and wellness campus	
Metolius			Small-scale transit center centrally located
Culver			Small-scale transit center centrally located
Warm Springs		Small-scale transit center centrally located	
Prineville		Small-scale transit center near Thriftway or Rays	

Maintenance Facilities

As CET expands its transit services and vehicle fleet, storage for additional vehicles and increased maintenance facilities will be needed. CET will need to be able to maintain and store its existing fleet as well as an additional 38 vehicles. Table 40 provides estimated fleet expansion timeframes based on new services and locations where

maintenance facility capacity should be added or increased. This will inform CET on when to pursue added vehicle storage capacity in these locations. CET should coordinate with agencies, partners, and private developers to identify potential locations and lands to implement these vehicle storage and maintenance facility expansions.

Table 40: Maintenance Facility Plan

Community	Short-Term (2025)	Mid-Term (2030)	Long-Term (2040)
Bend	Storage for 14 additional vehicles	Storage for 7 additional vehicles	-
	<i>Increased maintenance facilities</i>		
Redmond	Storage for 9 additional vehicles	Storage for 5 additional vehicles	-
	<i>Increased maintenance facilities</i>		
Madras	-	-	Storage for 2 additional vehicles (assumes 1 spare)
Warm Springs	Storage for 3 additional vehicles (assumes 1 spare)	-	-
Prineville	-	-	Storage for 2 additional vehicles (assumes 1 spare)

FUNDING STRATEGY

This section summarizes the funding strategy for implementing the transit services and capital described in previous sections.

The costs for providing CET service were projected for the 20-year plan time frame based on the assumptions described in the Service Plan and Capital Plan including increasing CET operating costs per service hour (e.g., based on inflation) and assumed local funding for capital costs (e.g., buses and facilities), i.e., local match. Based on the Capital Plan, an average of \$750K to \$1M annually is assumed for local match. Actual costs will depend on funding from grants and other sources, which vary over time. For conceptual purposes, an average of approximately \$750K in local annual capital cost match is assumed in FY 2020 and increased by 2% annually over the plan time frame to approximately \$1M by 2040.

Existing CET funding sources (including STIF) are assumed at projected levels for the near-term and short-term:

- ▶ **Existing/Near-Term (FY 2019 to FY 2021):** This represents existing services, which will be enhanced in the near-term based on the Spring 2019 STIF plans prepared by each Qualified Entity. The Service Plan focuses on the short-term through long-term time frames. STIF funding is not included in existing funding levels, but is reflected starting in the near-term.
- ▶ **Short-Term (FY 2022 to FY 2025):** Assuming that new funding sources outside of STIF are not available in the short-term, various enhancements identified as needs/priorities were deferred until mid-term or long-term. The

recommended short-term enhancements would result in an operating surplus in FY 2022 (beginning of short-term) but would exceed projected CET revenues by FY 2025 (end of short-term), based on cost and funding projections described above. The cost to run CET’s existing services by FY 2025 would be 35% greater. CET needs to secure additional funding (e.g. local contributions) and/or costs need to increase at a lower rate than is assumed in order to sustainably implement all of the short-term enhancement options. The full set of short-term enhancements was retained to give the STIF committee flexibility to prioritize enhancements and provide options for a 130% STIF list if funding exceeds projections.

Additional funding would be required to provide enhanced services in the mid-term and long-term phases:

- ▶ **Mid-Term:** Conceptually, the “Existing + STIF + 0.02% Property Tax (incorporated areas)” funding level is assumed. This level of additional funding would provide approximately \$5.5M to implement both the short-term and additional enhancements.
- ▶ **Long-Term:** This plan phase is not cost-constrained and may include a variety of enhancements whose implementation would depend on land use and other readiness factors. Currently, except for Sunday service, it sustains the same enhancements as the mid-term phase through 2040.

Table 41 provides a summary of costs and funding with respect to the transit service implementation strategy described in previous

sections. These costs and funding are broken down further in Table 42 to assist in transit service implementation by Qualified Entity. The

costs and funding are identified through the mid-term phase (2030) only given that long-term phase (2040) is not cost constrained.

Table 41: Systemwide Funding Plan

Phase Name	Existing	Near-Term	Short-Term	Mid-Term	Long-Term	% Change from Existing to:		
						Near Term	Short Term	Mid Term
Plan Years	2019-2020	2020-2021	2022-2025	2026-2030	2031-2040			
Representative Year	2019-2020	2020-2021	2024-2025	2029-2030	2039-2040			
Service Costs - Existing / Maintain	\$6,431,000	\$6,984,000	\$8,673,000	\$11,298,000	\$18,856,000	9%	35%	76%
Service Costs - Enhancements	\$0	\$1,684,000	\$3,334,000	\$10,173,000	\$24,582,000	-	-	-
Service Costs - Total	\$6,431,000	\$8,668,000	\$12,007,000	\$21,471,000	\$43,438,000	35%	87%	234%
Capital/Match Req't (Average)		\$752,000	\$814,000	\$899,000	\$1,096,000			
Existing + STIF Funding Only	\$6,456,000	\$9,890,000	\$11,000,000	\$12,500,000	\$16,000,000	53%	70%	94%
STIF Carryover								
<i>Funding Surplus (Deficit)¹</i>	\$25,000	\$470,000	(\$1,821,000)	(\$9,870,000)	(\$28,534,000)			
Existing + STIF + 0.02% Property Tax (incorporated areas)	\$6,456,000	\$9,890,000	\$11,000,000	\$17,900,000	\$24,800,000	53%	70%	177%
STIF Carryover								
<i>Funding Surplus (Deficit)</i>	\$25,000	\$470,000	(\$1,821,000)	(\$4,470,000)	(\$19,734,000)			

Note: Existing and Near-Term include funds available through STIF funding in the FY 2019 – 2021 timeframe that will be used for services that CET has not yet started operating.

Table 42: Funding Plan by Qualified Entity

Phase Name	Deschutes County			Crook County			Jefferson County			Warm Springs		
	Existing	Short-Term	Mid-Term	Existing	Short-Term	Mid-Term	Existing	Short-Term	Mid-Term	Existing	Short-Term	Mid-Term
Plan Years	2019-20	2022-25	2026-30	2019-20	2022-25	2026-30	2019-20	2022-25	2026-30	2019-20	2022-25	2026-30
Representative Year	2019-20	2024-25	2029-30	2019-20	2024-25	2029-30	2019-20	2024-25	2029-30	2019-20	2024-25	2029-30
Service Cost	\$5,484,000	\$9,387,000	\$18,102,000	\$336,000	\$667,000	\$950,000	\$557,000	\$1,097,000	\$1,585,000	\$153,000	\$381,000	\$806,000
STIF Funding Only	N/A	\$4,411,000	\$5,630,000	N/A	\$320,000	\$408,000	N/A	\$321,000	\$409,000	N/A	\$100,000	\$100,000
By Service Type												
Community Connector	\$855,000	\$1,927,000	\$2,765,000	\$98,000	\$350,000	\$538,000	\$330,000	\$780,000	\$1,173,000	\$153,000	\$381,000	\$806,000
Fixed-Route	\$2,290,000	\$4,466,000	\$11,315,000	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Dial-A-Ride (All)	\$2,339,000	\$2,994,000	\$4,022,000	\$238,000	\$317,000	\$412,000	\$227,000	\$317,000	\$412,000	\$0	\$0	\$0
Community Connector												
Warm Springs - Madras	\$0	\$0	\$0	\$0	\$0	\$0	\$76,000	\$129,000	\$190,000	\$153,000	\$262,000	\$386,000
Madras - Redmond	\$77,000	\$181,000	\$262,000	\$0	\$0	\$0	\$156,000	\$400,000	\$575,000	\$0	\$0	\$0
Redmond - Bend	\$342,000	\$664,000	\$928,000	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Prineville - Redmond	\$66,000	\$167,000	\$272,000	\$98,000	\$350,000	\$538,000	\$98,000	\$250,000	\$408,000	\$0	\$0	\$0
Sisters - Redmond	\$91,000	\$155,000	\$201,000	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Sisters - Bend	\$106,000	\$246,000	\$344,000	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
La Pine - Bend	\$174,000	\$357,000	\$463,000	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Warm Springs Rural Shopper/Medical Shuttle	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$20,000	\$53,000
Warm Springs / Employment Areas	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$99,000	\$367,000
La Pine - Sunriver	\$0	\$93,000	\$121,000	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Crooked River Ranch - Redmond	\$0	\$20,000	\$53,000	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0

Phase Name	Deschutes County			Crook County			Jefferson County			Warm Springs		
	Existing	Short-Term	Mid-Term	Existing	Short-Term	Mid-Term	Existing	Short-Term	Mid-Term	Existing	Short-Term	Mid-Term
Deschutes River Woods - Bend	\$0	\$44,000	\$121,000	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Bend Local Service												
Bend: Fixed-Route	\$2,290,000	\$3,795,000	\$9,163,000	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Bend: Dial-A-Ride	\$1,141,000	\$1,554,000	\$2,373,000	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Bend: DAR/Microtransit	\$0	\$725,000	\$218,000	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Non-Bend Local Service												
Redmond: Fixed-Rt/DAR	\$912,000	\$1,711,000	\$3,499,000	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
La Pine: DAR / Flex-Route	\$272,000	\$362,000	\$471,000	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Sisters: DAR / Flex-Route	\$14,000	\$37,000	\$48,000	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Madras: DAR / Flex-Rt.	\$0	\$0	\$0	\$0	\$0	\$0	\$227,000	\$317,000	\$412,000	\$0	\$0	\$0
Prineville: DAR / Flex-Rt.	\$0	\$0	\$0	\$238,000	\$317,000	\$412,000	\$0	\$0	\$0	\$0	\$0	\$0

ADDITIONAL IMPLEMENTATION ACTIONS

Additional implementation actions are necessary for CET in carrying out this plan to address its goals and objectives and to have the organizational capacity to increase services.

ADMINISTRATIVE RESOURCES

CET should establish an administration individual to offload administrative responsibilities from the transit operations and marketing teams. Administration staff handle internal tasks and operations that support all staff in their duties. Tasks typically include scheduling meetings, and preparing for staff and Board meetings. Table 43 identifies action items for administrative staff to support plan implementation.

Table 43: Administrative Resources Action Plan

Timeframe	Action Items
Within 2 Years	Hire an administration individual lead to assist with every-day office operations, particularly STIF reporting requirements.
Within 5 Years	<ul style="list-style-type: none"> ▶ Hire an HR professional to assist with employee tracking, discipline, and benefit functions. ▶ Purchase a map plotter GIS and planning needs
Ongoing	<ul style="list-style-type: none"> ▶ Monitor need for additional staff (e.g. IT, operations, marketing, travel training, health and human services). ▶ Support each department to create an annual work plan to address the necessary actions for the year and on-going activities. ▶ Purchase basic office equipment for current and new staff (e.g. computers, phones, printers, etc.), as well as added server capacity ▶ Provide Accident Investigation Training, Drug & Alcohol Awareness Training, and Harassment Training for staff and operators. ▶ Provide GIS, Remix, and TBEST training to planning staff for preparing service maps and to evaluate service areas.

FISCAL DEPARTMENT PLAN

The fiscal department manages all tasks related to money. Its responsibilities include producing an annual budget, performing accounting functions, and supporting procurement processes. Table 44 identifies action items for the fiscal department to support plan implementation.

Table 44: Fiscal Department Action Plan

Timeframe	Action Items
Within 2 Years	Conduct a fare analysis to understand the impacts and potential of fare-free services and subsidized fare for specific populations of riders.
Within 5 Years	Investigate alternative funding sources to support long-term service expansion.
Ongoing	Monitor and project existing funding sources.

ROUTINE REVIEW OF STIF PLAN

To effectively and sufficiently implement the transit service and capital plans, COIC should regularly review its STIF plan for evolving priorities and coordinate with ODOT to adjust funding levels as allowed. Action items are identified in Table 45.

Table 45: STIF Plan Update Plan

Timeframe	Action Items
Within 2 Years	Designate staff and develop STIF update plan.
Ongoing	<ul style="list-style-type: none"> ▶ Revisit STIF plans annually to reevaluate near-term priorities and modify where necessary. ▶ Meet with STIF committees annually when reevaluating near-term priorities.

VEHICLE FLEET REPLACEMENT

To continue running an efficient public transit service and meet the vehicle demand of the service plan, COIC should develop a vehicle fleet replacement plan that enables CET to effectively monitor its entire fleet, routinely dedicate budget for necessary replacements

accordingly, and routinely replace vehicles that meet eligibility requirements. Table 46 identifies action items related to vehicle fleet planning to support plan implementation.

Table 46: Vehicle Fleet Replacement Plan

Timeframe	Action Items
Within 2 Years	<ul style="list-style-type: none"> ▶ Designate staff and create a capital replacement schedule working with the fiscal department, including a bus purchasing plan to prepare for fleet expansion. ▶ Hire additional mechanic staff to maintain increase in fleet ▶ Procure fleet management software
Within 5 Years	Conduct a vehicle size/capacity needs and alternative fuels/battery electric bus study.
Ongoing	<ul style="list-style-type: none"> ▶ Monitor vehicle conditions and useful life and routinely update replacement schedule. ▶ Allocate budget annually for vehicle replacement funding match.

MAINTENANCE FACILITIES MONITORING

To continue running an efficient public transit service and meet the service demand of the service plan, COIC should develop a maintenance facilities monitoring program that enables COIC to monitor the capacity of existing facilities, search for potential locations when additional storage is needed as service expands, and dedicate budget for property acquisition. Table 47 identifies action items related to facility planning to support plan implementation.

Table 47: Maintenance Facilities Plan

Timeframe	Action Items
Within 2 Years	<ul style="list-style-type: none"> ▶ Develop a monitoring program to meet fleet capacity needs of a growing system. ▶ Where possible, further develop existing facilities to increase vehicle storage capacity, amenities and needs for drivers and supervisors, and training space.
Within 5 Years	Search for potential locations for additional vehicle storage and operations space as service expands.
Ongoing	Dedicate budget annually for property acquisition.

COMMUNITY COORDINATION

To achieve the objectives under TMP Goal’s 1, 4, and 5, COIC should develop a coordination plan that enables COIC to integrate its services with partner agencies; communities and private developers; other local and inter-city transit service providers; and health and human service providers.

Partner Agencies

Partner agencies include the road authorities of the roadways along which CET operates, possibly including the Oregon Department of Transportation (ODOT); Deschutes, Jefferson, and Crook counties; the cities of Bend, Redmond, Sisters, La Pine, Prineville, Metolius, Culver, Madras; and the Confederated Tribes of Warm Springs. This section of the plan can assist COIC in routinely coordinating with these partner agencies to integrate and enhance its services in the following ways:

- ▶ Implement comprehensive plan policies supportive of CET’s TMP and development code amendments to support and establish transit supportive corridors, higher density and level of pedestrian-oriented development standards within ¼ mile of existing and planned transit stops;

- ▶ Continually improve the safety, accessibility, and efficiency of transit service; and
- ▶ Assess and improve pedestrian and bicycle connections and access to transit corridors and stops, including encouraging the completion of pedestrian and bicycle system gaps, implementing protected road crossings, and providing bicycle parking.

Table 48 identifies action items related to agency coordination to support plan implementation.

Table 48: Partner Agency Coordination Plan

Timeframe	Action Items
Within 2 Years	Work with the local agencies to implement the comprehensive plan and development code recommendations in the following section.
Within 5 Years	<ul style="list-style-type: none"> ▶ Work with local agencies on transit route/bus stop guidance or guidelines and improving safety of transit stops including street lighting. ▶ Work with Central Oregon school districts to further their safe routes to school programs and identify gaps in pedestrian and bicycle connections to bus routes. ▶ Work with local agencies to increase their capacity to provide TDM programming and support, either independent or in coordination with COIC.
Ongoing	<ul style="list-style-type: none"> ▶ Work with local agencies to improve pedestrian and bicycle access to mobility hubs and stops and provide long-term/secure bicycle parking at mobility hubs and park-and-ride facilities. ▶ Sit on local transportation committees to provide transportation options guidance and perspective. ▶ Work with local jurisdictions to ensure ADA compliance regarding transit infrastructure and bicycle and pedestrian access to transit.

Private Development Community

The private development community includes private businesses who develop on lands adjacent to CET services. This section of the plan can aid COIC in routinely coordinating with the private development community to integrate and enhance its services in the following ways:

- ▶ Developing model projects on primary corridors and at community transit hubs; and
- ▶ Continually improving the safety, accessibility, and efficiency of transit service.

Table 49 identifies action items related to private development community coordination to support plan implementation.

Table 49: Private Development Community Coordination Plan

Timeframe	Action Items
Within 2 Years	Develop a plan to monitor development throughout Central Oregon for transit service and facility opportunities.
Ongoing	<ul style="list-style-type: none"> ▶ Work with businesses and private developers to identify key locations along primary transit corridors to develop model projects (e.g. transit stops, mobility hubs, etc.) ▶ Work with businesses and private developers to increase safety at transit stops including street lighting. ▶ Work with private developers to improve pedestrian and bicycle access to mobility hubs and stops and provide long-term/secure bicycle parking at mobility hubs and park-and-ride facilities. ▶ Continue to explore new partners, such as bicycle and pedestrian advocacy groups and major employers.

Transit Service Providers

Transit service providers include those who operate within and connect to Central Oregon that are not CET. This section of the plan can aid COIC in routinely coordinating with local and other inter-city transit service providers and collaborating with Commute Options, organizations that provide transportation and travel training for people with disabilities, veteran’s groups, Transportation Management Associations, and other employer transportation programs to co-submit grant applications and consider joint operations and funding of cross-jurisdictional services.

Table 50 identifies action items related to transit service provider coordination to support plan implementation.

Table 50: Transit Service Provider Coordination Plan

Timeframe	Action Items
Within 2 Years	Develop a plan to coordinate with all inter-city transit services reaching CET’s service area to consider for integration/coordination to improve connectivity to other areas of the state.
Ongoing	<ul style="list-style-type: none"> ▶ Designate staff and develop a plan for coordinating with transit service providers operating within CET’s service area. ▶ Coordinate with transit service providers to improve access and transfers between their services and CET services including route scheduling and mutual stops, mobility hubs, and park-n-ride facilities. ▶ Collaborate with transit service providers to co-submit on grant applications to support cross-jurisdictional services, including those that operate outside of but reach CET’s service area.

Health and Human Service Providers

This section of the plan can aid COIC in routinely coordinating with health and human service providers to understand and meet the

needs of transportation disadvantaged populations. Table 51 identifies action items related to health and human service provider coordination to support plan implementation.

Table 51: Health and Human Service Provider Coordination Plan

Timeframe	Action Items
Within 2 Years	<ul style="list-style-type: none"> ▶ Designate or hire staff who specialize in Americans with Disabilities Act (ADA) compliance. ▶ Partner with HHS providers to share API portals and interfaces to ensure easy transportation payment coverage and benefits.
Ongoing	<ul style="list-style-type: none"> ▶ Work with health and human service providers to improve access to transit for disadvantaged populations such as including ADA compliant transit facilities and subsidized fare for low-income, disabled, and senior riders. ▶ Update the Coordinated Transportation and Human Services Plan every 3-4 years (last updated 2018).

TRANSIT STOP DESIGN

To achieve the objectives under TMP Goal 3, COIC should continue to implement its transit stop design guidelines, which that enable COIC to provide functional and appealing amenities at transit stops appropriate to the amount the stop is used. The Transit Infrastructure Guide included in the Technical Appendix includes transit stop design guidance. Table 52 identifies action items related to transit stop design to support plan implementation.

Table 52: Transit Stop Design Coordination Plan

Timeframe	Action Items
Within 2 Years	<ul style="list-style-type: none"> ▶ Organize bus stop easements, locations, and rights for current and future route planning. ▶ Update bus stop amenities data.
Ongoing	<ul style="list-style-type: none"> ▶ Create and maintain a bus stop inventory, including ADA-compliant or deficient stops. Provide in a GIS format for easy distribution to local jurisdictions. ▶ Install and maintain schedules in each bus shelter. ▶ Provide pedestrian-scale lighting at transit stops where street lighting is not present. ▶ Monitor the condition of bus stop amenities and update when needed.

TRANSIT SERVICE MARKETING

To achieve the objectives under TMP Goal 3, COIC should develop a transit service marketing plan that enables COIC to make riding CET service easy, safe, and comfortable in the following ways:

- ▶ Supporting Transportation Demand Management (TDM) efforts that address ridesharing programs, park-and-ride facility development, and more effective (e.g., personalized) outreach

- regarding existing transportation options;
- ▶ Continuing to promote transportation options via website and social media platforms;
 - ▶ Providing safety tools (e.g. blinky lights), incentives, and rewards to promote transit services to choice riders and to encourage existing passengers to keep riding the bus;
 - ▶ Addressing cultural and language barriers to using transit including consulting with Limited English Proficiency (LEP) populations to improve CET outreach and materials;
 - ▶ Developing materials for ongoing travel training program activities;
 - ▶ Continuing to improve ease of access/use of CET services for all customers, including centralized and accessible service information; and
 - ▶ Continuing to improve marketing and access for visitors/tourists.

Table 53 identifies action items related to transit service marketing to support plan implementation.

Table 53: Transit Service Marketing Action Plan

Timeframe	Action Items
Within 2 Years	<ul style="list-style-type: none"> ▶ Create a communications plan, with identified audiences, dates, messaging, and communications platforms. ▶ Include existing transportation options in all marketing materials and on the website to educate about for-hire transportation services and apps, such as ride-hailing or carshare companies. ▶ Update all materials and the website to provide enhanced information about mobility options to points outside Central Oregon and where and how CET connects to them. ▶ Provide customer service training and improve communication tools for bus stops complaints, service complaints and tracking requests for service, etc.
Ongoing	<ul style="list-style-type: none"> ▶ Develop reports on service performance monitoring and make public. ▶ Continue outreach to existing partners, including employers. Administer working sessions with partners and stakeholders. ▶ Outreach to new target audiences (such as minority populations, youth, and others), not just the commuting public. ▶ Work with employers, colleges/universities, and other organizations to develop new group pass program and sponsorship agreements. ▶ When new tools are added to CET’s services, update all materials and the website to reference the current services available and create a marketing or campaign strategy to share with the traveling public. ▶ Market park-and-ride facilities and monitor the ability to formalize more throughout CET’s service area. ▶ Promote CET’s ability to provide travel training and other programs in Spanish. ▶ Continue conventional marketing emphasizing TV, radio, digital media and newspaper. Continue outreach and engagement activities such as tabling, events, and liaison activities. ▶ Conduct specialized outreach for new routes and services, such as flyers and postcards. ▶ Work with local jurisdictions to market CET services and programs through utility bills or other announcements sent out to citizens (e.g. water bills, announcements through the office of the city manager, and seasonal Parks and Recreation pamphlets).

GROUP PASS PROGRAM

To achieve the objectives under Goal 4, COIC should refine its group pass program to support, market, and track program-enlisted employers, schools, institution, and communities in a regional effort to increase transit travel and reduce auto dependency. Table 54 identifies action items related to developing a transit pass program to support plan implementation.

Table 54: Group Pass Implementation Plan

Timeframe	Action Items
Within 2 Years	<ul style="list-style-type: none"> ▶ Research peer transit provider pass programs. ▶ Establish pass program models that are flexible and customized.
Within 5 Years	<ul style="list-style-type: none"> ▶ Refine brochures/outreach materials. ▶ Conduct enhanced business outreach. ▶ Continually update pass program webpage on CET website.
Ongoing	<ul style="list-style-type: none"> ▶ Enlist at least one new employer, college/university, or organization into the program each year. ▶ Seek partnerships with employers who rely on transit for workforce to provide monetary support for the service.

EMERGING TECHNOLOGY TRACKING

To achieve the objectives under Goal 5, COIC should develop an emerging technology plan that enables COIC to track emerging technologies and transit service models and how relevant advancements might support the vision and goals of CET. Table 55 identifies action items related to emerging technology tracking to support plan implementation.

Table 55: Emerging Technology Tracking Plan

Timeframe	Action Items
Within 2 Years	<ul style="list-style-type: none"> ▶ Purchase Mobile Data Terminals for all CET fleet. ▶ Secure a vendor with all on-board system capabilities in one platform, including automatic vehicle location capabilities, multiple service type interfaces, General Transit Feed Specification (GTFS) and real-time rider information. ▶ Purchase radio maintenance packages. ▶ Work with IT to plan for potential issues during a disaster or massive equipment failure. Provide a disaster recovery solution for network, internet, and critical systems. ▶ Evaluate and implement passenger WiFi for fixed-route vehicles and mobility hubs.
Within 5 Years	<ul style="list-style-type: none"> ▶ Monitor microtransit service models and adopt service standards. Consider staffing responsibility for ongoing oversight of operations. ▶ Provide a GIS web app resource for inventory of existing stops and routes, deficient stops, wanted stops on existing routes, and future routes. Include tax lots for development reviews by local jurisdictions.
Ongoing	<ul style="list-style-type: none"> ▶ Explore new technology such as apps, social media, and other tools to support service expansion and improve rider experience. ▶ Evaluate and implement updated digital signage for passenger announcements and schedule notification at transfer stations and major bus stops. For some locations, explore options to purchase and install Reader Boards that give estimated arrival times of buses with messages and voice recordings. ▶ Evaluate and update security and disaster response features and processes to remain current with technology advances. ▶ Dedicate budget towards access control and security systems which house fleet, maintenance equipment and transit facilities.

9.2 TRANSIT-SUPPORTIVE STRATEGIES

This section summarizes recommendations for jurisdictions in the CET service area to assist in implementing this plan, including incorporating transit-supportive policy and development provisions in local plans and codes.

To implement this plan, service area jurisdictions should consider the adoption actions described in Table 56.

Each jurisdiction has a Local Agency Overview and Implementation Plan attached to this plan that details the service planning, capital planning, policy, and code amendment recommendations. The following sections provide more detail – including jurisdiction-specific guidance – related to transit-supportive policy and development code recommendations

Table 56: Local Jurisdiction Adoption Actions

Plan/Code	Adoption Actions
Comprehensive Plan	Local jurisdictions should have policies in their adopted plans that support the recommendations in this plan. Recommended transit-supportive policy statements are proposed in the Comprehensive Plan Integration section. Jurisdictions should adopt these recommendations as part of the transportation element of their comprehensive plan. This can be accomplished as an amendment to the adopted comprehensive plan document or through an update of the local transportation system plan, the transportation element of the local comprehensive plan.
Development Code	Transit-supportive development requirements can help further regional and local transit policy objectives and implement the recommendations in this plan. To assist local partners in implementing this plan, code amendment recommendations for each jurisdiction are summarized in the Development Code Implementation. Based on these recommendations, specific development code language were produced for each community and are included in the Technical Appendix to this plan. Recommended code amendments are formatted as “adoption-ready,” but may require some refinement by the jurisdiction. In some cases “model code” language is suggested to further policy discussions within the community and with local decision makers in preparation for potential future code amendments.

COMPREHENSIVE PLAN INTEGRATION

To ensure consistency between local planning and the recommendations in this plan, each community should adopt service planning recommendations (including mapping) and capital planning recommendations from this plan. As part of a community’s comprehensive plan or transportation system plan, those recommendations can serve as an updated transit plan.

Likewise, recommended transit-supportive policy statements should also be reflected in local comprehensive plans or transportation system plans, serving as part of an updated

transit plan. Recommended policy statements for local jurisdictions echo the vision, goals, and objectives that are included in this. The proposed local policy language is below. Each jurisdiction in the CET service area should review existing plan policies to assess if the following transit policies, and vision of this plan, are reflected or if policy enhancements could be made, using the following language as a guide.

1. *The [City/County] will facilitate provision of transit service to its community members, with particular attention to members who may be “transit-*

- dependent” due to factors such as age, income, or disabilities.*
2. *The Cascades East Transit (CET) Master Plan provides policy and implementation direction for transit planning in jurisdictions within the district’s service area, including route development, financing, and physical improvements necessary to maintain and improve public transit service for jurisdiction residents, businesses, institutions, and visitors.*
 3. *The [City/County] will continue to engage in long-range planning and implementation efforts led by CET.*
 4. *The [City/County] will invite transit service providers to participate in the development of long-range plans and review of land use applications that may have implications for transit service.*
 5. *The [City/County] will require development or will facilitate coordination between development and the transit service provider to provide transit-related improvements such as shelters and lighting to complement transit service and encourage higher levels of transit use. Transit stop improvements will be coordinated with the transit service provider and must be consistent with adopted transportation and transit plans.*
 6. *[For jurisdictions with existing or planned fixed route service] The City will support higher-density and mixed land use around transit stops and in transit corridors to make transit service more feasible and effective.*
 7. *The [City/County] will provide or will require development to provide adopted transportation system-related improvements such as pedestrian and bicycle connections to transit stops, including ADA-accessible improvements, given nexus and proportionality can be demonstrated for private development.*
 8. *The [City/County] will support connections between transit and other transportation services and options.*
 9. *The [City/County] will support improved transit access to benefit public health, including providing access to active transportation options and health-supporting destinations such as health care, groceries, and recreation.*
 10. *The [City/County] will support strategies to reduce single-occupancy vehicle trips, greenhouse gas emissions, and other pollution.*

DEVELOPMENT CODE IMPLEMENTATION

The implementing development code recommendations in this subsection reflect recommendations made in the *Transit-Supportive Development Strategies Memo*, included in the Technical Appendix. Transit-supportive development, or transit-oriented development (“TOD”), strategies focus on code language that institutionalizes coordination between transit agency and developer and supports transit- and pedestrian-oriented density and design.

Recommendations for implementing development code is presented below by jurisdiction. Opportunities for vetting and adopting recommended code are identified.

BEND

Implement transit-supportive development code through targeted modifications of existing development code sections. The amendments would apply to varying levels of geography:

- ▶ Existing and planned transit routes;
- ▶ Proposed primary transit corridors; and
- ▶ Existing and planned transit stops

Agency Overview and Implementation Plan memo.

These amendments can be combined with, or modified in light of, other amendments that the City will be adopting to implement its updated Transportation System Plan later in 2020.

Table 57 provides an overview of the recommended development code amendments. Adoption-ready development code language or model language and other guidance is included in the Bend specific Local

Table 57: Recommended Development Code Amendments - Bend

Coordination	Require coordination between Bend and CET for development application review and for the provision of transit stop improvements along existing and planned transit routes.
Use Standards	Limit specific auto-dependent uses in primary transit corridors.
Development Standards	Encourage additional building height in primary transit corridors for housing.
Parking-Related Standards	Prohibit parking and circulation in the front setback in primary transit corridors; enhance parking lot landscaping and walkway standards; refine preferential parking space requirements for ridesharing; allow transit-related uses (e.g., park-and-rides and transit stops) in parking lots; and update bike parking requirements, particularly in conjunction with transit stops.

REDMOND

Implement development code through targeted modifications of existing development code sections as well as model policy and development code language to consider for future comprehensive plan and code updates.

guidance is included in the Redmond specific Local Agency Overview and Implementation Plan.

Proposed adoption-ready code language can be integrated into regular meetings and code reviews being held with the City’s Planning Commission. Model policy and code language can be considered and refined during future comprehensive plan and development code updates. One update opportunity may follow completion of the City’s Fixed Route Planning and Feasibility Study Analysis in Fall 2020.

Table 58 provides an overview of the recommended development code amendments. Adoption-ready development code language or model language and other

Table 58: Recommended Development Code Amendments - Redmond

Coordination	Require coordination between Redmond and CET related to the provision of transit stop improvements at existing and planned transit stops.
Use Standards	Limit auto-oriented and -dependent uses (including drive-throughs) adjacent to existing and planned transit routes and stops.
Development Standards	Enhance development standards to include pedestrian-oriented building features such as windows and weather protection along existing and planned transit routes; and possible pedestrian amenities in front setbacks adjacent to existing and planned transit stops.
Parking-Related Standards	Add parking-related requirements such as enhanced parking lot walkway standards; restricting parking and circulation between building and street and establishing preferential parking spaces for ridesharing (with exceptions for ADA-accessible spaces) along transit routes; bike parking space design and amount requirements (particularly in conjunction with transit stations); parking space reductions related to transit access; and allowing transit-related uses (e.g., park-and-rides or small transit centers) in parking lots.

PRINEVILLE

Implement development code through adoption-ready code language, model development code language modified into adoption-ready code language, or policy language, to be considered during future comprehensive plan and code updates.

Table 59 provides an overview of the recommended development code

amendments. Adoption-ready development code language or model language and other guidance is included in the Prineville specific Local Agency Overview and Implementation Plan.

The model language can be modified and considered for adoption as part of amendments that the City will adopt to implement its next update of its Transportation System Plan.

Table 59: Recommended Development Code Amendments - Prineville

Coordination	Require coordination between Prineville and CET for development application review on sites adjacent to existing or planned transit stops and for provision of transit stop improvements.
Development Standards	Enhance development standards to include building entrances oriented toward transit stops, connections between buildings and transit stops, and minimum building articulation, windows, and weather protection along transit routes.
Parking-Related Standards	Add parking-related requirements such as pedestrian connections through large parking lots to sidewalks and streets with existing or planned transit service; preferential parking spaces for ridesharing; bike parking spaces (particularly in conjunction with transit centers); parking space reductions related to transit access; and allowing transit-related uses (e.g., park-and-rides or small transit centers) in parking lots.

MADRAS

Implement development code through targeted modifications of existing development code sections.

Table 60 provides an overview of the recommended development code amendments. Adoption-ready development code language or model language and other guidance is included in the Madras specific

Local Agency Overview and Implementation Plan.

Code language can be discussed as educational and policy ideas at Planning Commission work sessions in the near term and then considered for adoption as part of future comprehensive plan and development code updates in the longer term.

Table 60: Recommended Development Code Amendments - Madras

Coordination	Require coordination between Madras and CET for development application review adjacent to existing and planned transit routes and stops, as well as for provision transit stop improvements.
Development Standards	Enhance development standards to reduce maximum setbacks in specific zones where adjacent to existing or planned transit stops and encourage pedestrian amenities in front setbacks adjacent to transit stops.
Parking-Related Standards	Add parking-related requirements such preferential parking spaces for ridesharing and allowing transit-related uses (e.g., park-and-rides or small transit centers) in parking lots.

WARM SPRINGS

Implement development code through adoption of targeted modifications of existing development code sections. Where model development code language is provided, refine that language into adoption-ready text for targeted modifications in existing code.

Table 61 provides an overview of the recommended development code

amendments. Adoption-ready development code language or model language and other guidance is included in the Warm Springs specific Local Agency Overview and Implementation Plan.

Code language can be discussed as educational and policy ideas at Tribal Council meetings in the near term and then considered for adoption as part of future code updates in the longer term.

Table 61: Recommended Development Code Amendments – Warm Springs

Coordination	Require coordination between Warm Springs and CET for development application review and for provision of transit stop improvements.
Development Standards	Enhance development guidelines to include building entrances oriented toward transit stops and connections between buildings and transit stops and limited minimum building setback adjacent to transit stops.
Parking-Related Standards	Add parking-related provisions such as landscaping in and around parking lots adjacent to transit stops and walkways through parking lots; allowing transit-related uses (e.g., park-and-rides and transit centers) in parking lots; and bicycle parking (encouraged at park-and-rides and transit centers).

SISTERS

Implement development code through targeted modifications of existing development code sections.

Table 62 provides an overview of the recommended development code amendments. Adoption-ready development

code language or model language and other guidance is included in the Sisters specific Local Agency Overview and Implementation Plan

Proposed code amendment language can be considered for adoption as part of future comprehensive plan and development code updates.

Table 62: Recommended Development Code Amendments - Sisters

Coordination	Require coordination between Sisters and CET for development application review and for the provision of transit stop improvements.
Parking-Related Standards	Add parking-related requirements such as walkways in parking lots; preferential parking spaces for ridesharing; bike parking spaces (in conjunction with transit stops and park-and-rides); and allowing transit-related uses (e.g., park-and-rides or small transit centers) in parking lots.
Other Provisions	Make necessary amendments to define and allow for transit hub uses.

LA PINE

Implement development code through targeted modifications of existing development code sections.

Table 63 provides an overview of the recommended development code amendments. Adoption-ready development code language or model language and other

guidance is included in the La Pine specific Local Agency Overview and Implementation Plan.

Proposed code amendment language can be considered for adoption as part of future comprehensive plan and development code updates.

Table 63: Recommended Development Code Amendments – La Pine

Coordination	Require coordination between La Pine and CET for development application review on sites adjacent to existing or planned transit stops and for the provision of transit stop improvements.
Parking-Related Standards	Add parking-related requirements such as walkways through parking lots; preferential parking spaces for ridesharing; and allowing transit-related uses (e.g., transit stops or park-and-rides) in parking lots

JEFFERSON, CROOK, AND DESCHUTES COUNTIES

Implement development code through targeted modifications of existing development code sections as part of future code updates.

Table 64 provides an overview of the recommended development code amendments. Adoption-ready development code language or model language and other updates.

guidance is included in the county specific Local Agency Overview and Implementation Plans.

Code language can be discussed as educational and policy ideas at Planning Commission meetings in the nearer term and then refined as needed and considered for adoption as part of future code updates in the longer term.

Table 64: Recommended Development Code Amendments – Counties

Coordination	Require coordination between counties and CET for development application review for sites adjacent to existing or planned transit routes and for the provision transit stop improvements.
Parking-Related Standards	Explicitly allow transit-related uses (e.g., park-and-rides or transit centers) in parking lots.

9.3 TMP UPDATE SCHEDULE

The TMP should be updated every five to ten years to allow CET to prioritize the future, monitor progress in implementing identified projects, update the future financial outlook and planning, and to verify and update the population, land use, and growth trends used to determine and prioritize service enhancements. It is important to check progress since the last TMP and to realign goals, priorities, and projects based on the new “existing” and “future” systems.