Bend Metropolitan Planning Organization

PUBLIC TRANSIT PLAN AND TRANSIT CORRIDOR LAND USE ASSESSMENT

Public Transit Plan

BMPO Bend Metropolitan Planning Organization

DKS Associates TRANSPORTATION SOLUTIONS

otak

NELSON NYGAARD

March 2013

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Table of Contents

Page

1 Introduction and Project Background 1-1
Planning Process 1-2
Project Oversight 1-2
Project Deliverables 1-3
Plan Outline 1-4

2 Community Profile and Demographics 2-1
Community Profile 2-1
Demographics 2-2
Population and Employment Projections 2-11
Travel Patterns 2-14

3 Existing Land Use and Transit Services 3-1
Existing Land Use 3-1
Existing Transit Services 3-1

4 Community Input 4-1
Onboard Survey (March, 2012) 4-1
Community Survey (February-April, 2012) 4-9

5 Key Findings and Transit Needs Assessment 5-1
Key Findings 5-1
Needs Assessment 5-3

6 Goals and Objectives 6-1
Existing Transit Goals and Objectives 6-1
Recommended Transit Goals and Objectives 6-1

***7* Building a Complete Transit System: Service Quality and Land Use 7-1**
Service Quality and Land Use 7-1
Flexible Service Plan 7-19

8 Building a Complete Transit System: Non-Service Elements 8-1
Facilities and PAssenger Amenities 8-1
Access 8-9
Transportation Demand Management (TDM) 8-15
Marketing and Branding 8-18

9 Implementation 9-1
Operating and Capital Cost Estimates 9-1
Transit Funding Strategies 9-7
Financial Analysis 9-11
Implementation Actions and Phasing 9-21

Appendices

Appendix A. Land Use and Transit Demand – Literature Review
Appendix B. Future Service Concepts – Supporting Detail
Appendix C. Funding Options
Appendix D. Bend Urbanized Area Map, 2010 U.S. Census

Related Documents

Future Opportunities Technical Memorandum (Land Use Assessment)
Existing Conditions Technical Memorandum

Table of Figures

Page

Figure 1-1 Planning Process 1-2
Figure 2-1 Demographic Summary 2-2
Figure 2-2 Population Density, 2010 2-4
Figure 2-3 Senior (Aged 65 or Older) Population Density, 2010 2-5
Figure 2-4 Youth (Aged 10 to 17) Population Density, 2010 2-6
Figure 2-5 Low-Income Household Density, 2005-2009 5-Year Average 2-7
Figure 2-6 Density of No Vehicle Households, 2005-2009 5-Year Average 2-8
Figure 2-7 Minority Population Density, 2010 2-9
Figure 2-8 Density of Population Speaking English Less than "Well", 2005-2009 5-Year Average 2-10
Figure 2-9 Population Growth Projections, Bend UGB and Deschutes County 2-11
Figure 2-10 Top Employers in Bend (over 400 employees), 2011 2-11
Figure 2-11 Population Density by Census Block, 2010 2-12
Figure 2-12 Projected Population Density by TAZ, 2030 2-12
Figure 2-13 Employment Density by TAZ, 2010 2-13
Figure 2-14 Projected Employment Density by TAZ, 2030 2-13
Figure 2-15 Commute Flows to, from, and within Bend (Primary Jobs), 2009 2-14
Figure 2-16 Work Locations of Bend Residents, 2009 2-15
Figure 2-17 Home Locations of Bend Workers, 2009 2-15
Figure 2-18 Commute Mode Share, 2006-2010 5-Year Average 2-16
Figure 2-19 Commute Travel Time to Work, Overall and by Mode, 2006-2010 5-Year Average 2-16
Figure 3-1 Hawthorne Station 3-2
Figure 3-2 Existing Local Transit Services 3-3
Figure 3-3 Existing Regional Transit System 3-4
Figure 3-4 Bus Service Characteristics 3-5
Figure 3-5 Weekly Boardings and Alightings for Top 15 Bus Stops 3-6
Figure 3-6 Major Activity Centers 3-7
Figure 3-7 Existing Weekly Transit Boardings and Alightings, 2012 3-8
Figure 3-8 Monthly Fixed-Route Ridership and Productivity by Route, 2009-2011 3-9
Figure 3-9 Monthly Ridership by Route, 2011 3-10
Figure 3-10 Average Weekday Ridership by Time of Day, November 1-14, 2011 3-10
Figure 3-11 Dial-A-Ride Service Characteristics 3-11
Figure 3-12 Monthly Dial-A-Ride Ridership and Productivity, 2009-2011 3-11
Figure 3-13 Summary of Performance and Operating Costs, FY 2009-2010 3-12
Figure 3-14 Operating Funding Sources, FY 2009-2010 3-12
Figure 4-1 Onboard Survey: Trip Purpose 4-1
Figure 4-2 Onboard Survey: Transfer Patterns by Route 4-2
Figure 4-3 Onboard Survey: Major Fixed-Route Origin-Destination Patterns 4-3
Figure 4-4 Onboard Survey: How do you typically get to and from the bus stop? 4-4
Figure 4-5 Onboard Survey: How often do you ride CET buses? 4-4

Figure 4-6 Onboard Survey: How would you have made this trip if CET bus service was not available? 4-5
Figure 4-7 Onboard Survey: Age 4-5
Figure 4-8 Onboard Survey: Perception of CET Bus Service 4-6
Figure 4-9 Onboard Survey: Priority Improvements 4-7
Figure 4-10 Onboard Survey: Selected Open-Ended Comments by Category 4-8
Figure 4-11 Online Survey: Commute Mode to Work by Number of Days Used 4-9
Figure 4-12 Online Survey: Work/School Commute Origin-Destination Patterns 4-10
Figure 4-13 Online Survey: Satisfaction with Fixed-Route Bus Service 4-11
Figure 4-14 Online Survey: Factors in Deciding to Use Transit 4-12
Figure 4-15 Online Survey: Reasons for Not Riding the Bus 4-13
Figure 4-16 Online Survey: Impact of Potential Transit Improvements 4-14
Figure 4-17 Online Survey: Top 3 Service Improvement Priorities 4-14
Figure 4-18 Tradeoffs in Transit Service Provision 4-15
Figure 5-1 Major Public Transportation Needs 5-4
Figure 7-1 Conceptual Service Models 7-2
Figure 7-2 Relationship between Density and Daily Trips by Mode 7-4
Figure 7-3 Existing and Projected Population and Employment Density along Primary Transit Corridors 7-6
Figure 7-4 Primary Transit Corridors 7-7
Figure 7-5 Summary of Service Design Policy Guidelines 7-9
Figure 7-6 Existing Fixed Route (FR) and Dial-A-Ride (DAR) Performance Data and Measures 7-12
Figure 7-7 Bend Transit Service Efficiency Standards 7-14
Figure 7-8 Bend Transit Service Quality/Reliability Standards 7-15
Figure 7-9 Bend Route-Level Operating Standards – *Initial Discussion Draft* 7-17
Figure 7-10 Guidelines for New Service Operating Standards 7-17
Figure 7-11 Recommended Changes to Monthly and Periodic Data Collection/Reporting 7-18
Figure 7-12 Short-Term Service Improvements 7-23
Figure 7-13 Initial and Long-Term Recommended Service Characteristics 7-28
Figure 7-14 Long-Term Service Headway Targets 7-28
Figure 7-15 Near Mid-Term Concept for Service to Planned OSU Facility 7-30
Figure 7-16 Restructured 30/60-Minute Mid- to Long-Term Service Concept 7-36
Figure 8-1 Existing and Proposed Major Public Transit Facilities 8-2
Figure 8-2 Existing and Proposed Transit Facilities 8-5
Figure 8-3 Existing and Potential Regional Transit Facilities 8-6
Figure 8-4 Bus Stop Tiers and Investment Guidelines 8-8
Figure 8-5 Comparison of CET and BAT Branded Signage and Vehicles 8-19
Figure 8-6 Sample of Existing CET Route Maps and Schedules (Website Versions) 8-23
Figure 9-1 Operating Cost Estimates, Total and Increase from Current Costs (2012 Dollars) . 9-1
Figure 9-2 Peer Comparison of Bend Transit Service Provision, Utilization, and Operating Spending, 2012 Dollars 9-4
Figure 9-3 Overall Capital Cost Estimates for Service Packages (2012 Dollars) 9-6
Figure 9-4 Ten Year Capital Plan 9-18
Figure 9-5 Ten Year Operating Cost Projections and Performance Indicators 9-19

Figure 9-6 Projected Mid-Term Fixed-Route Operating Costs and Performance Measures Relative to Peers 9-20
Figure 9-7 Implementation Actions and Phasing 9-22

1 INTRODUCTION AND PROJECT BACKGROUND

In November 2011, the Bend Metropolitan Planning Organization (BMPO) initiated this project to update the long-range Public Transit Plan (PTP) for the Bend area, to address existing and future public transportation needs, provide an assessment of land use conditions along current and potential future transit corridors, and recommend strategies to coordinate future transit investments with transit-supportive land uses.

Over the past decade, Bend has been one of the fastest growing communities in Oregon. With a current population of 76,639 residents, the Bend area is projected to grow to over 109,000 residents by 2025. Population growth is running about 5% behind estimated projections, which were developed prior to the economic downturn.[1] The area's historically rapid population growth and rates of development dictate the need to think strategically about how BMPO, the City of Bend (City), and Cascades East Transit (CET) plan for and accommodate public transit and transit supportive land uses.

The City of Bend launched its fixed-route transit system service in 2007 as Bend Area Transit (BAT). Utilization of the system has grown significantly and the local system is integrated with a regional transit network, both now operated by CET. As Bend continues to grow and demand on the transit system increases, the presence and quality of transit will become increasingly important criteria for land use development and, at the same time, land use will be a key criterion for determining the level of transit service required.

This interdependence raises the following questions that motivated this project:

- How can the MPO and City of Bend encourage denser, transit-supportive development in areas where transit service investment is needed?
- What are the areas that are most appropriate to focus transit supportive land uses?
- How can transit and transit-oriented development be a catalyst for achieving other goals in Bend, such as economic development, social justice, and preservation of the environment?

This plan aims to address this "chicken-and-egg" issue by identifying:

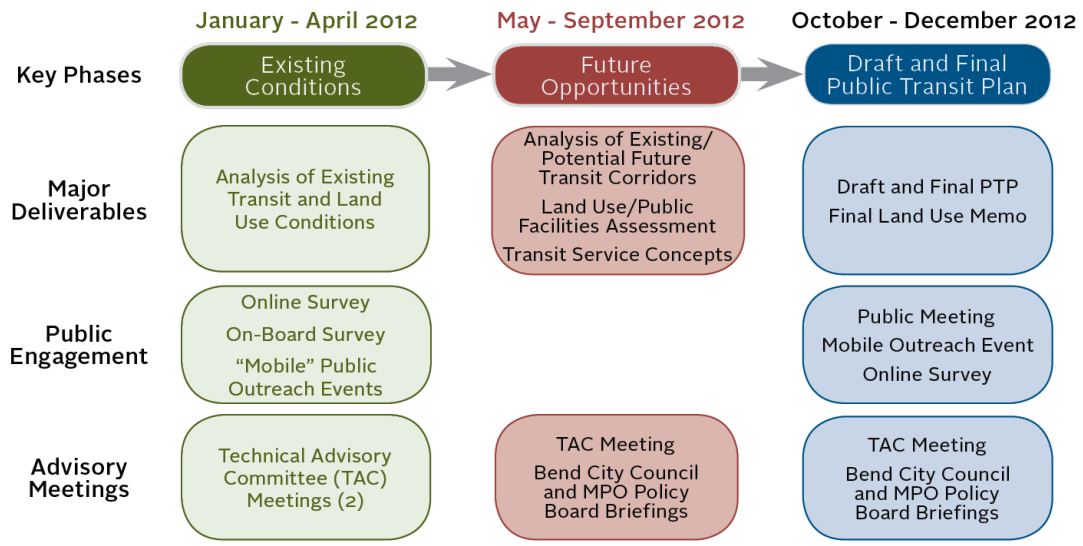
[1] Current population from 2010 U.S. Census. Projections from Deschutes County, Coordinated Population Forecast, 2004.

- A set of future service improvements that can be implemented in response to future population/employment growth and funding availability.
- A network of corridors where the highest-quality service is planned and where transit-intensive land uses are located in close proximity to the best transit service.
- Land use policies that help ensure development and street design along those corridors take a transit-oriented form.

PLANNING PROCESS

The project involved three major phases: (1) analysis of existing conditions, (2) assessment of future land use opportunities and development of transit service concepts, and (3) development of the long-range transit public transit plan (PTP). Figure 1-1 illustrates these phases in relation to key deliverables, public outreach opportunities, and meetings with the Technical Advisory Committee (TAC) for the project as well as briefings to provide updates to and receive input from the MPO Policy Board and Bend City Council. The next section describes the role of the TAC and Chapter 4 summarizes the input received from the public.

Figure 1-1 Planning Process



PROJECT OVERSIGHT

This section describes the role of the project management team and TAC in providing direction and input at key stages of the project.

Project Management Team

The project management team included representatives from BMPO, the City of Bend, the Oregon Department of Transportation (ODOT), the Oregon Department of Land Conservation and Development (DLCD), and CET. Core project management team members met regularly throughout the project. City of Bend staff provided BMPO and the consultant team with specific input and direction at key stages of the project, particularly related to land use and transportation, and CET planning and operations staff helped develop and validate transit service concepts.

Technical Advisory Committee (TAC)

The Technical Advisory Committee, working with MPO and CET staff and the consultant team, played an important role in guiding the public transit plan. The full TAC met four times, providing valuable input and discussion. TAC members reviewed and provided comments on plan deliverables throughout the project.

In addition to Project Management Team members, the TAC included representatives from human services and non-profit service providers, Deschutes County, Bicycle and Pedestrian Advisory Committee (Deschutes County), Central Oregon Community College (COCC), St. Charles Medical Center, Downtown Bend (Chamber), and Bend Park & Recreation District.

PROJECT DELIVERABLES

The project includes the following two major deliverables, in addition to an Existing Conditions Memo that helped inform both deliverables:

- **Public Transit Plan (PTP)**. The PTP is contained in this document and identifies short- and long-term transit improvements and strategies for the Bend area. The PTP will serve as a component of the overall land use and transportation planning process in Bend and can be adopted as an element of (or otherwise incorporated into) the BMPO Metropolitan Transportation Plan (MTP) and the City of Bend Transportation System Plan (TSP).

- **Future Opportunities Memo**. This companion document provides an assessment of opportunities for land use changes that can support public transit within BMPO boundaries and identifies additional strategies for coordinating transit with land use. This document will inform future land use planning in Bend, in particular as it relates to the City of Bend's proposed Urban Growth Boundary (UGB) expansion and the State of Oregon Land Conservation and Development Commission's (LCDC) partial acknowledgement/remand of this proposal in 2010.

PLAN OUTLINE

The PTP is structured into the following chapters:

- **Chapter 1: Introduction and Project Background.** Provides an overview of the project and describes the planning process and oversight structure.
- **Chapter 2: Community Profile and Demographics.** Presents demographic and land use trends that impact transit demand.
- **Chapter 3: Existing Land Use, Transit Services, and Public Facilities.** Provides an overview of existing land use, transit services, and public facilities in Bend.
- **Chapter 4: Community Input.** Summarizes results of public outreach efforts, including a survey conducted on-board CET local buses in Bend, an online community survey, and project outreach events.
- **Chapter 5: Key Findings and Transit Needs Assessment.** Summarizes key findings from the demographic analysis, review of existing conditions, and community input.
- **Chapter 6: Goals and Objectives.** Recommends updates to the transit goals and objectives for the City and MPO. The following two chapters describe elements of a "Complete Transit System" that function together to achieve the desired local outcomes for transit in Bend.
- **Chapter 7: Service and Land Use Element**. Describes service quality and land use, and provides a flexible service plan for the short-, mid-, and long-term time frames.
- **Chapter 8: Non-Service Element.** Describes facilities, access, transportation demand management, and marketing/branding.
- **Chapter 9: Implementation.** Describes operating/capital costs and actions for implementing the recommended improvements.

The PTP provides references to more detailed information provided in the following appendices, or the related documents outlined on the previous page.

- **Appendix A: Land Use Transit Demand.** Summarizes research into the relationship between density and transit ridership.
- **Appendix B: Future Service Concepts.** Provides additional detail related to topics discussed in Chapters 7, 8, and 9.
- **Appendix C: Funding Options.** Summarizes transit funding options.
- **Appendix D: Updated Bend Urbanized Area Map.** Provides a map of the revised 2010 Census Boundary for the Bend Urbanized Area.

The Existing Conditions memo provides additional detail on the topics in this chapter.

2 COMMUNITY PROFILE AND DEMOGRAPHICS

COMMUNITY PROFILE

The city of Bend is the fifth-largest metropolitan area in Oregon and the largest city east of the Cascades, with a population of 76,639 in 2010. Bend comprises nearly 50% of the total population of Deschutes County. Bend grew rapidly in the 1990s and early-to-mid 2000s, however the housing downturn significantly affected housing values and employment, particularly construction jobs. Employment is not projected to return to a level near its 2007 peak until 2020.[2]

Bend is home to Central Oregon Community College (COCC). COCC enrollment has grown significantly in recent years. Full-time equivalent enrollment increased from 3,463 in 2007 to 5,479 in 2011 at the Bend campus—an increase of 58%. Total Bend campus enrollment was 14,632 in 2011. The Oregon State University (OSU) Cascades Campus is co-located with COCC and offers four-year and master's degrees. It has also grown significantly and has 678 students as of the Fall 2011 term. OSU is actively planning a new facility along Colorado Avenue in southwest Bend, with enrollment of 5,000 students projected within the next several years, of which about 8% are expected to live on-campus.

Located on the eastern edge of the Cascade Range along the Deschutes River, Bend is a hub for recreation with a relatively dry, high desert climate year-round. Tourism (including the Mt. Bachelor Ski Resort), manufacturing, high tech, and health care, are major economic sectors. Emerging or niche market products and services include semiconductors, software, medical instruments, and recreational equipment.

[2] Carolyn Eagan (OED Economist for Region 10), Personal Communication, January 2012.

DEMOGRAPHICS

This section reviews demographic information for Bend, focusing on segments of the population that typically have the greatest need for public transit services. Figure 2-1 lists these demographic categories and their share of the population in Bend compared to the state of Oregon overall. [3]

Figure 2-1 Demographic Summary

Demographic Category	City of Bend	Oregon
Total population	76,639	3,831,074
% Youth (persons aged 10-17) [a]	12.4%	13.9%
% Seniors (persons aged 65+) [a]	10.1%	10.2%
% Minority	12.7%	21.5%
% Low-Income Households [b]	10.4%	14.0%
% Persons with a Disability [c]	12.0%	13.4%
% Households without a Vehicle [b]	5.4%	7.6%
% Population Speaking English Less than "Well" [b]	1.8%	3.6%

Notes: Minority includes non-white persons of one race and persons of two or more races. Low-income households are those earning below the federal poverty level. Disability is for the civilian non-institutionalized population aged 5 years or older. Population speaking English less than "well" is based on persons aged 5 years or older.

Sources: (a) U.S. Census Bureau, 2010 U.S. Census, Summary File 1: P1, P9, P12. (b) U.S. Census Bureau, American Community Survey, 2006-2010 5-Year Averages: B16004, B25044, C17002. (c) U.S. Census Bureau, American Community Survey, 2008-2010 3-Year Averages: S1810. Due to the change in disability questions in 2008, only a 3-year average is available.

The density of population, jobs, and services in a city are major determinants of transit demand. Figure 2-2 illustrates the general population density in Bend, based on 2010 Census data, in relation to existing transit service. Additional maps (Figure 2-3 through Figure 2-8) illustrate how specific population segments are distributed in the city, based either on U.S. Census data (by block) or American Community Survey (ACS) data (by block group, which includes multiple Census blocks). The population segments analyzed, and their general relationship to transit demand, are as follows:

- **Seniors.** Older adults often exhibit higher demand for transit as they become less capable or willing to drive themselves, or can no longer afford to own a car on a fixed income. They tend to use public transportation during the middle of the day for shopping and medical appointments. Seniors aged 65 or older account for just over 10% of the Bend population.

[3] Each of these categories is based on a single characteristic, thus some individuals will be included in one or more demographic group.

As shown in Figure 2-3, some of the highest densities of seniors aged 65 or older reside in east Bend between Greenwood Avenue and Neff Road.

- **Youth.** Young people without driver's licenses or those unable to drive need transit service for school and after-school activities, part-time jobs, and access to recreation and entertainment particularly during the summer months. National trends show that a lower proportion of younger adults feel they need to own their own vehicle than earlier generations. Figure 2-4 shows youth density in relation to transit routes.
- **Persons with disabilities.** Persons with disabilities often are heavily dependent on public transit service. In the city of Bend, 12% of the overall population has one or more disabilities, on average between 2008 and 2010, including 9.5% of the population aged 18 to 64 and nearly 36% of the population aged 65 or older.[4]
- **Low-income households.** Over 10% of households in Bend are considered low-income, defined as earning at or below the federal poverty level, which is based on household size. An additional 19% of the population in the city of Bend earns between 100% and 200% of the federal poverty level. Figure 2-5 shows the density of low-income households in relation to transit routes.
- **Households without access to a vehicle.** One of the most influential indicators of transit demand is access to a motor vehicle, whether due to lack of economic means, inability to drive, or by choice. Over 5% of households in Bend do not have access to a vehicle. Figure 2-6 shows that the distribution of these households is roughly aligned with the distribution of low-income households and/or seniors.
- **Minority households.** "Minority" is defined for the purposes of this analysis as non-white persons of one race and persons of two or more races. The proportion of the minority population in Bend is 12.7%. Figure 2-7 illustrates the density of minority households in Bend.
- **Persons with limited English speaking skills**. Limited English speaking skills is an indicator of the ability for upward economic mobility and correlates closely to income. This can be another indicator of a household's relative dependency on transit. Roughly 2% of city of Bend residents speak English "less than well." Figure 2-8 identifies parts of Bend with the highest densities of population speaking English "less than well."

[4] Due to a change in disability questions starting in 2008, only a 3-year average is available for disability data. Data from the 3-year average is not available at the block group level and is not mapped.

Figure 2-2 Population Density, 2010

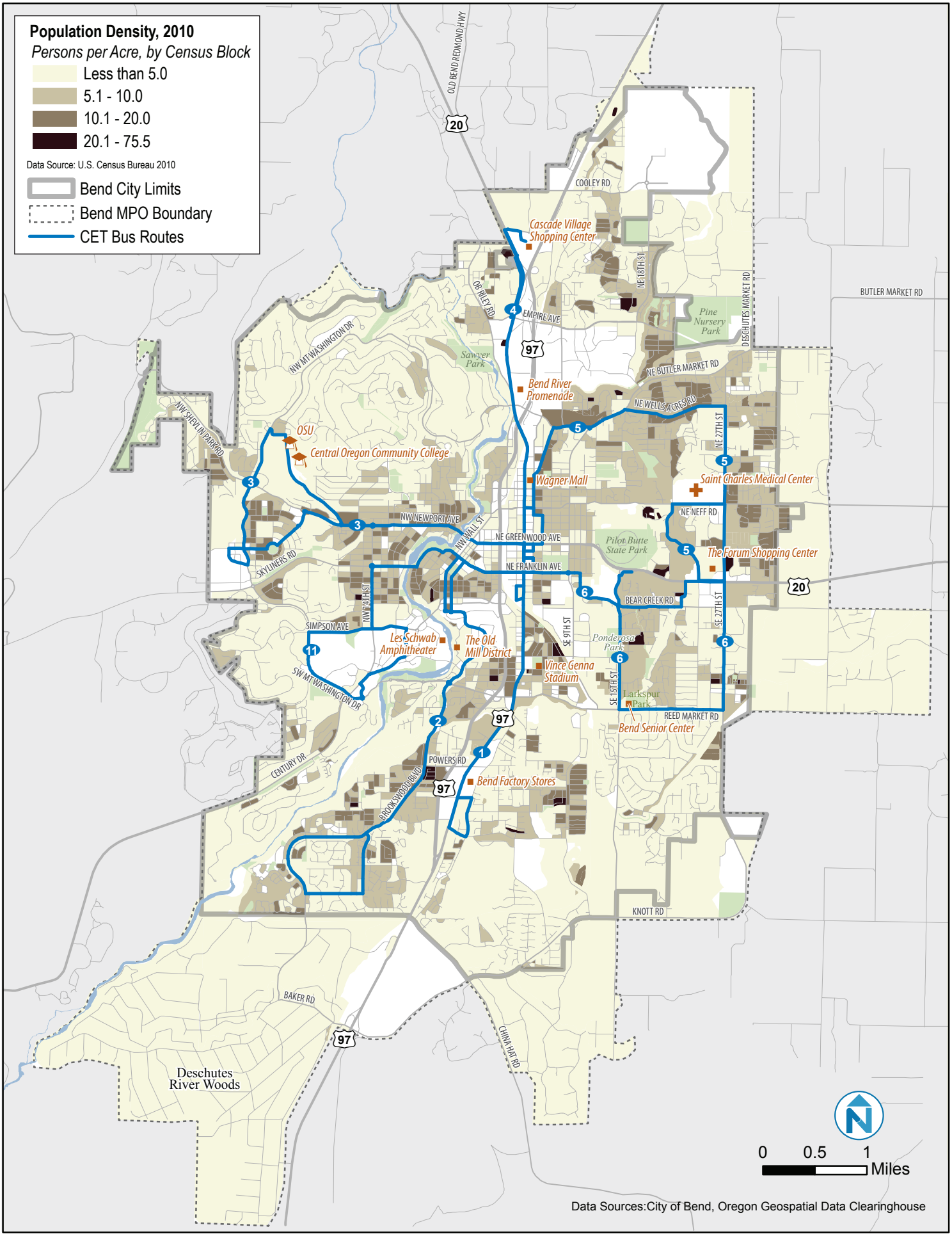


Figure 2-3 Senior (Aged 65 or Older) Population Density, 2010

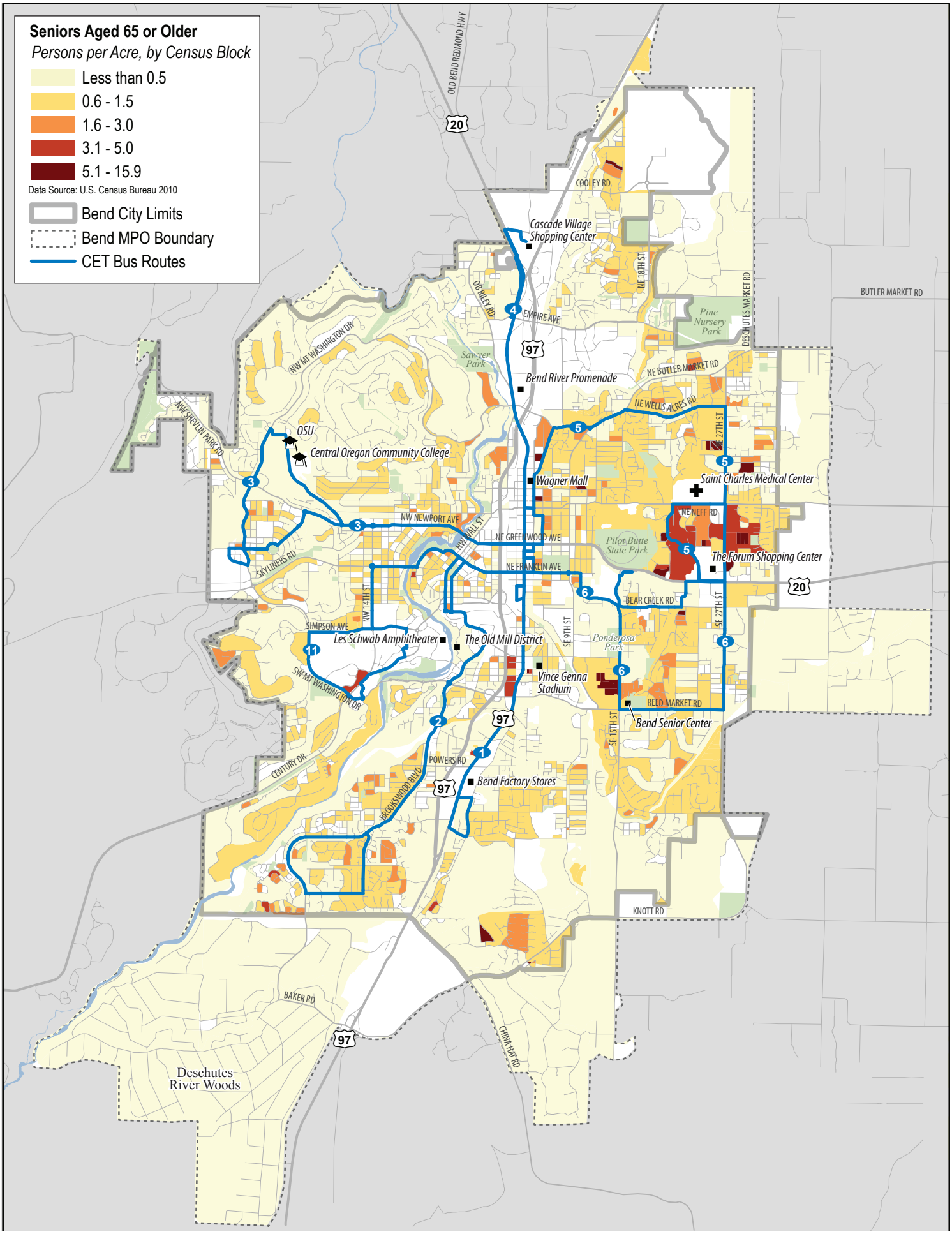


Figure 2-4 Youth (Aged 10 to 17) Population Density, 2010

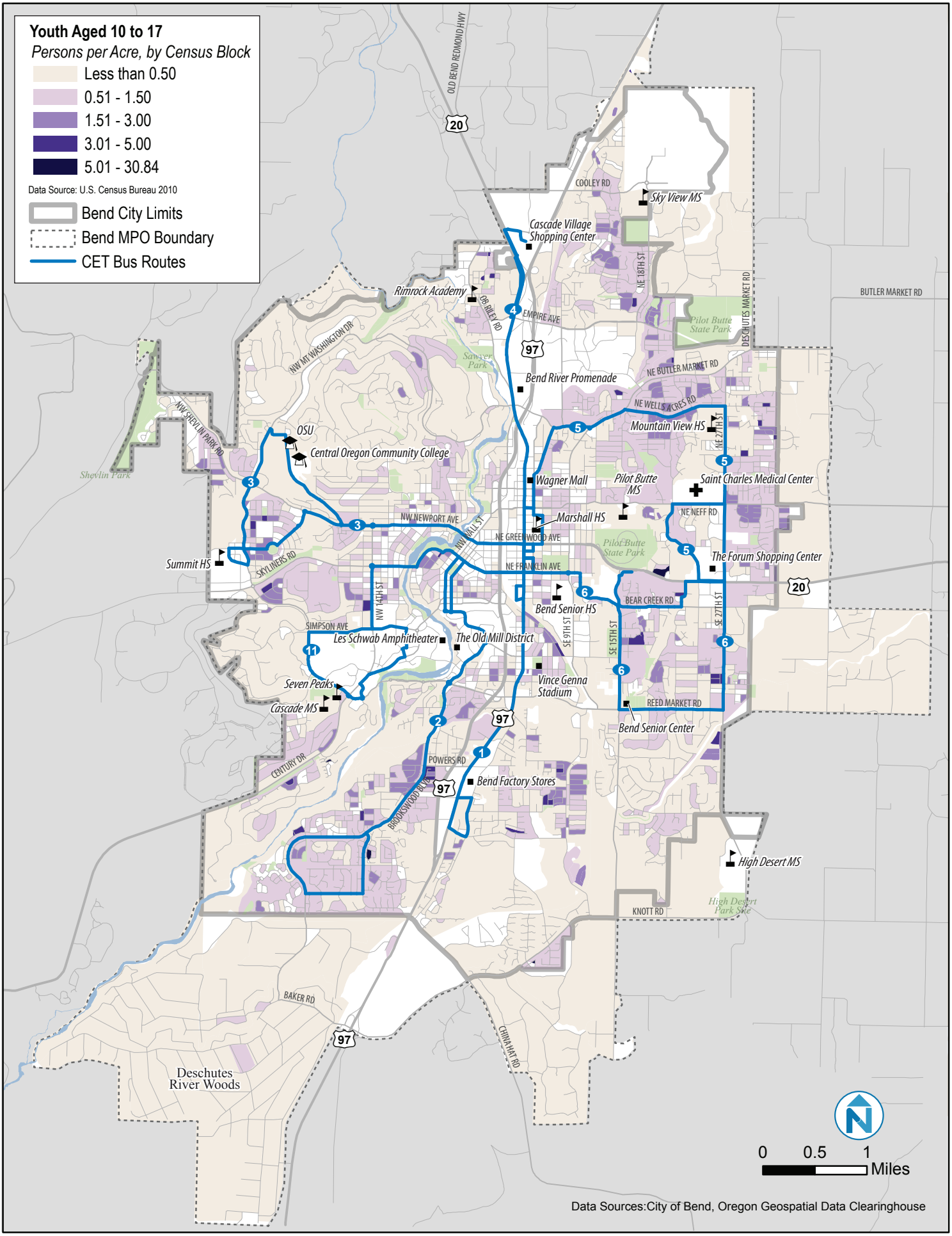


Figure 2-5 Low-Income Household Density, 2005-2009 5-Year Average

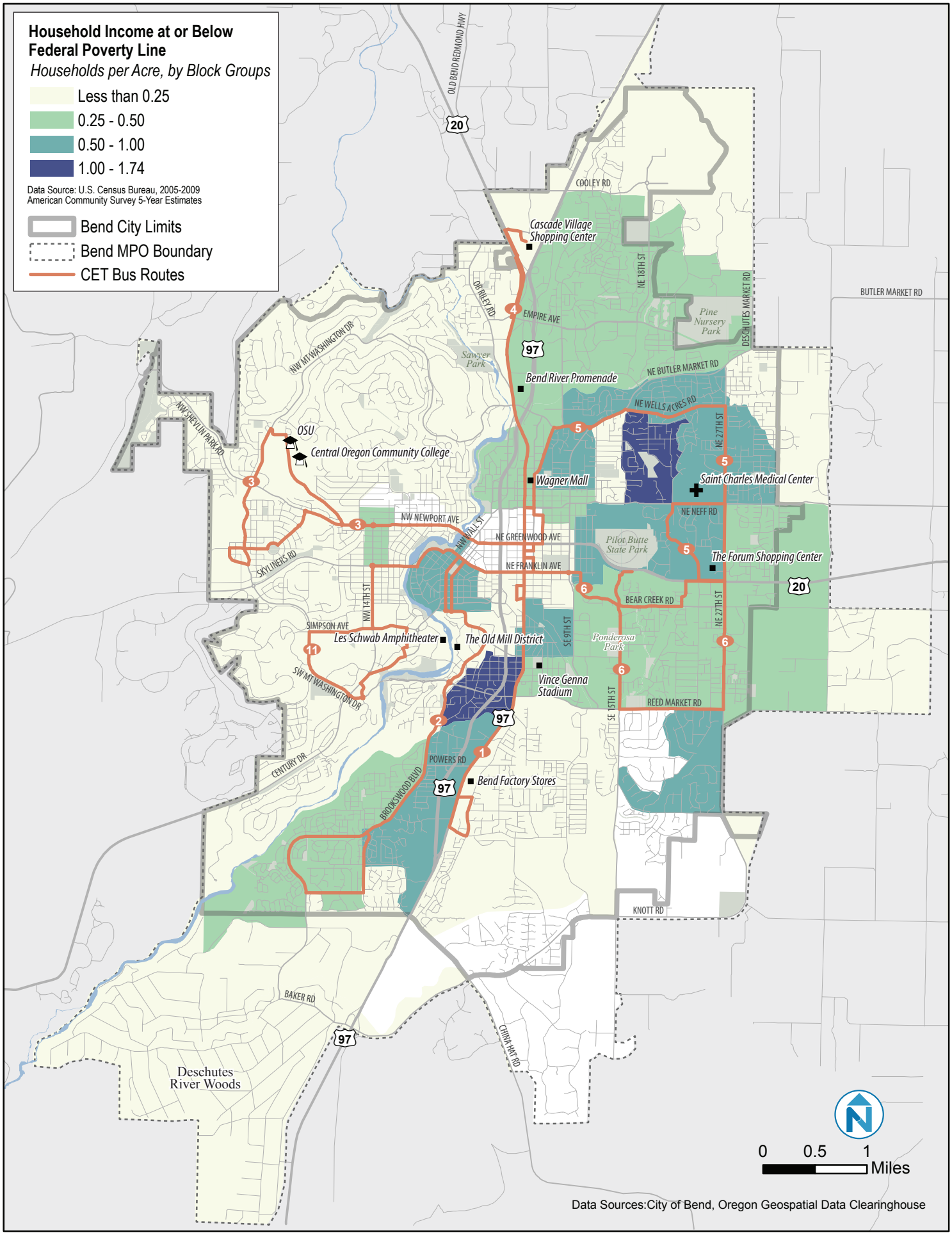


Figure 2-6 Density of No-Vehicle Households, 2005-2009 5-Year Average

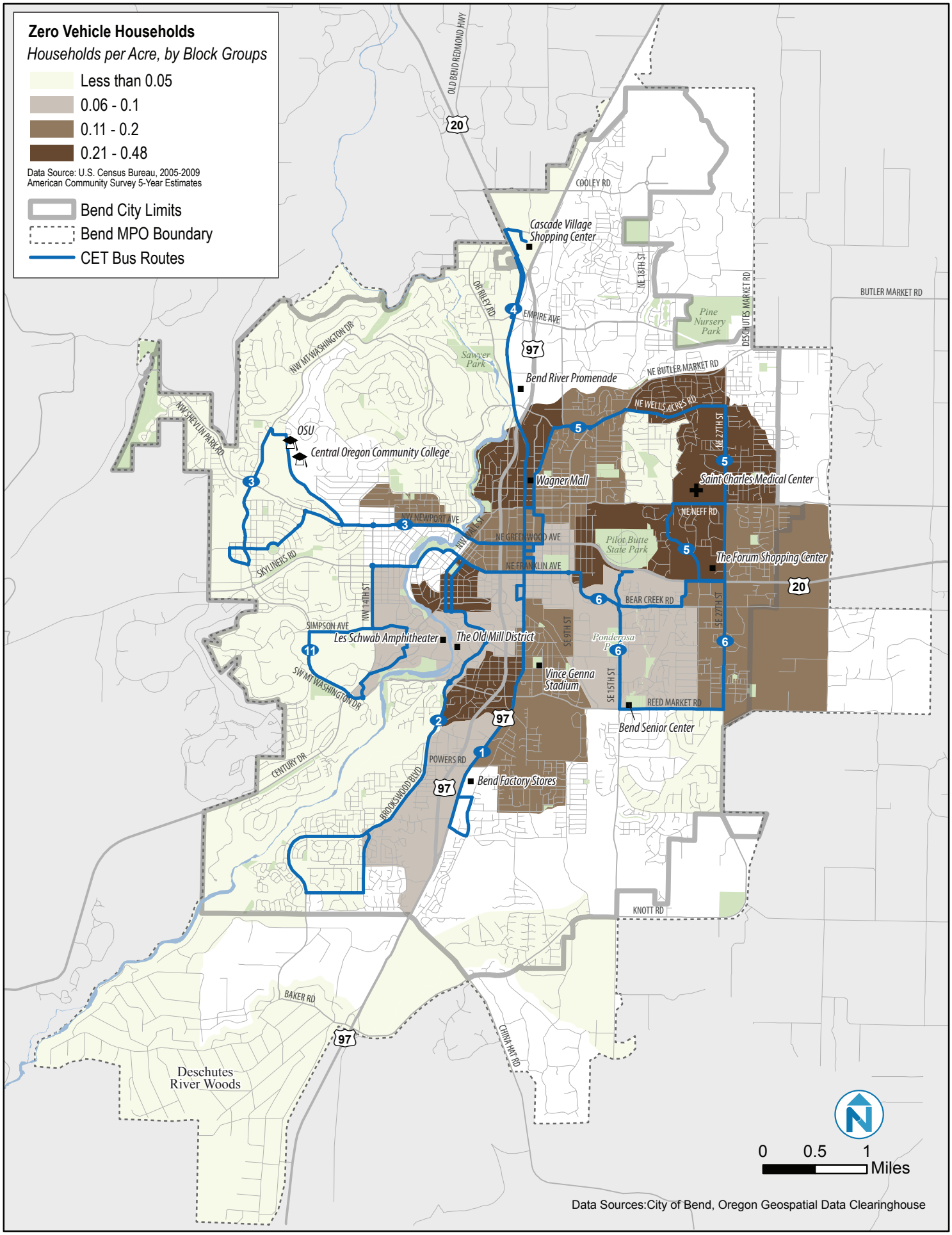


Figure 2-7 Minority Population Density, 2010

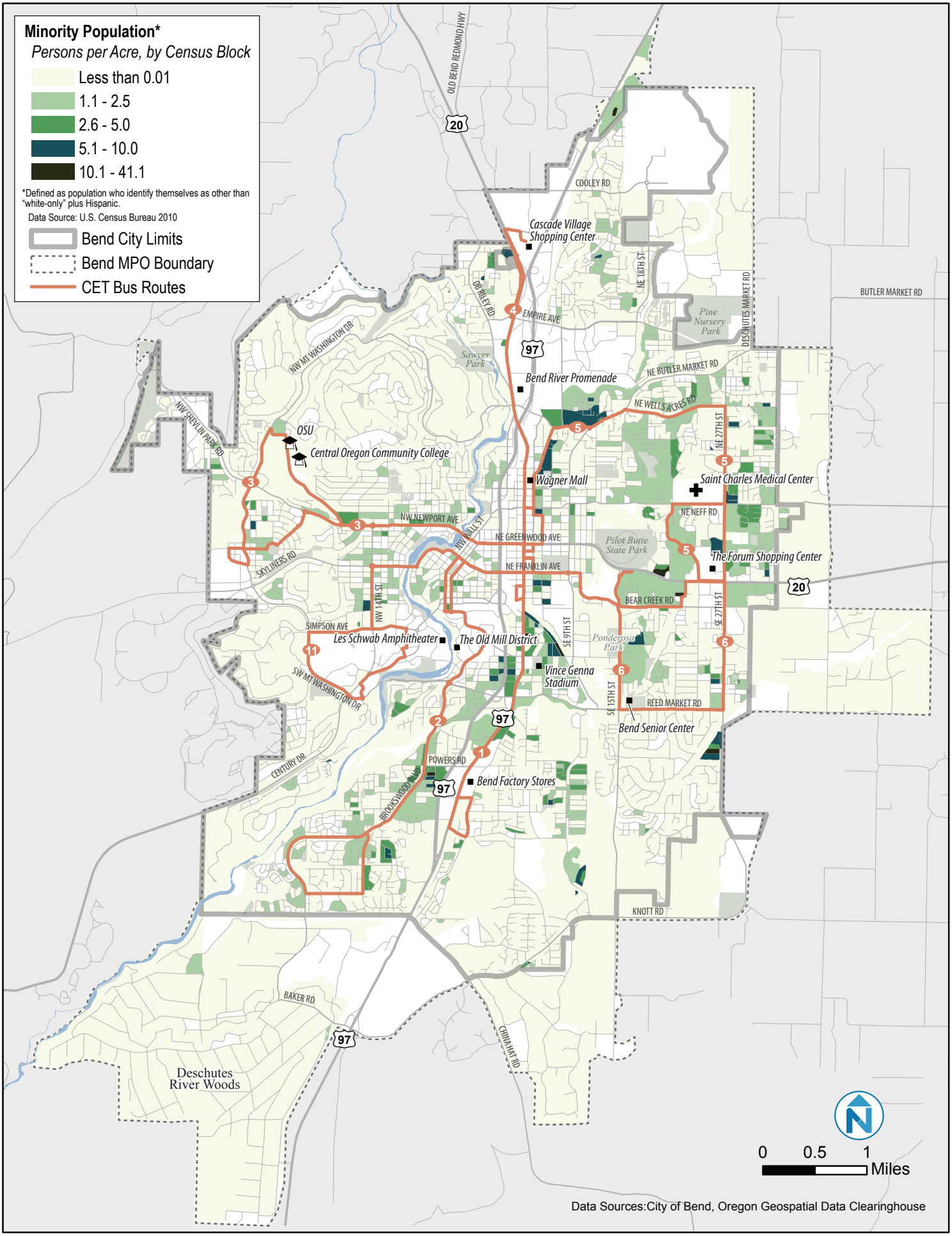
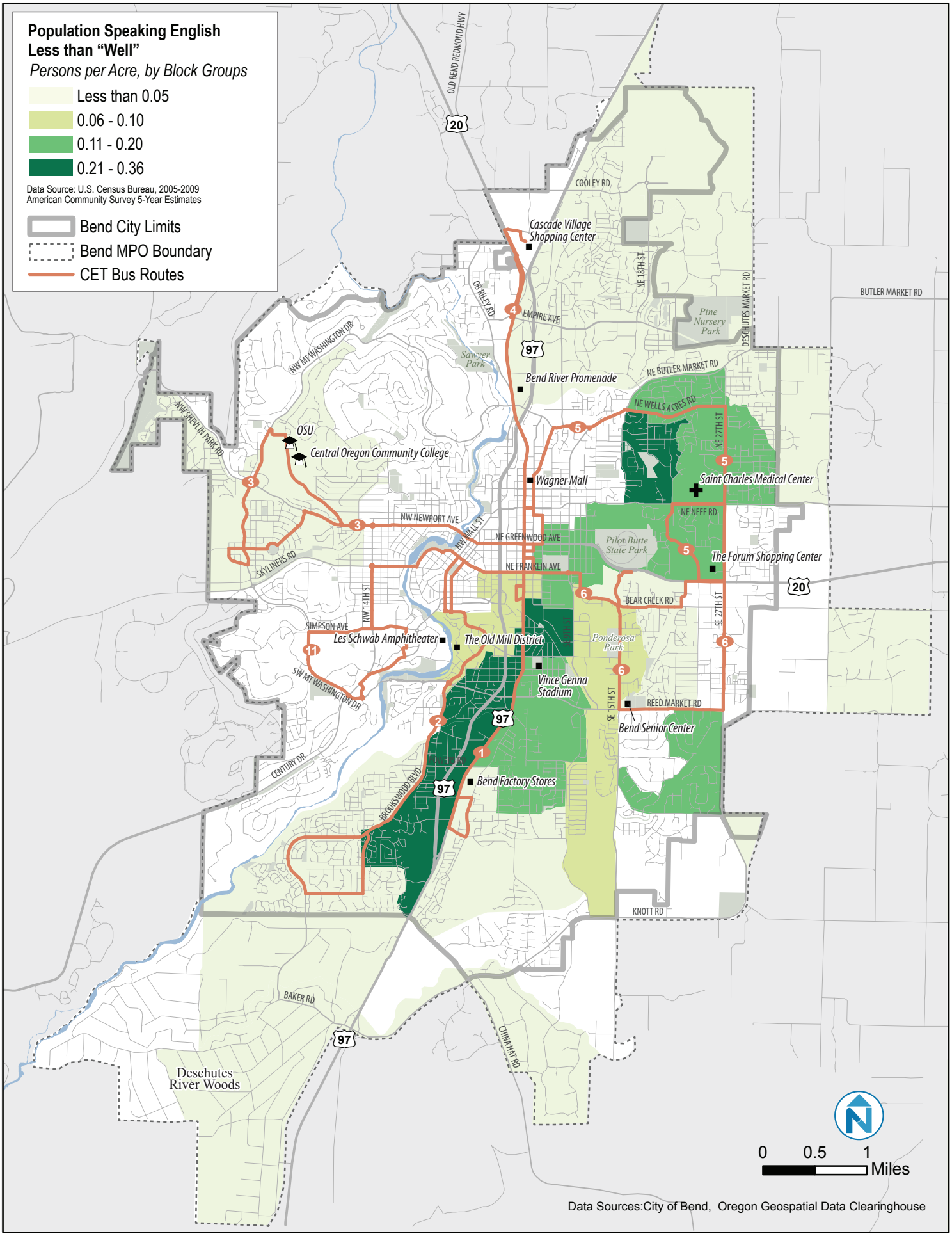


Figure 2-8 Density of Population Speaking English Less than "Well", 2005-2009 5-Year Average



POPULATION AND EMPLOYMENT PROJECTIONS

Figure 2-9 lists the most recent population projections (2004) for Bend (Urban Growth Boundary) and Deschutes County. These projections forecast over 100% growth for both Bend and Deschutes County between 2000 and 2025—an average increase of slightly more than 4% annually.

However, actual 2010 population estimates from the Portland State University Population Research Center (PRC) were approximately 5% lower than the earlier 2010 forecast: 76,740 for Bend and 157,905 for Deschutes County as of July 1, 2010.

Figure 2-9 Population Growth Projections, Bend UGB and Deschutes County

Geography	2000 (Actual)	2010 (Projected)	2010 (Actual)	2025 (Projected)	% Change, 2000-2025
Bend UGB	52,800	81,242	76,740	109,389	107.2%
Deschutes County	116,600	166,572	157,905	240,811	106.5%

Source: Deschutes County Coordinated Population Forecast, 2000-2025, August 25, 2004. Actual population for 2010 is from the 2010 U.S. Census.

About 65% of jobs in Deschutes County are located within the Bend Urban Growth Boundary (UGB). The largest employers in the city of Bend include St. Charles Medical Center, Central Oregon Community College (COCC), Bend Memorial Clinic, and the City of Bend (see Figure 2-10). As a result of the economic downturn, the level of employment in the region is not expected to reach peak 2007 levels until 2020.[5]

Figure 2-10 Top Employers in Bend (over 400 employees), 2011

Employer Name	Avg. # of Employees	Source/Notes
St. Charles Medical Center	2,978	1, Includes Redmond center
Sunriver Resort	900	2, Seasonal high, 2012
Les Schwab Tire Center	870	1. Regional
Mt. Bachelor	760	1, Seasonal high
Walmart	591	1, Regional
Bend Memorial Clinic	558	1
Safeway	500	1
Fred Meyer	472	1, Regional
Opportunity Foundation	420	1

Note: Does not include public sector employers, e.g., COCC.

Sources: (1) Bend Chamber of Commerce, 2011. (2) Economic Development for Central Oregon (EDCO), 2012.

[5] Carolyn Eagan (OED Economist for Region 10), Personal Communication, January 2012. Peak employment in the Tri-County Region 10 area, of which Deschutes County comprises about 85% of jobs, was 84,870.

Figure 2-11 Population Density, 2010 U.S. Census

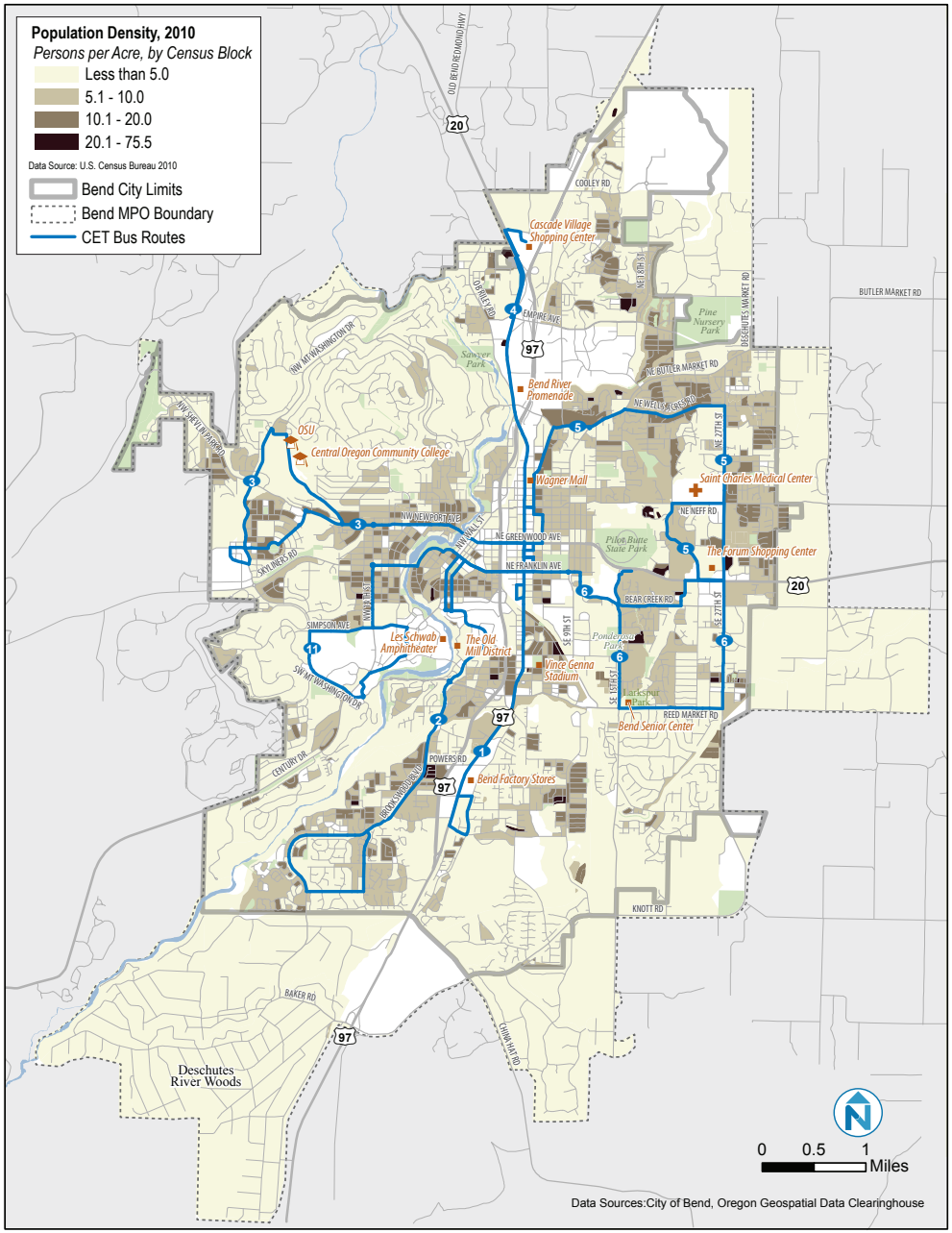


Figure 2-12 Projected Population Density, 2030

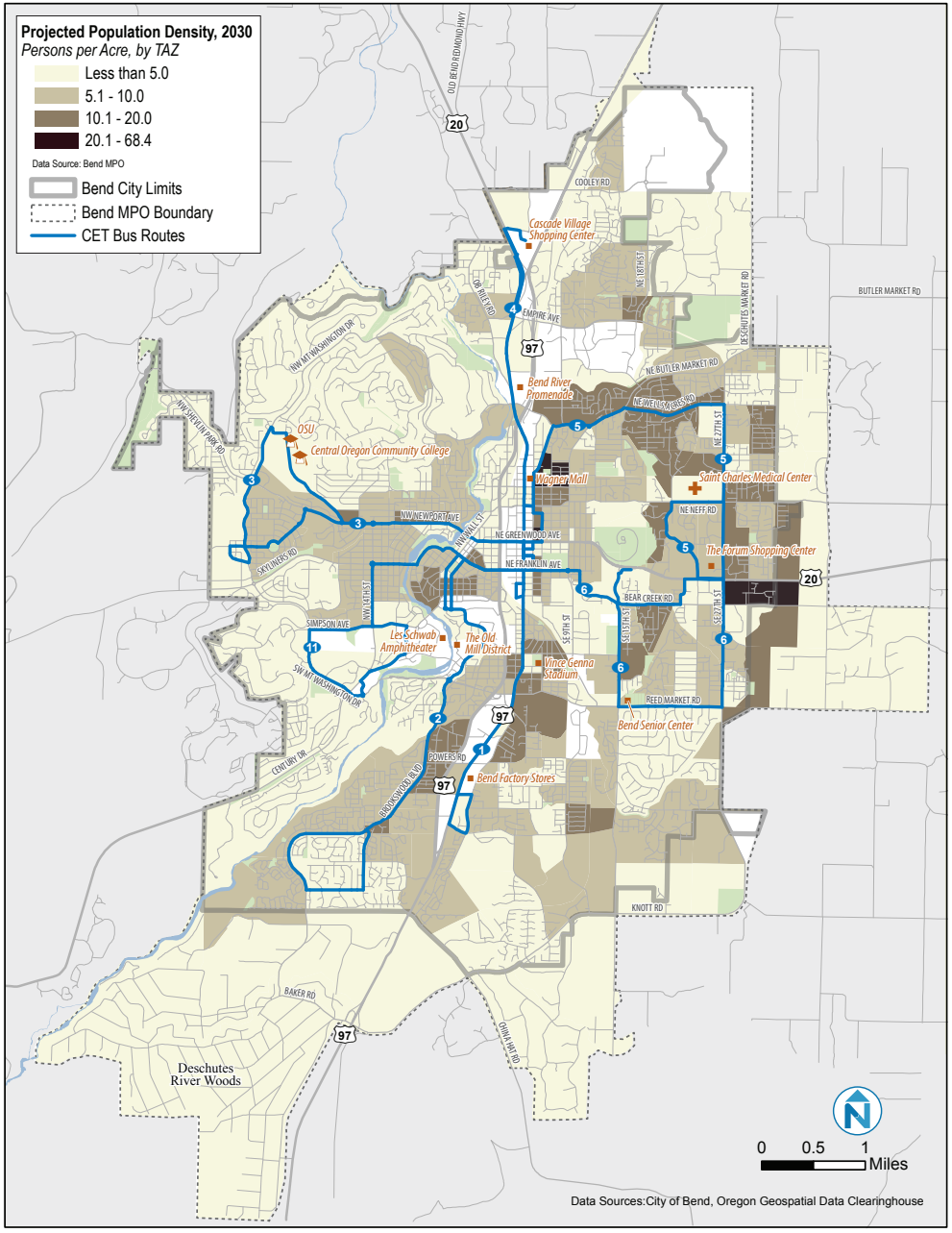


Figure 2-13 Employment Density, 2010

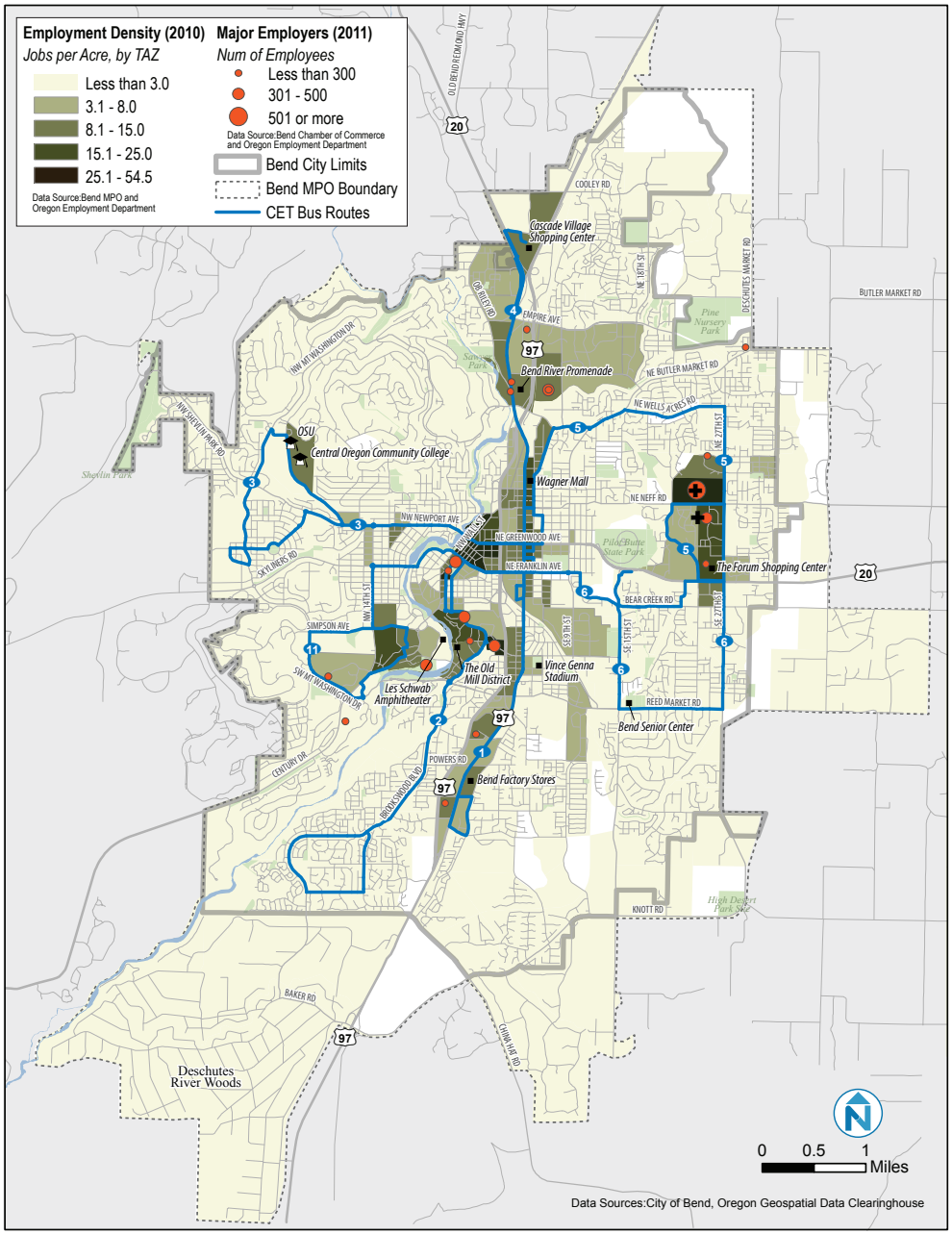
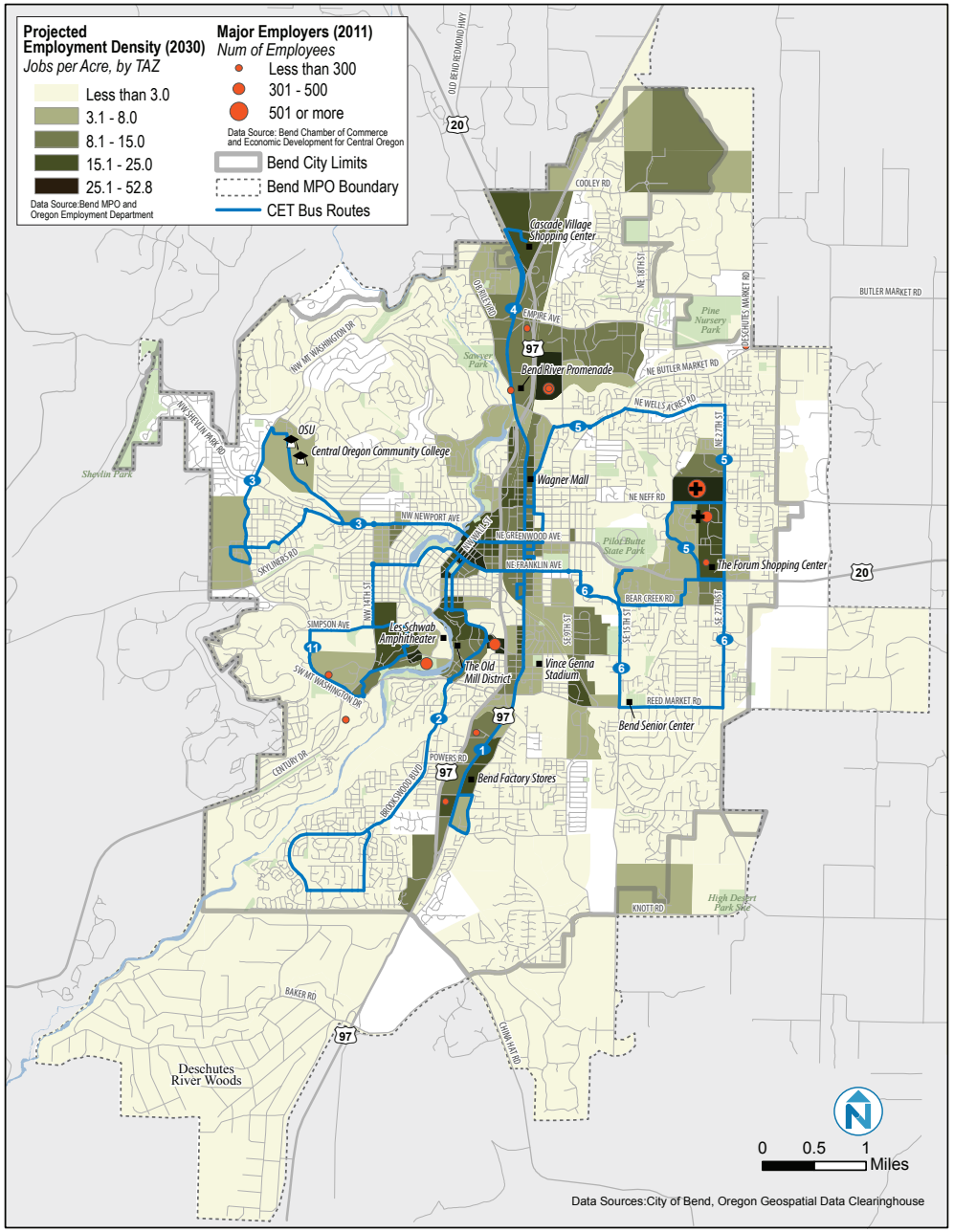


Figure 2-14 Projected Employment Density, 2030

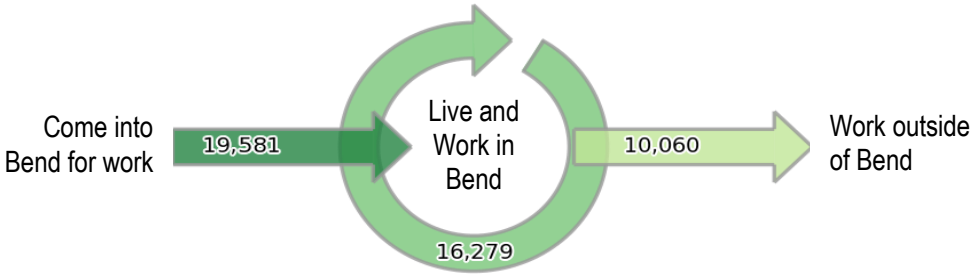


TRAVEL PATTERNS

Work Commute Patterns

Based on U.S. Census Bureau LEHD (Longitudinal Employer-Household Dynamics) data for 2009, of the over 38,000 total jobs in the city of Bend, nearly 21,000 (about 55%) are held by workers who live outside of Bend. About 16,000 Bend workers both live and work in Bend.[6] In addition, about 10,000 Bend residents work outside of the city; this represents about 38% of residents who are working. The maps in Figure 2-16 and Figure 2-17 illustrate the work locations of Bend area residents and the home locations of Bend area workers.

Figure 2-15 Commute Flows to, from, and within Bend (Primary Jobs), 2009



Source: U.S. Census Bureau, LEHD, 2009

Figure 2-16 (left panel) shows the work locations of Bend area residents in 2009, in relation to bus routes in Bend. These locations generally correspond to where existing bus service runs, with the exception of clusters of jobs in NE and SE Bend (see inset map). Outside of city limits, there is a moderate concentration of jobs in the vicinity of Bend Municipal Airport. Outside of the Bend area, there are moderate concentrations of residents employed in Redmond, Prineville, and Sun River.

Figure 2-17 (right panel) illustrates the home locations of Bend area workers. While the most significant concentrations of home locations within city limits have transit service, the exceptions are in the southeast quadrant of the city and in the northern portion of the city, east and west of Highway 97 (see inset). Outside of city limits, there is no fixed-route transit service to Deschutes River Woods, in the southwest corner of the Bend MPO boundary.[7] Outside of the Bend area, the highest concentrations of home locations are in Redmond, Prineville, Tumalo area, and Sun River/La Pine area.

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[6] Limited to primary jobs, defined as the one job for each worker that provides the most earnings.

[7] As of 11/26/2012, a stop for the Bend-La Pine Community Connector was implemented at the Riverwoods Baptist Church in Deschutes River Woods (on Cinder Butte Road near the intersection with Baker Road). A future stop at the Riverwoods Country Store may be feasible in the future, but would involve additional capital costs.

Figure 2-16 Work Locations of Bend Residents, 2009

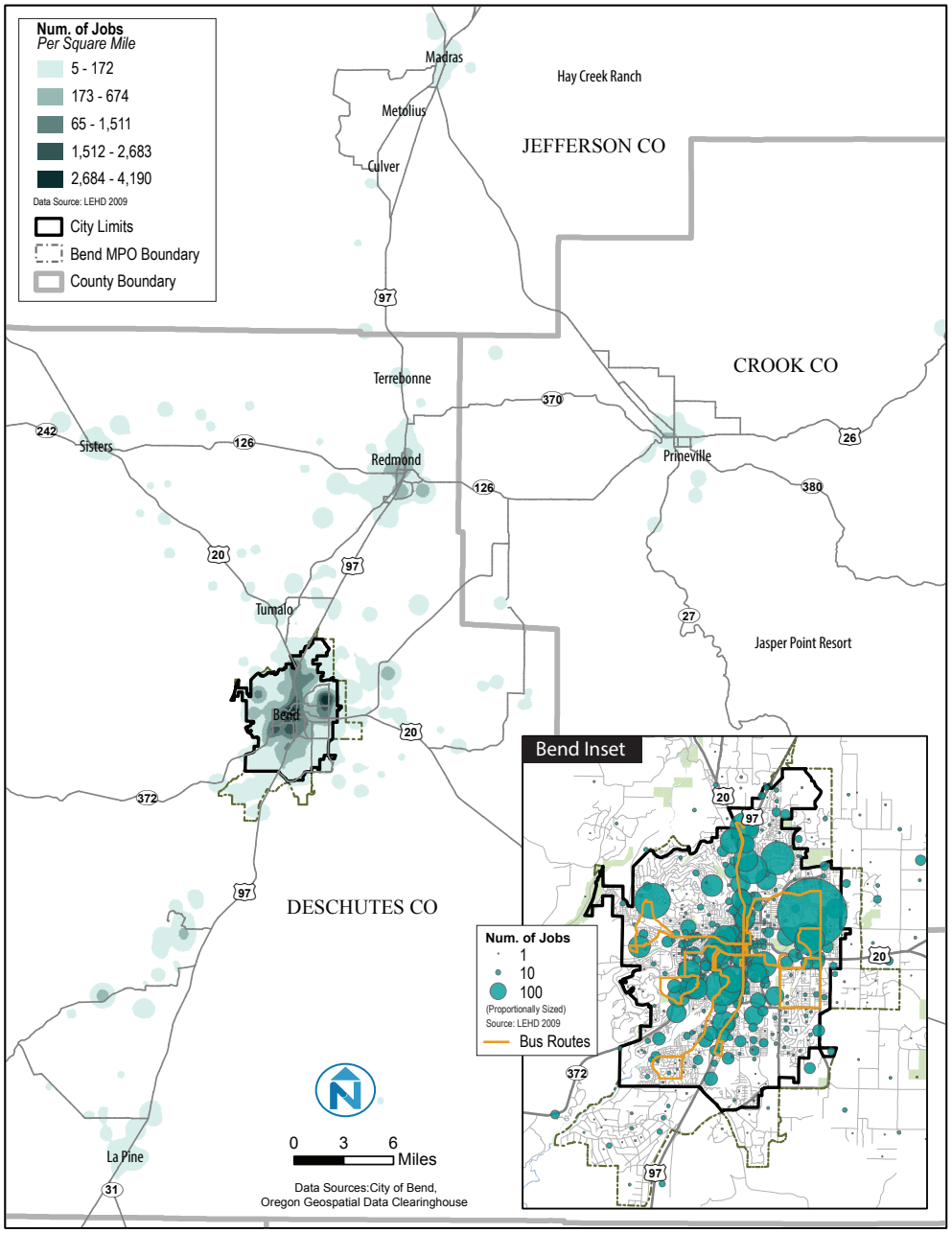
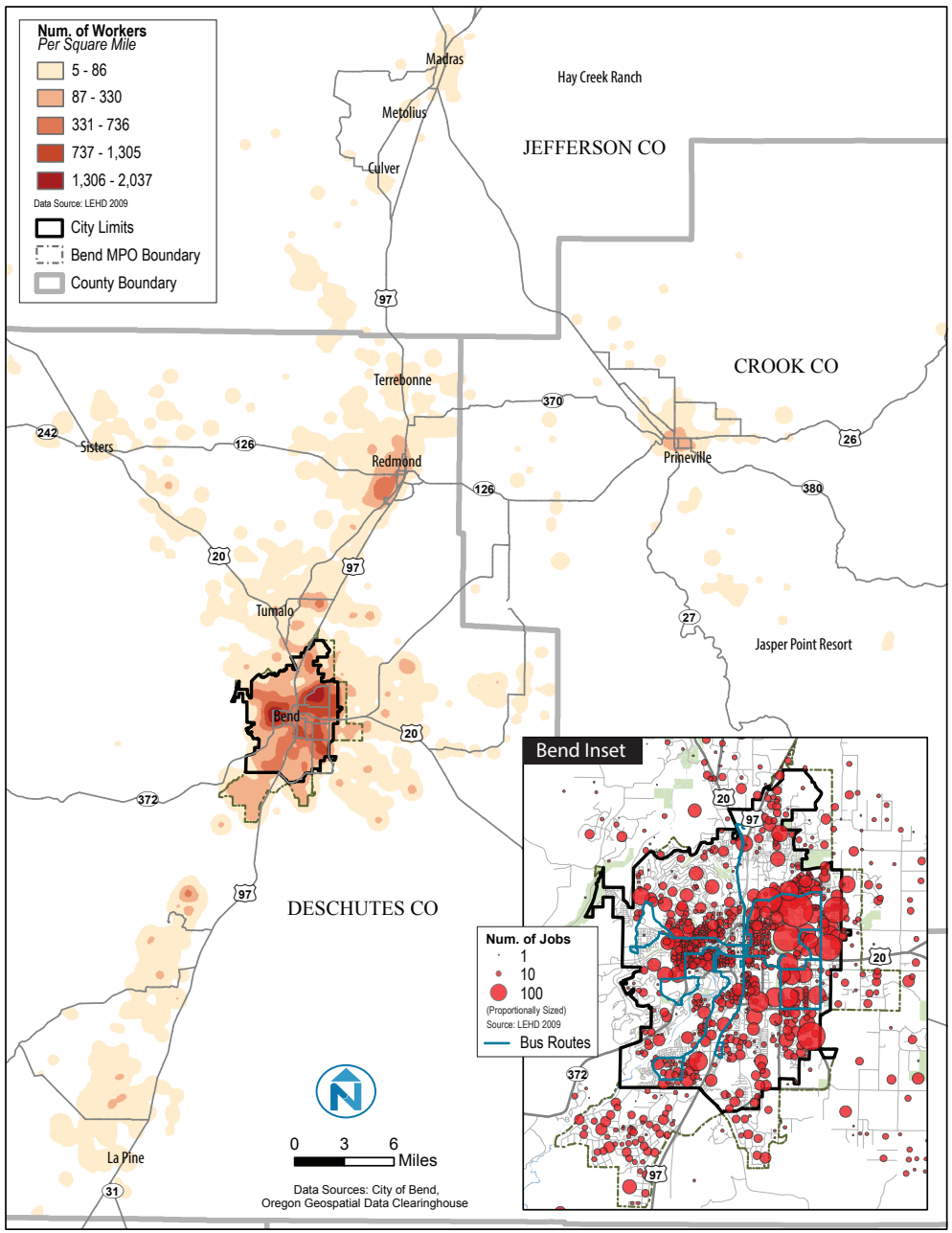


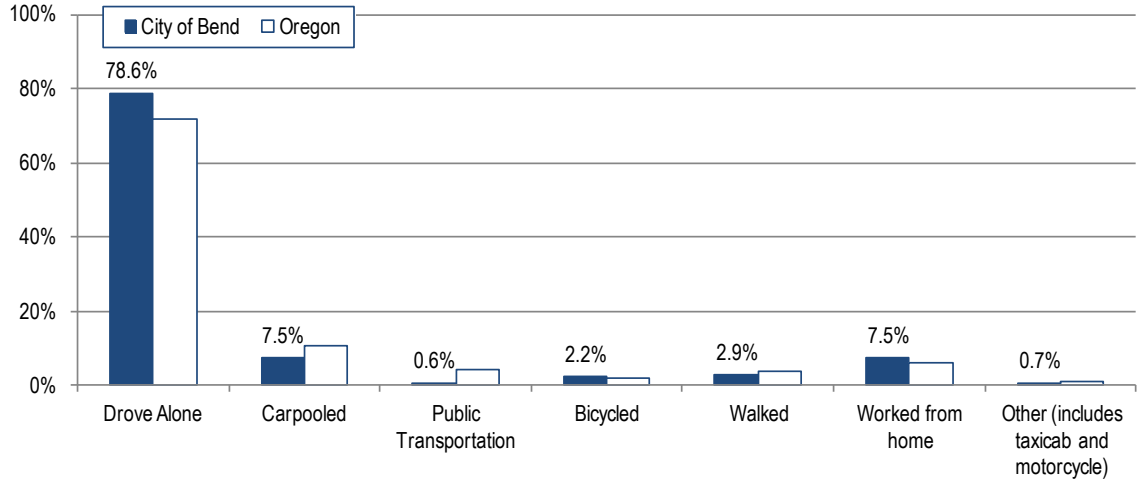
Figure 2-17 Home Locations of Bend Workers, 2009



Work Commute Mode

Figure 2-18 illustrates the percentage of work commute trips in Bend made by different forms of transportation (mode share), based on the ACS. Less than 1% of workers age 16 or older residing in Bend commute to work by public transportation, while over 2% bike to work and nearly 3% walk.

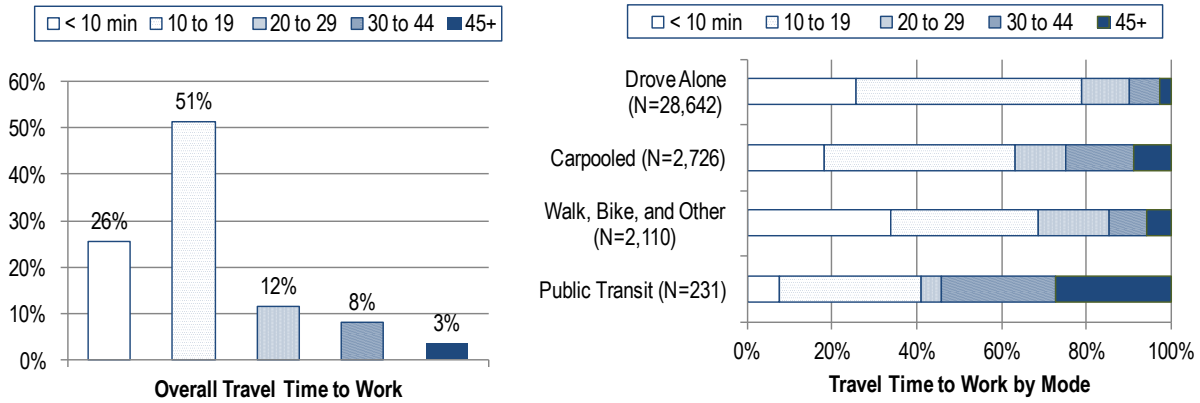
Figure 2-18 Commute Mode Share, 2006-2010 5-Year Average



Source: American Community Survey, 2006-2010 5-Year Average

The left panel of Figure 2-19 shows that most Bend residents have relatively short commutes; more than 75% of working residents travel fewer than 20 minutes to work. However, the right panel of Figure 2-19 shows that the majority of transit riders had commutes of 30 minutes or more (see lowest horizontal bar).

Figure 2-19 Commute Travel Time to Work, Overall and by Mode, 2006-2010 5-Year Average



Source: American Community Survey, 2006-2010 5-Year Average. "Other" includes walk, bicycle, taxicab, and motorcycle modes.

The Existing Conditions memo provides additional detail on existing land use and transit services.

3 EXISTING LAND USE AND TRANSIT SERVICES

EXISTING LAND USE

Land use and development in the City of Bend is guided by its adopted General Plan. The General Plan is implemented primarily by the City's development code. The City's General Plan and Zoning map illustrate land use or zoning districts, which define characteristics such as allowed land uses and intensity of development. These districts include several types of residential zones (low, standard, medium, and high-density), non-residential zones such as commercial or industrial, and mixed-use zones that allow both residential and non-residential uses to be combined on a site. The City's Urban Growth Boundary (UGB) establishes land appropriate for annexation and urban development based upon a 20-year population projection, and the Urban Reserve Boundary identifies the long-term expansion needs of the City beyond the 20-year period.

EXISTING TRANSIT SERVICES

Transit Overview

Local fixed-route bus service in Bend is operated by Cascades East Transit (CET) and serves developed areas within the Bend city limits. As shown in Figure 3-2, the system consists of seven routes that are designed to radiate in a "hub and spoke" pattern from the main transit center, Hawthorne Station (shown in Figure 3-1). CET Community Connector service provides direct regional connections between Hawthorne Station and La Pine and Redmond. From Redmond, the regional transit hub, additional connections are available to Redmond Airport, Prineville, Madras, and Sisters, as shown in Figure 3-3. CET also operates seasonal service to Mt. Bachelor and the Ride the River route in Bend. Figure 3-4 describes the characteristics of local, regional, and seasonal services.

In addition, Dial-A-Ride (curb-to-curb) service is available to persons with disabilities and low-income seniors within Bend city limits.

Local Fixed-Route Service

Seven local bus routes depart from Hawthorne Station on common schedules to facilitate transfers between routes. This timed-transfer system is known as a "pulse" and its "hub-and-spoke" design (see Chapter 7) allows any destination in Bend that is served by transit to be reached with no more than one transfer. Passenger stops are spaced at intervals ranging from two blocks to about a mile. Most routes terminate in a one-way loop to extend coverage at the end of each route or to turn the bus around.

- **Routes 1 (S. 3rd) and 4 (N. 3rd)** operate in both directions along 3rd Street (Highway 97 Business Route).
- **Routes 2 (Brookswood) and 11 (Galveston)** serve SW Bend, including downtown Bend and the Old Mill District.
- **Route 3 (Newport)** serves Central Oregon Community College (COCC), Northwest Crossing, and Summit High School.
- **Routes 5 (Wells Acres) and 6 (Bear Creek)** serve the portion of the city east of 3rd Street, north and south of Greenwood Avenue, respectively. These routes serve key activity centers including St. Charles Medical Center, the Forum Shopping Center, and the Senior Center.

Buses run every 40 minutes on weekdays, from about 6:20 AM to 6:15 PM. Service hours are slightly shorter on Saturdays and buses run every 80 minutes. There is no service on Sundays. Route 11, the newest local route, runs for slightly shorter weekday hours than other routes and has several gaps in service. Route 11 also does not run on Saturdays. A one-way fare is $1.50, discounted to $0.75 for seniors (age 60 and older) or persons with disabilities. A full-fare pass allowing all-day use costs $2.50 and a monthly pass costs $30.

All CET fixed-route buses have a rack that can carry two bicycles. In 2011, 1,700 bikes per month were brought on buses in Bend, on average.

Figure 3-1 Hawthorne Station

Hawthorne Station is located on SE Hawthorne Ave. directly east of 3rd Street. It has an indoor waiting area with restrooms and shelters for CET local and regional buses as well as other inter-city buses.

Figure 3-2 Existing Transit Services

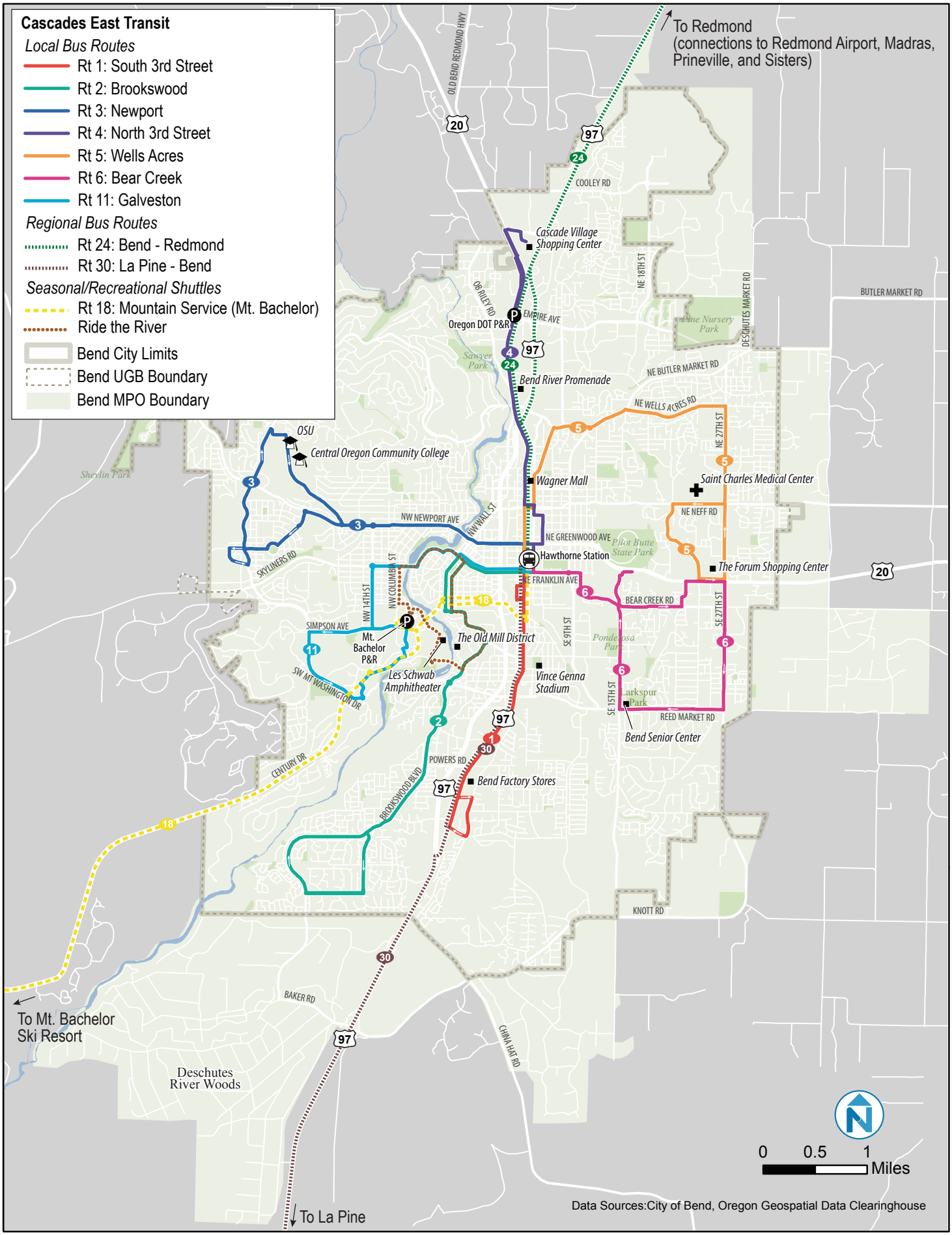


Figure 3-3 Existing Regional Transit Services

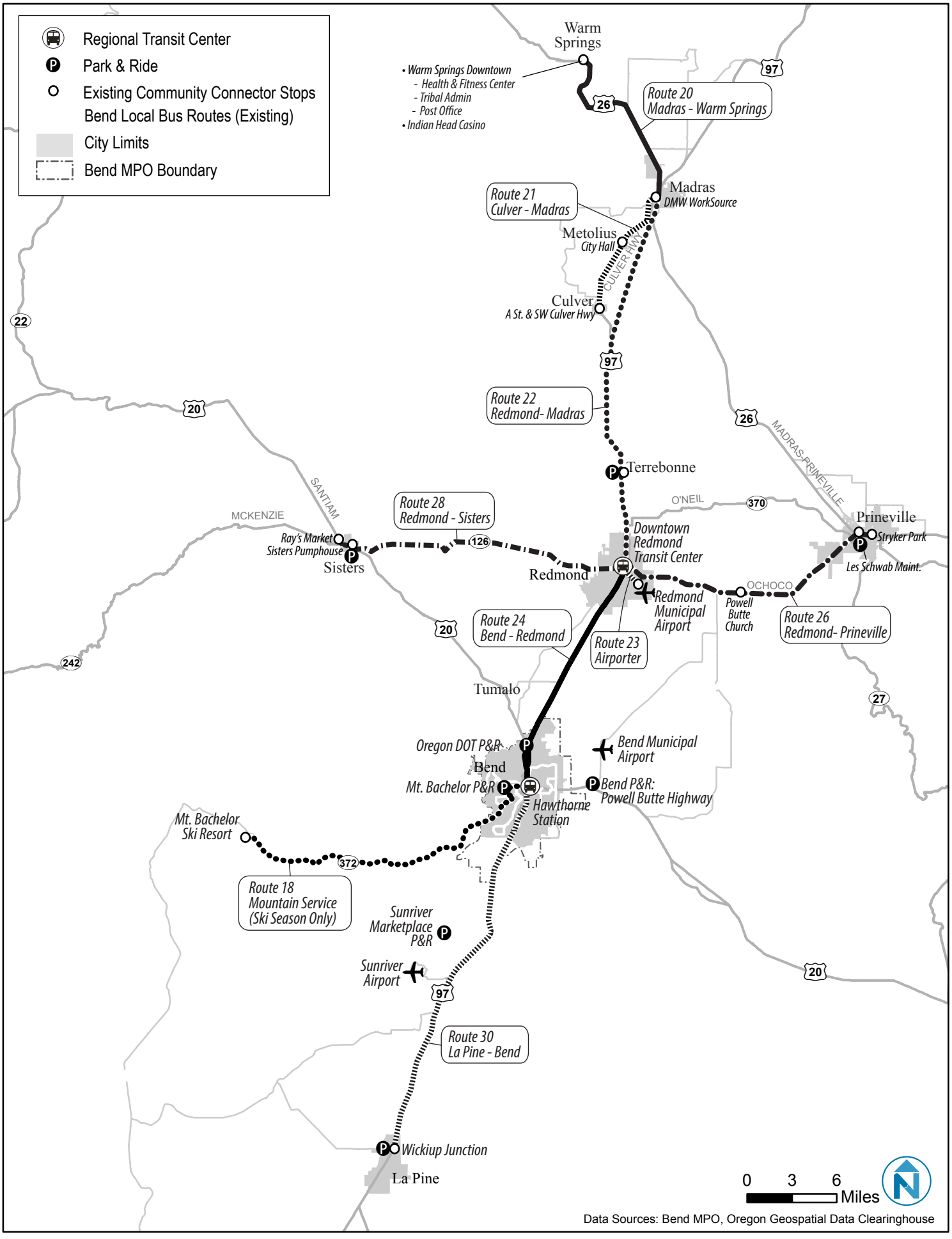


Figure 3-4 Bus Service Characteristics

Route # and Name	Days of Operation	Weekday[1,2] Hours of Service (Span)	Frequency or Number of Daily Trips	Key Destinations/ Connections [3]
Bend Local Service				
1 South 3rd St.	Mon - Sat	6:20 AM – 6:15 PM [1]	40 minutes, 80 minutes Saturdays	Fred Meyer, Bend Factory Outlets, Walmart
2 Brookswood	Mon – Sat	6:20 AM – 6:15 PM [1]	40 minutes, 80 minutes Saturdays	Downtown Library, Old Mill District
3 Newport	Mon – Sat	6:20 AM – 6:30 PM [2]	40 minutes, 80 minutes Saturdays	COCC/OSU Campus, Summit High School
4 North 3rd St.	Mon – Sat	6:20 AM – 6:15 PM [2]	40 minutes, 80 minutes Saturdays	Cascade Village, ODOT Park & Ride (P&R)
5 Wells Acres	Mon – Sat	6:20 AM – 6:15 PM [1]	40 minutes, 80 minutes Saturdays	Mtn. View High School, St. Charles Medical Center, Forum Shopping Center
6 Bear Creek	Mon - Sat	6:20 AM – 6:15 PM [2]	40 minutes, 80 minutes Saturdays	Senior Center, Municipal Court, Bend High School, Veterans Center, Worksource Bend
11 Galveston	Mon - Fri	7:20–5:45 PM (not continuous)	40 minutes (no service 9:50–11:20 AM, 12:30 – 2:40 PM, and 3:50–4:40 PM), no service on Saturdays	Mt. Bachelor Park & Ride, Social Security, Bend Memorial Clinic
Selected Regional Services [4]				
24 Redmond-Bend	Mon – Fri	6:00 AM – 6:30 PM	4 AM and 4 PM round trips (no midday service from 11:10 am – 1:20 pm)	From Redmond, regional connections include Madras (22), Prineville (26), Sisters (28)
30 La Pine-Bend [4]	Mon – Fri	6:45 AM – 6:15 PM	To Bend: 2 AM, 1 PM. To La Pine: 1 AM, 2 PM. No service from about 9:00 AM-3:30 PM	Wickiup Junction P&R (Burgess Road & Hwy 97)
23 Redmond-Airport	Mon – Fri	7:00 AM – 5:30 PM	4 AM and 3 PM round trips (no midday service, from about 11:30 AM - 2:30 pm)	Redmond Transit Center to Redmond Airport
Seasonal Shuttles				
18 Mt. Bachelor	Daily	6:40 AM – 5:40 PM	During ski season, 6 trips to Mt. Bachelor (one additional Wed. trip) and 5 return trips to Bend.	Mt. Bachelor P&R (SW Columbia & Simpson). 2 round trips serve Hawthorne Station.
Ride the River	Fri – Mon	11:35 AM – 6:45 PM	During summer (3rd weekend in June to Labor Day), every 30 minutes	Drake, McCay, and Riverbend Parks

Notes: (1) Saturday service runs from approximately 7:20 am to 5:15 pm. (2) Saturday service runs from approximately 8:00 am to 4:30 pm. (3) All listed routes except Redmond Airport Shuttle and seasonal shuttles serve Hawthorne Station. (4) Reflects regional service changes effective 10/1/2012.

Activity Centers and Boarding Activity

Figure 3-6 illustrates major activity centers in Bend in relation to fixed-route bus service and a "network buffer" that illustrates a quarter-mile walking distance to/from bus stops. This map shows that transit is within a reasonable walking distance of many major destinations in Bend.

Figure 3-7 illustrates boarding and alighting activity along each bus route. The map illustrates distribution of activity along each route and underutilized portions of routes. Figure 3-5 identifies stops with the highest boarding activity.

Figure 3-5 Weekly Boardings and Alightings for Top 15 Bus Stops

Stop #	Route	Stop Description	Boardings	Alightings	Shelter
MAIN	All	Hawthorne Station	4,046	3,655	Yes
317	3	COCC (Library)	602	552	Yes
614	6	East side of 15th at Riviera	194	157	No
413	4	West side of 3rd S. of NE Mervin Samples	164	48	No
533	5	West side of NE Purcell N. of NE Lotus	159	106	No
203	2	West side of NW Wall at Library	150	216	No
411	4	Cascade Village Mall, N. end of JC Penney	149	172	No
608	6	South side of Hwy 20 at NE 27th	146	134	No
302	3	North side of Greenwood and Bond	128	112	No
229	2	East side of NW Bond S. of NW Kansas	125	41	Planned*
112	1	West side of S. Hwy 97 north of Pinebrook	106	111	Yes
619	6	1645 NE Forbes in WorkSource parking lot	105	65	No
404	4	East side of 3rd N. of Revere (Wagner Mall)	104	81	Yes
539	5	NE 27th at Forum Shopping Center	99	55	No
517	5	NE Neff at St. Charles Medical Center	96	78	Yes

Note: * As of 5/2012. Additional planned shelters include stop #'s 412, 108, 537, 1133, 1130, 1136.

Source: CET Boarding and Alighting Survey, 1/14/2012 to 1/19/2012, and CET Bus Stop Inventory as of 12/3/2012.

Figure 3-6 Major Activity Centers

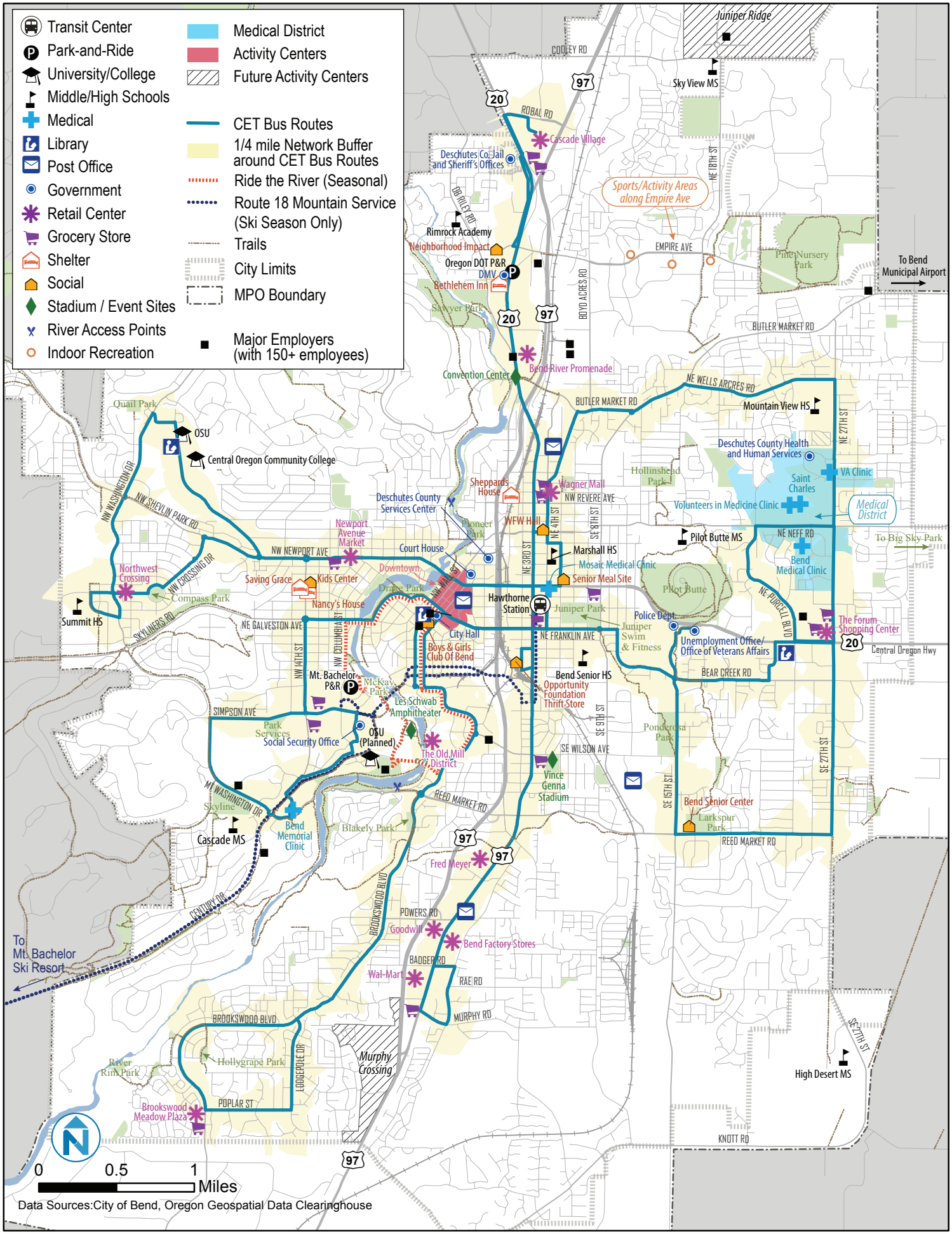
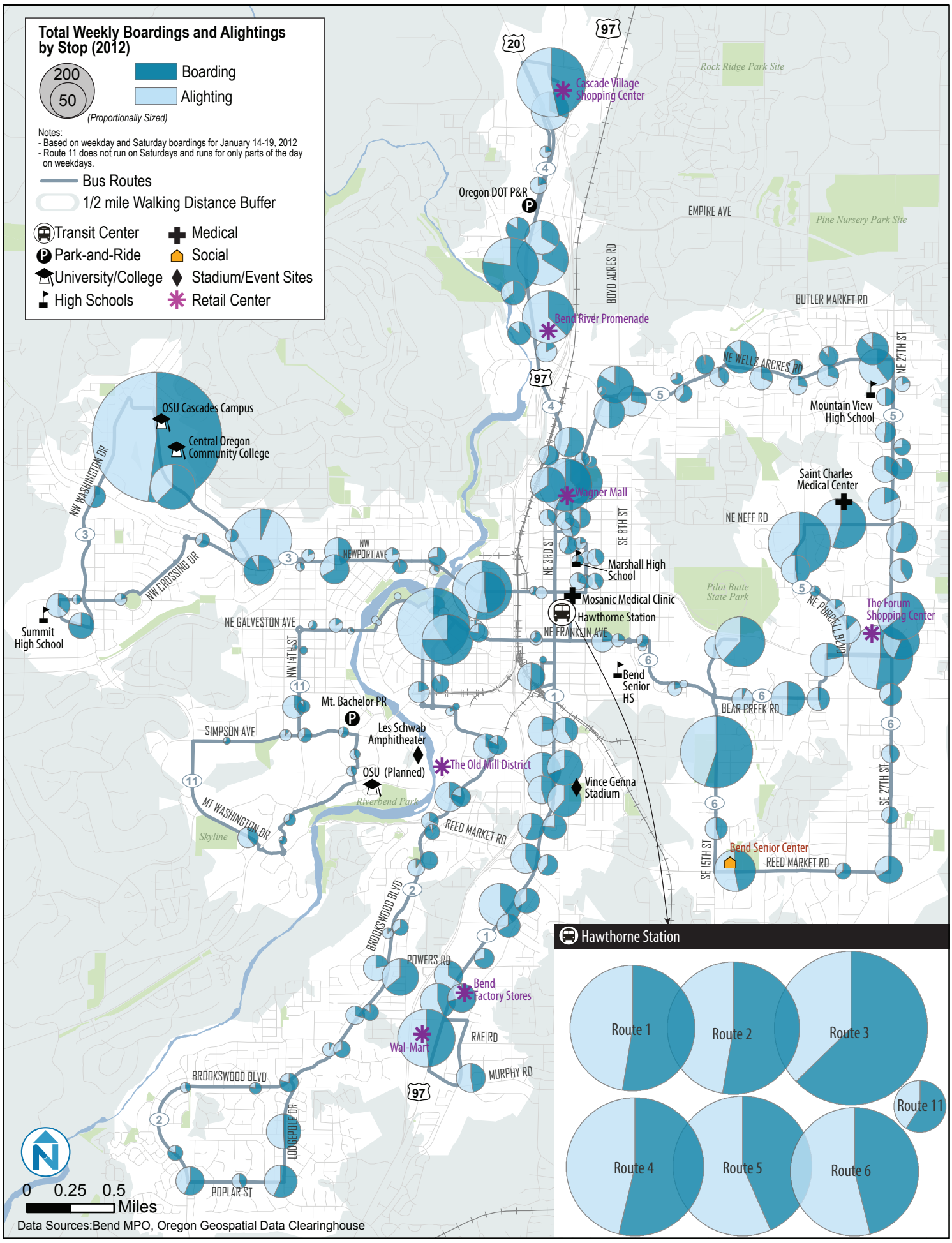


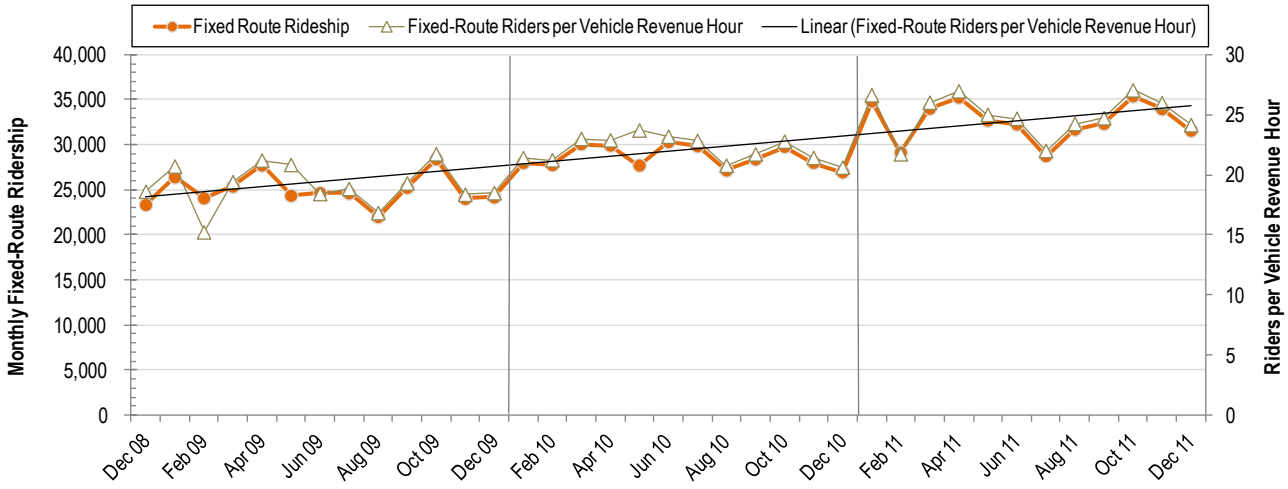
Figure 3-7 Existing Weekly Transit Boardings and Alightings, 2012



System Performance

The fixed-route system in Bend served over 391,000 rides in calendar year 2011. Figure 3-8 illustrates that ridership on the fixed-route system increased over the past three years. Productivity, or the number of riders carried per vehicle revenue hour, has also increased; the additional ridership was served using existing capacity in the system (without additional vehicles or trips).

Figure 3-8 Monthly Fixed-Route Ridership and Productivity by Route, 2009-2011

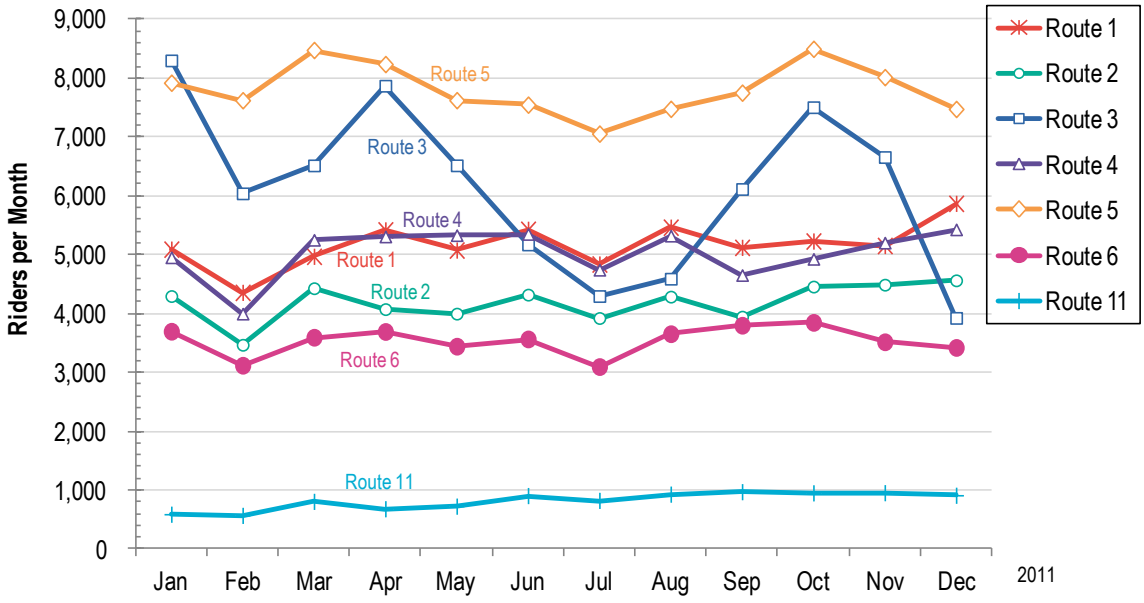


Source: Data from Cascades East Transit

Figure 3-9 shows ridership for each fixed-route in 2011. Route 5 (serving the St. Charles Medical Center area) and Route 3 (serving the COCC/OSU campus) are the highest ridership (and most productive) routes in the system, serving nearly 24% and nearly 19% of total ridership, respectively. Ridership on Route 3 declines significantly outside of COCC school sessions. Route 11 (Galveston corridor) has the lowest ridership and productively of the Bend local fixed-routes, but operates for limited hours, with fewer trips per day than other routes, and does not run on Saturdays.

Based on data from November, 2011, the average number of daily boardings ranges from about 1,500 to 1,700 on weekdays and about 400 on Saturdays, which includes transfers. It is estimated that approximately 600-650 individual riders use the fixed-route system each weekday. Routes 1, 4, and 5, which provide access to retail and services, have the strongest Saturday ridership.

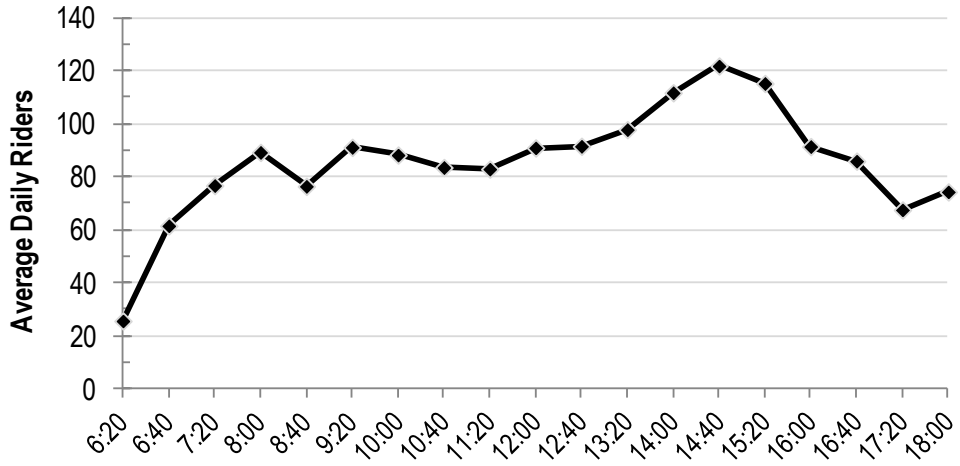
Figure 3-9 Monthly Ridership by Route, 2011



Source: Data from Cascades East Transit

Ridership is consistent throughout the day and is strongest in the midday period on most routes, peaking between about 2:00 – 3:00 PM, illustrated in Figure 3-10. This indicates that a primary use is for non-commute trips, such as shopping or errands. The lack of evening service hours limits the utility of the system for work shifts beyond 6 PM, such as at St. Charles Medical Center, or for many service sector jobs.

Figure 3-10 Average Weekday Ridership by Time of Day, November 1-14, 2011



Source: Data from Cascades East Transit

Dial-A-Ride

Dial-A-Ride (DAR) curb-to-curb service is provided for individuals with disabilities who cannot ride the fixed-route bus system, as well as for low-income seniors. Priority is given to persons with disabilities. DAR operates seven days a week within Bend city limits. The geographic coverage and days/hours of availability, listed in Figure 3-11, exceed the requirements for complementary paratransit service specified by the Americans with Disabilities Act (ADA) of 1991.[8] Up to 10 vehicles are in service at any time.

Figure 3-11 Dial-A-Ride Service Characteristics

Days and Hours of Service	Scheduling Hours	Peak Vehicles in Service
Monday – Friday: 6:30 AM - 6:00 PM Saturday: 7:45 AM - 5:00 PM Sunday: 8:45 AM - 3:15 PM	Monday-Friday 7:30 AM - 4:30 PM	10

Source: Cascades East Transit

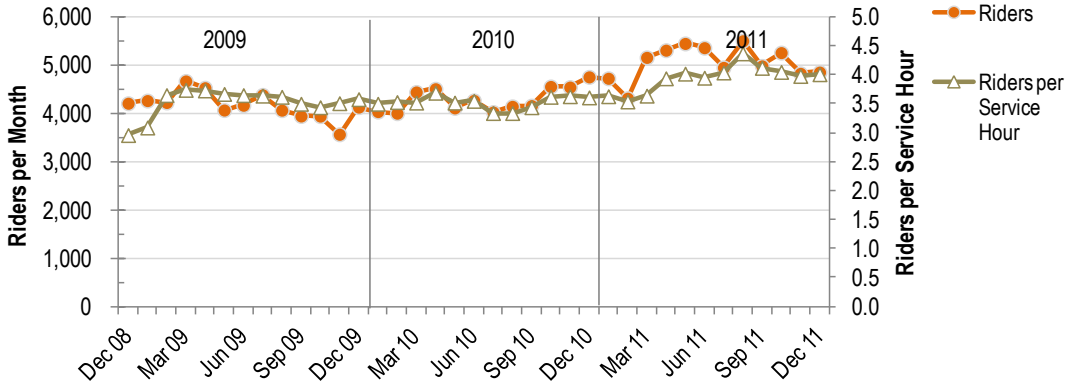
A full-fare one-way trip costs $2.50, one dollar more than a trip on fixed-route bus service. A 50% discount is available for low-income disabled passengers or low-income seniors (60 and older).

Reservations may be made for the next day or up to 14 days in advance, but same day rides or changes are not accepted. DAR allows subscription, or regularly scheduled, trips subject to a 30-day waiting period and on a first-come, first-served basis. Riders must complete an eligibility process to use the service.

Dial-A-Ride Performance

Figure 3-12 illustrates DAR ridership for 2009-2011, in relation to the number of rides provided per vehicle hour (productivity).

Figure 3-12 Monthly Dial-A-Ride Ridership and Productivity, 2009-2011



Source: Data from Cascades East Transit

[8] The ADA requires that door-to-door trips be offered to ADA- eligible customers between origins and destinations located within ¾-mile of fixed-route transit services. One-way fares may be up to double the one-way fixed-route fare for the same trip distance.

Operating Cost, Performance Indicators, and Funding

In fiscal year 2009-2010, the operating cost of fixed-route service was approximately $1.5 million, of which over 10% was recovered from fares. The average cost per hour of fixed-route service was about $72 per vehicle hour. Dial-A-Ride service costs an additional $1.0 Million to operate. As shown in Figure 3-13, it is over four times more expensive to serve a trip on Dial-A-Ride than an individual boarding on fixed-route service.

Figure 3-13 also compares several cost performance metrics for Bend fixed-route and DAR service to metrics for a set of peers. The cost per hour of fixed-route service is lower than the peers, while the DAR cost is higher. This may relate to a larger service geography than is required by the ADA. The cost per passenger is lower than the peer average for both fixed-route and DAR. Fixed-route services recover a lower share of operating cost from fares than peers, while DAR fare cover the same percentage of operating cost as the peer services.

Figure 3-13 Summary of Performance and Operating Costs, FY 2009-2010

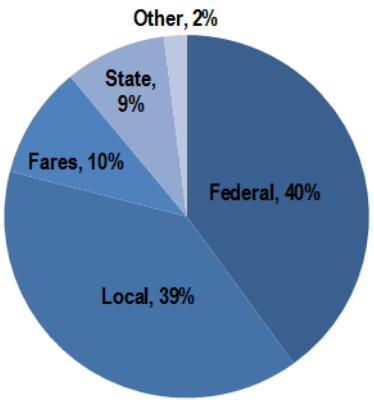
Service Type	Ridership (Unlinked Trips)	Operating Cost	Cost per Vehicle Revenue Hour	Cost per Ride (Unlinked Trip)	Farebox Recovery
Fixed-Route					
Bend	327,904	$1.5 M	$71.24	$4.54	10.9%
Peer Average*	-	-	$99	$5.18	13.2%
Dial-A-Ride					
Bend	49,524	$1.0 M	$72.08	$20.34	8.2%
Peer Average*	-	-	$58	$24.79	8.2%

Notes: * Peer data includes RVTD in Medford (OR), Everett and Yakima (WA), Redding (CA), Pueblo (CO), and Santa Fe (NM) for 2010.

Source: National Transit Database

To support fixed-route and Dial-A-Ride service, the City of Bend provides transit operating funding of over $1 million from its general fund, the largest non-federal revenue source, to meet the requirement for local matching funds for Federal section 5307 and 5310 funds. Federal funds provide about 40% of operating costs.

Figure 3-14 Operating Funding Sources, FY 2009-2010



Source: National Transit Database, 2010

The Existing Conditions memo provides additional detail on the onboard rider and online community surveys, as well as other community input.

4 COMMUNITY INPUT

This chapter describes the results of focused outreach efforts conducted as part of the project, including an onboard bus rider survey, an online community survey, several mobile outreach events, and a public open house.

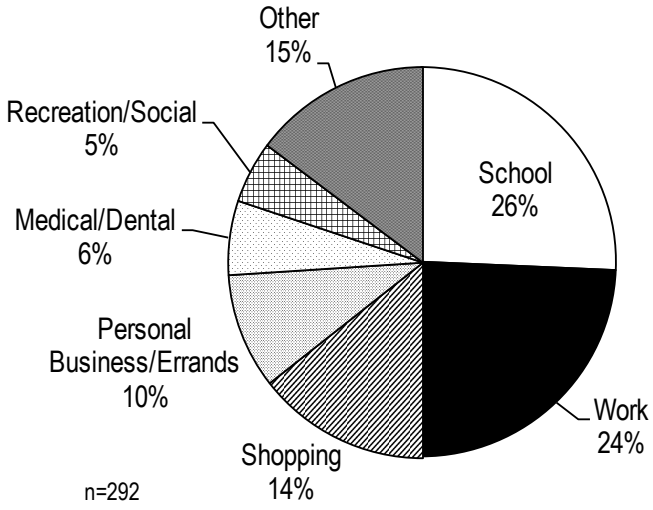
ONBOARD SURVEY (MARCH, 2012)

An on-board vehicle survey was conducted on fixed-route transit vehicles in Bend between March 12-17, 2012 to obtain information about the travel patterns, demographic characteristics, and perceptions of existing transit riders.[9] Survey forms were available in both English and Spanish, and 323 total surveys were completed.

Passenger Trip Purpose

School trips comprise over a quarter of the trips, while work trips make up about 24%, a relatively small share of trips. About half of trips serve other purposes, including shopping, personal business, and recreation/social visits, or combinations of trip purposes. The results are consistent with the system's strong midday ridership and relatively low late afternoon/evening ridership. A high proportion of non-work trips is not surprising given that service stops running at around 6 PM.

Figure 4-1 Onboard Survey: Trip Purpose

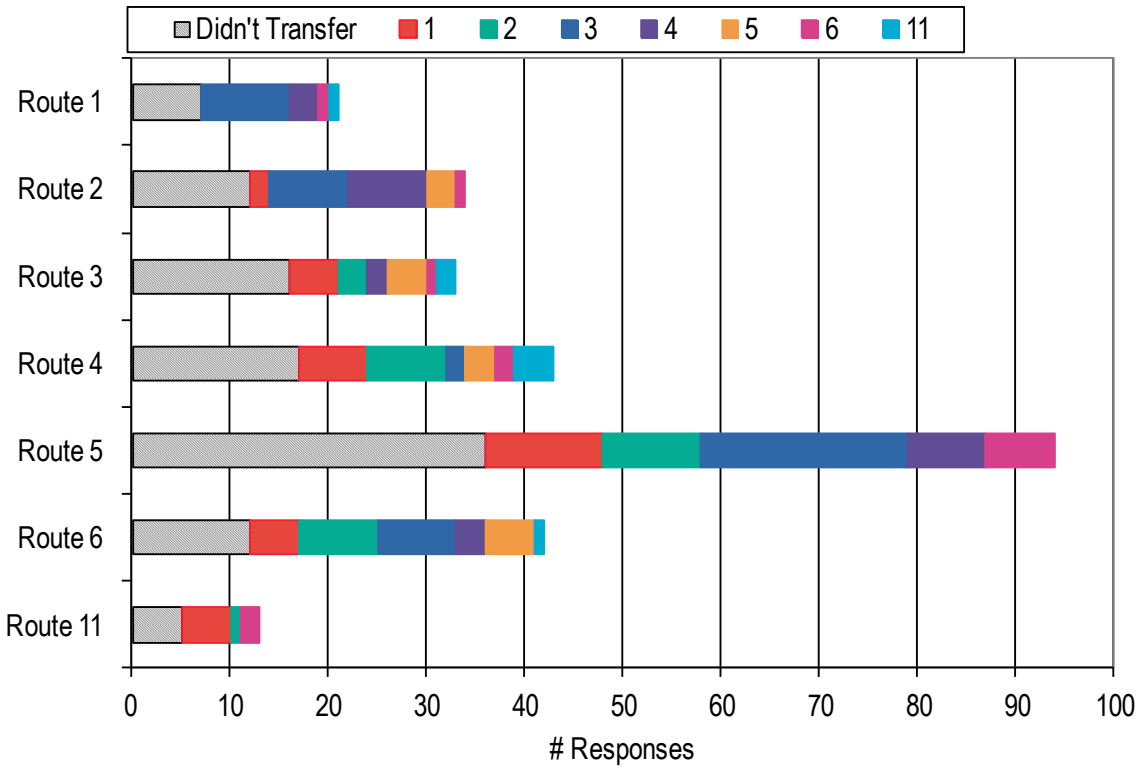


[9] While focused on Bend, the survey was conducted as part of the COIC Regional Transit Master Plan.

Transfer Activity

Over 60% of surveyed passengers making local trips in Bend required a transfer to complete their trip. As illustrated in Figure 4-2, the most significant transfer activity is on Route 5 (Wells Acres) to/from Route 3 (COCC). Routes 1, 2, and 6 also have moderately high transfers to Route 5. A high transfer rate is typical of a hub-and-spoke system such as in Bend (see Chapter 7). This system design allows local passengers to reach any point served by the local route system using no more than two buses, and also regional passengers to reach any point on the system with a transfer at Hawthorne Station, but can result in a longer travel time for some trips.

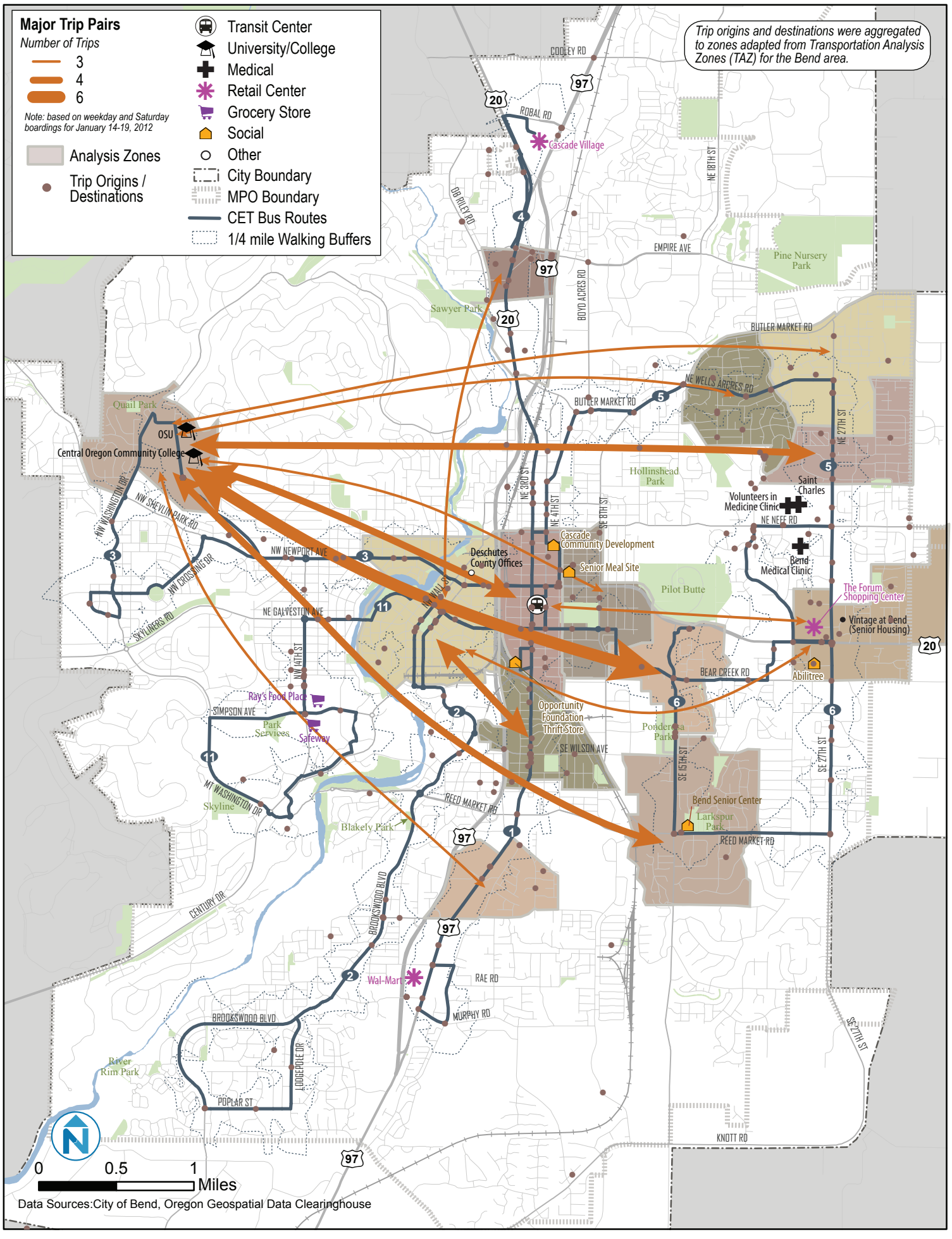
Figure 4-2 Onboard Survey: Transfer Patterns by Route



Major Travel Patterns

Figure 4-3 shows the locations of passenger origins and destinations for respondents that provided this information (and where it was possible to map the location provided). The map illustrates major common travel patterns, including to or from COCC and downtown. Many of these patterns require a local-to-local or regional-local transfer at Hawthorne Station.

Figure 4-3 Onboard Survey: Major Fixed-Route Origin-Destination Patterns

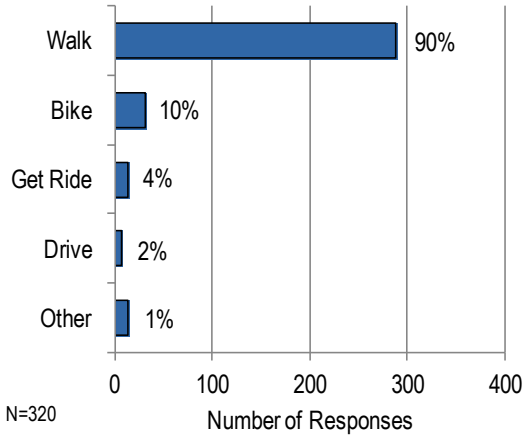


System Access

Most passengers (about 90%) walk to the bus stop, as shown in Figure 4-4, and of these passengers, 87% walk 10 minutes or less to/from the bus. A relatively small number of passengers walk between 16 and 50 minutes to/from the bus.

Bicycling is the second highest means of access to the bus (10%) and most bicyclists travel between one and three miles to get to the bus (55%), while 35% travel less than a mile.

Figure 4-4 Onboard Survey: How do you typically get to and from the bus stop?

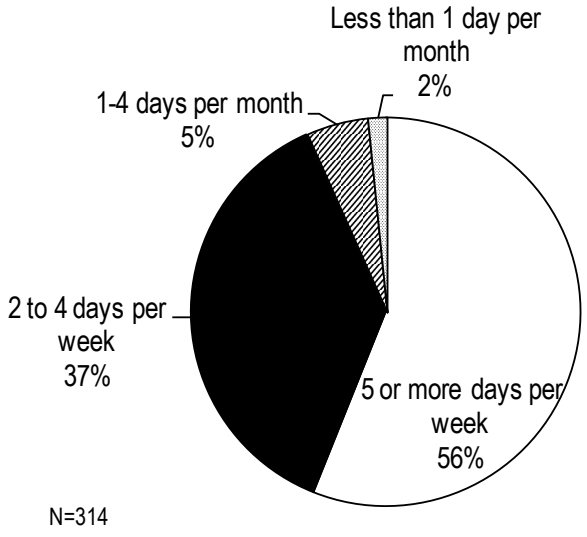


Usage Patterns

The majority of passengers (56%) are daily riders, using the bus 5 or more days per week, while 37% ride frequently (2 to 4 days per week). Combined, 93% of riders captured by the survey use the system multiple days per week.

Seventy percent (70%) of riders have been using the system for over a year, including over a quarter of riders who have been riding for over four years. However, the system is also attracting new passengers (28% less than a year), which includes regional passengers.

Figure 4-5 Onboard Survey: How often do you ride CET buses?

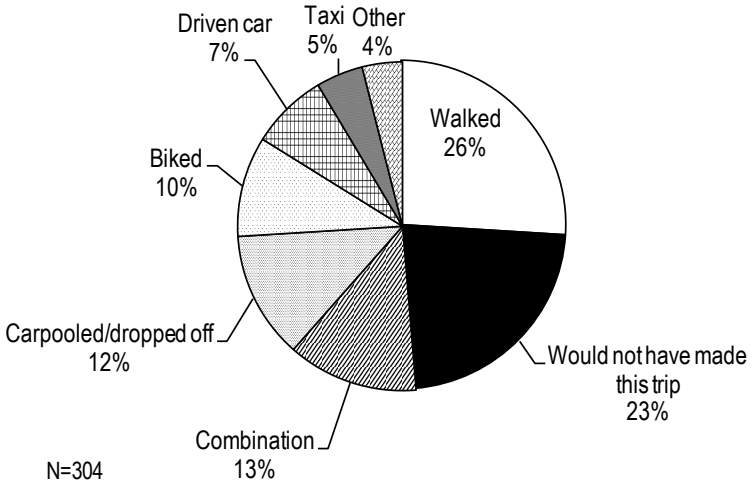


Reliance on Transit

If CET bus service was not available, over a quarter of respondents would have walked to their destination, which reflects relatively short trip distances in Bend. Nearly a quarter reported that they would not have made the trip. Others would have gotten a ride, biked, or driven a car.

These results suggest that the fixed-route system serves a high proportion of "transit-dependent" riders and a relatively small number of "choice" riders, although the majority of passengers have a variety of transportation choices.

Figure 4-6 Onboard Survey: How would you have made this trip if CET bus service was not available?



Note: It is likely that these results will vary significantly at different times of the year.

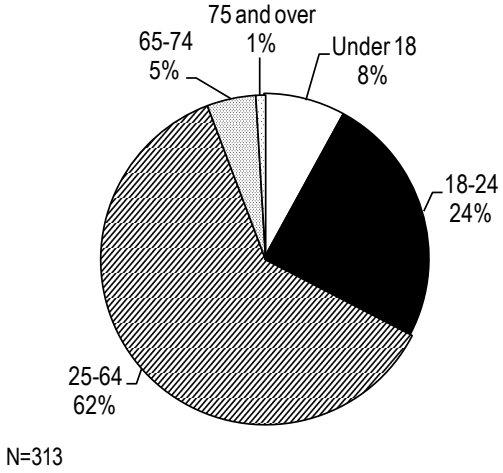
Demographic Characteristics

The majority of passengers (62%) are between age 25 and 64, as shown in Figure 4-7. About a quarter are between 18 and 24 years old. Less than 10% of passengers are under age 18, while only 6% are 65 or older.

Nearly a third of passengers are students, nearly a quarter are unemployed and seeking work, while 22% are employed part-time and 21% are employed full-time.

Passengers are predominantly lower-income; 63% have a household income of less than $15,000 annually and a total of 81% have a household income below $25,000. About 17% of riders have a household income between $25,000 and $74,999, while only 2% live in households earning $75,000 or more.

Figure 4-7 Onboard Survey: Age



Passenger Satisfaction and Improvement Priorities

Transit riders are mostly satisfied with fixed-route bus service overall. Nearly 40% rate overall service as "Excellent" and a total of 86% rate service as either "Excellent" or "Good." As shown in Figure 4-8, riders are most satisfied with the courtesy of drivers (over 65% "Excellent"). On-time arrivals received the fewest positive ratings; nearly a quarter of passengers rated on-time arrivals as "Fair" or "Poor." This is an especially important finding as timed transfers between routes are a very important part of the system. Several written comments specifically mentioned Route 5. Several other attributes were perceived slightly more favorably, but still rated over 20% "Fair" or "Poor," including condition of stops, passenger information (maps and schedules), ease of transfers, ease of understanding the system, availability of seats on the bus.

Figure 4-8 Onboard Survey: Perception of CET Bus Service

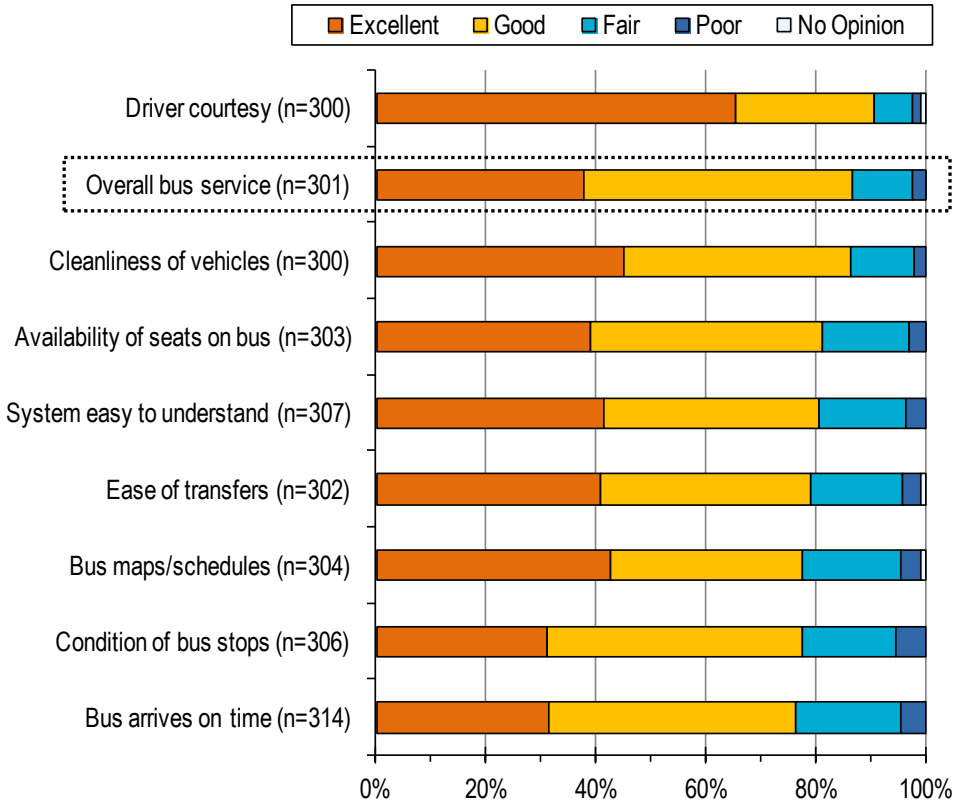
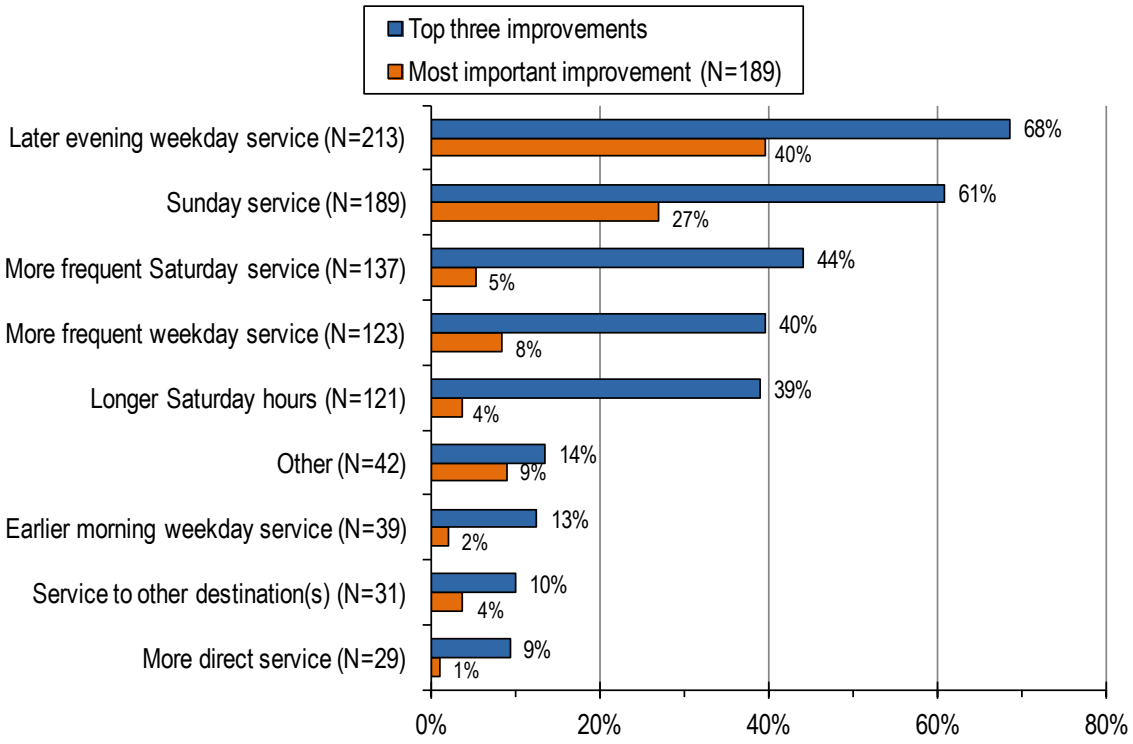


Figure 4-9 illustrates the priority system improvements that bus riders identified as influencing their choice to ride the bus more often. Later evening weekday service and Sunday service are among the top three priorities for over 60% of riders, and are also the most important improvement for 40% and 27% of riders, respectively. No other improvements are identified as one of the top three priorities by 10% or more of riders. More frequent service, both on Saturdays and

on weekdays, and longer Saturday hours are all identified as priority improvements by a substantial share of riders (nearly 40% or more).

Figure 4-9 Onboard Survey: Priority Improvements



Service that runs until 10:00 PM would meet the needs of most riders (86% of riders who identified later service as a priority), and starting service at 5:00 AM would meet the needs of most riders (85% of riders who identified earlier service as a priority).

Passenger Comments—Key Themes

A selection of open-ended comments provided by passengers is provided in Figure 4-10. Many of the comments relate to priority improvements, including Sunday service, later evening service, and additional shelters. Comments on specific routes include improving frequency, hours, and Saturday service on Route 11 and addressing schedule or routing issues on Route 5.

Figure 4-10 Onboard Survey: Selected Open-Ended Comments by Category

Category	Number of Comments	Example(s)
Driver Commendation	19	▪ You guys rock. I love the transit system and 90% of its employees. I feel the buses give me the chance to accomplish things and go places without being strained. Thank you so much for your service to this community.
Sunday	11	▪ I would ride it to church with my son, while now if we don't have a ride we don't go.
Later	8	▪ … later bus service would likely be more popular in the evenings with the amount of immobile teenagers who want to go downtown or shopping or to the movies. ▪ …I go to college at COCC, there are certain classes that I… need to take that are late classes. ▪ Most people riding bus work "service related" jobs (Walmart, restaurant, fast food). We are not 9-5 workers.
Stop Amenities	8	▪ Benches and covered stops would be nice during winter months.
General Praise	7	▪ My whole household uses CET, and has for years. We're 6, 18-27 year old college kids and we rely on this. We'd use it a lot on weekends! Please expand!
Saturday - Route 11	6	▪ Please run #11 more often and on Saturday. #11 is the best way to the westside BMC and Athletic Club and shopping. ▪ Route #11 needs to start earlier— if you need to be at work by 8:00 a.m. you're out of luck. Too many service breaks on #11 and walking from library to Century Drive is ok in summer but sure gets old in winter.
Route 11 Frequency or Hours	6	
Frequency	5	▪ More frequent weekday bus service in rush hour ▪ If you were able to return to the original 30 minute headway, there would be 2 positive results: a. more efficient use of time. b. It would be far easier to remember bus times.
Specific Coverage, Routing, or Stop Issues	5	▪ Please consider a route off of Empire Avenue or 18th St. ▪ …I feel like the CET bus should go into Deschutes River Woods. So a lot of people don't have to walk an extra 3 miles in the bad weather to get close to home.
Route 5 Schedule or Other Issues	4	▪ Not a fan of the #5 schedule. It's not at regular intervals so makes it more difficult to time buses. ▪ BMC is one of the last stops and should be one of the first stops.

COMMUNITY SURVEY (FEBRUARY-APRIL, 2012)

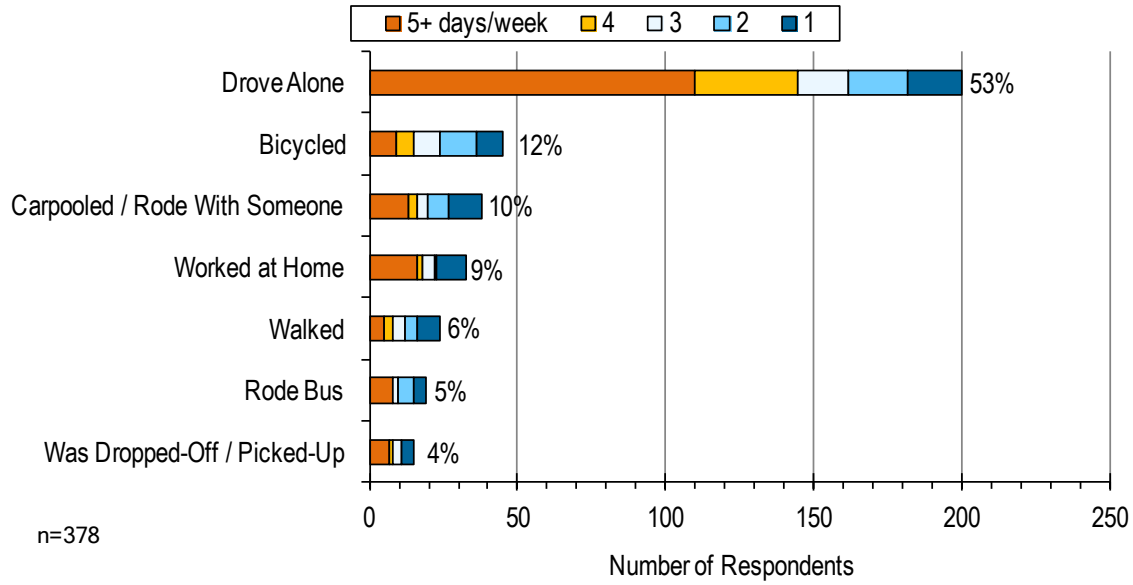
To receive input from the broader community, including more infrequent transit riders and non-riders, an online (web-based) survey was developed and made available between February and April 2012. Over 420 survey responses were received.

Respondent Characteristics

Characteristics of survey respondents include:

- Over 88% reside in Bend, including about 10% who live outside city limits.
- Nearly 66% work in Bend, over 13% are retired, and nearly 16% attend school or college.
- As shown in Figure 4-11, the majority of respondents drive alone to work (53%), but only a little more than half of those individuals drive five days per week. Overall, only 44% of respondents use the same mode five or more days per week. The second largest share of respondents bicycle to work at least once a week (12%), although only a fifth of those do so every day. About 5% of respondents use transit to get to work. In addition, about 14% of respondents use a CET bus to get to school while about 11% ride the COCC Shuttle or a school bus.

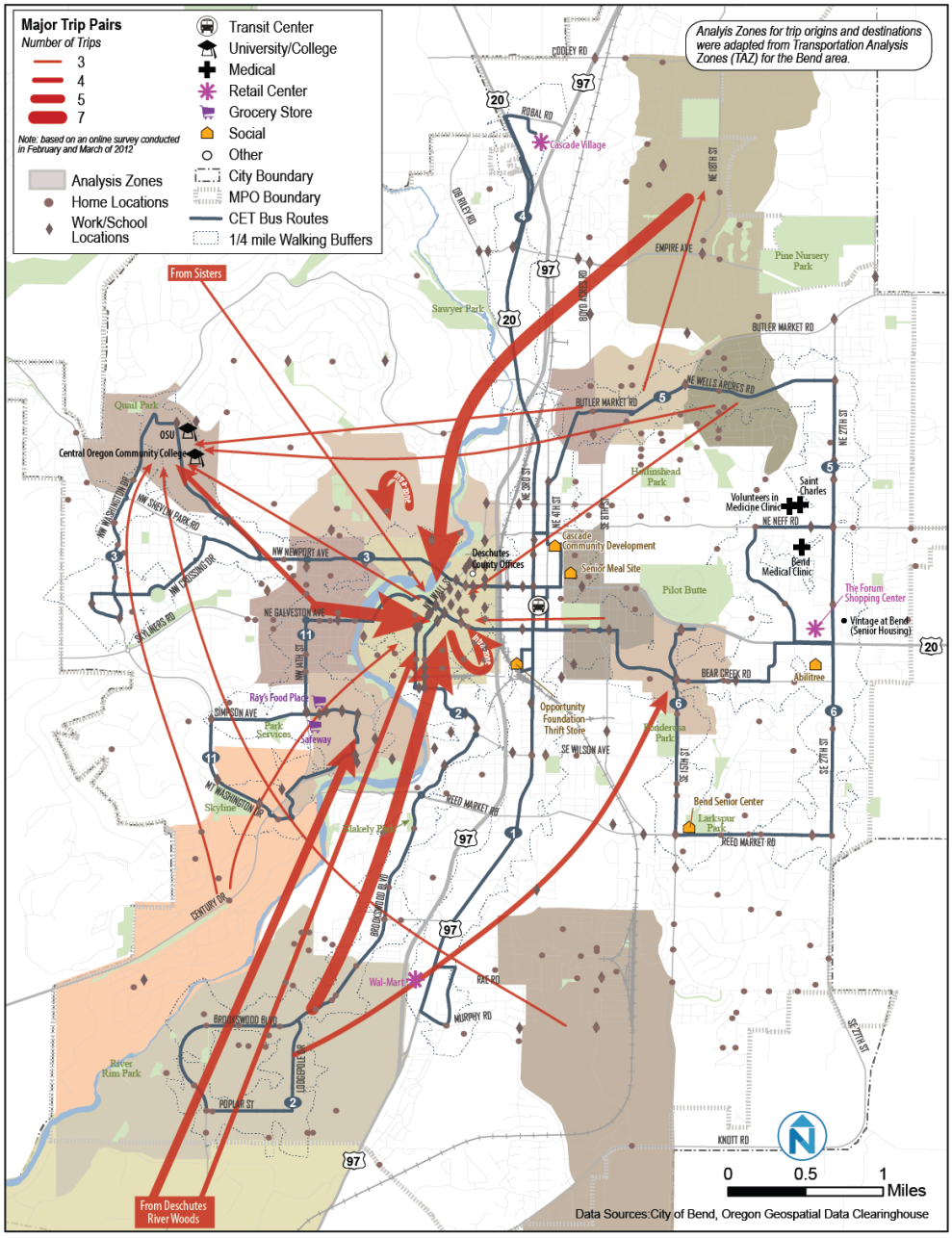
Figure 4-11 Online Survey: Commute Mode to Work by Number of Days Used



Travel Patterns

Figure 4-12 shows the locations of respondents' work and school commute origins and destinations in relation to existing transit routes. The trip patterns were categorized by zones and the map also illustrates the most significant common origin-destination patterns. Examples of major trip patterns not served by transit include between outer NE Bend and downtown, between Deschutes River Woods and downtown, and outer SE Bend to COCC.

Figure 4-12 Online Survey: Work/School Commute Origin-Destination Patterns



Satisfaction with Work/School Commute and Perceptions of Existing Transit Service

Satisfaction with Work/School Commute

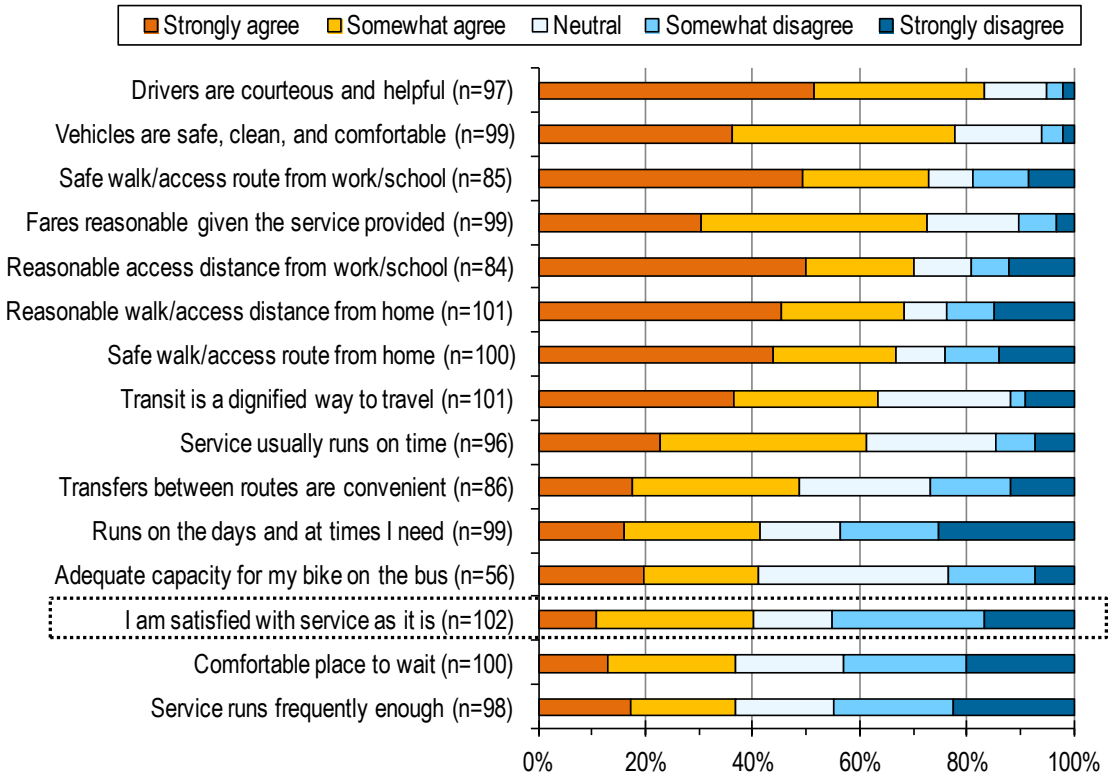
Over 66% of respondents were satisfied or very satisfied with their work commute, while 11% were unsatisfied or very unsatisfied. Nearly 62% of students were satisfied or very satisfied with their school/college commute, while 15% were unsatisfied or very unsatisfied.

Satisfaction with Fixed-Route Bus Service (Transit Riders)

Nearly 32% of respondents used some form of public transit in Bend within the last year, covering all CET local and regional routes serving Bend and seasonal/recreational shuttles.

Only 40% of transit users responding to the survey were satisfied with the service as it is, as shown in Figure 4-13. The key issues identified are convenience—in terms of service that runs frequently enough and on the days and times when people need it—and lack of a comfortable place to wait for the bus. The most positively cited aspects of the service are driver courtesy and safety/cleanliness of vehicles.

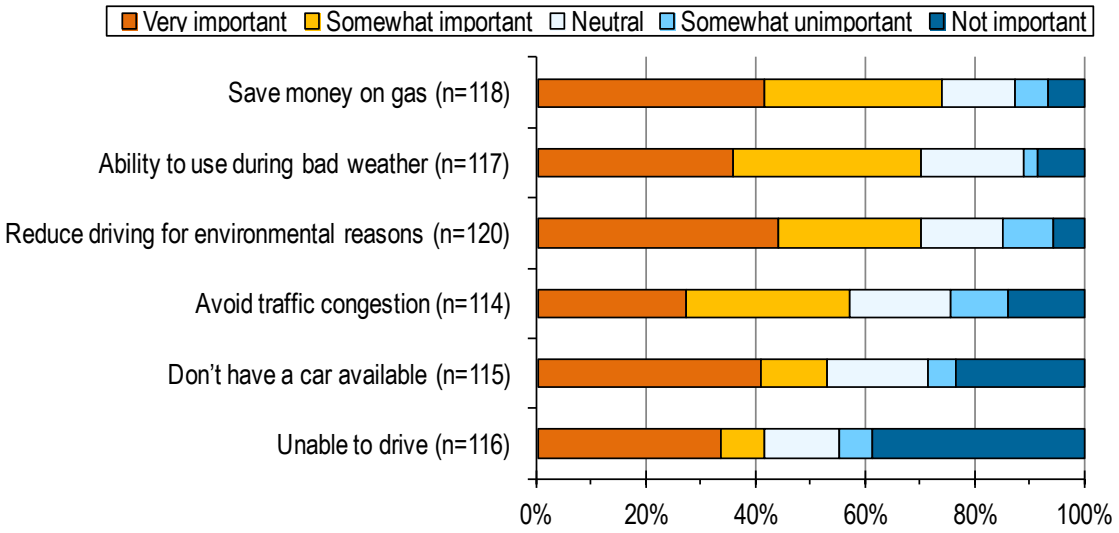
Figure 4-13 Online Survey: Satisfaction with Fixed-Route Bus Service



Decision Factors in Using Transit (Transit Riders)

Respondents cited both "choice" and "transit dependent" factors in their decision to use transit. The largest share of respondents indicated that saving money on gas, riding during bad weather, and environmental reasons are very or somewhat important to their decision to use transit. A substantial share of riders also cited lack of an available vehicle and being unable to drive as very or somewhat important factors.

Figure 4-14 Online Survey: Factors in Deciding to Use Transit

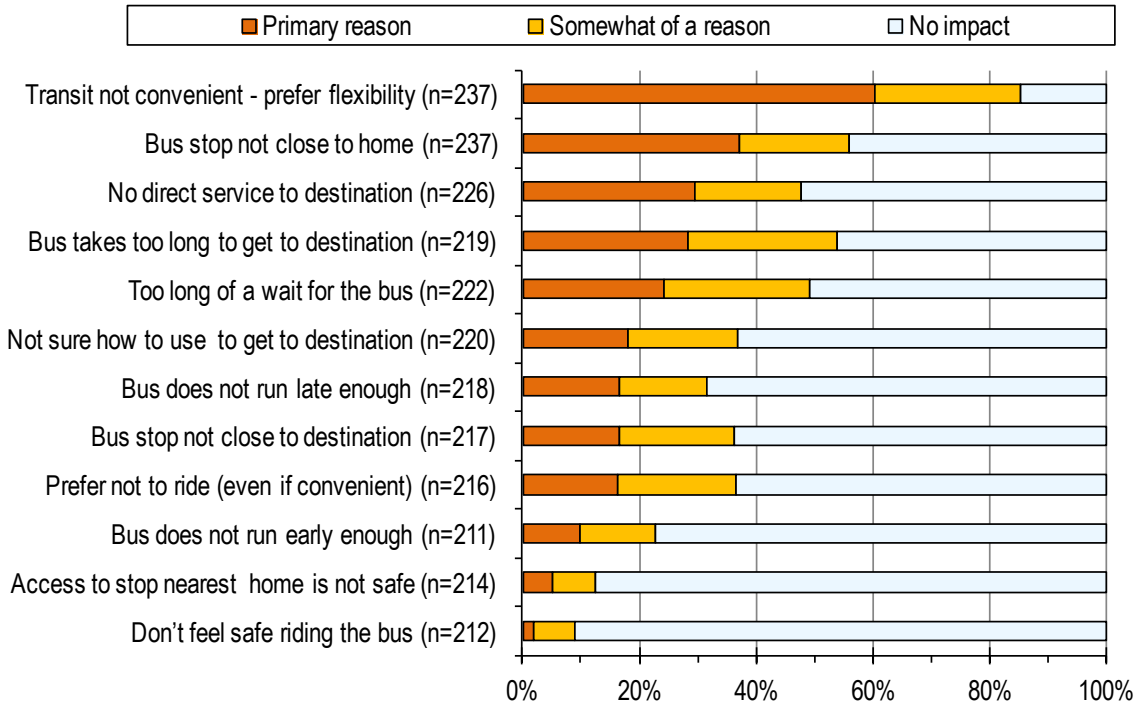


Reasons for Not Riding the Bus (Non-Transit Users)

Respondents who have not used transit in the past year were asked to identify primary and secondary reasons that they do not ride the bus in Bend. The results, illustrated in Figure 4-15, identify the convenience of transit as the key barrier to transit use in Bend. About 85% of respondents (including primary and secondary reasons) indicated that transit is not a convenient option and that they prefer the flexibility of using their own vehicle. Respondents identified a number of other convenience-related factors as primary reasons for not riding, including lack of a stop near their home, service that is too indirect or takes too long, or too long of a wait for the bus.

However, fewer than 20% indicated they wouldn't ride the bus even if it were convenient, indicating that most respondents are receptive to using transit if it were convenient. In addition, the responses indicate that perceived safety (both on and off-board) is not a major barrier to using transit. Fewer than 10% of respondents don't feel safe riding the bus and about 12% feel that access to the stop nearest them is not safe (including primary and secondary reasons).

Figure 4-15 Online Survey: Reasons for Not Riding the Bus



Priorities for Improving Service

All respondents were asked what improvements would encourage them to use transit, or use it more often. As shown in Figure 4-16, the highest share of respondents indicated that service later in the evening would encourage them to ride the bus or ride more often, followed by more direct service, more frequent service, and service to areas without existing coverage. Including improvements that respondents indicated *may* encourage them to ride, new coverage and more direct service received the highest share of responses.

Figure 4-17 identifies the top three priorities identified by survey respondents, among the same set of potential improvements. The highest share of respondents identifies routes to areas without existing service as a high priority, followed by later evening service and more frequent service. Several improvements identified as high priorities on the onboard (rider) survey, including Sunday service and more Saturday service hours, were lower priorities among the general public.

Figure 4-16 Online Survey: Impact of Potential Transit Improvements

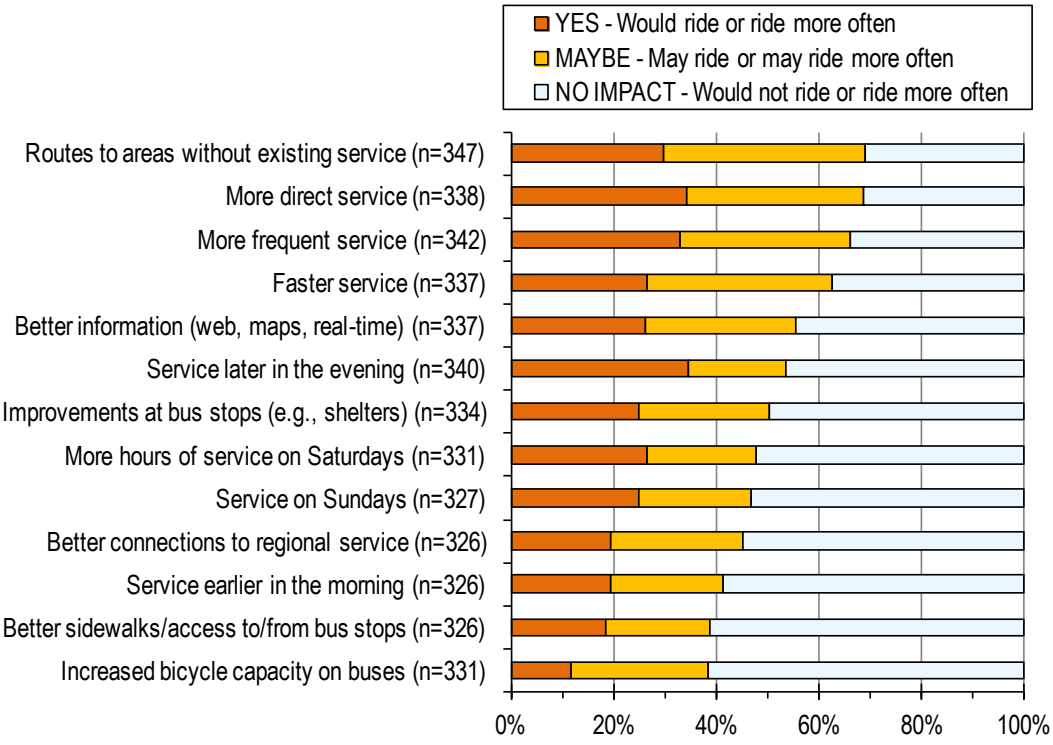
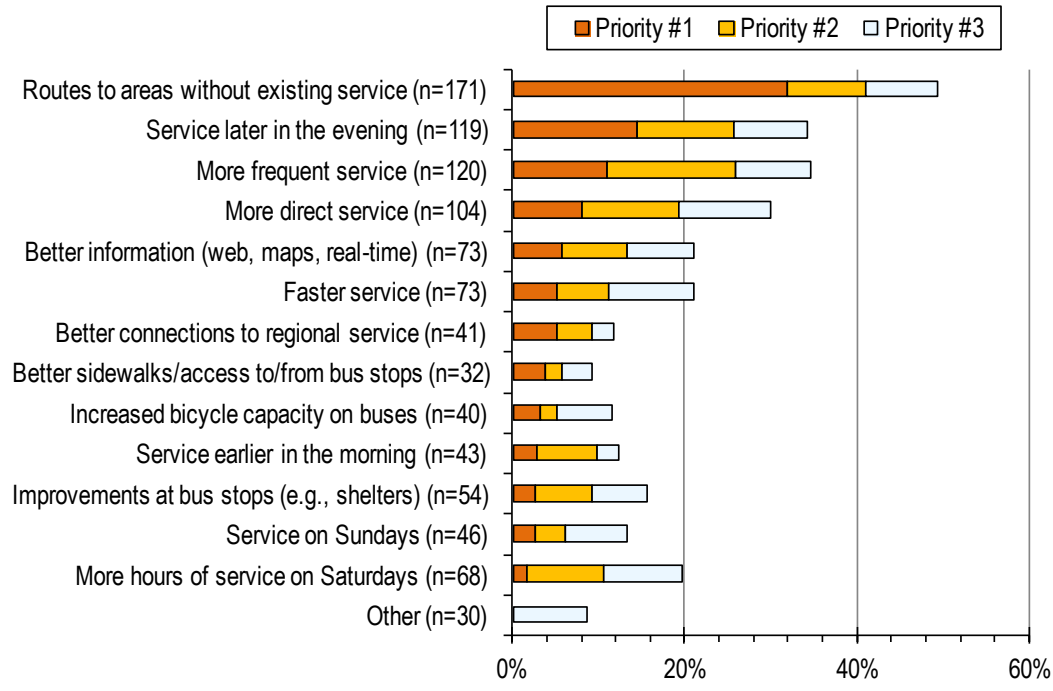


Figure 4-17 Online Survey: Top 3 Service Improvement Priorities

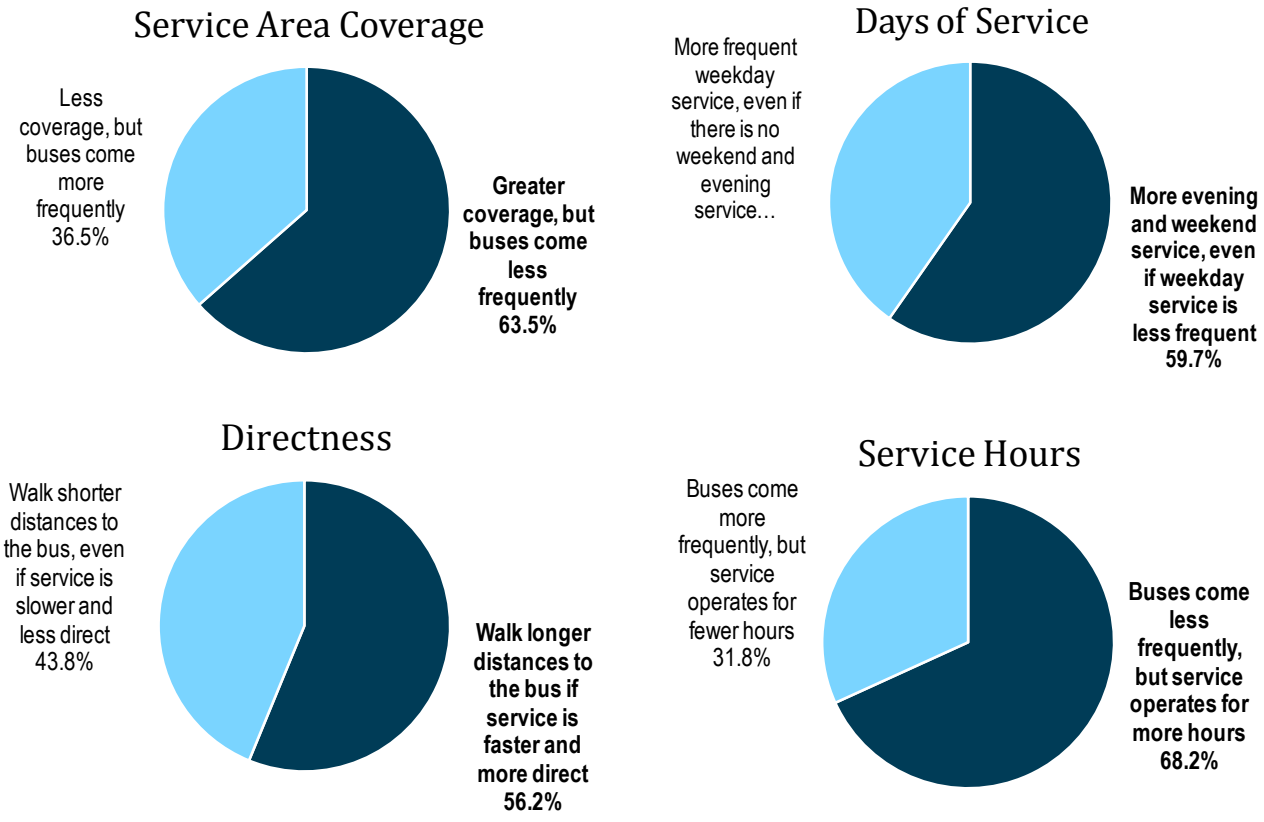


Tradeoffs in Providing Transit Service

A series of "tradeoff" questions asked respondents to select between two options in how scarce transit resources should be allocated. Although the choices are difficult ones to make, the results help identify how the community values transit and help guide how the community would like transit service to be designed. As shown in Figure 4-18, respondents are willing to:

- Accept less frequent service in order to enable increased geographic service coverage (over 63%)
- Have stops further apart and to walk longer distances if service is faster and more direct (over 56%)
- Have more evening and weekend service even if weekday service is less frequent (nearly 60%)
- Have buses come less frequently if service operates for more hours (over 68%)

Figure 4-18 Tradeoffs in Transit Service Provision



Mobile Outreach (April 2012)

Several "Mobile Outreach" events were conducted in April 2012 to provide additional opportunities for the project team to discuss the project with community members and obtain additional input. These events included:

- Hawthorne Station (Transit Riders) - April 5, 2012
- Bend Community Center (Senior Lunch) – April 6, 2012
- Earth Day Fair –April 21, 2012
- Downtown Bend Library – April 25, 2012
- Outreach at churches, focused on the Latino community – Various

A summary of public feedback received is included in the Existing Conditions memo.

Public Transit Plan and Service Concepts Outreach (October 2012)

A public open house and a mobile outreach event at Hawthorne Station were held on October 3 and October 4, 2012 to solicit input on proposed service improvements from the community and bus riders. In addition, an online survey was posted on the transit plan website, to allow members of the public who were not able to attend one of the events to learn about proposed service improvements and concepts in this plan and provide input.

A summary of public feedback received is included in Appendix B.

5 KEY FINDINGS AND TRANSIT NEEDS ASSESSMENT

This chapter summarizes some key findings from the analysis of existing conditions (Chapters 2 and 3) and community input (Chapter 4), and provides an assessment of the major public transportation needs for the Bend area.

KEY FINDINGS

Based on the analysis of demographics, land use, and existing transit service, key findings include:

- Transit's relevance in Bend and the Central Oregon has increased dramatically in the past several years. Both the local fixed-route and regional Community Connector system are relatively new, including the fairly recent transition from the "BAT" to "CET" in Bend, and as such CET facilities and fleet are still evolving.
- Despite the impact of the economic downturn, Bend's population grew by nearly 24,000 people between 2000 and 2010, an increase of about 45%. However, this level of growth is about 5% lower than earlier projections. Although there are a number of growing economic sectors, the housing downturn significantly affected employment (particularly construction-related jobs) and employment is not expected to recover to peak 2007 levels until 2020.[10]
- Bend is a growing regional center for higher education, with significant recent growth in COCC and OSU enrollment. COCC is one of the most significant transit destinations in Bend for both local and regional service, and the planned OSU facility, with projected enrollment of 5,000 students within several years, is a key opportunity for transit.
- Regional commuters are also a key future opportunity for an integrated local-regional transit system. About 10,000 residents travel outside of Bend for work, while nearly 20,000 workers come into Bend for work. By

[10] Carolyn Eagan (OED Economist for Region 10), Personal Communication, January 2012.

comparison, about 16,000 people (over 60% of Bend's working residents) both live and work in the city,

- Although most residents (nearly 79%) drive alone to work as their primary commute mode, a majority of community survey respondents appears to be open to using transit if it was "convenient."
- About 31% of residents live within a quarter-mile walking (network) distance of a bus stop and about 60% live within a half-mile network distance of a stop.
- The timed-transfer, hub-and-spoke system allows any destination in Bend that is served by transit to be reached with no more than one transfer. The majority of riders (over 60% of those making local trips in Bend) require a transfer to complete their trip. Since commute times and many trip distances in Bend are relatively short, the need to transfer on the current bus system imposes a significant penalty. While more than 75% of working residents have relatively short commutes of 20 minutes or less, more than half of workers who primarily ride transit have commutes of 30 minutes or more. In particular, the location of Hawthorne Station means that a transfer is necessary to access downtown from routes serving the eastern part of the city.
- The system currently serves primarily non-work trips. About a quarter of riders use transit to get to school, while about half of riders use it for purposes other than getting to work or school. Fewer than 1% of resident workers use public transportation as their *primary* commute mode to work.
- The utility of local transit in Bend is limited by its operating hours (until about 6:00 PM), which do not meet the needs of some workers, particularly those in service sector jobs, as well as college students. Later evening service is consistently identified as high priority need.
- Existing transit riders, which include a relatively high share of transit-dependent riders, are appreciative of transit service but recognize its limitations; only 40% of existing riders are "strongly" or "somewhat" satisfied with the system as it currently is.
- Existing service levels are not high enough to allow spontaneous use of transit. In particular, relatively low frequency and long travel times for some trips that require a transfer limit transit's appeal for "choice" riders.
- Transit ridership and productivity (number of riders per vehicle hour) have increased over the past three years and the existing structure of the fixed-route system has been able to accommodate the ridership growth.

However, high ridership and/or transit delays due to congestion have emerged as issues on some transit routes and corridors.

- The Americans with Disabilities Act (ADA) of 1991 requires transit operators to provider complementary paratransit service within a ¾ mile distance of fixed-route bus service. Bend Dial-A-Ride operates within Bend city limits and provides geographic coverage and days/hours of availability that exceed ADA requirements for complementary paratransit service.
- Disincentives to auto use (e.g., delay, congestion, parking supply, etc.) are currently not significant in Bend. However, congestion is predicted to increase by 2030 and the opportunity to address congestion through traditional means is limited. Factors such as the cost of gas are potential, but uncertain, incentives to use non-auto travel modes.

NEEDS ASSESSMENT

Public transportation needs were identified from the above analysis and input. The project TAC also provided important input into the assessment of overall priority. Figure 5-1 identifies the prioritized major transit needs, among which later evening service is a shared top priority among both existing riders and more infrequent or non-riders. Existing riders' top priorities include additional weekend service followed by increased weekday frequency of service. More infrequent riders or non-riders top priorities include coverage to areas without existing coverage as well as more frequent and more direct service.

Numerous more nuanced needs were identified. The most significant operational issue among these is:

- Difficulty with on-time performance and maintaining a 40-minute running time on Route 5 (Wells Acres), resulting in this route being off of the coordinated pulse departure time[11] for several hours each day and overcrowding.

Other issues/needs include:

- Route 11 (Galveston), e.g., longer service hours, consistent headway, Saturday service.
- Better information, clarity, e.g., "Hard to plan around 40-minute schedules."

[11] All Bend local fixed bus routes generally leave Hawthorne Station at the same time every 40 minutes (e.g.,6:40 am, 7:20 am, 8:00 am, etc.) to allow passengers to make connections between routes.

- Improved regional connections, e.g., Redmond Airport (direct), no reservations, etc.
- Additional service coverage, including in NE Bend, SE Bend, and Deschutes River Woods, and Park & Ride access.

Figure 5-1 Major Public Transportation Needs

Expressed Major Service Needs	Overall Assessment	Assessment of Relative Priority as Identified by:		
		Current Riders	General Public	TAC
Early Evening Service Hours (6:00 – 8:00 PM)	High	High	High	High
Increase Saturday Frequency	High	High	Low	High
Provide Sunday Service	High	High	Low	High
Increase Weekday Frequency	High	Medium-High	High	High
Later Evening Service Hours (8:00 – 10:00 PM)	Medium	Medium	High	Medium
Expand Saturday Hours	Medium	Medium	Low	Medium
Early Morning Service Hours (Start at 5:00 AM)	Medium	Medium	Low	Medium
Provide Faster, More Direct Service	Low-Medium	Low	Medium	No Clear Consensus
Expand Service Coverage	Low-Medium	Low	High	Address other needs first

6 GOALS AND OBJECTIVES

This chapter provides a set of goals and objectives specific to the provision of transit service in Bend. A logical starting point for updating/developing transit-specific goals and objectives is the City of Bend's Transportation System Plan (TSP) and the Bend MPO Metropolitan Transportation Plan (MTP).

EXISTING TRANSIT GOALS AND OBJECTIVES

The following strategies for public transit in the TSP, which are also included in the MTP, lay out the vision for transit within city and MPO boundaries. They are excerpted below:

- **6.4.2 MULTI-MODAL STRATEGIES:** Public transportation is an important element of multi-modal transportation planning. It provides a valuable transportation alternative for high volume travel corridors….
- **6.4.3 COMMUNITY MOBILITY:** Public transportation improves mobility for a wide range of the traveling public…. Thus, public transportation is a valuable service that fills a much broader function than solely trip reduction. It provides mobility for those without cars as well as being an alternative to the automobile for many travel needs of the community.

This language in the MTP and TSP makes it clear that public transportation is a key element of multimodal transportation planning as a matter of MPO and City policy and identifies various benefits derived from transit. It also states that, beyond reducing vehicle trips, transit provides a valuable service to a diversity of users—people who depend on transit for mobility as well as people who choose to use it.

The City of Bend's Transportation System Plan expresses the vision for transit through four objectives, six supporting policies, and seven implementation actions.

RECOMMENDED TRANSIT GOALS AND OBJECTIVES

Based on the input received through this process, the TSP provides a solid foundation for the development of goals and objectives presented in the Public

Transit Plan. However, the PTP presents the objectives, policies and implementation actions in a different manner so that progress towards each goal can be monitored more directly. As such, the TSP objectives are presented in the PTP as "Goals" and the TSP policies are presented as "Objectives" in the PTP. Modifications to existing language (as noted) and new objectives are presented under each goal, with additions shown in italics; deletions are not indicated.

Goal 1: Provide public transportation services for the transportation disadvantaged

Objectives

A. Preserve and improve the existing Dial-A-Ride service. (Modified TSP Policy #1).

B. Equitably provide transit services throughout the city, including to areas with high concentrations of low-income households, households without a vehicle, seniors, and people with disabilities.

C. Provide transit service to all middle and high schools, as well as higher education facilities.

Goal 2: Reduce reliance on automobiles and develop public transportation facilities

Objectives

A. *Support and promote expansion of* a *reliable* public transportation system that *makes transit an attractive travel choice for* Bend residents and visitors in order to reduce reliance on the automobile. *Over time, the best transit service in Bend (highest frequency, most reliable, longest service span, etc.) should be provided in "primary transit corridors," as presented in the Public Transit Plan*. (Modified TSP Policy #2)

B. Work with other governmental agencies to support implementation of a 20-year-*Public Transit Plan*. Ordinances shall be adopted that implement the Public Transit Plan. (Modified TSP Policy #6).

Goal 3: Increase mobility, accessibility, *and visibility of transit* throughout the urban area

Objectives

A. Work with *COIC,* Central Oregon communities, and the State to *maintain or improve connections between local Bend transit services and* inter-urban public transportation services. Priority shall be given to *high*-ridership corridors *and connections*. (Modified TSP Policy #4)

B. Coordinate with *the Central Oregon Intergovernmental Council (COIC)*, the State, and other jurisdictions to evaluate funding alternatives and seek appropriate resources to *preserve and* support *future expansion of the* public transportation system. Effort should be made to evaluate creative funding techniques that may include the combination of public and private transportation resources in coordination with other agencies and transportation providers. (Modified TSP Policy #3)

C. Continue to partner with local organizations, businesses and agencies to enhance the image of transit throughout the community.

Goal 4: Provide infrastructure and land use planning to support transit

Objectives

A. Implement land use ordinances and other regulations that establish pedestrian and transit-friendly design along potential or existing transit routes, to improve access to the fixed-route transit system. (Modified TSP Policy #5)

B. Encourage new development requiring transit service, such as schools, hospitals, clinics, high-density housing, etc., to locate along an existing transit route. Encourage the highest-intensity uses to locate along primary transit corridors, which would offer the highest level of transit service.

C. Support implementation and/or improvement of *secondary transit hubs* including the Central Oregon Community College, the St. Charles Medical Center, and sites on the north and south reaches of Bend*, including land acquisition and other infrastructure*. (Modified Implementation Action #d)

D. Acquire properties (or secure joint use agreements) for Park-n-Ride lots at strategically located sites *throughout the urban area. These locations may be co-located with secondary transit hubs or other major stops* (see also *Objective 4C*).

The Complete Transit System Concept

A Complete Transit System is a unifying concept for complementary transit **service quality and land use elements** (e.g., service levels and land use policies) and **non-service elements** (e.g., facilities, pedestrian and bicycle access, etc.) that function together to achieve the desired local outcomes for transit in Bend. A Complete Transit System is the foundation for improving the quality of transit service and facilities in Bend, making transit an attractive travel option for "choice" riders and better meeting the access and service needs of "transit dependent" riders.

The Public Transit Plan provides strategies and recommendations for Bend to develop a Complete Transit System. These concepts support the goals outlined in this chapter, and are described in further detail in the following chapters (Chapter 7 – Service Quality and Land Use and Chapter 8 – Non-Service Elements).

Service Quality and Land Use

This element relates transit service to characteristics of transit-supportive land use and urban form. It describes the concept of primary transit corridors—a network of streets where transit service levels are aligned with the desire and capacity to increase land use intensity, and utility capacity is sufficient to support that level of intensity.

- Service design, service types, and vehicles
- Policies and investments related to management of street right-of-way (e.g., that provide priority to transit vehicles)
- Coordination of local and regional service

Non-Service Elements – Facilities and Amenities

Facilities and amenities include types of transit facilities, passenger amenities at those facilities, and thresholds (e.g., number of boardings) for prioritizing these capital investments. This element addresses:

- Transit centers, secondary transit hubs, and park & ride facilities
- Stops and shelters

Non-Service Elements - Access

Access strategies identify multimodal access strategies to increase the number of residents within a convenient distance to transit (typically considered to be about a quarter-mile for bus service), including:

- Pedestrian Access: Sidewalks, curb ramps, street crossings
- Bicycle Access: Bicycle facilities, parking, and end-of-trip facilities

Non-Service Elements – Demand Management

This element addresses:

- Partnership opportunities between local and regional public transit providers and businesses, institutions, and other organizations that influence or use public transit service
- Programs and policies to promote the use of public transit among Bend residents and employees

Non-Service Elements – Marketing/Branding

This element identifies strategies and programs to improve the overall perception of transit as an attractive travel option and help foster a "culture" of transit use in Bend.

Appendix B provides additional detail on the service quality and land use Complete Transit System elements, and on the flexible service plan.

7 BUILDING A COMPLETE TRANSIT SYSTEM: SERVICE QUALITY AND LAND USE

The relationship between the quality of transit service provided and land use defines the transit ridership potential. Transit ridership is driven by "internal" factors including the level and cost of service. The more frequent the service, the more convenient it becomes and more choice riders (those that are not dependent on public transportation) use it. As with any other product or service, the demand for transit is also influenced by how well it is promoted or marketed to potential users. But "external" factors can greatly outweigh those directly controlled by the service provider. Even convenient, free, and well-advertised service may not attract riders if no one lives or works near it.

This section provides an overview of service models and types that can be used to deliver transit service along with guidelines that specify how population and employment density help to determine the level and type of service that should be provided on a particular street or corridor. Following is a discussion of specific service concepts for the short-, mid-, and long-term time frames.

SERVICE QUALITY AND LAND USE

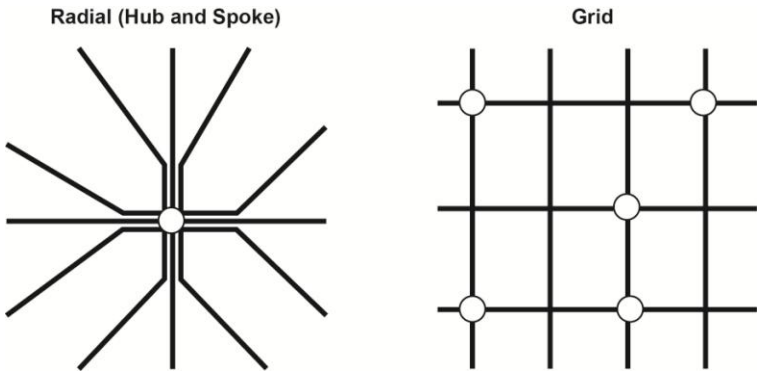
Service Models

The existing Bend transit system operates in a "hub and spoke" pattern from the Hawthorne Station transit center. This is also known as a radial service design, illustrated in the left panel of Figure 7-1, where all bus routes depart from a single hub at a common time to allow transfers between routes. The practice of coordinated departures from the hub is also known as a "pulse." An alternative service model, the grid network shown in the right panel of Figure 7-1, enables more cross-town service and multiple transfer locations.

The hub and spoke model should continue to be appropriate for Bend within the 20-year time frame of this plan. This plan does not propose "cross-town" service that bypasses the Hawthorne Station, but the service concepts detailed in Chapter 8 will create opportunities for secondary hubs where transfer opportunities are

available outside of the primary hub. In either service model, bus routes can also be "interlined," where a single physical bus serves one route before "turning into" another route. This may be done for scheduling reasons or to provide a more convenient single-seat connection for passengers.

Figure 7-1 Conceptual Service Models



Source: Nelson\Nygaard

Service Types

The following bullets describe general types of transit services that are used to meet transportation needs:

- **Local Fixed-Routes** operate on a defined route, stops, and schedules. Trunk and primary routes are more oriented to productivity (high ridership) while secondary routes are more coverage-oriented.
  - **Trunk** routes are "spine" routes linking major attractions throughout the community. Deviations and loops are generally not acceptable. "Rapid Bus" service may be appropriate for such trunk routes (see sidebar below).
  - **Primary** routes have a greater neighborhood orientation than trunk routes. Limited deviations from the most direct routing to serve community centers may be acceptable.
  - **Secondary** routes provide mobility in neighborhoods that are less urban in character. Deviations are acceptable to meet specialized neighborhood needs.
- **Local Dial-A-Ride** is door-to-door paratransit service provided for residents who are unable to use fixed-route bus service due to a disability. In smaller communities or communities without fixed-route bus service,

See "Right-of-Way Management" in Appendix B for discussion of transit priority and other features that can be implemented to help transit stay on schedule, particularly for trunk or primary service types.

Dial-A-Ride may be used to provide transportation to the general public (as was the case in Bend prior to introduction of fixed-route service).

- **Regional Service**
  - **Inter-city Bus** service, such as the CET Community Connector, provides longer-distance travel between regional centers, more significant urban centers, and/or more distant communities.
  - **Vanpool** is shared-ride service, typically driven by one of the passengers to a particular location, such as a place of employment.

Rapid Bus ("Light" or "Partial" Bus Rapid Transit)

Rapid Bus is a type of service with features designed to improve performance and attract riders. It can be considered as a "light" or "partial" version of bus rapid transit (BRT) service such as the EmX in Eugene (below left). The following elements differentiate BRT from traditional fixed-route bus service:

- **Right-of-way design and management.** Full BRT often runs in exclusive or grade-separated lanes allowing fast travel times even in congested corridors. Rapid Bus may run in mixed traffic with transit priority features such as transit signal priority (TSP) or queue jumps (described below).
- **Stop/station design and access requirements.** BRT stations often include real-time passenger information, level boarding, off-board fare payment, and enhanced station amenities.
- **Service model/operating plan.** BRT often has longer distances between stops, follows a direct route with no/few deviations and provides frequent, all-day service.
- **Vehicle type.** BRT vehicles are often "branded" or stylized to distinguish them from local buses and may have features such as multiple, wide doors to increase boarding capacity.

Along a continuum, full BRT implements these elements more aggressively than Rapid Bus. RapidRide (below right) in the Seattle area is a recent example of a RapidBus-type service.

The EmX in Eugene is an example of a full BRT system, which is distinguished by its use of exclusive street right-of-way or grade-separated running ways.

Source: Flickr user functoruser.

The RapidRide service in the Seattle area is an example of Rapid Bus service. It runs in mixed traffic with transit priority features, but has branded, stylized vehicles and some well-developed station features.

Source: Nelson\Nygaard

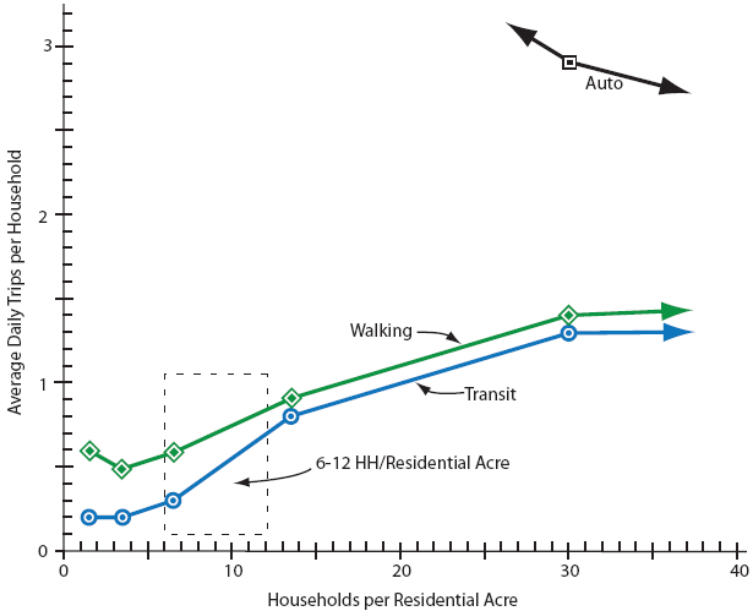
Land Use

See Appendix A, Land Use and Transit Demand, for additional background.

Transit ridership is directly related to population and employment density along transit corridors.[12] Overall, industry experience suggests that residential densities in the range of about 4 to 7 households per gross acre are a minimum threshold for high-performing transit and also represent a point at which overall mode shift away from driving begins to increase exponentially. As illustrated in Figure 7-2, this relationship is not linear, and transit demand (and corresponding reduction in per-capita auto travel) tends to increase most dramatically between about 6 and 12 households per acre. For purely residential areas, the minimum threshold corresponds to a density of 10 to 15 persons per acre, with the strongest increase in demand occurring between about 15 to 30 persons per acre.[13]

In practice, combined employment and population density drives transit performance, and the above ranges can be considered in terms of the number of residents plus the number of jobs.

Figure 7-2 Relationship between Density and Daily Trips by Mode



Transit demand tends to increase most dramatically between about 6 and 12 households per acre. Current average population density along transit corridors in Bend is approximately 2 households per acre.

Source: Nelson\Nygaard, based on MTC Household Travel Survey, 1990

[12] Appendix A provides a more detailed review of literature that attempts to quantify this relationship.

[13] Converted based on the average household size of Bend area (2.39 persons per household in the 2010 U.S. Census).

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 BMPO, the City of Bend, and CET manage and coordinate land use, public infrastructure, and transit service provision. Few areas and no complete corridors in Bend currently have the land use characteristics to support a high level of transit service (e.g., as frequent as every 15 or even 30 minutes). Primary transit corridors are a mechanism to coordinate transit and land use to achieve these land use characteristics and make this level of service feasible along Bend's most important arterial transit corridors by:

- Securing a commitment from the transit provider (CET) to maintain the highest level of transit service, and focus future investments in service capacity, frequency, and amenities along identified, mutually agreed-upon corridors where the City will focus land use planning.
- Influencing the City's zoning and development policies to encourage intensification of land use around primary transit corridors. Designating primary corridors provides a statement to the community that the City will seek to update land use plans where arterial transit corridors are currently not built or zoned for transit-supportive densities, but might be.
- Allowing the City to plan utility infrastructure (sewer, water, etc.) to support higher-intensity development along arterial transit corridors.
- Providing direction to City engineers and planners about where street rights-of-way should be designed and managed to help maintain transit operating speed and reliability. This enables transit to provide the best possible user experience, prevents timed-transfer connections from breaking down, and allows transit operating resources to be spent on improving service.
- Encouraging dense and/or transit-intensive land uses to locate on primary corridors, or at a minimum, along the supporting network. Primary transit corridors communicate preferred locations for uses that generate high transit demand and/or that desire to have transit service. For example, if a planned land use that is known to require transit, such as a social services office or school, chooses not to locate on a primary corridor, it does so with the knowledge that it may not get the best transit service. When such uses locate away from transit, they inevitably create pressure for the transit agency to provide service where it cannot be done efficiently.

It is important to emphasize that while Bend should prioritize the highest-quality transit service in primary transit corridors, some transit routes serving primary corridors will also provide transit coverage outside of primary corridors.

Two tiers of corridors are recommended—definite and candidate—to categorize the potential for future transit demand and likely phasing of particular corridor segments:

- **Definite corridors.** These are the most densely developed corridors and/or have the greatest development potential and connect key destinations that generate transit demand. They have the highest potential to warrant transit service investments (e.g., more frequent or more direct).
- **Candidate corridors.** These may be less densely developed corridors, but that have longer-term development potential. They could be elevated to a primary transit corridor if land uses become more transit-supportive and destinations that generate transit demand develop along the corridors.

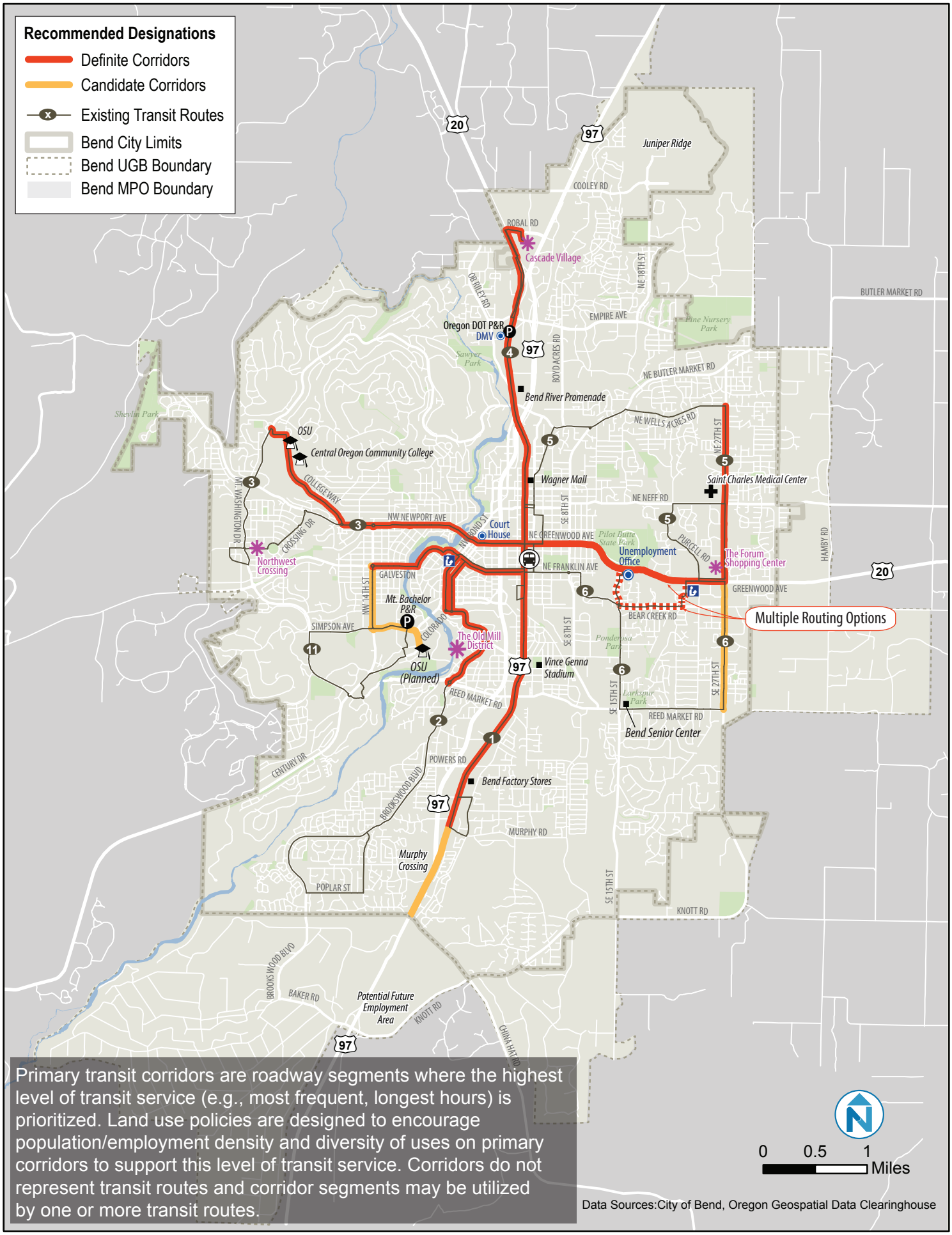
Recommended primary transit corridors are shown in Figure 7-4 (map). The table below (Figure 7-3) lists the existing and projected combined population and employment density within a quarter-mile walking distance of recommended primary transit corridors, including both "definite" segments (strongest transit demand) and "candidate" segments (future potential). Combined densities range from about 8 to 14 persons/jobs per acre currently and about 11 to 16 persons/jobs per acre by 2030.

Figure 7-3 Existing and Projected Population and Employment Density along Primary Transit Corridors

Primary Transit Corridor[1]	2010 Population and Employment Density[2]	2030 Population and Employment Density [2]
Greenwood (3rd to 27th)	7.8	10.5
27th Street (Wells Acres to Reed Market)	9.6	12.6
3rd Street (Hawthorne to Murphy)	8.9	13.0
3rd Street (Hawthorne to Cascade Village)	8.4	13.3
Galveston (3rd to NW 14th)	13.1	14.9
Newport (3rd to NW 14th)	14.4	15.9
Wall/Bond (Franklin to Reed Market) [3]	11.9	12.6

Notes: (1) Includes definite and candidate segments of primary transit corridors. (2) Within a quarter-mile walking (network) distance of each corridor. (3) Does not include north of Franklin or south of Reed Market.
Source: Future Opportunities Memo, Figure 14

Figure 7-4 Primary Transit Corridors



Service Design Guidelines

> See "Service Quality and Land Use" in Appendix B for sample service standards used by TriMet in the Portland area and additional service design criteria.

Figure 7-5 provides service and land use policy guidelines for local and regional transit service. It relates specific service types and characteristics to several "transit market" factors:

- **Density.** Density is considered to be the combined level of population and employment per gross acre. The organization of density is a key consideration that determines the size of a transit market. A particular level of service requires a minimum density *over a minimum area*. For example, an isolated apartment building or social services agency site may have a high density within a small area, but is a relatively limited and difficult to serve transit market.
- **Destinations.** Activity centers clustered along a route, with strong anchors, or major activity centers, at each route endpoint make transit more attractive and efficient.
- **Community Design.** Neighborhoods where all roads are designed to connect to major streets allow transit users to reach stops without walking out-of-direction. Community design impacts pedestrian access and safety, a critical non-service element that is discussed in more detail below. People will not use transit if it is difficult or dangerous to access a bus stop.

The density guidelines in Figure 7-5 were tested against various geographic areas in Bend using current (2010) and projected (2030) population and employment data and adjusted to provide realistic service level targets for Bend. For example:

- Downtown Bend currently meets the density guideline for 15-minute service. None of the other areas evaluated currently meet this guideline.
- NE 27th (St. Charles Medical Center and Forum Shopping Center area) currently meets the density guidelines for 30-minute service, and based on current 2030 projections would meet the guidelines for 15-minute service by 2030.
- Central 3rd Street (between BNSF railroad crossings) is projected to meet density guideline for 30-minute service by 2030.
- Several segments of recommended primary transit corridors, e.g., Galveston Avenue, Old Mill District, Greenwood Avenue (between 3rd and 12th Streets), are currently in the range of 8 to 12 persons per acre (combined population and employment), but 2030 population and employment projections fall short of the density guideline for 30-minute service.

Figure 7-5 Summary of Service Design Policy Guidelines

Service Attributes				Transit Market Factors	
Service Type	**Route Type**	**Service Characteristics**	**Modes of Service**	**Density Along Route [1]**	**Destinations / Anchors [1]**
Local Service					
Trunk / Primary Fixed-Route	High Frequency Urban Local Fixed-Route	▪ Frequent (15-minute or better) ▪ Fast (may have limited stops) ▪ Two-way service	Bus (or Future Rapid Bus[3])	20+ persons/acre within ¼ mile of corridor served	▪ High-quality anchors ▪ 25+ persons per acre within ¼ to ½ mile radius
Primary Fixed-Route	Moderate Frequency Urban Local Fixed Route	▪ 30-minute headway (frequency) ▪ All-day local service	Bus	16+ persons/acre within ¼ mile of corridor served	▪ High-quality anchors ▪ Major trip generators
Secondary Fixed-Route	Low Frequency Urban Local Fixed Route	▪ 60-minute headway (frequency) ▪ May be limited to weekdays	Bus	8+ persons/acre within ¼ mile of corridor served	▪ Major trip generators (hospital, senior center, etc.)
Not currently proposed [2]	Community Shuttle/Circulator	▪ Local circulation ▪ Personalized to community or neighborhood demand centers	Bus, Vintage Trolley, Mini-Bus, Van	2+ persons/acre within ¼ mile of corridors served	▪ No anchors required, but large trip generators needed along route
Not currently proposed [2]	Flex Route	▪ Local circulation ▪ Optional point-to-point service and on-demand curbside pickups/drop offs	Bus, Mini-Bus	0.5+ persons per acre, average in Flex Area	▪ Major trip generators
Regional Service					
Intercity Bus	Community Connector	▪ Limited stop services between regional centers ▪ May also serve one or two primary local destinations	Rail, Bus, Com-muter Coach	None if connecting to other transit services or park-&-ride facilities	▪ Regional urban centers ▪ Local transit centers
Vanpool	Vanpools	▪ Shared ride, driven by one of the passengers	Van	Not Applicable	▪ Large employment centers ▪ Park-&-ride facilities ▪ Regional transit centers

Notes: (1) Considered as combined persons and jobs per acre. (2) The table includes guidelines for community circulators and flex routes; although these are not specifically recommended in this plan, these service types may be applied to meet future community needs. The "Downtown Circulator Considerations" section in Appendix B summarizes strengths and weaknesses of a potential Bend downtown circulator service. (3) See "Rapid Bus" sidebar above for a description of the Rapid Bus mode.

Fixed-Route Service Expansion Process

Expansion, modification, or increased service levels (e.g., 15, 30, or 60-minute service) for the fixed route transit system should be based on the density thresholds identified in Figure 7-5, as well as subjected to the performance standards described in the section below.

In addition, for a corridor to become a permanent primary transit corridor, with an eventual goal of 15-minute service, it should receive mutual agreement by the City and CET. The City and CET should err on the side of setting high thresholds for increasing service on primary corridors, while maintaining a broad category of candidate corridors. While the relationship between land use and ridership will be the subject of more research that may cause refinements in the thresholds, an overriding goal of designating primary corridors is permanence—the same permanence that developers currently recognize as represented by rail (e.g., light rail or streetcar). Therefore, once a corridor is built and served to primary service levels, it should not drop below those levels. In the case of corridors where a new development plan will allow the area to cross a key density threshold, the network of primary transit corridors should be expanded at the same time—or just in advance of—the density increase.

Performance Standards

This section describes performance standards for transit, such as productivity (passengers per revenue hour). These standards are complementary to the service design standards described above and are intended to supplement the performance standards being developed for overall CET services as part of the Regional Transit Master Plan.

The Value of Performance and Design Standards

Monitoring system performance and designing the "right" mix of transit service is an important task for Bend. Standards and measures provide a consistent framework for the effective management, evaluation, and planning of public transit services, and for communicating with the public and elected officials about how those services are performing. Performance and design standards should:

- Reflect and support the vision for and the overall mission of public transit in Bend (see Chapter 6). Goals and objectives provide a "foundation" for public transit, whereas standards provide a formal, quantifiable structure for how the service should be implemented, perform over time, and be modified to meet overall goals.

- Ensure compliance with all applicable federal, state and local regulatory requirements. *Are the services operated within the law?*
- Facilitate the simple, straightforward evaluation of the service. *Can transit service be monitored and evaluated with the existing staff resources and technology?*
- Provide a clear rationale for service increases (increased frequency or service span), service expansion (route extensions or new routes to areas not currently served), and service reductions (what services should be reduced when budgets are cut or if resources have to be reallocated to increase or expand service elsewhere). Service standards will help justify critical decisions affecting service delivery.
- Provide benchmark measures that can be written into approved service and operating policies.
- Provide criteria for the design and operation of safe and effective transit service. *How should new service be introduced and how should services be operated?*

Existing Performance Data and Standards

Cascades East Transit is currently collecting a variety of performance data on the fixed route and demand response services operating in Bend (as well as throughout the CET system). Every month, a management report summarizes the performance data in a simple spreadsheet report. A sample CET Monthly Management Report is included in Appendix B (see Figure B-3).

Figure 7-6 below presents a summary of the performance data that is currently being collected and the performance measures that are reported on a monthly basis. Although data are generally tracked/calculated on a systemwide basis, data should be collected separately for the fixed route and Dial-a-Ride services so that planning decisions can be made regarding these services separately (for example, wheelchair boardings).

Figure 7-6 Existing Fixed Route (FR) and Dial-A-Ride (DAR) Performance Data and Measures

Performance Data	
Ridership ▪ Total Ridership (FR and DAR) ▪ Elderly/disabled rides (FR) ▪ Ridership by route (FR) ▪ Bikes (Combined FR/DAR)* ▪ Passengers in wheelchairs (Combined FR/DAR)* **Customer Service and Service Delivery Data** ▪ Service Hours and Service Miles (FR/DAR) ▪ Farebox Revenue (FR/DAR) ▪ Trip Purpose (DAR) ▪ Total Calls (DAR) ▪ Ride Denials (DAR) ▪ FTA Denials (DAR) ▪ Ride Refusals (DAR)* ▪ No Rides Found ▪ No Shows (DAR) ▪ Late Cancelations (DAR) ▪ Subscription Trips (DAR)* ▪ Will Call Trips Performed (DAR)* ▪ Driver Complaints (Combined FR/DAR) ▪ Call Center/Dispatch Complaints (Combined FR/DAR) ▪ Program/General Complaints (Combined FR/DAR) ▪ Compliments (Combined FR/DAR)	**Fare Collection** ▪ Farebox revenue (FR and DAR) ▪ Monthly Passes (FR)* ▪ Multi Zone Monthly Passes (FR)* ▪ Multi Zone Day Passes (FR)* **Operating Costs** ▪ Costs by category (FR and DAR) **Safety and Security** ▪ Incidents (FR and DAR) ▪ Non-Preventable Accidents (FR/DAR) ▪ Preventable Accidents (FR/DAR) ▪ Injuries (FR and DAR)
Performance Measures	
▪ Passengers per Service Hour (FR and DAR) ▪ Service Miles per Passenger (FR/DAR) ▪ Cost per Passenger (unlinked trips) (FR/DAR) ▪ Cost per Service Hour (FR and DAR)* ▪ Farebox Recovery (FR/DAR) ▪ On-Time Performance (FR and DAR)*	

* Indicates data or a measure that is tracked/calculated, but not reported on the CET Monthly Management Report

Source: CET Monthly Management Report, October 2012

Recommended Performance Standards

While specific standards can vary, industry practice generally uses the following categories for service performance and design:

- Efficiency standards
- Service quality/reliability and quality/performance standards
- Service design standards (provided above in Figure 7-5, and will be addressed more generally for CET as part of the Regional Transit Master Plan).

Efficiency Standards

Efficiency standards use operational data to measure how efficiently the transit system is performing. The efficiency measures identified in Figure 7-7 are included in the monthly CET Management Report (Figure B-3 in the appendix), with the exception of operating cost per hour, which can easily be calculated from data listed in the report, and passengers per mile; the inverse, miles per passenger, is reported.

The above efficiency standards comply with the basic performance indicators required by the National Transit Database (NTD) and are largely consistent with the following operating and cost data already collected by the City.

Service Quality/Reliability Standards

Service quality and reliability standards ensure that the transit services provided in Bend meet certain standards for attracting and maintain ridership and customer satisfaction. Figure 7-8 presents recommended service quality and reliability standards. These standards were set based on industry standards, recent service trends, and a peer review of transit operations in cities comparable to Bend. The purpose of setting standards is to help the transit operator make and track efficiency improvements where they warranted, and maintain current standards where service currently exceeds industry or peer benchmarks.

Figure 7-7 Bend Transit Service Efficiency Standards

Performance Standard	Fixed Route Benchmark	Dial-a-Ride Benchmark	Notes/Comment
Service Efficiency: Passengers per Revenue Hour [a]	Minimum of 16.0 (2015) Minimum of 20.0 (2020) 2010: 15.7 [a] 2010 peer average: 20.1	4.0 (2015) 4.0 (2020) 2010: 3.5, 2011: 4.2 2010 peer average: 2.1	Fixed-route targets set to improve productivity over time.
Service Efficiency: Passengers per Revenue Mile [a]	Minimum of 1.2 (2015) Minimum of 1.2 (2020) 2010: 1.2 2010 peer average: 1.4	Minimum of 0.2 (2015) Minimum of 0.2 (2020) 2010: 0.33 2010 peer average: 0.19	Fixed-route target set at current (2010) level. For fixed-route service this may be most useful as a route-level measure.
Cost Efficiency: Operating Cost per Revenue Hour	Maintain under $83 (2015) Maintain under $99 (2020) 2010: $71.24 2010 peer average: $99	Maintain under $76 (2015) Maintain under $84 (2020) 2010: $72.08 Peer average: $58	Fixed-route target set based on FY 2013 and 2014 budgeted costs with subsequent 3.5% annual increases costs. Dial-A-Ride target set based on assumed annual increases of 2% from 2012 level, designed to reduce costs to the peer level (assuming peer costs grow at 3.5%) within 10 years (2022).
Cost Effectiveness: Operating Cost per Passenger	Maintain under $5.00 2010: $4.54 2010 peer average: $5.18 See also route-level standards below.	Maintain under $25 2010: $20.34 2010 peer average: $24.79	Assumes equal (or faster) growth in ridership compared to operating costs.
Cost Effectiveness: Farebox Recovery Ratio	15% (2015) 15% (2020) 2010: 10.9% 2010 peer average: 13.2%	Minimum of 8% (2015) Minimum of 10% (2020) 2010: 8.2% 2010 peer average: 8.2%	Fixed-route targets set to improve farebox recovery over time.

Notes: Based on industry standards, recent service trends, and peer review. Peer data includes Medford (OR), Everett and Yakima (WA), Redding (CA), Pueblo (CO), and Santa Fe (NM). (a) Vehicle revenue hour standard is used for NTD reporting of fixed-route service. Internally, CET reports fixed-route service efficiency by vehicle *service* hour: 22.1 passengers per vehicle service hour in 2010 and 24.9 passengers per vehicle service hour in 2011. A service hour standard is appropriate given Bend's timed-transfer system, however the above standard is based on vehicle revenue hours for comparability with peers.

Source: Peer data from National Transit Database (NTD), 2010

Figure 7-8 Bend Transit Service Quality/Reliability Standards

Standard	Fixed Route Benchmark	Dial-a-Ride Benchmark	Comment
On-time Performance	No trip should depart prior to the scheduled departure time. 90% of all arrival times should be within 5 minutes of scheduled time, tracked at the halfway point and final route destination. Track at timepoints as data collection capabilities improve.	All Dial-a-Ride trips shall arrive at pick-up points no earlier than 15 minutes before and no later than 15 minutes after the scheduled pick up time, 95% of the time.	This performance standard can be monitored on the fixed-route service by occasional point checks at key time points. Dial-a-Ride performance can be measured from regular data collected on all trips.
Passenger Complaints	Objective is to minimize legitimate passenger complaints, but no more than 25 per 100,000 boardings.		
Maintenance	The number of road calls should not exceed 10 per 100,000 revenue miles. At least 85% of all regular fleet vehicles should be available for operations at all times. The ratio of spare vehicles to regular fleet vehicles should not exceed 20%. 95% of scheduled vehicle inspections shall be completed on time		Road calls are the number of times a vehicle must be taken out of service while in operation. A high number of road calls indicates the need for a more aggressive vehicle replacement program or changes to maintenance procedures. The current spare ratio is within the benchmark level.
Bus Trips Cancelled	No scheduled trips should be cancelled, with exception of cancellations due to safety or weather conditions.		Service cancellation can be eliminated or minimized through increased reliability and sufficient spare vehicles.
Accidents	The objective should be no preventable accidents, but the number of preventable accidents should not exceed: 1 preventable accident per 100,000 revenue miles 2 accidents per 100,000 revenue miles 2 major accidents per 1,000,000 revenue miles		Operator training efforts should be adjusted to address specific types of preventable accidents.
Cancellations and No-Shows	N/A	No more than 5% of scheduled trips should be cancelled by passengers within one hour of scheduled trip, and no more than 2% of trips due to last-minute cancellations.	Cancellations and no-shows are an unproductive use of resources; occurrences should be tracked to identify customers and reasons. Actions should be taken to minimize recurrence. Cancellation of scheduled trips was 24% in 2011 (may relate to a subscription trips including work cancellations beyond rider control.) No shows were about 1% in 2011 (includes late cancellations).
Trip Coverage / Trip Denials	N/A	100% of all ADA-eligible trips should be accommodated.	A trip is considered "denied" if the trip cannot be accommodated one hour before or one hour after the desired time. Denials are not permitted under the ADA. In 2011, there were no FTA denials.

Route-Level Performance Measures and Standards

While route ridership and productivity are the most common measures of a successful transit route, additional and differentiated performance measures provide a more complete picture of route-level operations. The following measures are proposed to measure the success of individual routes:

- **Passengers per Revenue Hour.** Because it is so commonly employed and often provides a snapshot of overall performance, this measure is suggested for the evaluation of service types and individual routes.
- **Passengers per Revenue Mile.** Although this measure is not as relevant for Bend as all routes are relatively short, it nonetheless provides a good indication of routes that are experiencing delay or are simply long routes.
- **On Time Performance.** The reliability of route operations is also critical. Measuring an individual route's schedule adherence tracks whether a customer can count on a bus being there as scheduled, and helps identify the need for measures to improve transit reliability.
- **Passenger Loading.** Lack of seating capacity negatively impacts passenger comfort and can impede efficient passenger loading and unloading. Tracking this measures helps identify the need

Figure 7-9 summarizes the fixed route operating standards for the local service types identified in Figure 7-5 (above); current fixed-route services fall into the "secondary fixed-route" category, but will more differentiated in the future. Poor performance suggests that a route should be modified or eliminated. Exceptional performance suggests the route could be expanded, larger vehicles could be used, or headways can be improved.

Figure 7-9 Bend Route-Level Operating Standards – *Initial Discussion Draft*

Standard	Trunk / Primary Fixed-Route	Primary Fixed-Route	Secondary Fixed-Route	Community Circulator *	Flex Route *
Passengers per Vehicle Revenue Hour	25	15-20	10-15	Neighborhood / Feeder: 8-10 University: 15-20	4-10+
Passengers per Vehicle Revenue Mile	2.0	1.0	1.0	1.0	-
On-Time Performance	90%	90%	90%	90%	90%
Passenger Loading (Ratio of Passengers to Seats)	Off-peak: 0.85 to 1.0 Peak: 1.0 – 1.2	Off-peak: 0.85 to 1.0 Peak: 1.0 – 1.2	Off-peak: 0.85 to 1.0 Peak: 1.0 – 1.2	Off-peak: 0.85 to 1.0 Peak: 1.0 – 1.2	Off-peak: 0.85 to 1.0 Peak: 1.0 – 1.2

Notes: *These service types are not recommended as part of this plan

Figure 7-10 provides guidelines for new services, recognizing that it will take time to build ridership and productivity to the same levels as established routes. However, a new route that is not able to meet performance standards after a period of time may require modifications or redesign.

Figure 7-10 Guidelines for New Service Operating Standards

Time from Implementation	% Compliance with Standards
6 months	60%
1 year	75%
2 years	100%

Recommended Changes to Performance Data Collection

Figure 7-11 identifies recommended changes to tracking and/or reporting of performance data.

While most of the data needed to support the monitoring of performance measure is already available to CET based on existing data collection procedures, equipment upgrades would allow for improved data collection and performance monitoring. Automated farebox revenue data and automated passenger counting equipment may be among the most useful tools in collecting this data, as well as transit vehicle tracking (via an automated vehicle locator, or AVL, system, see Chapter 8). Software that supports these tools typically has extensive reporting capabilities to automate the process of not only calculating performance, but also

generating reports to share with the COIC Board and/or the BMPO Policy Board, such as the following, which were manually collected and tabulated as part of this planning study.

- Boardings/alightings by stop (collected in January 2012)
- Boardings by route, day, and time (collected in November 2011)

Figure 7-11 Recommended Changes to Monthly and Periodic Data Collection/Reporting

Reporting Period / Mechanism	Changes Recommended
Monthly (CET Management Report or other route-level performance reporting.))	▪ Add operating cost per service hour (by service) ▪ Add passengers per service mile (by service). This may be most useful as a route-level measure. ▪ On-time performance (halfway point and end of route; increased to timepoints as data collection capabilities improve). This is most useful as a route-level measure.
Periodic, with a goal of collecting data on every scheduled weekday and Saturday trip	▪ Boarding/alighting counts by stop ▪ Boardings by route, day, and time

FLEXIBLE SERVICE PLAN

The service concepts presented in this section are based on planning-level estimates of travel time and operating and capital costs for each route. The project team will continue to refine these estimates in close coordination with CET; however, CET operations staff will ultimately be responsible for validating and implementing these concepts at an operational level, including driving each route at different times of day, developing driver and passenger schedules, and making route adjustments to reflect local conditions when different aspects of the plan are implemented.

Time Frames

The service concepts proposed in this plan were developed around the following time frames, assumptions, and constraints:

- **Short-term service improvements (Years 1 to 3).** It is assumed that no additional operating revenues are available in the short-term time frame. Therefore these concepts focus on addressing the most pressing operational issues affecting the fixed-route system—in particular, to enable Route 5 to run within a 40-minute schedule all-day—with a cost-neutral approach (no increase in operating costs).
- **Mid-to-long-term service improvements (up to 20 years).** These concepts, built around primary transit corridors, recommend restructuring the system into a more flexible and scalable model that will support continued growth of the system. These concepts are organized into the following time frames:
  - **Near Mid-Term (Year 4).** Two routes are redesigned and there is additional service on Route 11 to support the planned OSU facility on SW Colorado Avenue. In addition, one additional evening run is provided on all routes, extending service until nearly 7:00 PM, helping serve work shifts that end at 6:00 PM.
  - **Mid-Term (Years 5 to 10).** An initial implementation of the restructured system provides more frequent service on several routes (every 30 minutes), while several routes run hourly. One new route is added and early evening weekday service is provided (until 8 PM). On Saturdays, routes run hourly, with up to 30-minute service on primary transit corridors. The cost of the initial restructuring is somewhat financially constrained based on evaluation of peer systems.
  - **Long-Term (up to 20 years).** A set of flexible service options can be implemented in phases, linked to available funding and criteria for

service expansion. As such, the long-term concept is not financially constrained, but maintains required funding levels within the range of peer systems.

Short-Term Service Improvements

This section identifies short-term improvements to the Bend fixed-route system to address key operational issues or help meet priority needs, given a constraint of no increase in operating costs.

Key Operational Issues and Proposed Route-by-Route Changes

Restructure Route 5 (NE - Wells Acres) and Route 6 (SE - Bear Creek). This change would allow Route 5 to run on the standard 40-minute pulse (coordinated) schedule all-day and allow passengers to make timed connections between routes.

- Operational Issue. Route 5, serving St. Charles Medical Center, has had significant on-time performance issues due to high boarding activity, wheelchair boardings, and traffic congestion. Earlier in 2012, Route 5 was taken off of the coordinated pulse schedule for several hours midday since it was unable to complete a round trip by the next pulse departure time. While taking it off of the pulse allows Route 5 to stay on schedule, it also impacts passengers' ability to make timed connections to/from other routes.
- Proposed Changes. A variety of options were explored to address the operational issues with Route 5 (see Appendix B) describes the leading alternative considered and compares the benefits and impacts of the two options). The proposed changes interline Routes 5 and 6 in order to allow Route 5 to return to the standard 40-minute pulse schedule in the short-term. As illustrated in Figure 7-12:
  - Outbound Route 5 turns into inbound Route 6 after serving St. Charles Medical Center and Purcell Boulevard. Instead of turning right (north) onto NE 27th Street, the bus stops on Greenwood Avenue west of NE 27th Street (#608). It then completes the inbound portion of Route 6, returning to Hawthorne Station.
  - Outbound Route 6 turns into inbound Route 5 after serving Bear Creek Road and Greenwood Avenue. The route serves a new stop[14] on Greenwood Avenue at Purcell Boulevard, instead of the existing Route 6 stop (#608) slightly further east. Instead of turning right (south) onto NE 27th Street from Greenwood Avenue, the bus turns left (north)

[14] Subject to evaluation of ridership demand

onto 27th. It then becomes the inbound Route 5 bus at the first stop on 27th north of Greenwood (#538).

- Inbound Route 5 does not serve St. Charles Medical Center directly. Passengers returning from the Medical Center or who live on Purcell Boulevard can either take the outbound Route 5, which turns into the inbound Route 6 and returns to Hawthorne Station, or walk to the nearest inbound Route 5 stop, on 27th just south of Neff (#518). This is about a third of a mile walk from the Medical Center.
- At Hawthorne Station, inbound Route 5 turns into outbound Route 6 (to Lava Lanes and the Forum Shopping Center). Inbound Route 6 becomes outbound Route 5 to St. Charles Medical Center.

In addition to improving all transfers to/from Route 5, this change improves connectivity to St. Charles Medical Center for residents and activity centers along Route 6. However, the change impacts inbound Route 5 trips from the Medical Center and some stops on Purcell Boulevard to destinations on Route 5, e.g., Mtn. View High School.

- Other Considerations:
  - As described below, a new route along Greenwood Avenue (Route 7) is proposed in the mid-term concept that will provide a direct connection from St. Charles Medical Center to Hawthorne Station. It is proposed that Route 5 and Route 6 then be connected in a bidirectional loop.
  - Traffic signal and signal timing improvements on 27th Street, planned for summer and early fall of 2012, will help alleviate delays due to traffic congestion.

Comparison of Service Alternatives for Route 5

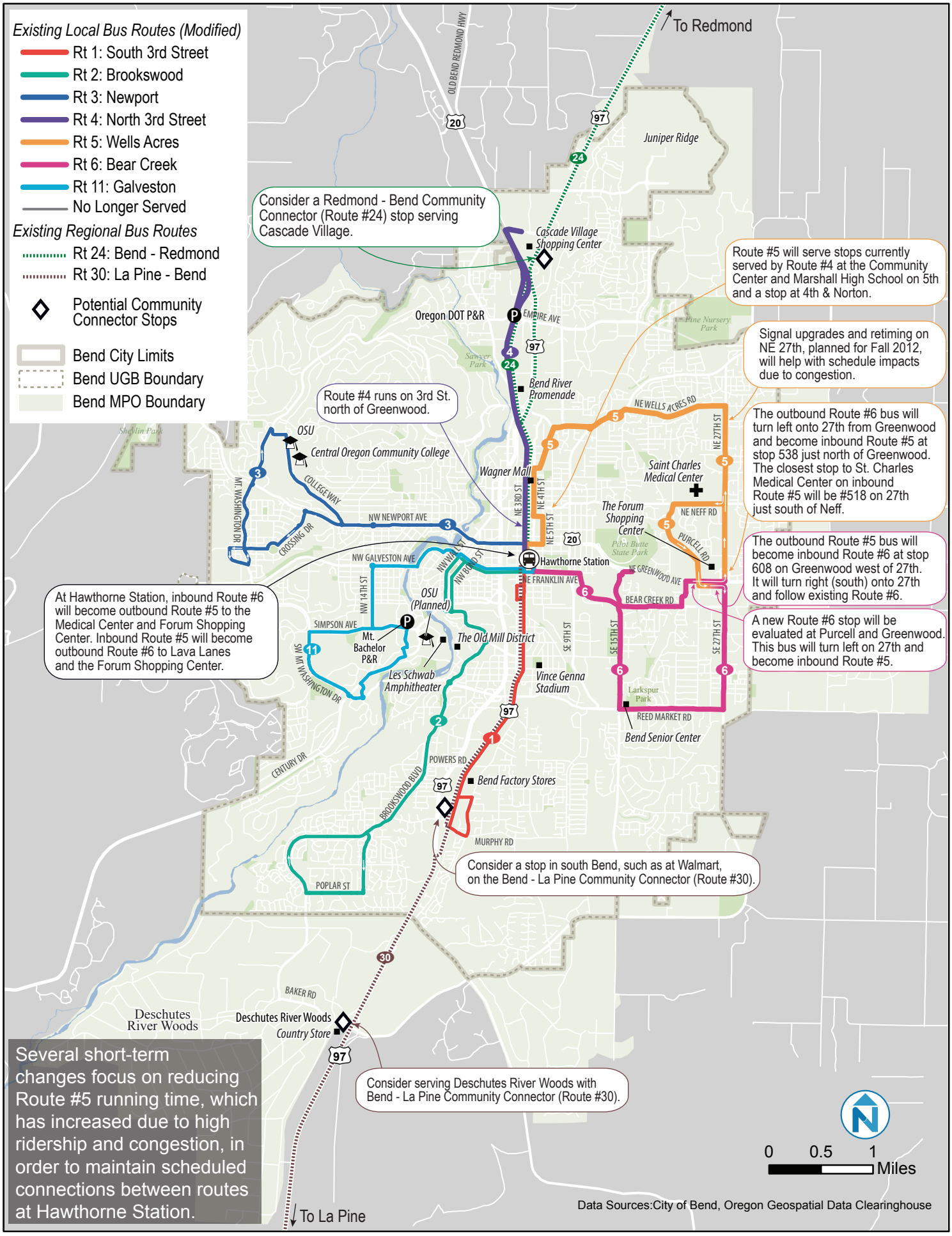
See Appendix B for a discussion of other options considered for Route 5 and a comparison with the leading alternative.

Move Route 4 (North 3rd Street) routing back to 3rd Street between Greenwood and Olney Avenues; Route 5 serves current Route 4 stops on 5th Street north of Greenwood.

- Operational Issue: In early 2012, Route 4 was routed on 4th and 5th Streets between Greenwood and Olney Avenues in order to better serve the Bend Community Center on 5th Street, which serves as the senior meal site[15], as well as Marshall High School. This deviation has increased running time on Route 4.
- Proposed Changes: Route 4 runs on 3rd Street and Route 5 serves current Route 4 stops on 5th Street north of Greenwood Avenue and at 4th Street and Norton Avenue. This change will reduce running time for both routes.
- Other Considerations: There is currently no traffic signal at 4th/Greenwood, although a potential future signal, as proposed in the Central Area Plan as part of broader changes to traffic circulation, could provide transit routes with a more efficient means of crossing Greenwood Avenue.

[15] As of September, 2012, senior meals are now served on a week-by-week basis, depending on available funding.

Figure 7-12 Short-Term Service Improvements



Additional Short-Term Service Strategies

Additional short-term strategies can be used to provide more direct and convenient service as well as serve trip origins and destinations located outside of Bend city limits, which can best be served through close coordination of Bend local fixed-route service with CET regional transit services; this outcome is the goal of the Regional Transit Master Plan (RTMP) that is being developed by the Central Oregon Intergovernmental Council (COIC).

- **Use regular interlining to provide more direct, one-seat connections between major origin and destination pairs.** As described above, Routes 5 and 6 will be regularly interlined. Additional regular interlining that is currently practiced for schedule recovery (i.e., matching shorter and longer routes) can also be marketed to passengers as more direct transit connections:
  - Route 1 (S. 3rd Street) to Route 3 (COCC)
  - Route 2 (Brookswood) to Route 4 (N. 3rd Street)

  Note: In the mid-term concept, it is proposed that new Route 7 (Greenwood Avenue) be paired with Route 3.
- **Consider low-floor buses for use on routes with the most wheelchair boardings, and high overall boardings, when acquiring new/replacement vehicles**. Low-floor buses streamline the time needed to board wheelchairs and other passengers. Wheelchair lifts on buses in the current CET fleet can take up to five minutes, making it difficult for routes that run on a tight schedule to run on-time if there are multiple wheelchair boardings, including Routes 4 and 5.
- **Use Community Connector routes to serve areas near/outside Bend city limits.** Community Connector routes could serve a limited number of destinations[16] in Bend to provide regional passengers with more direct access to destinations or serve locations on the periphery of Bend that are not served by the fixed-route system. The Community Connector route from Redmond could potentially serve Cascade Village on some trips and/or directions. The La Pine Community Connector could make a stop in Deschutes River Woods; as of November

A Community Connector stop could serve Deschutes River Woods, if a suitable location can be identified/negotiated. The Riverwoods Country Store (above) or Riverwoods Baptist Church are potential options.

[16] Providing fixed-route service with local stops outside of Bend city limits would create a requirement to provide ADA Paratransit service, which is a significant additional expense.

2012 a stop was implemented at the Riverwoods Baptist Church. Longer-term, a stop with a small Park & Ride and/or Bike & Ride could be negotiated at the Riverwoods Country store, but would require some infrastructure improvements.

- **Coordinated Marketing of Regional Connections.** The regional system of Community Connector routes can provide Bend residents with access to regional destinations such as the Redmond Airport, a connection that is available today with an advance reservation. Converting the Airport shuttle to a fixed-route (no reservations required), adding runs timed with additional flight arrivals and departures, and marketing the Airport service should help attract Bend residents. As increased frequency and service hours make the Bend fixed-route system more convenient to use in the future, coordinated marketing and education would better inform Bend residents of regional connections available to them.
- **Use vanpools to serve dispersed employment sites.** Vanpools may be an effective means of serving dispersed employment sites (e.g., Bend Municipal Airport). Vanpools are likely to be more attractive to regional passengers using Community Connector (intercity) service and could be coordinated with regional service schedules. However they would also provide an additional transportation option for Bend residents.

Mid- to Long-Term Service Concepts

This section recommends concepts for restructuring the Bend fixed-route system to provide greater flexibility in keeping up with future growth. It first describes the proposed changes to the fixed-route service model and highlights the benefits of making the recommended changes. It then provides an overview of service characteristics for each proposed time frame and describes the proposed phasing of improvements. Finally, improvements included in each proposed time frame are detailed on a route-by-route basis.

The concepts are somewhat cost constrained based on an evaluation of peer systems, but are also structured as a flexible set of service options to meet the identified needs as funding resources become available.

Recommended Service Model

As discussed above, the existing radial, hub-and-spoke design will continue to be applicable in Bend for the foreseeable future. Hawthorne Station remains the primary timed transfer hub, but new transfer opportunities are introduced over

time. The key recommendation for the mid-to-long-term is to restructure the system using 30- and 60-minute cycle times[17] and 15-, 30-, or 60-minute headways[18] so that it can scale to meet longer-term service and land use goals. The existing system uses 40-minute cycle times and 40-minute headways. The recommended restructuring has the following benefits:

- **Improves legibility and ease-of-use**. Headways that divide evenly into an hour (e.g., 15, 30, and 60 minutes) make it easy for passengers to remember the bus schedule because the pattern is repeated each hour. Passengers no longer need to consult a schedule but know they can catch the bus at the same time each hour.
- **Supports the need for convenient transfers**. Consistent headways also make it easier for passengers to remember the schedule for timed connections, which also occur at the same times each hour.
- **More flexible and scalable over time.** Some existing routes do not require 40 minutes to complete and could run in 30 minutes. This frees capacity to provide service elsewhere. Other routes, with traffic congestion and growth of the system, are already reaching the limit of a 40-minute cycle time, e.g., Routes 5 (Wells Acres), 4 (N. 3rd), and 2 (Brookswood). A 60-minute cycle time also enables future expansion of routes to provide additional coverage.
- **Focuses service investments where ridership and land use opportunity is greatest.** Headways in increments of 15 minutes make it easier to scale up frequency (from 40 to 30 minutes initially) on high-demand routes serving major destinations, e.g., 3 (Newport - COCC) and 5. Service could be scaled down (from 40 minutes to hourly) on lower-demand routes, e.g., 6 (Bear Creek) and 11 (Galveston). The level of service would be scaled based on a set of criteria (described below).

Recommended Phasing Approach and Service Characteristics

This section describes the proposed phasing of improvements in the mid- to long-term within the following time frames:

- Near mid-term phase (Year 4), contingent on a planned OSU facility on SW Colorado Avenue
- Initial mid-term implementation of the restructuring (Years 5 to 10)
- Flexible options for phased longer-term implementation (up to 20 years).

[17] Cycle time, also referred to as running time, is the time it takes a bus to complete a single round-trip along its route.

[18] Headway is the time interval between consecutive buses arriving at a particular stop along a route (in the same direction).

The phasing recommendations for new or expanded service are based on the prioritized needs and results of the corridor evaluation conducted as part of the Future Opportunities analysis (Future Opportunities memo). Priorities for service expansion should be reevaluated as growth occurs, based on updated funding and land use projections and the recommended service expansion thresholds.

Increased frequency and hours of service should be prioritized on routes that serve the network of primary transit corridors that comprise the core of the transit system, illustrated in Figure 7-4 (above). Land use policies would encourage higher-density development and mixed uses along these corridors in order to support an increased level of transit service.

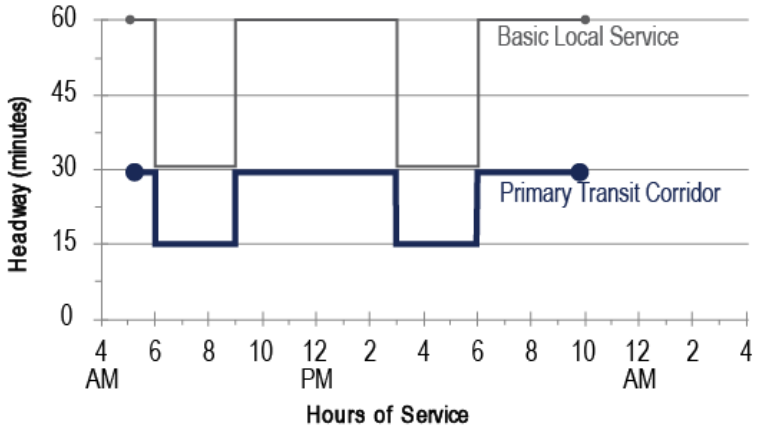
Figure 7-13 identifies the recommended service characteristics of the restructured concept at each time frame in comparison to the existing system and short-term modifications. Figure 7-14 illustrates the long-term targets for service span (hours) and headway for primary transit corridors and routes providing local service. Contingent on land use (see service targets below), primary corridors could see headways as high as every 15 minutes during peak periods in the long-term, while other local service routes could run as frequently as every 30 minutes during peak periods. The base headway for primary corridors would be 30 minutes while the base headway for other local service routes would be hourly.

Figure 7-13 Initial and Long-Term Recommended Service Characteristics

	Existing System and Short-Term Modifications	Near Mid-Term: New OSU Facility and Later Hours	Mid-Term: Initial Restructuring Concept	Long-Term Restructuring Concept
Time Frame	Years 1-3 (FY 2012 – FY 2014)	Year 4 (FY 2015)	5-10 Years (FY 2016 – FY 2022)	up to 20 Years (FY 2023 – FY 2032)
Weekday Service Hours	6:15 AM – 6:15 PM Route 11 runs only 6 hours per day	6:15 AM – 7:00 PM (one additional trip) Route 11 runs all day	6:00 AM – 8:00 PM	5:00 AM – 10:00 PM 60 minute service after 8:00 PM
Weekday Headways	40 minutes	40 minutes 60 min. on Route 11	30 or 60 minutes	15, 30 or 60 minutes (variable by route and time of day)
Saturday Service Hours	7:00/8:00 AM – 4:00/ 5:00 PM No Route 11 service	No Change Saturday Service on Route 11	8:00 AM – 5:00 PM	7:00 AM – 7:00 PM
Saturday Headways	80 minutes	No Change	60 minutes [1]	30-60 minutes
Sunday Service Hours	None	None	None	8:00 AM – 5:00 PM
Sunday Headways	N/A	N/A	N/A	60 minutes
# of Routes	7	No Change	8	9
# of Peak Buses	7	No Change	9	20

Notes: Appendix B provides a detailed listing of service characteristics by route for both the initial restructuring and the long-term concept. (1) Routes serving primary transit corridors could run every 30 minutes on Saturdays.

Figure 7-14 Long-Term Service Headway Targets



Headway is the time interval between consecutive buses arriving at a stop along a route.

Near Mid-Term Improvements (Year 4; Contingent on Planned OSU Facility)

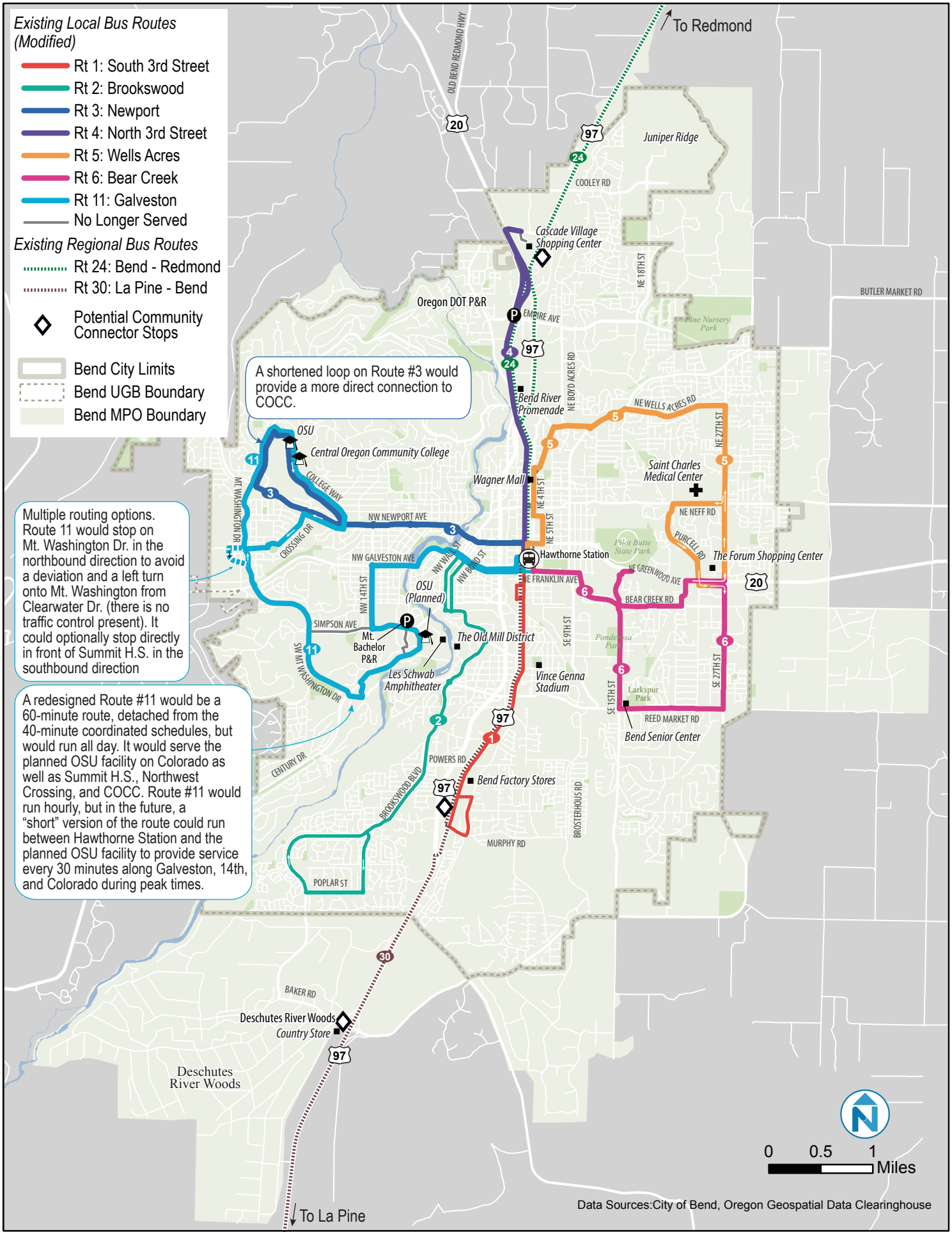
A new OSU facility is planned for Colorado Avenue, with up to 5,000 students within the next several years. This facility would likely increase demand for transit along existing Route 11 (Galveston), which currently only runs for only six hours per day and does not run on Saturdays, as well as for a connection between the new facility and the current COCC (and OSU) campus, served by Route 3.

The proposed changes, illustrated in Figure 7-15, are to restructure Routes 3 and 11 to provide a direct connection between the planned OSU facility and COCC:

- **Route 3 (Newport to COCC).** Shorten the Route 3 terminal loop (see Figure 7-14) to provide a more direct connection to COCC. Route 3 would follow Shevlin Park Road to Mt. Washington Drive and would no longer serve Northwest Crossing or Summit High School, which would instead be served by a modified Route 11.
- **Route 11 (Galveston).** Modify Route 11 to serve the planned OSU facility on Colorado and extend Route 11 to COCC, also serving Northwest Crossing and Summit High School. Route 11 would be enhanced to operate all-day and on Saturdays. Route 11 would run hourly, and would not fully coordinate with the schedule of other routes, until other routes are restructured to run every 30 or 60 minutes (see below).

In addition, if any additional operating resources are available, it is recommended to fund one additional evening trip on all routes, extending service to about 7:00 PM.

Figure 7-15 Near Mid-Term Concept for Service to Planned OSU Facility



Initial Restructuring Concept (Mid-Term: Years 5 to 10)

The initial restructuring concept can be considered for implementation in the mid-term time horizon (Years 5 to 10). It represents the transition from the existing 40-minute cycle time/headway system to one based on 30- or 60-minute cycle times and 15, 30, or 60 minute headways. Service days and hours for the initial implementation are similar to current days and hours, except for the introduction of early evening service hours (6 PM – 8 PM), the highest priority need identified. The concept includes the following elements, which are illustrated in Figure 7-16 along with long-term concepts:

- Short-term modifications to Routes 4, 5, and 6.
- Implement highest priority enhancements:
  - Expand early evening service hours (until 8:00 PM).
  - Provide all-day service on Route 11 (hourly).
- Provide new Route 7 (Greenwood to Forum Shopping Center and St. Charles Medical Center). Restructure Routes 5 and 6 at the same time to avoid service duplication; a bidirectional loop is recommended (described in more detail below).
- Provide increased Saturday frequency (from every 80 minutes to hourly), which could include 30-minute service on some primary corridors.
- Provide 30 minute weekday service on most routes serving primary transit corridors. Routes 1, 3, and 7 should all be able to complete a round trip in 30 minutes, while Route 4 would require a second bus and is therefore initially recommended to have 30-minute service only during peak periods. A short version of Route 11 can be used to provide 30-minute service to the new OSU campus, at least during peak periods.

Long-Term Service Concept (up to 20 years)

The long-term concepts are also shown in Figure 7-16 and include (listed in general order of priority, based on public input):

- Expand early morning and later evening hours: 5-6 AM, 8-10 PM (at least on primary corridors). Early morning service levels are assumed to be similar to midday service, however later evening routes are assumed to operate similar to Sunday service (above bullet) to reduce costs.
- Implement Sunday service (hourly). This could include 30-minute service on some primary corridors, however the long-term concept assumes that routes which cycle in 30-minutes will be interlined to reduce operating costs (this is similar to existing Saturday service). However, some transfers may require a wait of up to 30 minutes.

- Expand Saturday hours to 7 AM – 7 PM.
- Increase weekday frequency to 30 minutes all-day on primary corridor routes.
- Increase Saturday frequency to 30 minutes on primary routes, e.g., 1, 4, 7, and portions of 2 and 11. This level of service may not be needed on Route 3 to COCC, but offering it would maintain the interlining between Routes 3 and 7.
- Expand service in NE and SE Bend, *as warranted by a service policy tied to land use targets*. This can be done most cost-effectively using additional running time available on routes that cycle in 60 minutes (2, 4) or with additional routes that cycle in 30 minutes.
  - NE: Extend Route 4 to Juniper Ridge and/or to provide service in the NE neighborhoods using a terminal loop.
  - SE: Extend service on Route 2 to Murphy/Brosterhous/15th (hourly). The existing loop using Poplar would continue to be served hourly. This would provide 30-minute service through downtown and the Old Mill District.
  - NE: New Route 8 in NE (8th/Boyd Acres/Empire/18th to Juniper Ridge and/or Cascade Village) (hourly).
- Increase peak frequency on non-primary routes to 30 minutes (where justified by service policy).
- Increase midday frequency on non-primary routes to 30 minutes (where justified).
- Provide peak 15 minute frequency on primary routes (where justified).

Route Concepts

This section provides a more detailed discussion of changes and improvements on a route-by-route basis.

New Routes

- **Route 7 (Greenwood) – mid-term:** A new Route 7 would serve Greenwood Avenue between Hawthorne Station and the Forum Shopping Center and St. Charles Medical Center. This route, shown in Figure 7-16, is included in the initial mid-term implementation. It would be interlined with Route 3 to COCC and would provide a direct east-west connection across the city. Route 7 would serve land uses located at Greenwood and 15th Street that are currently served by Route 6. Between 15th Street and

Dean Swift Road, the route could optionally use Greenwood or follow Bear Creek Road. *If the Greenwood routing is adopted, it is critical to:* (1) provide accessible pedestrian connections from residential neighborhoods along Bear Creek to serve each new stop on Greenwood Avenue (see Appendix B, Figure B-16 for a map of existing and planned accessways from the Bend TSP), and (2) to provide safe pedestrian crossings of Greenwood Avenue, e.g., using rectangular rapid flashing beacon treatments (see Chapter 8).

- **Route 8 (8th/Boyd Acres/Empire/18th) – long-term.** A new Route 8 would provide service coverage in NE Bend, as shown in Figure 7-16. Based on the corridor evaluation and field evaluation of the potential routing options, this route serves 8th between Hawthorne Station and Wells Acres Road, Boyd Acres south of Empire, and 18th south of Cooley Road. This route could have a terminus at Juniper Ridge, with a terminal loop to serve the planned Juniper Ridge Town Center, or a terminal loop serving the NE neighborhood (indicated by the cross-hatched areas on the map). Alternatively, this route could terminate at Cascade Village or an alternative major transit stop serving the north part of Bend; a future major transit stop could also be located at/near Juniper Ridge in conjunction with Route 8.

Modifications to Existing Routes

- **Route 1 (South 3rd Street).** Route 1 would continue to operate similar to today. In the future, it could be extended to run down 3rd Street south of Murphy Road if significant land uses develop there. This change would require a 60-minute running time as opposed to the current 30-minute running time. A major transit stop and bicycle parking can be added at the south end of the route, such as near Walmart or in conjunction with the Murphy Crossing development, to enable longer-distance access including a possible Community Connector stop. A small, co-located park and ride with this stop could also support shared rides (carpools or vanpools) to worksites outside of Bend, such as Sunriver.
- **Route 2 (Brookswood) – long-term.** Route 2 could be extended to serve the planned connection of Murphy Road across the Bend Parkway, as illustrated in Figure 7-16. It would make two trips every hour, with one trip providing hourly service on the existing loop on Lodgepole Drive and Poplar Avenue and the other serving the proposed extension to Murphy and Brosterhous Road; this would provide 30-minute headways on Route 2 through downtown and the Old Mill District.
  - Bicycle parking is recommended at the stop at Poplar Street and Brookswood Boulevard to enable bicycle access from Deschutes River

Woods. A relatively new shopping center at Brookswood and Amber Meadow Drive is located about 0.1 miles south of the current end of the route, however there are currently no suitable turn-around options.

  - The Murphy Road extension would serve residential uses and middle and high school sites that are planned by 2030 both north and south of Murphy Road. A turn-around would be required, such as a roundabout that is planned at Murphy/Brosterhous in conjunction with the future extension of Murphy Road to 15th Street; alternatively it may be possible to use an access road through R.E. Jewell Elementary School.
  - A short version of the route (turning around at approximately Reed Market) could also be added at certain times to increase peak frequencies in downtown or the Old Mill District, or to provide later evening service.

- **Route 3 (Newport to COCC)**: This route would be redesigned to provide more direct service to COCC.
  - A shortened Route 3 loop (as shown) would provide a more direct connection to COCC. It would no longer serve Northwest Crossing or Summit High School, which would be served by a redesigned Route 11 that would maintain the connection between Summit High School and COCC (see below).
  - Route 3 would be interlined with the new Route 7 to provide a more direct east-west connection across the city**.**
  - A one-way, clockwise loop through COCC is preferred for operational reasons during snowy weather.
- **Route 4 (North 3rd) – long-term**: This route could be extended to serve Juniper Ridge, when warranted, and/or serve a terminal loop through NE neighborhoods.
  - Route 4 will be on a 60-minute cycle time following the initial implementation of the restructuring concept, which should make a terminal loop through NE neighborhoods feasible at no additional operating cost, but is contingent on minimizing delays at-grade railroad crossings, e.g., on Cooley Road.
  - Cascade Village is currently recommended as a major transit stop serving the north part of Bend, with bike parking to support access from surrounding neighborhoods. However, in conjunction with potential future changes/realignment of Hwy 20 and/or Hwy 97, an alternative major transit stop location may be identified that can also serve as a park and ride and/or stop for the Bend-Redmond Community Connector shuttle.

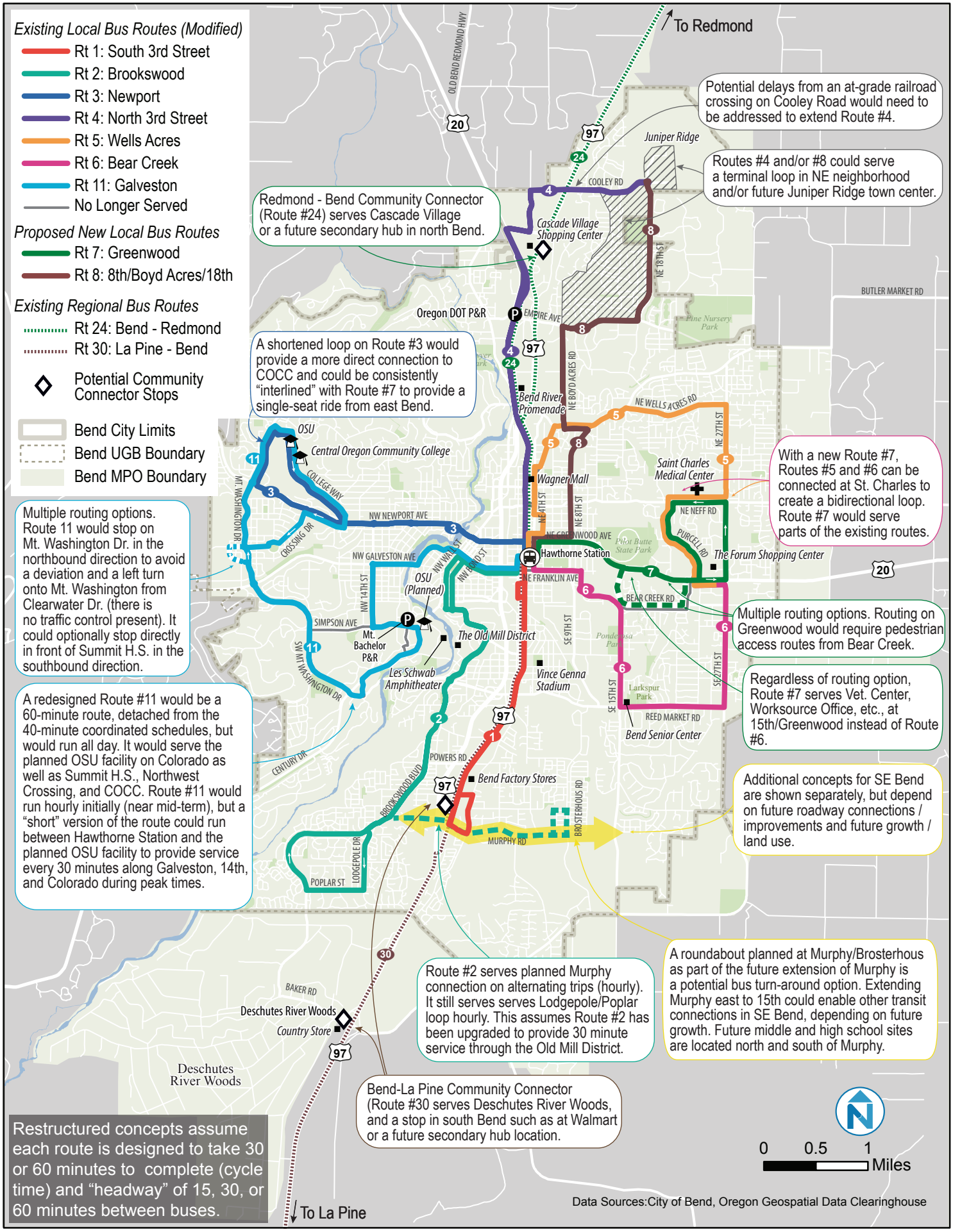
  - In conjunction with any changes or realignment of Hwy 20 and/or Hwy 97, it would be highly desirable to provide a bidirectional stop in proximity to the Deschutes County Sheriff and State Police offices located on Jamison Road, which are currently served only on outbound trips.
  - Stop placement and transit priority improvements can also be evaluated on 3rd Street to optimize transit running time.

- **Route 5 (Wells Acres) and Route 6 (Bear Creek):** With introduction of the new Route 7 serving St. Charles Medical Center from Greenwood Avenue, Routes 5 and 6 can be combined into a bidirectional loop. This would be similar to the short-term interlining of the two routes, however, they would no longer serve 27th (between Greenwood and Neff) and Bear Creek (between 15th and Dean Swift), to avoid duplication of service with Route 7. Route 6 would no longer serve uses at Greenwood & 15th (e.g., Lava Lanes, Veterans Center, Worksource Office, etc.), which would be served by Route 7. Routes 5 and 6 would initially operate hourly in each direction. More frequent service could be provided in the peak as allowed by funding and demand. These routes may have sufficient running time to provide some additional coverage in SE Bend; additional concepts for SE Bend are discussed below.
- **Route 11 (Galveston):** This route will be redesigned to provide an increasingly important connection between the planned OSU facility on Colorado Avenue and COCC. Implementation should be timed with and contingent upon development of the OSU facility.
  - Extend route to Northwest Crossing, Summit High School, and COCC.
  - Upgrade to operate all-day with hourly service. In the early mid-term time frame, its schedule would not be coordinated with the 40-minute pulse. However, Route 11 currently does not fully coordinate with other routes due to its limited weekday service hours.
  - In the mid-term time frame, the schedule would be coordinated as other routes also move to a 30- or 60-minute schedule. A "short" version of Route 11, turning around at OSU, can be used to provide 30-minute headways between Hawthorne Station and the OSU facility, including through downtown and the Galveston Avenue primary transit corridor. This could be implemented as a downtown circulator (Appendix B) using a Colorado Avenue or Reed Market Road crossing.

Additional Long-Term Service Concepts

Appendix B provides a map illustrating several additional long-term concepts in NE and SE Bend that could be enabled by planned/future projects to complete roadway connections or address connectivity issues. It is difficult to anticipate how land use and transit demand will respond to these improvements, therefore the map identifies potential connections and where applicable, suggests how they may be served.

Figure 7-16 Restructured 30/60-Minute Mid- to Long-Term Service Concept



8 BUILDING A COMPLETE TRANSIT SYSTEM: NON-SERVICE ELEMENTS

This section provides a general description of non-service transit system elements that complement enhanced service levels and transit-supportive land use, and recommended non-service improvements and strategies for meeting the public transportation needs and priorities identified in Chapter 5.

FACILITIES AND PASSENGER AMENITIES

Bus stops are the basic type of transit facility and serve as the "front door" of the transit system. The location, design, and operations of stops and other facilities often define the first impression of transit and are important not only for retaining existing riders, but also attracting new ones. The location and spacing of bus stops have a strong influence on transit system performance, e.g., helping buses stay on schedule. Major types of transit facilities include:

- **Transit Centers**. Transit centers are the primary locations where bus routes converge and buses can layover between trips. In Bend, Hawthorne Station is the primary transit center and provides shelters and an indoor waiting area with restrooms. It facilitates transfers to/from regional routes as well as intercity services.
- **Major Transit Stops / Secondary Transit Hubs.** Major transit stops provide a higher level of amenities at major stop locations. Such stops may function as secondary hubs that provide additional transfer and layover locations outside of the main transit center.
- **Park and Ride Facilities**. Park and ride lots may be co-located with transit centers and 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.

Figure 8-1 identifies existing and recommended major public transportation facilities in Bend. Figure 8-2 provides a map of these facilities, as well as existing, planned, and proposed (conceptual) stops and amenities in relation to existing/proposed routes. It is important to note that more detailed public input and evaluation of conceptual stop locations will need to be conducted by CET and/or the

City of Bend based on the final routing, and that not all of the illustrated stops may be implemented. It is also assumed that all stop locations will be designed to meet the Americans with Disabilities Act (ADA) minimum requirements for new bus stops, which will allow for safe passenger access to and from the bus stop. Further guidance for siting ADA accessible bus stops can be found in the Transit Cooperative Research Program (TCRP) Report 19, Guidelines for the Location and Design of Bus Stops[19].

Figure 8-4 (below) provides guidelines for tiers of stops and amenities that can be provided, based on available resources, passengers' needs, and operational considerations.

Figure 8-1 Existing and Proposed Major Public Transit Facilities

Facility Type	Existing	Recommended/Proposed Future Facilities
Transit Centers	Hawthorne Station (between 3rd/4th Streets)	Could be considered in conjunction with future redevelopment or transportation infrastructure opportunities
Major Transit Stops / Secondary Transit Hubs		East: St. Charles Medical Center West: COCC North: Cascade Village (or future alternative location in North Bend) and/or Juniper Ridge South: Walmart or Murphy Crossing areas Enhancements such as shelters or bicycle parking are identified in Figure 8-2
Park & Ride Lots	ODOT P&R Mt. Bachelor	Potential future alternative P&R in north Bend (with a new secondary hub location) Deschutes River Woods (Minor Park & Ride)

Facility/stop amenities can be prioritized based on passenger utilization (e.g., number of daily boardings), the guidelines provided in Figure 8-4, and other operational considerations.

[19] http://onlinepubs.trb.org/onlinepubs/tcrp/tcrp_rpt_19-a.pdf

Transit Hub

The existing transit center, Hawthorne Station, is described in the Bend Transportation System Plan (TSP) as the "interim transit center location." Hawthorne Station meets the needs of the current transit system and this plan recommends that Hawthorne Station continue to serve as Bend's primary transit center.

> ***Transit Center Location Considerations***
>
> See Appendix B for a discussion of considerations for relocating the primary transit center at Hawthorne Station in response to future growth or redevelopment/connectivity opportunities.

Major Transit Stops / Secondary Hubs

The Bend TSP currently proposes major transit stops at St. Charles Medical Center (east Bend) and COCC (west Bend). This plan recommends major transit stops at these locations as well as in north and south Bend. Figure 8-4 provides high-level costs for infrastructure improvements at major transit stops, e.g., shelters or high-capacity shelters, real-time bus arrival information, bicycle parking, etc. These infrastructure investments would enable these stops to serve as future secondary transit hubs, facilitating transfers between routes in the future as enabled by future service expansion, e.g., between Routes 3 and 11 in west Bend, Routes 4 and 8 in north Bend, Routes 1 and 2 in south Bend, etc. New roadway connections (such as the 27th-Empire link) may create additional transfer opportunities outside of the primary transit center. This plan does not recommend service that bypasses the main transit center, however such service may be feasible in the future.

The additional major transit stop / secondary hub locations are recommended in:

- **North Bend**, at Cascade Village or an alternative secondary hub location that may be identified in conjunction with potential future changes/realignment of Hwy 20 and/or Hwy 97, and that can also serve as a park and ride and/or stop for the Bend-Redmond Community Connector shuttle. A major transit stop and/or secondary hub at Juniper Ridge may also be warranted in the future, depending on the nature/level of development and detailed service design for Routes 4 and/or 8.
- **South Bend**, at a location to be determined (could include Walmart or Murphy Crossing area).

Park & Rides and Regional Transit Connections

As shown in Figure 8-1, two existing Park and Ride lots are identified in the Bend TSP:

- ODOT Park & Ride located off of Hwy. 97 in the north parking lot of the ODOT Region 4 offices
- Mt. Bachelor Park & Ride located northwest of SW Simpson Avenue and SW Columbia Street

An additional Park & Ride is located east of city limits at Powell Butte Highway, but does not provide a current or planned connection to transit.

A strategy in this plan is to use regional Community Connector routes to provide service at selected locations outside current city limits and/or beyond extent of the fixed-route system. Where warranted by demand, such service should be coordinated with Secondary Transit Hub and/or Park & Ride facility locations. Two such locations were identified within the MPO Boundary as described above and shown in Figure 8-2 and Figure 8-3:

- Deschutes River Woods
- North Bend, e.g., the existing ODOT Park & Ride, or an alternative future location

Desire among the public for additional Park & Ride facilities and access to transit service was identified through public input for this plan. Figure 8-3 highlights potential park & ride locations, which would be considered of as part of the COIC Regional Transit Master Plan (RTMP) and the Regional Park & Ride Plan. These include:

- Sun River. Transit service would require identifying a suitable stop location, ideally in close proximity to Highway 97 to avoid excessive delay to passengers traveling between Bend and La Pine.
- Tumalo. The Bend urbanized area boundary was recently extended to include Tumalo, based on the 2010 U.S. Census; a map of the revised boundary is provided in Appendix D. Transit access in this area would likely depend on future regional service between Bend and Sisters.

Figure 8-2 Existing and Proposed Transit Facilities

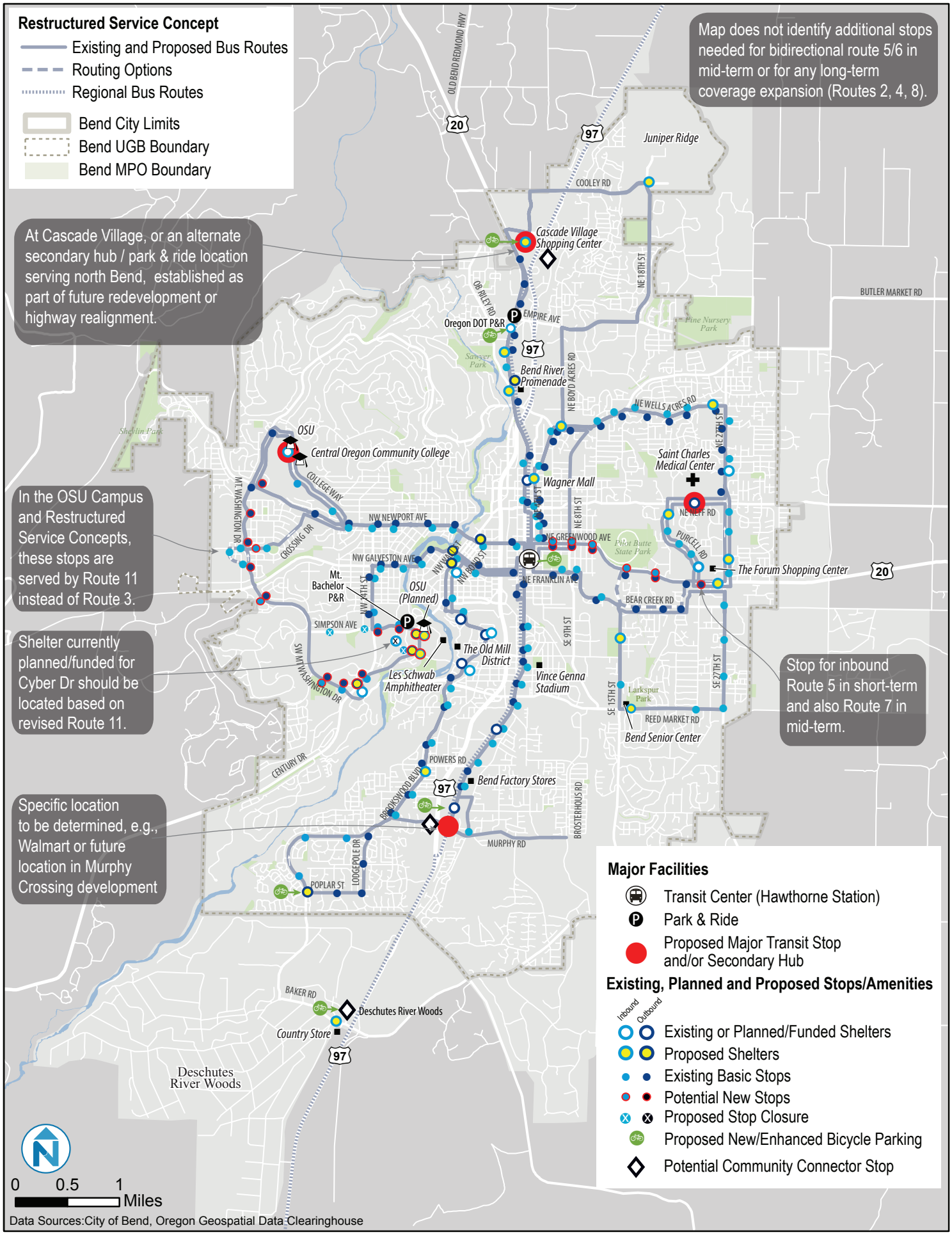
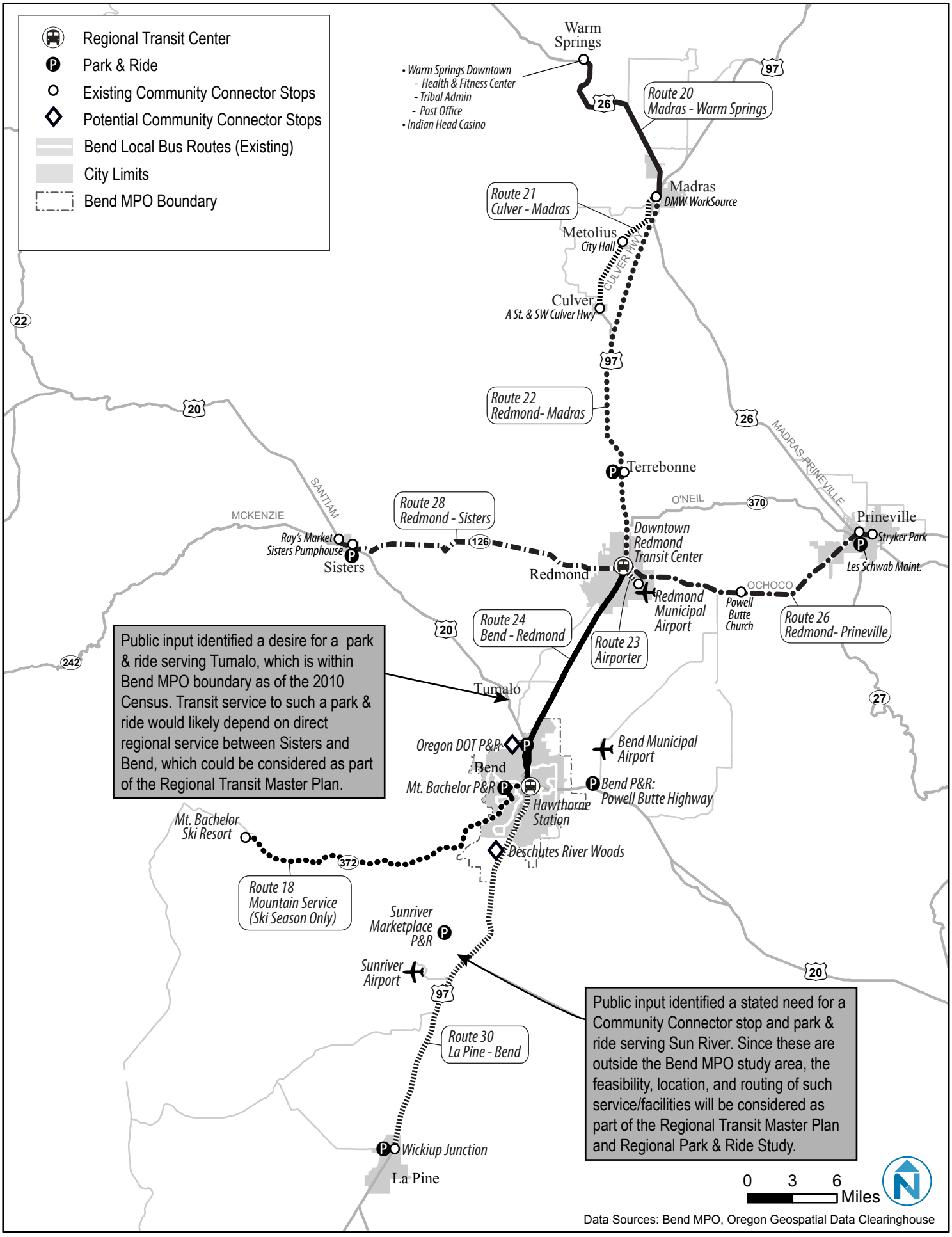


Figure 8-3 Existing and Potential Regional Transit Facilities



Passenger Amenities

Safe and comfortable passenger amenities at stops and other facilities are an important element of any successful transit service. At major transit stops, shelters provide needed protection from inclement weather and sun; seats provide passengers a comfortable option while waiting for transit; and trash receptacles ensure that the stop remains clean and attractive. Route/time information should also be posted at every stop. Higher-end station amenities include bicycle parking and real-time bus arrival information to let passengers know when their bus will arrive.

Thresholds for Investments in Stop Amenities

Figure 8-4 provides recommended thresholds for investing in stop amenities at transit facilities, including three tiers of improvements ranging from a basic package of amenities at a neighborhood stop to shelters and higher-end amenities and upgrades at high-demand stops and transit hubs.

Figure 8-4 Bus Stop Tiers and Investment Guidelines

	Tier 1: Basic Neighborhood Bus Stop	Tier 2: Major Bus Stop with Shelter	Tier 3: Enhanced Bus Stop
Examples of Uses	Typical stop in Bend with a concrete pad, seat, route sign, map/schedule, and information in Braille	High Use Stops, Minor Park & Ride, Transfer Points	Transit Centers, Major Park & Ride, Secondary Hubs
Threshold for Prioritizing*	Low = <25 Daily Boardings	Medium = 25-49 Daily Boardings	High = >50 Daily Boardings
Estimated Cost	$1,900[a]	$6,200 [a]	$10,200 [a] - $30,000 [b]
Required / Preferred Elements	▪ Basic seat desired but not required ▪ Benches at high-end of boarding range ▪ Posted route/time information ▪ Meets ADA requirements (e.g., pad) ▪ Good pedestrian access desirable	▪ Shelter/Seating ▪ Posted route/time information ▪ Good pedestrian access preferred (sidewalk, curb ramps, etc.)	▪ High capacity shelter(s) ▪ Enhanced signage and maps ▪ Lighting ▪ Excellent pedestrian and bicycle access (e.g., protected crossings)
Optional Elements		▪ System map ▪ Bicycle parking	▪ Real time bus arrival information ▪ Secure bicycle parking and/or bicycle sharing ▪ Public art
Existing Local Examples	 Franklin Avenue	 COCC	 Hawthorne Station

* Based on available funding for facility improvements.

Sources: Costs from (a) Cascades East Transit, 2012. Actual costs. (b) Nelson\Nygaard order-of-magnitude estimate. Photos from Nelson\Nygaard

ACCESS

This section focuses on the importance of providing safe and convenient pedestrian and bicycle access to transit. Improving the actual and perceived safety of accessing transit is an essential complement to the quality of transit service and facilities, particularly for attracting choice riders to the system.

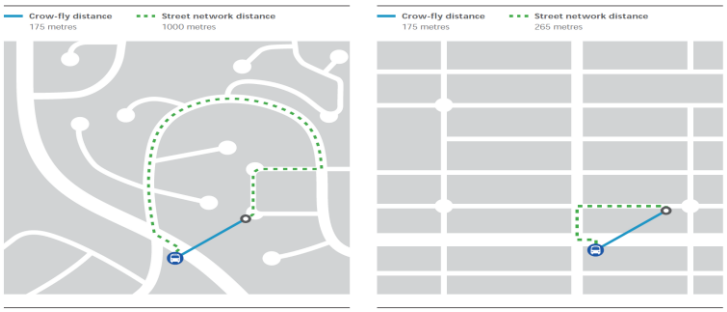
Pedestrian Access to Transit

Most transit trips begin and end with a walking trip, and walking is the primary means of accessing transit in Bend (about 90% of passengers). This makes the pedestrian environment along transit routes critical to encouraging use of transit, particularly for riders who have other options. In general, most transit riders are willing to walk about a quarter-mile to access a bus stop. About 30% of Bend residents live within a quarter-mile of the existing transit system based on network walking distance, which takes street connectivity and physical barriers into account, and 60% live within a half-mile network walking distance. The Federal Transit Administration (FTA) formally defines the pedestrian catchment area for transit as a half-mile radial distance from a transit stop.[20]

Access from the starting point or final destination of a trip to/from the nearest transit stop also needs to account for other barriers to walking including hills and presence of sidewalks and other infrastructure to allow convenient access to/from the transit stop nearest a particular location. Improving and installing sidewalks, ensuring curbs and stops are ADA-accessible, and enhancing the walking environment along key transit streets improves the attractiveness and viability of transit for more users and more types of trips. Several important characteristics of good pedestrian access to transit include:

[20] https://www.federalregister.gov/articles/2011/08/19/2011-21273/final-policy-statement-on-the-eligibility-of-pedestrian-and-bicycle-improvements-under-federal#h-17

- **Direct.** There should be a continuous and connected network of streets, sidewalks, and other types of pedestrian accessways that provide efficient walking routes.



Source: TransLink, Transit-Oriented Communities

- **Accessible**. Sidewalks must be barrier-free and have curb ramps at intersections. Transit riders with mobility impairments need a clear end-to-end sidewalk path from their front door to the bus stop.

Source: Seattle Department of Transportation

- **Safe**. Street crossings must serve transit stops on both sides of a street. There should be ample lighting along the street and at stations and clear lines of sight. Protected crossings (e.g., pedestrian signal and/or median) are critical on multi-lane arterials with fast-moving traffic.

Source: Flickr, Richard Drdul

- **Comfortable.** Seating and shelters enable a comfortable wait at stops. Shelters should provide protection from wind, rain, and sun; offer clear sight-lines and visibility; and accommodate all riders including those in wheelchairs. Prominent, inviting stops/shelters also advertise the presence of transit service on a street.

Source: Duo-Gard Industries

- **Visually engaging.** Studies have shown that people are willing to walk farther on streets that have active, street-facing buildings and vibrant street life.

Source: Bend MPO

Bicycle Access to Transit

Bicycle infrastructure that links into and along transit corridors and station areas helps transit riders connect to transit and extends transit's reach. Bicyclists are typically willing to travel at least 1.5 miles to access transit and up to 3-4 miles to access high-quality transit or regional connections. The Federal Transit Administration (FTA) formally defines the bicycle catchment area for transit as a three-mile radial distance from a transit stop.[21]

Networks of low-stress and high-visibility bicycle facilities—such as off-street bicycle paths, neighborhood greenways, and cycle tracks/buffered bike lanes—are a critical component of bike/transit integration. Secure bicycle parking at the main transit center and secondary transit hubs or other major stops on the periphery of the fixed-route system help make bicycling an attractive means of accessing transit.

Pedestrian and Bicycle Access Improvements

This section discusses specific corridors or areas where pedestrian and bicycle access can be improved.

Greenwood Avenue Pedestrian Access and Safety

As discussed in Chapter 7, pedestrian improvements would be required along Greenwood Avenue to support the proposed Route 7:

- Pedestrian accessways would need to be created from Bear Creek Road to stops along Greenwood, at locations including NE 12th Street and one to two locations between 15th Street and Dean Swift Road. See Figure B-16 (Appendix B) for a map from the Bend TSP that shows existing/planned connections).
- Protected crossings would need to be created to allow safe crossings to each stop location on Greenwood. Where signalized intersections are not

Rectangular Rapid Flashing Beacon (RRFB) at Greenwood Avenue and 12th Street. As at this crossing, on four-lane arterials it is important to provide a raised median with pedestrian refuges.

Source: Bend MPO

[21] https://www.federalregister.gov/articles/2011/08/19/2011-21273/final-policy-statement-on-the-eligibility-of-pedestrian-and-bicycle-improvements-under-federal#h-17

warranted or appropriate, a rectangular rapid flashing beacon (RRFB) crossing is one type of crossing which may be implemented; such as at Greenwood Avenue and 12th Street as shown on the previous page. At least one RRFB would be needed between 15th Street and Dean Swift Road.[22] A signalized intersection may be warranted at Dean Swift Road, although it is only about 0.10 miles west of a signal at Purcell Boulevard. West of the RRFB at 12th Street, there is a signalized intersection at 8th Street and an RRFB is planned at 6th Street.[23]

Hawthorne Station Pedestrian Safety

Buses currently stop and layover on both sides of Hawthorne Avenue between 3rd and 4th Streets. This block is also open to general vehicle traffic and potential pedestrian safety issues include:

- Transit riders transferring between buses or accessing the transit center generate significant pedestrian activity across Hawthorne Avenue.
- Buses block passenger sight lines and passengers hurrying to catch their bus may not be attentive to cars traveling on the street.
- There is an exit from the Safeway shopping center just west of bus stops on the south side of Hawthorne.

The additional routes and increased frequency and hours of service recommended in this plan will increase bus and pedestrian activity on Hawthorne in the future. Further study is recommended of pedestrian and circulation improvements to increase the safety of the on-street transit center. Such improvements could include:

- Closing Hawthorne to non-transit vehicle traffic between 3rd and 4th Streets, creating a transit mall.
- Developing a mid-block crossing with safety features such as a raised crossing, embedded pavement lights, etc., to visually alert drivers to the presence of pedestrians.
- Evaluating and optimizing need for/provision of on-street parking relative to transit operational requirements on 4th Street between Hawthorne and Greenwood Avenues.

[22] City staff have envisioned an RRFB in this vicinity, potentially at the Azure Drive intersection (not included in any formal planning document).

[23] A pedestrian crossing at Greenwood/6th Street is on the City's Fiscally-Constrained SDC Project List. Table C-1 (Amended),

There are potential conflicts between pedestrians and cars using Hawthorne Avenue at the transit center, shown looking west towards 3rd Street. Increased transit frequency and additional routes will increase the potential for conflicts. The car in the photo is turning out of the Safeway parking lot.

Source: Nelson\Nygaard

Additional Pedestrian Safety and Access Improvements

Although not specified in detail in this plan, additional locations of pedestrian safety concern for community members that were identified through public input are illustrated in the Community Input section of the Existing Conditions memo, including locations along 3rd Street.

Bicycle Access Improvements

Figure 8-4 identifies the stop/station location types where supporting bicycle facilities such as covered or secure parking, potential future bike share stations (see Bicycle Sharing sidebar), and other end of trip amenities may be most appropriate. Figure 8-2 illustrates several such locations on a map.

Bicycle Sharing

A bicycle sharing system consists of bicycle rental stations located throughout a downtown or city. Bicycle sharing is intended to facilitate short, urban trips and make active transportation options more readily available. Of importance for transit, bicycle sharing enables first- and last-mile connections to/from destinations beyond convenient pedestrian access from the bus stop or where it is not practical or convenient to bring a bike on an end-to-end transit trip.

There are a variety of models for implementing a bicycle sharing system.* Most modern systems provide a self-serve parking station where bikes can be rented and returned. Emerging technologies include "station-less" systems, where GPS and wireless communications (e.g., cell phones) allow a bike to be rented and returned in any location within the service area. Bike sharing system examples in cities most comparable to Bend (both have larger student populations) include:

Bike sharing system in Boulder, CO

Source: Flickr user kai.bates

- Boulder, CO. The Boulder B-Cycle system is free for the first half hour. It charges $4 for each additional half-hour period, $5 for a 24-hour period, or $55 for an annual pass.
- Pullman, WA. The Green Bike system serves Washington State University. It offers free same-day rentals for students and faculty and offers daily rentals for up to 7 days, starting at $3.50 per day for members.

Support for Bike Sharing in Bend

In an online survey of Bend residents, workers, and students conducted as part of this project:

- 77% of respondents stated that they would use a bike sharing service in Bend as part of a transit trip.
- 55% of respondents stated that they would use such a service in general.

Notes/Sources: * FHWA, Bike Sharing in the United States: State of the Practice and Guide to Implementation, 2012. http://www.bicyclinginfo.org/promote/bikeshareintheus.pdf

TRANSPORTATION DEMAND MANAGEMENT (TDM)

Transportation Demand Management (TDM) is a term for strategies that increase overall transportation system efficiency by encouraging a shift from single-occupant vehicle (SOV) trips to other means of travel such as transit, bicycling, walking, and ridesharing. This increase in system efficiency can also be achieved by eliminating SOV trips, or by shifting auto trips out of peak periods when roads are most congested. TDM strategies work to reduce reliance on automobiles by:

- Improving travel options
- Providing incentives and information to encourage and help individuals change their travel behavior
- Providing infrastructure to help people change their travel behavior

Categories of TDM Strategies

Improved Transportation Options

- Biking and walking
- Transit and ridesharing

Incentives to Use Alternative Modes

- Universal transit passes
- Telework and flexible work schedules
- Road and parking pricing
- Road space allocation (bike lanes, transit-only lanes)
- Commute Challenges

Parking Management and Land Use

- Parking cash-out programs
- Priority parking for carpools & vanpools
- Land use management
- Mixed-use development
- Increased densities in transit corridors

In the context of public transportation, simply providing transit service is often not enough to encourage people to use transit. TDM strategies—including subsidized transit passes, a Guaranteed Ride Home program, and vanpool options that connect with regional transit service—can provide complementary options to increase the use of transit service.

Universal Pass Program

Universal transit passes are an effective means to reduce the number of car trips in an area. By removing barriers to using transit, including the need to search for cash for each trip, people become more likely to take transit for both work and non-work trips.

Cascade East Transit Group Bus Pass Program

CET provides a Group Pass Program where employers (or other organizations) consisting of 10 or more individuals can purchase transit passes at a discounted cost. The employer enters into an annual contract to purchase a pass for its employees at the discounted rate. The employer/organization can offer passes to employees for free or at a reduced cost. In this way, the cost per person for the service is significantly reduced, and ridership within the group can be expected to increase significantly. COCC is a major user of the group pass program and offers a Zone 1 pass to students for $10 (normally $30) or a Multi-Zone pass for $60 (normally $100).

Guaranteed Ride Home Program

A Guaranteed (or emergency) Ride Home Program typically supplements a TDM program. This type of program provides commuters who regularly carpool, vanpool, bike, walk, or take transit to work with a free and reliable ride home when an unexpected emergencies arises. Guaranteed Ride Home programs help commuters view use of public transit and other non-SOV travel options to get to work as a more dependable option.

Commute Options Programs

Commute Options promotes transportation options in Central Oregon. Its programs include:

- Partnerships with local businesses on various transportation option incentive and promotion programs.
- Rewards from local businesses for commuting completed by modes including walking, biking, car/vanpooling, and public transit.
- Commute Options Week
- Facilitating car/vanpooling, including local administration of the statewide Drive Less Save More campaign. The Drive Less Connect tool (https://drivelesssavemore.icarpool.com) helps facilitate carpool matching.
- Safe Routes to School programs

Vanpool

Vanpools typically work best for employer markets whose commuters travel mid- to long-distances. A national study estimates that nearly 8% of commuters who live more than 15 miles from work and work for employers with 100+ employees are potential candidates for vanpooling.[24]

The impetus for people to join a vanpool depends on several factors, including traffic congestion, land use, and availability/cost of parking. Vanpools can also provide a relaxing way to travel, since the passengers have time to read, work, sleep, and socialize. For regional commutes in Central Oregon, the primary monetary incentive to use vanpools is likely to be the cost of gas.

[24] FDOT Research Center. Vanpool Pricing and Financing Guide. http://www3.cutr.usf.edu/tdm/pdf/Vanpool_values.pdf

There are three basic models for vanpool service

- **Owners/Operators:** Individuals buy/lease a vehicle directly; affordable insurance and adequate coverage are major issues with this type of vanpool.
- **Employers:** Companies buy/lease vehicles for use by their employees.
- **Private Operators**: Third-party vanpool providers such as VSPI and Enterprise operate vanpools for commuters, companies, and government agencies. This is the primary model for vanpools in the U.S., including in Central Oregon.

In Bend, Commute Options and CET could coordinate vanpools with regional Community Connector schedules at the Hawthorne Station (or future secondary transit hubs) to provide service to employment areas in Bend that are not currently served by fixed-route transit, or to dispersed employment sites outside city limits, such as Bend Municipal Airport. The map of work locations in Bend provided in Figure 2-16 illustrates work locations in relation to transit routes.

Transportation Management Associations

Transportation Management Associations (TMAs) are often member-based organizations that offer customized commute planning, commute benefits consultations, and information on ridesharing, transit, and non-motorized transportation to businesses in a defined geographic district. TMAs partner with governments and transit agencies to develop programming, marketing, and incentive programs for employers and employees alike. These organizations represent opportunities to broaden the reach of TDM programs and bolster the effectiveness of individual employer efforts. TMAs typically work best in concentrated geographic areas, such as downtowns, college campuses, or other employment clusters. CET and Commute Options currently provide some of these functions to employers, including travel training, distribution of commuter tax benefit information, and implementation of special transit programs, such as a Group Pass Program.

MARKETING AND BRANDING

This section highlights the importance of marketing and branding elements and offers suggestions for improving marketing and branding of CET services in the Bend area. Marketing for transit generally refers to information and collateral that lets transit customers know how to use—and remember how to use—transit services. Branding relates to a name or logo that identifies the transit services offered in the community. If transit were treated like a commodity, effective branding ensures that the community not only recognizes what the brand represents, but that individuals have positive and memorable experiences with that brand. Marketing then refers to reinforcing the brand and ensuring that information on how to use transit is readily accessible, understandable, and easy to remember.

Marketing and branding is only one feature of a successful transit system. However, good information and strong system legibility is critical for people who may be learning how to use transit for the first time, as well as for long-time users. Because many people in the community may never have used transit, effective branding and marketing of the system might be the only impression they have of transit services available.

Branding of the System

This section provides a high-level assessment of Cascades East Transit's marketing and branding initiatives in the Bend area.[25] Transit services in the Bend area are presented to the public as Cascades East Transit, or CET. The CET logo (shown at right) is colorful and simple, effectively communicating to the public that it is an established part of the transportation system.

The CET brand is used on all printed marketing materials, including on the CET system brochure, individual route schedules, on the website, and on most transit vehicles. The CET brand also portrays a regional system—one that does not just provide service in Bend, but also throughout central Oregon. This is a strength of the CET brand, and like other regional transit providers, will eventually be synonymous with transit in central Oregon—much like TriMet in the Portland area or LTD (Lane Transit District) in Eugene. One recommendation for improvement related to the brand is:

[25] This does not include a full assessment of the entire CET system, but many of the observations and considerations presented for Bend could also be applicable to all CET marketing and branding initiatives.

- **Fully transition to the CET brand system-wide.** While the CET brand is well-used to represent the transit service in Bend, some remnants of Bend Area Transit (BAT) still exist, which could create confusion among some users (new and old). This includes some buses and stops that are still branded as BAT, as well as bus stop signs that have both CET and BAT on the sign (see photos at right and below). It is recognized that completing the transition from BAT to CET will take time, and money, but this should be one of CET's highest priorities related to information and branding. This is reflected in a recent community survey in which 84% of Bend residents surveyed who could name the local transit system identified the services in Bend as BAT.[26]

Figure 8-5 Comparison of CET and BAT Branded Signage and Vehicles

CET or Transitional Branding

BAT Branding

[26] Only 60% of respondents to the Community Preferences Survey conducted for the Central Oregon Regional Transit Master Plan (RTMP) could name the transit system without being prompted. Of those who could name the transit system, 84% said BAT and 16% said CET or Cascades East Transit.

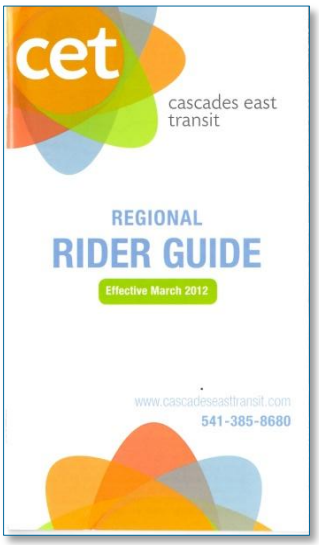
System Information

Perhaps the most visible aspect of the CET system—besides the buses and bus stops—is the printed and electronic information that describes how to navigate the system. This includes all printed materials such as brochures, maps, flyers, fare media, etc. This also includes all information that is available electronically—either through the CET website or another online source (such as Google Transit).

Maps and Schedules

CET's primary source of printed information is its Regional Rider Guide. This 4" x 7" guide provides all relevant information on the fixed-route services in Bend, as well as regional Community Connector service and the local community bus services that CET operates in cities outside of Bend. The Rider Guide is an attractive, easy-to-use reference that is a convenient carrying size. The front section of the Guide includes a fold-out map of the CET services in Bend, followed by individual route maps and schedules for each route.

All route information and schedules are clearly presented in the Guide, along with schedules and key activity centers along each route. Most of the individual routes—identified by numbers—also have a major street associated with that route, which conveys important directional information to passengers. For example, as shown in Figure 8-6, Route 4 is identified as "Route 4 - North 3rd Street, which quickly indicates that this route serves the North 3rd Street corridor. Most of the schedules include a beginning and ending destination, such as Hawthorne Station, Cascade Village, St. Charles Medical Center, etc., and these destinations are clearly indicated on the corresponding route maps. Similarly, most routes and schedules are presented as inbound and outbound segments. This additional information makes it easier for passengers to understand how each route operates and how to read the schedule. Some routes, however, such as Route 3 (see left panel of Figure 8-6) and Route 6, do not include the inbound/outbound designation, nor do they include an end location. Route 3, in particular, has a strong destination at the end of the route (COCC) that could be more clearly identified on the route schedule.



Other information about the route, such as Saturday service hours, snow schedules, and major timepoints, are clearly presented in the brochure. As shown in Figure 8-6, major timepoints listed in the schedules are assigned a letter that is

used to clearly illustrate the timepoint location on the route map. The Rider Guide also includes some basic information in Spanish, such as how to board and alight the bus, pay the fare, and transfer between routes. It is assumed that if a Spanish-speaking rider calls the main number (541-385-8680), they will be able to speak to a Spanish-speaking representative.

Several potential improvements to the Rider Guide include:

- **Include basic Bend Dial-A-Ride information.** Not all people who use the Rider Guide will exclusively be using fixed-route service in Bend, or they could be interested in other transit options in the future (or for friends/family members). As such, including some basic information about the Bend Dial-A-Ride service should be included in the Guide. This could be as simple as a few sentences about the service and eligibility requirements, as well as a phone number for more information (the CET website does provide basic information about Bend DAR).

- **Color-code individual routes and schedules.** Like the CET website, the individual routes should be color-coded (if it is possible to do so cost-effectively) to match the route map on the Bend Service Map and other signage. This would make it easier to identify the appropriate route and will reinforce the color-coding of the system that is already present on bus stop signs and on the system map.

- **Be consistent with route naming conventions.** Not all routes are presented as inbound and outbound segments, and not all routes are associated with a major destination (e.g., St. Charles, Cascade Village, etc.). To be consistent between routes, schedules should be presented as inbound and outbound segments, and each of these segments should include a major destination or terminal point for each segment. For example, Route 3 should have an outbound designation and the major destination at the end could be "to Summit HS/COCC."

- **Be consistent with "micro-information" on all routes.** One nice feature, which is only presented on the Route 6 schedule, is a list of important phone numbers along that route (e.g., Bend Senior Center and Bend Municipal Court). Not only is this information helpful to riders, but it also encourages riders to use the transit guide for other purposes, which could make them consider using transit for trips they may otherwise make on another mode. It is recognized that space in the Guide is limited, and so this could only be provided where space exists.

Electronic Information

The primary source of electronic information for transit services in Bend is the dedicated website www.cascadeseasttransit.com. This fairly comprehensive site includes most of the same information provided in the Regional Rider Guide, as

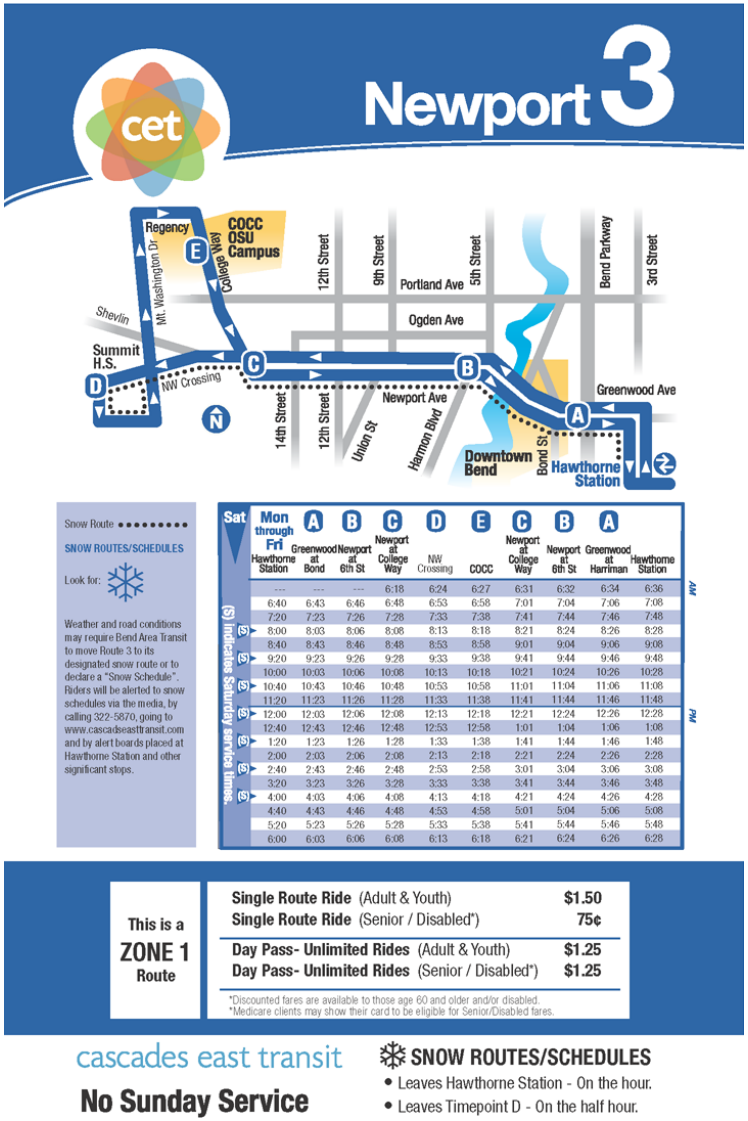
well as additional elements such as news and updates, service alerts, and route-by-route information real-time information about service delays. The website design functions well on a mobile device. The website also includes some basic information on other programs offered by CET or COIC, like the employer group pass program, advertising and travel training. Like the Regional Rider Guide, the website provides some information in Spanish, as well as information about other transportation or transit providers in the region.

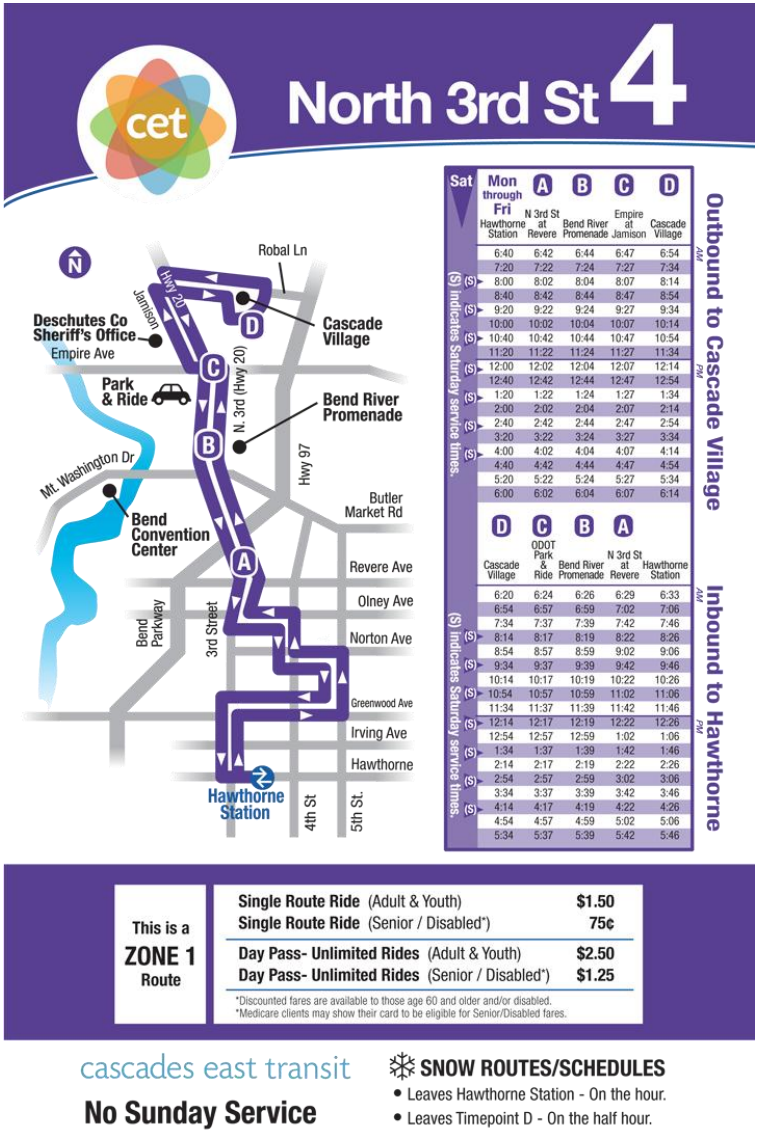
Possible improvements to the website include:

- **Provide links to other regional transportation/transit providers on the Programs → Commute Options page.**[27] Like the link to the Mt. Bachelor Shuttle page, each listing for other services, e.g., the COCC Campus Shuttle, should have a direct website link. In addition, it would be preferable to open these links in a separate window or tab, rather than taking users away from the CET website.
- **Add information to the Programs → Planning page.** Blank pages are generally discouraged on websites. In the case of planning projects, it is better to not provide a page than to provide a page with no information. It is suggested that this page simply be removed until information is available.
- **Explain travel training.** Rather than just provide contact information on the Programs → Travel Training page, it would be helpful to provide a brief explanation of what travel training is and why it is valuable.
- **Consider a Facebook or Twitter page.** Social networking sites are quickly becoming an additional way to reach transit riders. While social networking sites have limitations (they should not be used to replace the basic information on the website), they can be valuable for making service announcements, announcing special events/services, or just communicating with riders. Given that about a third of riders in Bend are age 24 or younger, social media could be a particularly effective means of engaging with this ridership segment. Social networking sites can also provide a more "human" face to the agency by allowing riders to interact directly with CET staff. It should be cautioned that if a Facebook or Twitter page is established, it will require regular attention and monitoring.

[27] http://www.cascadeseasttransit.com/commute-options.html. In addition, it would be helpful to add "Commute Options to the horizontal menu bar drop-down under Programs.

Figure 8-6 Sample of Existing CET Route Maps and Schedules (Website Versions)





Fare Information

Fare information is very clearly presented both in the Regional Rider Guide and on the website. The zonal system and fares associated with the different fare media are clearly presented. No improvements to fare information are necessary.

Accessibility Information

While the type in the Rider Guide is small in order to keep all information in a compact brochure, it may be difficult for some users to read. But, CET should be commended for complying with the ADA by providing information in alternate formats (large print, Braille, audio tape) on request. It is assumed that this information remains up-to-date and is consistent with updates to the Regional Rider Guide.

The website includes some elements that would be easier to access for people who require a text web browser. For example the maps do not appear to have a <title> attribute that provides additional information about an element. The <title> attribute allows users to put their mouse over the map and see information about where that link will take them. This is especially important for text web browsers, which rely on title attribute tags to navigate images.

9 IMPLEMENTATION

OPERATING AND CAPITAL COST ESTIMATES

Operating Costs

Figure 9-1 provides operating costs associated with each set of service options and time frame. The long-term options are designed as a flexible set of service options that can be implemented incrementally based on available funding, future priorities, and service/land use targets. The full long-term cost implies that there is 15-minute service on all primary corridors and 30-minute service (either all-day or peak-hour) on most other routes.

Figure 9-1 Operating Cost Estimates, Total and Increase from Current Costs (2012 Dollars)

Time Frame	Option	Total Annual Fixed-Route Vehicle Revenue Hours	Total Annual Fixed-Route Operating Costs	Total Annual ADA Paratransit Costs	Total Peak Fixed-Route Vehicles
Current	Existing System	20,700	$1.5 M	$1.0 M	7
Short-Term	Route 4, 5, 6 Modifications	Neutral	Neutral	Neutral	7
Near Mid-Term	Route 3/11 Changes All-Day & Sat Route 11 One additional evening trip on all routes (up to 1 hour)	24,100 (+16%)	$1.73 M (+$235,000)	$1.06 M (+$55,000)	7
Mid-Term	Initial 30/60 Restructuring with some enhancements	32,900 (+59%)	$2.37 M (+$880,000)	$1.11 M (+$110,000)	9 (+2)
Long-Term	30/60 Minute Restructuring with all enhancements [1]	78,700 (+280%)	$5.7 M (+$4.2 M)	$1.28 M (+$280,000)	20 (+13)

Notes: Based on planning-level estimates. Cost increases listed are relative to current costs. (1) Long-term improvements are designed to be implemented incrementally and increased service levels (particularly 15-minute service) would be conditioned on service design guidelines.

ADA Paratransit Costs

The Americans with Disabilities Act (ADA) of 1991 requires that complementary ADA paratransit service (i.e., Bend Dial-A-Ride) offer ADA-eligible customers door-to-door service between origins and destinations located within ¾-mile of regular fixed-route transit services. Bend DAR already provides geographic coverage within Bend city limits, exceeding ADA requirements, therefore no increase in ADA costs is assumed for service coverage expansion within Bend city limits. Bend DAR currently operates seven days a week, however, expanding the hours of fixed-route service beyond existing hours of ADA paratransit service will result in increased DAR operating costs beyond the current approximately $1.0 million in annual costs.

Order-of-magnitude estimates of this increase were developed, based on assumptions for the number of DAR vehicles that will need to operate in different time periods. Implementing early evening service is estimated to increase ADA paratransit costs by about $55,000 annually for each additional hour, or a total of $110,000 (+11%). Expanding early morning, later evening, Saturday, and Sunday service hours is estimated to cost about $170,000 annually (+17%), or a total of about $280,000 (+28%). Appendix B provides a more detailed breakdown of the estimated increases in ADA paratransit costs.

Peer Comparison

To assess the current level of service and level of expenditures on transit in Bend, it was compared to a set of peer cities from around the western U.S., ranging from about 50,000 to 150,000 in population and without a large college or university.[28] Bend is approximately in the middle of the group in terms of population density. Although it has a large university, Corvallis was included because it is a comparable city in terms of population and is also located in Oregon. Peer data is summarized in Figure 9-2. Key findings from this comparison include:

- Bend has the second-lowest current transit service hours per capita, the lowest transit operating spending per capita, and the lowest level of current rides per capita.
- Placing Bend's per capita ridership (four rides per capita) in context, national research estimates a range of three to five rides per capita for a new system. This has been achieved with a level of service that is at the low-end of the peer group. With the initial restructuring concept (mid-

[28] With the exception of Corvallis, these cities were originally used in a 2006 service plan to estimate ridership for the initial Bend fixed-route system.

term) level of investment, Bend would still be in the bottom-tier of the peer group in terms of service hours per capita and operating investment per capita.

- Assuming all of the long-term service improvements are implemented by 2030, Bend would be in the top tier of the peer group in terms of service hours per capita (1.03) and operating cost per capita ($74), assuming current population levels. However, assuming population growth to 110,000 (the projected 2025 level) by 2030, Bend would operate 0.72 revenue hours per capita (compared to the current peer average of 0.60) and operating cost per capita of about $52 (compared to the current peer average of $62).

Figure 9-2 Peer Comparison of Bend Transit Service Provision, Utilization, and Operating Spending, 2012 Dollars

	Service Area Population (2010) [1]	Density (Pop. Per Square Mile)	Total Annual Vehicle Revenue Hours	Annual Vehicle Hours per Capita (2010)	Fixed-Route Annual Operating Costs	Annual Operating Costs per Capita (2010)	Annual Ridership (Unlinked Trips)	Annual Rides per Capita (2010)	Operating Cost per Rider (2010)
Bend	76,639	2,395	20,902	0.27	$1,489,094	$19.43	327,904	4.3	$4.54
Route 3/11 + 6-7 pm (near mid-term)	-	-	24,100	0.31 [a]	$1,735,000	$22.64	-	-	-
Initial Restructuring (mid-term)	-	-	32,900	0.43 [a]	$2,369,000	$30.91	-	-	-
Full restructuring (long-term)	-	-	78,700	1.03 [b]	$5,666,000	$73.74 [b]	-	-	-
Medford, OR	150,000	2,586	33,658	0.22	$4,772,691	$31.82	979,124	6.5	$4.87
Redding, CA	117,478	1,175	43,736	0.37	$3,180,273	$27.07	672,379	5.7	$4.73
Pueblo, CO	105,000	2,692	40,430	0.39	$3,478,182	$33.13	951,123	9.1	$3.66
Yakima. WA	92,035	3,287	54,850	0.60	$5,760,027	$62.59	1,312,116	14.3	$4.39
Santa Fe, NM	76,100	1,856	76,988	1.01	$6,053,701	$79.55	838,841	11.0	$7.22
Everett, WA	105,000	3,088	129,830	1.24	$14,240,792	$135.63	2,289,587	21.8	$6.22
Corvallis, OR	55,125	3,938	26,949	0.49	$2,328,937	$42.25	3,388,516	61.5	$0.69
Peer Average (excluding Corvallis) [2]	**107,602**	**2,447**	**58,063**	**0.60**	**$6,247,611**	**$61.60**	**1,490,241**	**11.4**	$5.18

Notes: (1) Service area population from 2010 NTD for all peers, except Bend population from 2010 U.S. Census. (2) Corvallis is excluded from average due to high student population. (a) Assumes 2010 population, but Bend's population would be higher if/when these service levels are realized. (b) Assuming the full set of long-term improvements is realized by 2030 and Bend's population is 110,000 (the current 2025 projection), vehicle hours per-capita would be 0.72 and operating costs per capita would be about $52.

Source: National Transit Database, 2010. U.S. Census, 2010.

Capital Improvements

The primary capital improvements related to each service option include additional vehicles or installation of new stops. Figure 9-3 identifies overall capital cost estimates for each service package and time frame. Appendix B provides a more detailed breakdown of operating and capital cost estimates for individual service elements.

- Short-term costs are related to changes to Routes 4, 5, and 6. Initial implementation can be made using one additional temporary stop and existing temporary stops on 5th Street, but the costs assume permanent infrastructure. CET has an agreement with the ADA community that allows for temporary stops to be implemented contingent on a stop improvement plan for design and construction of permanent, accessible stop infrastructure.
- Near mid-term costs are related to stop infrastructure for restructuring Route 3 and 11 to serve the new OSU facility, but no additional vehicles are required.
- Mid-term (initial restructuring) capital costs include two additional vehicles to operate the new Route 7 (low-floor recommended including for Route 3 interlining) and operate 30-minute peak headways on Route 4, permanent stop infrastructure for Route 7, and stop infrastructure for bidirectional Routes 5 and 6.
- Long-term costs include increased frequency on additional routes and service expansion (Routes 2, 4, and 8).

Figure 9-4 provides a more detailed 10-year capital plan, also addressing vehicle replacement needs.

Figure 9-3 Overall Capital Cost Estimates for Service Packages (2012 Dollars)

Time Frame	Option	Peak Vehicles	Additional Vehicles Required	Estimated Cost of Additional Vehicles[1]	Estimated Non-Vehicle Capital Improvements
Current	Existing System	7	0	None	N/A
Short-Term	Route 4, 5, 6 Modifications	7	0	None	$12,000 [a]
Near Mid-Term	Route 3/11 Modifications	7	0	None	$68,000 [b]
Mid-Term	Initial 30/60 Restructuring with some enhancements	9	2	$540,000 [c]	$116,000 [c]
Long-Term [1]	30/60 Minute Restructuring with all enhancements [1]	20	11	$2.5 M [d]	$266,000 [d]
TOTAL		**20**	**13**	**$3.1 M**	**$462,000**

Notes: Appendix B (Figure B-12) provides unit costs. (1) Intended for incremental implementation over the long-term, conditional on service design guidelines. (a) Assumes 1 major and 3 basic stops. (b) Assumes 6 major and 16 basic stops. (c) Assumes 2 new low-floor buses for Routes 7 and 3. For Route 7, assumes 10 major and 4 basic stops. Additional costs would include a planned crossing at 6th and Greenwood, at least one new protected crossing on Greenwood between 15th and Dean Swift, and a potential signal at Dean Swift. For bidirectional Route 5/6, assumes 11 basic and 4 major stops. (d) Assumes 6 new low-floor and 5 standard mid-size buses. Assumes 10 new major stops, 50 new basic stops, 5 enhanced stops (e.g., secondary hubs), and enhancements at Hawthorne Station.

TRANSIT FUNDING STRATEGIES

Additional information on potential transit funding options is provided in Appendix C

As discussed above, transit operating costs for the existing fixed-route system in Bend are approximately $1.5 million annually, not including about $1 million in costs for ADA Paratransit (Bend Dial-A-Ride). The initial implementation of the restructured system and service improvements proposed for the mid-term time frame (4 to 10 years) is estimated to cost (in 2012 dollars) an additional $880,000 in annual fixed-route operating resources, $110,000 in additional ADA paratransit costs, and $540,000 for additional vehicles (assuming low-floor buses). The short- and mid-term improvements (up to 10 years) would also require an estimated capital investment of about $196,000 (in 2012 dollars) for bus stops and related infrastructure.

A variety of federal and state funding sources are available to help fund these improvements, but in many cases must be leveraged with a local match. The City of Bend currently provides a primary source of local matching funds through its general fund, which the City has committed to providing through September 2015. State funds are also an important source of local matching funds. A number of public-private partnership opportunities (such as advertising, group passes, and sponsorships) each offset only small portions of the cost of operating transit, but collectively are an important component of transit funding.

This section provides an overview of the primary existing and potential funding sources for transit, including federal, state, and local sources as well as public-private partnerships, and summarizes their potential applicability for Bend; Appendix C provides additional details on existing and potential funding sources.

Federal Funding Sources

Federal funding currently comprises about 37% of Bend transit funding. The recently enacted Moving Ahead for Progress in the 21st Century Act (MAP-21) legislation provides a new structure for federal funding programs and is effective from October 1, 2012 through the end of federal fiscal year (FY) 2014. Increased funding for transit is available for local and/or regional transit in the Bend area as a result of population growth (reflected in the 2010 U.S. Census) and MAP-21. The following formula-based programs for urbanized areas in federal FY 2013 are relevant to Bend; unless otherwise noted, these programs require a 20% local

match for capital assistance and a 50% match for operating assistance (if applicable):[29]

- **Urbanized Area Formula Program (FTA Section 5307)**. This program is primarily intended to fund fixed-route operating or capital costs and consolidates several previous programs. The estimated Bend Urbanized Area apportionment for federal FY 2013 is about $1.16 million, an increase of over $450,000 from current 5307 funding, offset by the discontinuation of discretionary grants provided under the Jobs Access Reverse Commute (JARC) program (nearly $90,000 in FY 2013).[30] This reflects the new MAP-21 program structure[31] and apportionment formulas as well as the increase in the Bend-area population based on 2010 Census data. A 20% local match is required for capital and a 50% local match for operating expenditures. Up to 10% of 5307 funds can be applied to preventative maintenance or ADA Paratransit service and matched at 20%.
- **Enhanced Mobility for Seniors and Individuals with Disabilities Program (FTA Section 5310).** This program provides funding for services to seniors and persons with disabilities that go beyond traditional fixed-route services and ADA paratransit. It also consolidates several existing programs and can now be used for operating costs in addition to capital costs. The State of Oregon (ODOT) allocates these funds to small urban areas and the Bend area will receive over $266,000 in 5310 funds for the federal FY 2013 and FY 2014 biennium, an increase of about $57,000 over the two-year period. In general, this funding source requires a 20% local match for capital and a 50% local match for operating expenditures, however only a 10.27% match is required for purchased transportation services, which applies to all current 5310 funding.
- **Bus and Bus Facilities Formula Grants Program (FTA Section 5339).** This is a new funding program that funds capital expenses related to vehicles and facilities, replacing an existing grant-based program. Bend would receive funds based on a formula (making funding more predictable from year-to-year), estimated at about $122,000 for federal FY 2013.[32]

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[29] Funding in federal FY 2013 (10/1/2012 – 9/30/2013) may not correspond directly to the CET FY 2013 fiscal year; it may fund transit in the Bend Urbanized Area during COIC's FY 2014 (7/1/2013 to 6/30/2014).

[30] MAP-21 eliminated JARC as a separate program and JARC funds are now included in the overall 5307 funding allocation; Bend received nearly $90,000 in grant-based JARC funding in CET FY 2013.

[31] Formula funding from the 5340 (Growing States and High Density States) and Job Access and Reverse Commute (JARC) programs is now included in the 5307 program.

[32] Funding for this program is about $6.7 million for all small urban areas in Oregon (allocated by ODOT). Specific allocations are not known at this time but it is estimated that about $122,000 would be available for the Bend area, based on the total Oregon small urban area funding and Bend's share of all Oregon small urban area 5307/5340 formula funds.

Funding may be pooled for multiple years, which would be required for the purchase of some vehicles, e.g., a standard mid-size bus costs over $160,000 while a low-floor bus is estimated to cost about $270,000. This funding source requires a 20% local match and is only eligible for capital expenditures.

Additional federal formula and discretionary programs are also available, including the Small Transit-Intensive Cities program, which allocates $218,747 under MAP-21 to small urban areas for each of six criteria[33] met. Corvallis is the only such area in Oregon to receive these funds and meets two of the six criteria.

Overall, Bend will be eligible for approximately $530,000 in additional federal funds starting in its FY 2014. These federal funds could be utilized for different purposes, i.e., for capital or operating, local or regional, etc.

State Funding Sources

The State of Oregon provides a relatively small share of transit funding for Bend. About 75% of funds from the Oregon Special Transportation Fund (STF) is allocated on a formula-basis (to counties, transit districts, and tribal governments); Bend receives an allocation through Deschutes County based on a local public involvement process to support services for older adults and persons with disabilities. The State also distributes some funds through discretionary grants. STF funds may be used for capital or operating purposes and are eligible as local match for federal funds. A relatively low local match rate of 10.27% is required when delivered in the form of contracts to purchase human transportation services.

Additional discretionary programs through the State of Oregon include:

- Mass Transit Vehicle Replacement Program, which prioritizes the oldest vehicles within each vehicle class statewide for replacement
- Enhance and Fix-IT process, which funds capital improvements (e.g., transit and/or bicycle/pedestrian infrastructure) as well as preservation and maintenance
- Connect Oregon, which funds multimodal transportation improvements

[33] The criteria are: Passenger Miles per Vehicle Revenue Mile, per Vehicle Revenue Hour, and per Capita; Vehicle Revenue Miles and Hours per Capita, and Passenger Trips per Capita.

Local Revenues

Under the City of Bend's operating agreement with COIC, it currently provides operating funding of over $1 million from its general fund[34], the largest overall revenue source, to meet the requirement for local matching funds for Federal section 5307 and 5310 funds. The City's agreement with COIC runs through September 1, 2015, and can potentially be extended for additional one-year periods. The City of Bend funding increases based on the Portland Consumer Price Index (CPI) each September 1.

COIC, which operates CET service, is pursuing a strategy to develop a sustainable, long-term funding source to provide local matching funds to operate local and regional service. This strategy could result in a ballot measure (in Bend and/or other parts of the region) seeking voter approval for a funding levy, such as a property tax, payroll tax, or transportation services fee, that would provide a stable funding source for the overall regional transit system.

Fares, Public Private Partnerships, and Other Sources

A variety of other sources each comprise relatively small shares of transit funding, but can collectively provide a significant supplement to federal, state, and local sources. Fares are the largest such source, comprising about 14% of total revenues including Fixed-Route, Dial-A-Ride, and group pass sales. Advertising currently provides about 1% of revenues. CET already has an innovative partnership that obtains discounts on vehicle maintenance in exchange for allowing the contracted provider to perform other maintenance work in the CET facility during off-hours. Potential public-private partnerships include:

- Educational institutions, including COCC and OSU/Cascades (passes, service partnerships, etc.), as well as Bend – La Pine Schools (opportunities for high school-aged students to attend classes offered at either of the colleges)
- Major employers (passes, stop sponsorship, etc.)
- Commute Options (vanpools)
- Medical institutions, such as St. Charles Medical Center or Bend Memorial Clinic (active transportation)
- Churches (Sunday service)

[34] 1,027,650 for FY 2013. Adjusted based on the Portland Consumer Price Index (CPI) each September 1.

- Chamber of Commerce / Tourism (potential downtown circulator)

FINANCIAL ANALYSIS

This section describes the operating and capital cost projections for CET services in Bend over the next 10 years. It is intended to provide a high-level analysis of the funding required to provide transit service in Bend (both operating and capital costs). This includes the required "local match" to secure federal funding available for the Bend area, maintain the existing service levels and vehicle fleet in the short-term time frame, and implement the identified mid-term service enhancements in the 3 to 10 year time frame, contingent on increased, sustainable transit funding levels. It is assumed that fixed-route service will be maintained at current levels through FY 2015 (short-term) and that near mid-term and mid-term service enhancements will be implemented in FY 2016 and FY 2018, respectively.

The analysis is based on actual figures for 2011/12, the CET FY 2013 budget, and initial CET budget estimates for FY 2014. These figures are projected to 2021/22 (FY 2022) based on a number of assumptions as detailed in this section.

Operating Cost and Revenue Assumptions

Operating Expenses

Figure 9-5 provides projected operating expenses over the next 10 years (Row B). For FY 2013 and FY 2014, these are primarily based on CET budgeted operating costs. Major assumptions used in developing projections for future years include:

- For FY 2014, an additional $50,000 in operating costs above the FY 2013 budgeted level is assumed. The share of costs is assumed to be approximately 60% for fixed-route and 40% for Dial-A-Ride, based on FY 2012.
  - Fixed-Route: Base costs of approximately $69 per service hour are assumed in FY 2013 and $71 per hour in FY 2014. Operating cost increases of 3.5% annually are assumed starting in FY 2015.
  - Dial-A-Ride: Base costs of approximately $63 per service hour are assumed in FY 2013 and $64 per hour in FY 2014. Operating cost increases of 2.0% annually are assumed starting in FY 2015. This lower rate compared to fixed-route service reflects a desire to shift the cost curve for Dial-A-Ride to be lower than the cost of fixed-route on a per-hour basis, similar to peer agencies (see Service Standards in Chapter 7). It assumes that CET will be able to increase the cost-efficiency of

Dial-A-Ride service over time, e.g., based on periodic evaluation of geographic coverage, hours of service, and eligibility policies that currently exceed ADA requirements.

Ridership Growth

For the purpose of estimating fare revenues and calculating projected performance metrics, this scenario uses the following ridership assumptions.

- **Fixed-Route**. CET fixed-route ridership in Bend has seen over 19% annual ridership increases from 2009-2011. Although this rate may continue, the following more conservative assumptions related to ridership were used:
  - **Population Growth**. The population in Bend grew by just 0.4% from 2010 to 2011. However, population growth is assumed to recover and Bend is assumed to grow at the same rate as is projected for Deschutes County (2.33% from 2010-2015, 2.00% from 2016-2020, and 1.68% from 2021-2025).
  - **Ridership per Capita**. CET carried 4.3 rides per capita (unlinked trips) in 2010 and 5.1 in 2011. This rate is assumed to grow by 5% annually. (A lower-end growth rate of 2% annually is also used, to provide an estimated range.) Additional increases in transit ridership per capita are assumed in 2016 and 2018 responding to service changes (percent increase in service hours), based on an elasticity of 0.3 (2016) and 0.5 (2018); a greater response is assumed for the latter, more substantial change. [35]
  - **Ridership**. Based on the assumed population growth and increase in transit ridership per capita, ridership is estimated to increase by up to 7% annually in non-service change years.
- **Dial-A-Ride**.
  - **Service Hours**. It is assumed that service hours will be held constant (at 2011 levels), except for increases where fixed-route service changes require additional ADA service (in 2016 and beyond).
  - **Productivity**. It is assumed that Dial-A-Ride productivity (number of passengers per hour) will remain constant at 2013 levels – slightly over four trips per service hour.

[35] The concept of elasticity is used to estimate the percent increase in ridership that can be expected based on the percent increase in service. For example, an elasticity of 0.5%, which is an average industry-standard value for changes in service levels, means that there would be a 0.5% increase in ridership for each 1% increase in service levels.

- **Ridership and Ridership per Capita**. Based on the above assumptions, the number of Dial-A-Ride trips would increase slightly, by slightly more than 3% over the 10-year period. Ridership per capita would decline slightly, from 0.8 rides per capita in 2011 to 0.7 rides per capita. Although recent trends in Bend have shown a decline in Dial-A-Ride utilization, the aging of the population over the life of this plan is likely to increase demand for Dial-A-Ride (e.g., the rate of disability generally increases with age).[36] As noted above, CET would need to evaluate measures to maintain Dial-A-Ride service utilization at current levels.

Fares and Fare Revenues

The following fare increases were assumed to keep pace with cost increases:

- **Fixed-route**. The one-way adult fare was assumed to increase by 25 cents in FY 2014 (a 17% increase), from $1.50 to $1.75, and then increase at an average of 5 cents annually (about 3% per year) over the 10-year period. The resulting fare would be $2.15 in FY 2022.[37]
- **Dial-A-Ride**. The one-way non-discounted fare was assumed to increase by 25 cents in FY 2014 and FY 2015, and then increase an average of 10 cents annually (about 3% per year) over the 10-year period. The resulting fare would be $3.70 in FY 2022.[38]

For both fixed-route and Dial-A-Ride, an average fare was calculated based on the projected ridership and FY 2013 budgetary estimates for fare revenue. The average fare was assumed to remain constant as a percentage of a full fare over the 10-year period analyzed. With the assumed fare increases described above, farebox recovery on fixed-route service would increase to the 20-25% range, above the recommended minimum standard of 15%. Dial-A-Ride farebox recovery would be within the 8-10% range recommended as a minimum standard.

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[36] Although beyond the scope of this study, the following method could be used in the future to refine demand estimate for Dial-A-Ride: (1) Segment population by age (city or county-level projections). (2) Determine the number of riders per capita by age group (from dispatch system). (3) Determine the number of trips per rider by age group (from dispatch system). (4) Estimate Dial-A-Ride demand based on projected growth within each age group.

[37] Among six peer agencies, only two have higher fares than Bend: both RVTD (Medford) and Redding, CA have one-way fares of $2.00. The agency with the lowest fares, City of Yakima Transit at $0.75, has significant local revenues through a sales tax. Fares at the other agencies are either $1.00 or $1.10. The average one-way fare is $1.23.

[38] The current one-way fare is 167% of the fixed-route fare and this percentage would increase slightly to 172% at the end of the 10-year period. ADA paratransit fares may be up to double the one-way fixed-route fare. Among the six peer agencies considered, all agencies except for Everett Transit charge an ADA fare that is double the one-way adult full fare cost.

Federal, State, and Local Revenues

The existing FY 2013 CET budget for Bend includes nearly $2.4 million in revenues for operations and maintenance of both fixed-route and Dial-A-Ride service.[39] Figure 9-5 includes the following assumptions for revenue sources and funding levels, based on the existing FY 2013 CET budget for Bend service and known/assumed future sources:

- **Federal.** Increased federal funding (approximately $530,000) will be available to Bend under the 5307/5340, 5310, and 5339 programs starting in its FY 2014, based on the MAP-21 transportation bill; the specific 5339 funding allocation for Bend is not currently known and is estimated to be about $122,000 based on the total Oregon small urban area funding and Bend's share of all Oregon small urban area 5307/5340 formula funds. Although Federal funding in uncertain beyond the two-year duration of MAP-21 (through 2015), it is assumed that MAP-21 funding levels will be maintained with an adjustment for inflation based on the federal CPI (assumed to be 3%). Unobligated Federal funds are assumed as a capital reserve and applied to future year expenses; funds can be deferred for 3-6 years depending on funding program.
- **State**. The level of STF funding is not currently known but is assumed to be maintained at FY 2013 levels in FY 2014 with subsequent increases based on the federal CPI.
- **City of Bend (Local Funds).** The Portland CPI, which is used to adjust the City of Bend funding contribution ($1.03 million in FY 2013) each September 1, is assumed to be 2.5%.
- **Advertising.** Increased advertising revenues are assumed, based on $5,000 per fixed-route vehicle, increased annually based on the Portland CPI.

This plan does not make a specific recommendation on the use of additional federal revenues, but decisions about their use could include consideration of:

- Building capital reserves to help with vehicle capital replacement needs in future years.
- Mitigating potential reductions in funding from other sources, e.g., State STF funds, and potential increases in fuel costs, Bend Dial-A-Ride contract costs, etc.

[39] For past years, total operating costs were stated as approximately $2.5 million (approximately $1.5 million for fixed-route service and $1.0 million for Dial-A-Ride service); these figures were the basis for operating cost estimates for service enhancements. The FY 2013 budget is the first where all transit operations transitioned from the City of Bend to CET.

- Providing a contribution towards regional transit services; Bend residents comprise an estimated 40% of riders on the Redmond-Bend Community Connector shuttle.
- Purchasing low-floor vehicles (or making other capital improvements) at an earlier date than is assumed.

Overall Transit Funding Requirements

The financial scenario shown in Figure 9-5 uses the following assumptions to determine additional requirements for local funds to match available federal funds:

- Federal funds are used to fulfill capital needs identified in this plan (with 20% local match)
- Federal funds are used to provide "purchased" human transportation services (with a 10.27% local match).
- Federal funds are then used to cover operating costs identified in this plan (with a 50% local match).

Based on this scenario, the Bend area has sufficient local funds to leverage federal funds available to it, but will require additional local funding to implement the service recommendations of this plan. The overall future funding requirements for transit in Bend are as follows:

- Prior to the near mid-term service changes recommended for FY 2016, unobligated federal funds are assumed to be used to build a capital reserve (but could be used for other purposes as discussed above).
- In FY 2016 and FY 2017, following the near mid-term service changes (assumed in FY 2016), there would be annual funding deficits of about $50,000 in FY 2016 and $125,000 in FY 2017. *Although there would be cumulative operating surpluses, service increases are not financially sustainable without new local revenue source(s).*
- In FY 2018 and beyond, realizing the recommended mid-term service improvements would require an average of about $525,000 in additional local funding annually; this includes the 30/60 minute service restructuring, new Route 7, evening service until 8 PM, etc.

Potential sources for additional funds could include:

- An increased City of Bend funding contribution
- Service partnerships, such as with OSU or COCC
- Additional revenues from group pass sales
- MPO federal discretionary funds

- Connect Oregon funding (capital infrastructure)
- New local revenue sources

Appendix C provides additional detail on potential funding sources.

Capital Costs

Figure 9-4 identifies capital costs for the initial ten years of this plan.

- It assumes inflation of 3.5% annually, above unit costs included in Figure B-12 (Appendix).
- Based on the estimated duty-cycle for the fixed-route fleet (200,000 mile/7-year or 350,000 mile/10-year minimum lifetime) a number of vehicles are likely to require replacement, although additional preventative maintenance may be able to further extend vehicle lifetimes. Over the next five fiscal years (FY 2014 – 2018) it is assumed that one fixed-route vehicle will be replaced annually; high-floor vehicles are assumed for cost reasons. Starting with FY 2017 it is assumed that new and replacement fixed-route vehicles will be low-floor buses.
- The typical duty cycle for a Dial-A-Ride vehicle is 150,000 miles/5-year minimum lifetime. It is assumed that one Dial-A-Ride vehicle will need to be replaced each year.

Summary of Analysis Results

Figure 9-5 shows projected operating and capital costs and revenues for fixed-route transit and Dial-A-Ride in Bend over the next ten years, based on the assumptions detailed above. The analysis assumes constant fixed-route service hours in FY 2013 – 2015 and implementation of fixed-route service enhancements in FY 2016 and 2018. Based on the financial scenario presented in Figure 9-5:

- The system would have an annual operating surplus in FY 2014 and FY 2015 (Row V), including unobligated federal funds.
- Although federal funds could make it possible to implement the near mid-term service enhancements in FY 2016, this service level would not be sustainable without additional local funding.
- In FY 2018 and beyond, an average of about $525,000 in additional local funding would be required in order to implement the mid-term service enhancements, including restructuring service to have 30-minute headways on routes serving primary corridors. Total *local* funding of about $1.75 million on average would be needed, not including

advertising. This assumes that STF funding remains stable at FY 2013 levels and that unobligated federal funding is not used for other purposes.

The bottom portion of Figure 9-5 shows performance indicators for fixed-route and Dial-A-Ride service.

Figure 9-6 shows how the projections for fixed-route operating costs compare to peer agencies, accounting for projected population and ridership growth in Bend. For the mid-term, the resulting estimates of ridership per capita (7.5 to 8.7) are comparable to peer agencies closest to Bend in terms of service hours per capita.

Figure 9-4 Ten Year Capital Plan

	FY 2013	FY 2014	FY 2015	FY 2016	FY 2017	FY 2018	FY 2019	FY 2020	FY 2021	FY 2022	10-Year Total
	Estimated	Estimated	Projected	Projected	Projected	Projected	Projected	Projected	Projected	Projected	Projected
Fixed-Route Vehicle Replacement[1]	$0	$173,067	$178,259	$183,607	$189,115	$194,788	$332,066	$342,028	$352,289	$362,857	$2,308,076
Vehicles for New Fixed-Route Service[2]	$0	$0	$0	$0	$313,004	$322,394	$0	$0	$0	$0	$635,398
Dial-A-Ride Vehicle Replacement[3]	$0	$79,200	$81,576	$84,023	$86,544	$89,140	$91,815	$94,569	$97,406	$100,328	$804,601
Facilities (Stops, Shelters, etc.) [4]	$0	$33,843	$34,858	$98,595	$35,010	$161,555	$37,142	$25,335	$26,095	$26,878	$479,312
Other Capital Programs[5]	$0	$0	$0	$123,806	$0	$0	$0	$0	$0	$0	$123,806
Marketing and Branding[6]	$0	$0	$49,719	$5,628	$0	$5,970	$0	$6,334	$0	$6,720	$74,370
TOTAL CAPITAL EXPENSES	$0	$286,110	$344,412	$495,658	$623,673	$773,848	$461,023	$468,266	$475,790	$496,784	$4,425,564

Notes: Unit costs listed in Figure B-12 of the appendix, inflated by 3.5% annually to account for inflation.

(1) Fixed-route vehicle replacement: 1 high-floor, medium duty buses per year (2014 - 2018). 1 low-floor bus per year (2019-2022). If additional funds are available for capital purchases, low-floor buses could be substituted for high-floor buses.
(2) New fixed-route vehicles: 1 low-floor bus per year, e.g., for Routes 3 and 7 (assumes interlining when Route 7 begins operation) (2017, 2018).
(3) Dial-A-Ride vehicle replacement:1 cutaway vehicle per year (2014 – 2022).
(4) Assumes 4 “basic” and 2 “major” stop enhancements per year. Upgrades to two major transit stops/secondary hubs assumed (2017 and 2019).
(5) Other capital programs includes implementation of an Automated Passenger Counting system (2016).
(6) Marketing and branding includes allowance to complete conversion of BAT vehicles/facilities to CET (by 2015), marketing assessment (2015), and at least biannual marketing campaigns (2016, 2018, 2020, and 2022).

Figure 9-5 Ten Year Operating Cost Projections and Performance Indicators

		FY 2013 Estimated	FY 2014 Estimated	FY 2015 Projected	FY 2016 Projected	FY 2017 Projected	FY 2018 Projected	FY 2019 Projected	FY 2020 Projected	FY 2021 Projected	FY 2022 Projected
	Number of Service Hours Assumed	20,700	20,700	20,700	24,100	24,100	32,900	32,900	32,900	32,900	32,900
A=B+F	TRANSIT EXPENSES	$2,398,730	$2,734,840	$2,864,027	$3,347,228	$3,559,373	$4,542,762	$4,345,275	$4,471,563	$4,601,960	$4,749,782
B=C+D	**Operating Expenses (1)**	**$2,398,730**	**$2,448,730**	**$2,519,615**	**$2,851,570**	**$2,935,700**	**$3,768,913**	**$3,884,252**	**$4,003,297**	**$4,126,170**	**$4,252,998**
C	*Bend Fixed-Route Service*	*$1,430,858*	*$1,460,684*	*$1,511,808*	*$1,806,610*	*$1,869,841*	*$2,664,054*	*$2,757,296*	*$2,853,802*	*$2,953,685*	*$3,057,064*
D	*Bend ADA Paratransit Service*	*$967,872*	*$988,046*	*$1,007,807*	*$1,044,960*	*$1,065,859*	*$1,104,859*	*$1,126,956*	*$1,149,495*	*$1,172,485*	*$1,195,935*
E	*Potential Regional Service Contribution*										
F	**Capital Expenses (2)**	**$0**	**$286,110**	**$344,412**	**$495,658**	**$623,673**	**$773,848**	**$461,023**	**$468,266**	**$475,790**	**$496,784**
G=H+I+R	TRANSIT REVENUES - Existing Sources (3)	$2,398,730	$3,040,481	$3,151,963	$3,289,529	$3,411,712	$3,639,785	$3,783,220	$3,934,229	$4,090,954	$4,255,884
H=I+J	**Farebox (4)**	**$337,695**	**$411,350**	**$453,389**	**$512,937**	**$557,539**	**$694,809**	**$755,956**	**$822,361**	**$892,099**	**$967,591**
I	*Fixed Route Passenger Fares*	*$259,758*	*$325,620*	*$359,865*	*$414,698*	*$456,130*	*$588,530*	*$646,457*	*$709,642*	*$776,159*	*$848,430*
J	*Paratransit Passenger Fares*	*$77,937*	*$85,731*	*$93,524*	*$98,240*	*$101,409*	*$106,279*	*$109,499*	*$112,720*	*$115,940*	*$119,161*
K=L+K+…Q	**Intergovernmental (5)**	**$2,032,702**	**$2,591,631**	**$2,660,111**	**$2,734,516**	**$2,811,018**	**$2,889,677**	**$2,970,553**	**$3,053,711**	**$3,139,215**	**$3,227,131**
L	*Local Assistance (City of Bend)*	*$1,027,650*	*$1,053,341*	*$1,079,675*	*$1,106,667*	*$1,134,333*	*$1,162,692*	*$1,191,759*	*$1,221,553*	*$1,252,092*	*$1,283,394*
M	*Federal 5310 Operating Funds (6)*	*$87,131*	*$133,409*	*$133,409*	*$137,411*	*$141,533*	*$145,779*	*$150,152*	*$154,657*	*$159,297*	*$164,076*
N	*Federal JARC*	*$89,321*	*$0*	*JARC program sunsets after FY 2014 (formula-based allocation included in 5307/5340 program under MAP-21)*							
O	*Federal Operating or Capital - 5307/5340 (7)*	*$705,913*	*$1,160,068*	*$1,194,870*	*$1,230,716*	*$1,267,638*	*$1,305,667*	*$1,344,837*	*$1,385,182*	*$1,426,737*	*$1,469,539*
P	*Federal Capital - 5339 (7)*	*-*	*$122,126*	*$125,790*	*$129,563*	*$133,450*	*$137,454*	*$141,577*	*$145,825*	*$150,200*	*$154,706*
Q	*State Operating Assistance (STF) (8)*	*$122,687*	*$122,687*	*$126,368*	*$130,159*	*$134,063*	*$138,085*	*$142,228*	*$146,495*	*$150,890*	*$155,416*
R = S+T+U	**Other Local Revenue**	**$28,333**	**$37,500**	**$38,463**	**$42,076**	**$43,155**	**$55,299**	**$56,710**	**$58,156**	**$59,640**	**$61,162**
S	*Advertising*	*$23,333*	*$32,500*	*$33,313*	*$36,772*	*$37,691*	*$49,672*	*$50,913*	*$52,186*	*$53,491*	*$54,828*
T	*Sponsorships*	*$5,000*	*$5,000*	*$5,150*	*$5,305*	*$5,464*	*$5,628*	*$5,796*	*$5,970*	*$6,149*	*$6,334*
U											
	OPERATING BALANCE										
V=A-G	Annual Surplus / Deficit - Operating & Capital (existing funding) (9)	$0	$305,640	$287,935	($57,698)	($147,661)	($902,976)	($562,055)	($537,333)	($511,005)	($493,898)
W	*Previous year reserves applied (if required) (10)*	*$0*	*$0*	*$0*	*$57,698*	*$147,661*	*$388,216*	*$0*	*$0*	*$0*	*$0*
X	*Additional local (or other) new revenues needed (11)*	*$0*	*$0*	*$0*	*$0*	*$0*	*$514,760*	*$562,055*	*$537,333*	*$511,005*	*$493,898*
Y	**Annual Operating Balance (Capital or Operating Reserve)**	**$0**	**$305,640**	**$287,935**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**
Z	***Cumulative Operating Balance (Capital or Operating Reserve)***	***$0***	***$305,640***	***$593,575***	***$535,877***	***$388,216***	***$0***	***$0***	***$0***	***$0***	***$0***

Fixed Route Performance Indicators										
Cost Per Rev Hrs	$69.12	$70.56	$73.03	$75.59	$78.24	$80.97	$83.81	$86.74	$89.78	$92.92
Cost Per Passenger	$3.16	$3.00	$2.89	$3.08	$2.98	$3.38	$3.26	$3.16	$3.06	$2.96
Fare Box/Recovery	18.2%	22.3%	23.8%	23.0%	24.4%	22.1%	23.4%	24.9%	26.3%	27.8%
Average Fare Per Passenger	$0.57	$0.67	$0.69	$0.71	$0.73	$0.75	$0.77	$0.78	$0.80	$0.82
Average Subsidy Per Passenger	$2.59	$2.33	$2.21	$2.38	$2.25	$2.63	$2.50	$2.37	$2.25	$2.14
Passenger Per Rev Hrs	21.9	23.5	25.2	24.5	26.2	24.0	25.7	27.5	29.4	31.3

Dial-A-Ride Performance Indicators										
Cost Per Rev Hrs	$62.76	$64.06	$65.34	$66.65	$67.98	$69.34	$70.73	$72.15	$73.59	$75.06
Cost Per Passenger	$15.22	$15.54	$15.85	$16.17	$16.49	$16.82	$17.16	$17.50	$17.85	$18.21
Fare Box/Recovery	8.1%	8.7%	9.3%	9.4%	9.5%	9.6%	9.7%	9.8%	9.9%	10.0%
Average Fare Per Passenger	$1.23	$1.35	$1.47	$1.52	$1.57	$1.62	$1.67	$1.72	$1.77	$1.81
Average Subsidy Per Passenger	$14.00	$14.19	$14.38	$14.65	$14.92	$15.20	$15.49	$15.79	$16.09	$16.39
Passenger Per Rev Hrs	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1

Notes:

(1) Operating expenses from Operating Assumptions or Op Alt 1 Worksheets, based on 2012 average cost of $72 per hour, assuming 3.5% annual increases (due to inflation) for FR and 2% for DAR. Assumes increased service in FY 2016 and FY 2018.

(2) Capital expenses from Capital Alt 1 Worksheet, includes assumed vehicle replacement needs and other facilities\infrastructure needs. Includes additional vehicles to support increased service in FY 2018.

(3) FY 2013 and 2014 base revenues from FY 2013 CET Proposed Budget (with revisions) and/or new ODOT or MAP-21 allocations. Additional local funds will be required to fully match the federal dollars included in FY 2014 and later years.

(4) Assumes a $0.25 fare increase in FY 2014 on fixed-route and Dial-A-Ride. In subsequent years, assumes 5 cent annual fare increases on fixed-route and 10 cent annual fare increases on Dial-A-Ride.

(5) City of Bend funds assumed to increase based on Portland CPI. MAP-21 funding levels assumed for federal sources starting in FY 2014, and assumed to increase annually at federal CPI, which is assumed to be 3% .

(6) Federal 5310 funds require a local match of 10.27% , based on use for purchased services.

(7) It is assumed that federal funds are first used to fulfill capital needs (20% local match), then operating costs (50% local match). It is assumed that 10% of 5307 funds can be applied to preventative maintenance or ADA service and matched at 20% .

(8) State (STF) operating assistance is not currently known, but is assumed to continue at FY 2013 levels in FY 14, and to increase at Federal CPI subsequently.

(9) Does not include operating surplus from past years (assumed to be held as a capital reserve). Assumes current funding sources/levels.

(10) Operating surplus (reserves) from past years includes previous years' unobligated Federal funds (can be deferred for 3-6 years depending on funding program) that will require adequate local match.

(11) Identifies the level of additional local or other new revenues sources that would be required to operate transit in Bend, after any previous years' reserves are exhausted.

Figure 9-6 Projected Mid-Term Fixed-Route Operating Costs and Performance Measures Relative to Peers

			Fixed-Route						
	Service Area Population	Density (Pop. Per Square Mile)	Total Annual Vehicle Revenue Hours	Annual Vehicle Hours per Capita	Annual Operating Costs [2]	Annual Operating Costs per Capita	Annual Ridership (Unlinked Trips) [6]	Annual Rides per Capita (2010)	Operating Cost per Rider (2010)
Actual, 2010									
Medford, OR	150,000	2,586	33,658	0.22	$4,772,691	$31.82	979,124	6.5	$4.87
Redding, CA	117,478	1,175	43,736	0.37	$3,180,273	$27.07	672,379	5.7	$4.73
Pueblo, CO	105,000	2,692	40,430	0.39	$3,478,182	$33.13	951,123	9.1	$3.66
Yakima. WA	92,035	3,287	54,850	0.60	$5,760,027	$62.59	1,312,116	14.3	$4.39
Santa Fe, NM	76,100	1,856	76,988	1.01	$6,053,701	$79.55	838,841	11.0	$7.22
Everett, WA	105,000	3,088	129,830	1.24	$14,240,792	$135.63	2,289,587	21.8	$6.22
Peer Average	107,602	2,447	58,063	0.60	$6,247,611	$61.60	1,490,241	11.4	$5.18
Bend	76,639	2,395	20,902	0.26	$1,489,094	$19.43	327,904	4.0 (5.1 in 2011)	$4.54
Projected, Adjusted for Inflation									
Bend – Near mid-term (Projected – 2016)	86,000 [a]	2,531 [b]	24,100 [c]	0.28	$1,936,000 [f]	$22.50	507,000 – 586,000 [g]	5.9 – 6.8	$3.31 - $3.82
Bend - Mid-Term (Projected – 2018)	89,500 [a]	2,797 [b]	32,900 [d]	0.37	$2,854,000 [f]	$32.00	647,000 – 788,000 [g]	7.5 – 8.7	$3.62 - $4.41
Bend – Long-Term (Projected – 2030)	110,000 [a]	-	78,700 [e]	0.72	-	-	-	-	-

Notes:

(a) Assumes that Bend's population increases at the same annual rate as Deschutes County is projected to increase overall, starting with 2011 estimate, and that Bend will attain the projected 2025 population of 110,000 by 2030.
(b) Assumes no change in existing city limits.
(c) Near mid-term includes Route 3/11 restructuring, all-day and Saturday service for Route 11, and 1 additional evening trip on all routes; assumed for 2016.
(d) Mid-term includes initial restructuring for 30/60 minute service, near mid-term enhancements, evening service until 8 PM on all routes, new Route 7, etc.); assumed for 2018.
(e) Long-term includes the full set of potential improvements. Operating costs and ridership were not projected for the long-term.
(f) Operating costs assume increase in costs of 3.5% annually, from FY 14 budget estimates.
(g) Projected ridership based on annual increase in rides per capita of 2.0% to 5.0%, with additional increases due to service changes.

Source: National Transit Database, 2010. U.S. Census, 2010.

IMPLEMENTATION ACTIONS AND PHASING

Figure 9-7 provides a matrix listing implementation actions, including likely responsibility and phasing.

- Implementation responsibility identifies lead versus supporting role in implementation.
- Phasing is based on the following time frames: first year (early short-term), short-term (years 1-3), mid-term (years 4-10), and/or ongoing.

Figure 9-7 Implementation Actions and Phasing

Action #	Recommended Actions	Lead Implementer(s)	First-year	Short-Term	Mid-Term	Ongoing/ Monitor
	Goal 1: Develop public transportation services for the transportation disadvantaged					
1.1	**Ensure that local funding for Bend Dial-A-Ride service is maintained beyond the City of Bend's current funding commitment (through September 2015).**	BMPO[1], CET[1], City of Bend[1]		✓	✓	
1.2	**Acquire low-floor buses as part of new/replacement vehicle purchases and prioritize on routes with high levels of wheelchair boardings and/or ridership.**	CET[1]		✓	✓	
1.3	**Assess balance between fixed-route and Dial-A-Ride services on a periodic basis, based on available financial resources and as fixed-route service is enhanced in the future.** This could include evaluation of the costs and cost-effectiveness of providing Dial-A-Ride service that exceeds ADA requirements in terms of: (1) , geographic coverage beyond the required ¾ distance from fixed-route service (currently within city limits); (2) service at days and times when fixed-route service does not operate (e.g., on Sundays); (3) eligibility for low-income seniors.	CET[1], City of Bend[2]		✓		✓
	Goal 2: Reduce reliance on automobiles and develop public transportation facilities					
	Funding					
2.1	**Identify a source(s) for local matching funds (as needed) to secure additional transit funding under MAP-21. This could include assessment of City of Bend's willingness to increase its funding commitment**	CET[1], BMPO[2], City of Bend[2]	✓	✓		
2.2	**Ensure that local funding for fixed-route transit is maintained beyond the City of Bend's funding commitment (through September 2015).** Develop local funding sources sufficient to support the mid-term service improvements recommended in the PTP.	BMPO[1], CET[1], City of Bend[1]		✓	✓	
2.3	**Renegotiate terms of the bulk ticket discount program with COCC, with the aim of developing a group pass program.** Demand for the existing program has exceeded the levels for which it was designed/intended.	CET[1], COCC[2]	✓	✓		

Responsibility: 1=Lead, 2=Support

Time Frames: First Year=First year of short-term time frame, Short-Term=Years 1-3, Mid-Term=Years 4-10

Action #	Recommended Actions	Lead Implementer(s)	First-year	Short-Term	Mid-Term	Ongoing/ Monitor
	Facilities & Infrastructure					
2.4	**Adopt bus stop amenity design standards, e.g., based on Figure 8-4**. This should include standards for new bus shelters that enhance transit visibility and meet passenger needs for weather protection. This could also be addressed in the community-oriented design process described in item 2.4 (below). Pursue opportunities to integrate advertising or sponsorships as part of the funding package for shelters or other stop enhancements.	CET[1], City of Bend[2], BMPO[2]		✓		
2.5	**Develop specifications for new/replacement vehicles that modernize the fleet in order to be more appealing and attractive to a broad range of users and align vehicle capacity to passenger demand/needs on each route.** This could include transit signal priority, real-time passenger information, and other ITS capabilities, e.g., automated passenger counters (APCs). In the mid-term time frame (or beyond) this could include a community-oriented process to design vehicles (and other system elements) to community specifications (e.g., similar to Boulder, where such a process was embraced in development of the Hop, Skip, Jump, etc., local transit services; see footnote for details[40]).	CET[1]			✓	
2.6	**Develop a program of transit-supportive capital improvements.** This program should be coordinated with the City's Capital Improvement Plan (CIP), to identify and prioritize transit-supportive capital improvements around major transit nodes, primary transit corridors, and planned routes including: • Bus stops at major intersections (both sides of the street) and amenities at the most highly used stops (using stop amenity thresholds in Figure 8-1 as a guideline). • Bicycle/pedestrian improvements (e.g., street crossings serving stops and activity centers along arterial transit streets such as 3rd Street and Greenwood Ave.) • Transit signal priority to allow buses to better maintain schedule on congested corridors.	City of Bend[1], CET[1], BMPO[2], ODOT[2]	✓	✓	✓	Review/ update every 2 years
2.7	**Develop a sidewalk repair and infill program**, with a specific emphasis on access to transit facilities.	City of Bend[1], BMPO[2], CET[2]		✓	✓	

[40] http://www.ctaa.org/webmodules/webarticles/articlefiles/ct/fall98/boulder.pdf

Responsibility: 1=Lead, 2=Support

Time Frames: First Year=First year of short-term time frame, Short-Term=Years 1-3, Mid-Term=Years 4-10

Action #	Recommended Actions	Lead Implementer(s)	First-year	Short-Term	Mid-Term	Ongoing/ Monitor
2.8	**Evaluate pedestrian safety and transit operational improvements for the on-street bus transfer facility at Hawthorne Station. This could include consideration of:** (1) converting Hawthorne Avenue to exclusive transit and pedestrian use between 3rd and 4th Avenue, e.g., east of the Safeway driveway; (2) providing a mid-block crossing for use by passengers (e.g., raised pavement surface, pedestrian-activated lighting, etc.). A "neck-down" could be included in the design of the mid-block crossing, assuming it does not impact bus movements; (3) on-street parking on 4th Avenue between Hawthorne and Greenwood, given current and future transit operations.	City of Bend[1], CET[2], , BMPO[2]		✓	✓	
2.9	**Evaluate locations and opportunities for major transit stops in north and south Bend, at existing or future stop locations.** These locations may serve as secondary transit hubs, facilitating connections between local or regional routes (based on future service enhancements identified in this plan or the RTMP), as well as ride sharing. See Figure 8-1 and Figure 8-2 for locations and potential stop features.	CET[1], City of Bend[2], BMPO[2]		✓	✓	
2.10	**Develop bike parking facilities, preferably covered, at secondary hub locations and other outlying stop locations.** Recommended locations are identified in Figure 8-2.	CET[1], BMPO[2], City of Bend[2], ODOT[2], Commute Options[2]		✓	✓	
2.11	**Evaluate feasibility of a bicycle-sharing program**. Implement as feasible (based on an appropriate service model, partnerships, etc.). Bicycle sharing can serve "last-mile" connections to destinations beyond walking distance of transit stops and relieve capacity limitations for transporting bicycles in racks on buses.	BMPO[1], City of Bend[2], Commute Options[2]			✓	
2.12	**Implement speed & reliability improvements on 3rd Street**. Such investments could include signal timing, transit signal priority, and evaluating stop placement to minimize delay to buses. Bus routes on 3rd should be able to complete a round trip within the scheduled time (currently 40 minutes; in the mid-term time frame, 30 minutes for south 3rd Street [Route 1] and 60 minutes for north 3rd Street [Route 4]).	City of Bend[1], ODOT[1], BMPO[2], CET[2]			✓	

Responsibility: 1=Lead, 2=Support

Time Frames: First Year=First year of short-term time frame, Short-Term=Years 1-3, Mid-Term=Years 4-10

Action #	Recommended Actions	Lead Implementer(s)	First-year	Short-Term	Mid-Term	Ongoing/ Monitor
	Service or Service-Related					
2.13	**Implement short-term service improvements to Routes 4, 5, and 6.** Conduct additional outreach to Route 5 and 6 passengers who will be affected by the changes. Create a temporary stop for outbound Route 6/inbound Route 5 on eastbound Greenwood at Purcell. Add this stop and existing temporary stops on 5th Street to the program for developing permanent stops.	CET[1]	✓			
2.14	**Implement near mid-term service and infrastructure improvements on Routes 3 and 11, timed with and contingent on a new OSU facility on SW Colorado with a projected enrollment of 5,000 students within the next several years.** Pursue partnerships with OSU (and/or others) to fund the increase in operating costs for all-day Route 11 service as well as additional early-evening service.	OSU[1], COCC[1], CET[2], City of Bend[2]			✓	
2.15	**Secure funding for and implement pedestrian access corridors from Bear Creek Road to Greenwood Avenue to support implementation of Route 7.** This should include required traffic signals and/or protected pedestrian crossings (e.g., rapid flashing beacon) to connect access corridors to future stop locations. A map of existing/planned accessways is provided in Appendix B, Figure B-16.	City of Bend[1], ODOT[2], CET[2]			✓	
2.16	**Review priorities for eliminating at-grade railroad crossings including consideration of when transit service on a corridor may be feasible/likely and whether the potential for delay at railroad crossings could preclude future transit service.** For example, Cooley Road in northeast Bend and Reed Market Road in southeast Bend; the COACT Report on Central Oregon Rail Planning (2009) prioritized both the Cooley and Reed Market Road crossings as "High."	City of Bend[1], CET[2], BMPO[2]		✓		

Responsibility: 1=Lead, 2=Support

Time Frames: First Year=First year of short-term time frame, Short-Term=Years 1-3, Mid-Term=Years 4-10

Action #	Recommended Actions	Lead Implementer(s)	First-year	Short-Term	Mid-Term	Ongoing/ Monitor
	Goal 3: Increase mobility, accessibility, and visibility of transit throughout the urban area					
	Regional Service Enhancements					
3.1	**Utilize the Bend-La Pine Community Connector (Route 30) to provide a stop in Deschutes River Woods.** Identify potential locations (e.g., Riverwoods Baptist Church initially and/or Riverwoods Country Store in longer-term) amenable to a stop location, assess feasibility, and negotiate a joint-use agreement. Secure funding for any infrastructure improvements needed at the Riverwoods Country Store (e.g., pave rear portion of parking lot) if this location is pursued in the longer-term. Note: Service to Riverwoods Baptist Church started on 11/26/2012.	CET[1], BMPO[2]	✓		✓	
3.2	**Evaluate a Bend-Redmond Community Connector (Route 24) stop in the north part of Bend.** An initial location could be the ODOT Park & Ride near the DMV office on 3rd Street. In the longer-term, the stop could be co-located with a future major transit hub / secondary hub location in north Bend (see 2.9).	CET[1], BMPO[2]		✓	✓	
3.3	**Evaluate a Bend-La Pine Community Connector (Route 30) stop in the south part of Bend.** An initial location could be the existing Route 1 stops near Walmart. In the longer-term, the stop could be co-located with a future major transit hub / secondary hub location in south Bend (see 2.9).	CET[1], BMPO[2]		✓	✓	
3.4	**Promote vanpools to dispersed employment sites.** Identify opportunities for promoting vanpools to employment sites not currently served by the fixed-route system or located outside of Bend city limits (e.g., Bend Municipal Airport). Assess demand for such vanpools to serve regional demand in coordination with Community Connector routes as well as local demand.	Commute Options[1], CET[2], BMPO[2]	✓	✓		
3.5	**Develop a region-wide volunteer driver program to fill a need for transportation connections not served by transit, i.e., outside service area or service days/times.**	Commute Options[1], CET[2]	✓	✓		
	Marketing and Branding					
3.6	**Market regular interlining of routes to passengers as a convenience feature.** Initially, this item refers to marketing existing route interlining practices (e.g., route 1-3, 2-4, 5-6).	CET[1]	✓			✓

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Time Frames: First Year=First year of short-term time frame, Short-Term=Years 1-3, Mid-Term=Years 4-10

Action #	Recommended Actions	Lead Implementer(s)	First-year	Short-Term	Mid-Term	Ongoing/ Monitor
3.7	**Build upon the "open" transit data published in Google Transit.** Make trip planning capabilities available on the CET, City of Bend, and Commute Options websites. Provide real-time transit arrival information including on mobile devices (when available). Market enhancements to online trip planning and real-time information to current and potential riders.	CET[1], City of Bend[2], BMPO[2], Commute Options[2]	✓	✓	✓	
3.6	**Develop capabilities for targeted communication with customers including on their mobile devices (via text messages, e-mail, social media, etc.), such as to provide updates on delays or snow routes.**	CET[1]		✓		
3.7	**Develop a plan to complete the transition from BAT to CET in all system branding, including vehicles and stops.**	CET[1], City of Bend[2]		✓		
3.8	**Conduct a comprehensive assessment of CET's marketing and branding and develop action plan.** This could include an assessment and update of the Rider Guide, website, social media, bus stop materials, etc.	CET[1], BMPO[2]	✓	✓		
3.9	**Review / update marketing materials on a regular basis.** This could include recommended improvements outlined in the Marketing and Branding section of Chapter 8, such as enhancements of the Rider Guide and increased development of social media (assuming staff is able to monitor and keep sites up-to-date). In addition, consider marketing regular interlining of routes to passengers as a convenience feature.	CET[1], Commute Options[1]				Every 2 years
3.10	**Develop marketing materials for service between Bend and Redmond Airport.** Coordinate service with major flight departure/arrival times to the extent possible and place marketing materials at strategic locations.	CET[1]		✓		Annually
	Performance Standards					
3.11	▪ **Evaluate use of automatic passenger counters (APCs) to enhance data collection capabilities.** Based on outcome of evaluation, include APC technology in new vehicle acquisitions.	CET[1]		✓	✓	
3.12	**Develop strategies to reduce the high rate of cancellations (potentially related to the large number of subscription trips).**	CET[1]		✓		

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Time Frames: First Year=First year of short-term time frame, Short-Term=Years 1-3, Mid-Term=Years 4-10

Action #	Recommended Actions	Lead Implementer(s)	First-year	Short-Term	Mid-Term	Ongoing/ Monitor
	Goal 4: Provide infrastructure and land use planning to support transit					
4.1	**Adopt a Primary Transit Corridors policy.** This policy should identify corridors with the highest potential ridership (see Primary Transit Corridors map, Figure 7-4) where the City, BMPO, and CET will prioritize the highest level of transit service over time and where major transit-supportive land uses are encouraged to locate. This policy should be reviewed periodically to ensure the primary transit corridors reflect current and planned land use intensity.	City of Bend[1], BMPO[2], CET[2]	✓	✓		Every 5 years
4.2	**Develop a transit overlay zoning ordinance and adopt it around primary transit corridors and/or major transit nodes (e.g., Hawthorne Station).** The Future Opportunities memo provides a more in-depth discussion of elements that could be addressed in such as ordinance and other opportunities to incorporate transit-supportive elements into the existing City code.	City of Bend[1], BMPO[2]		✓		
4.3	**Require review of transit service needs as part of the development review process.** Develop a protocol for integrating assessment of transit requirements (including involvement of CET staff, and funding contribution for staff time) into early review of development/land use proposals, particularly those with potentially significant impact on transit ridership and/or where the proposed use is located away from transit.	City of Bend[1], BMPO[2], CET[2]		✓		
4.4	**Coordinate public facility master plans (e.g., sewer, water, etc.) with priorities/opportunities for intensifying land use along primary transit corridors.** In particular, consider prioritizing facility upgrades that would relieve capacity constraints and enable development.	City of Bend[1], BMPO[2], CET[2]		✓		
4.5	**Evaluate a mechanism to formalize developer contributions to funding for transit infrastructure.**	City of Bend[1], BMPO[2]		✓		

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APPENDICES

Appendix A Land Use and Transit Demand

Appendix B Future Service Concepts – Supporting Detail

Appendix C Funding Options

Appendix D Updated Bend Urbanized Area Map