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CET 2040 Transit Master Plan

Bend Local TAC Meeting
(CET TMP Bend Focus)
September 19th, 2019

KITTELSON & ASSOCIATES

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Meeting Purpose and Desired Outcomes

Meeting Purpose

Review the Bend focus area work on the following topics

- Mobility Services Overview
- Fixed-Route Transit Network Analysis
- First-Last Mile Strategies

Desired Outcomes

Input from TAC on:

- Potential Primary Transit Network
- Mixed-route service alternative to be further explored
- Mobility hub types and potential strategy

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Meeting Agenda

TIME	SUBJECT	LEAD PRESENTER	GUIDANCE REQUESTED
3:00	Welcome and Introductions	Andrea Breault COIC	
3:10	Project Status and Schedule	Susie Wright Kittelson & Associates	Confirm Understanding, Questions for Clarification, Reflect on member comments/input from the 8/19 meeting
3:25	Mobility Services Overview	Susie Wright Kittelson & Associates	- Do you have comments on the example mobility hubs from other cities? - Do you have questions about the microtransit and micromobiity overviews?
3:45	Fixed-Route Transit Network	Susie Wright Kittelson & Associates	- Do you have comments on the recommended and candidate corridors? - Do you have comments on the fixed-route service alternatives proposed for evaluation or others we should consider? - Do you have comments on the transit center options?
4:15	Mobility Hub Types and Strategy	Susie Wright Kittelson & Associates	- Do you have comments on the mobility hub types and typical characteristics? - Do you have comments on the draft mobility hub strategy map and NE Bend case study?
4:55	Next Steps/Adjourn	Andrea COIC	

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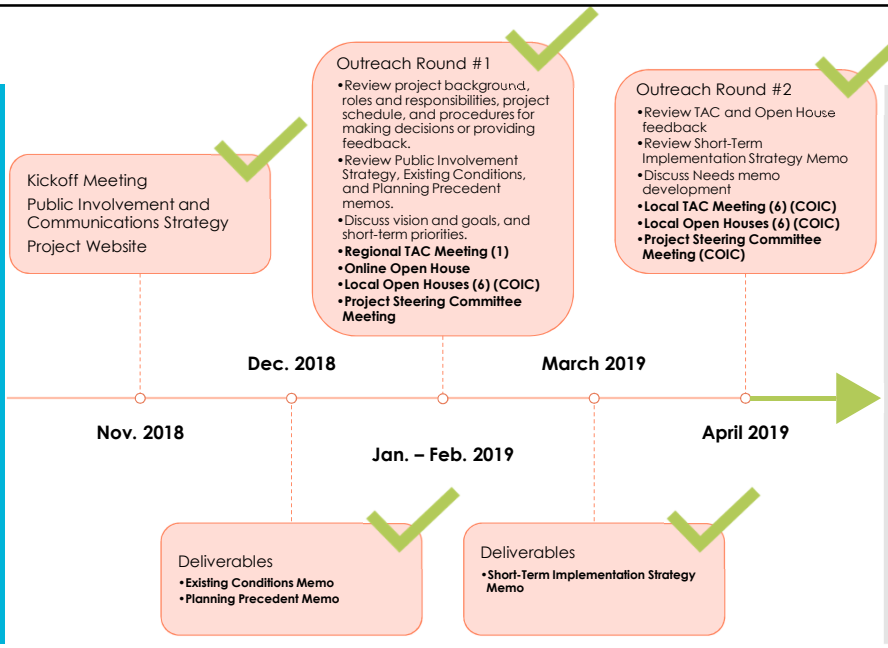
Project Status and Schedule

(Month 1-6)



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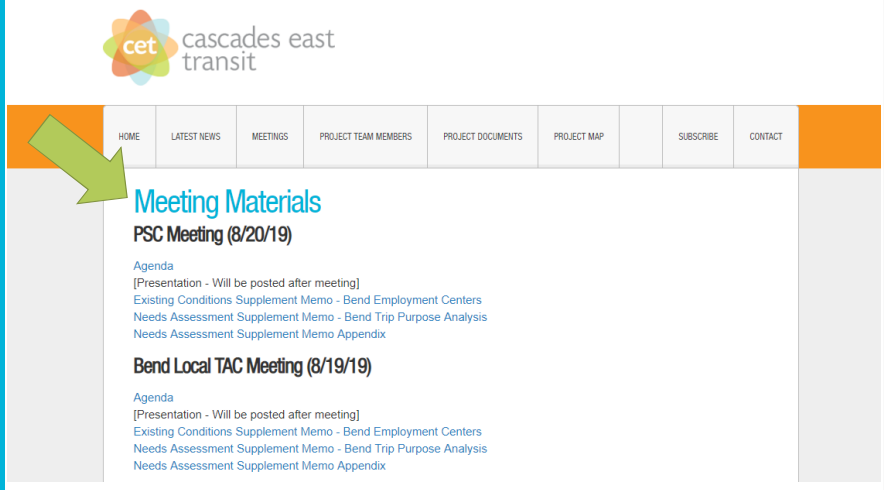
Project Status and Schedule

(Month 1-6)

Prior Project Documents



http://cettransitplan.com/websites/56/pages/328

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Project Status and Schedule

(CET TMP Bend Focus, Month 7 - 11)

Existing Conditions – Bend Employment Centers
Needs Assessment – Bend Trip Purpose Analysis
- **Existing Conditions Memo**
- **Needs Assessment Memo**

May – July 2019

August – September 2019

First/Last Mile Analysis
Feasibility of Increasing Frequency, Expanding Service, Enhancing RideBend Service,
Transit Technology Update Analysis

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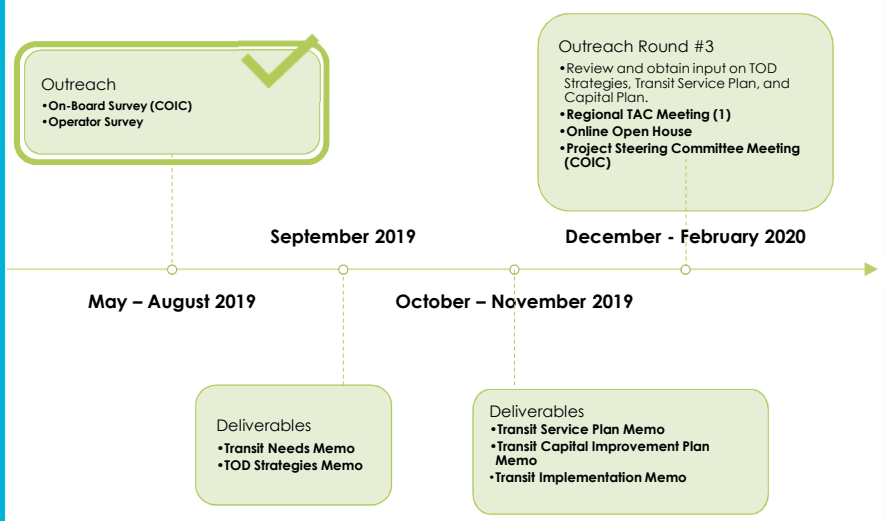
Project Status and Schedule

(Month 7-14)



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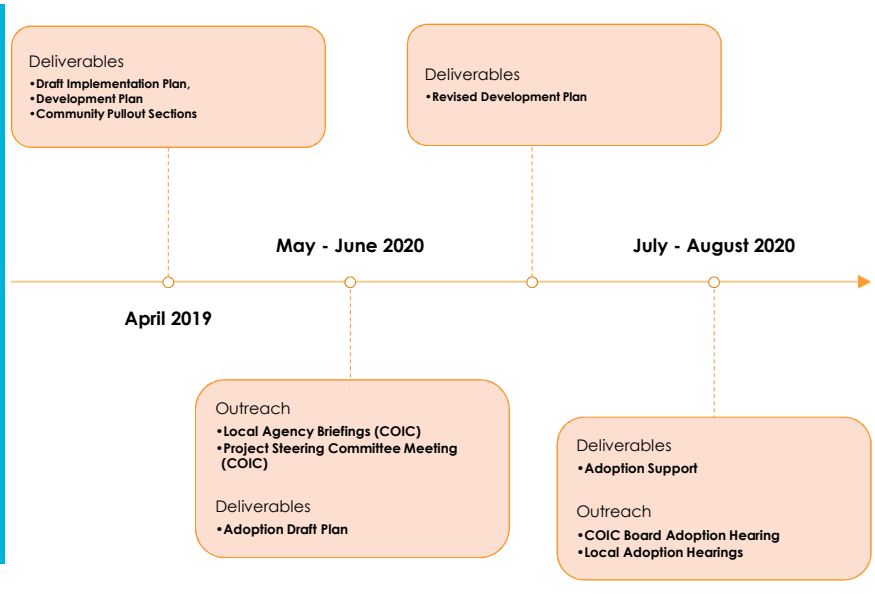
Project Status and Schedule

(Month 15-18+)



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Tasks 5 and 6 Memo

Needs Assessment Supplement Memo

Bend Mobility Services and Fixed-Route Transit Network Analysis

- Mobility Services Overview
- Fixed-Route Transit Network
- Mobility Hub Types and Strategy

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Mobility Services Overview

Mobility service options that are currently operating or under consideration in Bend

Existing/Planned Mobility Service Options in Bend

Relevant services that are operating nationally

National Mobility Services Information

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Mobility Services Overview

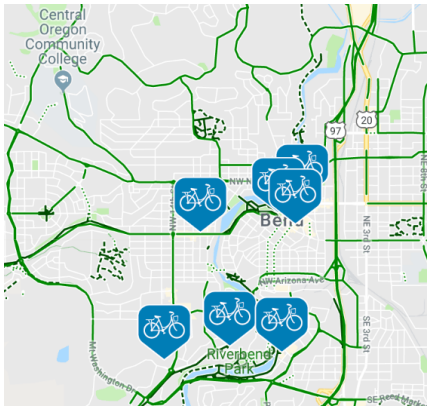
Existing or Planned Mobility Service Options in Bend

Bike Share

- 2016: 30 bikes at 3 stations
- 2017: expanded w/private sponsorship

Scooter Share

- 2019: deferred
- 2020: e-scooter pilot being considered



Bike Share Stations (Figure 1, Pg. 2)

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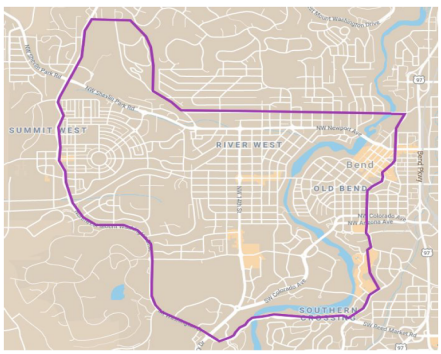
Mobility Services Overview

Existing or Planned Mobility Service Options in Bend

Ride Bend

- 2017-18: CET operated fixed route
- 2019: piloted demand-response service by Downtowner, LLC

Summer Service Area (Figure 3, Pg. 3)



Fall Service Area (Figure 4, Pg. 4)

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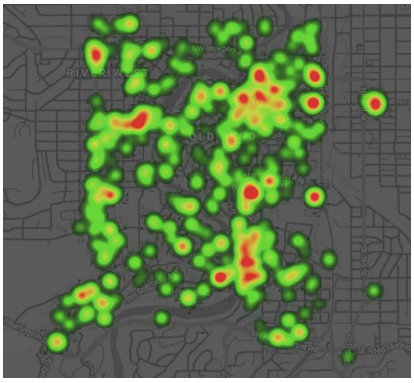
Mobility Services Overview

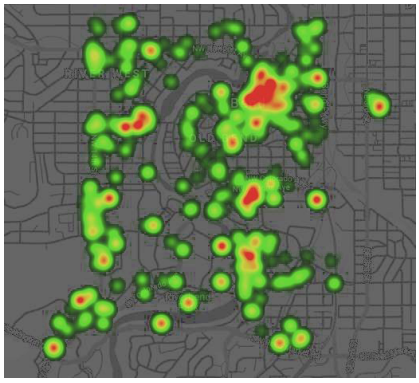
Existing or Planned Mobility Service Options in Bend

Ride Bend

- 2017-18: CET operated
- 2019: piloted by Downtowner, LLC



Summer 2019 Pickup Location (Figure 5, Pg. 4)



Summer 2019 Dropoff Locations (Figure 6, Pg. 4)

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Mobility Services Overview

Existing or Planned Mobility Service Options in Bend

Car Share

- Hosted by OSU-Cascades until August 2019

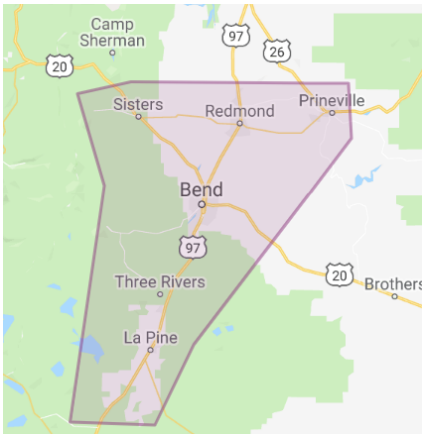
Taxi Cabs

Vanpool and Carpool

- Coordination through Commute Options

Ride Hailing

- Uber: Bend
- Lyft: Bend, Prineville, Redmond, Sisters, Three Rivers, and La Pine



Lyft Service Area (Figure 7, Pg. 5)

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Mobility Services Overview

National Mobility Services Information

Mobility Hubs

- "…more than just a transit station. Mobility hubs consist of quality transit stations and the surrounding area. They serve a critical function in the regional transportation system as the origin, destination, or transfer point for a significant portion of trips."
  - Metrolinx (regional transportation agency in greater Toronto area)

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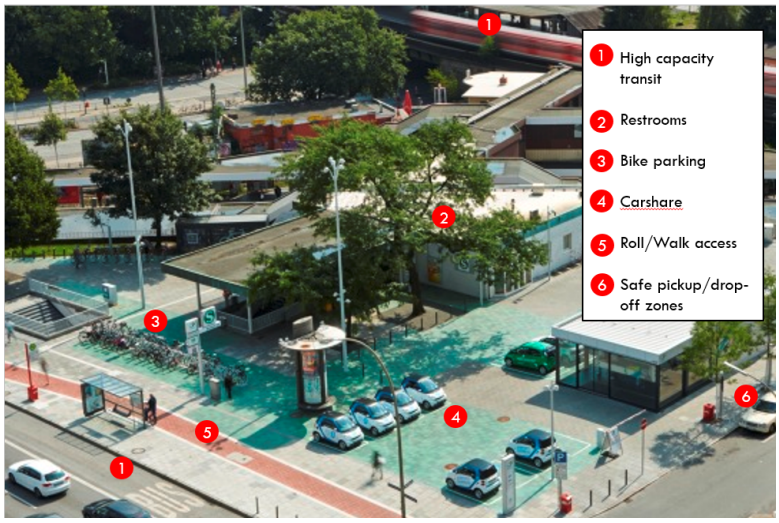
Mobility Services Overview

National Mobility Services Information



Mobility Hub Concept in Hamburg, Germany (Figure 8, Pg. 6)

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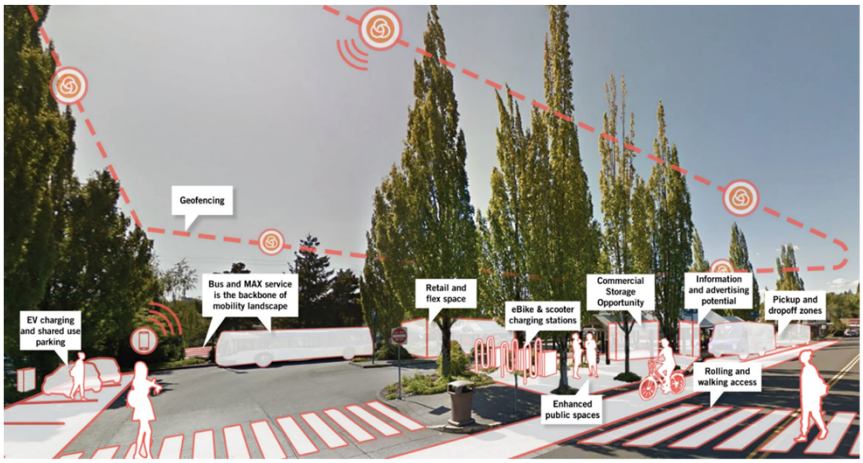
Mobility Services Overview

National Mobility Services Information



Mobility Hub Concept in Portland, Oregon (Figure 9, Pg. 7)

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Mobility Services Overview

National Mobility Services Information

Microtransit/General Public Demand-Response Transit Services

- "…offered by private sector transportation service companies… that provide what some might call a middle ground between taxis and public transit… defined as one in which passengers crowdsource minibus and van rides by requesting rides on their smartphones through an app provided by the private company, much like UberPool or Lyft Line."
  - TCRP Synthesis 141
- Can be operated by public sector as well (essentially general population dial-a-ride with enhanced scheduling, routing, and dispatch software)

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Mobility Services Overview

National Mobility Services Information

Transit Agency	Contract or In house	Cost per Vehicle Service Hour	Passengers per Vehicle Service Hour	Cost per Passenger Trip
AC Transit	In house	$214.00 (fully allocated)	3	$71.00
Cherriots	In house	$65.00	3.5	$18.57
DART (Dallas)	Contracted. DART provides vehicles and facilities but not fuel.	$46.00	2.5 for original DRT service and 3.5 for new GoLink service.	$18.40 $13.14
Greater Dayton RTA	In house and contracted	RTA pays Lyft and taxis and uses in-house paratransit.	Not applicable	$13.00
Denver RTD	Contracted	$83.00	3.8	$21.84
HART	Contracted	HART pays contractor by trip and not by hour.	3.5	$10.00
Houston METRO	In house	$75.00	2.4	$31.25
Kitsap Transit	In house	$130.72	3.66	$35.68
LYNX	Contracted	$41.17	3.3	$12.60
MST	Contracted	$54.18	4.03	$13.44
NVTA	Contracted	$44.48	2.6	$17.00
NCTD	Contracted	$97.00	2.7	$36.00
TDU	Contracted and in house	$34.69	4.7	$7.34

Note. The numbers are self-reported figures from agencies that responded.

Ridership and Operating Costs for General Public Demand Response Services (Table 1, Pg. 8)

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Mobility Services Overview

National Mobility Services Information

Micromobility

- "…shared-use, fleets of small, fully or partially human-powered vehicles such as bike, e-bikes, and e-scooters…"
  - NACTO

Trip Planning Platforms

- "one-stop shop" online trip planning platforms; increasing interest outside of large urban areas
- Help customers navigate the range of services available in mobility hubs including micromobility

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Mobility Services Overview

- Do you have comments on the example mobility hubs from other cities?
- Do you have questions about the microtransit and micromobility overviews?

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Fixed-Route Transit Network Analysis

Past and recommended updated primary transit network

Primary Transit Network

Proposed frequency scenarios for analysis

Fixed-Route Frequency and Ridership Potential

Identify potential enhanced transit services along primary transit corridors

Enhanced Transit Service Corridors

Identifies new routing options for primary transit network

Additional Fixed-Route Service Options

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Fixed-Route Transit Network Analysis

Primary Transit Network

The concept of **primary transit corridors** (introduced in the 2012 Bend Transit Plan) identifies the roadway segments that are most significant for transit.

- A **policy tool** to help the City of Bend and CET manage and coordinate land use, public infrastructure, and transit service provision.
- A **mechanism** to coordinate transit and land use to achieve land use characteristics that can support high level of transit service along Bend's most important arterial transit corridors.
  1. Securing a commitment from the transit provider (CET)
  2. Influencing the City's zoning and development policies
  3. Providing direction to City engineers and planners about where street rights-of-way should be designed and managed
  4. Encouraging dense and/or transit intensive land uses to locate on primary corridors

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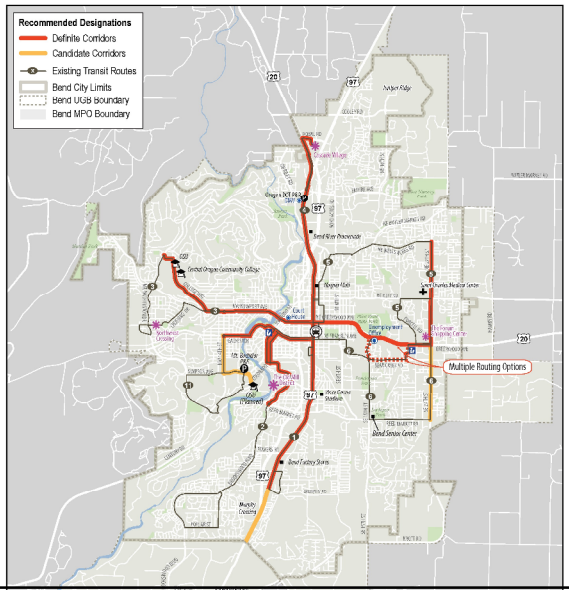
Fixed-Route Transit Network Analysis

Primary Transit Network



2012 Primary Transit Network (Figure 10, Pg. 12)

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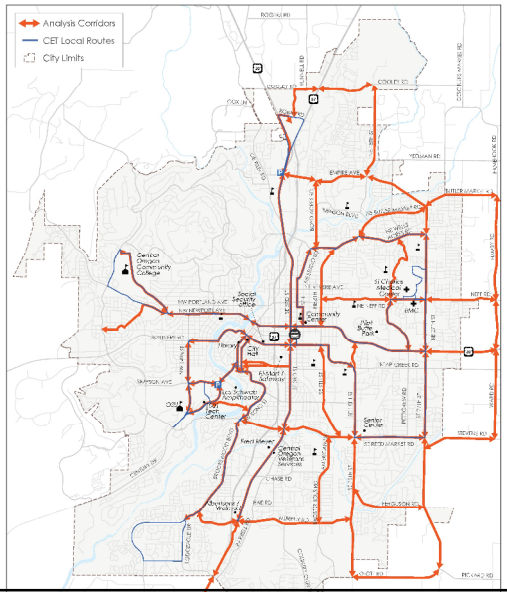
Fixed-Route Transit Network Analysis

Primary Transit Network



Segments Evaluated for Primary Transit Network Update (Figure 11, Pg. 14)

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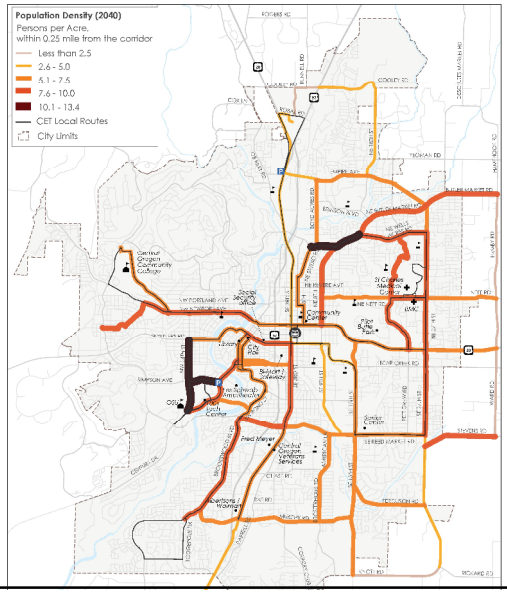
Fixed-Route Transit Network Analysis

Primary Transit Network



2040 Population Density by Corridor Segment (Figure 12, Pg. 15)

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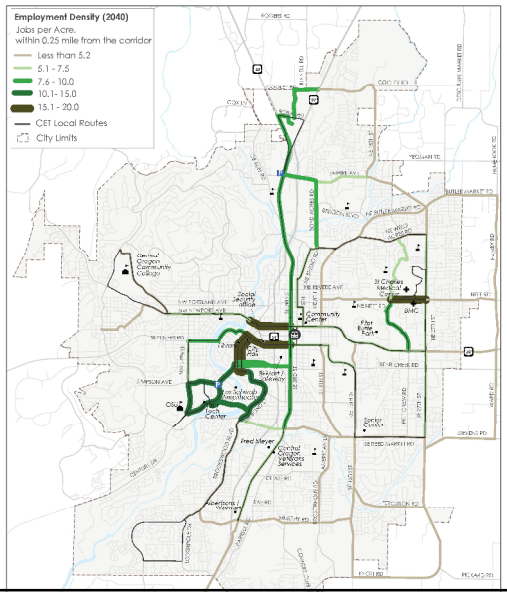
Fixed-Route Transit Network Analysis

Primary Transit Network



2040 Employment Density by Corridor Segment (Figure 13, Pg. 16)

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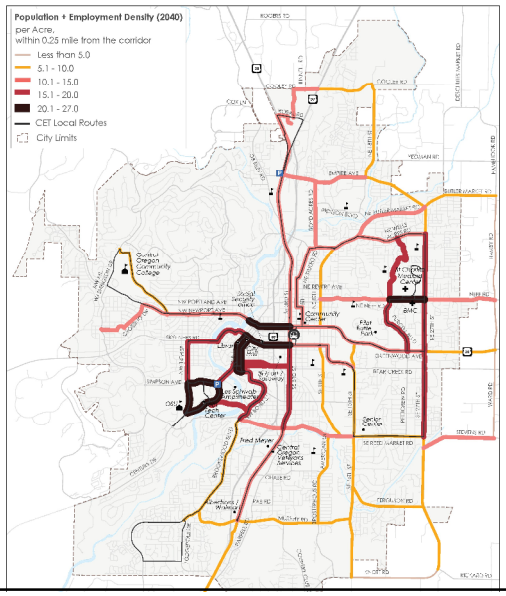
Fixed-Route Transit Network Analysis

Primary Transit Network



2040 Combined Population and Employment Density by Corridor Segment (Figure 14, Pg. 17)

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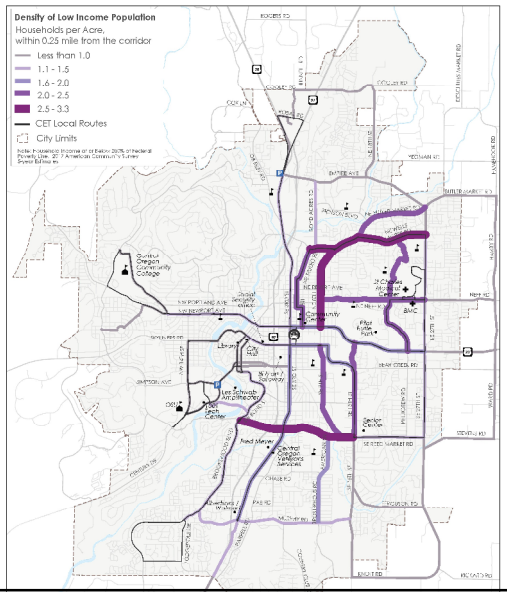
Fixed-Route Transit Network Analysis

Primary Transit Network



2017 Low-Income Population (200% of Federal Poverty Level) Density by Corridor Segment (Figure 15, Pg. 18)

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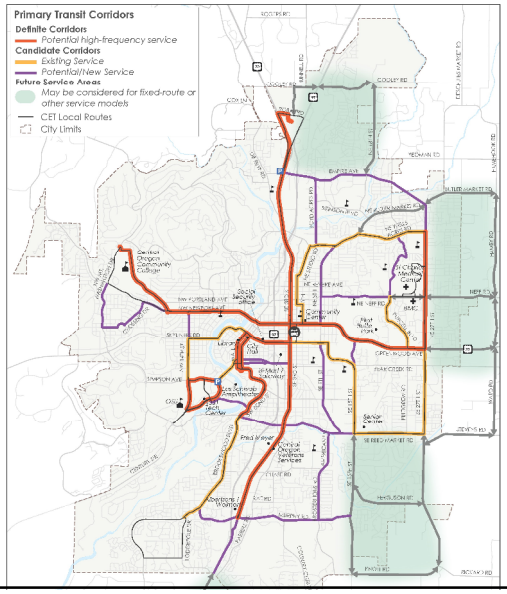
Fixed-Route Transit Network Analysis

Recommended Primary Transit Network



2017 Low-Income Population (200% of Federal Poverty Level) Density by Corridor Segment (Figure 15, Pg. 18)

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Fixed-Route Transit Network Analysis

Recommended Primary Transit Network

Corridor	Population Density [1]		Low-Income Population Density [2]	Employment Density [3]		Combined Population and Employment Density	
	2010	2040	2017	2010	2040	2010	2040
Definite							
Franklin Avenue	3.5	7.5	1.2	11.4	16.3	15.0	23.8
OSU Area (Simpson/Century/Colorado	0.9	10.8	0.4	6.0	10.9	6.9	21.7
Wall/Bond Streets	3.8	6.3	1.1	9.7	14.3	13.4	20.6
Greenwood Avenue	3.7	7.0	1.8	7.5	10.2	11.3	17.1
27th Street	4.8	8.8	1.5	4.5	6.6	9.3	15.4
Newport Avenue	5.7	7.9	1.5	5.2	7.1	10.8	15.0
South 3rd Street	3.8	7.0	1.9	4.5	6.9	8.3	13.9
North 3rd Street	1.6	4.2	0.9	6.0	9.4	7.6	13.6

Recommended Primary Transit Network Classifications and Corridor Characteristics (Density – per Acre) (Table 2, Pg. 21)

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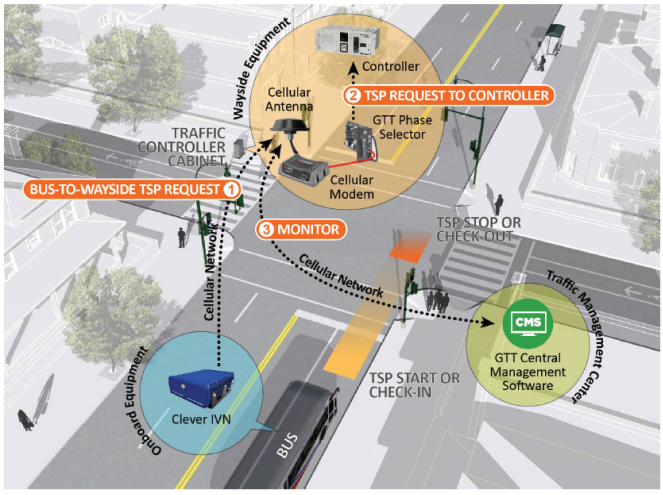
Fixed-Route Transit Network Analysis

Primary Transit Network Technology Options



Clever Devices/GTT TSP System in Washington Metro Area (Source: Kittelson & Associates, Inc.)

Example Distributed TSP System (Figure 17, Pg. 22)

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Fixed-Route Transit Network Analysis

Fixed-Route Frequency and Ridership Potential

- 15-minute peak/30-minute off-peak
- 20-minute peak/40-minute off-peak

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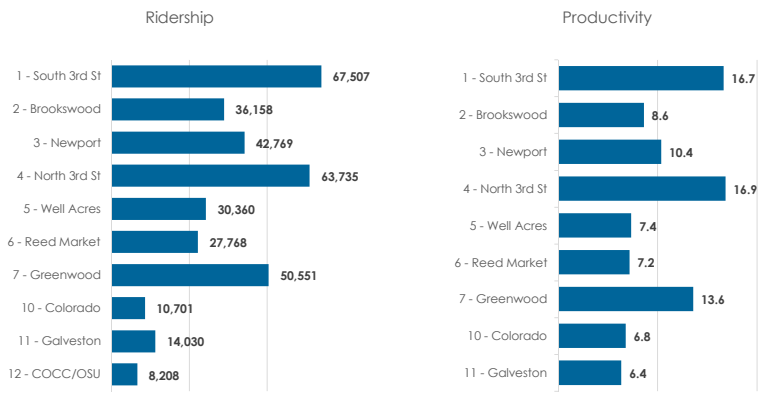
Fixed-Route Transit Network Analysis

Enhanced Transit Service Corridors



Bend Fixed-Route Ridership and Productivity (Figure 18, Pg. 24)

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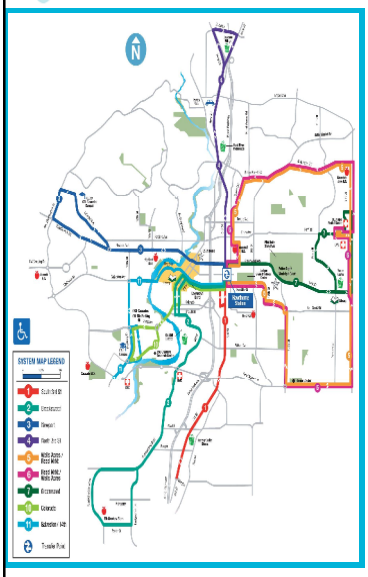

Additional Fixed-Route Service Options

Area / Corridor	Existing Routes	Market Assessment / Travel Pattern Findings	Potential New Connections	Potential Interlining Options
West	3	▸ Growth in travel within westside area, potentially including between COCC/Northwest Crossing areas and OSU area	▸ North-south connections with OSU/Old Mill areas along 14th Street or through downtown	▸ No specific option identified
Downtown	2, 3, 10, 11	▸ Relatively even distribution of trips around city ▸ No direct transit connection for people traveling from east of Bend Parkway	▸ Extension of Route 7 to serve downtown (e.g., along Newport, Wall, and Bond Avenues)	▸ Routes 2, 3, 10, and/or 11 with routes serving eastside
OSU Area	10, 11	▸ Large forecasted growth in trips, particularly within surrounding area and with southwest area, south 3rd, Cascade Village, central eastside, and St. Charles Medical Center areas	▸ Connection along Reed Market ▸ Connection to Newport Avenue along 14th Street	▸ Routes 10 and/or 11 with routes serving eastside
Old Mill Area	2, 10	▸ Highest growth to/from south, southeast, downtown, central eastside and and OSU areas	▸ Enhanced connections with downtown and OSU areas	▸ No specific option identified
Southwest / Brookswood	2	▸ Strong demand to/from downtown ▸ Strong east-west along Murphy Road	▸ Extension of Route 2 along Murphy Road	▸ Route 7

Fixed-Route Options to Enable New Transit Connections (Table 3, Pg. 25)

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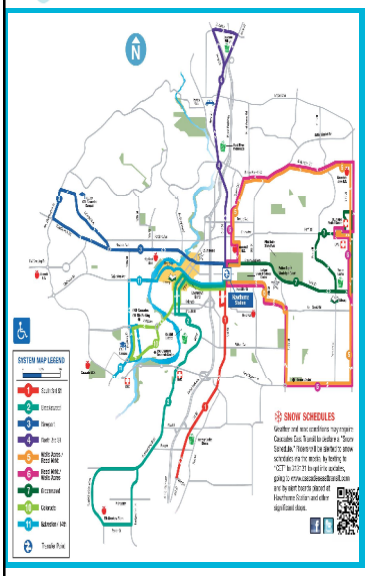

Additional Fixed-Route Service Options

Area / Corridor	Existing Routes	Market Assessment / Travel Pattern Findings	Potential New Connections	Potential Interlining Options
South/3rd	1	▸ East-west connections to corridor rather than between north and south 3rd ▸ Highest growth is to downtown, central eastside, southwest, and OSU areas	▸ Extension of Routes 1 or 2 east-west along Murphy Road to connect 3rd with southeast and/or southwest areas ▸ East-west connection along Reed Market Road	▸ No specific option identified
Southeast	None	▸ Highest growth to southwest, south 3rd, Old Mill, and OSU areas	▸ Potential east-west connections to existing routes along Reed Market and/or Murphy Roads	▸ N/A
Central Eastside	All	▸ Travel patterns well-served by existing routes. ▸ With a potential westside transit center, key patterns to maintain include Old Mill, OSU, and south 3rd areas	▸ N/A	▸ N/A
East	5, 6, 7	▸ Within eastside area (well-served by existing routes) ▸ Between medical center and other areas, with concentration to/from downtown ▸ Growing demand to Empire Ave and Cascade Village areas	▸ Connection of Empire Avenue and 27th Street using new roadway connection ▸ Enhanced connections with downtown and OSU areas	▸ Route 7 and any route serving downtown

Fixed-Route Options to Enable New Transit Connections (Table 3, Pg. 25)

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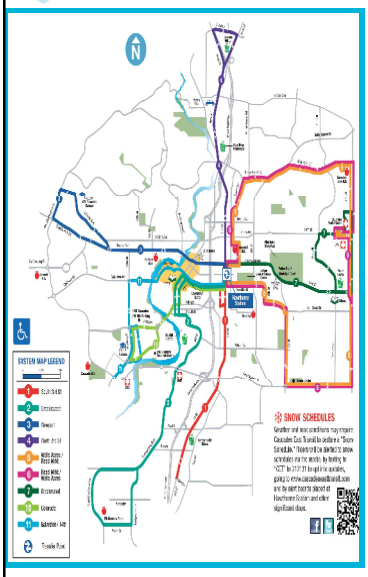

Additional Fixed-Route Service Options

Area / Corridor	Existing Routes	Market Assessment / Travel Pattern Findings	Potential New Connections	Potential Interlining Options
Northeast	**None**	▸ Within northeast and to/from Cascade Village, Juniper Ridge, and St. Charles Medical Center areas	▸ Potential extension of Route 4 and new connection along Empire Avenue	▸ No specific option identified
North/3rd	4	▸ Highest growth to/from northeast (including Juniper Ridge), downtown, and OSU areas ▸ North-south connections along 3rd do not appear to be the dominant travel pattern	▸ Extension of Route 4 to Juniper Ridge ▸ New connection between Cascade Village and St. Charles Medical Center area via Empire Avenue	▸ Route 4 and Route 2 or any other route serving downtown

Fixed-Route Options to Enable New Transit Connections (Table 3, Pg. 25)

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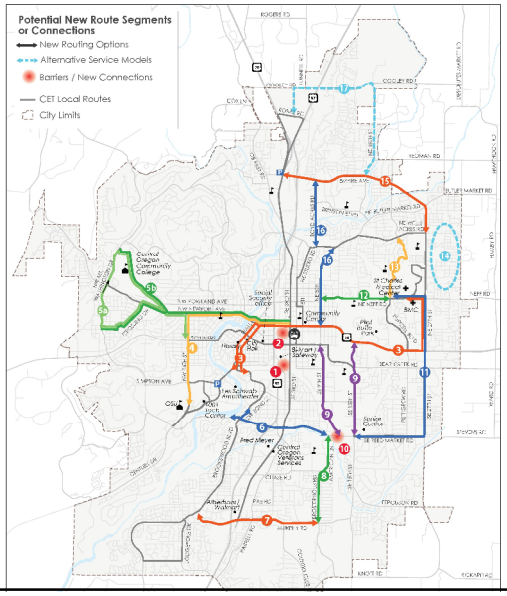
Fixed-Route Transit Network Analysis

Additional Fixed-Route Service Options



Potential New Route Segments or Connections (Figure 19, Pg. 29)

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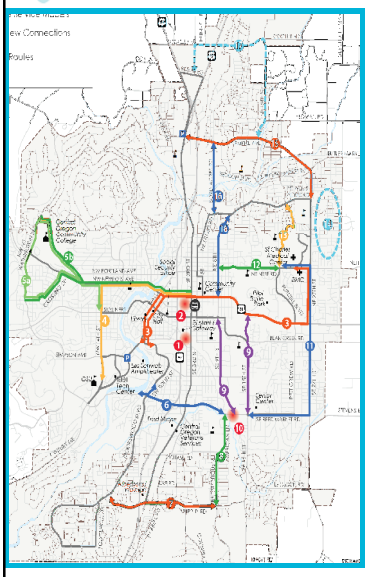

Additional Fixed-Route Service Options

Map Identifier	Category	Description
1	Barriers / New Connections	A connection of the Colorado/Arizona Couplet is under consideration in the Bend TSP. This connection would help CET to transition a more grid-like system and would support a potential westside transit center.
2	Barriers / New Connections	A pedestrian/bike overcrossing of the Bend Parkway at Hawthorne Avenue has been previously identified in the Bend TSP.
3	New Routing Option	Route 7 (Greenwood) could connect across the Bend Parkway to Newport and use Wall/Bond (or an alternative street) to connect through downtown to the Old Mill District and/or OSU-Cascades campus, providing a single-seat ride. The route could continue to stop at Hawthorne Station (or alternatively, a mobility hub in the central eastside).
4	New Routing Option	Service on Newport Avenue (e.g., Route 3) could connect to the OSU-Cascades campus via NW 14th St. Alternate routes would need to serve COCC and Northwest Crossing.
5	New Routing Option	Restore service to Northwest Crossing. Options include: (a) one-way loop using Mt. Washington Drive. (b) Route 3 trips (with increased frequency, e.g., every 15 minutes) alternate between Northwest Crossing and COCC.
6	New Routing Option	Reed Market could provide a new east-west connection through south-central Bend to the Old Mill District, Downtown Bend, and/or the OSU-Cascades campus.
7	New Routing Option	New connections using Murphy Road could be integrated with Route 1 (South 3rd), Route 2 (Brookswood), or a new route.
8	New Routing Option	New service on American Lane / Brosterhous Road.
9	New Routing Option	New service on 9th Street as a possible alternative to 15th Street as part of a new route in Southeast Bend

New Potential Service Options or New Connections (Table 4, Pg. 28)

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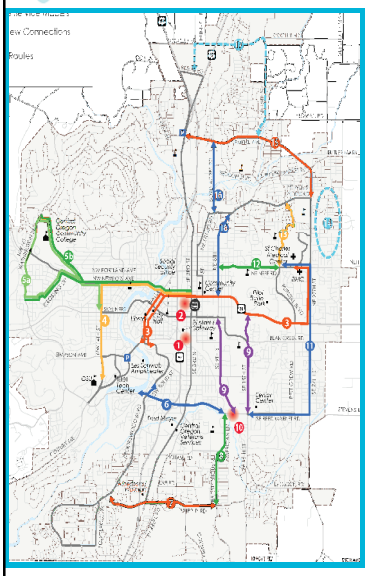

Additional Fixed-Route Service Options

Map Identifier	Category	Description
10	Barriers / New Connections	An at-grade BNSF railroad crossing on Reed Market Road west of 9th Street creates significant operational issues to providing an east-west connection on Reed Market Road (see #6 and #11) and creating north-south connections in Southeast Bend (e.g., American Lane and SE 9th or SE 15th Streets).
11	New Routing Option	Possible reconfiguration of Route 6 to connect to the Old Mill District, downtown Bend, and/or the OSU-Cascades campus via Reed Market Road (see #6). This could complement a future westside transit center.
12	New Routing Option	Alternative routing options to be explored for serving the area bounded by Pilot Butte, SE Purcell Road, NE Wells Acres Road, and east of NE 8th Street, including potential service on Neff Road
13	New Routing Option	Possible new routing option using Purcell between NE Neff and Wells Acres Roads.
14	Alternative Service Models	Explore alternative service models for serving new development east of NE 27th Street.
15	New Routing Option	Possible new connection using Empire Avenue and NE 27th Street.
16	New Routing Option	Potential for new service on NE 8th Street and/or Boyd Acres Road.
17	Alternative Service Models	Alternative models to be explored for northeast Bend and the Juniper Ridge area.

New Potential Service Options or New Connections (Table 4, Pg. 28)

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Fixed-Route Transit Network Analysis

Additional Fixed-Route Service Options

Transit Center Location Implications

- Current transit center disadvantages:
  - Beyond comfortable walking distance to downtown designations
  - Lacks significant transit demand generators in close proximity
  - 3rd Street pedestrian environment
  - Capacity to support future expansion is limited

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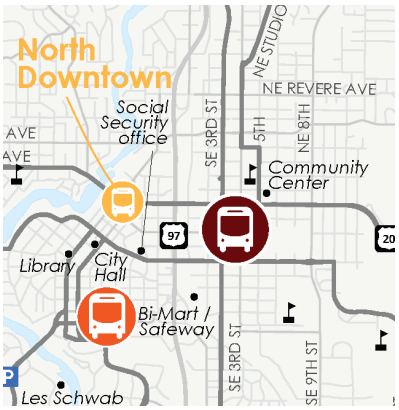
Fixed-Route Transit Network Analysis

Additional Fixed-Route Service Options

Transit Center Location Implications

- Conceptual options:
  - **Option 1** – relocate transit center to new location on east side in conjunction with Hawthorne Avenue ped/bike crossing under the Parkway (Bend TSP)
  - **Option 2** – relocate transit center to west side near downtown and/or Old Mill generally near Colorado/Arizona and between the Parkway and Bond/Wall couplet



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Fixed-Route Transit Network Analysis

Additional Fixed-Route Service Options

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

Transit Center Implications (Table 5, Pg. 31)

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Fixed-Route Transit Network

- Do you have comments on the recommended and candidate corridors?
- Do you have comments on the fixed-route service alternatives proposed for evaluation or others we should consider?
- Do you have comments on the transit center options?

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Mobility Hub Types and Strategy

Application of mobility hubs, microtransit, micromoblity, and pedestrian/bicycle transit access enhancements

Overview

Conceptual costs and benefits for using alternative mobility strategies to serve selected underserved areas

Conceptual Costs/Scenario Evaluation Measures

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Mobility Hub Types and Strategy

Additional Fixed-Route Service Options

Applications of Mobility Hubs

- Transit Centers
- Secondary Transit Hubs
- Major Transit Stops
- Park and Ride Facilities

Applications of Microtransit

- Could be considered an alternative to fixed-route transit service for lower-density areas/lower demand times of day

Applications of Micromobility

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

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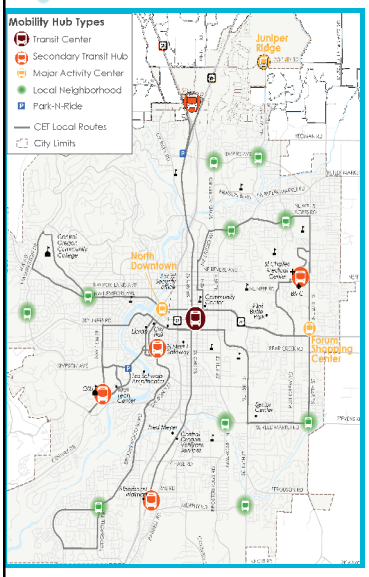

Mobility Hub Types and Typical Characteristics (Table 6, Pg. 34)

Mobility Hub Types & Typical Characteristics

Type	Example Locations	Context (Transit and Land Use)	Mobility Services	Technology Features
Transit Center	▸ Hawthorne Station (or future replacement in central eastside)	▸ Central transit hub with multiple local and Community Connector routes	▸ Context-sensitive park-and-ride ▸ Drop-off area ▸ Car sharing ▸ Micromobility	▸ Real-time information ▸ Off-board fare payment
Secondary Hub	▸ Cascade Village (North) ▸ Walmart (South) ▸ OSU (West) ▸ St. Charles (East) ▸ Hawthorne Station (if Transit Center is relocated) ▸ South Downtown Bend/Old Mill (vicinity of Colorado / Arizona); upgrade if transit center is relocated	▸ Major activity center with 2+ connecting routes ▸ Potential Community Connector stop	▸ Context-sensitive park-and-ride ▸ Drop-off area ▸ Car sharing ▸ Micromobility	▸ Real-time information ▸ Off-board fare payment
Major Activity Center	▸ North Downtown Bend (vicinity of Newport/Hawthorne) ▸ COCC ▸ Forum Shopping Center ▸ Major employment areas	▸ High ridership stop	▸ Micromobility	▸ Real-time information ▸ Off-board fare payment
Local Neighborhood	▸ Local route terminus ▸ Neighborhood stop (fixed-route or deviated route)	▸ Low-to-medium density residential land uses ▸ Can be employed with micromobility where urban form limits transit access	▸ Drop-off area ▸ Micromobility	▸ Real-time information
Local stops	▸ Typical stop	▸	▸ Bike parking	
Park-and-ride lots (major or minor)	▸ ODOT P&R ▸ Mt. Bachelor	▸ City edge for unstructured parking ▸ Structured parking opportunities in central city, dense mixed use development areas	▸ Micromobility ▸ Bike parking ▸ Drop off area	▸ Real-time information

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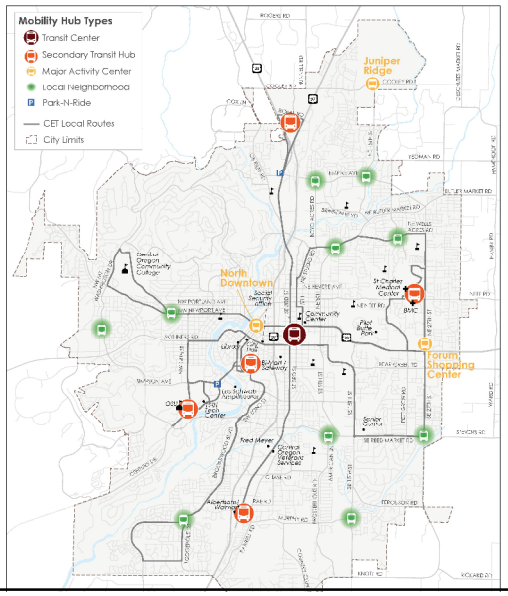
Mobility Hub Types and Strategy

Conceptual Mobility Hub Locations(Figure 20, Pg. 35)

Mobility Hub Types & Typical Characteristics



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Mobility Hub Types and Strategy

Conceptual Costs and Scenario Evaluation Measures

Northeast Bend

- **Fixed-route extension**: potential route along Boyd Acres
- **Fixed-route extension w/deviations**: potential route along Boyd Acres with possible deviations off route
- **Microtransit or shuttle**: connection to central transit center and/or secondary transit hubs (i.e. Cascade Village)
- **Bicycle/pedestrian connectivity enhancements**: sidewalk, shared use-paths, buffered bike lanes, standard bike lanes, and/or shared-lane markings along gaps in underserved areas #2, #3, #5, and #6 (see Table 7, pg. 38)

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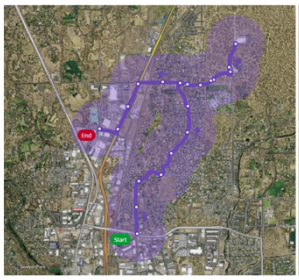
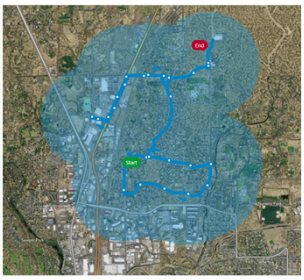
Mobility Hub Types and Strategy

Conceptual Costs and Scenario Evaluation Measures



Option 1
Fixed-Route Extension

Option 2
Fixed-Route w/Deviation



Option 3
Microtransit

Conceptual NE Bend Service Areas (Figure 23, Pg. 44)

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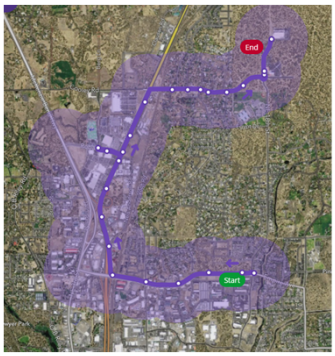
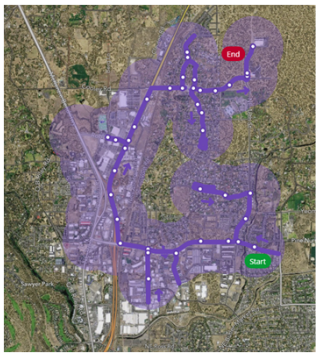
Mobility Hub Types and Strategy

Conceptual Costs and Scenario Evaluation Measures



Option 4a
Core (Non-Neighborhood Routes)



Option 4b
Core (Non-Neighborhood) Routes w/Bike/Ped Enhancements, Mobility Hubs, and Micromobility

Conceptual NE Bend Service Areas (Figure 23, Pg. 44)

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Mobility Hub Types and Strategy

Conceptual Costs and Scenario Evaluation Measures

Service Areas Considered and Evaluation Measures	1. Fixed-Route Extension	2. Fixed-Route Extension with Deviations	3. Microtransit / Shuttle Feeder to Secondary Transit Hub	4a. Core (non-Neighborhood) Routes	4b. Core (non-Neighborhood) Routes with Bicycle Pedestrian Enhancements, Mobility Hubs, and Micromobility
Assumptions	• 13 hours per day, Hourly Frequency • $100 per service hour (similar to CET) • Productivity of 7-10 riders per service hour (similar to lowest-performing CET routes)		• Up to 13 hours per day, on-demand • $50 per service hour (similar to RideBend) • Range of 1 to 2 vehicles • Productivity of 3 to 5 passengers per service hour	• 13 hours per day, 30 minute frequency (could also vary between peak and off-peak) • $100 per service hour (similar to CET) • Productivity of 10 riders per service hour (similar to lowest-performing CET routes)	• Same as 4a but with enhanced bike/ped connections, mobility hubs and micromobility
Transit Access: # of Residents (2017)	1,800	2,000	4,000	2,000	3,500
Transit Access: # of Jobs (2017)	400	45	1,000	600	850
Low-Income Residents (200% of Poverty, 2017)	100	150	300	150	250
Annual Operating Cost	$85,000 (extension)	$120,000 (extension)	$100,000 to $200,000	$450,000	$450,000
One-Time Capital Cost	Existing Fleet or $50,000 to $100,000 for a new bus		$50,000 to $100,000 for 1 to 2 vehicles	Existing Fleet and $100,000+ for a new bus	
Potential Annual Riders	6,000 – 8,000	8,000 – 10,000	6,000 to 20,000	Up to 40,000	Up to 70,000
% of local trips from NE Bend travel demand model zone to/from/within Bend	0.4% to 0.5%	0.5% to 0.7%	0.5% to 1.3%	2.8%	4.4%
Operating Cost per Rider	$10 to $14	$10 to $14	$10 to $16	$10	$6
Bicycle/Pedestrian Connectivity Enhancements	Similar needs (described above) for all scenarios for the major roadways to provide access to transit stops				Bike/ped access enhancements focused on key stops and mobility hubs)

Conceptual Evaluation of Mobility Service Options, NE Bend, Order-of-Magnitude Est. (Table 8, Pg. 43)

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Mobility Hub Types and Strategy

Conceptual Costs and Scenario Evaluation Measures

Conclusions

- **Higher number of residents and employees** provided access to microtransit in a given service area compared to a fixed-route
- **Incremental operating costs** for a fixed-route extension comparable to single vehicle microtransit operation (even assuming an hourly cost that is double that of microtransit)
- Given **typical productivity** (riders per service hour) for fixed-route transit and microtransit, these services could carry a similar number of passengers

However, if demand for microtransit service exceeds capacity of a single vehicle to provide timely, reliable pickups and drop-offs, operating costs would exceed fixed-route service operating costs.

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Mobility Hub Types and Strategy

- Do you have comments on the mobility hub types and typical characteristics?
- Do you have comments on the draft mobility hub strategy map and NE Bend case study?

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Next Steps

- Next Project Steering Committee (RPTAC) Meeting
  - 9/20/2019 (1:30 – 3:30)
- Round 3 Regional TAC Meeting
  - 10/14/2019 (2:00 – 4:30)
  - Needs (Entire Region), TOD Strategies,

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Adjourn

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