



# CET 2040 Transit Master Plan

Project Steering Committee Meeting  
(CET TMP Bend Focus)  
August 20<sup>th</sup>, 2019



## Meeting Purpose and Desired Outcomes

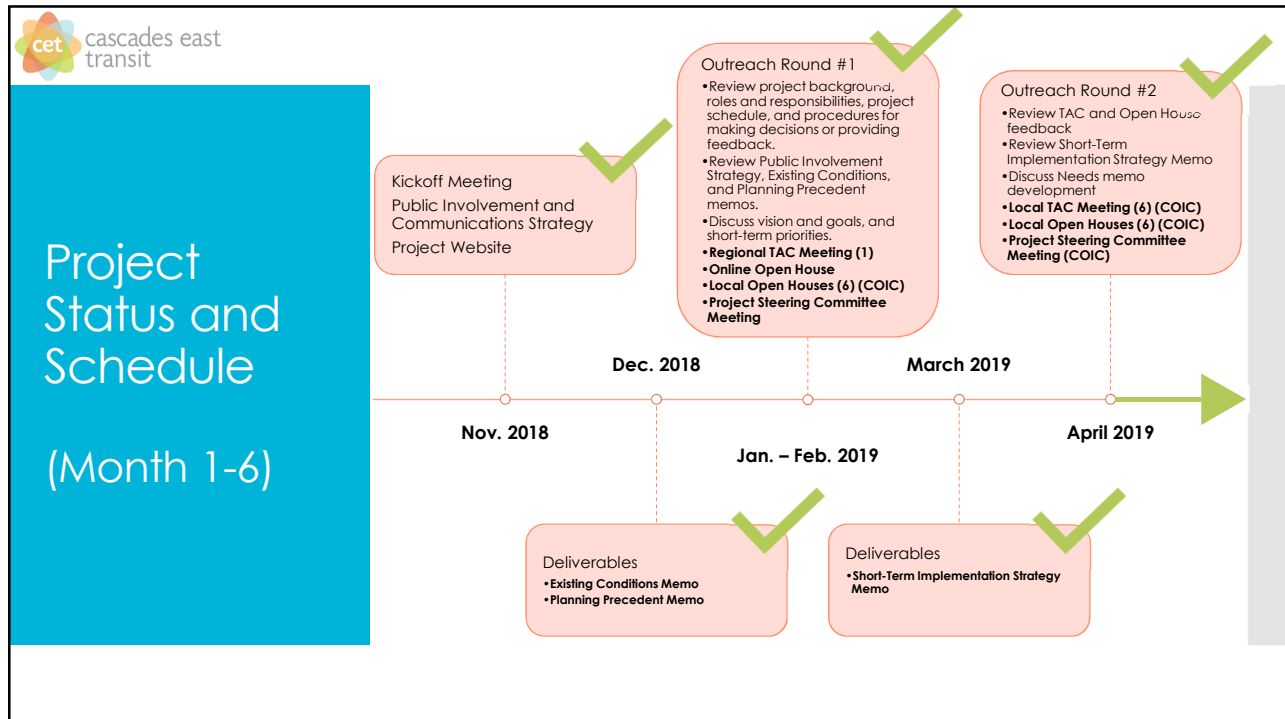
### Meeting Purpose

Provide project status update  
Provide overview and discuss additional Bend focus work  
Review existing conditions and trip purpose analysis for Bend  
•Task 3 Memo – Existing Conditions Supplement Memo – Bend Employment Centers  
•Task 4 Memo – Needs Assessment Supplement Memo – Bend Trip Purpose Analysis  
*Note: The full regional Needs Assessment Memo has not been completed. It will be reviewed at the next PSC meeting.*

### Desired Outcomes

PSC member understanding of additional Bend area focus work  
Validation of existing conditions and travel patterns in and to/from Bend  
Input from PSC on other considerations for existing conditions and needs in Central Oregon

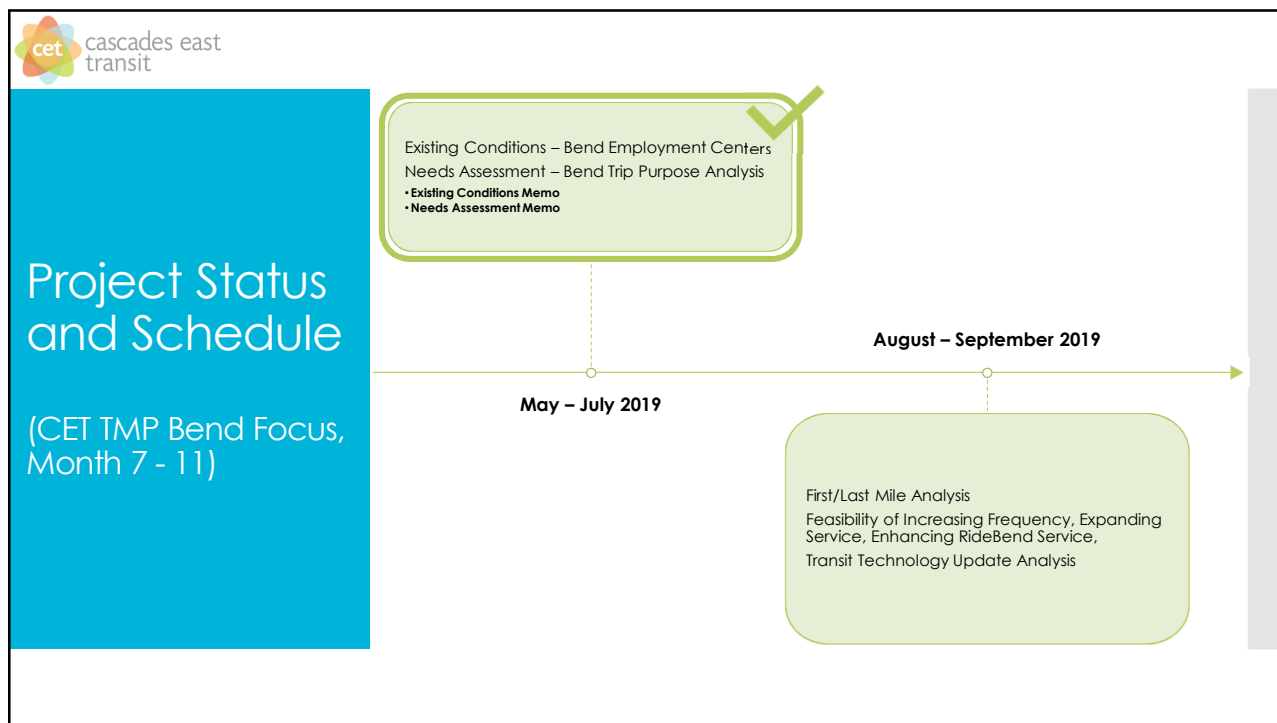
cet cascades east transit		TIME	SUBJECT	LEAD PRESENTER	GUIDANCE REQUESTED
Meeting Agenda	1:30	Welcome and Introductions	Richard Ross RPTAC Chair		
	1:35	Public Comment	Derek Hofbauer COIC		
	1:40	CET Updates (Proposed STIF Projects and Recreational Services)	Andrea Breault COIC	Confirm Understanding, Questions for Clarification	
	1:50	RPTAC Meeting Minutes	Richard Ross	Review and approval of April 2nd, 2019 RPTAC Meeting Minutes	
	1:55	Project Status and Schedule	Susie Wright Kittelson	Confirm Understanding, Questions for Clarification	
	2:05	Existing Conditions – Bend Employment Centers (Bend Task 3)	Susie Wright & Miranda Barrus Kittelson	Task 3 Memo  - Do you agree with the employment areas identified in this memo? Are there other employment areas that should be considered in this process?  - What employment areas should be considered in your area as transit needs are evaluated outside of Bend?	
	2:45	Needs Assessment – Bend Trip Purpose Analysis (Bend Task 4)	Susie Wright & Miranda Barrus	Task 4 Memo  - Is the local origin-destination analysis a good representation of commute patterns within Bend based on your knowledge?  - Is the intercity origin-destination analysis a good representation of the commute patterns to/from areas outside of Bend based on your knowledge?  - What type of commute patterns are present or anticipated in your area that should be considered as travel demand and land use is evaluated outside of Bend?  - Do you agree with the draft airport needs? Are there other airport needs that should be considered throughout this process?	
	3:25	Next Steps	Derek Hofbauer		
	4:55	Adjourn	Richard Ross		

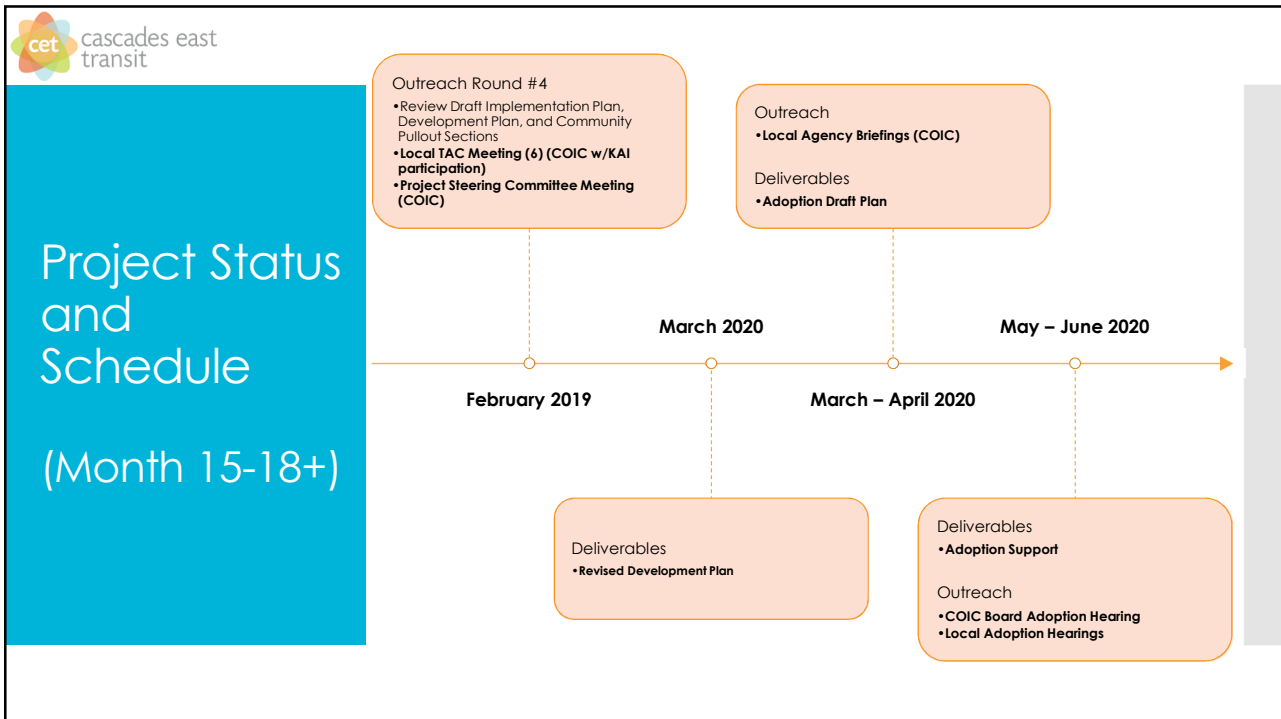
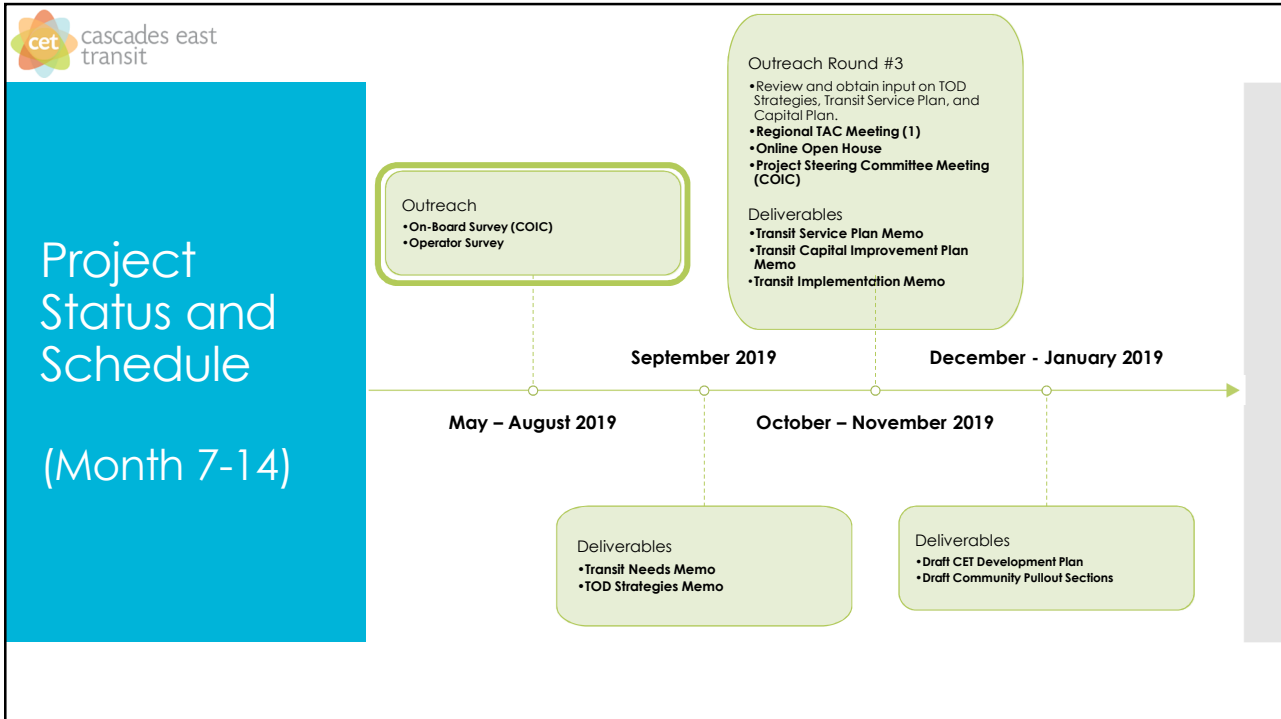


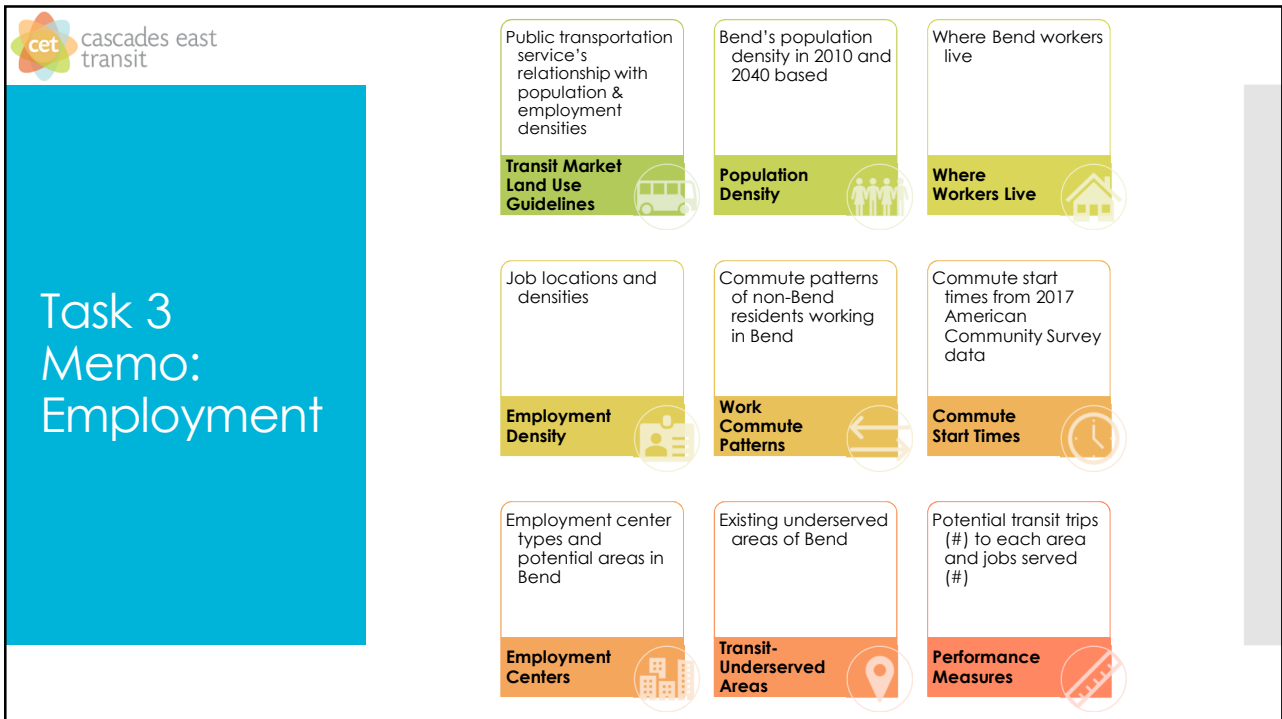
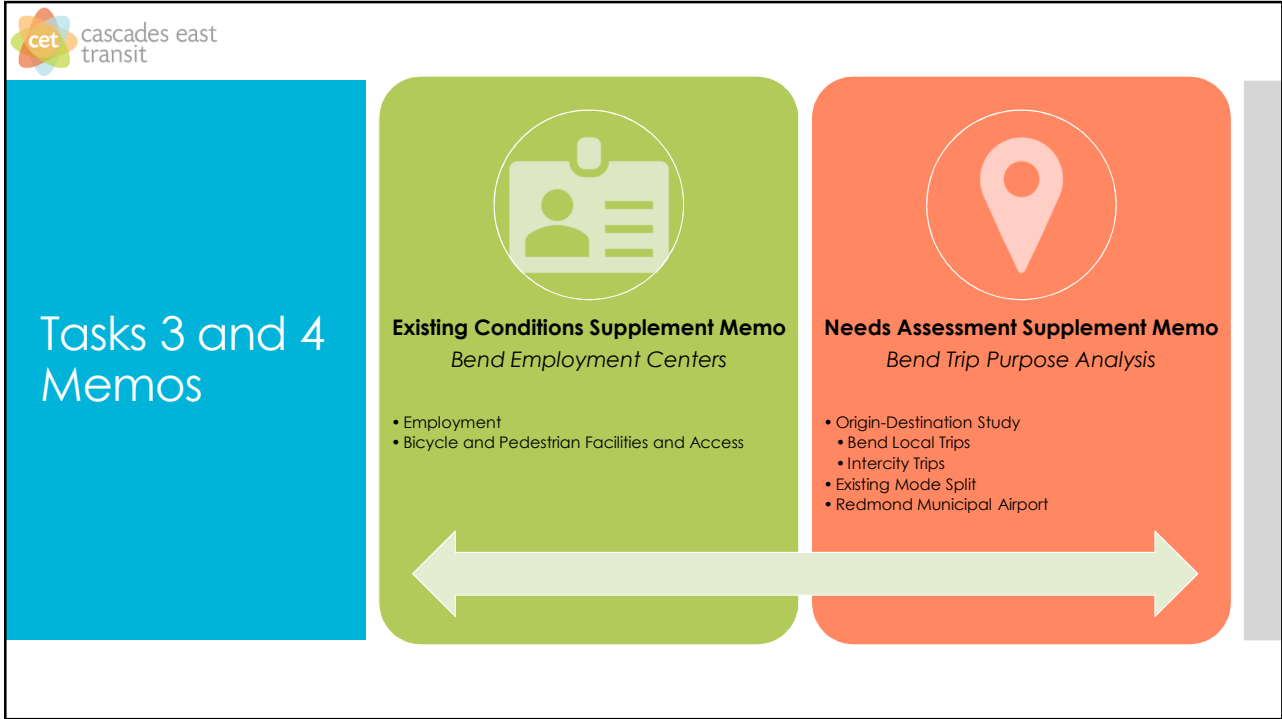
The screenshot shows the Cascades East Transit website. On the left is a blue sidebar with the text "Project Status and Schedule (Month 1-6)". The main content area is titled "Prior Project Documents" and features a navigation menu with items: HOME, LATEST NEWS, MEETINGS, PROJECT TEAM MEMBERS, PROJECT DOCUMENTS, PROJECT MAP, SUBSCRIBE, and CONTACT. A green arrow points to the "MEETINGS" link. Below the menu, there are two sections for meeting materials:

- PSC Meeting (8/20/19)**
  - Agenda
  - [Presentation - Will be posted after meeting]
  - Existing Conditions Supplement Memo - Bend Employment Centers
  - Needs Assessment Supplement Memo - Bend Trip Purpose Analysis
  - Needs Assessment Supplement Memo Appendix
- Bend Local TAC Meeting (8/19/19)**
  - Agenda
  - [Presentation - Will be posted after meeting]
  - Existing Conditions Supplement Memo - Bend Employment Centers
  - Needs Assessment Supplement Memo - Bend Trip Purpose Analysis
  - Needs Assessment Supplement Memo Appendix

At the bottom of the screenshot, a URL is provided: <http://cettransitplan.com/websites/56/pages/328>







Task 3  
Memo:  
Employment

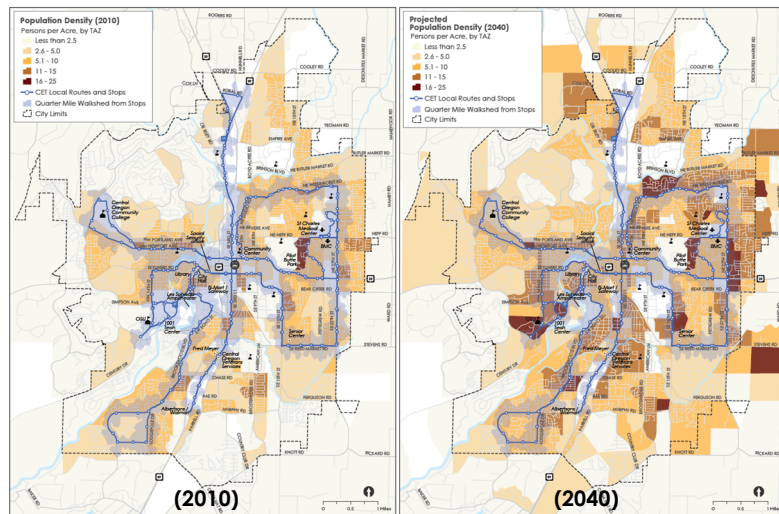
### Transit Market Land Use Guidelines

LAND USE			TRANSIT	
Land Use Type	Residents per Acre	Jobs per Acre	Appropriate Types of Transit	Frequency of Service
Urban Mixed-Use	20+	15+	BRT  Rapid Bus  Local Bus	10-15 minutes
Neighborhood & Suburban Mixed-Use	10-20	10-15	Local Bus	15-30 minutes
Mixed Neighborhoods	10-15	5-10	Local Bus  On-Demand	30-60 minutes or on-demand
Low Density	2-10	2-5	On-Demand  Rideshare  Volunteer Driver Pgm	60 mins or less or on-demand

Page 3, Figure 1

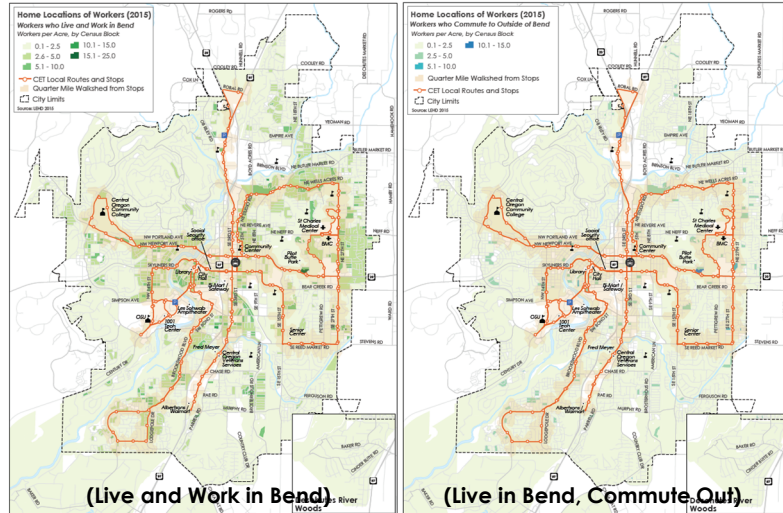
Task 3  
Memo:  
Employment

### Population Density



Page 5, Figure 2

### Where Workers Live (2015)



Page 7, Figure 3

### Where Workers Live (Cont.)

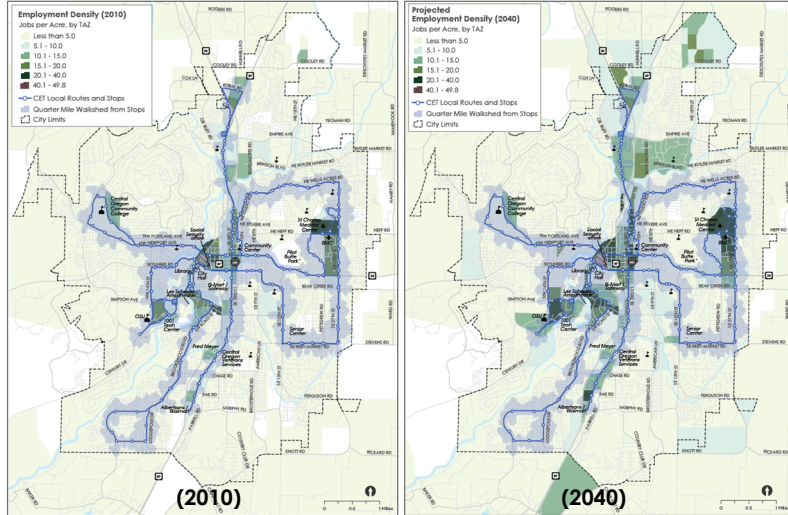
Where Bend Residents Work (Top 10)

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

Page 8, Table 1

# Task 3 Memo: Employment

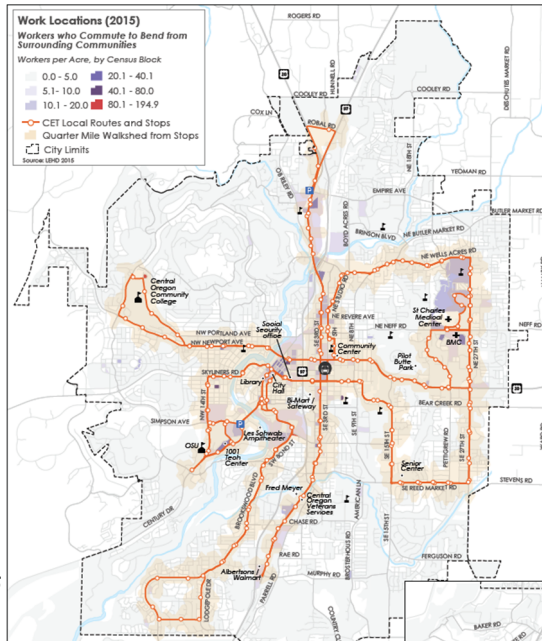
## Employment Density



Page 9, Figure 4

# Task 3 Memo: Employment

## Work Commute Patterns (2015)



Page 10, Figure 5



Task 3  
Memo:  
Employment

## Work Commute Patterns (Cont.)

Where People Who Work in Bend Live, 2015

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

Page 11, Table 2

 Task 3  
Memo:  
Employment

## Commute Start Times

Share of Commuters Leaving for Work at Certain Times (All Modes)

Geography/Category	# of People	% of Geography
<b>REGIONAL (All Cities)</b>		
Share of Regional Commuters Leaving for work between <b>5 and 6 am.</b>	4,473	<b>7%</b>
Share of Regional Commuters Leaving for work between <b>6 and 7 am.</b>	10,440	<b>16%</b>
Share of Regional Commuters Leaving for work between <b>7 and 9 am.</b>	30,524	<b>47%</b>
Share of Regional Commuters Leaving for work between <b>4 pm and 12 am.</b>	3,380	<b>5%</b>
Share of Regional Commuters Leaving for work between <b>12 and 5 am.</b>	3,163	<b>5%</b>
<b>BEND</b>		
Share of Bend Commuters Leaving for work between <b>5 and 6 am.</b>	2,157	<b>6%</b>
Share of Bend Commuters Leaving for work between <b>6 and 7 am.</b>	6,356	<b>16%</b>
Share of Bend Commuters Leaving for work between <b>7 and 9 am.</b>	19,054	<b>49%</b>
Share of Bend Commuters Leaving for work between <b>4 pm and 12 am.</b>	1,823	<b>5%</b>
Share of Bend Commuters Leaving for work between <b>12 and 5 am.</b>	966	<b>2%</b>
<b>REDMOND</b>		
Share of Redmond Commuters Leaving for work between <b>5 and 6 am.</b>	1,057	<b>9%</b>
Share of Redmond Commuters Leaving for work between <b>6 and 7 am.</b>	2,056	<b>17%</b>
Share of Redmond Commuters Leaving for work between <b>7 and 9 am.</b>	5,251	<b>43%</b>
Share of Redmond Commuters Leaving for work between <b>4 pm and 12 am.</b>	870	<b>7%</b>
Share of Redmond Commuters Leaving for work between <b>12 and 5 am.</b>	1,024	<b>8%</b>

Page 12, Table 3



Task 3  
Memo:  
Employment

### Commute Start Times (Cont.)

Percentage of Residents leaving Home to Commute to Work by Time of Day (All Modes)

Place	Total	12 a.m.	5 a.m.	6 a.m.	7 a.m.	9 a.m.	12 p.m.	4 p.m.
		To 5 a.m.	To 6 a.m.	To 7 a.m.	To 9 a.m.	To 12 p.m.	To 4 p.m.	To 12 a.m.
Bend city	38,706	2%	6%	16%	<b>49%</b>	16%	6%	5%
Culver city	661	11%	13%	14%	<b>35%</b>	12%	7%	8%
Deschutes River Woods CDP	2,700	5%	14%	12%	<b>44%</b>	13%	6%	6%
La Pine city	693	8%	10%	23%	<b>33%</b>	14%	8%	4%
Madras city	2,343	12%	4%	16%	<b>45%</b>	7%	14%	4%
Metolius city	413	13%	11%	23%	<b>29%</b>	5%	14%	5%
Prineville city	3,437	8%	9%	14%	<b>40%</b>	15%	9%	5%
Redmond city	12,205	8%	9%	17%	<b>43%</b>	11%	5%	7%
Sisters city	1,058	2%	8%	11%	<b>51%</b>	16%	11%	1%
Sunriver CDP	258	0%	0%	0%	<b>86%</b>	0%	3%	10%
Terrebonne CDP	476	5%	8%	4%	<b>41%</b>	0%	29%	13%
Three Rivers CDP	1,536	11%	4%	18%	<b>39%</b>	15%	11%	2%
Warm Springs CDP	880	8%	11%	10%	<b>54%</b>	5%	6%	6%

Page 13, Table 5



Task 3  
Memo:  
Employment

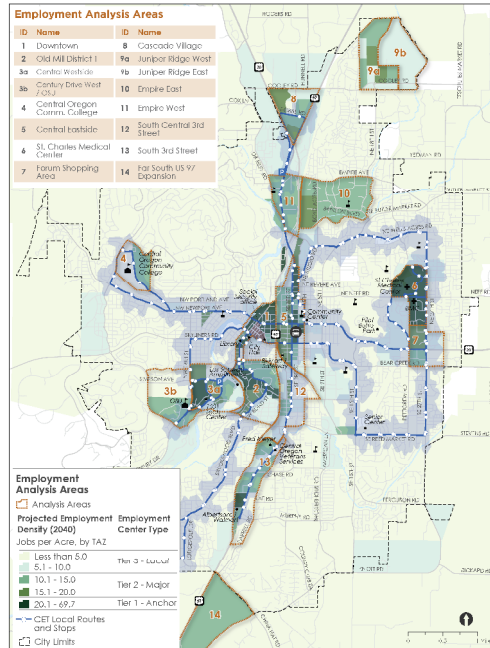
### Employment Center Guidelines

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

Page 14, Table 6

# Task 3 Memo: Employment

## Employment Centers (Cont.)



Page 15, Figure 6

# Task 3 Memo: Employment

## Employment Centers (Cont.)

Potential Employment Analysis Areas Jobs and Jobs Density

#	Employment Center	Number of Jobs [2]		Density of Jobs		Area Type in 2015
		2015	2040	2015	2040	
1	Downtown	4,300	4,900	25	30	Tier 1 - Anchor
2	Old Mill District [1]	3,700	4,900	12	15	Tier 2 - Major
3a	Central Westside	2,800	3,700	10	13	Tier 2 - Major
3b	Century Drive West (OSU)	1,200	2,000	4	7	Tier 1 - Local
4	Central Oregon Community College	1,000	1,100	6	6	Tier 3 - Local
5	Central Eastside	3,900	4,300	12	13	Tier 2 - Major
6	St. Charles Medical Center	6,400	5,800 [2]	33	33	Tier 1 - Anchor
7	Forum Shopping Area	1,600	1,900	9	11	Tier 3 - Local
8	Cascade Village	1,200	2,400	6	12	Tier 3 - Local
9a	Juniper Ridge West	100	3,000	0.3	12	--
9b	Juniper Ridge East	-	1,900	-	7	--
10	Empire East	2,800	5,400	7	14	Tier 3 - Local
11	Empire West	1,300	2,100	7	11	Tier 3 - Local
12	South Central 3rd Street	1,300	1,800	5	7	Tier 3 - Local
13	South 3rd Street	3,300	2,600 [2]	11	11	Tier 2 - Major
14	Far South US 97 Expansion	-	3,900	-	10	--

[1] Includes KorPine [2] Total employment appears to be less in 2040 St. Charles Medical Center and South 3rd Street; likely due to different data sources used for current and forecast conditions

Page 16, Table 7



# Task 3 Memo: Employment

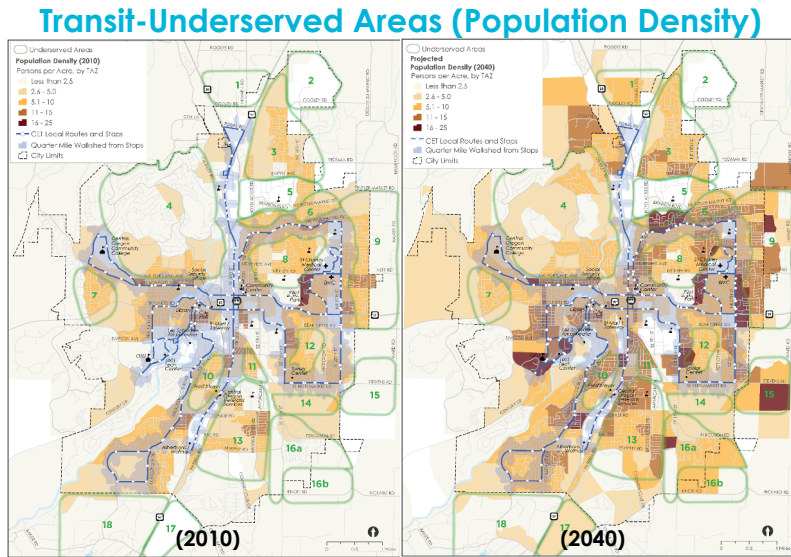
Transit Underserved Areas  
Page 19 & 20, Table 8

#	Potential Services Areas	Description	Population Density		Employment Density		Potential Services (Preliminary Assessment of Feasibility)					
			2010	2040	2010	2040	Fixed route		Demand-based routes (flex routes or SRTS)		Accessibility	Low stress routes (seapark)
			Assessment	Time Frame	Assessment	Time Frame	Assessment	Time Frame				
1	North Triangle	Low density future growth	0.4	3.6	0.1	4.7	✓	Future	✓	Future	✓	-
2	Juniper Ridge	Emerging employment	0.0	0.1	0.8	9.8	✓	Future	✓	Current	with fixed-route	-
3	North of Empire (Soyak Acres)	Moderate density residential	4.7	7.6	0.0	0.4	✓	Future	✓	Current	✓	✓
4	Northwest	Low density population	2.5	3.8	0.2	0.3	-	N/A	✓	Current	✓	-
5	South of Empire	Emerging employment area	1.4	1.4	4.6	11.1	✓	Future	✓	Current	✓	✓
6	Northeast Sutter Market Rd	Moderate residential beyond existing fixed route	8.0	10.6	0.2	1.1	-	N/A	-	N/A	✓	✓
7	Northwest Crossing	Moderate residential	6.7	8.1	0.3	1.2	✓	Current	✓	Current	✓	-
8	Neil Road, north of First Burle	Moderate residential beyond existing fixed route	5.7	8.0	0.4	0.7	✓	Current	✓	Current	✓	✓
9	East of 27th	Future residential	3.6	6.6	0.2	0.4	-	N/A	✓	Future	✓	-
10	West of Bond / Redwood	Moderate residential beyond existing fixed route	6.8	9.9	1.6	3.1	-	N/A	-	N/A	✓	✓
11	Kiwano Park	Moderate residential beyond existing fixed route	6.2	7.8	1.4	2.0	-	N/A	✓	Current	✓	✓
12	Larkspur	Moderate residential beyond fixed route	5.8	9.3	0.0	0.4	-	N/A	✓	Current	✓	✓
13	Old Farm (Munich / Sackerman)	Moderate residential	4.0	8.0	0.6	1.0	✓	Current	✓	Current	with fixed-route	-
14	South of Reed Market	Low residential beyond fixed route	4.1	5.0	0.1	0.3	-	N/A	✓	Current	✓	✓
15	Sevens Road	Future residential area	0.2	9.6	0.0	1.3	✓	Future	✓	Future	✓	-
16a	South 15th Street - North zones	Future residential or mixed-use area	1.4	6.4	0.1	1.0	✓	Future	✓	Future	✓	✓
16b	South 15th Street - South zones	Future employment area	0.3	4.6	0.0	7.8	✓	Future	✓	Future	✓	✓
17	South US 97	Future employment area	0.0	3.5	0.0	10.2	✓	Future	✓	Future	✓	✓
18	Cashmere River Woods	Low density residential area	1.3	1.7	0.1	0.1	-	N/A	✓	Current	✓	-



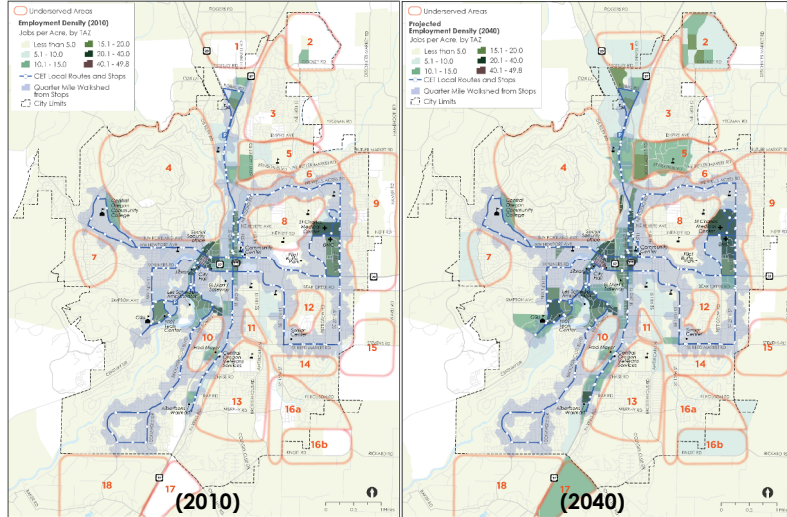
# Task 3 Memo: Employment

Page 21, Figure 7



Task 3  
Memo:  
Employment

Transit-Underserved Areas (Cont., Employment Density)



Page 22, Figure 8

Task 3  
Memo:  
Employment

Performance Measures

- Transit service scenarios for serving employment centers/areas such as those described above will be evaluated during the next phase of the project using a comparative measure of the number of potential transit trips serving each area, weighted by the number jobs served.
- This will be calculated by multiplying the projected number of daily transit trips (i.e., number of buses) within a quarter-mile distance of each area by the number jobs those trips would serve.
- Other suggestions on how to evaluate and prioritize transit service to employment areas?

# Task 3 Memo: Existing Conditions Supplement Memo

- Do you agree with the employment areas identified in this memo? Are there other employment areas that should be considered in this process?



# Task 3 Memo: Bicycle and Pedestrian Access and Facilities

Bicycle infrastructure gaps relative to transit access and employment and population densities

- Identified within established low-stress network (LSN) projects and along non-LSN Key Routes
- Correlated to population and employment densities

## Bicycle Facilities



Pedestrian infrastructure gaps relative to transit access and employment and population densities

- Identified within 0.25-mile and 0.50-mile walksheds to existing CET bus stops
- Correlated to population and employment densities

## Pedestrian Facilities



# Task 4 Memo: Origin-Destination Study

Analysis of trips with origins and destinations in Bend

**Bend Local Trips (Start and End in Bend)**



Analysis of trips between Bend and Redmond

**Travel Demand Between Bend and Redmond**



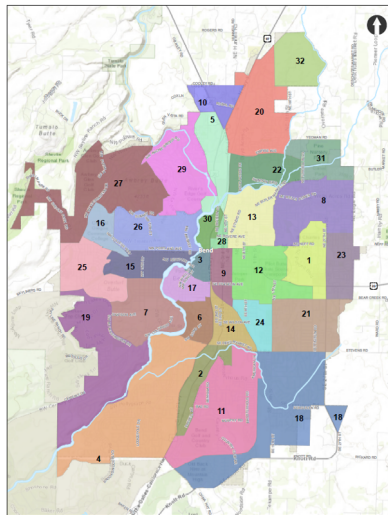
Origins and destinations for intercity trips to or from locations within the Bend-Redmond model to or from locations outside of the model area

**Intercity Travel Demand**



# Task 4 Memo: Origin-Destination Study

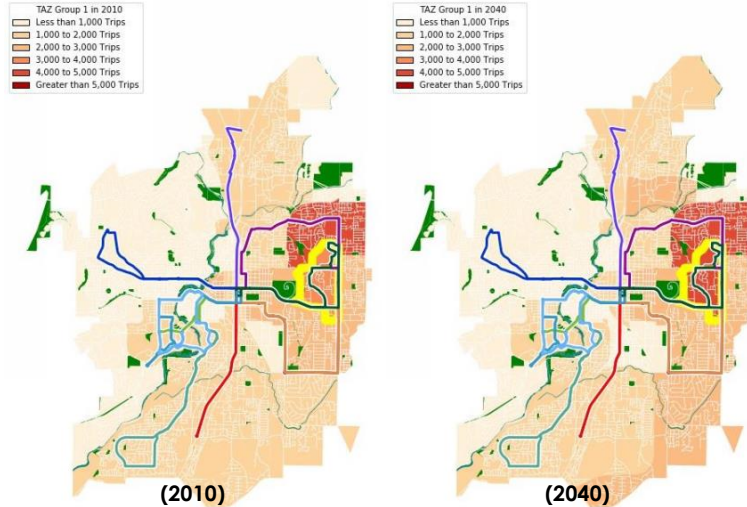
## Bend Local Trips (Start and End in Bend)



Bend Transportation Analysis Zone Groups

Task 4  
Memo:  
Origin-  
Destination  
Study

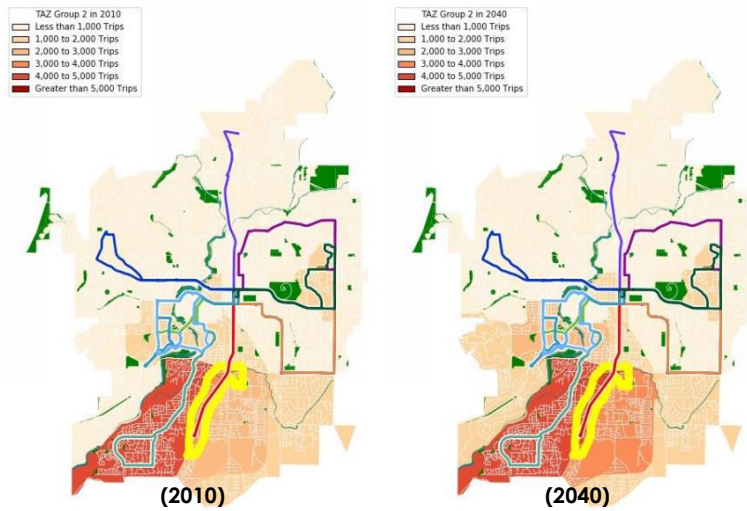
Bend Local Trips (Start and End in Bend, Cont.)



Trip Distribution to/from Group 1: Medical Center

Task 4  
Memo:  
Origin-  
Destination  
Study

Bend Local Trips (Start and End in Bend, Cont.)

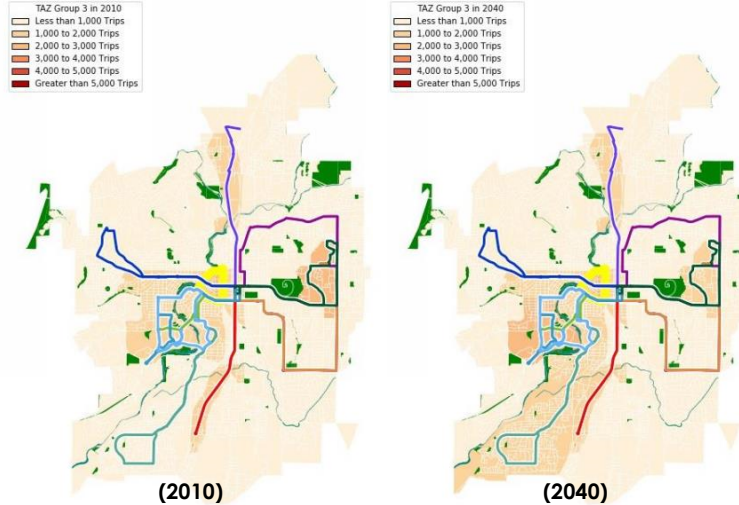


Trip Distribution to/from Group 2: Retail/Commercial Corridors along Highway 20-3rd Street



# Task 4 Memo: Origin-Destination Study

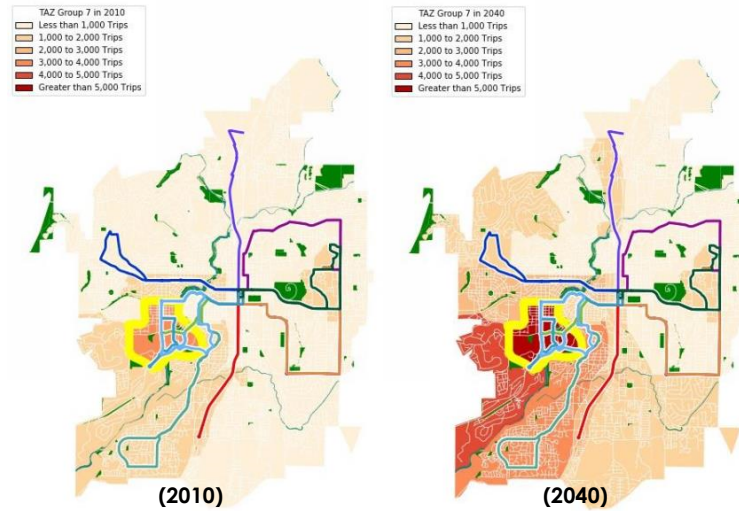
## Bend Local Trips (Start and End in Bend, Cont.)



Trip Distribution to/from Group 3: Downtown Bend

# Task 4 Memo: Origin-Destination Study

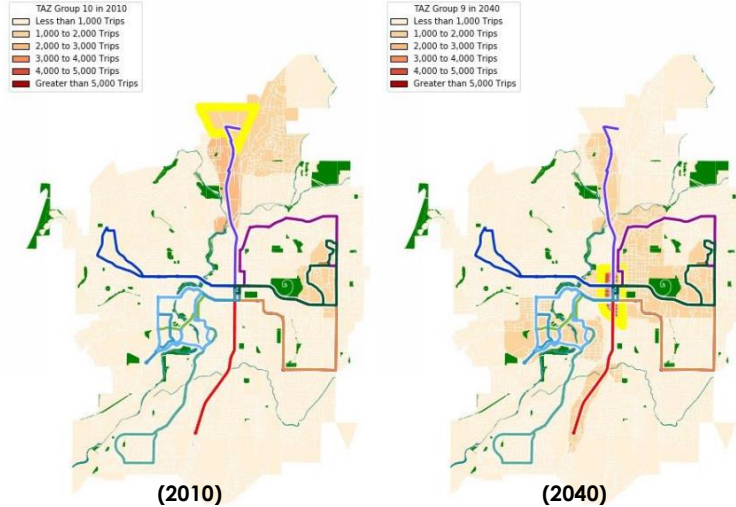
## Bend Local Trips (Start and End in Bend, Cont.)



Trip Distribution to/from Group 7: Oregon State University-Cascades

Task 4  
Memo:  
Origin-  
Destination  
Study

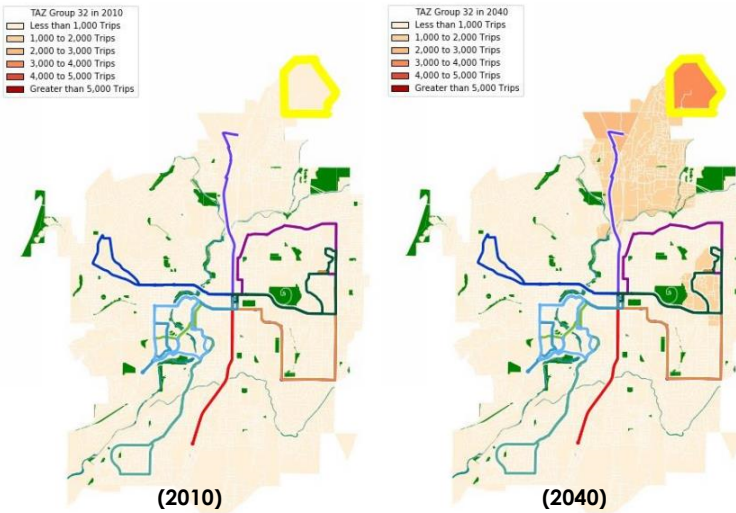
Bend Local Trips (Start and End in Bend, Cont.)



Trip Distribution to/from Group 9: Retail/Commercial Corridors along Highway 20-3rd Street

Task 4  
Memo:  
Origin-  
Destination  
Study

Bend Local Trips (Start and End in Bend, Cont.)



Trip Distribution to/from Group 32: Juniper Ridge

## Task 4 Memo: Needs Assessment Supplement Memo

- Is the local origin-destination analysis a good representation of commute patterns within Bend based on your knowledge?



## Task 4 Memo: Origin- Destination Study

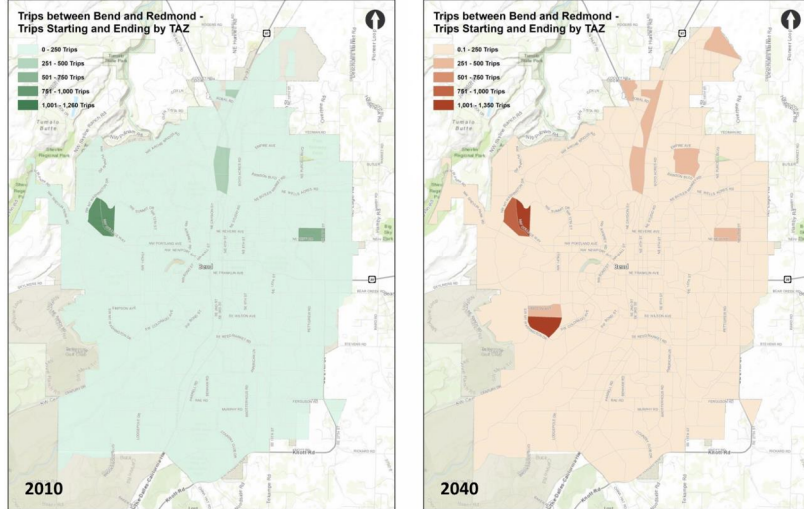
### Travel Demand Between Bend and Redmond

- In the 2010 Bend-Redmond model, there are approximately 13,600 total weekday trips between Bend and Redmond.
- The model projects that the number of trips between the cities will grow by approximately 65 percent by 2040 to 22,500.



# Task 4 Memo: Origin- Destination Study

## Travel Demand Between Bend and Redmond (Cont.)

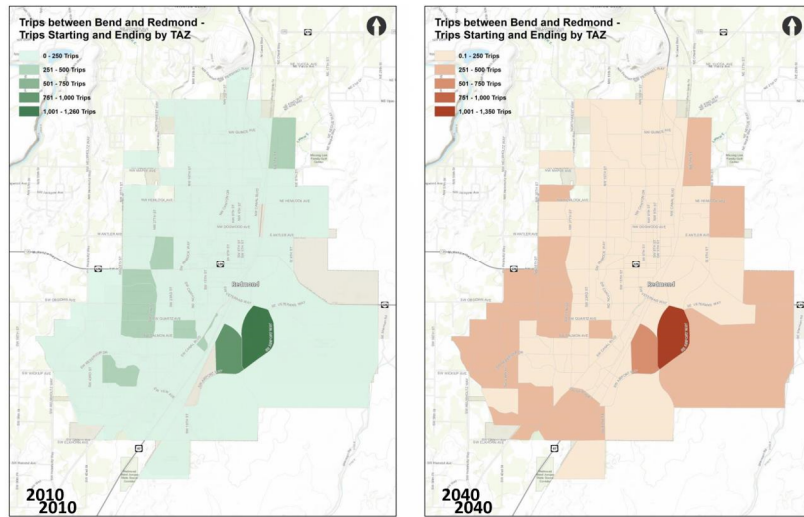


Bend Trips Connecting to Redmond (Total Trips per TAZ)



# Task 4 Memo: Origin- Destination Study

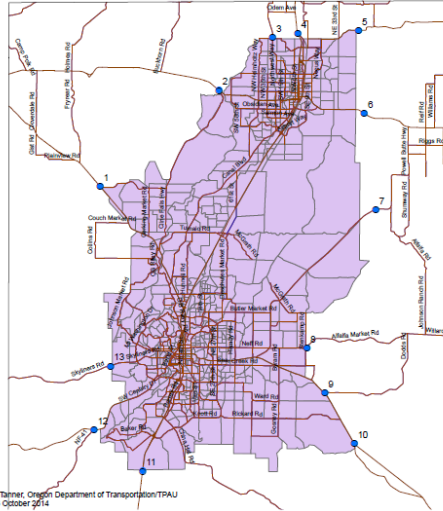
## Travel Demand Between Bend and Redmond (Cont.)



Redmond Trips Connecting to Bend (Total Trips per TAZ)

Task 4  
Memo:  
Origin-  
Destination  
Study

Intercity Travel Demand



T. Tanner, Oregon Department of Transportation/TRAU  
23 October 2014

Bend-Redmond Model External Areas

Task 4  
Memo:  
Origin-  
Destination  
Study

Intercity Travel Demand (Cont.)

Total Daily Regional Trips to and from Bend and Redmond

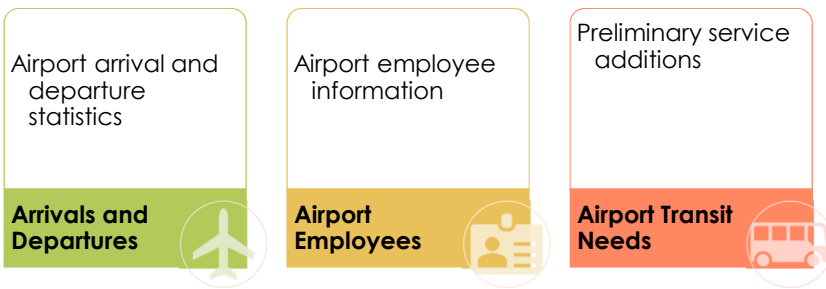
Direction of Travel	2010		2040	
	Bend	Redmond	Bend	Redmond
<b>LaPine / Sun River</b>	9,009	353	11,567	653
<b>Warm Springs / Madras</b>	4,806	7,051	7,326	8,195
<b>Prineville</b>	3,591	4,734	5,147	6,124
<b>Sisters</b>	5,029	2,700	7,424	3,870

# Task 4 Memo: Needs Assessment Supplement Memo

- Is the intercity origin-destination analysis a good representation of commute patterns to/from areas outside of Bend based on your knowledge?



# Task 4 Memo: Redmond Municipal Airport

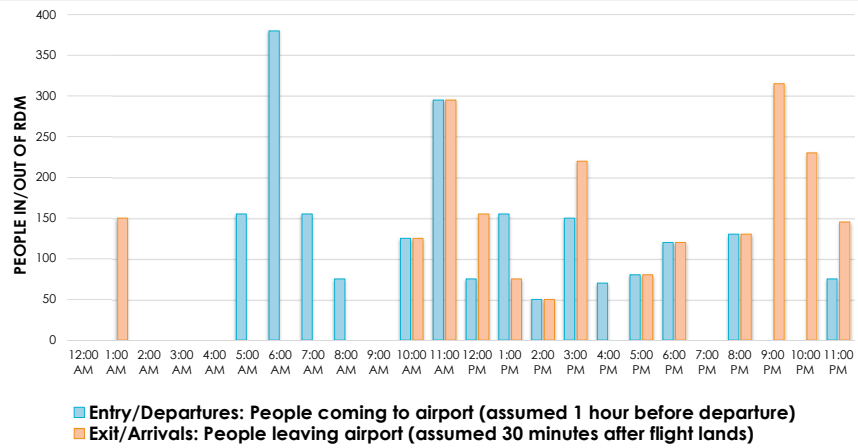




Task 4  
Memo:  
Redmond  
Municipal  
Airport

Arrivals and Departures (Cont.)

Monday, June 24 Flight Data – Represented as Typical Weekday Travel Patterns



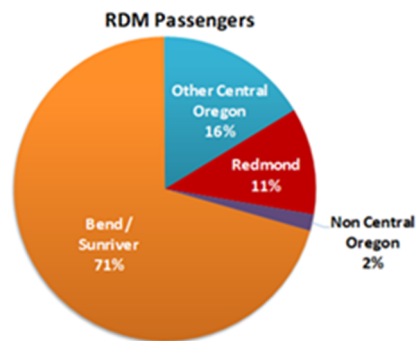
Source: flightradar24.com



Task 4  
Memo:  
Redmond  
Municipal  
Airport

Arrivals and Departures (Cont.)

RDM Passenger Origins and Destinations



Source: RDM

## Task 4 Memo: Redmond Municipal Airport

### Airport Employees

- Approximately 370 staff at RDM, not including airfield staff, such as FBO, flight school staff, etc.
  - **SP Plus** (three shifts: 12-8am, 8am-4 pm, 4pm-12am)
  - **TSA** (3am-last departure flight, ~11:15pm)
  - **Ground crews** (3am-1 hour after last arrival, ~1:30am)
  - **Air mechanics** (7pm-7am)
  - **Pub employees** (4:30am-8:30pm)
  - **Retail employees** (3:30am-8:30pm)
  - **Five rental car companies** (7:30am-1:00am)
  - **Security** (five shifts: 5am-1pm, 10am-5pm, 2pm-10pm, 5pm-12am, 10pm-6am)
  - **Airport administration:** (7am-4:30pm)
  - **Airport custodial staff:** (4am-2am)
  - **Airport operations:** (4am-11pm [summer], 4am-1am [winter])
  - **Others** (5am-7pm)

## Task 4 Memo: Redmond Municipal Airport

### Airport Transit Needs

- **New fixed-route connection between Hawthorne Station, Redmond Transit Hub, and RDM**
  - Hours of operation could serve 6:00 a.m. and 11:00 a.m. flight departures as well as 11:00 a.m. and 3:00 p.m. arrivals (all other peak times served by dial-a-ride transit).
  - Circulate Community Connector throughout Redmond between flight departures and arrivals.
  - Annual service cost is approximately \$460k at \$106/hour for 12 hours a day 365 days a year
- **New stop at RMD for Community Connector Route 24 (Redmond-Bend)**
  - Leave Redmond Transit Hub at 5:00 a.m. and final arrival to Redmond Transit Hub at 9:02 p.m.
  - Additional annual service cost is approximately \$58k for operating an extra 90 minutes a day 365 days a year



## Task 4 Memo: Needs Assessment Supplement Memo

- Do you agree with the draft airport needs: Are there other airport needs that should be considered throughout this process?

## Next Steps

- Project Steering Committee (RPTAC) Meeting
  - 8/20/2019 (1:30 – 3:30)
- Next Local Bend TAC Meeting
  - 9/19/2019 (3:00 – 5:00)
  - First/Last Mile Analysis; Feasibility of Increasing Frequency, Expanding Service, Enhancing RideBend Service; Transit Technology Update Analysis
- 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, TOD Strategies, Transit Service and Transit Capital Improvement Plan

