



DRAFT TRANSIT CAPITAL PLAN MEMORANDUM

Date: April 28, 2020 Project #: 22857
 To: Cascades East Transit Master Plan, Project Management Team
 From: Miranda Barrus and Susan Wright, Kittelson & Associates, Inc.
 Oren Eshel, Nelson\Nygaard
 Subject: Transit Capital Plan Memorandum

TABLE OF CONTENTS

Introduction..... 1
 Transit Capital Improvement Plan.....1
 Transit Vehicles..... 2
 Transit Facilities 7
 Transit Technology 17
 Transit Asset Management 18

INTRODUCTION

This memorandum describes the transit capital plan developed for the CET service area with respect to the local and regional plans review, existing conditions analysis, short-term implementation strategies, needs analysis, and transit-oriented development strategies, and transit service planning from Memos #1 through #6, as well as the first three rounds of public outreach.

TRANSIT CAPITAL IMPROVEMENT PLAN

This memorandum describes transit capital plan needed to support the existing system and planned system described in the Service Planning Memo. This memorandum considers vehicle types and lifecycles, funding opportunities, and infrastructure needs to enable the service plan to succeed. In addition, this memorandum includes the following:

- ▶ Recommended vehicles to support projected transit service needs
- ▶ Required investments in transit facilities over the planning horizon, including investments in transit stops, transit centers, park and rides, and maintenance centers
- ▶ Required or recommended investments in other passenger amenities
- ▶ Recommended technology investments
- ▶ Recommendations related to Transit Asset Management in accordance with ODOT and FTA requirements

TRANSIT VEHICLES

This section describes the condition of CET's existing fleet of transit vehicles, the need to expand its fleet based to support the added services described in the Service Planning Memo, ongoing vehicle replacement needs, and the annual costs CET should anticipate for vehicle replacements and fleet expansion.

EXISTING FLEET

As identified in the Existing Conditions Analysis (Memorandum #1), CET currently operates 70 revenue transit vehicles of varying size, capacity, and intended service. Vehicles range from 30-foot heavy-duty transit buses to small buses and specialized vans, having accessibility and bike features, and used for Community Connector routes, fixed-routes, dial-a-ride (Bend and Rural), and Deschutes National Forest access routes (e.g. recreational vehicles). Some transit vehicles are nearly brand new while others have outlived their useful life in either age or mileage. Currently, 11 revenue vehicles are considered partially or fully eligible for replacement.

In addition, 25 more vehicles have outlived their useful life in years (many of these have outlived their useful life in mileage as well). Further, CET's remaining 34 vehicles will outlive their useful life over the next 10 years. It is imperative that CET makes replacement of these vehicles, and its associated funding needs, a high priority in project prioritization in order to continue running an efficient public transit service. CET typically replaces approximately eight (8) vehicles per year. This is reflected in Table 1 which shows needed vehicle replacements over the next 10 years by service type. The table includes the average annual cost of vehicle replacement according to replacement needs on an annual basis spread out over the next 10 years. The following values are used to estimate the average annual vehicle replacement costs and are based on ODOT's negotiated transit vehicle pricing plus an additional \$30,000 for the Category A and Category B buses to include the costs for amenities such as e-fare readers, passenger counters, vehicle announcement systems, peplinks, wraps, fare boxes, radios, etc. The analysis also assumes replacing buses with the same size vehicle making it conservative as some vehicles may be replaced with smaller vehicles depending on the needs of a particular route or service.

- ▶ Bend fixed-route vehicle replacement cost
 - ▶ \$530,000/bus,
 - ▶ 12-year useful life
 - ▶ ODOT Category A
- ▶ Community Connector vehicle replacement cost
 - ▶ \$380,000/bus
 - ▶ 10-year useful life
 - ▶ ODOT Category B
- ▶ Dial-a-ride vehicle replacement cost
 - ▶ \$175,000/bus
 - ▶ 5-year useful life
 - ▶ ODOT Category C/D
- ▶ Microtransit
 - ▶ \$90,000/bus
 - ▶ 4-year useful life
 - ▶ ODOT Category E

Figure 1 provides an illustration of these vehicles according to their ODOT categories.



Category A



Category B



Category C



Category D



Category E

Figure 1: Transit Vehicles by ODOT Category

Table 1: Initial Replacement Estimates for Existing Fleet

Year	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
Bend Fixed-Route (\$530K/bus)	1	1	1	1	1	2	2	2	2	2	2
Bend Dial-A-Ride (\$175K/bus)	2	2	2	2	2	1	2	2	1	-	-
Recreation (\$380K/bus)	1	1	1	1	1	1	1	-	-	-	-
Community Connector (\$380K/bus)	1	1	1	1	1	2	1	1	-	-	-
Rural Dial-A-Ride (\$175K/bus)	3	3	3	3	3	2	2	2	-	-	-
Cost per Year	\$2.2M	\$2.2M	\$2.2M	\$2.2M	\$2.2M	\$2.7M	\$2.5M	\$2.1M	\$1.2M	\$1.1M	\$1.1M
Average Annual Cost over 10 Years	\$2.2M										
Annual Average Cash Match over 10 years (15%)	\$323K										

The average annual budget shown in Table 1 is a base estimate that does not consider inflation. If CET assumes an inflation rate of two percent each year, they should anticipate budgeting the following inflated dollars for initial existing fleet replacements:

- ▶ Full Cost: \$25.0M (approximately \$2.5M/year)
- ▶ Match Costs (15%): \$3.8M (approximately \$376k/year)

Assuming the existing fleet is replaced per the schedule in Table 1 and should continue to be replaced throughout the 2040 TMP based on their useful life (in years), CET should anticipate the additional replacement schedule of its existing fleet shown in Table 2.

Table 2: Estimates for Continued Replacement of Existing Fleet

Service/Bus Type	Cost Estimate		
	Short Term (2025)	Midterm (2030)	Long Term (2040)
Bend Fixed-Route (\$530K/bus)	-	-	12
Community Connector (\$380K/bus)	-	1	8
Recreation (\$380K/bus)	-	1	6
Bend Dial-A-Ride (\$175K/bus)	2	20	30
Rural Dial-A-Ride (\$175K/bus)	3	17	42
Base Average Annual Cost	\$1.6M		
Inflated Average Annual Cost	\$2.1M		
Base Annual Average Cash Match (15%)	\$243K		
Inflated Annual Average Cash Match (15%)	\$311k		

FUTURE FLEET

With the added CET services described in the Service Planning Memo, CET should anticipate expanding its vehicle fleet over the defined timeframe shown in Table 3. Note that in order to right-size vehicles for new services, only one Bend Fixed-Route bus is anticipated to be large, heavy-duty (ODOT category A) and the remaining vehicles are medium size or smaller. Note that some dial-a-ride services are incorporating smaller transit vehicles, vans, (ODOT category E1 vehicles); \$90k is used for cost estimating for these vehicles.

Table 3: Estimates for Expanded Vehicle Fleet

Service/Bus Type	Cost Estimate		
	Short Term (2025)	Midterm (2030)	Long Term (2040)
Bend Fixed-Route (\$380K/bus)	6	7	-
Redmond Fixed-Route (\$380/bus)	3	2	1
Community Connector (\$205-530K/bus)	12	-	-
Bend Dial-A-Ride/Microtransit (\$90-\$175K/bus)	4	-1	-
Rural Dial-A-Ride (\$175K/bus)	-1	-1	3
Base Average Annual Cost	\$596k		
Inflated Average Annual Cost	\$762k		
Base Annual Average Cash Match (15%)	\$89k		
Inflated Annual Average Cash Match (15%)	\$114k		

Assuming that these new vehicles will have the same useful life (in years) as their respective vehicles in CET's existing fleet, CET should also anticipate replacing the vehicles in Table 3 over the defined timeframe shown in Table 4.

Table 4: Estimates for New Vehicle Fleet Replacement

Service/Bus Type	Cost Estimate		
	Short Term (2025)	Midterm (2030)	Long Term (2040)
Bend Fixed-Route (\$380K/bus)	-	-	13
Redmond Fixed-Route (\$380/bus)	-	-	5
Community Connector (\$205-530K/bus)	-	4	16
Bend Dial-A-Ride/Microtransit (\$90-\$175K/bus)	-	4	9
Base Average Annual Cost	\$695k		
Inflated Average Annual Cost	\$888k		
Base Annual Average Cash Match (15%)	\$104k		
Inflated Annual Average Cash Match (15%)	\$133k		

2040 TMP FLEET

Considering the vehicles needed for both the existing and expanded fleets, Table 5 summarizes the annual budget CET should anticipate for all transit vehicles through its 2040 TMP.

Table 5: 2040 Transit Master Plan Fleet Cost Estimate

Service/Bus Type	Cost Estimate		
	Short Term (2025)	Midterm (2030)	Long Term (2040)
Bend Fixed-Route (\$380-530K/bus)	13	17	25
Redmond Fixed-Route (\$380/bus)	3	2	6
Community Connector (\$205-530K/bus)	19	7	24
Recreation (\$380K/bus)	6	2	6
Bend Dial-A-Ride/Microtransit (\$90-175K/bus)	17	28	39
Rural Dial-A-Ride (\$175K/bus)	19	20	45
Base Average Annual Cost	\$4.0M		
Inflated Average Annual Cost	\$5.1M		
Base Annual Average Cash Match (15%)	\$598k		
Inflated Annual Average Cash Match (15%)	\$765k		

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

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

TRANSIT FACILITIES

This section describes the capital investment needed to enhance existing and construct new transit stops, transit centers, park and rides, and maintenance facilities.

TRANSIT STOPS

As identified in the Existing Conditions Analysis (Memo 1), Table 6 summarizes the existing bus stops along Bend fixed-routes, including quantity and available amenities.

Table 6: Existing Bend Fixed-Route Bus Stops and Amenities by Route

Route (# of Stops)	ADA Pad	Benches	Trash Receptacles	Shelters	Braille Signs	Schedule Holders
1 – South 3 rd St (20)	90%	10%	95%	15%	90%	100%
2 – Brookwood (36)	83%	11%	47%	14%	83%	100%
3 – Newport (22)	91%	45%	50%	9%	82%	100%
4 – North 3 rd St (22)	77%	9%	68%	18%	91%	91%
5 – Wells Acres/Reed Market (43)	53%	21%	26%	7%	53%	53%
6 – Reed Market/Wells Acres (40)	73%	13%	40%	10%	60%	73%
7 – Greenwood (31)	97%	16%	45%	16%	45%	94%
10 – Colorado (14)	79%	7%	21%	7%	43%	100%
11 – Galveston/14 th (25)	44%	12%	20%	4%	48%	52%

The Service Planning Memo assumes the following additional stops to support new and extended fixed-routes in Bend:

- ▶ Route 4 Extension to Juniper Ridge: 10 new stops
- ▶ Route 2 Extension to Murphy/Brosterhous: 20 new stops
- ▶ New Route 8 to Northeast Bend: 40 new stops
- ▶ NE 27th/Empire: 10 new stops
- ▶ Reed Market (3rd Street to 15th): 5 new stops
- ▶ SE 15th Street: 13 new stops

Additionally, the Service Planning Memo assumes almost 100 new transit stops to support new fixed-route service in Redmond, 10 new transit stops to support new flex-route service in Madras, and 10 new transit stops to support new flex-route service in Prineville.

The Needs Analysis (Memo 4) also identified new transit stops for the following existing and future Community Connector routes that may need to be considered in CET's capital budget:

- ▶ Route 20 (Madras-Warm Springs): 2 new stops
- ▶ Route 22 (Madras-Redmond): 9 new stops
- ▶ Route 24 (Bend-Redmond): 2 new stops
- ▶ Route 26 (Prineville-Redmond): 6 new stops
- ▶ Route 29 (Sisters-Bend): 4 new stops
- ▶ Route 30 (La Pine-Bend): 1 new stop
- ▶ New Route 31 (La Pine-Sunriver): 2 new stops

Further, CET also maintains transit stops along its Community Connector routes. Some routes have overlapping stops, therefore, are not included twice:

- ▶ Routes 20 (Warm Springs-Madras): 14 existing stops
- ▶ Route 22 (Madras-Redmond): 3 existing stops
- ▶ Route 24 (Bend-Redmond): 1 existing stop
- ▶ Route 26 (Redmond-Prineville): 4 existing stops
- ▶ Route 28 (Sisters-Redmond): 4 existing stops
- ▶ Route 29 (Bend-Sisters): *same stops as Route 28*
- ▶ Route 30 (La Pine-Bend): 5 existing stops

Today, it costs CET up to \$15,000 to design and build their transit stops, which typically includes sidewalk, ADA improvements, signage, and shelters. Assuming a cost of approximately \$1,000 to maintain existing transit stops, CET should anticipate budgeting \$197 thousand per year as a basis to maintain and improve existing stops and design and construct new stops to support the new services described in the Service Planning Memo. If relying primarily on state and federal grants or local agency funds, CET could reduce this to assume match funding only.

If CET assumes an inflation rate of two percent each year, they should anticipate budgeting the following dollars for transit stops:

- ▶ Full Cost: \$4.8M (approximately \$252k/year)
- ▶ Match Costs (15%): \$718k (approximately \$38k/year)

Table 7 summarizes the annual budget CET should anticipate for all existing and new transit stops through its 2040 TMP.

Table 7: 2040 Transit Master Plan Transit Stops Cost Estimate

Service	Existing Transit Stops (\$1K/stop)	New Transit Stops (\$15K/stop)
Bend Fixed-Route	253	98
Community Connector	31	26
Redmond Fixed-Route	-	100
Madras Flex-Route	-	10
Prineville Flex-Route	-	10
Base Average Annual Cost		\$197K
Inflated Average Annual Cost		\$252K
Base Annual Average Cash Match (15%)		\$30K
Inflated Annual Average Cash Match (15%)		\$38K

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

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

Low stress active transportation networks are critical to providing access to public transportation services. In some areas that are served by existing routes, there are areas beyond a typical ¼ to ½ mile walking distance of a transit stop where improved pedestrian and bicycle connections can expand access to existing transit stops. Improving walking and biking routes along and cross roadways around bus stops makes it safer and more comfortable to access transit. These walking and biking routes were identified and prioritized based on walksheds of existing bus stops through the Bend Service Plan memorandum (see Figures 9A-9D, Tables 9 and 10, Figures 10A-10D, and Table 11). CET should coordinate with local partners to prioritize and improve the pedestrian and bicycle access on these routes.

TRANSIT CENTERS/MOBILITY HUBS

Mobility hubs are places (typically but not necessarily public spaces) where multimodal mobility services like public transportation are designed to facilitate convenient, safe, and accessible travel options and transfers between modes. Mobility hubs can include a variety of infrastructure and mobility service elements and are adaptable to a range of transit facilities. Table 8 identifies different types of transit centers and mobility hubs, including characteristics such as existing transit service and land use context, applicable mobility services, and technology features that make access to these services seamless and easy-to-navigate.

Large-Scale 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 Community Connector routes as well as longer-distance intercity services. The TDP Service Plan recommends transitioning to a more multi-centric system.

Secondary Transit Hubs and Small-scale Transit Centers are smaller-scale mobility hubs that provide additional transfer and layover locations outside of the main transit center (if applicable). In a multi-centric system, there may be no single transit center in the long-term.

Major Activity Centers is the smallest-scale mobility hub designation in the plan and provides a higher level of amenities, such as real-time information displays and bicycle parking, at major stop locations.

Park and Ride Facilities may be co-located with transit centers and secondary hubs and allow passengers to access transit by motor vehicle, be dropped off, or access shared rides (carpools or vanpools) to local or regional worksites. Park and rides may be located at public facilities or may be established through a cooperative agreement with a private landowner.

Table 8: Mobility Hub Types and Typical Characteristics

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

The Needs Analysis (Memo 4) identified the need for new and/or improved transit centers in the following locations:

- ▶ Bend: South Downtown/Korpine area (secondary hub)
- ▶ Hawthorne Station/Eastside Area (large scale or possibly smaller if other secondary hubs are constructed reducing the needs at Hawthorne Station)
- ▶ Sisters: northwest of downtown (small scale)
- ▶ Madras (small scale)
- ▶ Metolius (small scale)
- ▶ Culver (small scale)
- ▶ Warm Springs (small scale)
- ▶ Prineville: near Thriftway or Rays (small scale)

The design and construction of a small-scale transit center today can cost from \$500 thousand to \$1 million depending on the real estate costs (La Pine's transit center cost approximately \$800 thousand with donated land). Therefore, the following values are used to conservatively estimate the cost of the needed transit centers in the cities listed above:

- ▶ Large-Scale Transit Center: \$3 million
- ▶ Small-Scale Transit Center: \$1 million

CET should budget approximately \$9 million for these needed transit centers, or \$450 thousand per year through the 2040 TMP. Should state or federal grants become available, CET may be able to reduce this budget to \$68 thousand per year for local match.

If CET assumes an inflation rate of two percent each year, they should anticipate budgeting the following dollars for transit centers:

- ▶ Full Cost: \$11M (approximately \$575k/year)
- ▶ Match Costs (15%): \$1.6M (approximately \$86k/year)

The Bend Service Plan identifies several mobility hub locations within Bend at varying sizes offering various mobility services, summarized below:

- ▶ Secondary Transit Hub (medium scale): 5 hubs
- ▶ Major Activity Center (small scale): 2 hubs
- ▶ Local Neighborhood Stop (minor scale): 11 stops

The following values are used to estimate the cost of these Bend mobility hubs:

- ▶ Secondary Transit Hub: \$1 million
- ▶ Major Activity Center: \$500 thousand
- ▶ Local Neighborhood Stop: \$50 thousand

Therefore, CET should anticipate budgeting \$6.6 million for these needed transit centers, or \$328 thousand per year through the 2040 TMP. Should state or federal grants become available, CET may be able to reduce this budget to \$49 thousand per year.

If CET assumes an inflation rate of two percent each year, they should anticipate budgeting the following dollars for the timeframes defined below:

- ▶ Full Cost: \$8.0M (approximately \$419k/year)
- ▶ Match Costs (15%): \$1.2M (approximately \$63k/year)

Table 9 summarizes the annual budget CET should anticipate for transit centers and mobility hubs through its 2040 TMP.

Table 9: 2040 Transit Master Plan Transit Center and Mobility Hub Cost Estimate

Transit Centers			
Location	Small-Scale Transit Center (\$1M/center)	Large-Scale Transit Center (\$3M/center)	
Bend (Hawthorne Station)	-	1	
Sisters (Northwest of Downtown)	1	-	
Madras	1	-	
Metolius	1	-	
Culver	1	-	
Warm Springs	1	-	
Prineville (Thriftway or Rays)	1	-	
Base Average Annual Cost	\$450K		
Inflated Average Annual Cost	\$575K		
Base Annual Average Cash Match (15%)	\$68K		
Inflated Annual Average Cash Match (15%)	\$86K		
Mobility Hubs			
Location	Local Neighborhood Stop (\$50K/hub)	Major Activity Center (\$500K/hub)	Secondary Transit Hub (\$1M/hub)
Bend	11	3	6
Redmond		1	
Base Average Annual Cost	\$427K		
Inflated Average Annual Cost	\$544K		
Base Annual Average Cash Match (15%)	\$64K		
Inflated Annual Average Cash Match (15%)	\$81K		

PARK AND RIDES

The Existing Conditions Analysis (Memo 1) identified all park-and-ride locations, formal and informal, within Central Oregon, as summarized in Table 10. "Formal" lots are those that are ADA-accessible and officially designated by a government or agency as park-and-ride lots.

"Informal" lots are not so designated. Either kind of lot could be a dedicated parking facility or a lot shared with other uses. Informal lots could also exist in areas such as roadway shoulders. CET should work with local agencies to designate the informal park-and-ride locations highlighted in orange in Table 10 to formal sites, including implementing ADA accessible infrastructure.

Table 10: Existing Central Oregon Park-and-Ride Lots

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

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

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

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

MAINTENANCE CENTERS

As identified in the Existing Conditions Analysis (Memo 1), Table 11 summarizes CET's current maintenance facilities including their function and their transit vehicle capacity.

Table 11: Existing Operations and Maintenance Facilities

Facility	Description
La Pine (51340 US 97)	Includes driver's office and storage for 3 vehicles. Shared with Deschutes County Sheriff's Office.
Bear Creek Office (1250 NE Bear Creek Road in Bend)	Includes CET administration office, paratransit administration office, maintenance garage, and storage for 40 vehicles. A secure facility owned by COIC.
Redmond Office (343 E Antler Avenue)	Includes CET dispatch office, CET administration office, Cascades East Ride Center, maintenance garage, and storage for 18 vehicles. A secure facility owned by COIC.
Prineville Office (2321 NE 3 rd Street)	Includes driver's office and storage for 2 vehicles. Shared with Oregon Department of Education.
Madras Office (1170 SE Ashwood Rd)	Leased office space at the COCC Madras campus.
Madras Vehicle Parking (274 SW 4th Street)	Leased parking stalls for 2 dial-a-ride vehicles at the Madras Senior Center.

Considering CET's existing fleet and storage capacities and the need to increase CET's fleet by approximately 26 vehicles over the 2040 horizon to support added services described in the Service Planning Memo, CET should plan for operations and/or maintenance facilities in the locations listed below. These facilities should primarily provide vehicle storage. CET should coordinate these facilities with potential new transit centers identified throughout CET's service area in previous sections of this memo.

- ▶ Bend
 - ▶ storage for 12 additional vehicles
 - ▶ increased maintenance facilities
- ▶ Redmond
 - ▶ storage for 12 additional vehicles
 - ▶ increased maintenance facilities
- ▶ Sisters: storage for 2 vehicles (assumes one spare)
- ▶ Madras: storage for 2 vehicles (assumes one spare)
- ▶ Prineville: storage for 2 vehicles (assumes one spare)

Bend and Redmond are the primary locations where increased vehicle storage and maintenance facilities will be needed. Costs for these types of facilities can vary greatly depending on the ability to expand an existing facility or developing a new site CET should budget approximately \$500,000 each (\$1,000,000) for two facilities (one in Bend and one in Redmond) Should state or federal grants become available, CET may be able to reduce this budget to \$150,000 in matching funds, approximately \$7.5 thousand per year. If CET assumes and inflation rate of two percent each year, they should anticipate budgeting the following dollars for the timeframes defined below:

- ▶ Base Cost: \$1.0M (approximately \$50k/year)
- ▶ Full Cost: \$1.2M (approximately \$64k/year)
- ▶ Base Match Costs (15%): \$150k (approximately \$7.5k/year)
- ▶ Inflated Match Costs (15%): \$182k (approximately \$9.6k/year)

TRANSIT CAPITAL COST SUMMARY

Table 12 summarizes the capital cost estimates for CET's existing and new vehicle fleet, transit stops, transit centers, mobility hubs, and maintenance facilities to implement the full 2040 TMP. All totaled, CET should set aside approximately \$767,000 each year in current year dollars into a fund to support capital needs. This would be needed to provide 15% match to the full capital needs identified in this memo. The capital needs will be fewer if the mid-term and long-term service expansions included in the Service Plan do not occur due to lack of additional funding for operations.

Table 12: Summary of Capital Costs

Vehicle Fleet	
Base Average Annual Cost	\$4.0M
Inflated Average Annual Cost	\$5.1M
Base Annual Average Cash Match (15%)	\$598k
Inflated Annual Average Cash Match (15%)	\$765k
Transit Stops	
Base Average Annual Cost	\$197k
Inflated Average Annual Cost	\$252k
Base Annual Average Cash Match (15%)	\$30k
Inflated Annual Average Cash Match (15%)	\$38k
Transit Centers	
Base Average Annual Cost	\$450k
Inflated Average Annual Cost	\$575k
Base Annual Average Cash Match (15%)	\$68k
Inflated Annual Average Cash Match (15%)	\$86k
Mobility Hubs	
Base Average Annual Cost	\$427k
Inflated Average Annual Cost	\$544k
Base Annual Average Cash Match (15%)	\$64k
Inflated Annual Average Cash Match (15%)	\$81k
Maintenance Facilities	
Base Average Annual Cost	\$50k
Inflated Average Annual Cost	\$64k
Base Annual Average Cash Match (15%)	\$7.5k
Inflated Annual Average Cash Match (15%)	\$9.6k
TOTAL	
Base Average Annual Cost	\$5.1M
Inflated Average Annual Cost	\$6.5M
Base Annual Average Cash Match (15%)	\$767K
Inflated Annual Average Cash Match (15%)	\$980K

TRANSIT TECHNOLOGY

This section briefly summarizes the transit technology identified in the Needs Analysis (Memo 4) CET should plan for through its 2040 TMP.

TRANSIT SIGNAL PRIORITY

Transit Signal Priority is a general term for a set of operational improvements that use signal controller technology to reduce the wait time for buses at traffic signals by holding the green time and reducing the red time when a bus is detected. This can be done at all times or just when the bus is running late and may be implemented at individual intersections or across corridors or entire street systems. This is particularly valuable on routes with schedule adherence issues (such as Route 4: North 3rd Street) and can help reduce the travel time variability. Reduction in travel time variability allows agencies to tighten schedules, reduce travel time, and improve system reliability. CET should coordinate with ODOT through its 2040 TMP to provide transit signal priority in the following cities and along associated corridors.

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

OTHER TECHNOLOGY INVESTEMENTS

The following additional technology needs have been identified for inclusion in the Transit Master Plan; funding for technology improvements has been included in Deschutes County's STIF plan for FY 2021:

- ▶ One app/platform for fare payment and trip planning that:
 - ▶ Operates regionally
 - ▶ Provides estimated arrival and departure information in real-time
 - ▶ Works for all modes (e.g. bike share, fixed-route, DAR, etc.)
 - ▶ Coordinated with identified mobility hubs
 - ▶ User friendly for older, younger, and/or disabled populations (e.g. real-time text message updates to accommodate standard cell phones)
- ▶ Fare payment configuration to create additional fare payment options on buses
- ▶ Upgrade and/or replace computer aided dispatch/AVL software and equipment

TRANSIT ASSET MANAGEMENT

Transit asset management (TAM) is a comprehensive process of purchasing, operating, maintaining, and replacing transit capital assets (e.g. rolling stock, infrastructure, equipment, and facilities) over their useful life. The goal of this process is to promote safe, reliable, and cost-effective transit service. The Federal Transit Administration (FTA) started requiring in 2016 that public transit service providers receiving Federal transit assistance conduct transit asset management. The FTA defines three roles in its TAM planning framework:

Tier I Provider: recipient that owns, operates, or manages either (1) 101 or more vehicles in revenue service during peak regular service across all fixed-route modes or in any one non-fixed route mode or (2) rail transit. Tier I providers must develop their own, individual TAM plan.

Tier II Provider: recipient that owns, operates, or manages (1) 100 or fewer vehicles in revenue service during peak regular service across all non-rail fixed-route modes or in any one non-fixed route mode, (2) a subrecipient under the 5311 Rural Area Formula Program, (3) or any American Indian Tribe. Tier II providers can develop their own individual TAM plan or can be included in a group plan developed by a sponsor agency.

Sponsor Agency: State, designated recipient, or direct recipient that develops a group TAM for at least one Tier II provider.

COIC is a Tier II provider by these definitions and is likely to remain a Tier II provider over the horizon of the 2040 TMP. ODOT's Rail and Public Transit Division has developed a *Tier II Transit Asset Management Group Plan* for all Tier II providers in Oregon per FTA requirements. This includes Central Oregon Intergovernmental Council (COIC), which oversees CET. COIC, along with all other participants in this plan, are only able to participate in one group plan and have unified targets set by ODOT.

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

1. An **inventory of capital assets**, including number and type. All capital assets the provider owns must be included, except those with a purchase value under \$50,000 (that is not a service vehicle). The inventory also must include third-party owned or jointly procured exclusive-use maintenance facilities, passenger station facilities, administrative facilities, rolling stock, and guideway infrastructure utilized for transit service. The level of detail in the asset inventory must equate the level of detail in the provider's capital projects program.
2. A **condition assessment of the inventoried assets** that a provider has direct capital responsibility. The condition assessment must include detail sufficient to monitor and predict asset performance and to inform investment prioritization.
3. A description of **analytical processes** or **decision-support tools** used to estimate capital investment needs over time.
4. A **project-based prioritization** of investments.

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