



JEFFERSON COUNTY TRANSPORTATION SYSTEM PLAN

TECHNICAL MEMORANDUM #4

Date: February 1, 2021
To: Phil Stenbeck and Matt Powlison, Jefferson County
Don Morehouse, Oregon Department of Transportation

Project #: 22928

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Project: Jefferson County Transportation System Plan Update

Subject: Technical Memorandum #4: Solution Analysis and Funding Program

INTRODUCTION

This memorandum identifies solutions developed by the project team to address gaps and deficiencies in the existing and projected future transportation system identified in *Technical Memorandum #3: Existing and Future Conditions Inventory and Analysis*. The solutions identified in this memorandum primarily consist of transportation improvement projects, future planning efforts, and programmatic recommendations. The solutions set the groundwork for development of the Jefferson County TSP update and help address the requirements of Oregon Administrative Rule 660-012-020 (Elements of a Transportation System Plan) for establishing a coordinated network of transportation facilities adequate to serve state, regional, and local transportation needs.

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TRANSPORTATION SYSTEM NEEDS

Transportation system needs and potential solutions are summarized in the subsections below and include a description of the project, potential funding sources, draft priority for implementation, and planning level cost estimates based on 2020 dollars.

Potential solutions are intended to address transportation needs within the next 20 years, and are presented in the following categories:

- Street System
 - Roadway
 - Freight
 - Intelligent Transportation System (ITS)
 - Safety

- ▶ Multimodal System
 - Pedestrian
 - Bicycle
 - Public Transportation
- ▶ Other Transportation Systems
 - Bridge
 - Air
 - Rail

In addition to the addressing identified needs, solutions were developed consistent with the goals and objectives for the Jefferson County TSP identified in *Tech Memo #2: Goals, Objectives, and Evaluation Criteria*.

Design elements and cost estimates are identified for discussion and planning purposes and for determining a reasonable planning cost estimate only. The actual design and permitting elements for any facility are subject to change, will ultimately be determined through a preliminary and final design process, and are subject to County and/or ODOT approval. Please note that cost estimates and County contributions and partnerships are for planning level purposes only. All projects will be scoped separately and individually based on project needs.

PROJECT PRIORITIZATION

Solutions presented in this memorandum are identified as one of three prioritization categories:

- ▶ Opportunity Project: These are low-cost projects that can be implemented relatively easily, often through regular maintenance work.
- ▶ TSP Project: These are projects that are anticipated within the 20-year planning horizon but will require additional funding or design work to implement.
- ▶ Visionary Project: These are projects that are unlikely to occur in the 20-year planning horizon. However, the County would like to maintain these projects to document the longer-term desires and provide flexibility to adapt if circumstances change that may warrant the projects sooner.

The intent of these categories is to provide the County with flexibility to adapt to changing economic development and community needs over the next 20 years. The "Opportunity Projects" should be implemented in the near-term, as staff and funding resources are available.

STREET SYSTEM SOLUTIONS

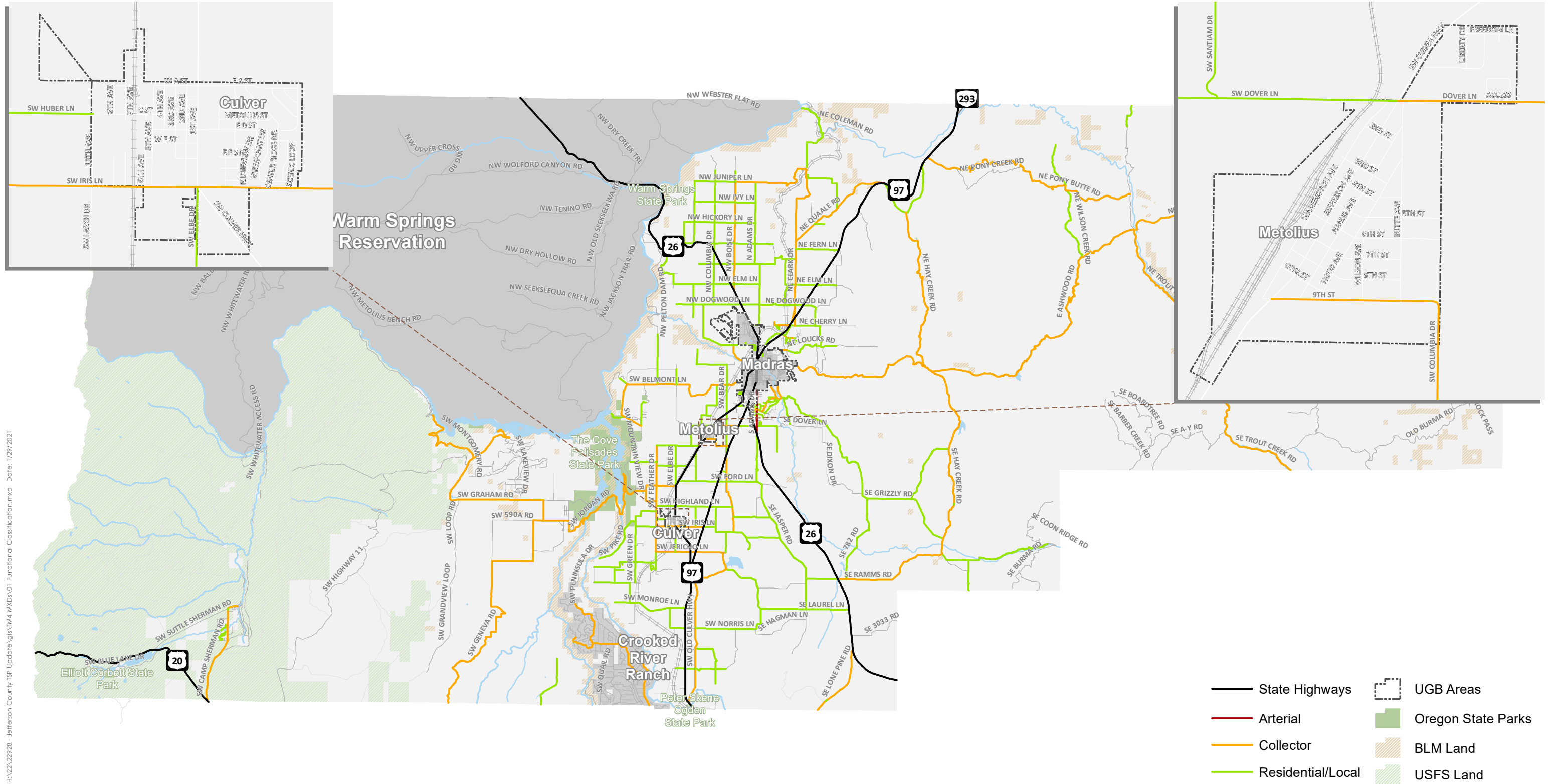
STREET SYSTEM

People driving, walking, biking, and taking transit all rely on the street network to access destinations locally within the County as well as regionally within Central Oregon. The street system solutions presented in this section address mobility, access, freight, and safety needs.

FUNCTIONAL CLASSIFICATION

The County's functional classification system provides a street hierarchy based on their primary function (moving people across regions or providing access to local destinations). The Oregon Department of Transportation (ODOT) identifies the appropriate classifications for state facilities whereas the County identifies the appropriate classifications for County streets. The classification levels also describe how the roadway "looks and feels" to the users and provides recommendations for vehicular lane width, roadside treatments, the presence of bicycle lanes and the need for sidewalk or trails adjacent to the road. Additional details on the functional classification system are provided in Technical Memorandum #3.

County staff and the project team reviewed the consistency of the existing roadway network with the identified functional classifications and did not identify roads to be re-classified. However, as noted in Technical Memorandum #3, ODOT and County data currently reflect different classifications for Laurel Lane, Springer Road, and Clemens Drive. The County will continue to coordinate with ODOT to confirm whether these roads should be maintained as Local Roads (consistent with County records) or updated to Collectors (consistent with ODOT records). The Functional Classification map is shown in Figure 1.



Data Source: Jefferson County
 Madras UGB and Warm Springs not included in TSP.



Figure 1

ROAD DESIGN STANDARDS

The County's existing roadway design standards for right of way and pavement width were presented in Table 4 of Technical Memorandum #3 and currently include "low volume" and "high volume" standards for each classification. In addition, the standards provide a "minimum" and "recommended" shoulder width.

Traffic volumes can change over time and volume data is not always readily available, particularly for new roads. This makes implementation of these standards challenging and potentially confusing for new developments. The proposed standards in this memorandum reflect one consistent cross-section for each roadway classification, without further distinction by volume. This change creates clarity regarding roadway standards and provides a consistent cross-section across the County. The proposed cross-section standards are presented in Table 1. Due to the rural nature of the County, dedicated sidewalks and bicycle lanes are not required nor practical to construct. Instead, people walking and biking can use the shoulder. In unique circumstances where a dedicated sidewalk, bike lane, or shared-use path may be more appropriate than a shoulder, the Public Works director has the ability to approve deviation from the standard cross section.

Table 1. Proposed Jefferson County Cross Section Standards¹

Functional Classification	Right of Way (ft)	Pavement Width (ft)*	Shoulder (ft)
Arterial	80	40	8
Major Collector	80	36	6
Minor Collector	72	36	6
Local	50	30	3

*Turning lanes, when required, will add additional width. Lane widths are to be 12 feet for each classification.

¹ Design for standard unless approved by the public works director. The public works director has the ability to allow deviation from standards in circumstances with unique constraints. In rural areas where cross section standards are not met on the existing roadway, the County has the ability to match the existing roadway and deviate from these standard when approved by the public works director.

Roads near the Madras Urban Growth Boundary (UGB), such as Birch Lane, Clackamas Drive, and Dogwood Lane, may be annexed by the City of Madras over time as the City grows. These three roads will become Collectors for the City. The City and County will be updating their Urban Growth Area Management Agreement (UGMA) in the Spring/Summer 2021. The City and County may consider requiring County roads be brought up to City standards at the time of annexation. The County's minimum right-of-way standards for collectors and arterials exceeds the City's right-of-way for collectors; this should help to provide adequate right-of-way to upgrade facilities as needed in the future. New road extensions into the County from the UGB boundary should involve coordination between the County and City.

As documented in Technical Memorandum #3, state highways are built according to ODOT's *Highway Design Manual (HDM)*. ODOT recently released the *Blueprint for Urban Design*, which provides more flexible standards for urban areas and unincorporated communities; this guidance may be used in conjunction with the HDM to determine the appropriate standard in rural areas and the smaller cities and unincorporated communities. According to the HDM, standard lane widths for rural two-lane highways, such as US 97 and US 26, is 12 feet. Standard shoulder widths are determined from the HDM Table 7-2 (ODOT Shoulder Standards), which indicates eight-foot standard shoulders for highways with AADT carrying more than 2,000 vehicles per day.

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The majority of the highways in unincorporated Jefferson County do not have sidewalks or curbs. Curb and sidewalks are typically installed in urban contexts, such as the City of Madras. A curb also requires ODOT to provide a 5-foot minimum shoulder for bicycles. Additional clearance requirements (e.g. railroad clearances vertical clearances) are provided in Chapter 4 of the HDM.

The City of Culver's Standard Details provide the typical sections for collector streets and local streets. The City of Metolius' Standard Detail Street Design provides street design standards for arterials, collectors, local residential streets, alleys, accessways and multi-use paths, and County collector roads. The street standards for Culver and Metolius are summarized in Table 2 and Table 3.

Table 2. Existing Cross Section Standards for Culver

Functional Classification	Right of Way (ft)	Pavement Width (ft)	Lane Width	Shoulder (ft)	Curb and Gutter	Sidewalk (ft)
Collector	60	38	12	7	Yes	5
Local	60	38	12	7	Yes	5

Data Source: City of Culver, Oregon Standard Details, Figures R1 and R2

Table 3. Existing Cross Section Standards for Metolius

Functional Classification	Right of Way (ft)	Pavement Width (ft)	Lane Width	Curb and Gutter	Sidewalk (ft)	Planting Strip/ Drainage Swale (each side)	On-Street Parking (When Allowed)
Arterial i.e. Jefferson Ave	60	28	12	Yes	5 to 10	7 to 8	Per ODOT Standard
Collector							
Existing Residential:							
Butte Ave	60	28 to 36	12	Yes	5 to 8	7 to 8	Parallel
Washington Ave	60	28 to 36	12	Yes	5 to 8	7 to 8	Parallel
"New Collector"	60 to 64	26 to 28	12	Yes	5 to 8	7 to 8	Parallel
Commercial "New Commercial"	60 to 64	38	12	Yes	5 to 10	7 to 8	Parallel
Local Residential:							
Existing (as of 2006)	60	24	12	Optional	N/A	None	Parallel
"New Residential"	60 to 64	38	12	Yes	5 to 6	6 to 7	Parallel
Alleys	16	N/A	N/A	None	None	None	None
Accessways & Multi-use Paths	10 to 18	6 to 10	3 to 5	None	None	None	None
County Collector Roads:							
9 th Street	60	22	11	None	N/A	None	Parallel
Dover Lane	60	25	12.5	None	N/A	None	Parallel

Data Source: City of Metolius Standard Detail Street Design

ACCESS MANAGEMENT

Providing adequate access to streets, land uses, and key destinations is a critical part of operating and planning for an effective transportation system for all users. ODOT and the County maintain standards to help balance the needs for both “through travelers” (including freight and public transportation) as well as serving the needs of area residents, employees, and visitors. No changes are proposed to the existing access spacing standards, found in Tables 5 through 7 of Technical Memorandum #3.

STREET SOLUTIONS

Solutions developed for the street plan include improvements focused on addressing the safety, connectivity and/or operational needs identified in Technical Memorandum #3.

SUMMARY OF NEEDS

The following needs were identified as part of the Existing and Future Conditions review as well as through agency and public outreach efforts:

- ▶ Consistent with its rural nature, the County roadways provide limited connectivity options between cities and unincorporated communities. As such, the ODOT roadways facilitate much of the County vehicular needs. Feedback from Public Advisory Committee and Project Management Team identified two specific connectivity needs:
 - Direct connections to the Cove Palisades recreation area.
 - Continuous connection of Cherry Lane between US97 and US26. This connection would reduce reliance on the highways and other local roads and serve potential future residential development in these areas.
- ▶ Two of the intersections studied do not meet County level-of-service standards but all meet ODOT mobility targets. The stop-controlled approaches at US 26/Colfax Lane/US 97 and US 97/Iris Lane are both anticipated to operate with high delays in the future.

IDENTIFIED SOLUTIONS

Table 4 provides a summary of the proposed roadway solutions focused on improving connectivity, and Figure 2 shows the locations of the roadway improvements. The table includes the location, description, priority, and planning-level cost estimates.

As shown in Table 4, Projects R-1 and R-2 reflect signage recommendations to better direct motorists to Cove Palisades recreation area. This is recommended in lieu of constructing new roadway segments given that new roadways would be costly to construct, would not provide material changes to the out-of-direction travel required today to the recreational area, and would help to minimize the potential for new intersections on US 97. The signage recommendations are offered given that current mapping applications (Google, Apple, Waze) do not always direct people to the Cove Palisades from the south or north along the designated, signed route.



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Several Visionary projects are identified to illustrate how the City of Madras may grow and extend the roadway network into the County over time. These projects are not anticipated to be needed within the 20-year planning horizon; coordinating with the City of Madras will be important at the time of development to ensure consistent cross-sections. In addition to the network identified here, the City of Madras will be working with ODOT to develop a Refinement Plan for the South Madras Area, which may impact the US 97 highway and other City/County roads in the area. The TSP should be updated after completion of the South Madras work to incorporate the recommendations of that study.

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Table 4. Proposed Roadway Solutions

Project ID	Project Name	Description	Planning Level Cost Estimate*	Expected County Contribution ¹	Funding Partner ¹	Lead Agency ¹	Implementation
R-1	Improve Signage for Access to Cove Palisades from South	Designate and sign (or improve existing signage) preferred routes to access Cove Palisades from US 97. From the south, add/improve signage at Feather Drive/Iris Lane and Iris Lane/Culver Highway.	\$10,000	\$5,000	ODOT	County	Opportunity Project
R-2	Improve Signage for Access to Cove Palisades from North	Designate and sign (or improve existing signage) preferred routes to access Cove Palisades from US 97. Change the primary route to follow Gem Lane, instead of Huber Lane. From the north, add/improve signage at the intersections of Gem Lane/Culver Highway, Gem Lane/Feather Dr, and Gem Lane/Frazier Dr. Remove old sign south of the intersection of Gem Lane/Culver Hwy.	\$10,000	\$5,000	ODOT	County	Opportunity Project
R-3	Cherry Lane Extension	Extend Cherry Lane approximately 4,200 feet to complete the connection between US26 and US97. Potential project elements to be considered in the design include topography (large hill in the vicinity) and power lines in the vicinity.	\$3,360,000	\$3,360,000	--	County	TSP Project
R-4	Cherry Lane/US26 Intersection Realignment Improvements	Realign eastern leg of intersection to align with western leg at 90 degree angle to support increased traffic with Cherry Lane extension project R-3 and to eliminate conflicting left-turns. Evaluate the need for intersection control changes when realignment occurs.	\$1,200,000	\$600,000	ODOT	County/ ODOT	TSP Project
R-5	OR361/Gem Lane Right-Turn Lane	Widen the southbound approach at the intersection of OR361/Gem Lane to allow for a right-turn lane and/or adequate width for traffic to queue without blocking through traffic. This provides storage during the event of a train blocking the tracks, in	\$200,000	\$20,000	ODOT	ODOT	Visionary Project

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Table 4. Proposed Roadway Solutions

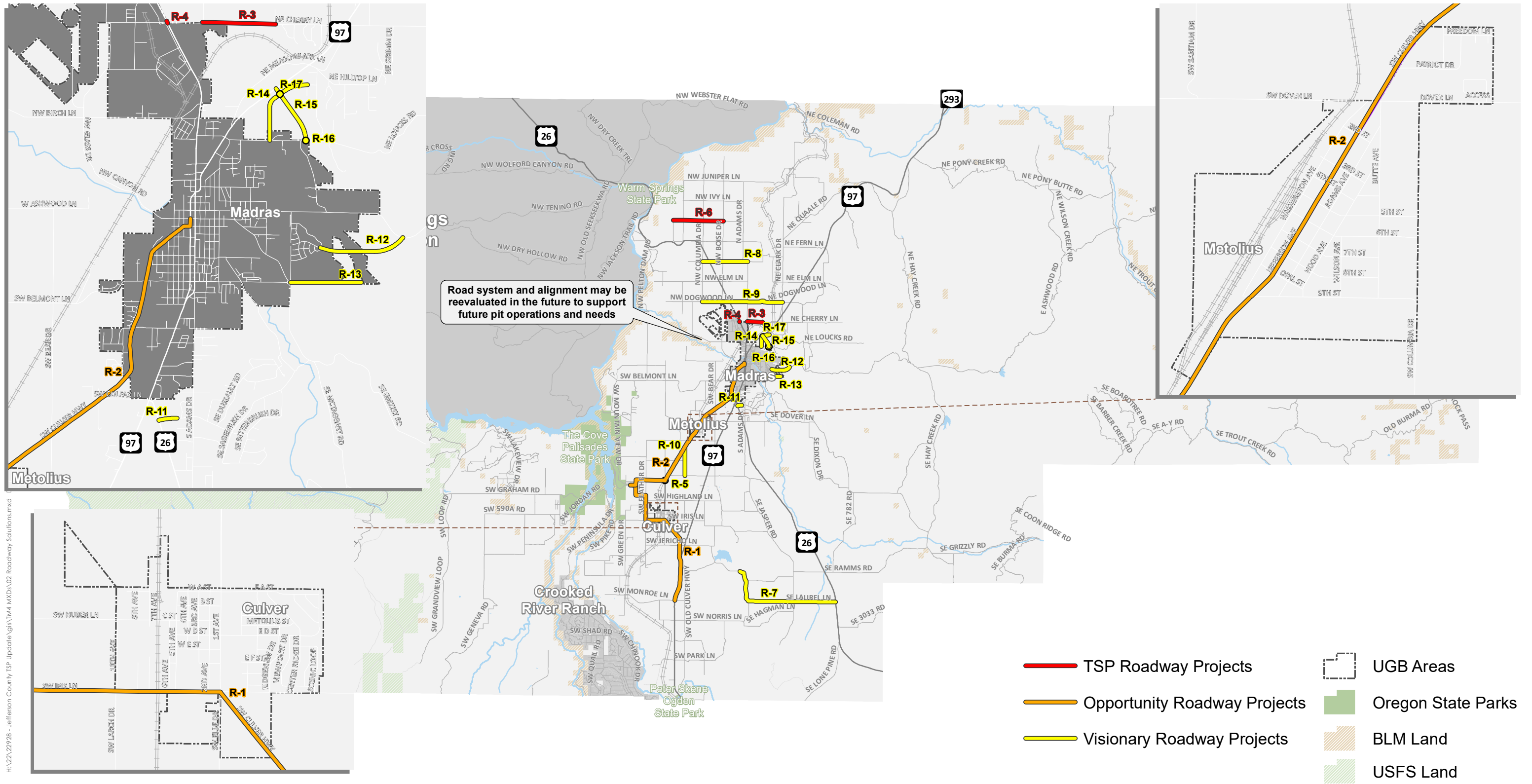
Project ID	Project Name	Description	Planning Level Cost Estimate*	Expected County Contribution ¹	Funding Partner ¹	Lead Agency ¹	Implementation
		support of the Cove Palisades preferred route (R-2).					
Projects Identified in Current TSP that are Recommended for Inclusion in Updated TSP							
R-6	NW Hickory Lane Paving	Complete paving of NW Hickory Lane from approximately 3,750 feet west of Boise Drive to Boise Drive.	\$1,665,000	\$1,665,000	--	County	TSP Project
R-7	SE Laurel Lane/ SE Springer Road/ SE Haystack Reservoir Road Paving	Upgrade and pave SE Laurel Lane, SE Springer Road, and SE Haystack Reservoir Road from US26 to SW Southside Road to improve the connection from US97 to US26.	--	--	--	County	Visionary Project
R-8	NW Fir Lane Improvements	Upgrade NW Fir Lane from NW Columbia Drive to N Adams Drive. Project need may be reevaluated pending the outcome of the US97 Corridor Study.	--	--	--	County	Visionary Project
R-9	NW Dogwood Lane Improvements	Upgrade NW Dogwood Lane from NW Columbia Drive to NE Clark Drive to Minor Collector Road Standards. Project need may be reevaluated pending the outcome of the US97 Corridor Study.	--	--	--	County	Visionary Project
R-10	SW Deschutes Drive Improvements	Upgrade SW Deschutes Drive to Minor Collector Road Standards between SW Highland Drive and OR361. Project need may be reevaluated pending the outcome of the US97 Corridor Study.	--	--	--	County	Visionary Project
R-11	SE Crestview Lane Extension	Extend SE Crestview Lane from S Adams Drive to US 26 as a Minor Collector.	--	--	--	County	Visionary Project
Projects to Support Future Urban Growth							
R-12	SE Yarrow Avenue Extension	Extend SE Yarrow Avenue east as a Minor Collector.	-	--	Madras	Madras	Visionary Project
R-13	SE J Street Extension	Extend SE J Street east as a Major Collector.	-	--	Madras	Madras	Visionary Project
R-14	NE Kinkade Road Extension	Extend NE Kinkade Road north from the UGB as a Major Collector, to connect with the NE Bean Drive Extension (R-15) and NE Boxwood Lane.	-	--	Madras	Madras	Visionary Project
R-15	NE Bean Drive Extension (North)	Extend NE Bean Drive north of Loucks Road as a Major Collector, to connect with US97 at a new intersection.	--	--	Madras	Madras	Visionary Project

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Table 4. Proposed Roadway Solutions

Project ID	Project Name	Description	Planning Level Cost Estimate*	Expected County Contribution ¹	Funding Partner ¹	Lead Agency ¹	Implementation
R-16	NE Loucks Road/ NE Bean Drive Roundabout	Construct a roundabout at the future NE Loucks Road/NE Bean Drive intersection to accommodate future traffic volume. This is also in the Madras Urban Area TSP.	--	--	Madras	Madras	Visionary Project
R-17	NE Hilltop Lane/ NE Brown Drive/ NE Meadowlark Lane Roundabout	Construct a roundabout at the NE Hilltop Lane/ NE Meadowlark Lane/ NE Brown Drive intersection to accommodate future traffic volume. This is also in the Madras Urban Area TSP.	--	--	Madras	Madras	Visionary Project

*Project cost estimates are planning level costs based on unit costs and do not include right-of-way costs or environmental constraints; these would be determined during project design.



Data Source: ODOT
 Madras UGB and Warm Springs not included in TSP.

Figure 2

FREIGHT SOLUTIONS

As noted in Technical Memorandum #3, ODOT classifies US 97, US 26 and US 20 as statewide freight routes.

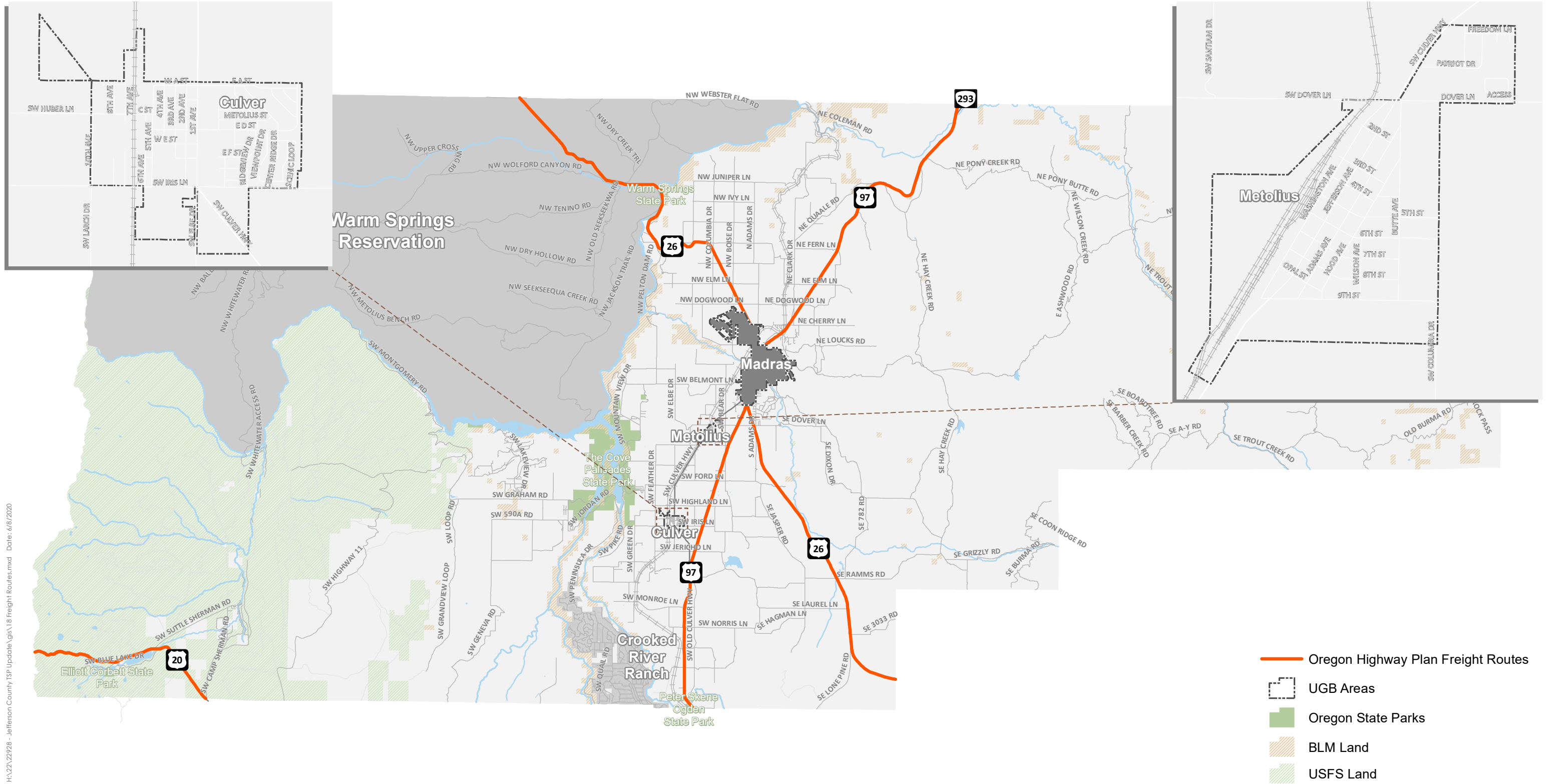
SUMMARY OF NEEDS

The County does not have any designated local freight routes today; instead connections to industrial and employment areas rely on the ODOT facilities.

Developable industrial lands are generally located in the western areas of Culver and Metolius, with adequate access provided via Culver Highway (OR 361). One quarry was identified (Rock & Road Quarry Products) on SW Eureka Lane (located southwest of Metolius), which may be accessed by SW Elbe Drive from the south or SW Eureka Lane from the east. A structurally deficient bridge is located on Elbe Drive at an irrigation canal at MP 0.89 along the route from the south; this bridge is identified as bridge project D-10 in Figure 8 of this memorandum.

The City of Madras developed an Industrial Site Readiness Plan in 2017. This Plan identifies infrastructure improvements, including railroad and street system improvements, necessary to support the development of the Industrial Park in Northeast Madras. Several of these recommendations are located on County land. The Industrial Site Readiness Plan should be referenced upon future development in the Industrial area to identify the planned infrastructure improvements.

There are no additional recommendations to support freight within Jefferson County and no proposed changes to designated freight routes on the highway system.



HA22, 22928 - Jefferson County TSP Update.gis\18 Freight Routes.mxd Date: 6/8/2020

Figure 3

INTELLIGENT TRANSPORTATION SYSTEM SOLUTIONS

Intelligent Transportation System (ITS) infrastructure enhances traffic flow, maintenance activities, and safety through the application of technology. The provision of reliable ITS infrastructure to inform motorists about incidents, weather conditions, and congestion is a useful and cost-effective tool for rural areas, such as Jefferson County. To date, the County has not developed an ITS Plan for its roadways.

SOLUTIONS

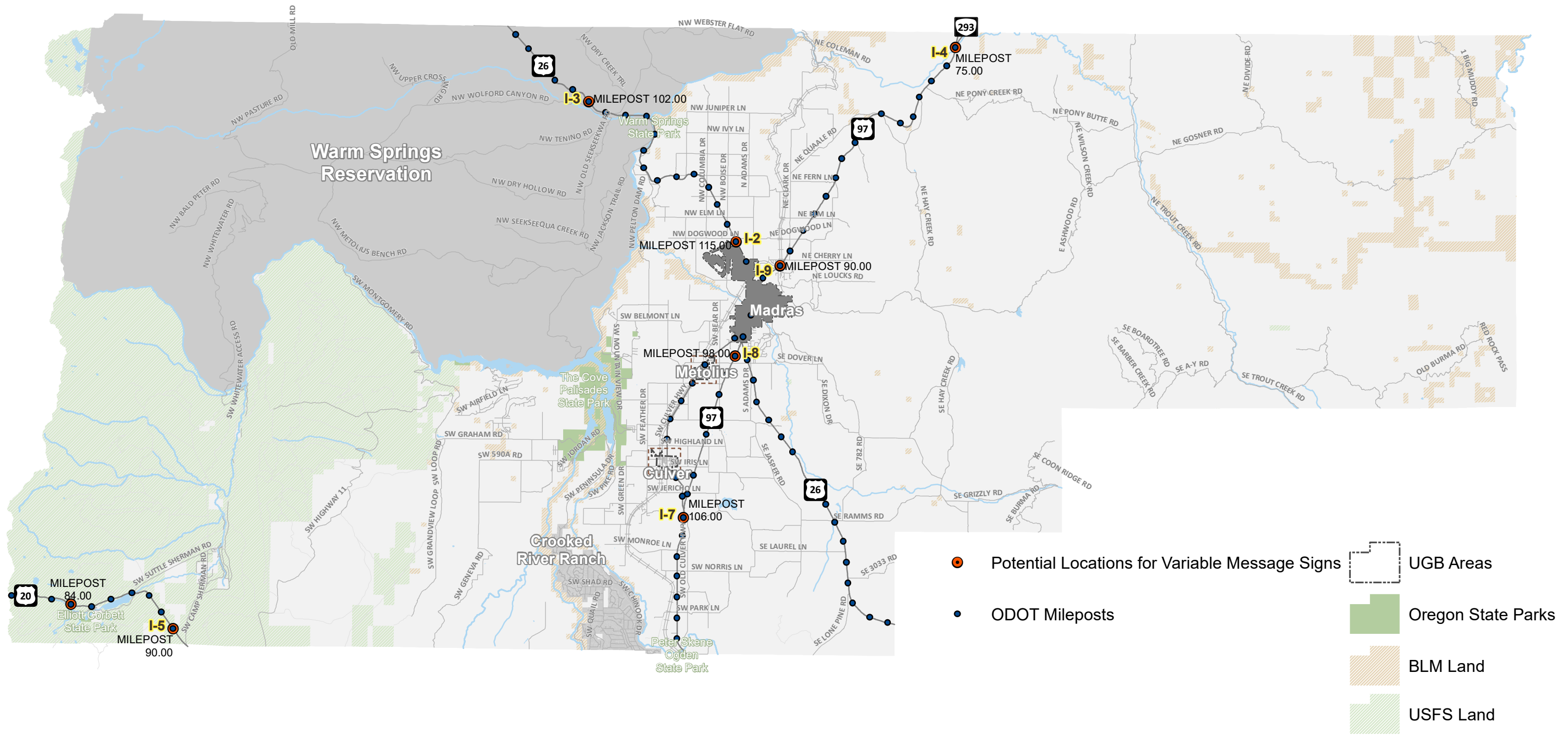
To provide cost-effective and flexible solutions over time, the County can collaborate with ODOT to develop an ITS plan. This plan could likely include provision of variable message signs at key locations to inform drivers about incidents, congestion associated with events, weather or roadway conditions, or other safety messages. 5 and Figure 4 identify key locations along state highways where variable message signs may be considered based on locations where roadway context changes, locations prone to changes in weather conditions due to elevations, locations prone to congestion, safety concerns, and locations with a lack of cell phone service. These locations should be further evaluated through an ITS Plan development that would follow adoption of the TSP. Additional components of an ITS Plan may include identifying locations for fiber, weather stations, video monitoring cameras, dynamic speed limit or speed advisory signs, curve speed warning signs, and intersection warning signs.

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Table 5. Proposed ITS Solutions

Project ID	Project Name	Description	Planning Level Cost Estimate	Expected County Contribution ¹	Funding Partner ¹	Lead Agency ¹	Implementation
I-1	County ITS Plan	Complete an ITS Plan for the County to identify key needs and solutions for the County to address safety, congestion, and weather issues.	\$150,000	\$15,000	ODOT	ODOT	TSP Project
I-2 through I-9	US26 MP116 Variable Message Signs	Install variable message signs to be used to inform drivers of incidents, weather conditions, etc. The following locations should be considered and evaluated through the ITS Plan: I-2: US 26 at MP 116 I-3: US 26 at MP 102 I-4: US 97 at MP 75 I-5: US 20 at MP90 I-6: US 20 at MP84 I-7: US 97 at MP106 I-8: US 97 at MP98 I-9: US 97 at MP 90	\$250,000-500,000 each	\$0 each	ODOT	ODOT	Visionary

HA22, 22928 - Jefferson County TSP Update.gis\TM4 MXDs\02 ITS Solutions.mxd Date: 11/17/2020



Madras UGB and Warm Springs not included in TSP.

Figure 4

TRANSPORTATION SAFETY IMPROVEMENTS

Transportation safety needs identified in *Technical Memorandum 3* are based on crash history, locations with geometric conditions that may be associated with crash risk, and locations of perceived needs based on drivers' experience and "near-misses."

SUMMARY OF NEEDS

Between 2013 and 2017, a total of 963 crashes were reported in Jefferson County, outside of the Madras UGB. Eight percent (81 crashes) of these resulted in fatalities or serious injuries. Among the fatal and severe crashes, the most common crash types were fixed object and head-on, and the most common contributing factor reported was excessive speed. Location-specific findings included:

- ▶ Four of the TSP study intersections experienced a fatal or severe injury crash:
 - OR361/Iris Lane: Two of the three reported crashes resulted in fatal or severe injury.
 - OR361/US97: One of the six reported crashes resulted in fatality.
 - US97/Iris Lane: One of the four reported crashes resulted in severe injury.
 - US26/Colfax Lane/US97: Two of the twelve reported crashes resulted in severe injuries.
- ▶ The section of US 97 south of Madras has experienced several fatal or severe crashes in recent years, which is not yet reflected in the crash data. Based on this input, this section of US 97 was identified for closer evaluation.
 - Within this segment of US 97 from Madras to the Deschutes County line, 17 fatal or severe crashes were reported between 2013 – 2017.
 - Five out of the 17 fatal/severe crashes were angle crashes, which occurred at the intersections of US97 with Dover Lane, Iris Lane, and Jericho Lane.
 - Six out of the 17 fatal/severe crashes were head-on collisions.
- ▶ Three locations in the County were identified by the ODOT 2017 Safety Priority Index System (SPIS, 90th percentile or higher):
 - Boise Drive, MP 2.33 (Boise Drive/Gumwood Lane), SPIS 95-100%
 - OR361, MP 9.34 (intersection of OR361/Iris Lane), SPIS 90-94.99%
 - US97, MP 87.42 (near intersection of US97/Colfax Lane/US26), SPIS 90-94.99%
- ▶ Based on feedback from the Project Advisory Committee, the following locations were identified as potential safety needs to be further evaluated during solutions development:
 - Mustang Road/Groundhog Road
 - Bear Drive/US97
 - Dover Lane/US97
 - Cherry Lane/US97
 - Frazier Drive/Fisch Lane
 - Frazier Drive/Gem Lane

PROGRAM CONSIDERATIONS

Several of the needs identified for the County reflect conditions best addressed through education, enforcement, or outreach programs. The County may consider implementing programs or systemic treatments at many locations throughout the County. The type of treatments that could be considered in the future include:

- ▶ **ROADWAY TREATMENTS TO REDUCE ROADWAY DEPARTURE CRASHES** - With new road construction and roadway maintenance projects, the County could consider the construction of shoulders (as required by roadway standards), centerline and shoulder rumble strips, edge-line striping, recessed or raised pavement markers, and/or curve signing upgrades.
- ▶ **ROADWAY TREATMENTS TO REDUCE SPEED** - With new road construction and roadway maintenance projects, the County could consider lane narrowing at targeted locations, transverse speed reduction markings, and speed feedback signs in conjunction with posted speed limit signs. In addition, enhanced enforcement at key corridors could focus on driving at appropriate speeds.
- ▶ **SAFETY DATA MONITORING** – County staff, in collaboration with ODOT, will continue to periodically analyze crash data and identify the need for engineering, enforcement and educational treatments at specific locations.
- ▶ **SAFE ROUTES TO SCHOOL** – The County should seek projects that improve safety near schools and school routes, particularly for those walking and biking to school.
- ▶ **ENHANCED INTERSECTION SIGNING AND STRIPING OPTIONS** – At identified collector and arterial intersections, the County could consider enhancements such as advanced warning signs, double advance signs, reflective striping and signage, oversized stop signs, double stop signs, stop ahead pavement markers, rumble strips, and edge-line treatments.

SOLUTIONS

Proposed solutions intended to reduce crash frequency, severity, and risk are shown in 6 and on the map in Figure 6. These locations were either supported by crash data, a review of current conditions at the site, or identified by members of the public as safety concerns.

Several project solutions indicate “systemic signage and striping enhancements”. The Federal Highway Administration’s (FHWA) *Low-Cost Safety Enhancements for Stop-Controlled and Signalized Intersections* report identifies treatment options that, when used together, help increase visibility and awareness of an intersection. Figure 5 shows an example of treatments that may be used together to increase visibility at stop-controlled intersections. These treatments may be supplemented with stop ahead pavement markings, rumble strips, oversized stop signs, and flashing beacons when appropriate.

Systemic sign enhancements are being implemented through ODOT ARTS funding at three intersections along Culver Highway/OR 361: SW Bear Drive, SW Highland Lane, and SW Jericho Lane. Construction is set to begin in January of 2022. These are not shown in the solutions list since they are already funded projects. Some intersections, such as OR 361/Bear Drive may be further evaluated for potential safety enhancements as part of the US 97 Corridor Plan, which will consider impacts to the County network as traffic patterns may shift.

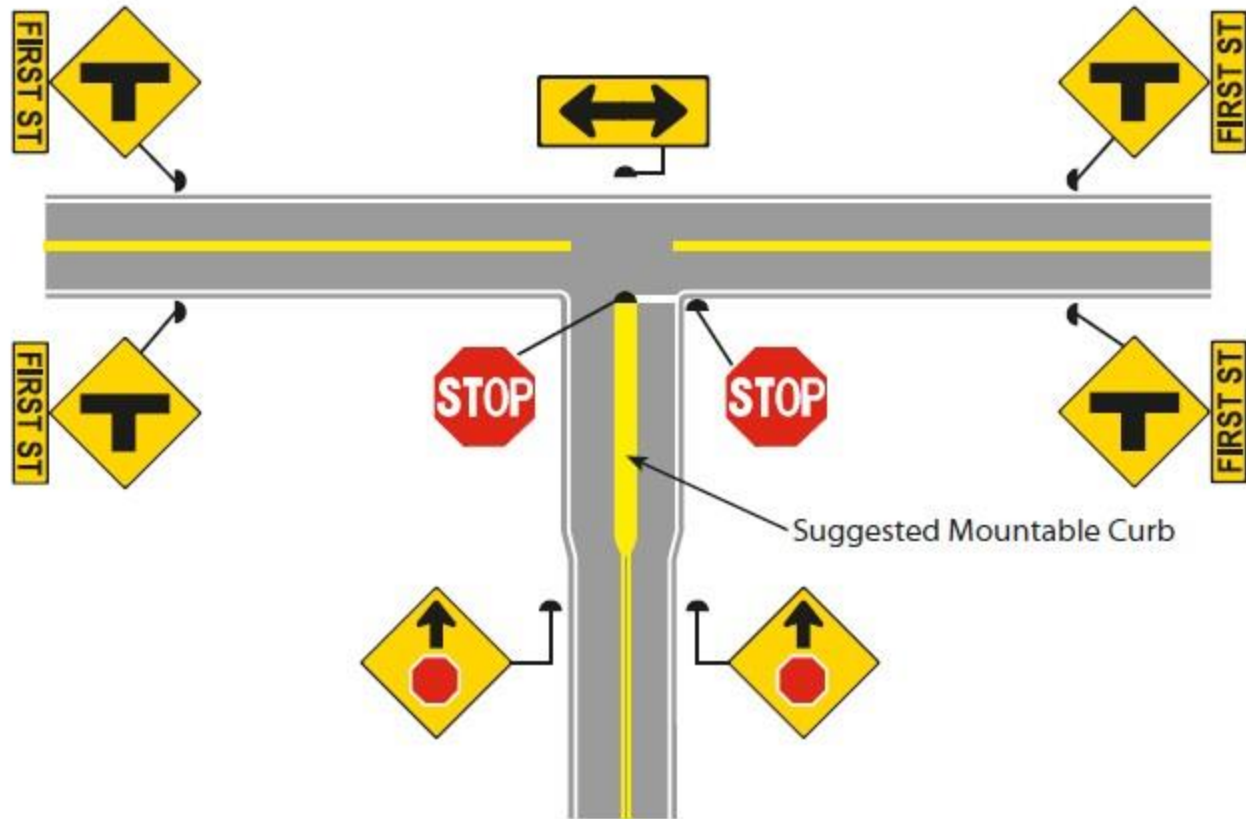


Figure 5. Example of Low-Cost Countermeasures for Stop-Controlled Intersections (FHWA)

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Table 6. Proposed Safety Solutions

Project ID	Project Name	Description	Planning Level Cost Estimate	Expected County Contribution ¹	Funding Partner ¹	Lead Agency ¹	Implementation
S-1	US 97 Corridor Study	Conduct a corridor study of US 97 south of Madras to determine the long-term safety and capacity needs and vision for the corridor. Operational data shows a high delay for side streets along this corridor. Crash history revealed 17 fatal/severe crashes on US97 between 2013 and 2017. Treatments to be evaluated may include access modifications, intersection control changes, highway capacity enhancements, roadway network modifications, and other treatments to reduce crashes.	\$150,000	\$15,000	ODOT	ODOT	TSP Project
S-2	Speed and Safety Education/ Enforcement Campaigns	Conduct outreach campaigns targeted at speed reduction and behavioral safety, in conjunction with increased enforcement along the US 97 corridor in partnership with The Oregon State Patrol (OSP) and Deschutes County	Varies	Varies	ODOT/ OSP/ Deschutes County	ODOT / OSP	TSP Project
S-3a	OR361/Iris Lane/Elbe Drive Intersection Safety Improvements	Install signing and striping enhancements (larger signs, wide stop bars, stop ahead pavement markings, etc.) to increase visibility and awareness of intersection. Improve delineation with recessed pavement markers, delineators, reflective signs, reflective posts, etc.	\$100,000	\$0	ODOT/ City of Culver	ODOT	TSP Project

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Table 6. Proposed Safety Solutions

Project ID	Project Name	Description	Planning Level Cost Estimate	Expected County Contribution ¹	Funding Partner ¹	Lead Agency ¹	Implementation
S-3b	OR361/Iris Lane/ Elbe Drive Intersection Traffic Control Improvements	Evaluate intersection for potential traffic control improvement (left turn lane, mini roundabout, realignment, etc.) to encourage slower speeds, better delineate the intersection, and reduce crash risk.	\$50,000	\$25,000	ODOT/City of Culver	ODOT	TSP Project
S-4	US97/Iris Lane Intersection Safety Improvements	Install advanced stop ahead signage on Iris Lane to increase visibility and awareness of the intersection.	\$20,000	\$2,000	ODOT	ODOT	Opportunity Project
S-5a	US26/Colfax Lane/US97 Intersection Safety Improvements - Systemic	Install speed treatments on the northbound approach to the intersection to encourage slower speeds as vehicles approach Madras. Treatments may include: transverse speed reduction markings and speed feedback signs (in conjunction with posted speed limit signs). Create maintenance agreement between jurisdictions for speed feedback signs.	\$117,000	\$0	ODOT	ODOT	TSP Project
S-5b	US26/Colfax Lane/US97 Intersection Safety Improvements – Infrastructure	Modify intersection approaches to encourage slower turning speeds and reduce crossing distance for vehicles. Install activated intersection warning sign to warn drivers on US 97 when vehicles are waiting on the side streets at the intersection. Widen centerlines to reduce travel lane width.	\$1,000,000	\$0	ODOT	ODOT	TSP Project
S-6a	US97/Dover Lane Intersection Safety Improvements- Evaluations	Evaluate the intersection skew to determine if geometric or sight distance improvements are needed. Evaluate whether vertical curve restricts sight distance.	\$10,000	\$0	ODOT	ODOT	Opportunity Project

JEFFERSON COUNTY TRANSPORTATION SYSTEM PLAN

Table 6. Proposed Safety Solutions

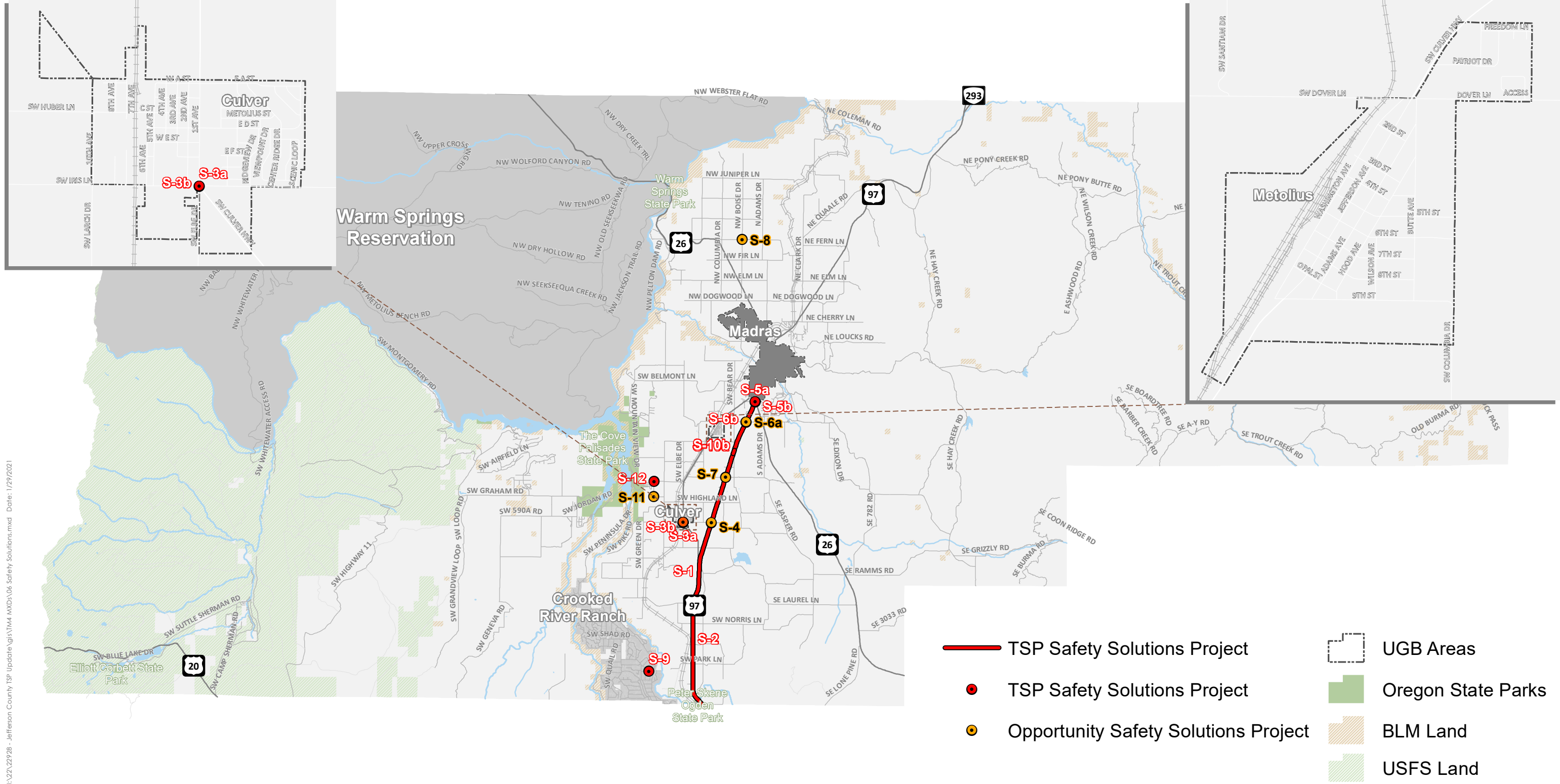
Project ID	Project Name	Description	Planning Level Cost Estimate	Expected County Contribution ¹	Funding Partner ¹	Lead Agency ¹	Implementation
S-6b	US97/Dover Lane Intersection Safety Improvements-Infrastructure	Install intersection warning system that is activated when vehicles are waiting on side streets. Widen shoulders near the intersection by 2'.	\$1,000,000	\$0	ODOT	ODOT	TSP Project
S-7	US97/Ford Lane Intersection Safety Improvements	Install signing, striping, and reflectivity enhancements to increase visibility and awareness of the intersection	\$40,000	\$0	ODOT	ODOT	Opportunity Project
S-8	Boise Drive/Gumwood Lane Intersection Safety Improvements	Install signing and striping enhancements to increase visibility and awareness of the intersection.	\$15,000	\$15,000	N/A	County	Opportunity Project
S-9	Mustang Road/Groundhog Road Intersection Safety Improvements	Reconstruct intersection to a 90 degree angle turn on Mustang Road; modify intersection approaches to reduce turning speeds; pave the approaches on Groundhog Road and Perch Road; install new stop bars; and install signing and striping enhancements to increase visibility and awareness of the intersection.	\$750,000	\$750,000	Crooked River Ranch Community	County	TSP Project
S-10a	Bear Drive/US97 Intersection Safety Improvements-Systemic	Install speed feedback signs. Create maintenance agreement between jurisdictions for maintaining and replacing speed feedback signs.	\$100,000	\$0	ODOT	ODOT	TSP Project
S-10b	Bear Drive/US97 Intersection Safety Improvements-Infrastructure	Install speed treatments. Consider lane narrowing (using centerline spacing or recessed pavement markers) to reduce speed. Consider limited shoulder widening to increase recoverable area for roadway departure crashes. (Cost is reflective of lane narrowing with recessed pavement markers and shoulder widening of 2').	\$1,000,000	\$0	ODOT	ODOT	TSP Project

JEFFERSON COUNTY TRANSPORTATION SYSTEM PLAN

Table 6. Proposed Safety Solutions

Project ID	Project Name	Description	Planning Level Cost Estimate	Expected County Contribution ¹	Funding Partner ¹	Lead Agency ¹	Implementation
S-11	Frazier Drive/ Fisch Lane Intersection Safety Improvements	Improve delineation along curve approaching intersection with additional chevrons and delineators. Consider widening the shoulders to increase recoverable area for vehicles and area for biking along Oregon Scenic Bikeway. (Note: Cost for shoulder widening is included in overlapping bicycle project.)	\$3,000 for delineation	\$3,000	N/A	County	Opportunity Project
S-12	Frazier Drive/ Gem Lane Intersection Safety Improvements	Install new 6' or wider shoulder for recovery area for vehicles. Improve delineation along curve with additional chevrons and delineators. Enhance signing and striping.	\$160,000	\$160,000	N/A	County	TSP Project

*Project cost estimates are planning level costs based on unit costs and do not include right-of-way costs or environmental constraints; these would be determined during project design.



Madras UGB and Warm Springs not included in TSP.



Figure 6

US 97 Corridor

The recommendations in the TSP for US 97 focus on near-term safety improvements that can be implemented to reduce crash risk without closing accesses or intersections, changing the existing traffic control, or modifying the movements permitted at each intersection.

The TSP Also recommends a focused corridor analysis of 20-year safety improvements on the section of US 97 south of the Madras UGB. This corridor study will be conducted following adoption of the TSP. Accordingly, Project S-1 addresses County intersections and private access points along US 97. In addition to technical analyses, this corridor study will include public engagement efforts to review potential solutions, given that these larger improvements will have impacts to existing accesses and change travel patterns on the County roadway system. For example, the intersection of Bear Drive/OR 361 will be evaluated to determine if/how traffic patterns may change and what potential safety recommendations may be needed at the intersection based on existing crash history and expected traffic changes.

Based on discussions between ODOT and the County, some of the key considerations of the Project S-1 study will include:

- ▶ Facilitating turning movements and east-west crossing traffic at key intersections such as Colfax Lane/US 26, Dover Lane, Iris Lane, and OR 361;
- ▶ Closing or modifying allowable turning movements at key intersections throughout the corridor;
- ▶ Identifying County roadway projects necessary to support the highway changes.;
- ▶ Accommodating local needs such as agricultural traffic and school traffic;
- ▶ Improving safety along the corridor by reducing crash frequency, severity, and risk;
- ▶ Providing adequate capacity along the corridor;
- ▶ Encouraging appropriate speeds and behavior; and
- ▶ Accommodating freight traffic.

MULTIMODAL SYSTEM

PEDESTRIAN AND BICYCLE SYSTEM

In rural Jefferson County, people walking and biking generally share the same roadside shoulders and/or shared-use paths. Facilities that are deficient for one user are usually deficient for the other, thus recommended improvements can benefit both users.

SUMMARY OF NEEDS

Facilities for people walking and riding bicycles are needed in the unincorporated communities and to provide access to recreational areas. In particular, the key needs include:

- ▶ Small unincorporated communities currently lack dedicated pedestrian and bicycle facilities to connect homes with schools and transit stops.
- ▶ The lack of connections between Metolius, Culver, Madras, and Crooked River Ranch make walking or biking between communities more difficult.
- ▶ Segments of US97 north of Madras and US26 east of Madras do not have paved shoulders that are of sufficient width to allow walking and cycling (i.e., at least four feet wide). This lack of paved shoulders requires people biking to share the lane on these high-speed roads.
- ▶ The Madras Mountain Views Scenic Bikeway is a 29-mile bicycle route that travels through Madras, Metolius, the Cove Palisades State Park, and Culver. Although signed, there are no dedicated bicycle lanes or shoulders of sufficient width along the majority of the route. The only shoulders available are within Madras and along OR361.

POLICY AND PROGRAM CONSIDERATIONS

Suggested general policy and program considerations for improving access and circulation for people walking and cycling are provided below.

- ▶ **ROADWAY STANDARDS** - Jefferson County should add shoulders on all new roadways or as part of all projects involving major reconstruction as conditions permit.
 - Providing shoulders consistent on all roads may not be feasible due to constraints such as right-of-way, built or natural environmental impacts, high costs to construct, etc. Ultimately, the inclusion of shoulders to provide spaces for people walking or biking on existing and new roads will not only expand the non-motorized transportation network but will also provide more travel options. The County Public Works Director may approve alternate options, such as shared-use paths, when appropriate. These facilities should provide transitions to different facilities as needed.
 - A priority bicycle network of roadways could be identified to help the County identify the specific roadways in need of shoulders as well as the financial and staffing resources needed to implement.

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- Placing additional priority for widening shoulders at key curves, hills, bridges, and other locations could be beneficial where vehicles and people biking may be at increased risk for sharing the road with limited visibility (curves) or higher speed differentials (hill climbs).
- The County and ODOT can collaboratively identify priority locations along the state highways for added or increased shoulder widths.
- ▶ **MONITORING SYSTEM** – Pending availability of resources, the County could establish a data monitoring program that helps to identify and prioritize locations with higher levels of walking and cycling activity. In combination with safety reviews, this data monitoring program can help the prioritization of resources in the future.
- ▶ **SAFETY PROGRAM** – In collaboration with other agencies, a countywide bicycle/pedestrian safety program could be implemented. Key activities may include:
 - Ensure that Jefferson County employees, particularly Sheriff's Department staff, have adequate training regarding bicycle/pedestrian safety and enforcement issues.
 - Encourage and support efforts by County schools or other organizations to develop and add a bicycle/pedestrian safety curriculum for students of all ages.
 - Consider installing signage along roadways where bicycle touring or other significant bicycling activity is expected advising travelers of the "rules of the road" pertaining to motorists and non-motorized travelers.
- ▶ **MAINTENANCE** – The County could develop a specific schedule (and associated budget) to prioritize maintenance activities along key cycling routes.
 - Ongoing maintenance is important to maximize the investment in bicycle and pedestrian facilities. Maintenance should provide for periodic removal of debris including small branches and other roadside debris that could create safety hazards for a bicyclist or pedestrian. Cracks and potholes impede safe non-motorized travel and should also be remedied promptly as is feasible. Explore opportunities for coordination and cooperation with state and federal agencies in examining innovative means of providing or funding pathways, trails, and equestrian facilities.
- ▶ **RAIL TO TRAILS** - Explore opportunities for development of non-motorized transportation facilities in the railroad right-of-way, or in abandoned railroad rights-of-way as these become available.
- ▶ **INTERSECTION SAFETY** - The County may identify intersections where changes are needed to enable adequate sight distance for pedestrians and bicyclists looking to cross the roadway. Appropriate sight distance should be calculated according to AASHTO's *A Policy on Geometric Design of Highways and Streets*. Additional treatments to enhance crossings at major intersections should be considered where appropriate.

SOLUTIONS

7 summarizes the proposed walking and cycling solutions that were identified to address the needs. These solutions are also reflected in Figure 7. Pedestrian and bicycle facilities provide options for people to walk and bike, providing mobility for those who may not drive. Although County roadway standards identify the need for shoulders on all new or reconstructed roads, the intent of this network and project list is to develop a priority bicycle system of roads where investments could be focused to create a continuous network of facilities for people riding bikes. As appropriate, the County's Public Works



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Director may identify alternative solutions to shoulders on key roadways as part of specific project design efforts.

The provision for and appropriate width of shoulders on each of the roadways identified in the table are defined in accordance with the County's cross-section standards. Although local streets are generally anticipated to only include signage, there may be key roadways in the future where the County identifies the need for shoulders along priority bicycle routes.

JEFFERSON COUNTY TRANSPORTATION SYSTEM PLAN

Table 7. Proposed Bicycle Solutions

Project ID	Project Name	Description	Planning Level Cost Estimate	Expected County Contribution ¹	Funding Partner ¹	Lead Agency ¹	Implementation
B-1	Oregon Scenic Bikeway Signing Improvements	Install new signing along the Oregon Scenic Bikeway to indicate that bicycles may be on the road/share the lane.	\$65,000	\$65,000	--	County	Opportunity Project
B-2	Culver Hwy Multi-Use Path	Install 10' shared use path along 11.5 mile stretch of road with sections along the Oregon Scenic Bikeway. This path would create a connection between Madras, Metolius, and Culver. Connect with B-24 to form connection between Madras and Peter Skene Ogden State Park. (Path may transition to sidewalks within Culver to align with Downtown Culver Streetscape Plan (P-7).)	\$13,500,000	--	ODOT	ODOT	TSP Project
B-3	Huber Ln Shoulder Widening	Install new 6' or wider shoulders along 2,400 ft stretch of the road that is along the Oregon Scenic Bikeway and provides connectivity to the city of Culver	\$775,000	\$775,000	--	County	Visionary
B-4	Feather Drive Shoulder Widening	Install new 6' or wider shoulders along 4,800 ft stretch of the road that is along the Oregon Scenic Bikeway.	\$1,545,000	\$1,545,000	--	County	Visionary

JEFFERSON COUNTY TRANSPORTATION SYSTEM PLAN

Table 7. Proposed Bicycle Solutions

Project ID	Project Name	Description	Planning Level Cost Estimate	Expected County Contribution ¹	Funding Partner ¹	Lead Agency ¹	Implementation
B-5	Fisch Lane View Drive Shoulder Widening	Install new 6' or wider shoulders along 2,650 ft stretch of the road that is along the Oregon Scenic Bikeway.	\$860,000	\$860,000	--	County	Visionary
B-6	Frazier Drive Shoulder Widening	Install new 6' or wider shoulders along 2,700 ft stretch of road that is along the Oregon Scenic Bikeway.	\$870,000	\$870,000	--	County	Visionary
B-7	Peck Road Shoulder Widening	Install new 6' or wider shoulders along 1,500 ft section of road that is along the Oregon Scenic Bikeway.	\$485,000	\$485,000	--	County	Visionary
B-8	Mountain View Drive Shoulder Widening	Install new 6' or wider shoulders along 7 mile stretch of road that is along the Oregon Scenic Bikeway	\$11,900,000	\$11,900,000	--	County	Visionary
B-9	Belmont Lane Shoulder Widening	Install new 6' or wider shoulders, where possible, on 6.75 mile stretch of road that is along the Oregon Scenic Bikeway; Constraint for consideration include topography such as narrow road, rocky hill, and drop off area	\$11,480,000	\$11,480,000	--	County	Visionary Project
B-10	Iris Lane Shoulder Widening	Install new 6' or wider shoulders along 2.93 mile section of road in order to enhance the county bicycle network	\$3,315,000	\$3,315,000	--	County	Visionary Project

JEFFERSON COUNTY TRANSPORTATION SYSTEM PLAN

Table 7. Proposed Bicycle Solutions

Project ID	Project Name	Description	Planning Level Cost Estimate	Expected County Contribution ¹	Funding Partner ¹	Lead Agency ¹	Implementation
B-11	Elbe Drive- South Section Signing Improvements	Install new signing along 1.3 mile section of road that directly serves Culver from the south to indicate that bicycles and people walking may be on the road.	\$10,000	\$10,000	--	County	Opportunity Project
B-12	Camp Sherman Road Shoulder Widening	Install new 6' or wider shoulders along 4.82 mile section of road in order to enhance the county bicycle network	\$8,200,000	\$8,200,000	--	County	TSP Project
B-13	Suttle Lake Rd Shoulder Widening	Install new 6' or wider shoulders along 2620' section of road in order to enhance the county bicycle network	\$840,000	\$840,000	--	County	TSP Project
B-14	Chinook Drive Shoulder Widening	Widen existing shoulders to at least 6' along 2.5 mile section of road in order to enhance the county bicycle network.	\$3,240,000	\$3,240,000	--	County	TSP Project
B-15	Shad Rd Shoulder Widening	Widen existing shoulders to at least 6' along 2.55 mile section of road in order to enhance the county bicycle network.	\$8,670,000	\$8,670,000	--	County	TSP Project
B-16	Mustang Rd Shoulder Widening	Widen existing shoulders to at least 6' along 1.2 mile section of road in order to enhance the county bicycle network	\$2,040,000	\$2,040,000	--	County	TSP Project

JEFFERSON COUNTY TRANSPORTATION SYSTEM PLAN

Table 7. Proposed Bicycle Solutions

Project ID	Project Name	Description	Planning Level Cost Estimate	Expected County Contribution ¹	Funding Partner ¹	Lead Agency ¹	Implementation
B-17	Meadowlark Rd Shoulder Widening	Install new 6' or wider shoulders along 1.2 mile section of road in order to enhance the county bicycle network	\$2,040,000	\$2,040,000	--	County	Visionary Project
B-18	Loucks Rd Shoulder Widening	Install new 6' or wider shoulders along 600 ft section of road in order to enhance the county bicycle and pedestrian network	\$190,000	\$190,000	--	County	Visionary Project
B-19	Hilltop Lane Shoulder Widening	Install new 6' or wider shoulders along 3800 ft section of road in order to enhance the county bicycle network	\$1,220,000	\$1,220,000	--	County	Visionary Project
B-20	Adams Drive Shoulder Widening	Increase shoulder widths to 6' along 5000 ft section of road in order to enhance the county bicycle network	\$1,600,000	\$1,600,000	--	County	Visionary Project
B-21	US 97 North Shoulder Widening	Increase shoulder widths to 8' along 17 mile section of road. Project design may include other alternatives such as a multi-use path instead. (Cost reflective of increasing shoulder widths).	\$32,500,000	\$0	ODOT	ODOT	Visionary Project

JEFFERSON COUNTY TRANSPORTATION SYSTEM PLAN

Table 7. Proposed Bicycle Solutions

Project ID	Project Name	Description	Planning Level Cost Estimate	Expected County Contribution ¹	Funding Partner ¹	Lead Agency ¹	Implementation
B-22	US 26 East Shoulder Widening	Increase shoulder widths to 8' along 1.6 mile section of road. Project design may include other alternatives such as a multi-use path instead. (Cost reflective of increasing shoulder widths).	\$36,800,000	\$0	ODOT	ODOT	Visionary Project
B-23	Feasibility Study for Connection Between Madras and Warm Springs	Look into options of providing additional connection between Madras and Warm Springs	\$50,000	\$5,000	ODOT, Madras, Warm Springs	ODOT	Visionary Project
B-24	Culver Hwy South Section Signing Improvements	Install new signing along a 6.8 mile section of road in order to enhance the county bicycle and pedestrian network and connectivity between Peter Skene Ogden State Park and Madras and to indicate that bicycles may be on the road/share the lane.	\$10,000	\$0	ODOT	ODOT	Opportunity Project
B-25	NW Birch Lane Bicycle Facility	Install bicycle facility on Birch Lane from Madras UGB to NW Glass Drive, consistent with the Madras TSP.	TBD in Project Development	-	Madras	Madras	Visionary Project
B-26	NW Glass Drive / NW Canyon Road Bicycle Facility	Install bicycle facility on NW Glass Drive/NW Canyon Road from NW Adler Street to Madras UGB, consistent with Madras TSP.	TBD in Project Development	-	Madras	Madras	Visionary Project

JEFFERSON COUNTY TRANSPORTATION SYSTEM PLAN

Table 7. Proposed Bicycle Solutions

Project ID	Project Name	Description	Planning Level Cost Estimate	Expected County Contribution ¹	Funding Partner ¹	Lead Agency ¹	Implementation
B-27	NE B Street Bicycle Facility	Install bicycle facility on NE B Street, extending approximately one mile east of Madras UGB, consistent with Madras TSP.	TBD in Project Development	-	Madras	Madras	Visionary Project
B-28	SE Grizzly Drive Bicycle Facility	Install bicycle facility on SE Grizzly Drive between SE J Street and SE Sagebrush Drive, consistent with the Madras TSP.	TBD in Project Development	-	Madras	Madras	Visionary Project
B-29	SE McTaggart Road Bicycle Facility	Install bicycle facility on SE McTaggart Road between Madras UGB and SE Sagebrush Drive, consistent with the Madras TSP.	TBD in Project Development	-	Madras	Madras	Visionary Project
B-30	SE Sagebrush Drive Bicycle Facility	Install bicycle facility on SE Sagebrush Drive between SE Dry Gulch Drive and SE Grizzly Road, consistent with the Madras TSP.	TBD in Project Development	-	Madras	Madras	Visionary Project
B-31	SE Madras Shared-Use Path	Install shared-use path system SE of Madras UGB, consistent with the Madras TSP.	TBD in Project Development	-	Madras	Madras	Visionary Project

JEFFERSON COUNTY TRANSPORTATION SYSTEM PLAN

Table 7. Proposed Bicycle Solutions

Project ID	Project Name	Description	Planning Level Cost Estimate	Expected County Contribution ¹	Funding Partner ¹	Lead Agency ¹	Implementation
B-32	Pedestrian/Bicycle Crossing Study at Culver HWY/US97 (MP105.74)	Evaluate opportunities for an enhanced crossing at intersection, potentially grade-separated, to provide opportunities for people biking and people walking to cross US97 for multimodal connection between Peter Skene Ogden State Park and Madras.	\$100,000	\$0	ODOT	ODOT	Visionary Project
B-33	Pedestrian/Bicycle Crossing Study at US97 MP112.43 (Near Peter Ogden State Park)	Evaluate opportunities for an enhanced crossing at intersection, potentially grade-separated, to provide opportunities for people biking and people walking to cross US97 for multimodal connection between Peter Skene Ogden State Park and Madras.	\$100,000	\$0	ODOT	ODOT	Visionary Project
BP-1	Dover Lane Shoulder Widening	Install new 6' or wider shoulders along 3,300 ft section of the road that is part of the Oregon Scenic Bikeway.	\$1,065,000	\$1,065,000	--	County	Visionary Project
BP-2	9th Street Shoulder Widening	Install new 6' or wider shoulders along 2,400' section of the roadway that is along the Oregon Scenic Bikeway.	\$775,000	\$775,000	--	County	Visionary Project

JEFFERSON COUNTY TRANSPORTATION SYSTEM PLAN

Table 7. Proposed Bicycle Solutions

Project ID	Project Name	Description	Planning Level Cost Estimate	Expected County Contribution ¹	Funding Partner ¹	Lead Agency ¹	Implementation
P-1	Butte Avenue Sidewalk	Install new 5-10' sidewalk in accordance with Metolius street standards on both sides of 3,500 ft stretch of the road that will enhance pedestrian facilities, safe routes to school, and city connectivity. (Cost accounts for 5' sidewalk width)	\$1,925,000	\$0	Metolius	Metolius	TSP Project
P-2	C Street Sidewalks	Install new 5' sidewalk in accordance with Culver street standards on both sides of 2,600 ft stretch of road that will enhance pedestrian facilities, safe routes to school, and city connectivity.	\$1,430,000	\$0	Culver	Culver	TSP Project
P-3	3rd Street Sidewalks	Install new 5-10' sidewalk in accordance with Metolius street standards on both sides of 800 ft stretch of the road that will enhance pedestrian facilities, safe routes to school, and city connectivity. (Cost accounts for 5' sidewalk width)	\$440,000	\$0	Metolius	Metolius	Visionary Project

JEFFERSON COUNTY TRANSPORTATION SYSTEM PLAN

Table 7. Proposed Bicycle Solutions

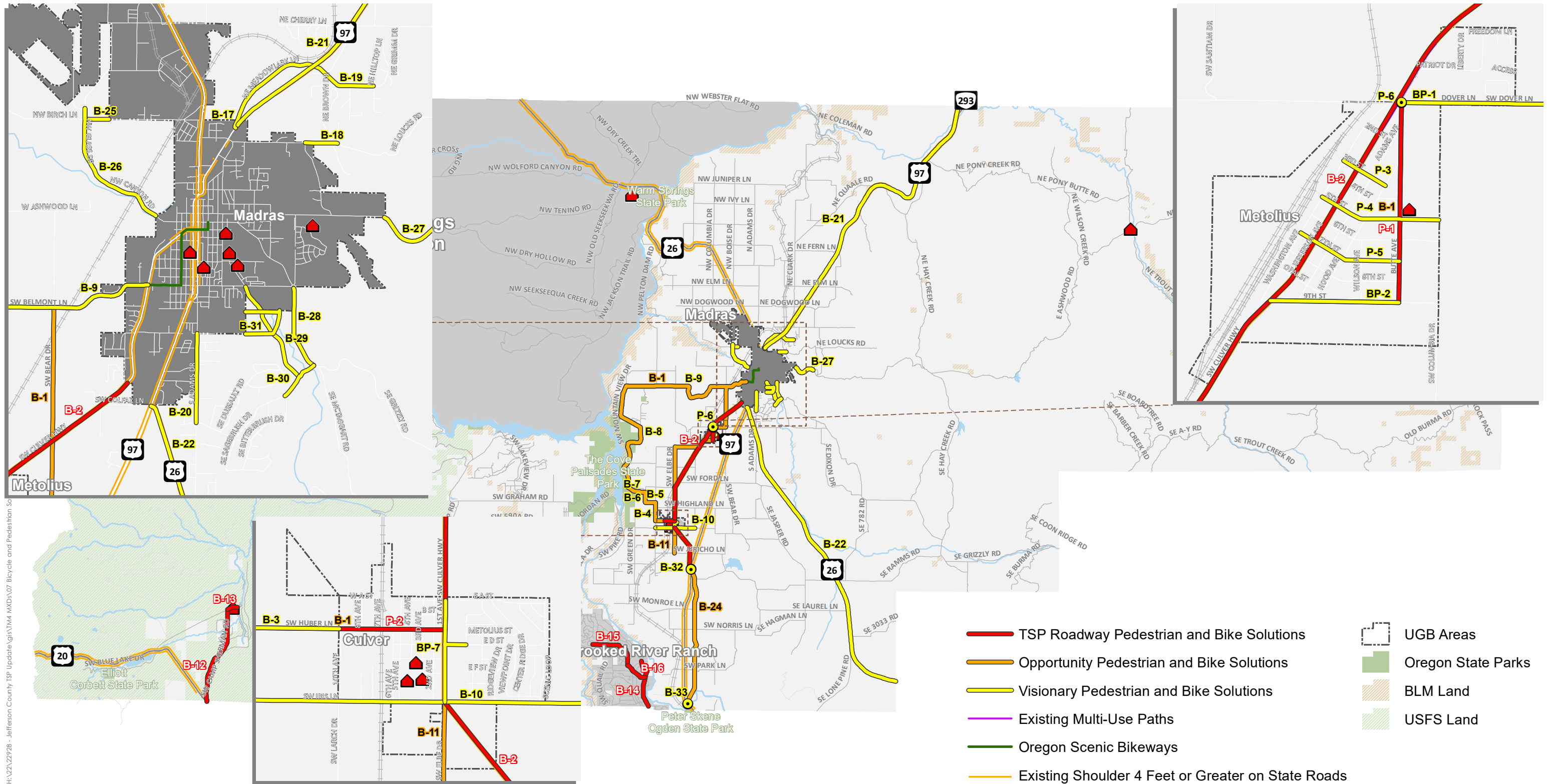
Project ID	Project Name	Description	Planning Level Cost Estimate	Expected County Contribution ¹	Funding Partner ¹	Lead Agency ¹	Implementation
P-4	5th Street Sidewalks	Install new 5-10' sidewalk in accordance with Metolius street standards on both sides of 1,950 ft stretch of the road that will enhance pedestrian facilities, safe routes to school, and city connectivity. (Cost accounts for 5' sidewalk width)	\$1,070,000	\$0	Metolius	Metolius	Visionary Project
P-5	7th Street Sidewalks	Install new 5-10' sidewalk in accordance with Metolius street standards on both sides of 1,800 ft stretch of the road that will enhance pedestrian facilities, safe routes to school, and city connectivity. (Cost accounts for 5' sidewalk width)	\$990,000	\$0	Metolius	Metolius	Visionary Project
P-6	Dover Lane/Butte Avenue Crosswalk	Install new continental crosswalk across Dover Lane with advance pedestrian warning signs that will enhance pedestrian facilities, safe routes to school, and city connectivity	\$7,000	\$7,000	-	-	Visionary Project

JEFFERSON COUNTY TRANSPORTATION SYSTEM PLAN

Table 7. Proposed Bicycle Solutions

Project ID	Project Name	Description	Planning Level Cost Estimate	Expected County Contribution ¹	Funding Partner ¹	Lead Agency ¹	Implementation
P-7	Culver Streetscape Project	Complete Culver streetscape project along 1st Avenue from Iris Lane to A Street and along D Street, as defined in the Culver Streetscape Plan, by installing sidewalks and curb ramps on both sides of the street, on-street parking and other streetscape elements such as lighting as defined in the Plan.	TBD at Project Development	\$0	Culver, ODOT	ODOT	Visionary Project
P-8	Safe Routes to School Plans	Develop Safe Routes to School Plans for the schools in Culver and Metolius.	\$50,000	\$25,000	Culver, Metolius, Jefferson County School District 509J	Culver, Metolius	TSP Project

*Project cost estimates are planning level costs based on unit costs and do not include right-of-way costs or environmental constraints; these would be determined during project design.



Data Source: ODOT
 Madras UGB and Warm Springs not included in TSP.



Figure 7

PUBLIC TRANSPORTATION SYSTEM

This section summarizes the solutions to address identified transit service and facility needs in the County.

SUMMARY OF NEEDS

Cascades East Transit (CET) provides public transportation services within and to/from Jefferson County in partnership with the County, cities, and Confederated Tribes of Warm Springs. The CET Transit Master Plan identified the following needs for areas in the County outside of Madras and Warm Springs:

- ▶ Community Connector: More service coverage; on-demand shopper/medical shuttle service
- ▶ Dial-A-Ride: Expanding coverage to include Crooked River Ranch, Metolius, and Culver
- ▶ Capital Needs: New Route 22 stops in Crooked River Ranch; New transit hubs in Metolius and Culver

SOLUTIONS

Public transportation solutions support the goal of providing greater transportation options by providing additional options for people who may not drive vehicles. 8 summarizes the draft public transportation solutions and associated costs identified in the CET Master Plan. Jefferson County receives STF and STIF transit funds through ODOT which are used to contract with CET for public transportation services. However, no additional County funds are anticipated to be provided for public transportation services. Transit funding is expected to be borne by the transit providers and not by the County.

JEFFERSON COUNTY TRANSPORTATION SYSTEM PLAN

Table 8. Proposed Transit Solutions

Project ID	Project Name	Description	Planning Level Cost Estimate	Expected County Contribution	Funding Partner	Lead Agency	Implementation
T-1	Madras to Redmond Community Connector for Shopper/ Medical Shuttle Service	Hire new drivers and accommodate new transit vehicles to provide on-demand shopper/medical shuttle service	--	\$0	CET	CET	TSP Project
T-2	Warm Springs to Madras Community Connector	Hire new drivers and accommodate new transit vehicles in order to modify route 20- Warm Springs to Madras to include improving connection to the Central Oregon Breeze; adding weekend service; and adding morning and evening trips	\$190,000 ¹	\$0	CET	CET	TSP Project
T-3	Madras to Redmond Community Connector Added Trips	Hire new drivers and accommodate new transit vehicles in order to modify route 22- Madras to Redmond include increase in peak period trip frequency and adding an evening trip	\$575,000 ¹	\$0	CET	CET	TSP Project
T-4	Dial-A-Ride for Crooked River Ranch, Metolius, and Culver	Hire new drivers and accommodate new transit vehicles in order to expand coverage to include Crooked River Ranch, Metolius, and Culver	\$410,000 ¹	\$0	CET	CET	TSP Project
T-5	Transit Center near Metolius	Build a small-scale transit center in Metolius	\$1,000,000	\$0	CET	CET	TSP Project
T-6	Transit Center near Culver	Build a small-scale transit center in Culver	\$1,000,000	\$0	CET	CET	TSP Project

¹Cost estimates for operations represent annual costs.

OTHER TRANSPORTATION SYSTEM NEEDS

The needs analysis only identified Bridge deficiencies; no specific air, marine, pipeline, or rail system deficiencies were identified within the County.

BRIDGE SYSTEM

There are 61 bridges located within Jefferson County and outside of Madras UGB. The County owns and maintains 36 bridges, while the state maintains the other 24 (another state agencies own one bridge).

Summary of Needs

- ▶ Five bridges in the County were identified as structurally deficient:
 - Camp Sherman Road at Lake Creek (MP 3.91)
 - Forest Service Road #14 at the Metolius River (MP 0)
 - Norris Lane at an Irrigation Canal (MP 0.39)
 - Elbe Drive at an Irrigation Canal (MP 0.89)
 - Bear Drive at an Irrigation Canal (MP 0)
- ▶ Thirteen County bridges are currently posted to accommodate designated load limits, including:
 - Monroe Lane
 - Feather Drive
 - Haystack Road
 - Irving Lane
 - Jordan Road - Deschutes River
 - Jordan Road - Crooked River
 - Highland Lane
 - Eureka Lane
 - Belmont Lane
 - Ashwood Road
 - Meadowlark Lane
 - Bear Drive
 - Gumwood Lane

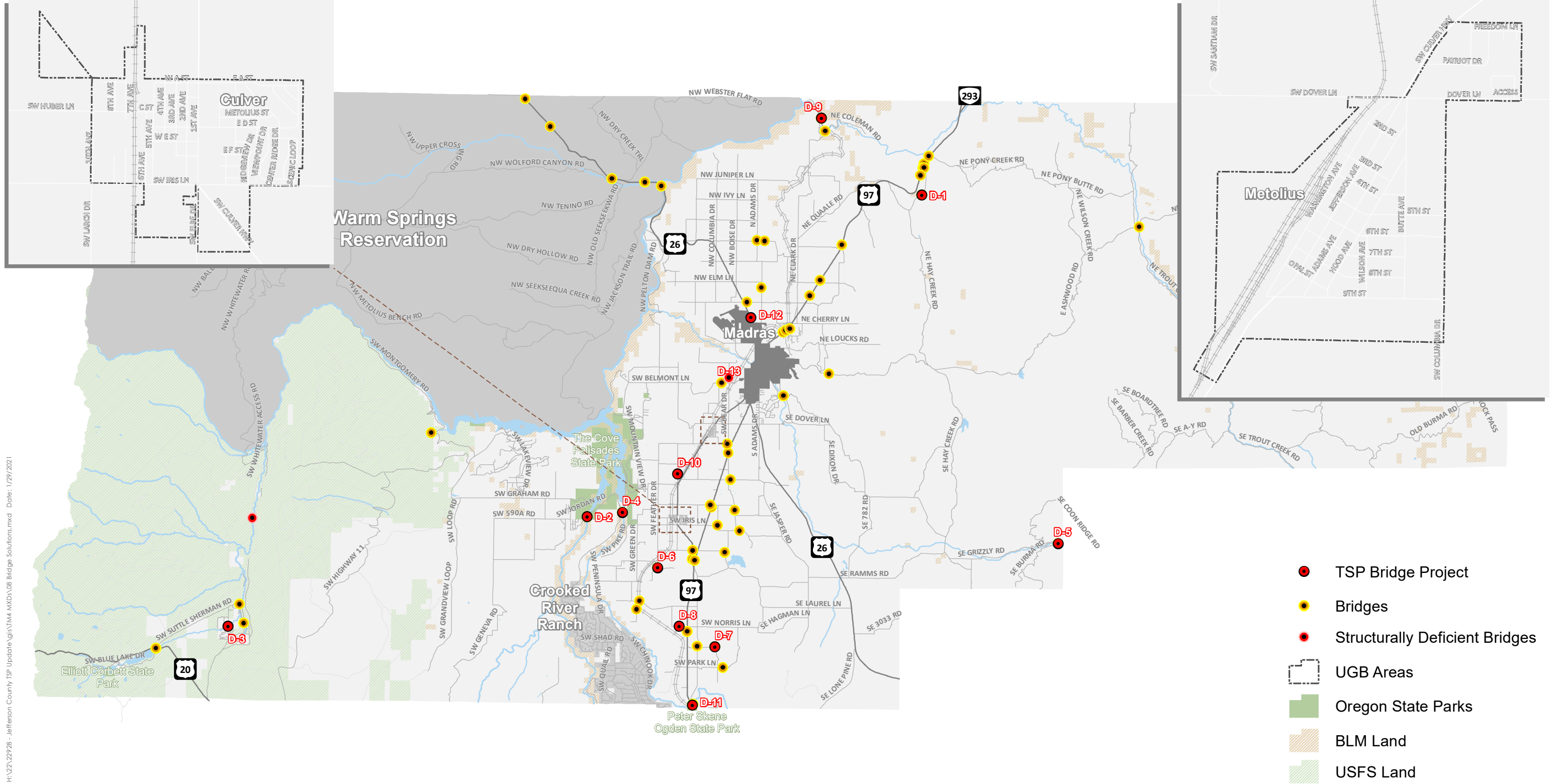
Bridge Solutions

The bridge solutions are based on the identified deficiencies and through input from County staff about specific needs. Weight restricted bridges were not identified for improvement unless they were noted to be structurally insufficient as well. Table 9 summarizes the proposed solutions and Figure 8 illustrates the locations. The County is currently developing a Bridge Resiliency Plan, which will include additional information and planning level cost estimates for the bridges identified in Table 9. This information will be revised and incorporated in Technical Memorandum #5.

JEFFERSON COUNTY TRANSPORTATION SYSTEM PLAN

Table 9. Proposed Bridge Solutions

Project ID	Project Name	Description	Lead Agency ¹	Implementation
D-1	Hay Creek, Old Hwy 97 Bridge	Perform study to determine if the bridge needs to be upgraded or replaced; County bridge ID#00813	County	TSP Project
D-2	Deschutes River, Jordan Rd Bridge	Perform study to determine if the bridge needs to be upgraded or replaced; County bridge ID#16C01	County	TSP Project
D-3	Camp Sherman Road Bridge at Lake Creek (MP 3.91)	Perform study to determine if the bridge needs to be upgraded or replaced; County bridge ID#16C03	County	TSP Project
D-4	Crooked River, Jordan Rd Bridge	Perform study to determine if the bridge needs to be upgraded or replaced; County bridge ID#16C06	County	TSP Project
D-5	Higgins Creek Bridge	Perform study to determine if the bridge needs to be upgraded or replaced; County bridge ID#20464	County	TSP Project
D-6	North Unit Canal, Feather Dr. Bridge	Perform study to determine if the bridge needs to be upgraded or replaced; County bridge ID#31C11	County	TSP Project
D-7	Irrigation Canal, Opal Ln Bridge	Perform study to determine if the bridge needs to be upgraded or replaced; County bridge ID#31C42	County	TSP Project
D-8	Norris Lane Bridge at an Irrigation Canal (MP 0.39)	Perform study to determine if the bridge needs to be upgraded or replaced; County bridge ID#31C48	County	TSP Project
D-9	Trout Creek, Coleman Rd Bridge	Perform study to determine if the bridge needs to be upgraded or replaced; County bridge ID#31C553	County	TSP Project
D-10	Elbe Drive Bridge at an Irrigation Canal (MP 0.89)	Perform study to determine if the bridge needs to be upgraded or replaced. This bridge is part of a route serving a rock quarry.	County	TSP Project
D-11	Bridge Suicide Prevention Measures Feasibility Study	Conduct a feasibility study to determine potential suicide prevention measures that could be taken on ODOT bridges over Crooked River Canyon; Bridge ID #00600 and #18211	ODOT, Oregon State Park System	TSP Project
D-12	US 26 Bridge at an Irrigation Canal (MP 115.59) and Detour	Develop a plan for detour management on county roads around weight restricted bridge; Bridge ID #07074	ODOT	TSP Project
D-13	Bear Drive Bridge at an Irrigation Canal (MP 0)	Perform study to determine if the bridge need to be upgraded or replaced. Preliminary engineering is funded through ODOT's local bridge program.	County	TSP Project



Data Source: ODOT
 Madras UGB and Warm Springs not included in TSP.



Figure 8

COST SUMMARY

This section summarizes the total cost of the solutions identified as TSP projects and/or Opportunity Projects to capture the total anticipated cost for the County over the next 20 years. Visionary projects are not included because they are not anticipated to be feasible within the next 20 years. Technical Memorandum #5 will compare these to the available funding and identify new funding sources for the County to consider.

Table 10 summarizes the total cost by project type and priority for the solutions identified in this memorandum. As shown, the County's cost responsibility totals to approximately \$28 million. Visionary bicycle projects, which are not anticipated to be feasible within the next 20 years, are estimated total approximately \$38 million for the County.

Table 10. Summary of County Contribution Costs

Project Type	Opportunity Project	TSP Project	Total
Roadway	\$10,000	\$3,960,000	\$3,970,000
ITS	\$0	\$15,000	\$15,000
Safety	\$20,000	\$950,000	\$970,000
Pedestrian & Bicycle	\$75,000	\$22,990,000	\$23,065,000
Transit	-	-	\$
Bridge	-	-	\$
Total	\$105,000	\$27,915,000	\$28,020,000

REGULATORY REVIEW

Angelo Planning Group (APG) completed a review and assessment of the County's Land Development Code (LDC) for compliance with the State of Oregon's Transportation Planning Rule (TPR), OAR 660 Division 12. The memorandum, provided in Appendix A, provides the intent, purpose, and requirements of the TPR, followed by a comprehensive review of the County's compliance.

NEXT STEPS

The draft solutions identified in this memorandum will be reviewed by the Project Management Team (PMT), Project Advisory Committee (PAC), and Public at virtual Public Open House meeting in December 2020. Based on input from these groups, the draft solutions will be revised into a Preferred Alternative, which will be summarized in *Technical Memorandum #5* in early 2021.

APPENDICES

Appendix A: Angelo Planning Group Regulatory Review



JEFFERSON COUNTY TRANSPORTATION SYSTEM PLAN

Appendix A: Angelo Planning Group Regulatory Review



MEMORANDUM

Jefferson County Regulatory Review

Jefferson County Transportation System Plan Update

DATE October 1, 2020
TO Project Management Team
FROM Darci Rudzinski and Clinton "CJ" Doxsee, Angelo Planning Group
CC FILE

INTRODUCTION

This memorandum presents a review of Jefferson County's Zoning Ordinance (ZO) and Jefferson County Code (JCC) Title 12 – Roads, Parks and Other Public Places and Title 16 – Subdivisions for compliance with the State of Oregon's Transportation Planning Rule (TPR), OAR 660 Division 12. The memorandum provides the intent, purpose, and requirements of the TPR, followed by a comprehensive review in the subsequent table.

The purpose of the TPR is *"...to implement Statewide Planning Goal 12 (Transportation) and promote the development of safe, convenient and economic transportation systems that are designed to reduce reliance on the automobile so that the air pollution, traffic and other livability problems faced by urban areas in other parts of the country might be avoided."* The TPR also establishes requirements for coordination among affected levels of government for preparation, adoption, refinement, implementation, and amendment of transportation system plans.

Specifically, the TPR requires counties with a population greater than 25,000 to prepare, adopt and implement a Transportation System Plan (TSP). Section -0045 of the TPR addresses implementation of the TSP. TPR Section -0060 (Plan and Land Use Regulation Amendments) specifies measures to be taken to ensure that allowed land uses are consistent with the identified function and capacity of existing and planned transportation facilities. Section -0060 establishes criteria for identifying the significant effects of plan or land use regulation amendments on transportation facilities, actions to be taken when a significant effect would occur, identification of planned facilities, and coordination with transportation facility providers.

In summary, the TPR requires that local governments revise their land use regulations to implement the TSP in the following manner:

- Amend land use regulations to reflect and implement the TSP.
- Clearly identify which transportation facilities, services, and improvements are allowed outright, and which will be conditionally permitted or permitted through other procedures.
- Adopt land use or subdivision ordinance measures, consistent with applicable federal and state requirements, to protect transportation facilities, corridors, and sites for their identified functions, through:
 - access management and control;
 - protection of public use airports;
 - coordinated review of land use decisions potentially affecting transportation facilities;
 - conditions to minimize development impacts to transportation facilities;
 - regulations to provide notice to public agencies providing transportation facilities and services of land use applications that potentially affect transportation facilities; and
 - regulations ensuring that amendments to land use applications, densities, and design standards are consistent with the TSP.
- Adopt land use or subdivision regulations for urban areas and rural communities to provide safe and convenient pedestrian and bicycle circulation and bicycle parking, and to ensure that new development provides on-site streets and accessways that provide reasonably direct routes for pedestrian and bicycle travel.
- Establish street standards that minimize pavement width and total right-of-way.

The following assessment of TPR compliance is based on the ZO and JCC Titles 12 and 16. Table 1 lists TPR implementation requirements, an assessment of existing County code and regulatory provisions that meet the requirements, and recommendations for changes to the ZO and/or JCC that will likely be needed to fully implement the a new TSP and bring the County regulations in compliance with the TPR. Recommended changes to local regulatory documents are intended to provide guidance to project staff during the update of the TSP. In particular, modifications to the ZO and JCC will be drafted during the planning process and become implementation recommendations consistent with the draft TSP.

Table 1: Jefferson County Regulatory Review

TPR Provision	Comments and Recommendations
OAR 660-12-0045	
(1) Each local government shall amend its land use regulations to implement the TSP.	
<p>(a) The following transportation facilities, services and improvements need not be subject to land use regulations except as necessary to implement the TSP and, under ordinary circumstances do not have a significant impact on land use:</p> <p>(A) Operation, maintenance, and repair of existing transportation facilities identified in the TSP, such as road, bicycle, pedestrian, port, airport and rail facilities, and major regional pipelines and terminals;</p> <p>(B) Dedication of right-of-way, authorization of construction and the construction of facilities and improvements, where the improvements are consistent with clear and objective dimensional standards;</p> <p>(C) Uses permitted outright under ORS 215.213(1)(j)–(m) and 215.283(1)(h)–(k), consistent with the provisions of OAR 660-012-0065; and</p> <p>(D) Changes in the frequency of transit, rail and airport services.</p>	<p>The purpose of this provision is to allow for certain transportation uses, such as operation, maintenance, and repair of transportation facilities identified in the TSP, without being subject to land use regulations.</p> <p>ZO Section 402.3 lists transportation improvements that are permitted in all zones, subject to applicable standards in the ordinance. Subsection B includes “construction of new roads specifically identified and planned for in an adopted TSP.”</p> <p>ZO Section 402.4 lists transportation improvements that require Planning Director approval pursuant to an Administrative Review procedure.</p> <p>ZO Section 402.5 provides a blanket provision that requires transportation improvements and facilities on rural lands and not listed in Sections 402.3 and 402.4 to have a statewide planning goal exception.</p> <p>Recommendation: Existing code provisions meet this TPR requirement. No further changes to the code are recommended.</p>
<p>(b) To the extent, if any, that a transportation facility, service or improvement concerns the application of a comprehensive plan provision or land use regulation, it may be allowed without further land use review if it is permitted outright or if it is subject to standards that do not require interpretation or the exercise of factual, policy or legal judgment;</p>	<p>See response to -0045(1)(a)</p>
<p>(c) In the event that a transportation facility, service or improvement is determined to have a significant impact on land use or to concern the application of a comprehensive plan or land use regulation and to be subject to standards that require interpretation or the exercise of factual, policy or legal judgment, the local government shall provide a review and approval process that is consistent with OAR 660-012-0050. To facilitate implementation of the TSP, each local government shall amend its land use regulations to provide for consolidated review of land use decisions required to permit a transportation project.</p>	<p>This TPR Section references project development and implementation – how a transportation facility or improvement authorized in a TSP is designed and constructed (660-012-0050). Project development may or may not require land use decision-making. The TPR directs that during project development, projects authorized in an acknowledged TSP will not be subject to further justification with regard to their need, mode, function, or general location. To this end, the TPR calls for consolidated review of land use decisions and proper noticing requirements for affected transportation facilities and service providers.</p> <p>ZO Section 902.5 allows for multiple land use applications on the same property to be submitted for concurrent review. The review procedure for the combined applications is subject to the highest applicable review procedure.</p> <p>Recommendation: Existing code provisions meet this TPR requirement. No further changes to the code are recommended.</p>

Table 1: Jefferson County Regulatory Review

TPR Provision	Comments and Recommendations
(2) Local governments shall adopt land use or subdivision ordinance regulations, consistent with applicable federal and state requirements, to protect transportation facilities, corridors and sites for their identified functions. Such regulations shall include:	
(a) Access control measures, for example, driveway and public road spacing, median control and signal spacing standards, which are consistent with the functional classification of roads and consistent with limiting development on rural lands to rural uses and densities;	<p>ZO Section 402 contains most of the provisions applicable to transportation improvements required through development.</p> <p>JCC Chapter 12.18 establishes road design standards for County roads. Section 12.18.110 allows the County to limit access to collector or arterial roads for applications abutting the roads. Access to state roads and highways are required to be in conformance with ODOT standards according to JCC 12.18.200. JCC Chapter 12.18 Table A provides minimum intersection spacing standards that are applicable to new County roads.</p> <p>Section 12.18.220 includes provisions for driveway designs. Driveway access onto arterials and collectors is not permitted within 150 feet of an intersection. Driveways are required to be spaced 75 feet from other driveways. Exceptions to the standards are specified.</p> <p>JCC Chapter 16.44 establishes road and utility improvement standards for subdivisions. Section 16.44.170 allows the County to limit access to collector or arterial roads. Section 16.44.260 regulates intersection spacing standards based on street classification, ranging from 100-500 feet. Section 16.44.280 provides access standards, including restricting residential access onto arterials and collectors within 100 feet of an intersection. It also limits access intervals to 75 feet.</p> <p>Recommendation: Existing code provisions meet this TPR requirement. Adopted access management standards will need to be reviewed and updated as necessary for consistency with the draft TSP.</p>
(b) Standards to protect future operation of roads, transitways and major transit corridors;	<p>ZO Section 421 provides standards for when a traffic impact study may be required as part of an application for Site Plan Review, conditional use permit, land division, or zoning amendment. The ZO specifies what the study is required to address, including measuring traffic at selected locations and identifying mitigation measures as appropriate.</p> <p>ZO Section 602 provides approval criteria applicable to conditional use applications. The approval criteria in subsection (D) requires that proposed development not cause traffic volumes that reduce performance standards below minimum acceptable levels.</p> <p>ZO Section 703 provides application requirements for land divisions. Subsection 703.1(H) requires a traffic impact study for land divisions that create more than 20 lots or that have access on a state highway, arterial, or major collector.</p> <p>ZO Section 803 provides approval criteria for zoning map amendments. Subsection 803.2(F) requires the application to demonstrate the amendment would not significantly affect a</p>

Table 1: Jefferson County Regulatory Review

TPR Provision	Comments and Recommendations
	<p>transportation facility and suggests a traffic impact study as a way to demonstrate compliance.</p> <p>ZO Section 414 provides site plan review requirements. Subsection 414.5 allows the Planning Director to require a traffic impact study as part of the site plan review procedures.</p> <p>Recommendation: Existing code provisions meet this TPR requirement. To the extent that the TSP update does not update existing traffic impact study requirements, no ZO amendments are recommended.</p>
(c) Measures to protect public use airports by controlling land uses within airport noise corridors and imaginary surfaces, and by limiting physical hazards to air navigation;	<p>ZO Section 313 establishes the Airport Management (AM) zone. The zone limits the types of uses to those that are compatible with aviation activities. Uses that are allowed or permitted conditionally are subject to the airport protection procedures provided in ZO Section 418.</p> <p>ZO Section 418 provides standards to restrict or limit structures, trees, and other objects from impacting or interfering with airport operations.</p> <p>ZO Section 406 includes additional sign standards, restrictions, and review procedures that apply to all signs. The Section includes additional regulations for signs located in the AM zone surrounding Madras Municipal Airport.</p> <p>ZO Section 508 (Variances) includes a provision that restrict variance requests to height limitations provided in Section 418.</p> <p>ZO Section 906 requires notice to be sent to airport owners if a proposed structure more than 35 feet in height is proposed within specified conditions.</p> <p>Recommendation: Current regulations are compliant with TPR provisions. No amendments are recommended.</p>
(d) A process for coordinated review of future land use decisions affecting transportation facilities, corridors or sites;	See response to -0045(1)(c)
(e) A process to apply conditions to development proposals in order to minimize impacts and protect transportation facilities, corridors or sites;	<p>ZO Section 603 (Conditional Uses) and 905 (Administrative Review) gives the review body for development the general authority to impose conditions of approval.</p> <p>Similarly, ZO Section 414.7 allows the review body to impose conditions of approval necessary to comply with ZO requirements as part of site plan review.</p> <p>ZO Section 705.2 (Land Divisions) gives the review body authority to impose conditions of approval as part of tentative plan approval for subdivisions.</p> <p>ZO Section 402.8 allows imposition of conditions that require higher transportation improvements than required by the ZO if deemed necessary to achieve specified outcomes. The section addresses approval conditions related to construction timing</p>

Table 1: Jefferson County Regulatory Review	
TPR Provision	Comments and Recommendations
	<p>and inspection, traffic control devices, sidewalks, bicycle facilities, and turnout areas.</p> <p>Recommendation: Current regulations are compliant with TPR provisions. No amendments are recommended.</p>
<p>(f) Regulations to provide notice to public agencies providing transportation facilities and services, MPOs, and ODOT of:</p> <p>(A) Land use applications that require public hearings;</p> <p>(B) Subdivision and partition applications;</p> <p>(C) Other applications which affect private access to roads; and</p> <p>(D) Other applications within airport noise corridors and imaginary surfaces which affect airport operations; and</p>	<p>ZO Section 906 addresses notice requirements as part of the administration and application review provisions. Subsection 906.1 requires notice be sent to airport owners under specified circumstances and any other “persons, agencies or jurisdictions deemed appropriate by the County” Administrative Decisions. Subsection 906.2 requires notice be sent to ODOT – in addition to the parties listed in Subsection 906.1 – for public hearings.</p> <p>ZO Section 704.2 requires notice be sent to affected agencies as part of the ordinances land division procedures.</p> <p>JCC Section 16.04.280 (Land Use Action Hearings) provides notice requirements for subdivisions. The land use action notice requirements require notice be sent to airport owners and owners of record for property within a specified distances.</p> <p>Recommendation: Existing code provisions meet this TPR requirement. No further changes to the code are recommended.</p>
<p>(g) Regulations assuring that amendments to land use designations, densities, and design standards are consistent with the functions, capacities and performance standards of facilities identified in the TSP.</p>	<p>See responses to -0045(1)(b), -0045(2)(b), and -0060.</p>
<p>(3) Local governments shall adopt land use or subdivision regulations for urban areas and rural communities as set forth below. The purposes of this section are to provide for safe and convenient pedestrian, bicycle and vehicular circulation consistent with access management standards and the function of affected streets, to ensure that new development provides on-site streets and accessways that provide reasonably direct routes for pedestrian and bicycle travel in areas where pedestrian and bicycle travel is likely if connections are provided, and which avoids wherever possible levels of automobile traffic which might interfere with or discourage pedestrian or bicycle travel.</p>	
<p>(a) Bicycle parking facilities as part of new multi-family residential developments of four units or more, new retail, office and institutional developments, and all transit transfer stations and park-and-ride lots;</p>	<p>ZO Section 423.2 requires one bicycle parking space for each ten vehicle parking spaces for any use that is required to provide ten or more parking spaces. The standards do not specifically require uses listed in -0045(3)(a) to provide bicycle parking.</p> <p>Recommendation: The County should consider including minimum bicycling parking requirements for multi-family, retail, office, and institutional developments.</p>
<p>(b) On-site facilities shall be provided which accommodate safe and convenient pedestrian and bicycle access from within new subdivisions, multi-family developments, planned developments, shopping centers, and commercial districts to adjacent residential areas and transit stops, and to neighborhood activity centers within one-half mile of the development. Single-family residential developments shall generally include streets and accessways. Pedestrian circulation through</p>	<p>On-site Circulation and Connections: ZO Section 414.6 requires site plans show that pedestrian and vehicular safety and welfare are protected as part of the site plan review. The provisions do not provide specific standards for circulation and connectivity.</p> <p>Parking Lots: ZO Section 423.4 provides general standards for off-street parking areas. It generally requires parking lots be</p>

Table 1: Jefferson County Regulatory Review

TPR Provision	Comments and Recommendations
<p>parking lots should generally be provided in the form of accessways.</p> <p>(A) "Neighborhood activity centers" includes, but is not limited to, existing or planned schools, parks, shopping areas, transit stops or employment centers;</p> <p>(B) Bikeways shall be required along arterials and major collectors. Sidewalks shall be required along arterials, collectors and most local streets in urban areas, except that sidewalks are not required along controlled access roadways, such as freeways;</p> <p>(C) Cul-de-sacs and other dead-end streets may be used as part of a development plan, consistent with the purposes set forth in this section;</p> <p>(D) Local governments shall establish their own standards or criteria for providing streets and accessways consistent with the purposes of this section. Such measures may include but are not limited to: standards for spacing of streets or accessways; and standards for excessive out-of-direction travel;</p> <p>(E) Streets and accessways need not be required where one or more of the following conditions exist:</p> <p>(i) Physical or topographic conditions make a street or accessway connection impracticable. Such conditions include but are not limited to freeways, railroads, steep slopes, wetlands or other bodies of water where a connection could not reasonably be provided;</p> <p>(ii) Buildings or other existing development on adjacent lands physically preclude a connection now or in the future considering the potential for redevelopment; or</p> <p>(iii) Where streets or accessways would violate provisions of leases, easements, covenants, restrictions or other agreements existing as of May 1, 1995, which preclude a required street or accessway connection.</p>	<p>designed for pedestrian safety. The provisions do not provide specific standards for separating pedestrians from vehicles.</p> <p>Bikeways and Sidewalks: ZO Section 402 allows the review authority to apply conditions of approval for transportation improvements to include sidewalks. The provisions outline when sidewalks may be required and references the standards they should be constructed to.</p> <p>JCC 12.18.230 requires sidewalks to be constructed in conformance with ODOT's Oregon Bicycle and Pedestrian Plan when required by the TSP, ZO, or City standards for locations inside the UGB.</p> <p>JCC 12.18.240 requires paved shoulders to be designed for use as bicycle facilities in conformance with the minimum road design standards during construction or reconstruction activities. The provisions allow multi-use paths in separate right-of-way to be used as an alternative. Minimum road design standards provided in Table A do not provide specific bicycle design standards. It includes shoulder width standards and recommendations according to functional classification.</p> <p>JCC 16.40.020 requires sidewalks to be constructed on both sides of a public street for all subdivisions inside an urban growth boundary. The provisions include an exception for single-family dwelling developments located outside an urban growth boundary that are smaller than 2.5 units/acre.</p> <p>Cul-de-sacs: ZO Section 402.7 provides approval standards for transportation improvements that limit cul-de-sacs to serving a maximum of 19 lots or parcels.</p> <p>JCC 12.03 defines a cul-de-sac (or dead-end road) as less than 1,320 feet in length. JCC 12.18.150 requires turnarounds every one-half mile on dead-end roads that are more than one-mile in length for local access roads.</p> <p>Exceptions: JCC 12.18.050 allows the public works director to approve variations to the road design standards after consultation with the planning director. The section includes approval criteria for the variation, which among others, includes "practical difficulties that will create unreasonable construction expense."</p> <p>JCC 16.40.020 allows the hearings body to make exceptions to the street standards when topographic conditions make it impractical.</p> <p>Transit Access: The County does not include transit-related provisions.</p> <p>Recommendations:</p> <ul style="list-style-type: none"> - The County should consider adding a new section in Chapter 4 – Supplementary Provisions that include clear and objective on-site circulation and connectivity standards that apply at least to neighborhood activity centers. Alternatively, the County could modify the approval standards for Site

Table 1: Jefferson County Regulatory Review

TPR Provision	Comments and Recommendations
	<p>Plan Review in Section 414.6 to include bicycle and pedestrian circulation provisions.</p> <ul style="list-style-type: none"> - The County should modify Section 423.4 to include standards for separating pedestrian and vehicular circulation in medium or large parking areas. - JCC 16.40.020 includes provisions for subdivisions inside UGBs and low-density development outside of UGBs. Additional direction should be included for other (non-subdivision) residential development inside a UGB and for medium or high density development outside of UGB. - Revisit JCC requirements to ensure that County TSP bicycle and pedestrian standards are referenced in/consistent with the code provisions. - Consider limiting cul-de-sac lengths to a maximum distance (in addition to or instead of maximum number of units). - The County should consider adding transit-supportive design standards for existing and planned development near transit stops. - The County should consider expanding street design standards exceptions to include accommodating existing buildings or other existing development.
<p>(c) Where off-site road improvements are otherwise required as a condition of development approval, they shall include facilities accommodating convenient pedestrian and bicycle travel, including bicycle ways along arterials and major collectors;</p> <p><i>[Note: Subsection (d) defines safe and convenient]</i></p>	<p>See response related to conditions of approval, Section - 0045(2)(e).</p>
<p>(e) Internal pedestrian circulation within new office parks and commercial developments shall be provided through clustering of buildings, construction of accessways, walkways and similar techniques.</p>	<p>See responses related to on-site circulation and connectivity standards, Section -0045(3)(b)</p>
<p>(4) To support transit in urban areas containing a population greater than 25,000, where the area is already served by a public transit system or where a determination has been made that a public transit system is feasible, local governments shall adopt land use and subdivision regulations as provided in (a)–(g) below:</p>	
<p>(a) Transit routes and transit facilities shall be designed to support transit use through provision of bus stops, pullouts and shelters, optimum road geometrics, on-road parking restrictions and similar facilities, as appropriate;</p>	<p>Cascade East Transit (CET) provides transit service to unincorporated areas within the County. CET recently updated their Transit Master Plan, which identifies and plans for new services and transit facilities for Central Oregon through the year 2040. Transit service in unincorporated areas of the County are currently limited, however the it can be anticipated that new or improved transit services and facilities will occur during the TSP planning horizon.</p> <p>Recommendation: The County should update the ZO to notify and coordinate with CET for development applications that affect CET facilities.</p>
<p>(b) New retail, office and institutional buildings at or near major transit stops shall provide for convenient</p>	<p>County provisions in the ZO and JCC do not include requirements for development near major transit stops.</p>

Table 1: Jefferson County Regulatory Review

TPR Provision	Comments and Recommendations
<p>pedestrian access to transit through the measures listed in paragraphs (A) and (B) below.</p> <p>(A) Walkways shall be provided connecting building entrances and streets adjoining the site;</p> <p>(B) Pedestrian connections to adjoining properties shall be provided except where such a connection is impracticable as provided for in OAR 660-012-0045(3)(b)(E). Pedestrian connections shall connect the on site circulation system to existing or proposed streets, walkways, and driveways that abut the property. Where adjacent properties are undeveloped or have potential for redevelopment, streets, accessways and walkways on site shall be laid out or stubbed to allow for extension to the adjoining property;</p> <p>(C) In addition to paragraphs (A) and (B) above, on sites at major transit stops provide the following:</p> <p>(i) Either locate buildings within 20 feet of the transit stop, a transit street or an intersecting street or provide a pedestrian plaza at the transit stop or a street intersection;</p> <p>(ii) A reasonably direct pedestrian connection between the transit stop and building entrances on the site;</p> <p>(iii) A transit passenger landing pad accessible to disabled persons;</p> <p>(iv) An easement or dedication for a passenger shelter if requested by the transit provider; and</p> <p>(v) Lighting at the transit stop.</p> <p>(c) Local governments may implement (4)(b)(A) and (B) above through the designation of pedestrian districts and adoption of appropriate implementing measures regulating development within pedestrian districts. Pedestrian districts must comply with the requirement of (4)(b)(C) above;</p>	<p>Similarly, County provisions do not include a pedestrian district type of designation. There is limited service in unincorporated areas of the County today, however transit service is expected to increase within the 20-year planning horizon.</p> <p>Recommendation: The County should update the ZO to include standards that require a transit facility or easement for developments proposed on the same site, or adjacent to, an existing or planned transit stop.</p>
<p>(d) Designated employee parking areas in new developments shall provide preferential parking for carpools and vanpools;</p>	<p>The ZO and JCC currently do not include provisions that require carpool and vanpool parking.</p> <p>Recommendation: The County should consider requiring new development with planned designated employee parking areas provide preferential parking for employee carpools and vanpools. A typical code requirement is requiring employers with more than a specific number of employees to dedicate a percentage of the required parking spaces for car/vanpools. Alternatively, code provisions could provide incentives for reduction in the overall number of required parking spaces for a development where transit or car/vanpools are accommodated.</p>

Table 1: Jefferson County Regulatory Review

TPR Provision	Comments and Recommendations
(e) Existing development shall be allowed to redevelop a portion of existing parking areas for transit-oriented uses, including bus stops and pullouts, bus shelters, park and ride stations, transit-oriented developments, and similar facilities, where appropriate;	<p>The ZO and JCC currently do not include provisions that allow portions of parking areas to redevelop for transit-oriented uses.</p> <p>Recommendation: Allow reductions to the minimum parking requirements to accommodate transit facilities.</p>
(f) Road systems for new development shall be provided that can be adequately served by transit, including provision of pedestrian access to existing and identified future transit routes. This shall include, where appropriate, separate accessways to minimize travel distances;	<p>The ZO and JCC currently do not include provisions that require connections with or orientation to transit facilities.</p> <p>Recommendation: The County should consider on-site bicycle and pedestrian circulation standards and/or building orientation standards to accommodate existing or planned transit facilities.</p>
(g) Along existing or planned transit routes, designation of types and densities of land uses adequate to support transit.	<p>When updating the transit element of the TSP, the County has the opportunity to review existing land uses and consider land use changes that would support transit.</p>
(6) In developing a bicycle and pedestrian circulation plan as required by OAR 660-012-0020(2)(d), local governments shall identify improvements to facilitate bicycle and pedestrian trips to meet local travel needs in developed areas. Appropriate improvements should provide for more direct, convenient and safer bicycle or pedestrian travel within and between residential areas and neighborhood activity centers (i.e., schools, shopping, transit stops). Specific measures include, for example, constructing walkways between cul-de-sacs and adjacent roads, providing walkways between buildings, and providing direct access between adjacent uses.	<p>The TSP update will make recommendations to the bicycle and pedestrian plan that are consistent with TPR -0020. This TPR requirement is currently addressed in the following areas:</p> <ul style="list-style-type: none"> - Walkways between cul-de-sacs and adjacent roads – See response and recommendations in Section - 0045(3)(b). - Walkways between buildings – See response and recommendations related to accessways in Section - 0045(3)(b). - Access between adjacent uses – See response and recommendations related to accessways in Section - 0045(3)(b). <p>Recommendation: This requirement will be addressed by the TSP update planning process, which will identify pedestrian and bicycle improvements for inclusion in the TSP, and is met by requiring improvements in developing areas consistent with adopted code provisions.</p>
(7) Local governments shall establish standards for local streets and accessways that minimize pavement width and total right-of-way consistent with the operational needs of the facility. The intent of this requirement is that local governments consider and reduce excessive standards for local streets and accessways in order to reduce the cost of construction, provide for more efficient use of urban land, provide for emergency vehicle access while discouraging inappropriate traffic volumes and speeds, and which accommodate convenient pedestrian and bicycle circulation. Notwithstanding section (1) or (3) of this rule, local street standards adopted to meet this requirement need not be adopted as land use regulations.	<p>Table A in JCC Chapter 12 provides minimum road design standards for County and local access roads. The minimum right-of-way for non-industrial local roads is 50 feet. The minimum pavement width for these roads is 30 feet.</p> <p>Table A in JCC Chapter 16 provides separate road design standards. The minimum right-of-way for non-industrial local roads ranges between 50 and 60 feet, with a pavement width ranging from 18 to 20 feet.</p> <p>Neither table provides standards for on-street parking.</p> <p>Recommendation: The County should update design standards to be consistent with the standards in the updated TSP.</p>
OAR 660-12-0060	

Table 1: Jefferson County Regulatory Review

TPR Provision	Comments and Recommendations
<p>Amendments to functional plans, acknowledged comprehensive plans, and land use regulations that significantly affect an existing or planned transportation facility shall assure that allowed land uses are consistent with the identified function, capacity, and performance standards of the facility.</p>	<p>ZO Chapter 8 includes amendment provisions. Amendments to the ZO are reviewed through a legislative decision process. Amendments to the zoning map are reviewed as a quasi-judicial review. Section 803.1 provides approval criteria for ZO text amendments and requires the amendment to be consistent with the Comprehensive Plan goals and policies – of which the TSP is a part. Section 803.2 provides approval criteria for map amendments and requires findings of no “significant affect” on transportation facilities. The approval criteria indicate a traffic impact study may be necessary to demonstrate compliance.</p> <p><u>Recommendation:</u> Existing code provisions meet this TPR requirement. No further changes to the code are recommended.</p>