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TECHNICAL MEMORANDUM #5

Sherman County Transportation System Plan Update

Preferred Alternative

Date: July 8, 2015 Project #: 18054
To: Michael Duncan, ODOT
Georgia Macnab, Sherman County
From: Casey Bergh, PE; Ashleigh Griffin; and Marc Butorac, PE, PTOE
cc: Project Advisory Committee

This memorandum outlines the draft preferred transportation system plan for Sherman County, which includes TSP elements consistent with OAR 660-12-020 and goals of OAR 660-12-025. The preferred plan includes recommendations for the County's transportation system, including:

- Roadway System Plan
- Access Management Plan
- Pedestrian and Bicycle System Plan
- Public Transportation System Plan
- Air/Marine/Rail/Pipeline/Transmission System Plan

The transportation components presented in this section were developed in accordance with the requirements of Oregon's Transportation Planning Rule (TPR). Each modal plan has been developed concurrent with the findings presented in the existing and future forecast conditions analysis. The plan also conveys the interests of the citizens, business owners, and governmental agencies within Sherman County, as expressed by the Public Advisory Committee (PAC) and in-person and on-line public workshops.

The preferred plan applies to the entire county, including areas within the incorporated cities of Rufus, Wasco, Moro, and Grass Valley and the unincorporated communities of Biggs and Kent.

PROJECT ADVISORY COMMITTEE (PAC) FEEDBACK

Draft projects were reviewed at the Project Advisory Committee (PAC) meeting in May 2015. Feedback was incorporated into the preferred project list and prioritization. *Attachment A summarizes the feedback received and changes made to the alternatives.*

ROADWAY SYSTEM PLAN

The Sherman County roadway system plan reflects the anticipated operations and circulation needs through the year 2035 and provides guidance on how to facilitate vehicular and freight traffic over the next 20 years. The plan focuses on the City- and County-owned and maintained roadway system. All state highways residing within the County are identified for coordination purposes.

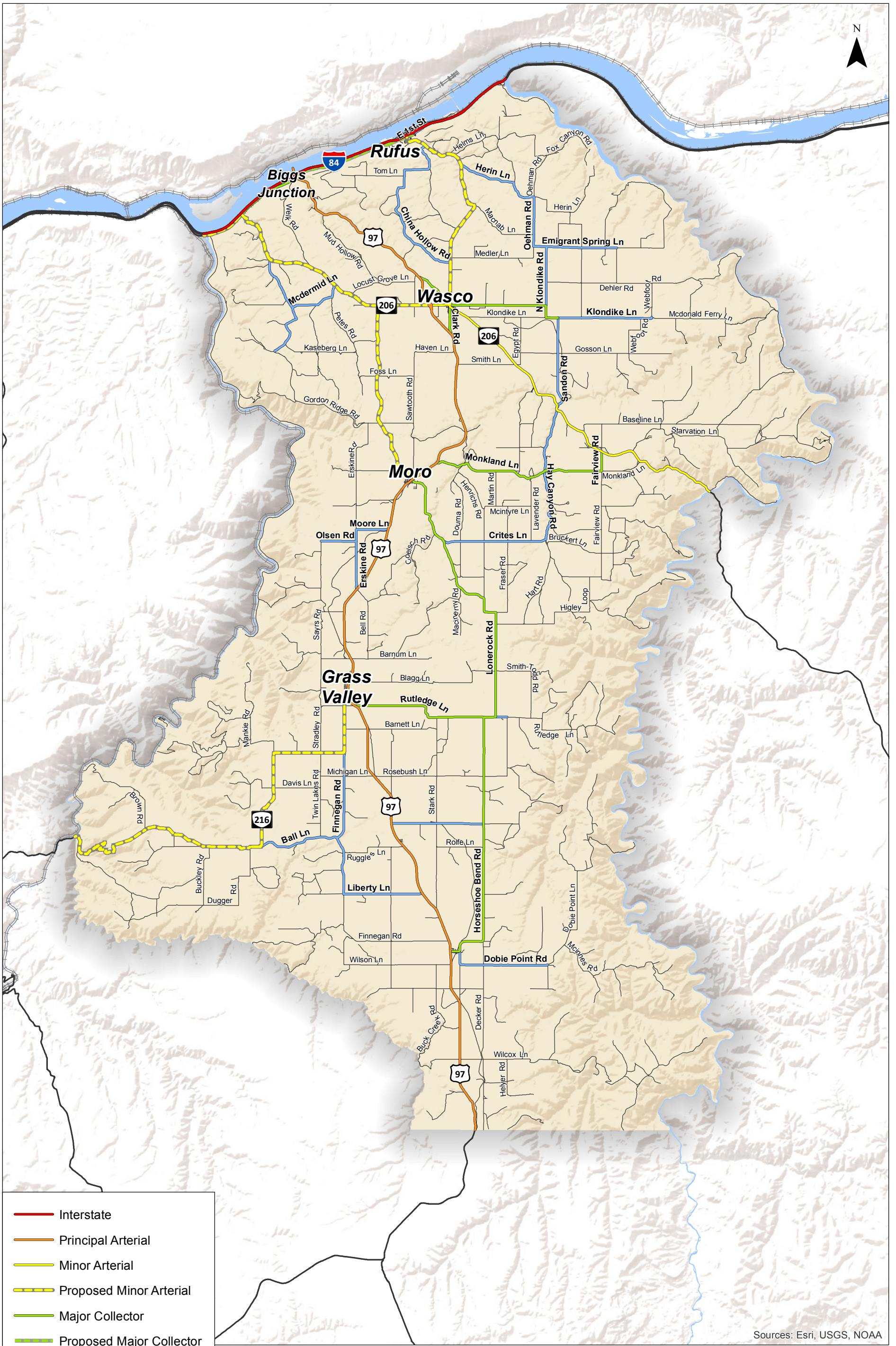
Functional Classifications

Functional classification of a roadway characterizes the intended purpose, amount and type of vehicular traffic it is expected to carry, provisions for non-auto travel, and the roadway's design standards. The classification considers access to adjacent land uses and the transportation modes to be accommodated.

The preferred functional classification system in Sherman County includes: Minor Arterial, Major Collector, Minor Collector, and Local Road. Table 5-1 provides a detailed description of each classification. Figure 5-1 presents the preferred functional classifications for all existing and planned County roadways.

Table 5-1. Sherman County Functional Classification Descriptions

Functional Classification	Description
Interstate	Primary function is mobility and to serve long-distance travel. These roadways are high-speed, divided roadways with limited access. Interstates link urban areas across the United States.
Minor Arterial	Primary function is to carry high levels of regional vehicular traffic at high speeds. These roads connect the collector road system to freeways, provide access to other cities and communities, and serve major traffic movements. Access is limited but can be accommodated with at-grade intersections.
Major Collector	<p>Primary function is to serve traffic from local roads and move them to arterials. These roads provide some degree of access to adjacent properties, while maintaining circulation and mobility for all users. Major Collectors carry lower traffic volumes at slower speeds than arterials. Major Collectors are often longer in length and have lower driveway density, higher speed limits, higher traffic volumes, and may have more travel lanes than Minor Collectors.</p> <p>Major Collectors can be located in urban or rural environments. In rural environments, Collectors generally serve intra-county travel. In rural areas, traffic volumes and spacing may be the most significant designation factors between Major and Minor Collectors. In urban areas, these roads serve both access and traffic circulation in higher dense residential, commercial, and industrial areas. They typically have higher speeds and more signalized intersections.</p>
Minor Collector	Primary function is to serve traffic from local roads and connect traffic to arterials. These roads can be urban or rural. In urban areas, they serve both access and traffic circulation but in lower density areas than Major Collectors. They also penetrate neighborhoods, but often for a shorter distance than Major Collectors. They typically have lower speeds and fewer signalized intersections. In rural areas, they serve to bring traffic from local roads to developed areas or connections to those areas. They provide service to smaller communities not served by a higher class facility and link locally important traffic generators with rural areas.
Local Road	Local roads account for the largest percentage of all roadways in terms of mileage. Their primary function is to provide direct access to adjacent land uses. They are characterized by short roadway distances, slow speeds, and low volumes. Local roads offer a high level of accessibility, serves passenger cars, pedestrians, and bicycles, but not through trucks.



Roadway Functional Classification
Sherman County, Oregon

Figure
5-1

K:\H_Portland\proj\file118054 - Sherman County TSP\figs\memo 5-5-1 Functional Classifications County.mxd - agriffin - 3:48 PM 6/19/2015

Design Standards

Roadway design standards were established for rural and urban conditions. The design standards take into consideration roadway function and operational characteristics, including traffic volume, capacity, operating speed, and safety. The design standards are necessary to ensure that as the road system develops, it will be capable of safely and efficiently serving the traveling public, while also accommodating orderly development of adjacent lands.

While not specifically outlined in this plan, improvements on state highways must meet ODOT design and operating standards provided in the ODOT Highway Design Manual.

Rural Design Standards

Rural roadway design standards for all County-owned and maintained facilities are shown in Exhibit 5-1, Exhibit 5-2, and Exhibit 5-3. Deviations from these design standards will be considered on a case-by-case basis and approved by the designated roadway manager (e.g., Roadmaster).

Sidewalks have not been included in the roadway design standards because the majority of County roadways are rural in nature and sidewalks are not typically provided. Bicyclists are expected to share the travel lane with vehicles in rural areas, consistent with guidance provided in the Oregon Bicycle and Pedestrian Design Guide.

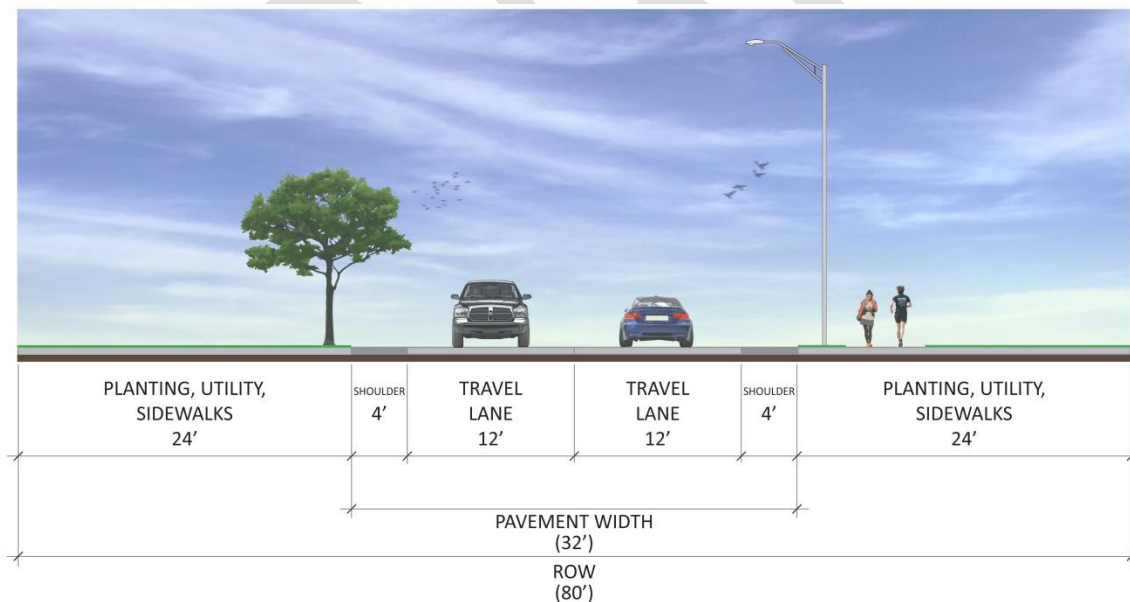


Exhibit 5-1. Rural Arterial Street Cross-Section

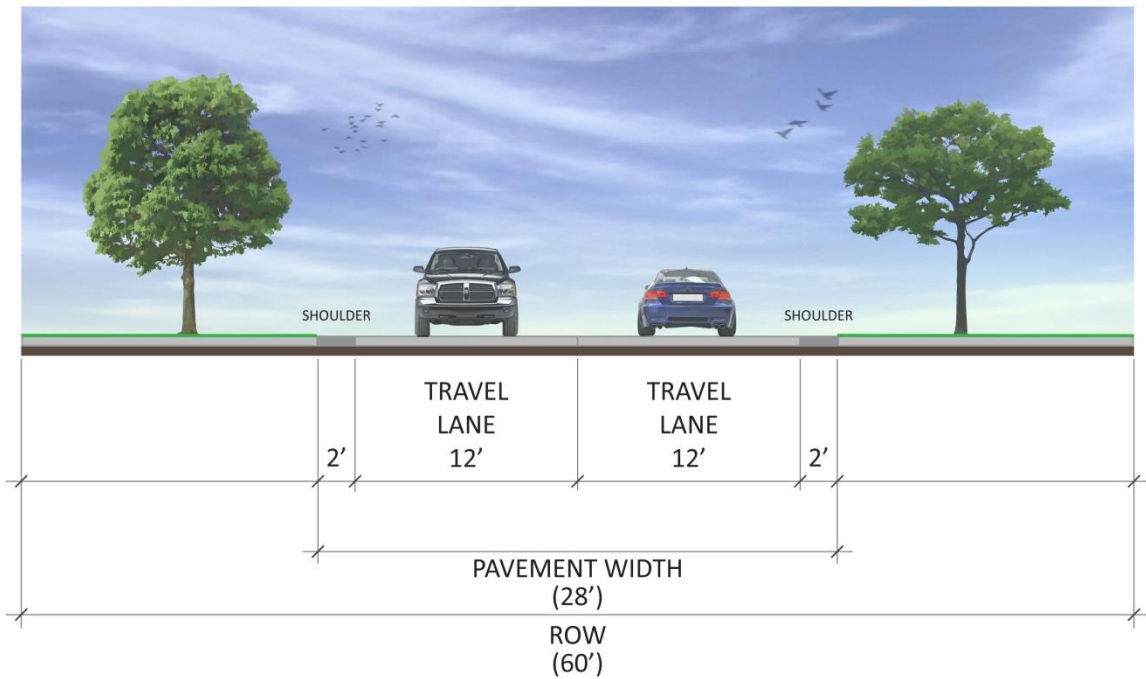


Exhibit 5-2. Rural Major and Minor Collector Street Cross-Section

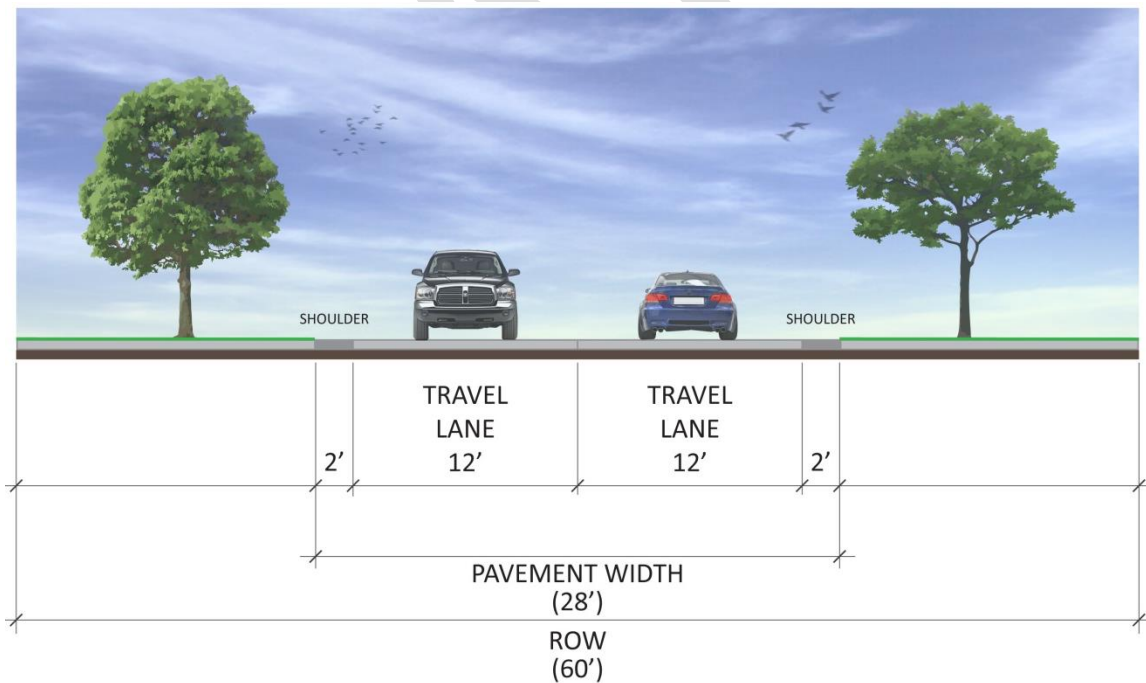


Exhibit 5-3. Rural Local Street Cross-Section

Urban Design Standards

Design standards for City roadways within urban areas (incorporated cities) are provided below.

Rufus Design Standards

City of Rufus’ street standards are summarized in Table 5-2. Exhibit 5-4, Exhibit 5-5, Exhibit 5-6, and Exhibit 5-7 illustrate the cross-sections based on the road design standards for the City of Rufus for arterials, collectors, local roads, and half-streets, respectively.

Table 5-2. City of Rufus Road Design Standards

Type of Street	Right-of-Way Width	Paving Width Between Curbs ⁶	Curb Return Radius	Maximum Percent of Grade	Minimum Radius of Curvature
Arterial ⁴	60'	42'	35'	10%	400'
Collector ⁴	60'	28'	35'	10%	300'
Residential ⁴	60'	24'	25'	10%	150'
Half Street ⁴	50'	20'	25'	10%	150'
Cul-de-sac ⁴	50-60' ¹	36' ¹	25'	10%	150'
Alley	20'	20'	15'	10%	150'

1. The paving radius at the turn-around of a cul-de-sac shall be 38' on a right-of-way radius of 50'.
2. Minimum grade of 0.3%. If unavoidable conditions exist, a grade of 2% steeper than that shown will be allowed.
3. One street name sign shall be provided at each intersection for each street.
4. Curbs and gutters shall be provided on both sides of the street on Arterial and Collector Streets with the council discretion of curb designs.
5. Curbs, Gutters, pedestrian walkways and bike lanes may be required on Residential, Half Street, and Cul-de-sac streets.
6. With approval from the City, pavement widths may be reduced to a minimum of 36' for Arterials, 24' for Collectors, 20' for Residential streets, 18' for half-streets, 15' for alleys, and 26' for a cul-de-sac.

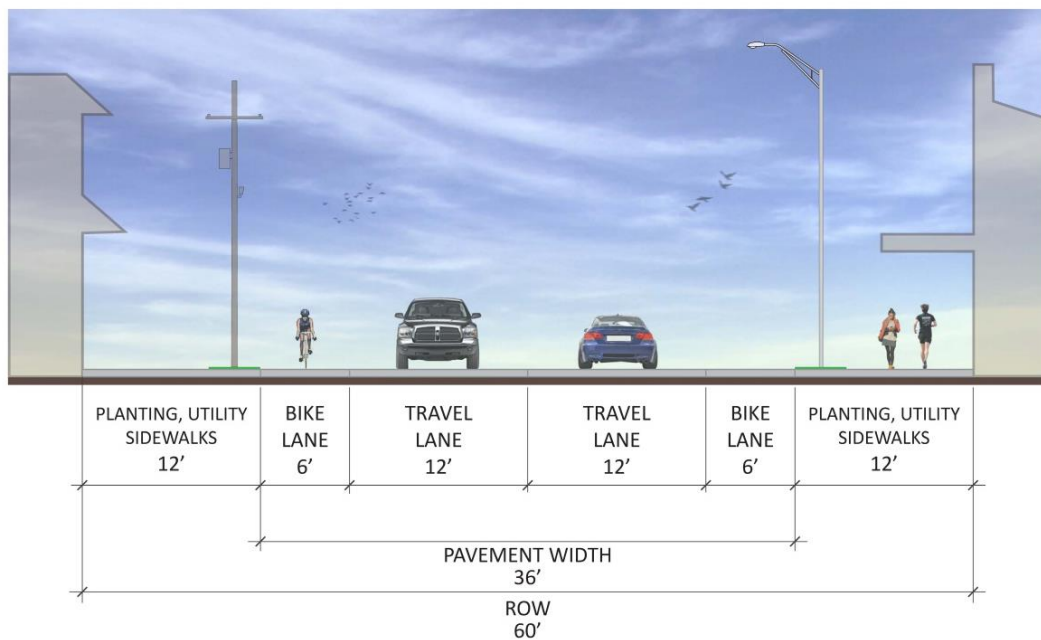


Exhibit 5-4. City of Rufus Arterial Design Standard

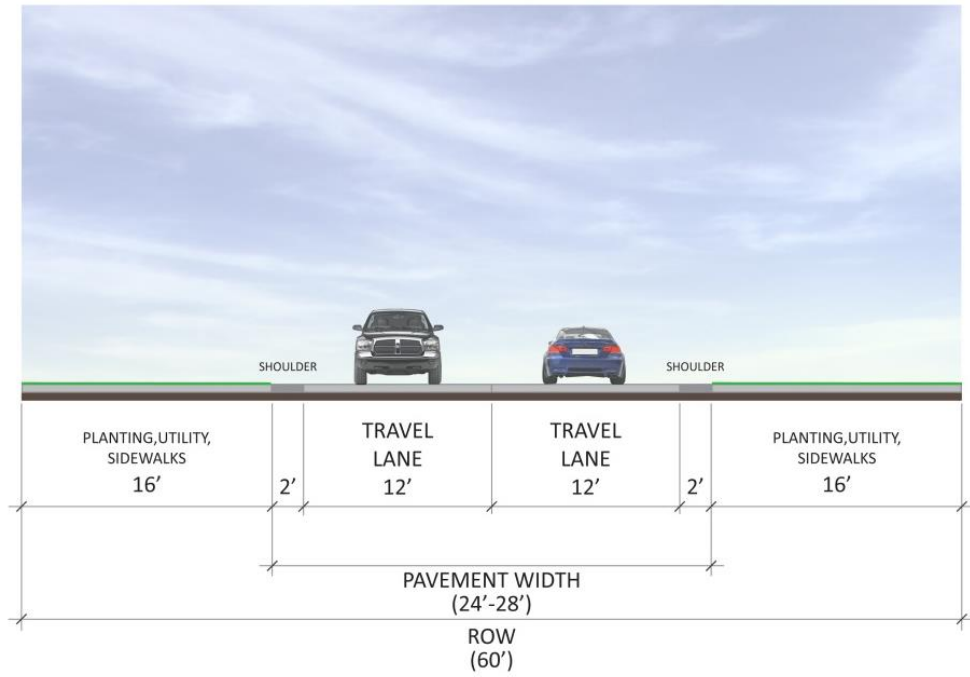


Exhibit 5-5. City of Rufus Collector Design Standard

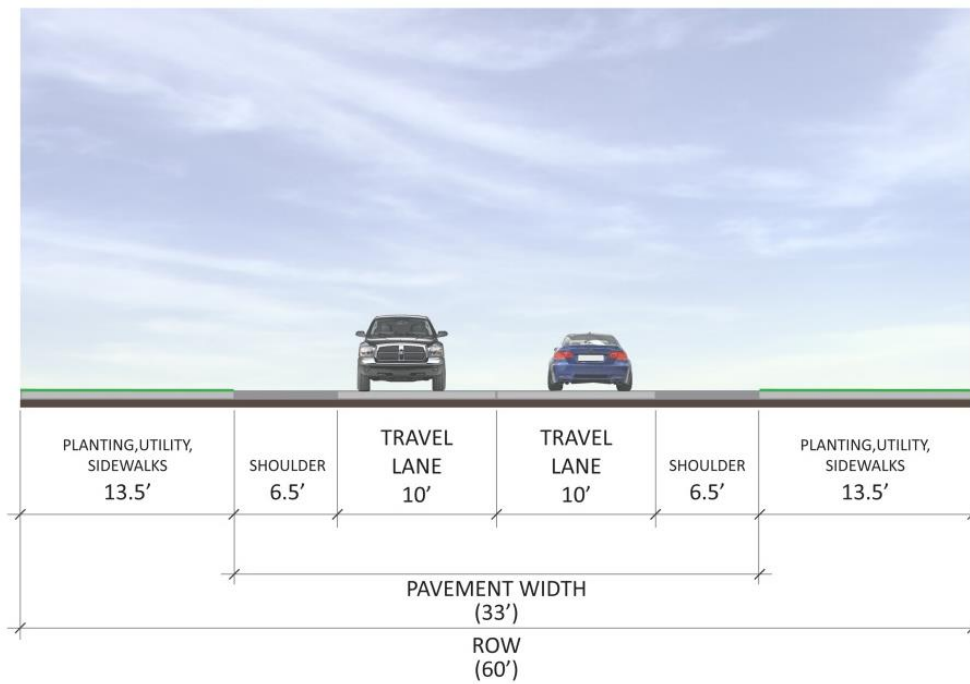


Exhibit 5-6. City of Rufus Local Road Design Standard

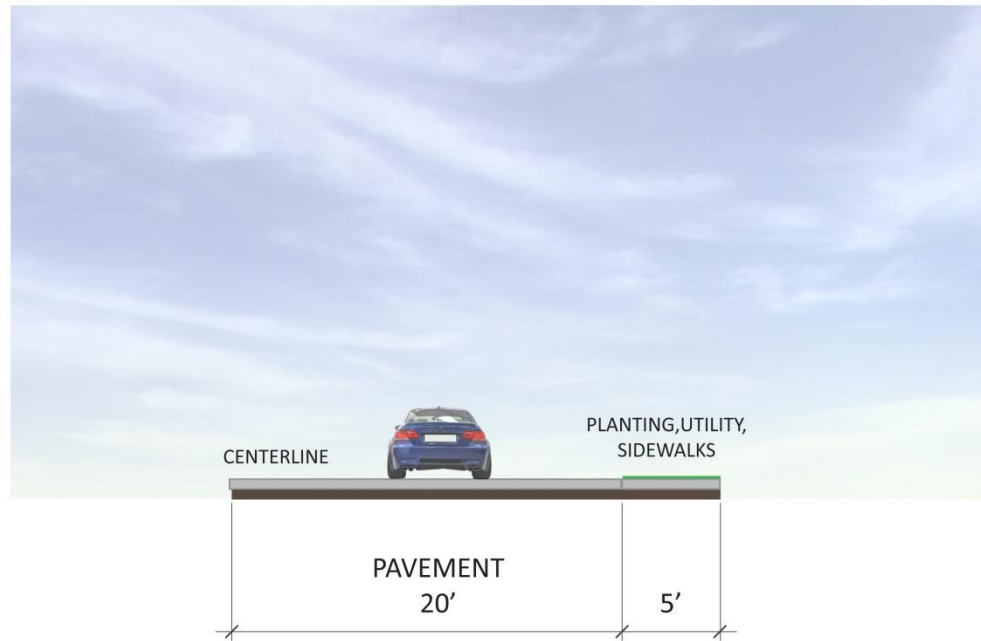


Exhibit 5-7. City of Rufus Half-Street Design Standard

Moro Design Standards

City of Moro’s street standards are summarized in Table 5-3. Exhibit 5-8, Exhibit 5-9, Exhibit 5-10, and Exhibit 5-11 illustrate the cross-sections based on the road design standards for the City of Moro for arterials, collectors, local roads, and half-streets, respectively.

Table 5-3. City of Moro Road Design Standards

Type of Street	Right-of-Way Width	Paving Width Between Curbs ⁵	Curb Return Radius	Maximum Percent of Grade	Minimum Radius of Curvature
Arterial ⁴	60'	42'	35'	10%	400'
Collector ⁴	50'	28'	35'	10%	300'
Residential ⁴	50'	24'	25'	10%	150'
Half Street ⁴	50'	20'	25'	10%	150'
Cul-de-sac ⁴	50-60' ¹	36' ¹	25'	10%	150'
Alley	20'	20'	15'	10%	150'

1. The paving radius at the turn-around of a cul-de-sac shall be 38' on a right-of-way radius of 50'.
2. Minimum grade of 0.3%. If unavoidable conditions exist, a grade of 2% steeper than that shown will be allowed.
3. One street name sign shall be provided at each intersection for each street.
4. Curbs and gutters shall be provided on both sides of the street on Arterial and Collector Streets. Curbs, Gutters, pedestrian walkways and bike lanes may be required on Residential, Half Street, and Cul-de-sacs.
5. With approval from the City, pavement widths may be reduced to a minimum of 36' for Arterials, 24' for Collectors, 20' for Residential streets, 18' for half-streets, 26' for a cul-de-sac, and 15' for alleys.

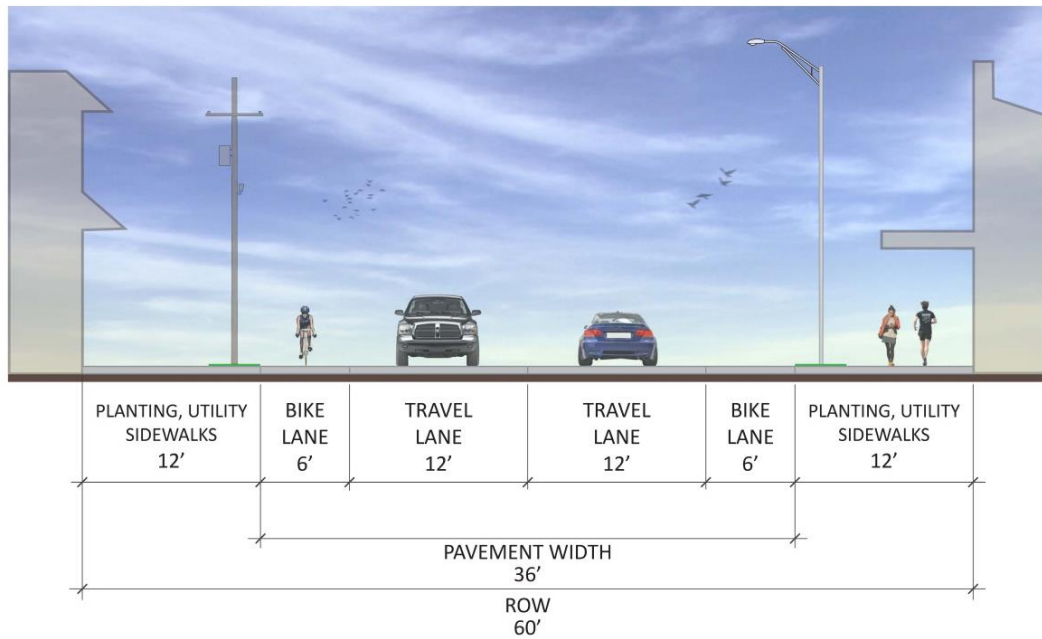


Exhibit 5-8. City of Moro Arterial Design Standard

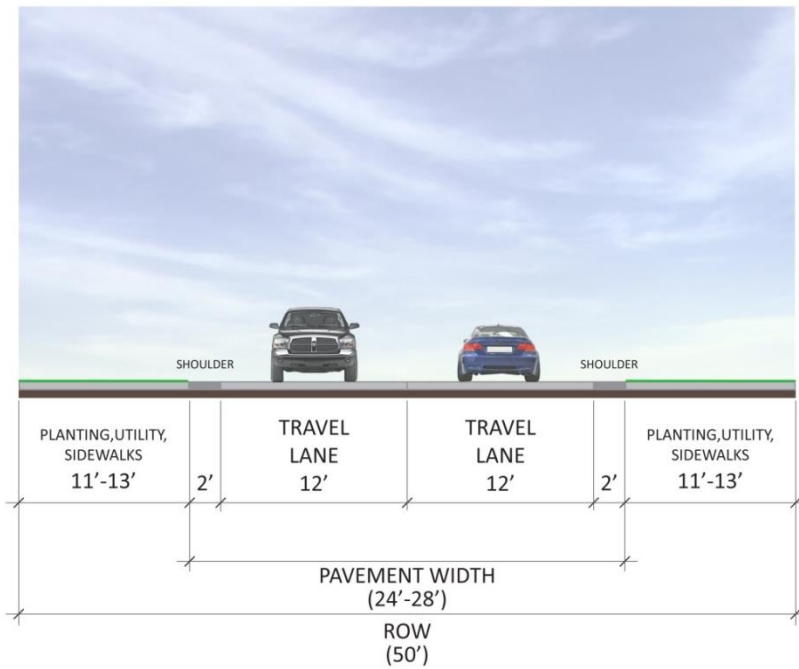


Exhibit 5-9. City of Moro Collector Design Standard

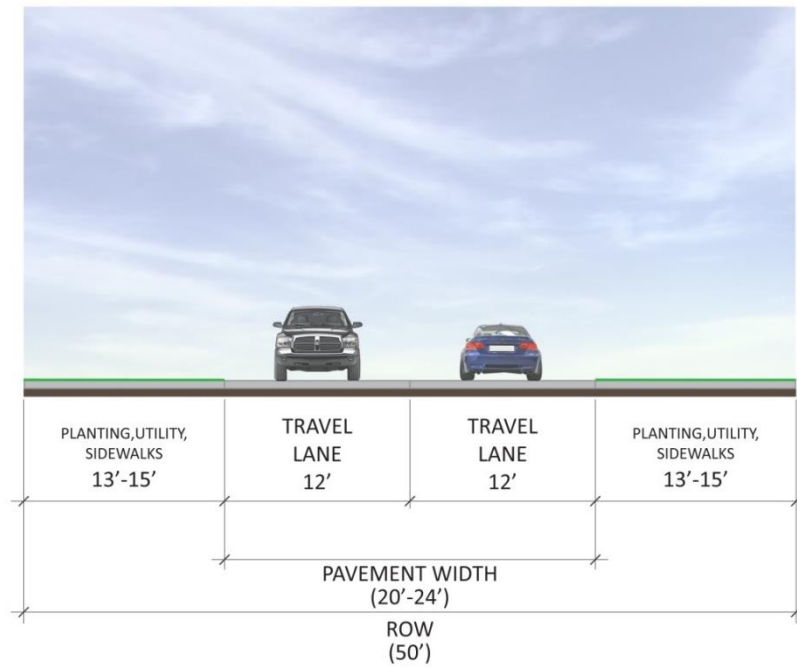


Exhibit 5-10. City of Moro Local Road Design Standard



Exhibit 5-11. City of Moro Half-Street Design Standard

Wasco Design Standards

City of Wasco’s street standards are summarized in Table 5-4. Exhibit 5-12, Exhibit 5-13, Exhibit 5-14, and Exhibit 5-15 illustrate the cross-sections based on the road design standards for the City of Wasco for arterials, collectors, local roads, and half-streets, respectively.

Table 5-4. City of Wasco Road Design Standards

Type of Street	Right-of-Way Width	Paving Width Between Curbs ⁵	Curb Return Radius	Maximum Percent of Grade	Minimum Radius of Curvature
Arterial ⁴	60'	42'	35'	10%	400'
Collector ⁴	60'	28'	35'	10%	300'
Residential ⁴	60'	33'	25'	10%	150'
Half Street ⁴	50'	20'	25'	10%	150'
Cul-de-sac ⁴	50-60' ¹	36' ¹	25'	10%	150'
Alley	20'	20'	15'	10%	150'

1. The paving radius at the turn-around of a cul-de-sac shall be 38' on a right-of-way radius of 50'.
2. Minimum grade of 0.3%. If unavoidable conditions exist, a grade of 2% steeper than that shown will be allowed.
3. One street name sign shall be provided at each intersection for each street.
4. Curbs and gutters shall be provided on both sides of the street on Arterial and Collector Streets. Curbs, Gutters, pedestrian walkways and bike lanes may be required on Residential, Half Street, and Cul-de-sacs.
5. With approval from the City, pavement widths may be reduced to a minimum of 36' for Arterials, 24' for Collectors, 20' for Residential streets, 18' for half-streets, 15' for alleys, and 26' for a cul-de-sac.

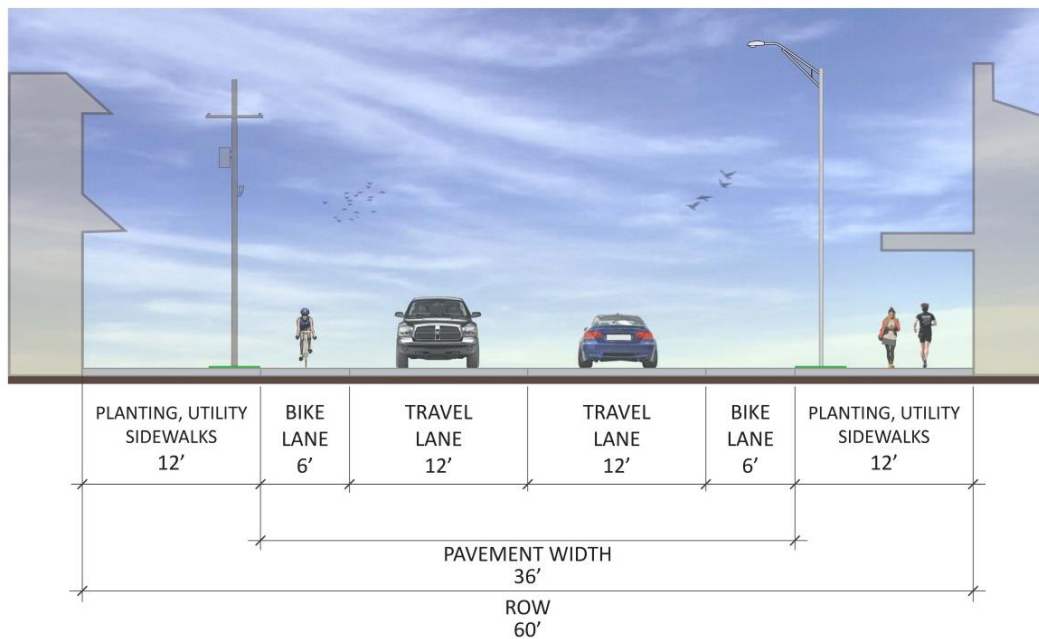


Exhibit 5-12. City of Wasco Arterial Design Standard

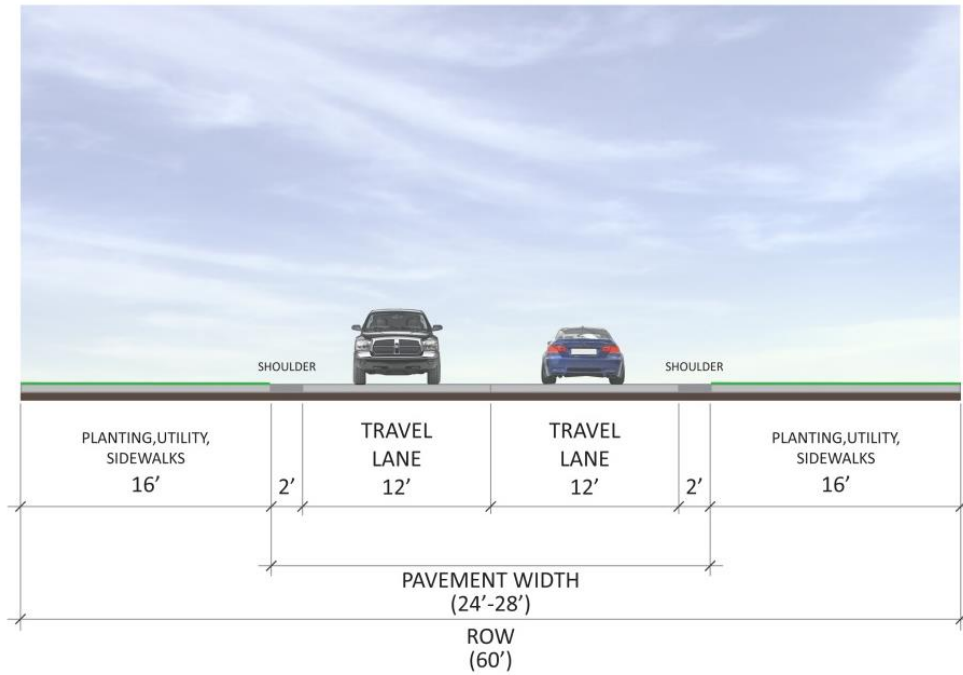


Exhibit 5-13. City of Wasco Collector Design Standard

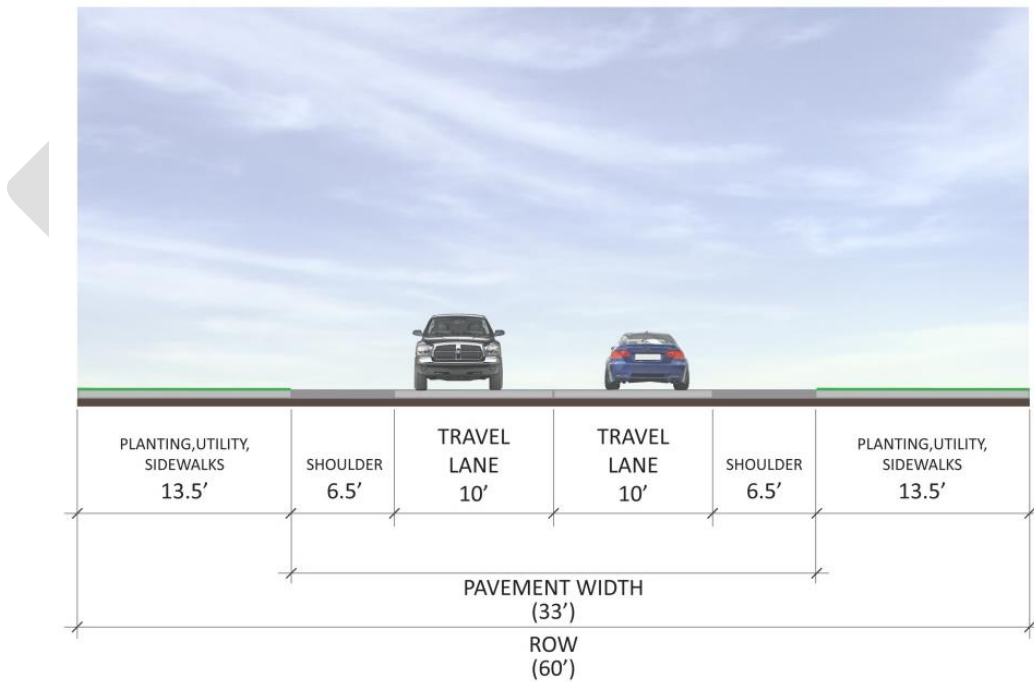


Exhibit 5-14. City of Wasco Local Street Design Standard

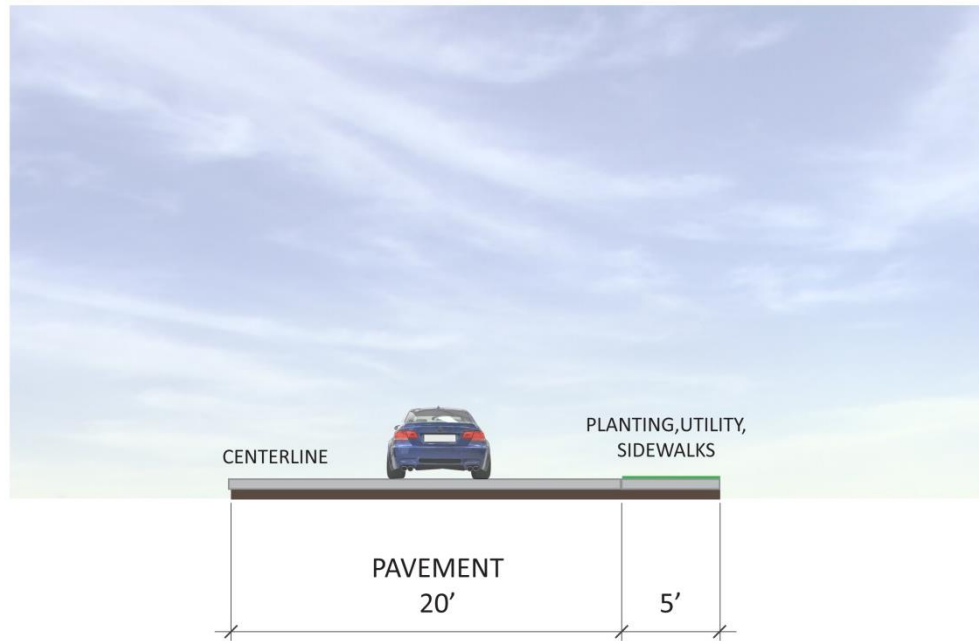


Exhibit 5-15. City of Wasco Half-Street Design Standard

Grass Valley Design Standards

City of Grass Valley’s street standards are summarized in Table 5-5. Exhibit 5-16, Exhibit 5-17, Exhibit 5-18, and Exhibit 5-19 illustrate the cross-sections based on the road design standards for the City of Grass Valley for arterials, collectors, local roads, and half-streets, respectively.

Table 5-5. City of Grass Valley Road Design Standards

Type of Street	Right-of-Way Width	Paving Width Between Curbs ⁵	Curb Return Radius	Maximum Percent of Grade	Minimum Radius of Curvature
Arterial ⁴	60'	42'	35'	10%	400'
Collector ⁴	60'	28'	35'	10%	300'
Residential ⁴	60'	24'	25'	10%	150'
Half Street ⁴	50'	20'	25'	10%	150'
Cul-de-sac ⁴	50-60' ¹	36' ¹	25'	10%	150'
Alley	20'	20'	15'	10%	150'

1. The paving radius at the turn-around of a cul-de-sac shall be 38' on a right-of-way radius of 50'.
2. Minimum grade of 0.3%. If unavoidable conditions exist, a grade of 2% steeper than that shown will be allowed.
3. One street name sign shall be provided at each intersection for each street.
4. Curbs and gutters shall be provided on both sides of the street on Arterial and Collector Streets. Curbs, Gutters, pedestrian walkways and bike lanes may be required on Residential, Half Street, and Cul-de-sacs.

5. With approval from the City, pavement widths may be reduced to a minimum of 36' for Arterials, 24' for Collectors, 20' for Residential streets, 18' for half-streets, 15' for alleys, and 26' for a cul-de-sac.

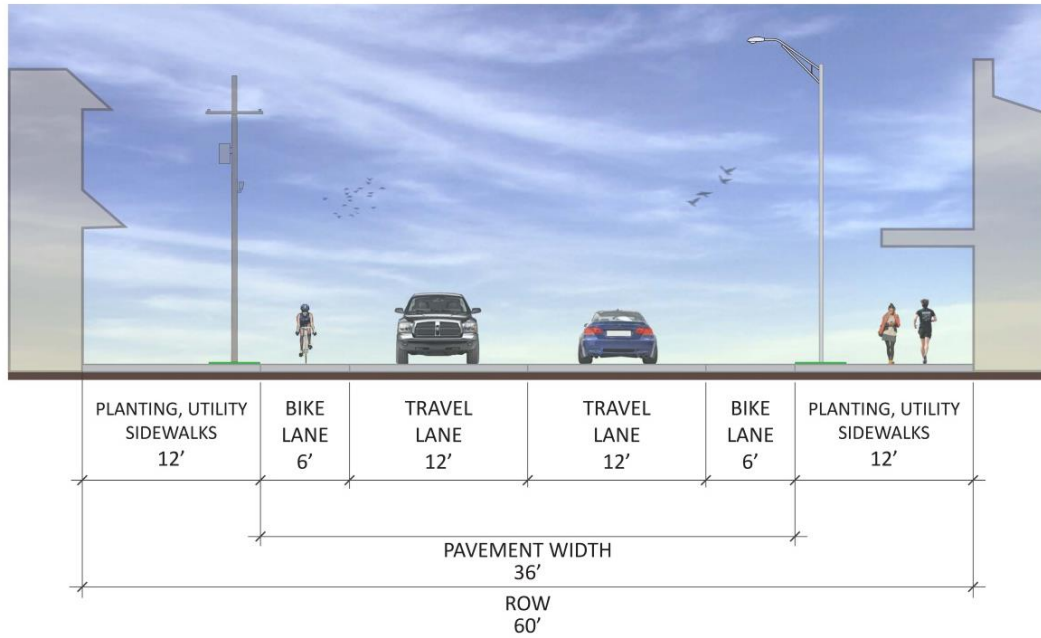


Exhibit 5-16. City of Grass Valley Arterial Design Standard

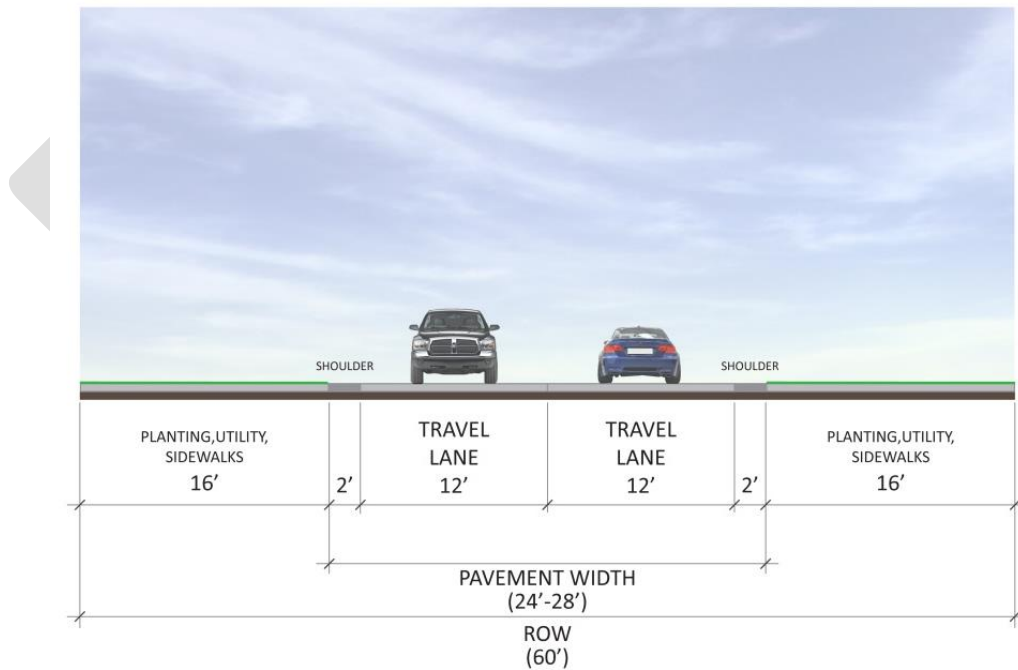


Exhibit 5-17. City of Grass Valley Collector Design Standard

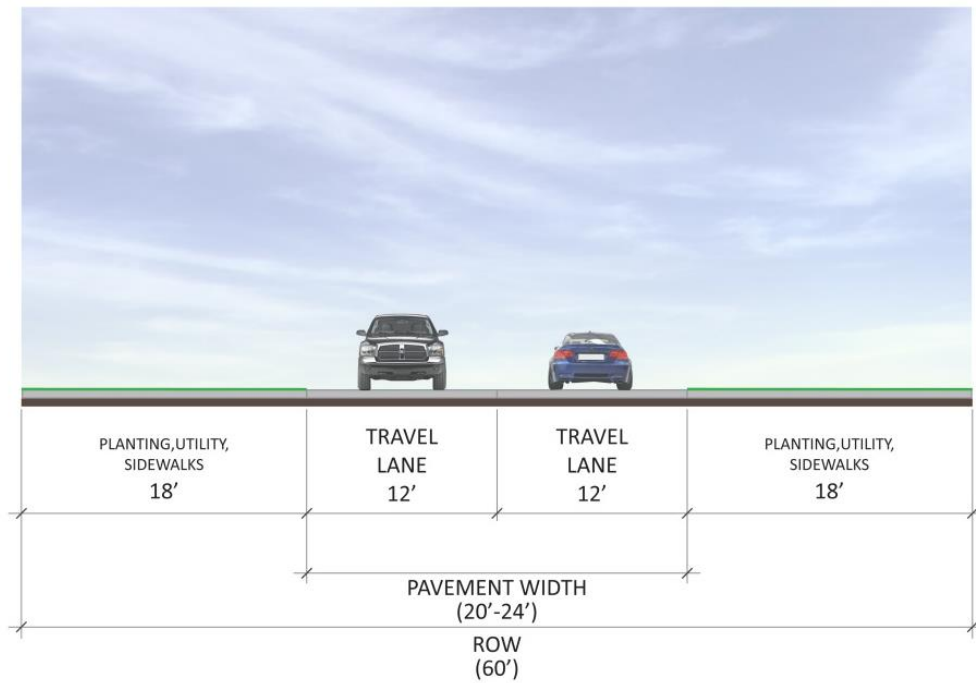


Exhibit 5-18. City of Grass Valley Local Road Design Standard

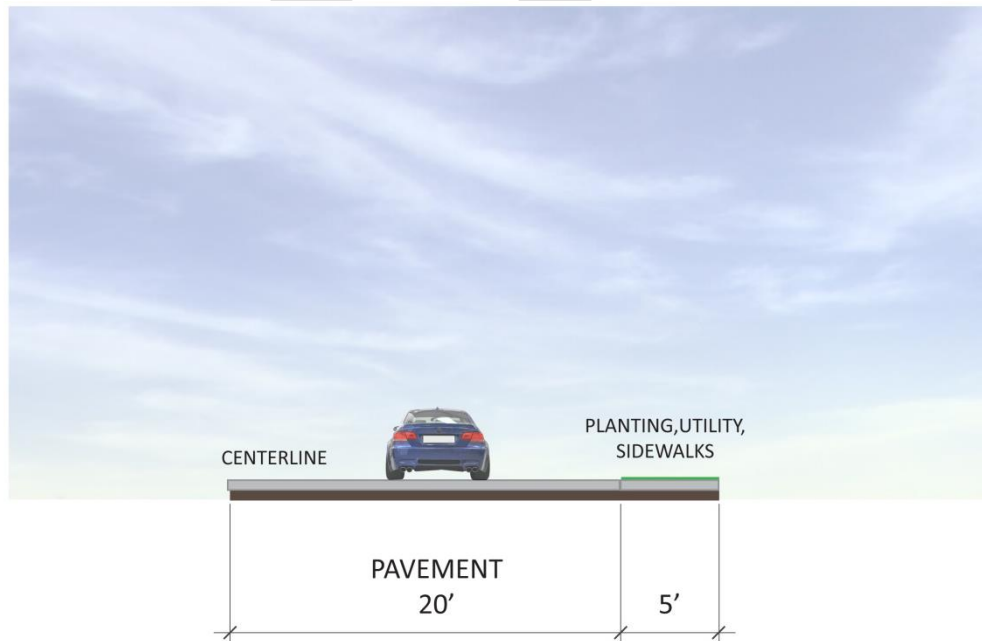


Exhibit 5-19. City of Grass Valley Half-Street Design Standard

Access Management Policy

Managing access to the County's road system is necessary to preserve capacity and maintain safety of the County's arterial and collector system. Capacity is preserved by minimizing the number of points

where traffic flow may be disrupted by traffic entering and exiting the roadway. Access management also enhances safety along roadways by minimizing the number of potential conflict points.

Access spacing standards for all driveways and private roads accessing County collector and arterial roadways are provided in Table 5-6.

Access to state facilities is governed by ODOT's access management standards provided in the most current version of the 1999 Oregon Highway Plan and in Oregon Administrative Rule 734-051. ODOT's standards also apply to access spacing on County facilities located within the management area of a freeway or expressway interchange, as defined by OAR 734-051.

The Oregon Transportation Planning Rule (TPR) defines access management as a set of measures regulating access to streets, roads, and highways, from public roads and private driveways. The TPR requires that new connections to arterials and state highways be consistent with designated access management categories. This TSP includes an access management policy that maintains and enhances the integrity (i.e., capacity, safety, and level of service) of Sherman County's roadways.

Table 5-6. Access Management Spacing Standards for Rural Sherman County Roadways

Functional Classification	Public Road Spacing	Private Drive Spacing
Collector	¼ mile	1,200 ft
Local Street	200-400 ft	Vary

These standards apply to new development or redevelopment; existing accesses are allowed to remain as long as the land use does not change. As a result, access management is a long-term process in which the desired access spacing to a street slowly evolves over time as redevelopment occurs.

Traffic Operations Standards

Sherman County has an obligation to maintain a safe, convenient, and economical transportation system. A maximum volume-to-capacity (v/c) ratio of 0.85 during a typical weekday peak hour should be maintained for all City- and County-owned or maintained intersections. At intersections with an ODOT facility, ODOT standards shall apply. For unsignalized intersections, the v/c ratio should be based on the intersection's critical movement. For signalized intersections, the ratio is based on the overall intersection operation.

Systemic Safety Plan

Several projects were identified in Technical Memorandum #4 to address safety concerns and reduce potential for crashes in Sherman County. The projects have been categorized as hot spot or systemic projects, consistent with the ODOT All Roads Transportation Safety (ARTS) program project classifications.

Background

ODOT allocates Oregon's Highway Safety Improvement Program (HSIP) funds through the ARTS program. The program currently splits funding between hot-spot and systemic safety projects. Hot spot safety projects are individual locations where a unique countermeasure could be applied to reduce the frequency and severity of crashes. Systemic safety projects include multiple locations where many low-cost countermeasures can be applied.

ARTS project funding will be allocated through the Statewide Transportation Improvement Program (STIP). The project locations are selected based on reported history of fatal and severe injury crashes. The draft 300-percent list for ODOT Region 4 2017-2021 Hotspot Safety projects does not include any projects in Sherman County. Similarly, the draft 150-percent list of 2017-2021 Systemic Safety projects in Region 4 does not include any projects in Sherman County.

County Systemic Safety Prioritization Methodology

Although no safety projects in Sherman County are included in the draft 2017-2021 STIP lists, a set of objective criteria were established to generate a prioritized list of projects that could be considered for future updates to the STIP.

A list of projects was generated based on a review of crash trends and locations with history of crashes in the County, including:

- Projects developed by the consultant team to address safety concerns identified by the Project Advisory Committee;
- Projects identified in ODOT's Roadway Departure, Intersection, and Pedestrian/Bicycle Safety Implementation Plans;
- Projects identified for locations with geometric and traffic control characteristics where low-cost, systemic countermeasures could reduce risk of roadway departure or intersection crash types.

Systemic countermeasures that may be applied for the Roadway Departure projects include centerline rumble strips, edgeline rumble strips, shoulder widening, guardrail, and curve warning signs, as summarized in Table 5-7. Intersection treatments may include additional signage, pavement markings, right-turn deceleration lanes, left-turn lanes, and mountable raised medians, as shown by the concepts in Table 5-8. Traffic volumes were not available for any of the locations where turn lanes or deceleration lanes were identified. Therefore, ODOT warrants should be reviewed prior to implementation of the left-turn or right-turn deceleration lanes. Cost estimates for these projects were based on unit costs from ODOT's list of approved Crash Reduction Factors (CRFs), 2014 ODOT bid items, and previous projects. A 40-percent contingency is applied to all estimates.

Table 5-7. Systemic Safety Countermeasure Toolbox for Rural Roadways












Systemic Safety Countermeasure	Description	Documented Effectiveness
<p>Milled Rumble Strip – Centerline</p>  <p>Photo: ODOT</p>	<p>Rumble strips are grooves in the roadway placed on the roadway in such a manner that, as the tires of a vehicle contact them, they produce sound (noise) and vibration. The noise and vibration produced by rumble strips is intended to alert inattentive drivers that they have departed from their lane. They can be placed on the shoulder (if adequate paved shoulder is available) or on the centerline.</p>	<p>38 to 50 percent reduction in injury crashes resulting from head-on and opposite direction sideswipe crashes on rural two-lane roads. (Source: NCHRP Report 641)</p>
<p>Milled Rumble Strip – Shoulder or Edgeline</p> 		<p>26 to 46 percent reduction in single-vehicle run-off-road injury crashes on two-lane rural roads (Source: NCHRP Report 641)</p>
<p>Horizontal Curve Signage</p>  <p>Photo: Speed Concepts: Informational Guide, FHWA</p>	<p>Provide Static Combination Horizontal Alignment/Advisory Curve Warning Sign, Install RECOMMENDED Chevron Signs on Rural Horizontal Curves</p>	<p>13 to 16 percent reduction in run-off-road injury crashes rural two-lane roads. Source: <i>Manual for Selecting Safety Improvements on High Risk Rural Roads</i> (FHWA-SA-14-075)</p>
<p>Shoulder Widening</p>  <p>Photo: Low Cost Treatments for Horizontal Curve Safety (http://safety.fhwa.dot.gov/roadway_dept/horicurves/fhwasa07002/ch6.cfm)</p>	<p>Widen the paved roadway shoulder to provide additional space for vehicles to recover if they exit the travel lane.</p>	<p>3 to 6 percent reduction in crashes per one foot of shoulder widening. (Source: <i>CMF Clearinghouse</i> and <i>ODOT's List of Approved CRFs</i>)</p>
<p>Safety Edge</p>  <p>Photo: Selecting Speed Treatments, FHWA (http://safety.fhwa.dot.gov/hsip/hrrr/manual/sec45.cfm)</p>	<p>Install Safety Edge treatment on the pavement edge drop-off to provide a more gradual drop-off and increase the likelihood of vehicle recovery if the vehicle exits the roadway. This may be done in conjunction with shoulder widening or pavement maintenance activities.</p>	<p>5 to 15 percent reduction in rural roadway crashes. (Source: <i>CMF Clearinghouse</i> and <i>ODOT's List of Approved CRFs</i>)</p>
<p>Guardrail</p>  <p>Photo: FHWA Horizontal Curve Safety (Source: http://safety.fhwa.dot.gov/roadway_dept/horicurves/cmhoricurves/)</p>	<p>Install guardrail to prevent vehicles from entering areas that are not recoverable. When guardrail is located close to the roadway, vehicles are more likely to hit it. However, these crashes are typically less severe than roadway departure crashes in locations without guardrail. Guardrail is often used in situations where there is limited recovery area for vehicles and steep drop offs or fixed objects are present.</p>	<p>38 percent reduction to 23 percent increase in run off the road crashes. Source: <i>CMF Clearinghouse</i> (CMF ID: 39). <i>Note: This item is not included in ODOT's list of approved systemic countermeasures.</i></p>

Table 5-8. Systemic Safety Countermeasure Toolbox for Rural Intersections

Systemic Safety Countermeasure	Description	Documented Effectiveness
<p>Basic Set of Sign and Marking Improvements</p>  <p>Photo: Low-Cost Safety Enhancements for Stop-Controlled and Signalized Intersections, FHWA</p>	<p>Install basic set of signs/markings from the ODOT Intersection Safety Implementation Plan, including: double up oversize warning signs, double STOP signs, mountable curb on stop approach (if feasible), street name signs, and stop bars.</p>	<p>40 percent reduction in intersection crashes at rural two-way stop controlled intersections.</p> <p>Source: <i>Low-Cost Safety Enhancements for Stop-Controlled and Signalized Intersections</i> (FHWA-SA-09-020)</p>
<p>Right-Turn Deceleration Lane</p> 	<p>Install right-turn deceleration lanes to provide an area for vehicles to slow down prior to completing a turning movement on high-speed roads. Deceleration lanes reduce the likelihood that vehicles will be rear-ended when slowing for a turn.</p>	<p>14 to 26 percent reduction in crashes at unsignalized intersections.</p> <p>(Source: <i>Highway Safety Manual</i> and <i>ODOT's List of Approved CRFs</i>)</p> <p>Note: This item is included in ODOT's list of approved CRFs as a hot spot treatment rather than systemic.</p>
<p>Left-turn Lane</p> 	<p>Install a left-turn lane to provide an area for vehicles to decelerate prior to making a left-turn and an area for vehicles to wait until a sufficient gap in traffic is available to complete the left-turn. Left-turn lanes help reduce rear-end crashes and discourage left-turn vehicles from taking smaller gaps in traffic because they have a refuge area.</p>	<p>33 to 55 percent reduction in crashes at rural unsignalized intersections.</p> <p>(Source: <i>Highway Safety Manual</i> and <i>ODOT's List of Approved CRFs</i>)</p> <p>Note: This item is included in ODOT's list of approved CRFs as a hot spot treatment rather than systemic.</p>
<p>Reduce Intersection Skew by Realignment</p>  <p>(Example of skewed approach prior to realignment.)</p>	<p>Realign the intersection to create a 90-degree intersection, removing any skewed approaches.</p>	<p>The effectiveness of this treatment varies depending on the skew angle of the intersection prior to realignment.</p>
<p>Improve Intersection Sight Distance</p>  <p>(Example of restricted sight distance that could be mitigated by tree removal.)</p>	<p>Improve intersection sight distance to meet minimum AASHTO guidance based on the posted speed limit of the major roadway.</p>	<p>44 to 89 percent reduction in crashes at rural unsignalized intersections.</p> <p>(Source: <i>ODOT's List of Approved CRFs</i>)</p>

Lists of prioritized Roadway Departure projects and Intersection projects, based on a set of objective criteria outlined in Table 5-9, are provided in Table 5-10 and Table 5-11. Figure 5-2 illustrates the locations of these projects throughout the County. The projects are ordered from highest to lowest priority based on the criteria each location satisfies. All locations where a fatal or severe injury crash occurred in the County were reviewed. However, crashes are not always associated with geometric factors. Crashes are random occurrences and often influenced by driver errors such as impaired driving and inattention. If no geometric factors were found during the review of the severe crash location, the location was excluded from the list of systemic safety projects. Similarly, locations where geometric concerns were identified by the County or Cities may be included even if no crashes have been reported during the past five years. No systemic pedestrian and bicycle safety projects were identified.

Table 5-9. Objective Criteria for Identifying and Prioritizing Systemic Safety Projects

	Roadway Departure Projects	Intersection Projects
Criteria for Identifying Locations for Systemic Projects	<ul style="list-style-type: none"> ▪ ≥1 Fatal or Injury A Crash ▪ ≥2 Injury B or C Crashes ▪ ≥3 PDO Crashes ▪ Presence of Roadway Departure Crashes ▪ Presence of a Horizontal Curve 	<ul style="list-style-type: none"> ▪ ≥1 Fatal or Injury A Crash ▪ ≥2 Injury B or C Crashes ▪ ≥3 PDO Crashes ▪ Restricted intersection sight distance ▪ Skewed intersection approach ▪ Uncontrolled approach speed >45 mph ▪ Functional classification ▪ Land use

Table 5-10. Systemic Safety Roadway Departure Projects

ID	Roadway	Start MP or Cross Street	End MP or Cross Street	Priority	Cost Estimate	Potential Countermeasures							
						Inlaid Raised Pavement Markers	Widen Shoulder & Install Safety Edge	Install Centerline and Shoulder Rumble Strips*	Curve Warning Signs	Chevrons at Curves	Guard-rail	Passing Lanes^	Speed Enforcement
95	US 97	0.86	6.20	High	\$18,500	X		X	X	X			
4	US 97	42.43	43	High	\$4,800	X		X	X	X		X	X
87	OR 206	3	6.1	Medium	\$12,900	X		X	X	X			
88	US 97	22.5	23.9	Medium	\$8,600	X		X				X**	
89	Scott Canyon Road	Rufus City Limits	Herin Lane	Medium	\$9,500	X	X	X	X	X			
90	US 97	12	13.28	Medium	\$6,600	X		X					
91	US 97	33.33	33.58	Medium	\$4,000	X		X	X	X			
49 & 86	Van Gilder Road	4	5.6	Medium	\$14,700	X	X	X	X	X	X		
92	Scott Canyon Road	Medler Ln	Gerking Canyon Rd	Low	\$6,600	X	X	X	X	X			
2	Herin Lane	Scott Canyon Road	Oehman Road	Low	\$9,200	X	X	X					
48	Lonerock Road	N/A	N/A	High	\$5,300	X	X	X			X		
59	Blagg Lane	N/A	N/A	Low	\$3,500	X	X	X	X	X			

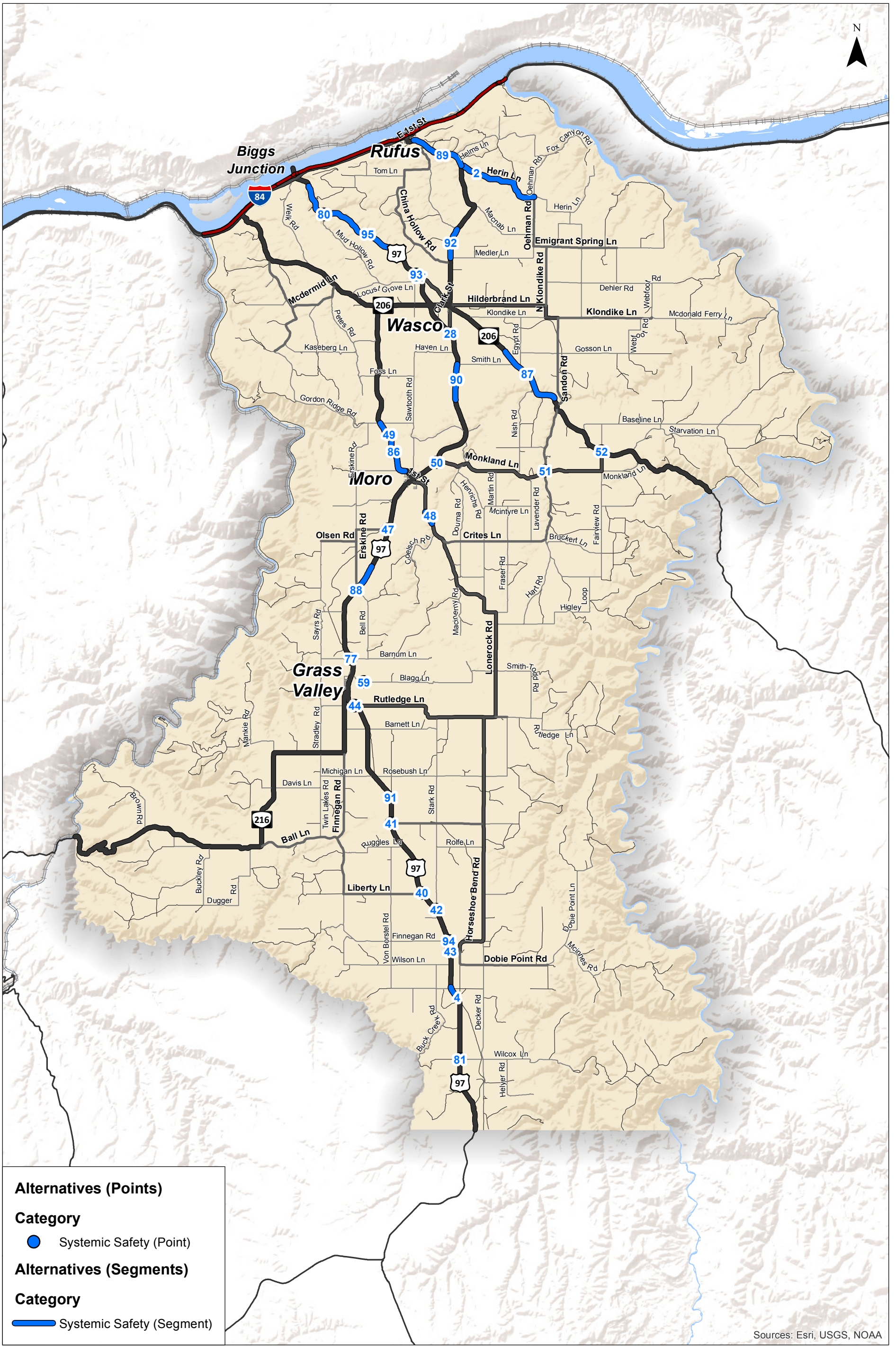
*Rumble strips should only be installed in locations where the shoulder width permits it.

^Passing lanes and speed enforcement should involve further study prior to implementation. Cost estimates do not include passing lanes.

**Passing lanes exist from approximately MP 23 to 23.55. The study should evaluate whether this passing lane can be lengthened.

Table 5-11. Systemic Safety Intersection Projects

ID	Major Road	Minor Road	Priority	Cost Estimate	Potential Countermeasures						
					Rural Intersection Signing and Marking Improvements	Right-turn deceleration Lane	Lengthen existing right-turn deceleration lane	Install left-turn lane	Lengthen existing left-turn lane	Improve sight distance	Reduce intersection skew
50	US 97	Monkland Lane	High	\$309,900				X		X	
77	US 97	Barnum Lane	High	\$309,900				X			
93	US 97	Sawtooth Road	High	\$6,500	X						
94	US 97	Finnegan Road	Medium	\$18,500							X
42	US 97	Stark Lane	Medium	\$5,000						X	
47	US 97	Moore Lane	Low	\$25,600			X				
52	OR 206	Fairview Road	Medium	\$27,300	X						X
44	US 97	Rutledge Lane	Medium	\$25,600							X
80	US 97	Mud Hollow Road	Medium	\$309,900				X			
40	US 97	Liberty Lane	Medium	\$210,000		X					
41	US 97	Bourbon Lane	Medium	\$309,900				X			
27	US 97	Old Highway 97	Medium	\$309,900				X			
20	W 1 st Street / Biggs-Rufus Highway	Industrial Access	High	\$309,900				X			
43	US 97	Dobie Point Road	High	\$514,900		X		X			
28	US 97	Clark Street	Low	\$25,600			X				
81	US 97	Wilcox Lane	Medium	\$309,900				X			
51	Monkland Lane	Hay Canyon Road	Medium	\$3,200	X						



Systemic Safety Projects
Sherman County, Oregon

Figure
5-2

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IMPLEMENTATION PLAN

This section outlines specific transportation system improvement projects as well as a categorization of the identified improvements into two groups: near- and long-term. The categorization presented reflects the relative time period in which it may be foreseeable for the County and Cities to implement the project; it is not intended to limit the selection of a project or the order in which projects will be implemented. The County will need to periodically update its TSP and will review the need and timing for improvements at those times.

Long-term projects may or may not be feasible within the twenty-year planning horizon, for reasons of both need and resources. However, they represent a vision for an efficient transportation system in the future, and they have been identified to support the preservation of the opportunities as future conditions may warrant them.

The construction of roads, water, sewer, and electrical facilities in conjunction with local development activity should be coordinated if the County is to develop in an orderly and efficient way. Consequently, the planned improvements identified should be considered in light of developing infrastructure sequencing plans, and may need to be modified accordingly.

The planned transportation improvement alternatives in Sherman County include those identified to address various types of transportation issues, which generally include:

- *Operations:* These projects provide the roadway capacity needed to accommodate future traffic flows and reduce delay.
- *Safety:* These projects consider opportunities to improve existing facilities to reduce probability and severity of crashes. These projects include those identified as part of the Systemic Safety Plan for the County.
- *Pedestrian and Bicycle Enhancements:* These projects improve existing facilities or create new facilities that provide greater connectivity and increase access to pedestrian and bicycle routes.
- *Heavy Maintenance:* These projects address the needs identified by the County that relate to roadway, roadside, or drainage and cannot be conducted as part of regular maintenance activities.
- *Full Reconstruction:* These projects include reconstruction of the roadway including removal of existing roadway and placement of aggregate base and asphalt pavement.
- *Feasibility Studies:* These projects have identified the need for some level of long-term improvements to different roadway segments or intersections. Given the size and complexity, a more detailed evaluation of potential improvements has been identified that is beyond the scope of the TSP.
- *Pilot Projects:* Pilot projects are innovative projects that can be done on an interim basis and can be reversed if needed.
- *Programs/Policies:* The programs and policies reflect changes to County or City operations or code that has an impact on the transportation system.

While site-specific projects, such as adding turn lanes at an existing intersection, have been included to improve conditions at particular locations, the alternatives collectively reflect a broader goal which is to develop an efficient transportation network that will reduce reliance on the state highways and limit potential for motor vehicle crashes while encouraging economic activity.

Roadway Transportation Improvements

The preferred near- and long-term transportation improvements within unincorporated areas of Sherman County are listed in Table 5-12, and the preferred transportation improvements for the incorporated cities of Rufus, Wasco, Moro, and Grass Valley are shown in Table 5-13. The table includes a project number for reference to the project location illustrated in Figure 5-3 for rural areas and Figure 5-4 for urban areas. Additionally, the tables include preliminary cost estimates with 40-percent contingency for the projects, excluding right-of-way. Potential non-binding funding sources were also identified for each project and are subject to negotiation at the time of project execution. *Cost estimate calculations and assumptions are provided in Attachment A.*

The implementation plan incorporates the preferred financing plan, which identifies that a limited amount of money will be available to fund projects. As a result, only improvements that are planned for implementation and are expected to have funding are shown in the near-term time frame. The long-term project timeline reflects the fact that some projects are not needed immediately and that it will take time to accumulate the funds to build those projects.

Table 5-12. Planned Transportation Improvements in Sherman County (including unincorporated areas of Biggs and Kent)

ID	Name	Description	Category	Type	Cost Estimate ¹	Potential Funding Source			
						ODOT/ State	County	Cities	Private
Short-Term Projects									
15	Roadway Design Guidelines	Update roadway design guidelines for each community.	Modernization	Policy	\$0		X	X	
72	Traffic Speeds on US 97	Improve education and enforcement related to traffic speeds in the County through programs and additional signage or campaigns. Evaluate the feasibility of using ITS treatments to reduce speed in Cities throughout the County.	Safety	Program/ Study	\$20,000	X	X	X	
73	Truck Volumes and Speeds on US 97 in Cities	Install speed reduction treatments on US 97 to reinforce posted speeds in cities. Speed reduction treatments may consider automated speed enforcement, speed feedback signs, roadway modifications to visually indicate to drivers that they are entering urban area.	Safety	Project	\$56,800	X	X	X	
74	Passing Opportunities on US 97	Conduct study to determine locations where passing lanes are needed. Supplement with previous work ODOT has completed.	Safety	Study	\$10,000	X	X		
5	Weather-related crashes	Conduct study to determine feasibility and cost of implementing treatments for weather related crashes, including: ITS treatments, different pavement materials, warning signs, etc.	Safety	Study	\$10,000	X			
16	OR 206/Fulton Canyon Road & Biggs-Rufus Highway Upgrade	Upgrade OR 206/Fulton Canyon Road from a major collector to a minor arterial from the intersection of US 97 to the intersection with Biggs-Rufus Highway. Route serves as a popular alternative to US 97 for local residents. Study the feasibility of improving the roads to arterial standards.	Modernization	Policy & Study	\$10,000	X	X		
17	Scott Canyon Road Upgrade	Upgrade Scott Canyon Road from a major collector to a minor arterial from OR 206 in Wasco to Biggs-Rufus Highway in Rufus. Route serves as a popular alternative to US 97 for local residents. Study the feasibility of improving the road to arterial standards.	Modernization	Policy & Study	\$0		X		
75	OR 216 Upgrade	Upgrade OR 216 from a major collector to a minor arterial from US 97 in Grass Valley to Deschutes River. This route is a popular route for river access along the Deschutes and for residents traveling to the east. Study the feasibility of improving the road to arterial standards.	Modernization	Policy & Study	\$10,000	X			
76	Van Gilder Road Upgrade	Upgrade Van Gilder Road from a major collector to a minor arterial from US 97 in Moro to the intersection with OR 206. Route serves as a popular alternative to US 97 for local residents. Study the feasibility of improving the road to arterial standards.	Modernization	Policy & Study	\$10,000		X		
Medium and Long-Term Projects									
11	US 97 Bridge over Columbia River at Biggs Junction	Improve or replace bridge to meet current design standards.	Bridge	Project	TBD	X			
18	Intermodal freight connections at Biggs Junction	Evaluate opportunities for improved freight connections between trucks, rail, and river cargo.	Intermodal	Study	\$20,000	X	X		X
14	Finnegan Road Bridge over Finnegan Creek	Improve or replace bridge to meet current design standards.	Bridge	Project	TBD		X		
26	Maddie's Hump	Upgrade to major collector. Study feasibility of widening shoulders.	Modernization	Project & Study	\$10,000	X	X		
46	US 97 / Erskine Road	Widen the throat of Erskine Road.	Modernization	Project	\$56,900	X	X		
30	Eastern Alternate Access to	Pave Blagg Lane from Oregon Raceway to Lonerock Road. Consider upgrading the functional classification.	Roadway	Project	\$2,559,600		X		X

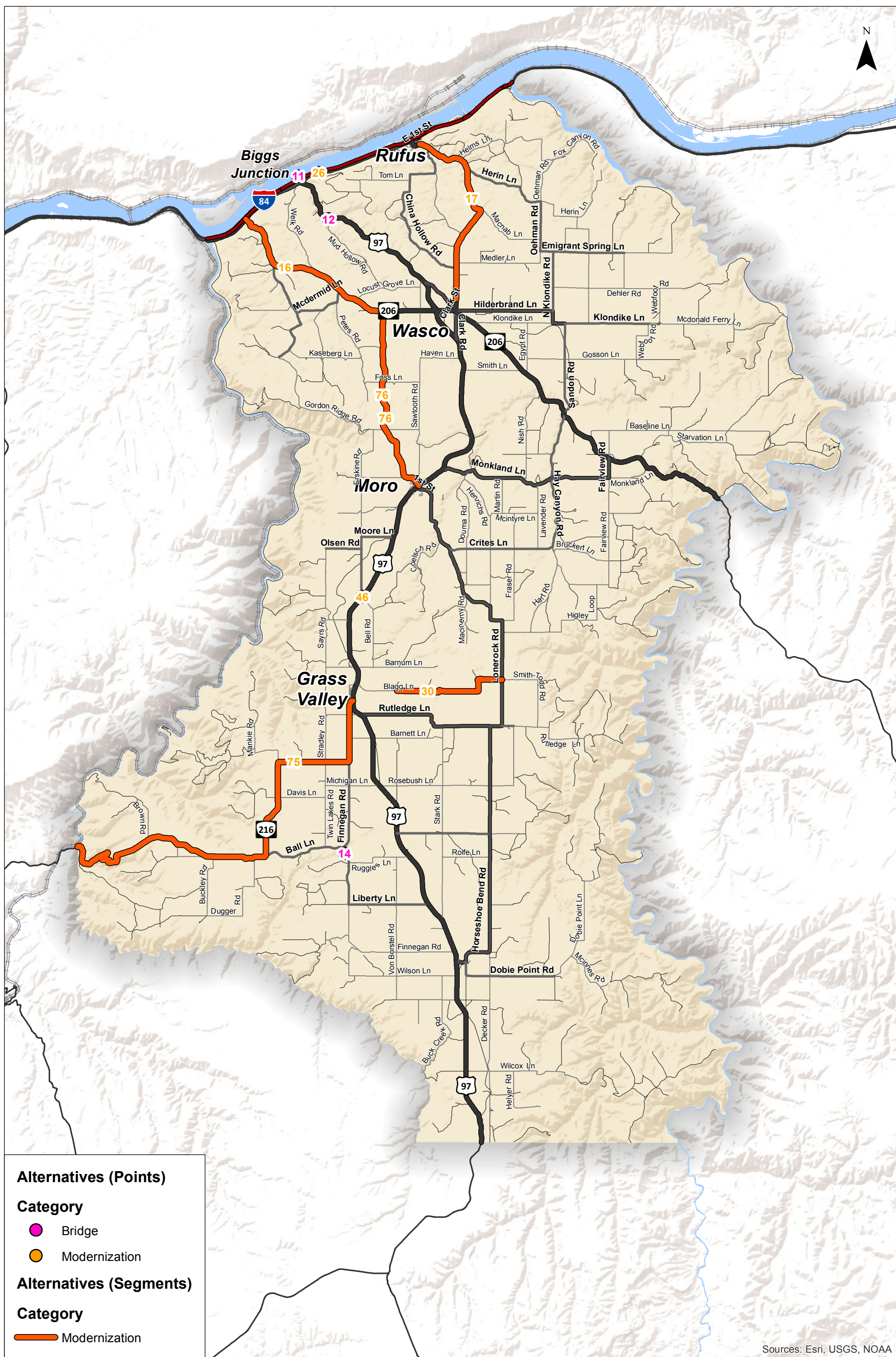
ID	Name	Description	Category	Type	Cost Estimate ¹	Potential Funding Source			
						ODOT/ State	County	Cities	Private
	Raceway								
31	Northern Alternate Access to Raceway	Construct a secondary access from the Oregon Raceway to Barnum Lane.	Safety	Project	\$484,100		X		X
12	Mud Hollow Road Bridge over Spanish Hollow Creek	Improve or replace bridge to meet current design standards.	Bridge	Project	TBD		X		
55	Wildlife Crossings	Conduct a study to determine where wildlife crossings are needed on the major state highways. Estimate the cost of installing the crossings.	Safety	Study	\$10,000	X			

Table 5-13. Planned Transportation Improvements in Urban Areas

ID	City	Name	Description	Category	Type	Cost Estimate ¹	Potential Funding Source			
							ODOT/ State	County	Cities	Private
Short-Term Projects										
23	Rufus	1st Street/Biggs-Rufus Highway Bridge (west of Sullivan Ln)	Evaluate structural integrity of the existing bridge and establish cost estimates for required improvements to support structural integrity and serve existing traffic use.	Bridge	Study	\$20,000	X	X		
24	Rufus	1st Street/Biggs-Rufus Highway Bridge (east of Fowler St)	Evaluate structure integrity of the existing bridge and establish cost estimates for required improvements.	Bridge	Study	\$20,000	X	X		
19	Rufus	Murray Street	Install traffic calming measures on Murray Street to reinforce posted speed and deter cut-through traffic.	Modernization	Project	\$10,000			X	
21	Rufus	2nd Street/Wallace Street	Connect 2nd Street to 1st Street 300' west of Wallace Street. Vacate 2nd Street from new connection to Wallace Street. Consider extending 3rd Street to 2nd Street/1st Street.	Safety	Project	\$95,800			X	
68	Rufus	Intersection of 2nd Street/Biggs Rufus Highway	Vacate 2nd Street from Murray Street to 1st Street.	Safety	Project	\$22,300	X		X	
56	Wasco	Wasco Wayfinding Signage	Provide better signage to direct vehicles to highways, Rufus, and Cottonwood Canyon State Park.	Modernization	Project	\$6,800			X	
66	Moro	High School Access	Restripe southern access points to restrict minor street left-turns to northern part of fork and make southern entrance one-way incoming northbound only. Add southbound left-turn lane at northern intersection on US 97. Relocated speed limit signs to reduce speed limit further in advance of intersection. Consider speed feedback signs to reduce speeds in advance of intersections.	Safety	Project	\$204,700	X	X	X	
Medium and Long-Term Projects										
22	Rufus	Biggs Rufus Highway (1st Street) lacks defined on-street parking.	Define access management along the highway and define on-street parking spaces.	Modernization	Project	\$28,400	X		X	

ID	City	Name	Description	Category	Type	Cost Estimate ¹	Potential Funding Source			
							ODOT/ State	County	Cities	Private
25	Rufus	2nd Street Bridge (east of Fowler St)	Close bridge to traffic when 2nd Street is closed to traffic as part of Project #68.	Bridge	Project	\$0			X	
69	Rufus	Fowler Street Parking	Vacate Fowler Street from 1st Street to 2nd Street and convert to a parking lot with access to 2nd Street only.	Modernization	Project	\$27,300			X	
71	Rufus	Rufus Parking Analysis	Conduct a parking options study and analysis for the business and residential block.	Modernization	Study	\$10,000			X	
45	Grass Valley	North Street/US 97	Reconstruct North Street approach to US 97 to provide larger turn radius, and add a left-turn lane from US 97 to North Street.	Modernization	Project	\$91,000	X		X	

¹ Cost estimate is planning level only. Does not include right-of-way costs.

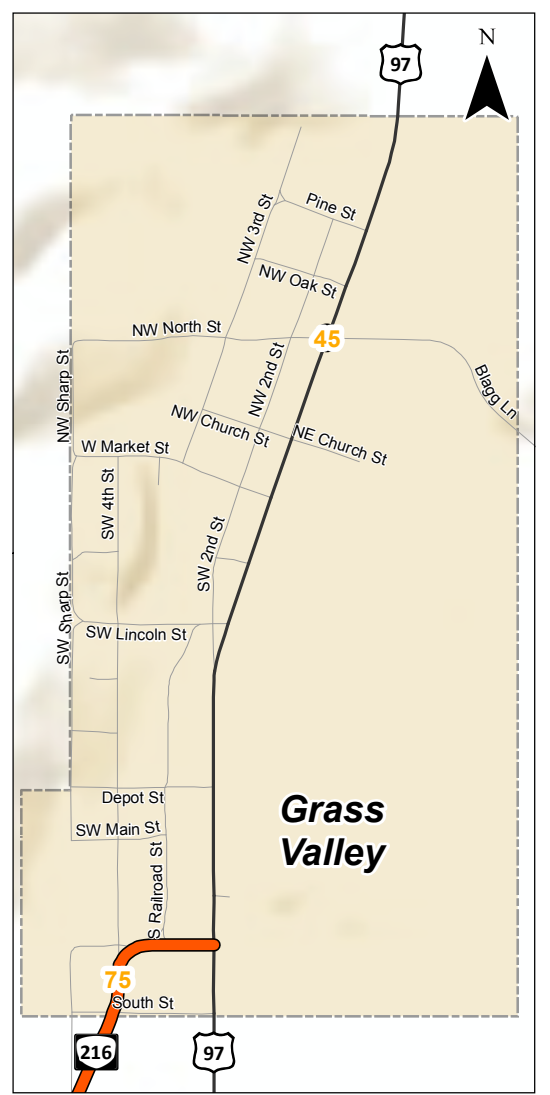
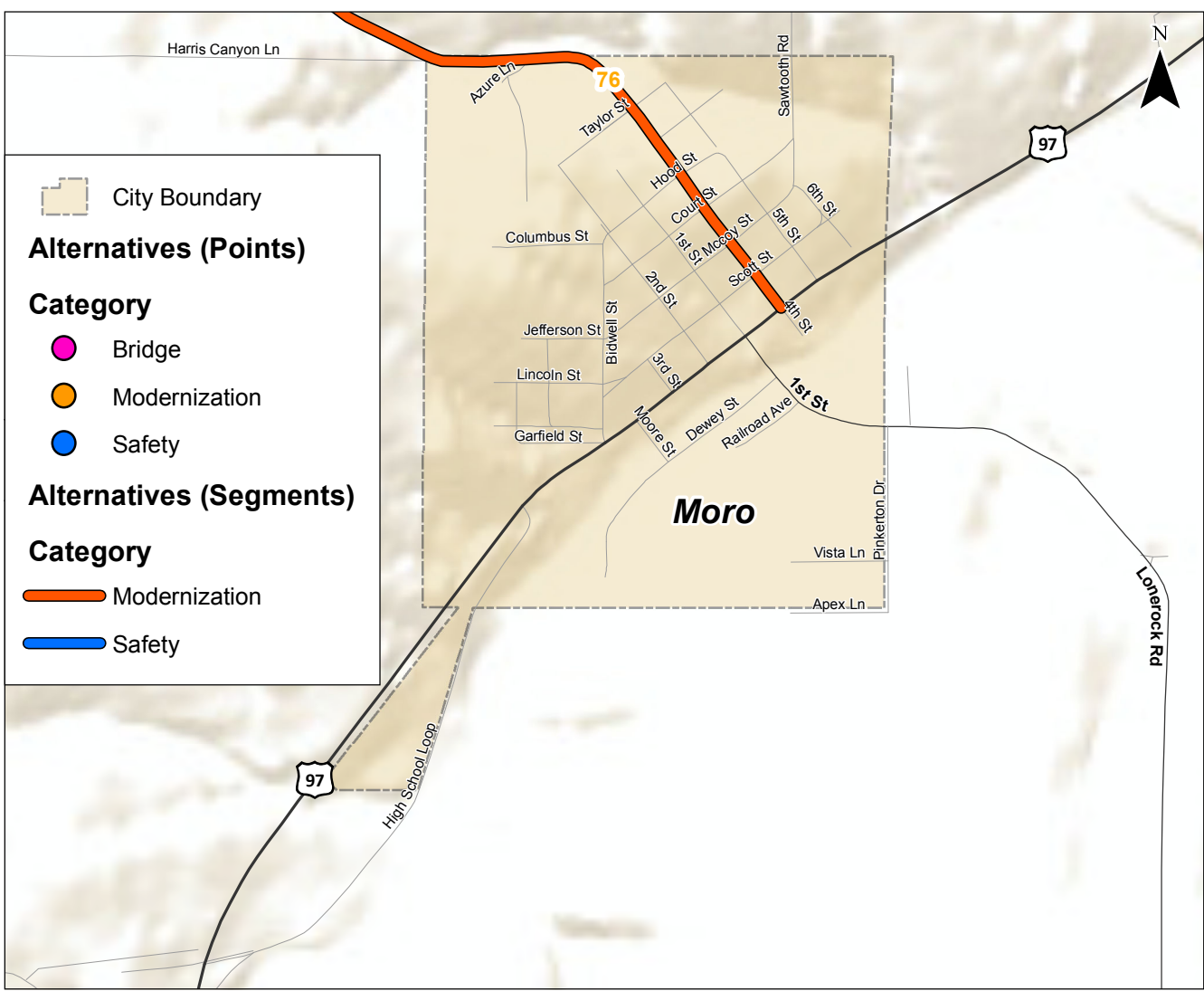
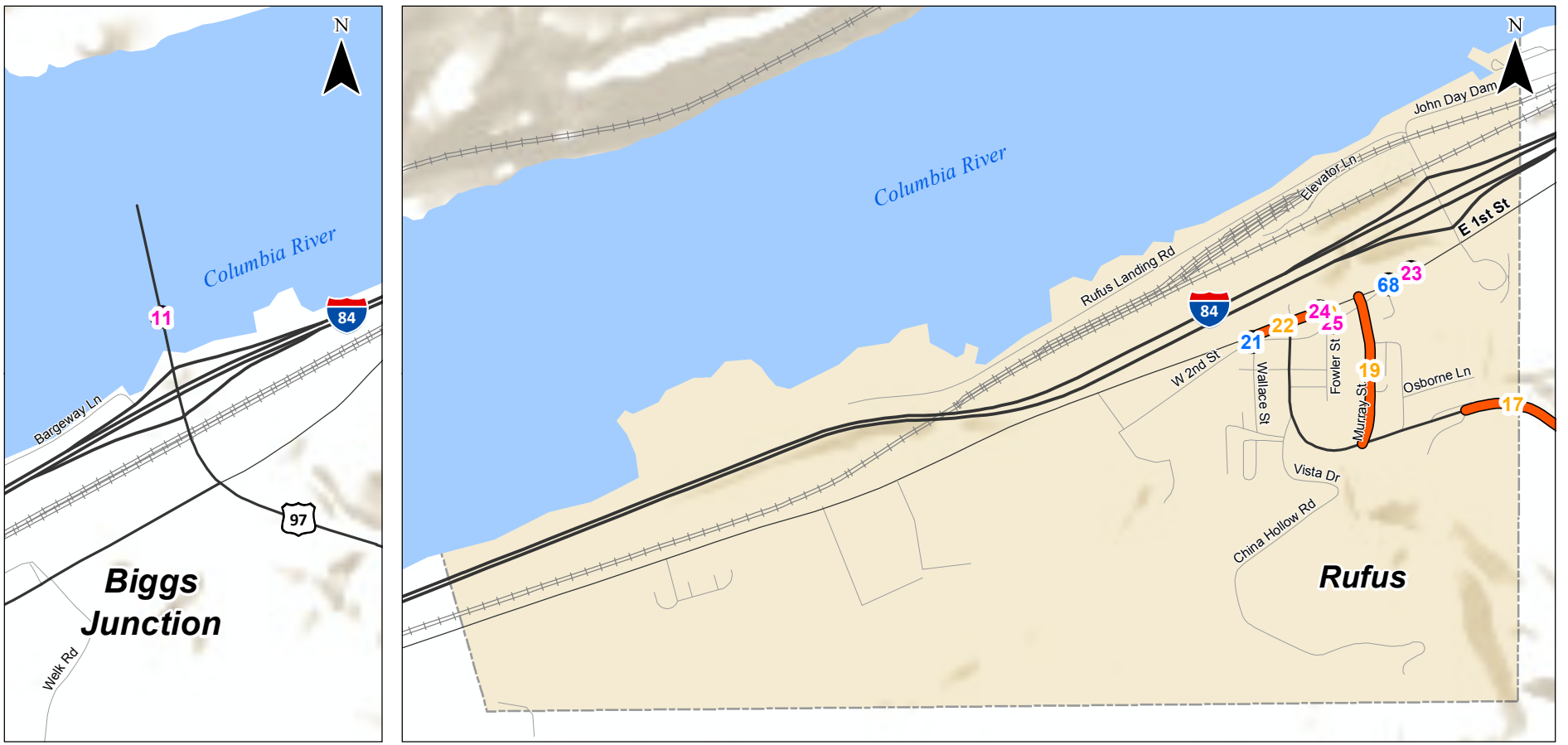


Sources: Esri, USGS, NOAA

Rural Transportation Alternatives
Sherman County, Oregon

Figure
5-3

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City Boundary

Alternatives (Points)

Category

- Bridge
- Modernization
- Safety

Alternatives (Segments)

Category

- Modernization
- Safety

Urban Transportation Alternatives
Sherman County, Oregon

Figure
5-4

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The total cost of projects, policies, programs, and feasibility studies shown in Table 5-12 and Table 5-13 that are expected to be implemented in the near-term is approximately \$500,000. The total cost of the medium/long-term alternatives is approximately \$3.3 million.

PEDESTRIAN AND BICYCLE SYSTEM PLAN

The future population growth in the incorporated areas of Rufus, Wasco, Moro, and Grass Valley will increase the need to expand the existing sidewalks in the Cities and to provide new paths in and around the incorporated areas to encourage residents and visitors to ride bicycles for transportation. Providing a connected network of pedestrian and bicycle facilities is important for:

- Serving shorter trips from neighborhoods to area activity centers, such as schools, churches, and neighborhood commercial uses;
- Providing access to regional park and ride lots to enhance intermodal connections; and
- Meeting residents' and visitors' recreational needs, further promoting economic activity in the County.

Table 5-14 and Figure 5-5 summarizes the planned pedestrian and bicycle projects for the next twenty years. In rural Sherman County, bicycle and pedestrian design standards provide paved shoulders on arterials and minimum two-foot paved or unpaved shoulders on all other, lower volume roads to facilitate pedestrian and bicycle travel. Within the cities, the standards for arterials include shoulders to accommodate bicyclists in a separate space from vehicles. Bicyclists are expected to share the road with vehicles on the other local roads in the cities due to the low speeds and low volumes.

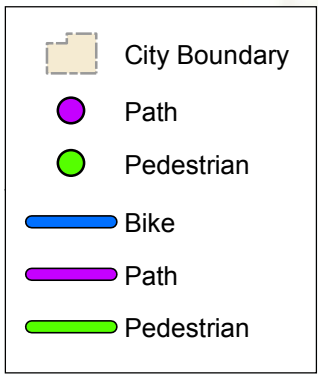
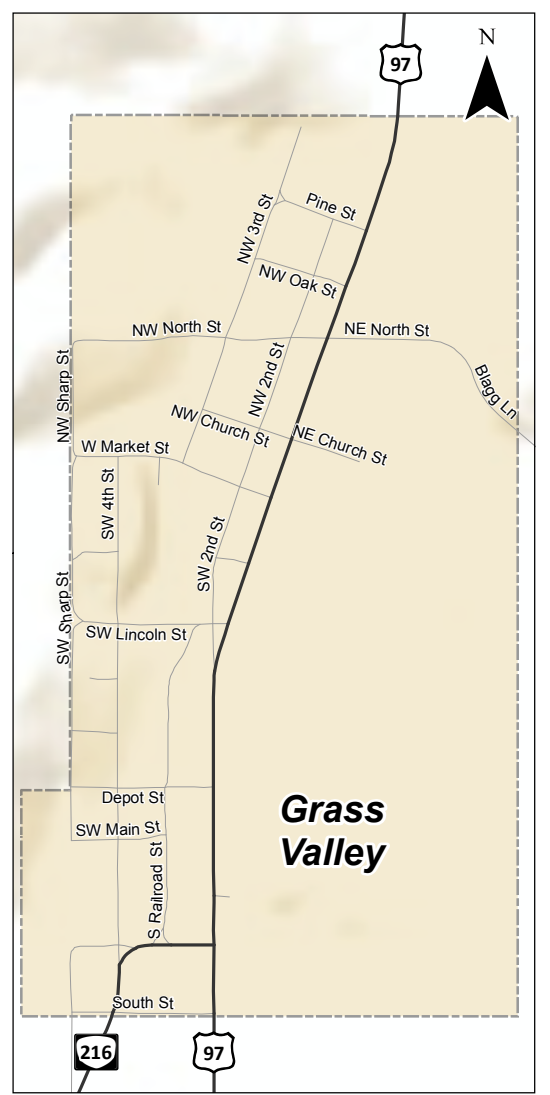
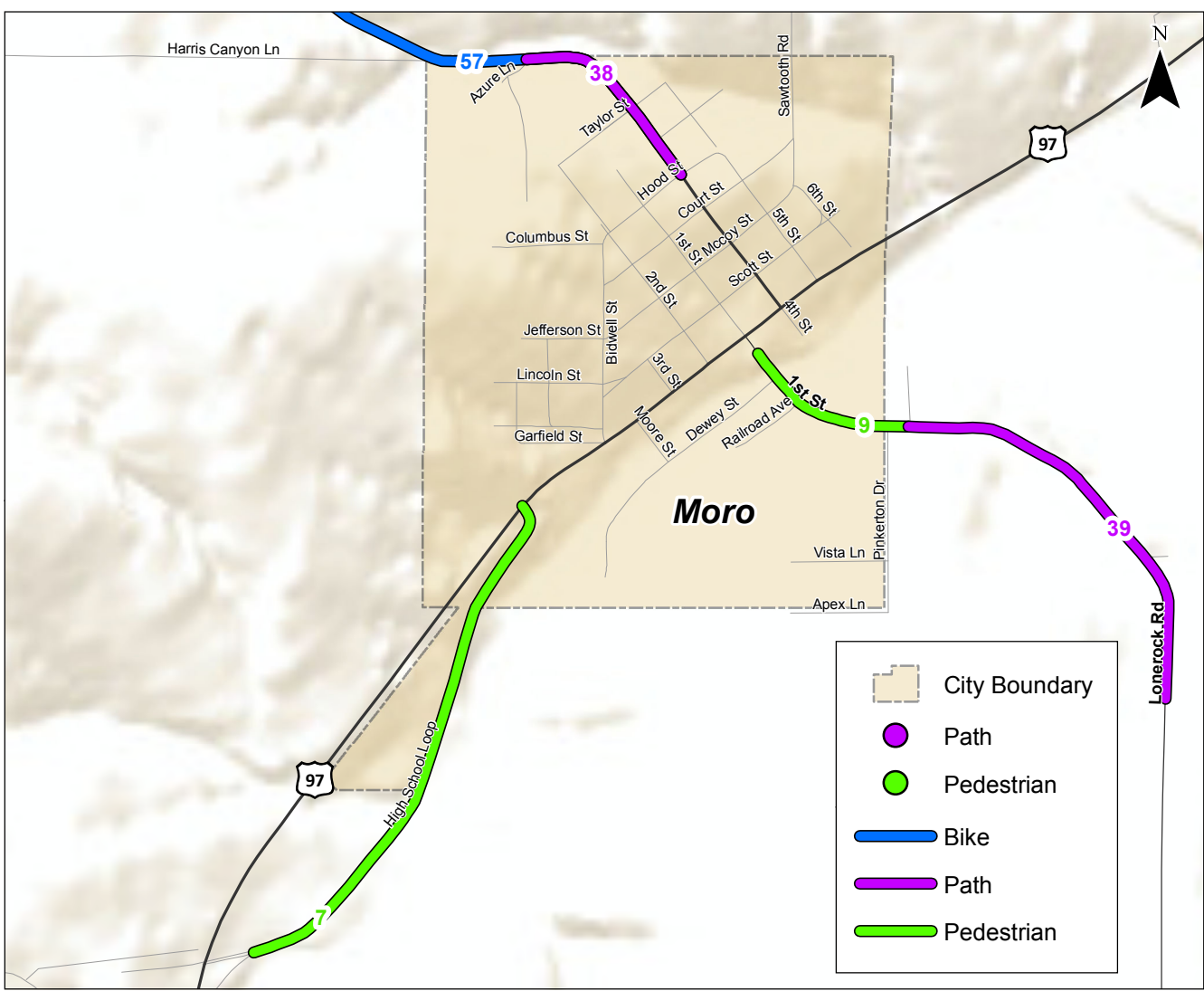
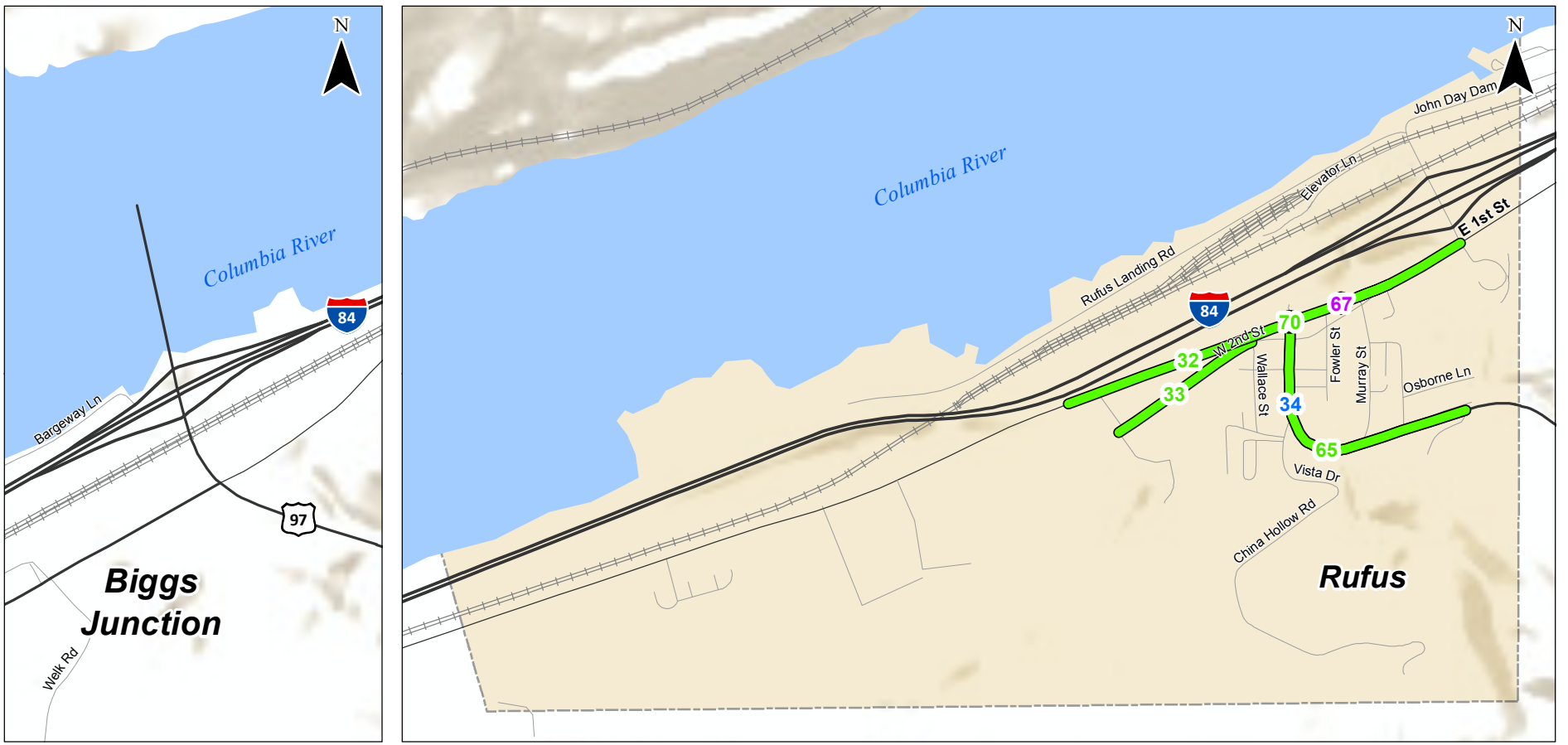
Arterials, collectors, and local streets should include sidewalks as they are developed within the city limits. A complete connected sidewalk network will encourage walking as a mode of transportation within the City. Key gaps in the existing sidewalk infrastructure as well as locations with sidewalks in need of repair are identified in Table 5-14 and Figure 5-5.

The total cost for all near-term pedestrian and bicycle system improvements is approximately \$350,000. The total cost for all medium/long-term pedestrian and bicycle system improvements is approximately \$4.7 million.

Table 5-14. Planned Pedestrian and Bicycle Improvements in Sherman County

ID	Location	Name	Description	Category	Cost Estimate ¹	Potential Funding Source			
						ODOT/ State	County	Cities	Private
Short-Term Projects									
32	Rufus	1st Street Sidewalks (Rufus)	Install sidewalks and pedestrian scale lighting along both sides of 1st Street from Sullivan Ln to Wallace Street	Pedestrian	\$300,600	X		X	
70	Rufus	Pedestrian Crossings of Biggs-Rufus Highway	Stripe crossing of 1st Street at Main Street.	Pedestrian	\$2,800	X		X	
Medium- & Long-Term Projects									
10	County	Bicyclist Routes	Promote the bike routes that are currently popular routes and identify opportunities to route cyclists off of US 97 when possible. Provide signage to encourage cyclists to use alternate routes from the highway and provide warnings signs on these routes to inform drivers of the bicycle routes.	Bike	\$17,000	X	X		
57	County	Van Gilder Road	Provide directional signage for cyclists; warning signs for motorists to share the road.	Bike	\$5,100		X		X
39	County	Ped/Bike Connections along Lonerock Road, east of City Limits of Moro	Install a shared-use path along Lonerock Road from East City Limits to Fairgrounds.	Path	\$270,300		X		
34	Rufus	Bikes on Main Street (Rufus)	Widen to accommodate a bicycle lane.	Bike	\$164,100	X		X	
65	Rufus	Main Street Sidewalks	Install sidewalks on Main Street from Vista Drive to 1st Street.	Pedestrian	\$500,600				
67	Rufus	Rufus Ped/Bike Access Under Freeway and Railroad	Conduct environmental impact study to determine whether Gerking Gulch is a feasible undercrossing of I-84 and railroad for ped/bike users between 1st Street and the Columbia River.	Path	\$20,000	X		X	
33	Rufus	2nd Street Sidewalks (Rufus)	Install sidewalks along the south side of 2nd Street from Main Street to Community Center	Pedestrian	\$368,100			X	
35	Wasco	Old Highway 97 Sidewalks	Install sidewalks on both sides of Old Highway 97 from Clark Street to 6th Street and along the east side of the road from 6th Street to Asher Street.	Pedestrian	\$1,032,000	X	X		
61	Wasco	OR 206 Sidewalks (Clark Street to Scott Street)	Install sidewalks on OR 206 from Clark Street east to Scott Street.	Pedestrian	\$723,400	X		X	
62	Wasco	Armsworthy Street Sidewalks	Install sidewalks on Armsworthy Street from Church Street to Scott Street.	Pedestrian	\$397,500	X		X	
63	Wasco	Clark Street Sidewalks	Install sidewalks on Clark Street from Old Highway 97 to Yates Street.	Pedestrian	\$231,400	X		X	
64	Wasco	OR 206 Sidewalks (Biggs Street to Church Street)	Install sidewalks on OR 206 from Biggs Street to Church Street.	Pedestrian	\$152,800	X		X	
79	Wasco	Existing Clark Street Sidewalks	Upgrade existing sidewalks along Clark Street from Columbia to Ellis, and add sidewalks on the east side.	Pedestrian	\$208,200	X		X	
9	Moro	Lonerock Road Sidewalks	Construct sidewalks on the north side of the road.	Pedestrian	\$172,300		X	X	
38	Moro	Ped/Bike Connections along 4th Street to Azure Lane in Moro	Install a shared-used path along 4th Street/Van Gilder Road from Hood Street to Azure Lane.	Path	\$134,600		X	X	X
7	Moro	Sidewalks to High School	Install sidewalks or a shared-use path between the High School and the existing sidewalks on Main Street.	Pedestrian	\$184,300	X	X	X	
84	Grass Valley	US 97 Pedestrian Scale Lighting	Install pedestrian scale lighting along the sidewalks on US 97 in Grass Valley.	Pedestrian	\$266,100	X		X	

¹ Cost estimate is planning level only. Does not include right-of-way costs.



Pedestrian and Bicycle Plan
Sherman County, Oregon

Figure
5-5

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PUBLIC TRANSPORTATION PLAN

Sherman County Community Transit operates a dial-a-ride transit service for the County. Between July 2013 and January 2015, almost 7,500 rides were provided by the transit service, covering a distance of over 130,000 miles. The majority of rides provided, over 6,000 rides, were for Seniors. The service is available on Monday and Thursday each week and offered for a fare of \$5 to all residents. Residents must request a pick-up 24-hours in advance and can be picked up anywhere in the County or Cities. Typical trips are to The Dalles for shopping, business, and medical appointments. Buses also transport residents to Hood River and Portland for medical trips.

Sherman County Community Transit has the funding and resources necessary to continue providing dial-a-ride transit service. Sherman County Community Transit receives funding from ODOT and is being reimbursed for Veteran medical trips by the Veteran's Administration. No fixed route service is needed to support the communities.

AIR SERVICE

The Wasco State Airport is located on the east side of Wasco in Sherman County. The airport dates back to 1946 and has been continuously operated by the State of Oregon since it acquired it in 1958. The airport accommodates general aviation and agricultural users serving the local community and the surrounding region. Wasco State Airport has a land area of approximately 66 acres and is zoned Airport Development (A-D) by Sherman County. The outer periphery of the airport is predominantly zoned Exclusive Farm Use (A-E). The airport is located entirely outside the City's urban growth boundary (UGB). Both the City of Wasco and Sherman County have adopted the FAA Part 77 Imaginary Surfaces Plan for the Airport. There are no planned projects associated with the Wasco State Airport.

MARINE SYSTEM PLAN

Sherman County is located on the Columbia River, a major water transportation route. The only river cargo operations that currently exist in the County are located at Biggs Junction, where Mid-Columbia Producers export much of their grain in the region.

Rufus also has access to the river which could be developed for recreational or industrial purposes in the future if the demand exists. Project number 18 in Table 5-12 identifies a planned study to evaluate opportunities for intermodal connections between the rail system, roadway system, and marine transportation system.

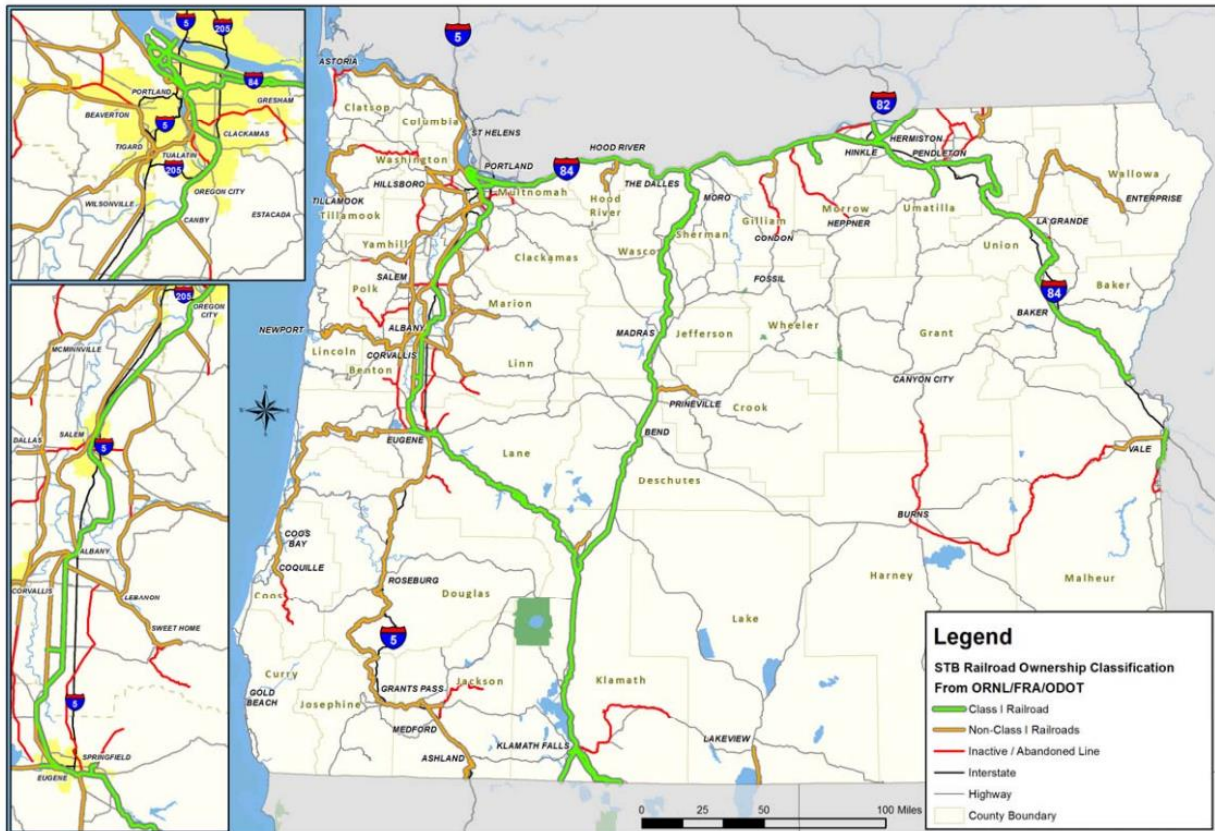
RAIL SERVICE

The Union Pacific Main Line (UP) and the Burlington Northern/Santa Fe Bend Branch (BNSF) serve Sherman County at Biggs Junction. The UP line includes a spur serving the Mid-Columbia Grain



Growers Terminal at Biggs. However no grain has been hauled from this spur for approximately 10 years. Therefore, there are no train stops in Sherman County today. There is currently no passenger rail service in the County.

As shown in Exhibit 5-20, the UP railroad that runs along the Columbia River through Sherman County is designated as a Class I Railroad. Project number 18 in Table 5-12 identifies a planned study to evaluate opportunities for intermodal connections between the rail system, roadway system, and marine transportation system.



Source: Oak Ridge National Laboratory Rail GIS Data, FRA, ODOT

Exhibit 5-20. State of Oregon Railroads

PIPELINE AND TRANSMISSION SYSTEM PLAN

Two natural gas pipelines run through Sherman County although they do not currently serve the County. If larger commercial or industrial development came to the County, the County may support the development of pipeline access for the County.

Future extension of a high-speed broadband service is planned from Idaho along the Columbia River. Sherman County may be able to provide broadband services to its citizens through this line. A

broadband internet connection could allow for implementation of Intelligent Transportation Solutions along I-84 that could have a positive effect on transportation safety and mobility. Other benefits of this added service could spur economic development.

TRANSPORTATION FINANCE ELEMENT

Funding for transportation projects is increasingly in short supply as existing infrastructure ages and transportation demands increase. This section provides a means for evaluating the likelihood that projects can be funded within the timelines identified in the TSP and defines priorities based on available funding opportunities.

The TPR requires that the Sherman County TSP address transportation funding, including the following elements:

- A list of planned transportation facilities and major improvements;
- A general estimate of the timing for planned transportation facilities and major improvements;
- Determination of rough cost estimates for the transportation facilities and major investments identified in the TSP; and,
- A discussion of existing and potential financing sources for each transportation facility and major improvement (which can be described in terms of guidelines or local policies).

Current Sherman County Transportation Funding Revenues

Sherman County has had an annual revenue of approximately \$2.2 million per year over the past ten years. This funding covers all transportation related projects, including maintenance and capital improvements projects. As shown in Exhibit 5-21, the County's transportation revenue comes from a variety of sources including property taxes, other local revenue, state revenue, and federal revenue. ODOT has historically been able to fund the County's transportation operations and maintenance activities for state facilities.

Exhibit 5-22 shows that the County has had a small portion of transportation revenue remaining at the end of each fiscal year with the exception of two years when the expenditures exceeded the revenue. Over the past ten years, approximately \$1.9 million in excess transportation revenue has been accumulated. The majority of transportation expenditures over the past 10 years have covered operations, maintenance, and system preservation, as shown in Exhibit 5-23. Approximately \$200,000 were used for new facilities and system enhancement projects during the past ten years.

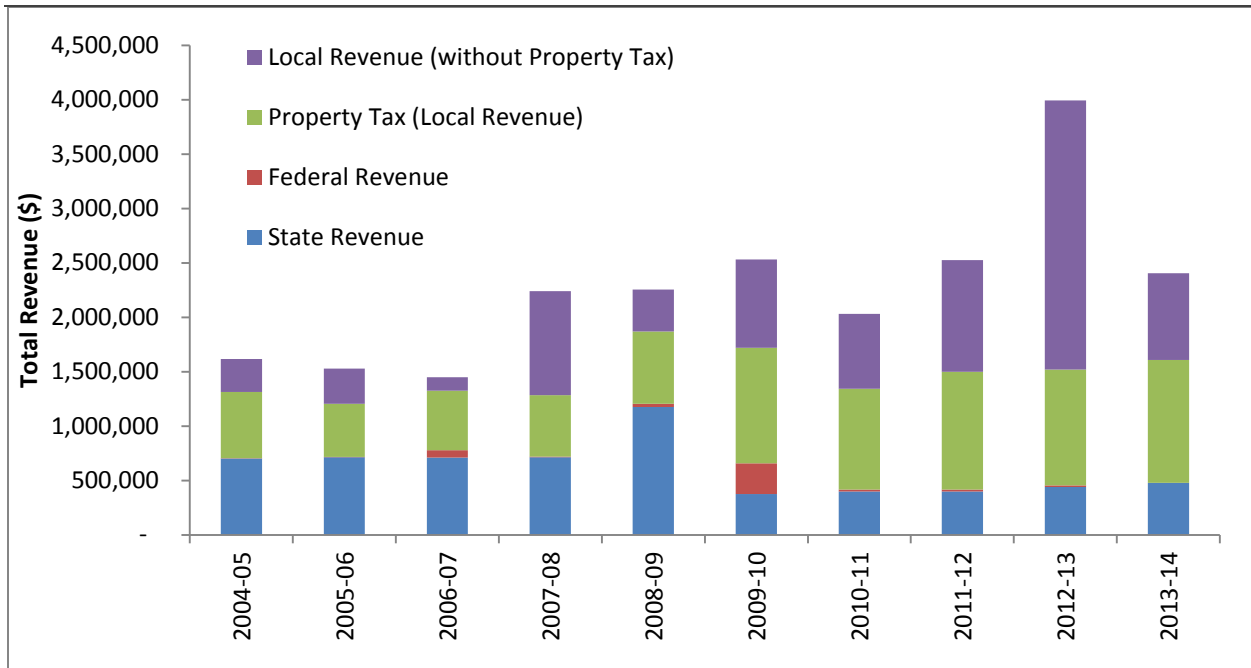


Exhibit 5-21. Sherman County Transportation Revenue Sources (2005 – 2014)

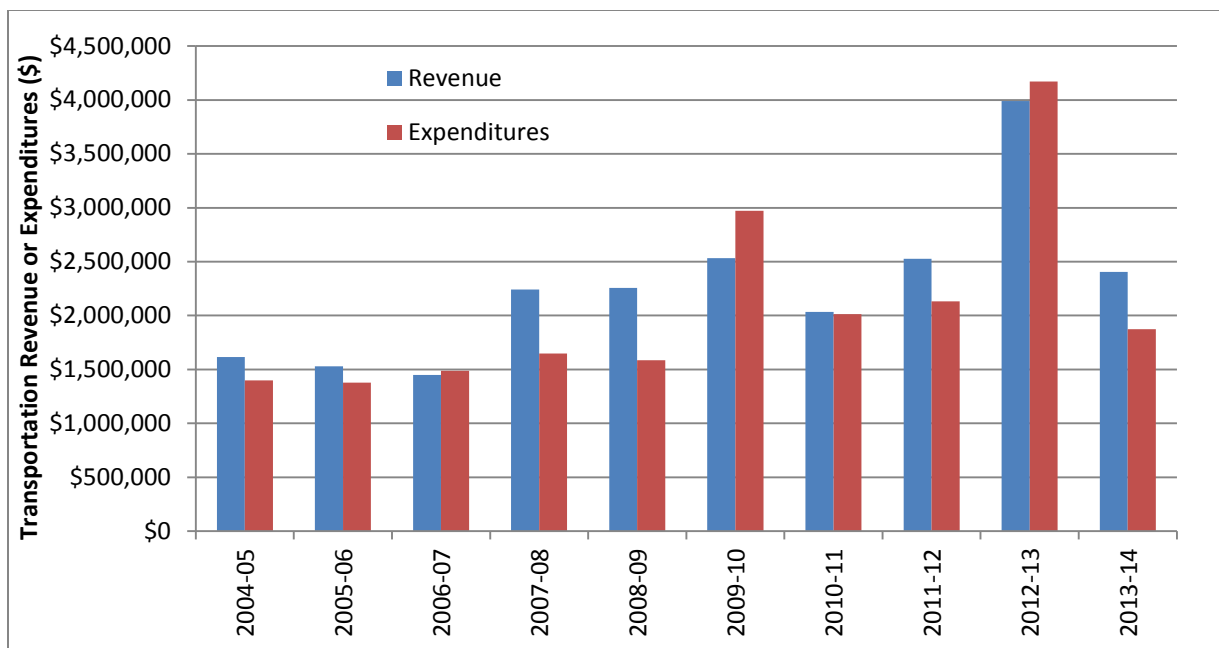


Exhibit 5-22. Sherman County Transportation Revenue Compared to Transportation Expenditures (2005 – 2014)

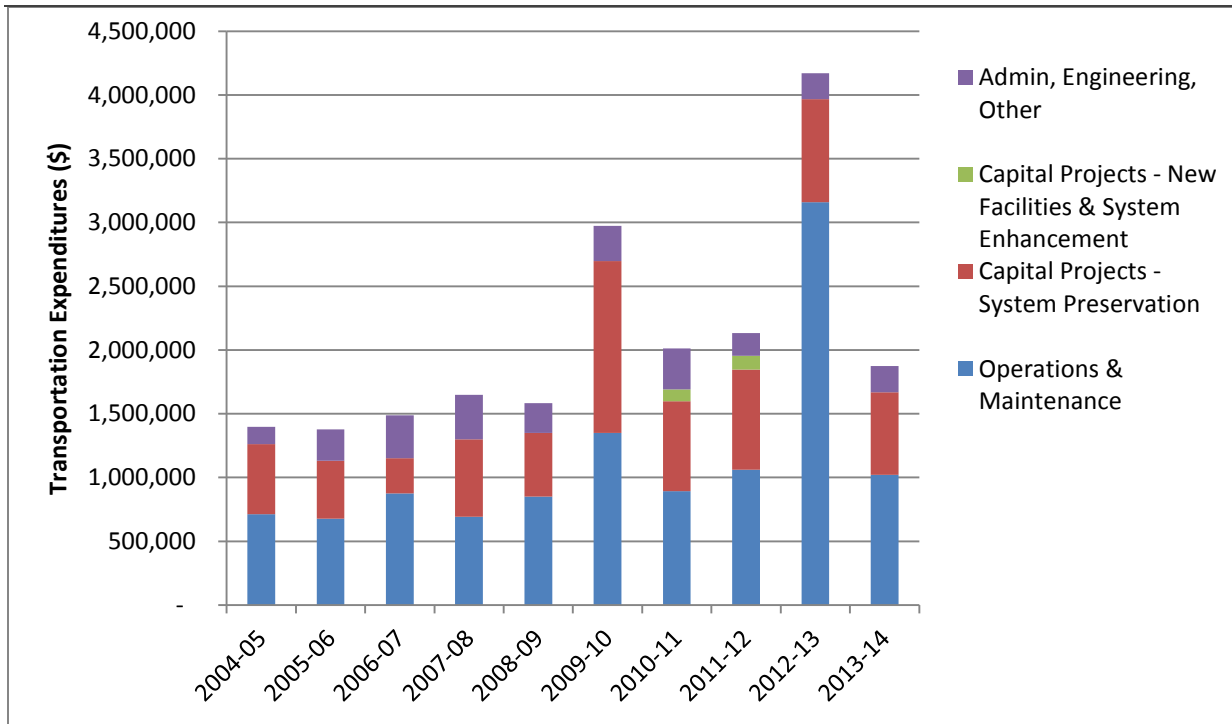


Exhibit 5-23. Sherman County Transportation Expenditures (2005 – 2014)

Transportation Funding Options

Sherman County faces two inter-related financing issues: how to finance operations and maintenance and how to finance capital projects. Presently, the majority of public works funding is devoted to operations and maintenance; there is no substantial funding for capital projects. As shown in Table 5-15, the total funding needed to accomplish all of the near-term alternatives summarized in this plan, including all projects and studies, systemic safety projects, and active transportation projects, would be approximately \$2,615,000. A comprehensive table summarizing all modal alternatives and their cost estimate is provided in Attachment C.

Table 5-15. Total Project Costs

Project Type	Near-Term	Medium/Long-Term
Systemic Safety	\$1,780,000	\$1,330,000
Roadway	\$530,000	\$3,250,000
Pedestrian and Bicycle	\$305,000	\$4,640,000
Total	\$2,615,000	\$9,220,000

Potential strategies for addressing these needs in Sherman County may generally be grouped into three categories: secure more external funding, identify public/private sponsorship opportunities, and raise local revenue through user fees and taxes. Observations on the use of these strategies are discussed below. They are not all mutually exclusive.

Identify Additional Grant Opportunities

ODOT offers multiple grant opportunities to support transportation projects. The County and Cities should identify grants from those summarized in Table 5-16 that are applicable to their projects. Some of these programs require a local match. The County and Cities should begin identifying these programs early in order to plan for the funding necessary to satisfy a local match. Using local dollars as a match for a grant opportunity is a strategy to stretch the local funding even farther.

Table 5-16. Grant Opportunities

Source ID	Source Title	Award Cycle	Intended Use	Applicable Project Types	Administration Agency	Deadline	Local Match	Website
1	Rivers, Trails, and Conservation Assistance Program	Annual	Technical assistance for recreation and conservation projects.	Shared-use paths	National Park Service	August	None	http://www.nps.gov/ncrc/programs/rtca/contactus/cu_apply.html
2	Highway Safety Improvement Program	Annual	Address safety issues on highways and High Risk Rural Roads	All	ODOT	Varies	10%	www.oregon.gov/ODOT/HWY/TRAFFIC-ROADWAY/highway_safety_program.shtml
3	Oregon Parks and Recreation Local Government Grants	Annual	Primary use is recreation; transportation allowed. Construction limited to outside road right-of-way, only in public parks or designated recreation areas	Shared-use paths	OPRD	Varies	20%	http://www.oregon.gov/OPRD/GRANTS/local.shtml
4	Recreational Trails Program	Annual	Recreational trail-related projects, such as hiking, running, bicycling, off-road motorcycling, and all-terrain vehicle riding.	Shared-use paths	OPRD	Varies	20%	http://www.oregon.gov/OPRD/GRANTS/trails.shtml
5	Land and Water Conservation Fund	Annual	Acquire land for public outdoor recreation or develop basic outdoor recreation facilities	Shared-use paths, bikeways, sidewalks	OPRD	Varies	50%	http://www.oregon.gov/OPRD/GRANTS/lwcf.shtml
6	Statewide Transportation Improvement Program	Biennial	Multi-year, statewide, intermodal program of transportation projects	Sidewalk, bikeways, crossing improvements	ODOT	Varies	Varies	http://www.oregon.gov/ODOT/HWY/STIP/
7	ATV Grant Program	Annual	Operation and maintenance, law enforcement, emergency medical services, land acquisition, leases, planning, development, and safety education in Oregon's OHV (off-highway vehicle) recreation areas	Shared-use paths	OPRD	February / April	20%	http://www.oregon.gov/oprd/ATV/pages/grants.aspx
8	Immediate Opportunity Funds	Biennial	Support primary economic development through the construction and improvement of street and roads.	All	ODOT	On-going	50%	http://www.oregon.gov/ODOT/TD/EA/reports/IOF_PolicyGuidelines2015%20doc.pdf
9	Enhance (STIP)	Biennial	Activities that enhance, expand, or improve the transportation system. Projects that improve or enhance the state's multimodal transportation system.	All	ODOT	August	10%	http://www.oregon.gov/ODOT/TD/STIP/Pages/WhatsChanged.aspx
10	ConnectOregon	Biennial	Non-highway transportation projects that promote economic development in Oregon.	Non-highway modes	ODOT	November	20%	http://www.oregon.gov/ODOT/TD/TP/pages/connector.aspx
11	All Roads Transportation Safety (ARTS)	Biennial	Address safety needs on all public roads in Oregon; reduce fatal and serious injury crashes.	All hot spot and systemic safety projects	ODOT	Varies	8%	http://www.oregon.gov/ODOT/HWY/TRAFFIC-ROADWAY/Pages/ARTS.aspx

Public/Private Sponsorship Opportunities

Public/Private sponsorships involve a private entity such as a local business owner working with the public agency to fund a project. In return for their investment in the community, these business owners often have recognition for their role, providing a marketing venue for the business. In Sherman County, one potential opportunity for this type of partnership is the bicycle wayfinding signage project. Private organizations that sponsor a sign may have the opportunity to provide their logo on a sign to help direct cyclists to their community and business.

Local Taxes and User Fees

Many types of user fees and taxes may be collected to finance road construction and operations. On that premise, it is assumed that the County will need to develop local revenue sources to supplement or replace federal resources if it hopes to maintain current levels of service and assuming that changes in state of federal financing, coupled with efficiency measures are not enough to close the funding gap. Table 5-17 lists options that the County and Cities may wish to consider for funding local roads. The sources include a mix of fees and taxes, some of which if implemented would have implications for other aspects of the County and City budgets. Some of these fees could also be used to provide a local match to obtain greater federal or state funding, further stretching local dollars.

Development Code Updates

In order to fund sidewalk projects, a change to the development code may be beneficial to local jurisdictions. The development code identifies the requirements that a developer must meet before obtaining permission to build. Local jurisdictions may choose to require developers to complete sidewalks in locations where they are identified in the TSP and enforce the completion through the development code. The jurisdiction may also choose to collect a payment in lieu of sidewalk construction from the developers and then use the money to construct complete sections of sidewalk when enough is collected to create efficiencies.

Table 5-17. Local Taxes and User Fee Options

Source	Description	Comments
General Fund	Property taxes from the county's permanent tax rate.	Diverting general fund revenue to the Road Fund would have significant consequences for other county services.
Supplemental 5-year Serial Levy	Voter approved property tax levied in addition to the county's permanent tax rate.	A road fund serial levy would have to be approved by voters every five years. A one-time approval would buy time for the county to develop other options. This method could fund operations and capital programs, some of which might reduce future maintenance requirements.
Road Utility Fee	Monthly user fee with revenue dedicated to road operations. May be enacted legislatively but could be challenged and brought to a vote.	This type of fee is becoming more common in cities but would require substantial investment in rate studies, administrative staffing, software and computer systems to enable the county to collect the revenue. This source is generally better suited to funding operations than for capital improvements, but it may free up existing resources for capital projects.
Vehicle Registration Fee	An extra fee on all registered motor vehicles in the county. May be authorized legislatively but could be challenged and brought to a vote.	State must be willing to act as a collection agent for the county, otherwise would be easy to implement. This source could fund operations or capital programs.
Motor Vehicle Title Fee	Require that all motor vehicles registered in the county also have their title recorded as personal property with the County.	This would generate two sources of revenue: from the fee itself and from personal property taxes levied on motor vehicles. This could be problematic for renters and would increase taxable property that the Assessor must account for.
County Gas Tax	May be enacted legislatively but could be challenged and brought to a vote.	A local-option fuel tax would be easy to collect because the infrastructure is already in place. Would generate revenue for the county from motorists passing through the county. This method could fund operations and capital programs.

ATTACHMENTS

Attachment A. PAC & Public Feedback on the Draft List of Alternatives

Attachment B. Cost Estimate Calculations

Attachment C. Planned TSP Alternatives

