

CHAPTER 7 MODAL PLANS

The purpose of this chapter is to describe the individual elements of the TSP for Klamath County; the TSP provides operational plans for each modal element within the county. Projects are summarized on corresponding maps at the end of this chapter; components of this TSP include roadway standards, access management recommendations, transportation demand management measures, modal plans, and an implementation program.

ROADWAY ELEMENT

The Klamath County TSP provides the county with an opportunity to review and revise roadway design standards to more closely fit with the functional roadway classification, and the goals and objectives of this TSP.

In appreciation of funding cycles and capital costs, Klamath County supports ODOT policy to develop two-lane State Highways through a four-step approach. The goal of this approach is to improve an existing two-lane rural highway, culminating in a four-lane facility with grade-separated interchanges and frontage roads. The four phases of development are implemented incrementally as the traffic volumes increase and the associated level of service decreases. Beginning with a standard two-lane rural State Highway, the improvement phases are as follows:

1. Addition of passing or climbing lanes every 3 – 5 miles
2. Continuous four-lane section
3. Adding grade-separated interchanges and overpasses/raised medians
4. Full access control with median barriers, frontage roads. Depending on the intersection, some elements of Phases 3 and 4 can be intermixed.

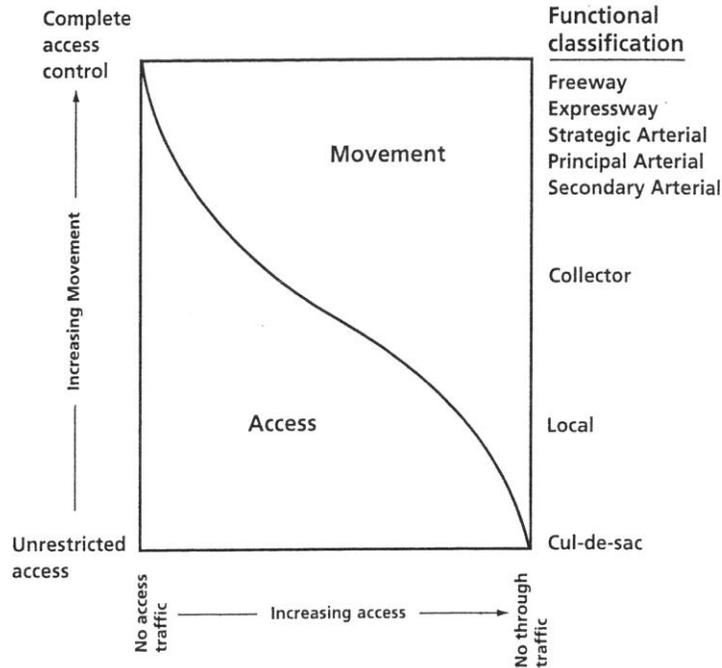
Considering the condition of Klamath County roadways and their rural nature, this four-phased approach is highly applicable. Available resources currently restrict efforts to Phase 1 for the near term.

Roadway Functional Class

Roadways have two functions, to provide mobility and to provide access. From a design perspective, these functions can be incompatible, since high or continuous speeds are desirable for mobility, while lower speeds are more desirable for access to homes and businesses. Furthermore, the number of accesses can have an inverse relationship to speed and safety, as more driveways (accesses) mean lower speeds and potentially more crashes.

Figure 7-1 below illustrates this tradeoff. Generally, arterials emphasize a high level of mobility for through movement; local facilities emphasize the land access function, and collectors offer a balance of both of these functions.

Figure 7-1. Relationship of Mobility and Access



Source: NCHPR Report 348, "Access Management Policies and Guidelines for Activity Centers." Metro Transportation Group. Transportation Research Board, Washington, DC 1993.

The functional class of a roadway relates to the intended purpose of that roadway. Whether the road serves to connect destinations and handle large volumes of high-speed traffic; or if it provides access to adjacent properties, the intent of the roadway will drive its physical characteristics (i.e., number of lanes, alignment, grade, speeds, anticipated volumes, etc.). For example, the vehicular traffic on a roadway can be directly related to specific land uses, and the fact that the road carries a lot or a little traffic does not determine its function. The traffic volume, design (including access standards) and size of the roadway are outcomes of function, but do not define function. Function can best be defined by connectivity; without connectivity, neither mobility nor access can be achieved. Roadways that provide the greatest reach of connectivity are the highest level facilities.

The Functional Classification for Klamath County is shown in Figure 7-2. A description of each functional classification follows. Generally, the geographic scope of the following descriptions goes from a physically large area for arterials, to moderate areas for collectors, to neighborhoods for local roads.

Rural Principal Arterials:

(State Highways) serve as the primary gateways in and out of the Klamath County area. These highways provide a connection between communities, towns, and cities. These highways are critical to the county because they generally serve the highest traffic volumes and longest trips between major attractors. Access control is critical on these facilities to ensure that they operate safely and efficiently.

Rural Minor Arterial System:

The minor arterial road system, in conjunction with the rural principal arterial system, forms a network with the following service characteristics:

1. Linkage of cities, larger towns, and other traffic generators (such as major resort areas) that are capable of attracting travel over similarly long distances.
2. Integrated interstate and inter-county service.
3. Internal spacing consistent with population density, so that all developed areas of the state are within reasonable distances of arterial highways.
4. Corridor movements consistent with items (1) through (3) with trip lengths and travel densities greater than those predominantly served by rural collector or local systems.

Minor arterials therefore constitute routes, the design of which should be expected to provide for relatively high travel speeds and minimum interference to through movement.

Rural Collector System:

The rural collector routes generally serve travel of primarily intra-county rather than statewide importance and constitute those routes on which (regardless of traffic volume) predominant travel distances are shorter than on arterial routes. Consequently, more moderate speeds may be typical. To define rural collectors more clearly, this system is sub-classified according to the following criteria:

- Major Collector Roads. These routes (1) serve county seats not on arterial routes, larger towns not directly served by the higher systems, and other traffic generators of equivalent intra-county importance, such as consolidated schools, shipping points, county parks, and important mining and agricultural areas; (2) link these places with nearby larger towns or cities, or with routes of higher classifications; and (3) serve the more important intra-county travel corridors.

- Minor Collector Roads. These routes should (1) be spaced at intervals consistent with population density to accumulate traffic from local roads and bring all developed areas within reasonable distances of collector roads; (2) provide service to the remaining smaller communities; and (3) link the locally important traffic generators with their rural hinterland.

Rural Local Road System:

The rural local road system, in comparison to collectors and arterial systems, primarily provides access to land adjacent to the collector network and serves travel over relatively short distances. The local road system constitutes all rural roads not classified as principal arterials, minor arterials, or collector roads.

Figure 7-2. Roadway Functional Classification (next page)

Figure 7-2A. Roadway Functional Class, Klamath Falls & Surrounding Area
(Page 7-6)

**KLAMATH COUNTY
TRANSPORTATION SYSTEM PLAN**

**Figure 7-2-A
Roadway
Functional Class
Klamath Falls and
Surrounding Area**

Legend

Road Classification

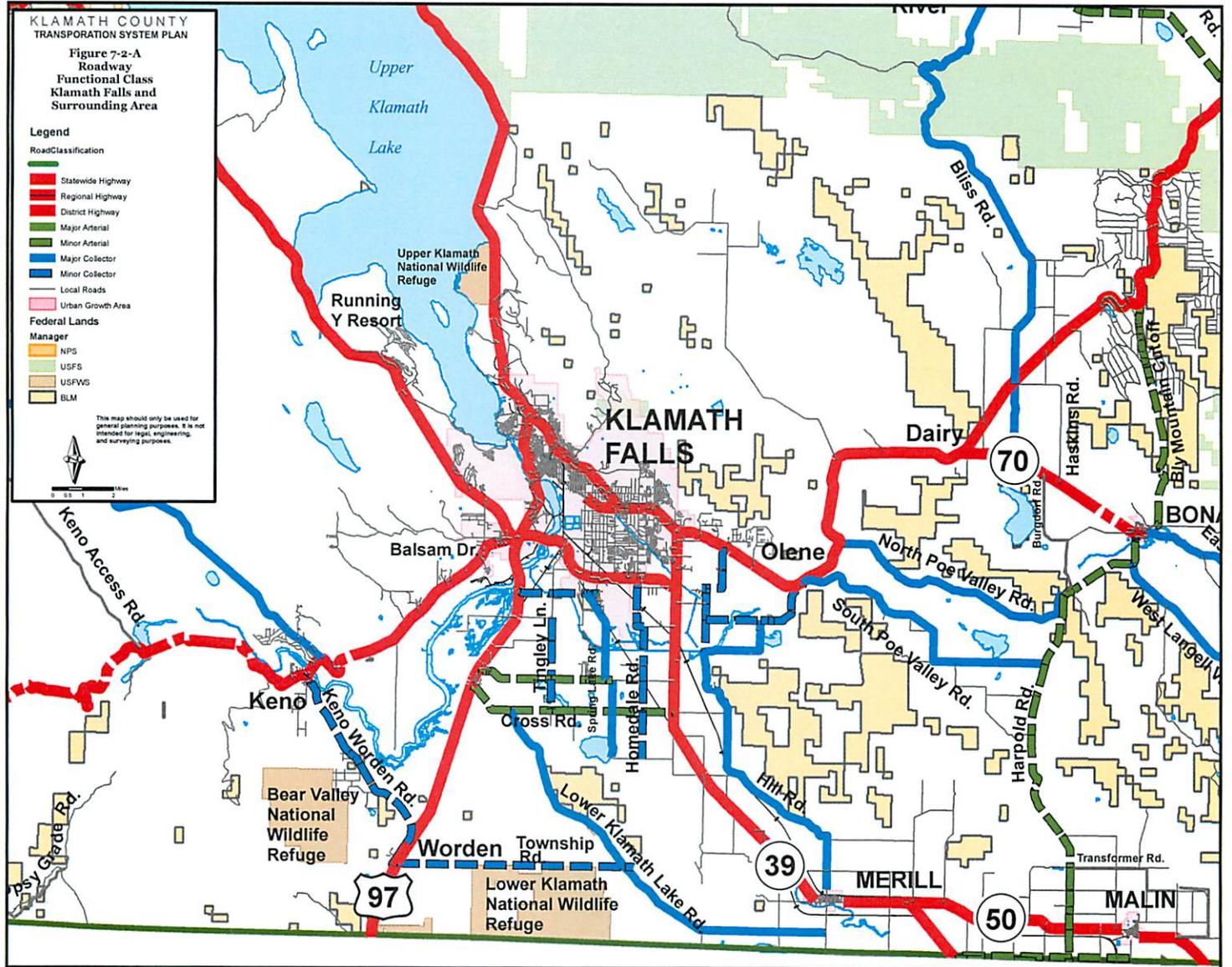
- Statewide Highway
- Regional Highway
- District Highway
- Major Arterial
- Minor Arterial
- Major Collector
- Minor Collector
- Local Roads
- Urban Growth Area

Federal Lands

Manager

- NPS
- USFS
- USFWS
- BLM

This map should only be used for general planning purposes. It is not intended for legal, engineering, and surveying purposes.



**KLAMATH COUNTY
TRANSPORTATION SYSTEM PLAN**

**Figure 7-2
Roadway
Functional Class**

Legend

Road Classification

-  Statewide Highway
-  Regional Highway
-  District Highway
-  Major Arterial
-  Minor Arterial
-  Major Collector
-  Minor Collector
-  Local Roads
-  Urban Growth Area

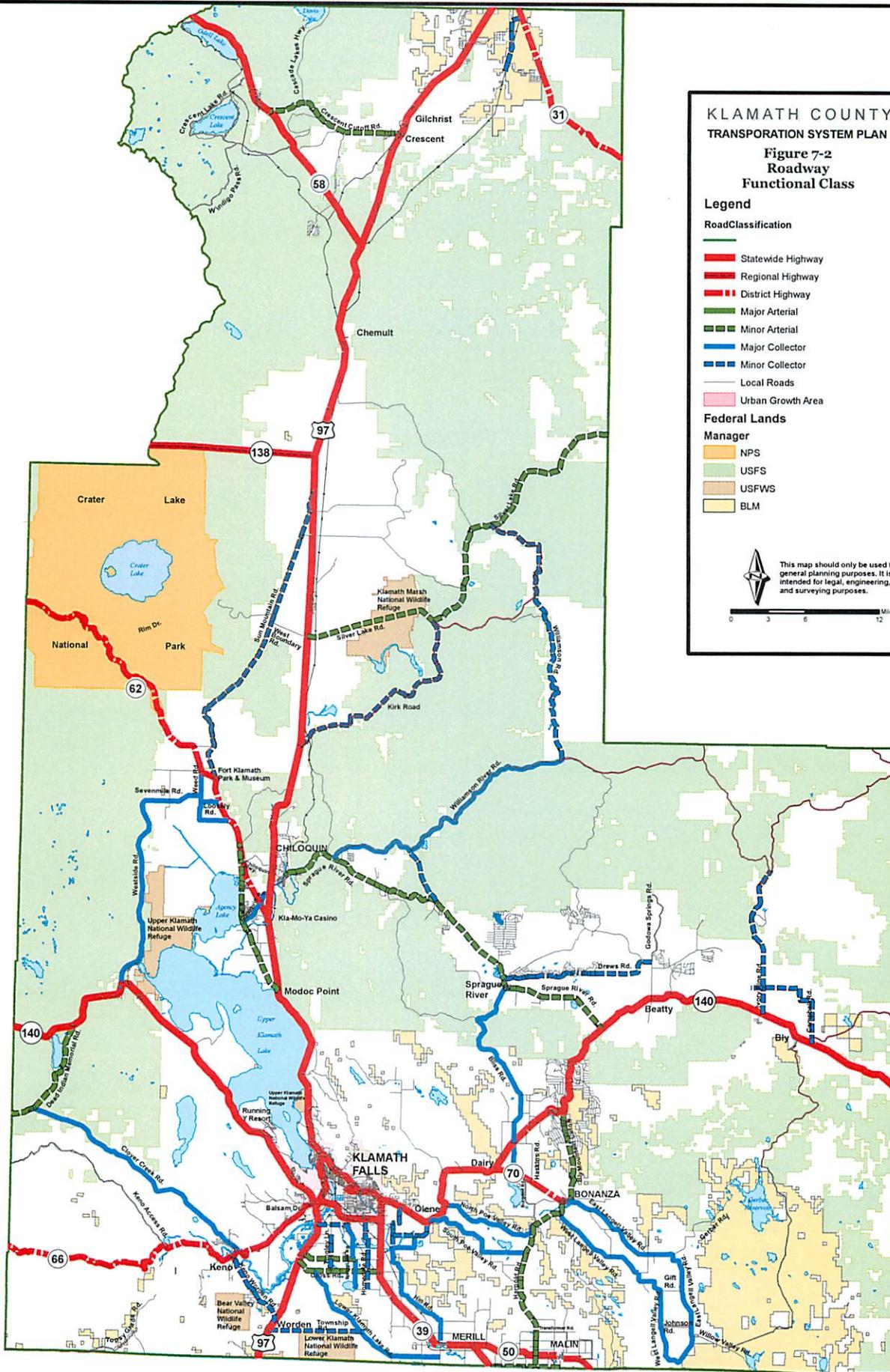
Federal Lands

Manager

-  NPS
-  USFS
-  USFWS
-  BLM



This map should only be used for general planning purposes. It is not intended for legal, engineering, and surveying purposes.



ROADWAY STANDARDS

State Highway Standards:

Roadway design standards for state highways are provided in the Oregon Highway Design Manual. These standards should be applied to all State Highway improvements.

Klamath County Road Standards:

Currently, Klamath County has a set of roadway design standards for the County which can be found in the *Klamath County Department of Public Works Standard Drawings, which is Appendix "A" to the Land Development Code*.

Suggested design standards on the Klamath County roadway system have been developed to maximize the safety and efficiency of the entire transportation system. The recommended roadway standards for arterials, collectors and local streets are summarized in Table 7-1. Because the final design of the roadway can vary from segment to segment due to adjacent land uses and demands, the objective was to develop a system that allows standardization of key characteristics to provide consistency and to provide guidelines for application that provides some flexibility while meeting standards.

**Table 7-1. Recommended Design Standards for
Klamath County Road Department¹**

Roadway Design Standards	
Vehicle Lane Widths: (minimum widths)	Truck Route = 12 feet Arterial = 12 feet Collector = 12 feet Local = 10-11 feet Turn Lane = 10-14 feet
On-Street Parking:	Not Applicable
Bicycle Lanes: (minimum widths)	Arterials = 4' paved shoulder Collectors = 4' paved shoulder Curb & Gutter Streets = 5' Standard Bike Lane = 6'
Sidewalks:	Shoulder or separated pathway
Landscape Strips:	Optional
Medians:	Optional
Neighborhood Traffic Management /Traffic Calming:	None
Turn Lanes:	When warranted
Maximum Grade:	Arterials = 6 % Collectors = 6 % Local Streets = 10 %

¹ Highway Design Manual

Four notable references that could be used to assist in Klamath County road design include the following:

- *A Policy on Geometric Design of Highways and Streets*, American Association of Highway Transportation Officials (AASHTO)
- *Roadside Design Guide*, AASHTO
- *Residential Streets – 2nd Edition*, American Society of Civil Engineers, National Association of Home Builders and Urban Land Institute
- *Residential Street Design and Traffic Control*, Institute of Transportation Engineers

Bike Lanes

In Klamath County, rural roadways generally do not require separate bikeway facilities. Bicyclists are essentially accommodated on the shared roadway or on a shoulder, depending on traffic volumes. In general, bike lanes or shared roadway facilities may be provided on arterials and collectors in areas where forecasted traffic volumes and bicycle use warrant their consideration. In areas with high bicycle use, a pathway should be considered, preferably located on both sides of the roadway, separated from the roadway by at least five feet of greenbelt or a drainage ditch.

Sidewalks

Rural roadways generally do not require separate pedestrian facilities. Pedestrians are generally accommodated on the shoulder of the roadway. In areas with high pedestrian activity, a corridor should be considered, preferably located on both sides of the roadway, separated from the roadway by at least five feet of greenbelt or a drainage ditch.

For the Inside Urban Areas Alternative, sidewalks are shown on the typical cross-sections as well as sidewalk minimum widths.

Access Management

Access management is important, for maintaining safety, overall traffic flows and mobility. Whereas local and neighborhood streets primarily function to provide access, collector, and arterial streets typically serve greater traffic volumes. Numerous driveways or street intersections increase the number of conflicts and potential for accidents, and decrease mobility and traffic flow. Klamath County needs a balance of streets that provide access and streets that provide mobility.

Following are several access management strategies that the county could implement to ensure that access and mobility are both considered and maintained:

Establish new county access management standards for all routes on new developments using maximums and minimums;

Work with land use development applications to consolidate driveways;

Potentially use medians on arterial routes to limit access;

Provide right in/right out driveways on arterials or collectors where appropriate;

Close and consolidate existing access points within 1,320 feet of interchanges, as possible;

Allow no new access within 1,320 feet of interchange ramps (Interchange Management Access Plan (IAMP) required for new interchanges);

Develop minimum traffic signal spacing on arterials and collectors in coordination with Klamath County and ODOT.

Access Management Standards

Access management is hierarchical, ranging from complete access control on freeways, to increasing use of streets for access purposes, parking, and loading at the local level.

For state highways the guidelines are specified in the *1999 Oregon Highway Plan*, Appendix C – Access Management Standards. Access to State Highways is controlled under Oregon Administrative Rules, Division 51 (OAR 754-54-0115 & 0190). Table 7-2 and Table 7-3 below show ODOT's access standards for regional and district highways; Table 7-4 shows ODOT's access standards for Statewide Highways.

Table 7-2. Access Management Spacing Standards for Statewide Highways (Feet*)

Statewide Highways

Posted Speed	Rural		Urban			
	Expressway**	Other	Expressway**	Other	UBA	STA
≥55	5280	1320	2640	1320		
50	5280	1100	2640	1100		
40 & 45	5280	990	2640	990		
30 & 35		770		770	720	Note 1
≤25		550		550	520	Note 1

* Measurement of the approach road spacing is from center to center on the same side of the roadway.

**Spacing for Expressway at-grade intersections only.

Table 7-3. State Highway Access Management Spacing Standards for Regional Highways (Feet*)

Posted Speed	Rural		Urban			
	Expressway**	Other	Expressway**	Other	UBA	STA
≥55	5280	990	2640	990		
50	5280	830	2640	830		
40 & 45	5280	750	2640	750		
30 & 35		600		600	425	Note 1
≤25		450		450	350	Note 1

* Measurement of the approach road spacing is from center to center on the same side of the roadway.

** Spacing for at-grade intersections only.

Note 1: Minimum spacing is either existing city block spacing, or city block spacing in local comprehensive plan.

Table 7-4. Access Management Spacing Standards for District Highways (Feet*)

District Highways

Posted Speed	Rural		Urban			
	Expressway**	Other	Expressway**	Other	UBA	STA
≥55	5280	700	2640	700		
50	5280	550	2640	550		
40 & 45	5280	500	2640	500		
30 & 35		400		400	350	Note 1
≤25		400		400	350	Note 1

* Measurement of the approach road spacing is from center to center on the same side of the roadway.

** Spacing for at-grade intersections only.

Note 1: Minimum spacing is either existing city block spacing, or city block spacing in local comprehensive plan.

Notes: For most roadways, at-grade crossings are appropriate. Allowed moves and spacing requirements may be more restrictive than those shown to optimize capacity and safety. Any access to a State Highway requires a permit from the ODOT District Office. Access will generally not be granted where there is a reasonable alternative access. Access shall be granted to a road with a lower classification rather than one with a higher classification. Lots within a new development will be accessed by internal roads or driveways, rather than driveways directly to existing roads.

Proposed access management guidelines by roadway functional classification for Klamath County are described in Table 7-5. These access management guidelines should be applied to county roads; they are generally not intended to eliminate existing intersections or driveways. Rather, they should be applied as new development occurs. Over time, as land is developed and redeveloped, the access to roadways will meet these guidelines. In some cases, where there is a recognized problem, such as an unusual number of collisions, these techniques and standards can be applied to retrofit existing roadways.

**Table 7-5. Proposed County Road Access Management
– Minimum Centerline Spacing Standards**

Functional Class	System Spacing	Minimum Spacing	Corner Clearance
Rural Major Arterial	1 mile	1,000	1,000
Rural Minor Arterial	1 mile	500	600
Rural Major Collector	¼ mile	250	100
Rural Minor Collector	¼ mile	250	50
Rural Local Street	200-400 feet	75	25

Transportation Systems Management (TSM)

TSM focuses on low cost strategies to enhance operational performance of the existing transportation system. Measures that can optimize performance include intelligent transportation systems (ITS), intersection channelization, access management (as noted in prior section), incident response and various programs that enhance existing transit operations.

One of the tools that typically brings positive results is ITS. Incident detection and response along rural highways in Oregon has long been a concern for ODOT. ITS technologies such as cellular call-in services are currently in use and can effectively provide additional capacity without increasing the size of the facility. In some cases, public opposition to adding traffic lanes due to construction delays, as well as the overall public cost of building them, makes ITS an attractive alternative, with many more applications and technologies than just a short time ago.²

² 1999 Oregon Highway Plan, ODOT.

Maintenance

Preservation projects, maintenance, and operation are essential to protect the county's investment in transportation infrastructure. With increasing road inventory and the need for greater maintenance of older facilities, protecting and expanding funds for maintenance is critical.

A pavement management program is a systematic method of organizing and analyzing information about pavement conditions to develop the most cost-effective maintenance treatments and strategies. Pavement management can be a major factor in maintaining facilities in an environment of limited revenues. As a management tool, it enables public works to determine the most cost-effective maintenance program. The concept behind a pavement management system is to identify the optimal rehabilitation time and to pinpoint the type of repair that makes which makes the most sense.

Modal Plans

The Klamath County modal plans have been formulated using information collected and analyzed through a physical inventory, forecasts, goals and objectives, and input from area residents. The plans consider transportation system needs for Klamath County during the next 20 years assuming the growth projections discussed in Chapter 5. The timing for individual improvements will be guided by the changes in land use patterns and growth of the population in future years. Specific projects and improvement schedules may need to be adjusted depending on where growth occurs within Klamath County.

Roadway System Plan

The improvements to the roadway system include projects from three primary sources:

- The Klamath Falls Urban Area TSP 1998;
- The Statewide Transportation Improvement Program, and
- Those identified from deficiencies in Chapter 4 of this document. All of the improvement alternatives appear in figures at the end of this chapter.

Klamath Falls Urban Area TSP, 1998

Projects identified in the 1998 Klamath Falls TSP, which relate directly to state facilities, are being carried forward in this TSP. These are as follows:

- OR 39: Summers Lane - Klamath Falls-Malin Hwy (Klamath Falls)

- OR 39: Junction Klamath Falls - Malin Hwy (Klamath Falls)
- OR 140 at Homedale Road (Interchange) (Klamath Falls)
- OR 66 at US 97 Interchange (Klamath Falls)
- Olene Extension from OR 39/140

Statewide Transportation Improvement Program Projects

The Oregon Department of Transportation has a comprehensive transportation improvement and maintenance program that includes the entire State Highway System. The Statewide Transportation Improvement Program identifies all the highway improvement projects in Oregon. The program lists specific projects, the counties in which they are located, and their construction year. The final 2008-2011 Statewide Transportation Improvement Program identified several major highway improvements and bridge replacements in Klamath County as follows:

- US 97; N Chiloquin SB & S Klamath Falls NB VMS
- [Intelligent Transportation System]
- US 97; Modoc Point- Shady Pine- [Modernization]
- US 97; OR31 Hwy Jct-SCL Crescent-[Pavement Preservation]
- OR 39: OC&E Railroad Over crossing Bridge (Dairy) – [Replace bridge]
- OR 39: Western – Lost River Diversion – [Modernization]
- OR 140: Ritter Road – Deer Run Road (Bly Mountain) – [Modernization]
- North Entrance to the Volcanic Legacy {All-American Road}
– [Enhancement]
- Chemult Train Station Welcome Center – [Enhancement]

Deficiencies

In addition to the projects identified in existing state improvement programs, roadway and bridge projects have been identified as possible projects from those identified in Chapter 4.

Corridor Refinement Plans

The following corridor Refinement Plans should be accomplished to study numerous un-permitted access points along these sections of major highways.

- A. Highway 97, Spring Creek to Crescent, MP 241-184
- B. Highway 97, Crescent to Deschutes County Line, MP 172.2 - 198
- C. Highway 58, from Highway 97 to Lane County Line
- D. Highway 97, Chiloquin area from Spring Creek to Modoc Point Road

The potential may exist for creation of frontage and backage roads to consolidated public access points, such as Michael Road at Milepost 175.46

IMPROVEMENT PROJECTS

This section describes potential improvements that address deficiencies in each element of the transportation system. Not all potential improvements have been carried forward; overall, these recommendations are based on costs and benefits relative to traffic operations, the transportation system and community livability.

The remainder of this section is organized into the following topics:

- Road Improvement Alternatives
- Freight Improvement Alternatives
- Public Transportation Alternatives
- Bicycle/Pedestrian Network Improvements
- Future County Projects

Road Improvements

This section describes potential 20-year improvement projects that are primarily intended to improve safety and mobility. Each project is listed under its associated roadway; to the extent that these road improvements also improve freight, bicycle, and pedestrian mobility, they are indicated as such. All of the following roadway projects, along with the freight-related improvements, are shown together on Figure 7-3.

In Chapter 8, Finance, each of these listed improvement projects appears in Table 8-4, along with associated project costs and implementation strategies. Based on feedback from the TAC, each project is also given a priority rating of either High (0-6 years), Medium (6-14 years) or Low (14+ years); in the list that appears on the following pages, a priority ranking is indicated before the project description.

U.S. Highway 97

The following list shows these potential 20-year street improvements along with their priority rating (all figures appear at the end of this chapter). These improvements and associated project numbers are:

- 97-1. (Low) Worden Passing Lane:**
{Milepost 289.5 – 291.5} Construct a 1 ½ -mile passing lane; widen shoulders.
- 97-2. (Medium) Keno-Worden Road Left-Turn Refuge:**
{Milepost 289.5} Construct left-turn lane and widen shoulders.
- 97-3. (Medium) Miller Island Road-Old Midland Hwy:**
{Mileposts 280.16-282.61} Widen shoulders and flatten slopes, guardrail.
- 97-4. (Medium) Link River Bridge #08347, UPRR & Pelican City Road Bridge #08352:**
{Mileposts 273.00 & 275.00} Widen bridges to meet current standards for Statewide Freight and Expressways.
- 97-5. (Medium) South Wocus Relocation & North Wocus Realignment:**
{Milepost 271.25 – 270.0}: Close South Wocus Road, reconnect South Wocus Road north of the continuous left-turn refuge on US 97; reconstruct northbound on-ramp at Klamath Falls Port of Entry. Reconstruct North Wocus to 90 degrees with US 97.
- 97-6. (Low) South Wocus Road-North Shady Pine:**
{Milepost 271.27 – 267.08}: Widen shoulders and guardrail.
- 97-7. (High) Modoc Point – Shady Pine Road:**
{Milepost 257.80 – 268.80} Preserve pavement, rockfall protection, widen shoulders, add retaining walls & guardrail.

- 97-8. (Low) North Shady Pine Road Realignment and Left Turn Refuge:**
{Mileposts 268.80-269.90} An additional long-term project to consider in this TSP, and to carry forward in subsequent updates of the County TSP: County has had recent, preliminary discussions with private property owners and ODOT regarding acquisition of county right of way just south of their project so the county could bring Shady Pine straight over to connect with US 97 to a T-intersection; this would allow the intersection to be completely improved, with left-turn refuge from US 97 provided and access management. The remaining portion of Shady Pine would then be vacated and Klamath Pacific could use the remaining area for its inventory.
- 97-9. (Low) Kla-Mo-Ya Casino:**
{Milepost 251.48} This TSP lays out the basic needs at this intersection; future updates of this TSP should examine the feasibility, timing, and type of interchange.
- 97-10. (Medium) Spring Creek Campground – Silver Lake Road:**
{Milepost 244- 227.78}: Widen shoulders
- 97-11. (High) US 97 - Passing Lane:**
Extensions construct an – additional 1 mile Passing Lane to the four existing Passing Lane between M.P. 183.16 – M.P
- 97-12. (Medium) West Boundary Road./Silver Lake Road. Left-Turn Refuge:**
{Milepost 227.25 – 227.75} Construct left-turn refuge and right deceleration lane, widen roadway
- 97-13. (Low) Interchange US 97/ OR 58 Jtc.:**
{Mileposts 195.37} Reconstruct the OR Highway 58 west bound off-ramp for south bound US Highway 97, signage.
- 97-14. (Low) South Crescent-Rosedale:**
{Mileposts 185.77-188.00} Construct continuous left turn refuge and widen roadway.
- 97-15. (Medium) Gilchrist Passing Lanes:**
{MP 181.0 – MP 183.0} Construct 2-mile passing lanes and widen shoulders.

97-16. (Low) Gilchrist Bridge-Klamath County Line:

{Mileposts 172.19 – 183.16} Left-Turn Refuges, Frontage roads, Access Management. This is an additional long-term project to consider in this TSP, and to carry forward in subsequent updates of the County TSP. Various left turn refuges and frontage roads are required to provide safe and permit access.

97-17. (High) Chemult Train Station Welcome Center:

This enhancement project is listed in the 2004-2007 STIP and is scheduled to begin construction in 2010.

97-18. (Medium) South Bound Port of Entry:

Relocate weigh scale and weigh shack north of US 97 Inspection Area, on and off ramps.

Oregon Highway 39

39-1. (Medium) OR 39 (Hwy #50)/OR 140 (Hwy #424) Jct. Signal:

{Milepost 1.78} Construct Signal for interchange at OR 39/ OR 140 Jct. Project to connect Southside Expressway *(See project #140-8 under Oregon Highway 140 projects).

39-2. (Low) Merrill Passing Lanes:

{Milepost 9.0 – 11.0} Construct passing lanes, widen roadway.

39-3. (Medium) OR 39/140 Western - Lost River Diversion (Klamath Falls):

{Mile Post 0.00 – 3.65} Reconstruct and widen roadway, construct continuous left turn refuge and sidewalks from Western Ave to Keller Road, Signal or round-a-bout at intersection of OR 39/140, reconstruct left turn refuge at short road, address width and height issues at aqueduct and BNSF railroad structures and access management.

39-4. (High) Alameda Ave Partial Viaduct Bridge #06741:

{Milepost 5.00-5.20} Replace bridge and bridge rail, construct sidewalk.

Oregon Highway 62

62-1. (Medium) Loosely Road Left-Turn Refuge:

Construct left-turn refuge, widen shoulders and enhance Loosely Road.

- 62-2. (Low) Junction Chiloquin Hwy 422 Left-Turn Refuge:**
Construct left-turn refuge and widen roadway for improved safety and enhanced access to Hwy 422.
- 62-3. (Low) Junction South Chiloquin Road Left-Turn Refuge:**
Construct left-turn refuge and widen roadway for improved safety and enhance access to OR 62.

Oregon Highway 140

- 140-1. (Low) Grizzly Road-Four-mile Flat Road (Lake-of-the-Woods):**
{Mileposts 41.0 – 51.16} Widen roadway and flatten slopes.
- 140-2. (Medium) Left-turn refuge at Varney Creek Road:**
{Milepost 42.5 – 43.25} Construct left-turn refuge, right turn lane and realign Varney Creek Road.
- 140-3. (High) Klamath County Boat Marina-Lakeshore Drive:**
{Mileposts 57.0 – 62.3} Widen roadway; install guardrail; reconstruct and realignment highway and curves to eliminate detours for oversized loads.
- 140-4. (High)Ridge Water Drive-OR 66/OR 140 Jtc.:**
{Mileposts 65.25-68.76}Widen highway to four lanes with median and median barrier, guardrail, signs.
- 140-5. (High) Orindale Interchange:**
{Milepost 67.22} Construct an Interchange to connecting Orindale Road and new developments, access management, frontage roads.
- 140-6. (High)South Klamath Hwy @ Homedale Road Interchange:**
{Milepost 4.63} Construct interchange; frontage roads, access management, traffic signal.
- 140-7. (Medium) Southside Expressway @ OR 39 Interchange:**
{Milepost 5.97} Construct interchange, access management and frontage roads* (See Project #39-2 of the Oregon Highway 39 project for the Signal.)

- 140-8. (Medium) Southside Expressway - Olene Extension:**
{Milepost 5.97 Hwy#424 to Milepost 10.00 Hwy#20} Construct a new alignment from the junction at Highway 39/Highway 140 to Olene (approximately 4 miles of new highway); reconstruct 1 mile of Reeder Road; construct a new bridge over BOR Lost River Canal; refurbish one bridge over BOR B Canal; add new guardrail and complete signage.
- 140-9. (Medium) Olene-Swan Lake Road:**
{Mileposts 8.0 -15.0} Widen shoulders, guardrail, widen bridge at B-Canal, flatten and realign curves, right lane deceleration lane at S Poe Valley Road; right deceleration lane at N Poe Valley Road.
- 140-10. (High) OC&E Over BNSF (Dairy) Bridge #02147:**
{Milepost 18.29-18.49} Replace bridge, install guardrail.
- 140-11. (High) Ritter Road – Deer Run Road (Bly Mtn):**
{Mileposts 25.17 – 32.56} Reconstruct and realign the highway; widen roadway; add guardrail, left-turn refuge at Bly Mountain Cutoff Road. (Project Scheduled for 2011).
- 140-12. (Medium) Sprague River Road Left Turn Refuge:**
{Mileposts 29.5-30.60} Construct Left turn refuge and right turn lane.
- 140-13. (High) Beatty Curves/Realignment and Shoulder Widening:**
{Mileposts 41- 45} Flatten curves, realign highway, widen shoulders, reduce the number of trees on the south side of the roadway to improve sight distance.

Oregon Highway 66

- 66-1. (Medium) OR 66/OR140/US 97 @ Green Spring Interchange:**
{Milepost 58.99} Interchange improvement - add south bound on and off loop ramps to eliminate left turns.
- 66-2. (Low) Orindale Road – OR 66/OR 140/US 97 Jct**
{Mileposts 57.81-58.99} Construct four lanes highway with continuous left turn refuge, curbs and sidewalks, drainage, and access management

- 66-3. (Low) Kern Swamp Road – Klamath River Bridge:**
{Mileposts 53.64 –50.26}. Reconstruct highway, realign curves, widen shoulders, and add guardrail and left-turn refuge at Clover Creek Road.
- 66-4. (Medium) Keno-Worden Road Left Turn Refuge:**
{Mileposts 49.41-50.4} Construct a left-turn refuge, sidewalks, drainage, and signs .

Oregon Highway 58

- 58-1. (Low) Klamath Northern Bridge Over Crossing:**
{Milepost 82.47} Replace the existing railroad bridge over OR 58 to current highway standards.
- 58-2. (Low) Diamond Peaks C.T. and Royce Mtn Way Left Turn Refuge and Shoulder Widening:**
{Milepost 70.0 to 72.0} Construct left turn refuge, widen shoulders. .
- 58-3. (Low) McNeele Drive Left Turn Refuge:**
{Milepost 80.77} Construct a left-turn refuge and widen shoulders for Mowich subdivision .

Oregon Highway 422

- 422-1 (High) Williamson River Bridge #01959:**
{Mileposts 4.47-4.67} Replace bridge deck, construct new bridge rail and guardrail.

FREIGHT IMPROVEMENTS

Truck Routes

The movement of freight through Klamath County is heavily dependent on the highway system, and US 97 is the most important roadway in the county with respect to trucks. In addition, a primary issue in the county regarding freight movement is the required out-of-direction travel on Oregon Highway 140 East and West.

Due to the substandard curvature of OR 140 from the Klamath County Boat Launch Park to Lakeshore Drive next to Upper Klamath Lake, trucks entering the county from the west are forced to detour north in a circuitous manner to get onto US 97. Klamath County recognizes the importance of OR 140 as an east-west freight route across the state; in keeping with Goal 6 of this Plan, this TSP recommends that freight improvements included in this modal plan have been grouped with the roadway improvement alternatives (see Figure 7-3), as several projects include passing lanes, which will enhance freight mobility.

NEW ROADS

In order to relieve traffic congestion on the Crater Lake Parkway Corridor and in particular the intersection of Foothills, CLP and Washburn Way, a new arterial is envisioned extending from Foothills Blvd to Old Fort Road at Collman Dairy Road, and then continuing on northwesterly serving the OIT/Sky Lakes area and Paradise Hill, on out to Highway 97 via Shady Pine.

The intersection of Summers Lane and OR 140, Hwy No. 424 exceeds the V/C ratio of 0.75 for that level facility according to the Oregon Highway Plan. This is currently impeding any further development of the Klamath Falls Airport Industrial Park. A proposed solution is to extend Brett Way from Summers Lane east to Homedale Road. Summers Lane would have a cul-de-sac installed on both sides of the existing at-grade railroad crossing, and a new at-grade crossing would be required south east of the old crossing to accommodate the Brett Way extension. The Homedale/140 intersection would also require improvements, such as signalization, a roundabout or an interchange. This project would alleviate a safety concern on the state highway and allow for new economic development.

FUTURE PROJECTS (BEYOND THIS TSP PLANNING HORIZON)

During the planning process, several capital improvement projects in the county were identified, though these particular projects are more conceptual in nature and are beyond the 20-year planning horizon of this TSP. The following conceptual projects were acknowledged by the Transportation Advisory Committee and therefore are included in this TSP for future consideration; these should be carried forward to future updates of county plans, so that if/when funding becomes available these projects can be prioritized accordingly. Future updates of this TSP should examine funding options that would be reasonably expected to be available to Klamath County and ODOT.

Width constraints on US 97:

As US 97 becomes a more popular and favored West Coast truck route, the current two-lane configuration around Upper Klamath Lake (from Modoc Point to Hagelstein Park – 6-mile section) makes future roadway widening extremely difficult and costly. If the highway were widened to the west, a viaduct would likely be required due to the existing railroad. To the east, major challenges exist in the form of an unstable hillside that is scattered with early Cultural sites, which, upon disturbance, would immediately cease any project work and require substantial excavation and documentation. However, if this segment remains only two lanes, it would essentially be the sole bottleneck on nearly 325 miles of highway. Some additional options to consider for widening US 97 in a 20- to 50-year timeframe include the following (each listed project is estimated to have a construction value of roughly \$200-\$300+ million):

- Realign highway over the top of the hill on existing ROW.
- Drop the highway down to the railroad level.
- Construct a two-lane causeway over the lake to parallel the existing roadway, which would accommodate southbound traffic; northbound traffic on existing alignment.
- Deck the highway for northbound over and southbound below.
- Existing road-cuts near the existing alignment could be pieced together to arrive at a 4-lane roadway.

With respect to future funding for the US 97 conceptual projects listed above, perhaps as an update to future TSP's or other Planning documents, the Oregon Transportation Commission suggests the following:

A study regarding the economic feasibility of adding capacity to US 97, whereby the added lanes would function as a toll facility; adding capacity to US 97 will be necessary to offload the burden on the portion of Interstate 5 between Eugene and the California border. An investigation into the feasibility of a public/private partnership should also be undertaken as part of future TSP updates. Irregardless of the final agreed upon solution for US 97, widening this 6-mile segment to 4 lanes is one of the biggest challenges facing ODOT and the county.

South Algoma Road Intersection:

Another long-term project to consider in subsequent updates of the Klamath County TSP: Moving this intersection north will be a major undertaking that would require a bridge to traverse an adjacent irrigation pond.

Spring Lake Road and Old Midland Road:

Construct a left turn refuge.

The following four road widening projects should be considered when the county turns its attention to Oregon Highway 140 west. Along Upper Klamath Lake (*see project #140-1 on page 7-18) there is a narrow section that forces wide-loads to detour off of 140 and travel north in a circuitous manner on these 4 roads as shown. It is recommended that these roads be improved to more efficiently handle freight traffic, or improve OR 140 to eliminate the required detour.

Westside Road: widen roads (detour)

Sevenmile Road: widen roads (detour)

Weed Road: widen roads (detour)

Loosely Road: widen road (detour)

Interchange at Highways 97/140/66:

The current configuration of this interchange is inefficient and substandard; however, it will also be very costly to upgrade to a grade-separated, free-flowing highway interchange. Options for funding this project should be explored and studied in the years to come and this project should be prioritized in future updates of this Plan. (The Access Management Plan for this project is in the 2008-2011 STIP)

Interchange at Running Y Road:

In the future, this intersection will need a grade-separated intersection to accommodate increasing traffic. Options for funding this project should be explored and studied in the years to come and this project should be prioritized in future updates of this Plan.

Interchange at Kla-Mo-Ya Casino (project #97-8):

In the future, this intersection will need a grade-separated intersection to accommodate increasing traffic. Options for funding this project should be explored and studied in the years to come and this project should be prioritized in future updates of this Plan. Preliminary estimates for a partial-diamond intersection at this location are on the order of roughly \$15 million.

Hwy 66 – widen, realign, curve correction from Kerns Swamp Road to Keno:

Need parallel road north of this area from Johnston Ranch Pit to Round Lake.

Destination Resort Overlay:

The traffic impact analysis (TIA) for the proposed Destination Resort Overlay also recommends several improvements at the Highway 97/Crescent Cutoff Road intersection to improve the at-grade railroad crossing and widen Crescent Cutoff Road. In addition, the TIA notes that a planned and funded ODOT Statewide Transportation Improvement Project (STIP) includes restriping US 97 through Crescent, from its existing four-lane configuration to a three-lane cross-section. This project may also include a new southbound right-turn deceleration lane on US 97 onto Crescent Cutoff Road. The TIA recommends that the Applicant construct the deceleration lane if: (1) ODOT cannot obtain STIP Funding for the deceleration lane; and (2) the Applicant can obtain adequate right-of-way for the deceleration lane.

Condition #31 – Prior to occupancy of any units in the resort, the RESORT shall execute a memorandum of understanding (“MOU”) with Klamath County and ODOT setting forth the RESORT’s obligations to: (a) Contribute to or construct the US 97/Crescent Cutoff intersection improvements set forth in the TIA (PDP Exhibit E) and the August 26, 2008 Supplemental Kittelson memorandum; and (b) Contribute the resort’s proportionate share on a per unit basis, of future capacity improvements at the collector/arterial intersections along the US 97 corridor within the City of La Pine, consistent with the June, 2008 TIA, the September 26, 2008 supplemental Kittelson memorandum and the findings and recommendations identified within the City’s Transportation System Plan (estimated TSP completion date: June 2009).

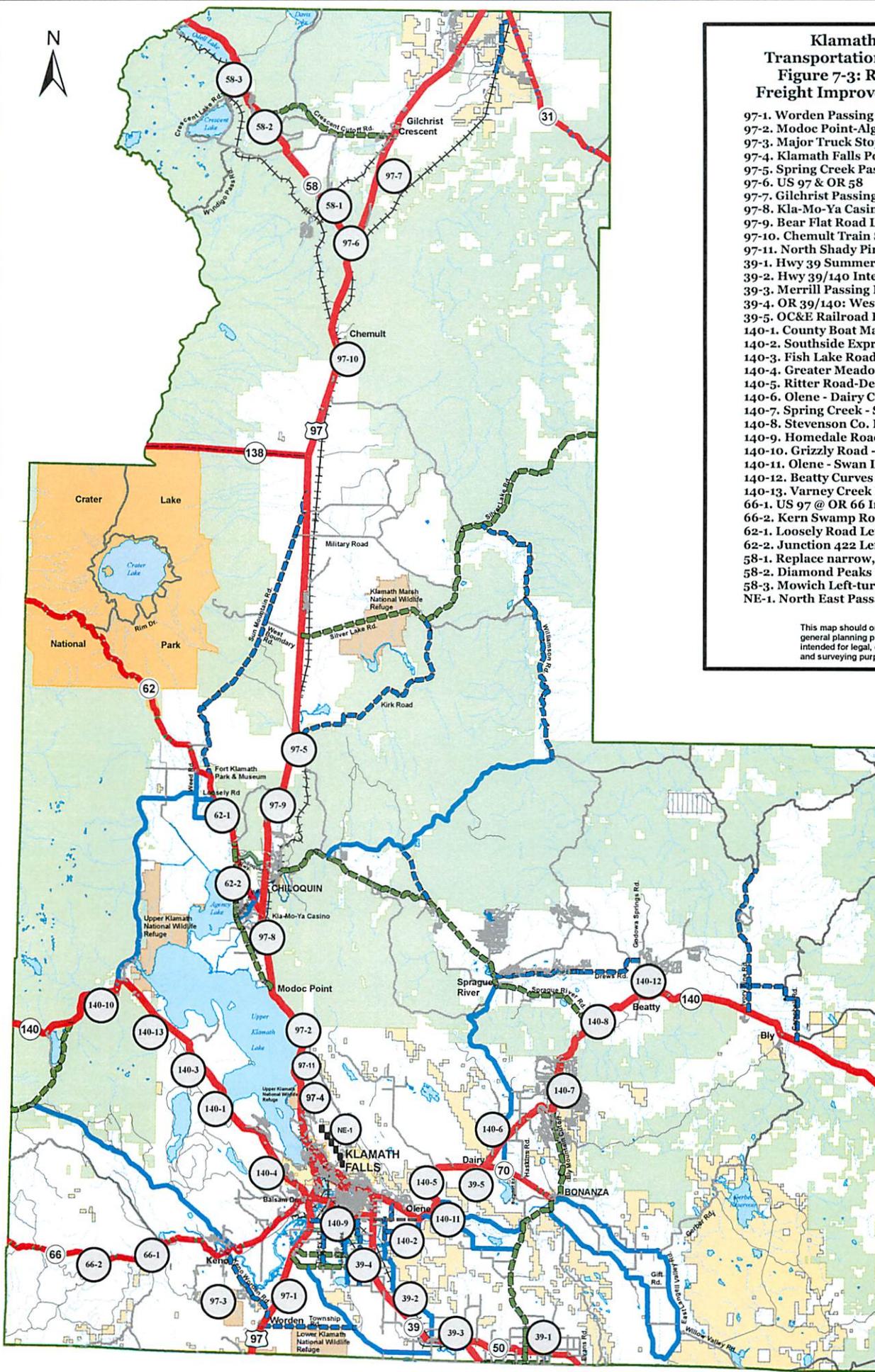
Condition #32 – The RESORT shall provide directional signage for the resort along US 97, Crescent Cutoff Road, and the Oregon 58, in accordance with requirements of KCLDC Article 66. The RESORT shall obtain all required sign permits from Klamath County Public Work and ODOT.



Klamath County Transportation System Plan Figure 7-3: Roadway and Freight Improvement Projects

- 97-1. Worden Passing Lane
- 97-2. Modoc Point-Algoma
- 97-3. Major Truck Stop-Left-turn Lane
- 97-4. Klamath Falls Port of Entry
- 97-5. Spring Creek Passing Lanes
- 97-6. US 97 & OR 58
- 97-7. Gilchrist Passing Lane
- 97-8. Kla-Mo-Ya Casino Interchange
- 97-9. Bear Flat Road Left-turn Lane
- 97-10. Chemult Train Station
- 97-11. North Shady Pine
- 39-1. Hwy 39 Summers Lane
- 39-2. Hwy 39/140 Interchange
- 39-3. Merrill Passing Lanes
- 39-4. OR 39/140: Western Lost River
- 39-5. OC&E Railroad Bridge #01247
- 140-1. County Boat Marina-Lakeshore Dr
- 140-2. Southside Expressway Extension
- 140-3. Fish Lake Road
- 140-4. Greater Meadows Snow Park
- 140-5. Ritter Road-Deer Run Road
- 140-6. Olene - Dairy Curve Correction
- 140-7. Spring Creek - Sycan Marsh
- 140-8. Stevenson Co. Park - E Canal
- 140-9. Homedale Road Interchange
- 140-10. Grizzly Road - Fourmile Flat
- 140-11. Olene - Swan Lake Road
- 140-12. Beatty Curves
- 140-13. Varney Creek Road
- 66-1. US 97 @ OR 66 Interchange
- 66-2. Kern Swamp Road - Bridge
- 62-1. Loosely Road Left Turn Refuge
- 62-2. Junction 422 Left Turn Refuge
- 58-1. Replace narrow, old bridge.
- 58-2. Diamond Peaks Development
- 58-3. Mowich Left-turns
- NE-1. North East Passage

This map should only be used for general planning purposes. It is not intended for legal, engineering, and surveying purposes.



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PUBLIC TRANSPORTATION

Basin Transit has six fixed-routes which provide transit service for the Klamath Falls urbanized area.

In the future, additional transit service should be oriented to:

- Klamath Tribes in Chiloquin
- Parks and athletic fields, and senior housing facilities
- Oregon 140 as Ridge Water and other developments occur
- Park-and-Ride lots (Peak-hour associated)

Currently, there are no plans for expanding service beyond the District boundaries (which are essentially the same as the Klamath Falls Urban Growth Area boundary). Basin Transit's service concentration is presently on improvements that offer better service to existing customers and/or expansion to meet anticipated needs due to growth or shifting population patterns. Local developments such as Ridge Water and Southview among others, suggest future needs for the District to expand or offer additional peak-hour service on Oregon 140 West.

Service to outlying areas of the county may eventually be implemented, particularly if fuel prices continue to escalate. Basin Transit's recent experience (out-of-county bus service funded by ODOT through the Senior Center) and additional studies have indicated that the use of such service would not justify the expense at this time. Park-and-Ride work trip services, for example, may be considered in the future.

BICYCLE AND PEDESTRIAN NETWORK

Potential bicycle and pedestrian-related improvement projects have been grouped together for this TSP and are listed below; they are also shown in Figure 7-4.

Crescent-Gilchrist Sidewalks (U.S. Highway 97):

Install ADA crossing; construct new sidewalk in the curb area; and re-construct the sidewalk/curbs as necessary.

Merrill Sidewalks (Oregon Highway 39):

Install ADA crossings; construct new sidewalks in current gutter sections; replace curb as necessary; and reconstruct sidewalk as necessary to improve access management.

Figure 7-4. Bicycle and Pedestrian Improvement Projects (next page)

**Klamath County
Transportation System Plan**

**Figure 7-4:
Bicycle and Pedestrian
Improvement Projects**

Legend

**Road Classification
Functional Classification**

- Statewide Highway
- Regional Highway
- District Highway
- Major Arterial
- Minor Arterial
- Major Collector
- Minor Collector
- Local Roads
- Railroads

- Cities
- Urban Growth Area
- Klamath County

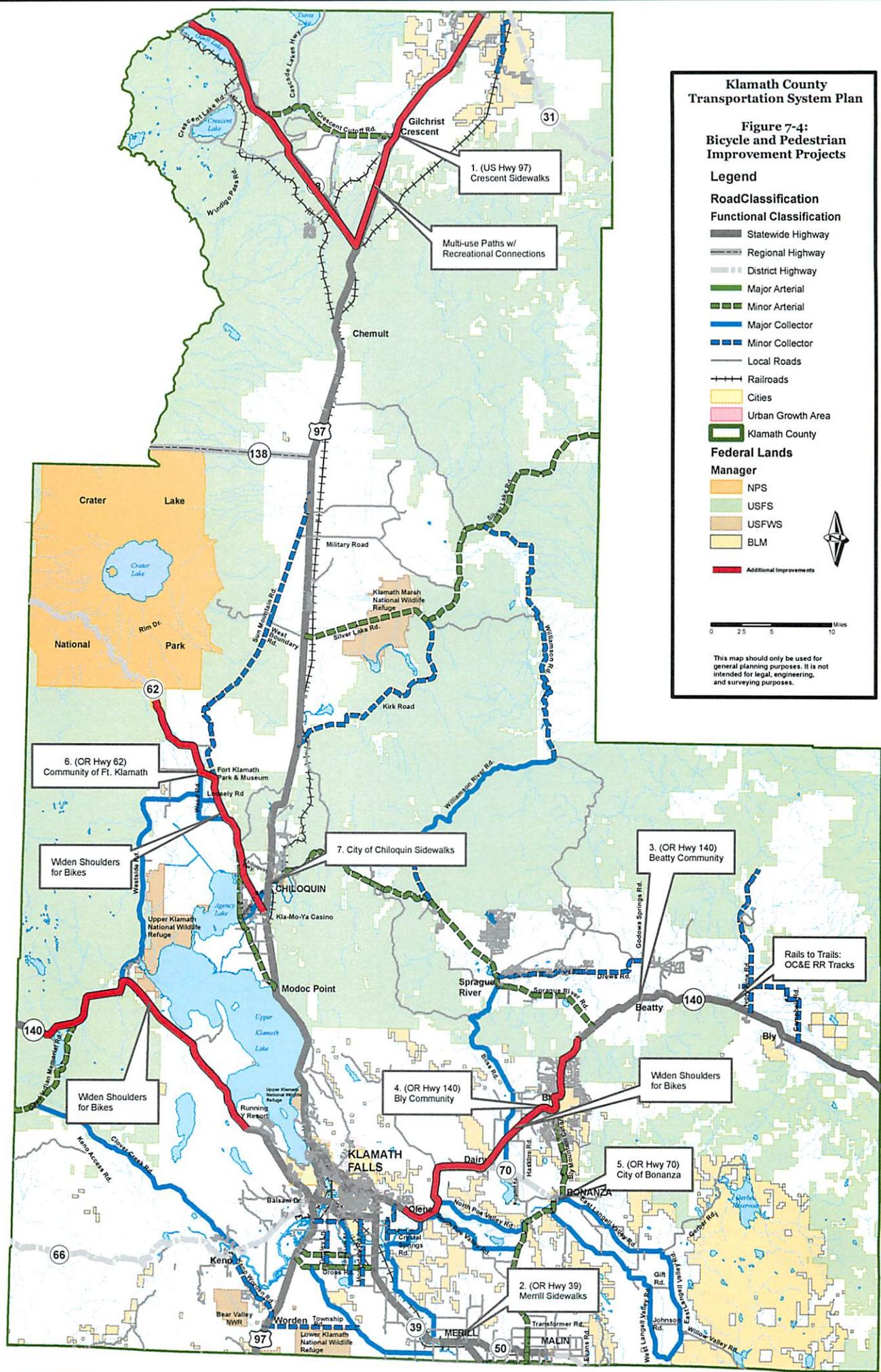
Federal Lands

- Manager**
- NPS
 - USFS
 - USFWS
 - BLM

Additional Improvements



This map should only be used for general planning purposes. It is not intended for legal, engineering, and surveying purposes.



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Community of Fort Klamath (Oregon Highway 62):

Construct sidewalks in curb areas and provide ADA crossings.

City of Chiloquin (Oregon Highway 422):

Construct sidewalk, curbs, and storm system from railroad tracks to Tribal Center.

Community of Keno (Oregon Highway 66):

Construct sidewalks from Klamath River Bridge to McCormick Road.

Crescent Lake (Oregon Highway 58):

Widen shoulders along Highway 58 to improve bicycle and pedestrian safety.

Town of Bonanza (Oregon Highway 70):

Construct sidewalks from Harpold Rd. – County /State Boundary.

City of Malin (Oregon Highway 39):

Construct sidewalks from M.P. 23.71 to M.P. 24.52.

INTELLIGENT TRANSPORTATION SYSTEMS

Intelligent Transportation Systems (ITS) include diverse technologies, ranging from information processing and communications to traffic control devices and electronics. These technologies were first introduced as a means of resolving the conflict between increasing travel demand and insufficient transportation infrastructure. The benefits of ITS strategies have become apparent to transportation departments across the country, and safety advantages have taken center stage as the major focus of many ITS programs.

Today, ITS is a collaborative effort that seeks to develop coordinated technologies to improve the efficiency of surface transportation through better informed drivers, improved traffic controls, information technology and electronic systems. ITS technologies are applied to vehicles and roadways that perform communications, data processing, traffic control, navigation and various other functions. The United States Department of Transportation (USDOT) has defined integration “links” connecting the various features of ITS infrastructure, and offers several components, some of which could be applicable to Klamath County³:

- Incident management
- Arterial management

³ Metropolitan ITS Integration, A Cross-Cutting Study, FHWA/FTA, August 2002

- Transit management
- Electronic fare payment
- Electronic toll collection
- Emergency management
- Highway-rail intersections
- Regional multi modal traveler information

Intelligent Transportation System (ITS) Facilities

ODOT has ITS facilities on US 97, OR 58, and OR 140. The types of ITS facilities in the county vary from variable message signs (VMS), cameras, road weather information systems (RWIS), and ice warning sign. The list of such facilities in the county are listed below:

Hwy OR 140 West

Lake of the Woods	Camera and RWIS
Seldom	Automated Ice Warning Sign (MP 41.7)
Doak Mountain	Camera and RWIS
Lake Shore Jtc	VMS
Hwy OR 140	East Camera and RWIS
Bly Mountain	Camera and RWIS

Hwy US 97

Green Spring Interchange	Camera
Modoc Point	Camera and RWIS
Diamond Lake Jtc	VMS
Chemult.....	Camera and RWIS
Klamath River Bridge (Northbound)	VMS
Collier (Southbound)	VMS

Hwy OR 58

Willamette Pass	Camera and RWIS
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The use of ITS technologies and strategies must be planned at the regional level and developed to properly and efficiently define projects so that they build upon one another. Regional integration is important so that planning and deployment of ITS can take place in an organized and coordinated fashion. It is also important that ITS solutions be implemented economically, in order to utilize public funds in a responsible manner. A regional ITS architecture illustrates this integration and provides the basis for planning the evolution of existing systems and the definition of future systems that facilitate the integration over time.

In Klamath County, the use of ITS could provide benefits to the roadway system and to overall safe travel throughout the county. Applicable components of the links listed above, with respect to the county, include incident and arterial management. There are a number of areas in the county that already have ITS components; following is a list of camera, automated signs, and variable message signs (VMS) for future implementation on the county road network:

Oregon Highway 140 West:

Automated chain up signs: (Mileposts 21, 41, 51, and 57)

Oregon Highway 140 East:

Automated chain up signs: (Mileposts 25, 33, and 62); Bly Maintenance Station - Camera and RWIS

US Highway 97 (several locations):

Midland Rest Area (KIOSK Center); Spring Creek Hill Camera and RWIS at bottom and top of hill; Diamond Lake junction camera and RWIS; Oregon Hwy 58 junction (VMS sign located south of Oregon Hwy 58 junction for northbound traffic); Gilchrist (VMS sign located north of Gilchrist for southbound traffic) with camera and RWIS; Chemult rest area (north and south bound - KIOSK Center).

Oregon Highway 58:

Automated chain up signs in the following locations (Mileposts 86, 75, and at Crescent Cut-Off Junction) with camera and RWIS.

Oregon Highway 62:

Fort Klamath (camera and RWIS)

Oregon Highway 66:

Keno (camera and RWIS)

Oregon Highway 66:

Green Springs Highway (Spencer Bridge camera and RWIS)

Oregon Highway 39:

California Border (camera and RWIS)

RAIL STATION

Chemult Train Station Welcome Center (Project #97-10):

This project will construction a new railroad station, reconstruct platform and provide parking. (Project scheduled for construction 2010 – listed in 2008-2011 STIP).

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