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TECHNICAL MEMORANDUM #1 – Plan & Policy Review

Basin Transit Service Development Plan Update

Plan and Policy Review

Date: February 27, 2012 Project #: 12799
To: Project Advisory Committee
From: Susan Wright, PE, Robert Kniefel, PE, Matt Kittelson, PE

The purpose of this memorandum is to document the relevant findings, policies, and projects contained in applicable plans and policies related to the Basin Transit Service Development Plan update. A list of the documents reviewed is shown below:

- Basin Transit Service Plans
 - Basin Transit Service Transit Plan (1995)
 - Basin Transit Service Locally Developed Public Transit Human Service Coordinated Transportation Plan (2009 Update)
- Statewide Plans
 - Oregon Transportation Plan (2007)
 - 2006 Oregon Highway Plan and amendments
 - 1995 Oregon Bicycle and Pedestrian Plan & 2011 Oregon Bicycle and Pedestrian Design Guide
 - 2003 HDM and amendments, including Chapter 12 Design Guidelines for Public Transit
- Local Agency Plans
 - Klamath County Comprehensive Plan
 - Klamath County Transportation System Plan
 - City of Klamath Falls Comprehensive Plan
 - Klamath Falls Urban Area Transportation System Plan

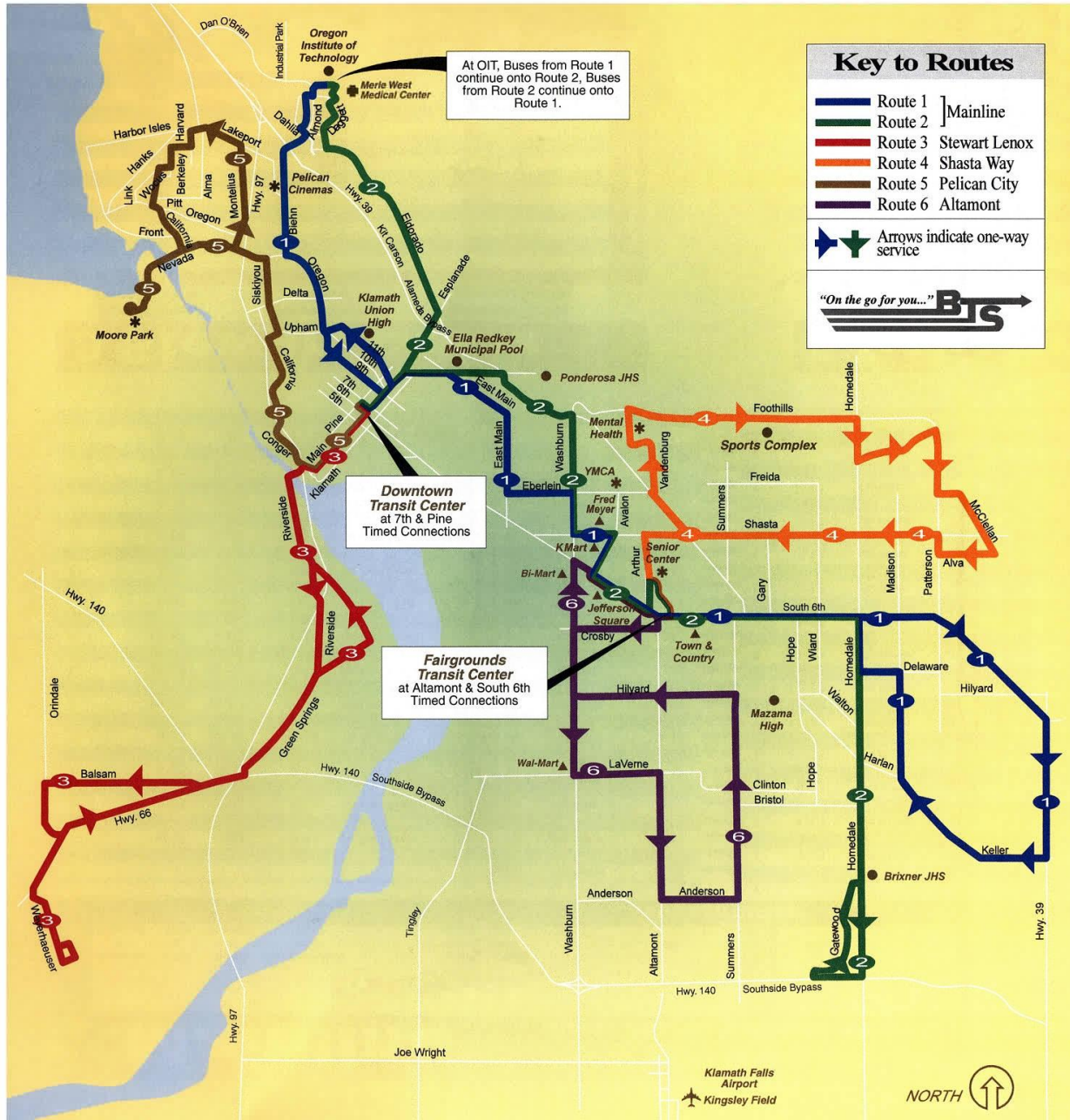
BASIN TRANSIT SERVICE TRANSIT DEVELOPMENT PLAN (1995)

Basin Transit Services (BTS) is the public transit agency for the Greater Klamath Falls Urban Area. The Transit District extends from Terminal City in the north to Kingsley Field in the south and from the

Klamath Falls city limits to an area just beyond OR 39 in the east. Within this area, BTS provides a combination of fixed route and demand responsive services.

The Transit Development Plan (TDP) was developed in December 1995. Its purpose was to develop a program of detailed service improvements for Basin Transit over a ten year timeline with a series of options to pursue over the long term. The restructuring plan prepared as part of the TDP study (the “no growth improvement plan”) was implemented in August 1995, so many of the changes recommended had been implemented at the time the plan was adopted.

The system represented by the 1995 no growth improvement plan is largely the same system in operation today, with the exception of modifications to two of the routes (Route 4 and Route 6). It consists of six fixed routes; Routes 1 and 2 jointly constitute a “mainline”, while the other four routes leave from transit stations that provide timed transfers. As part of the no growth improvement plan, two transfer stations were consolidated; the exact site of the new transfer station had not been determined at the time of the plan, but it has since been sited at the intersection of Altamont and South 6th Street. The existing system map (from the Basin Transit Service website) is provided on the following page.



Source: <http://www.basintransit.com/largemap.shtml>

The plan contained two options for expansion of the system beyond the no growth improvement plan, both of which provided increased frequency on the same routes rather than adding additional routes for fixed route service. It also listed two intersections that required improvements (Washburn & Laverne and Avalon & Shasta), noting that the intersections were unsafe at their current traffic volumes. It recommended signals, or, as in interim solution, four-way stops for those intersections.

Chapter 10 of the TDP outlines Basin Transit Services' policies, goals, and objectives for long-range planning. It notes that service effectiveness, especially for fixed-route service, is strongly impacted by the density and intensity of development. It also notes that increasing the frequency of fixed route

services is a higher priority than expanding geographic coverage as frequency has a greater impact on ridership. One of the goals outlined in Chapter 10 is to coordinate transit system development with community planning and development efforts, land use policy, and other transportation services. Related objectives are listed below (p. 10-6).

Objectives:

- a. Encourage new facilities which may have public transit impacts to locate in current service areas, with pedestrian access from current stops.*
- b. Encourage any new large developments to provide streets for through-operation of transit, and amenities (signs and shelters) for transit users.*
- c. Charge new facilities outside service areas which require service incremental cost of new service.*
- d. Coordinate with private transportation services.*

The document also suggests staff review of development proposals in light of BTS standards and guidelines; coordination with local government to implement development guidelines, standards, and incentives to encourage transit oriented development; and staff review for signs and shelters in new developments.

Chapter 10 also includes a set of transit-supportive land use guidelines and policies based on a central concept of intensification of land uses in areas of existing transit service. This section presents two alternative policies that support intensification to assist transit: a mainline transit overlay zone, or an arterial and collector street development policy. The mainline transit overlay zone would entail the designation of an overlay zone within one-half mile of Mainline Route 1; within this area, increased densities would be encouraged. The alternative policy would encourage new multi-family, commercial, and industrial development to locate along streets designated as arterials and collectors in the Transportation System Plan. Basin Transit identified potential incentives including reduction or elimination of permit and development fees, tax breaks, reduction of setback and open space requirements, or reduction of parking requirements. The plan also suggests that the city could create impact fees intended to address demand for future transit service expansion and charge them to developments located outside the overlay district or development other than single-family and two-family residential not on arterials or collectors. Basin Transit also suggests some transit-supportive development requirements:

- Requiring developments adjacent to designated arterial and/or collector streets to provide a clearly defined pedestrian pathway between each structure's primary entrance and the street right-of-way.
- Requiring new developments and substantial improvements (>25% of the existing development value) in areas zoned for multi-family, commercial, or industrial use to

improve any adjacent designated bus stop areas with benches, shelters, lighting, informational displays, etc. up to a limit of 5% of the value of the project.

Chapter 10 also identifies ways in which the city's street system can support transit, including:

- Signalization projects at identified dangerous intersections (Washburn & Laverne and Avalon & Shasta)
- Providing bus pullouts on new and redeveloping arterial streets in coordination with Basin Transit
- Requiring sidewalk and lighting improvements on both sides of arterial and collector streets and local streets in areas zoned for anything other than single-family or two-family residential (local streets in single-family and two-family residential areas would still be required to provide sidewalks and lighting on one side of the street). Recommended minimum sidewalks widths are shown in the table below.

Street Class / Zoning	Residential	Commercial	Light Industrial	Industrial
Local	5'	6'	6'	5'
Collector	6'	6'	6'	6'
Arterial	6'	8'	8'	6'

- Limiting curb cuts through shared driveways and minimizing driveway widths
- Including bus shelters at stops where boarding volumes warrant (>10 people per day); guidelines for shelter design are also provided

BASIN TRANSIT SERVICE LOCALLY DEVELOPED PUBLIC TRANSIT HUMAN SERVICE COORDINATED TRANSPORTATION PLAN (2009 UPDATE)

BTS originally developed the Locally Developed Public Transit Human Service Coordinated Transportation Plan in 2006. The focus of the plan is to document user preference and existing transit services available within Klamath County. Findings of the plan are summarized below:

- Primary transit uses include:
 - Shopping
 - Medical appointments
 - Work or school commute
 - Entertainment or recreation
- Public transit services available within Klamath County include:
 - BTS
 - Provides fixed route and dial-a-ride service Monday through Saturday

- The Klamath Tribes
 - Provides a variety of services focused mainly on Chiloquin, including weekday service to Klamath Falls, dial-a-ride service, and medical transport service. Service days vary by service type.
- Notable private transit services include:
 - Sage Stages
 - Provides weekly service (on Wednesday) from Alturas, CA to Klamath Falls, OR
 - Millennium Transport Service, Inc.
 - Service is based in Coos Bay, OR and provides wheelchair and stretcher van services locally and long distance
 - The Shuttle
 - Daily service from Klamath Falls, White City, Medford, and Ashland.
 - Yellow Cab
 - Taxi cab service in Klamath Falls. The service also provides wheelchair accessible service.
- A number of additional private transit services are available for different user groups
- One in four residents of the Klamath Falls UGB reports some kind of disability
- 16 percent of the Klamath Falls UGB population lives in poverty. This is higher than the Oregon average of 11 percent (based on 2009 data).

The plan also documents the service needs identified by stakeholders involved with the plan update. These are included in Chapter 3. Reoccurring responses include:

- Extended operation hours on Saturdays and service provided on Sundays and holidays
- Service to rural areas for commute purposes
- Reduced headways
- Extended operating hours
- Transport to and from Chiloquin 5 days a week for workers, 2-3 days for other needs

Based on the plan developed, BTS and the Klamath tribes established priorities for their transit services. These priorities are:

- BTS Priorities:

- Continued support of all existing services to include operating, planning, marketing, and capital needs. At a minimum those existing providers are listed in Chapter 2 of the document.
- Expansion of existing services to meet the needs identified by this plan such as more days of operation, expanded operating hours, and more service outside of the current service area.
- Creation of new service providers to meet the needs identified by this plan.
- Creation of more coordination to improve efficiencies in existing providers and thereby expand services.
- The Klamath Tribes Priorities:
 - Continued support of all existing services to all clients in the service area with priority given to tribal elders and disabled person and to include operating, planning, marketing, and capital needs.
 - Expansion of existing services, especially with the fixed bus route, to meet the needs of all clients in the service area, such as more days, hours, capital, and equipment.
 - Being able to expand and improve existing services to accommodate more clients in the northern rural areas of the Klamath Tribes service area and former reservation boundaries.
 - Creation of improved coordination to reduce inefficiencies with existing providers and expand service.

OREGON TRANSPORTATION PLAN (SEPTEMBER 2006)

The Oregon Transportation Plan (OTP) is the overarching policy document for a series of modal plans that together form the state transportation system plan (TSP). The OTP establishes goals, policies, strategies, and initiatives that address the core challenges and opportunities facing Oregon. It provides the framework for prioritizing transportation improvements, and as such figures into the development of the BTS TDP. Sections of particular interest include *Goals, Policies, and Strategies*, which provides guidance for transportation decision-making, and *Implementation*, which outlines key state initiatives that should be incorporated into plan development.

Goals, Policies, and Strategies

Goal 1 (*Mobility and Accessibility*) presents several important policies and strategies which should be considered through development of the BTS TDP.

- Policy 1.1 – Development of an Integrated Multimodal System

- Strategy 1.1.1 calls for regional and local transportation plans to address existing and future centers of economic activity, routes and modes connecting passenger facilities and freight facilities, intermodal facilities and industrial land, and major intercity and intra-city transportation corridors and supporting transportation networks.
- Strategy 1.1.2 involves promoting the growth of intercity bus services, along with other transportation modes, to link all areas of the state with national and international transportation facilities and services, as well as increasing the frequency of intercity services to provide travel options.
- Strategy 1.1.3 emphasizes consideration of interstate transportation needs and cooperation with neighboring states to improve interstate travel.
- Policy 1.2 – Equity, Efficiency, and Travel Choices
 - Strategy 1.2.1 entails developing and promoting inter- and intra-city public transportation. Steps include optimizing existing services; finding innovative ways to augment existing public transportation infrastructure and travel options; working to coordinate services; using information technologies effectively; and promoting frequent public transit, intercity bus, and passenger rail services to increase ridership and decrease travel times, particularly during peak travel periods and along heavily traveled corridors.
 - Strategy 1.2.2 calls for better integrating, locating, and designing passenger and freight multimodal transportation facilities and connections to expedite travel and provide travel options. Steps include locating bus and train stations together; coordinating intermodal connections; retrofitting roadways to support access to public transportation; supporting the development of grid street networks to increase connectivity and travel options; and supporting the development of adequate bicycle and pedestrian facilities.
- Policy 1.3 – Relationship of Interurban and Urban Mobility
 - Strategy 1.3.1 entails using a regional planning approach and inter-regional coordination to address problems that extend across urban growth boundaries.
 - Strategy 1.3.2 calls for development, maintenance, and improvement of parallel roadways and transit to provide alternatives to using intercity highways for local trips.

Goal 3 (*Economic Vitality*) also contains several relevant policies and strategies.

- Policy 3.2 – Moving People to Support Economic Vitality
 - Strategy 3.2.1 involves increasing coordination among various agencies and jurisdictions in order to facilitate travel through the support of trip planning,

- convenient and reliable intermodal connections, and shared tickets among carriers.
- Strategy 3.2.2: In regional and local transportation system plans, support options for traveling to employment, services, and businesses.
- Strategy 3.2.3: Support intercity bus to facilitate business and recreational travel.
- Policy 3.3 – Downtowns and Economic Development
 - Strategy 3.3.1: Coordinate private and public resources to provide transportation improvements and services to help stimulate active and vital downtowns, economic centers and main streets.
 - Strategy 3.3.2: Integrate transportation planning and investments with state and local economic development strategies and plans.
- Policy 3.4 – Development of the Transportation Industry
 - Strategy 3.4.2: Partner with public transportation providers and the private sector to develop innovative ways to deliver goods and services more efficiently such as public transportation services in rural areas.
 - Strategy 3.4.3: Partner with the private sector and public agencies to foster sustainable transportation services in rural areas.

Goal 4 (*Sustainability*) further outlines a number of potentially relevant policies and strategies.

- Policy 4.1 – Environmentally Responsible Transportation System
 - Strategy 4.1.2: Encourage the development and use of technologies that reduce greenhouse gases.
 - Strategy 4.1.4: Work collaboratively to streamline permit procedures and gain efficiencies to transportation system improvements while meeting or exceeding environmental benefits or regulations.
 - Strategy 4.1.5: In the construction and maintenance of transportation infrastructure and facilities, reduce the consumption of non-renewable construction materials, promote their efficient use and reuse, and reduce other environmental impacts such as stormwater impacts where appropriate
 - Strategy 4.1.6: To determine the most cost-effective investments, consider using life-cycle costs in transportation maintenance, purchase of equipment, selection of materials, and design and engineering of infrastructure where appropriate.
- Policy 4.2 – Energy Supply
 - Strategy 4.2.2: Support the conversion of passenger vehicles and public transportation fleets to more fuel-efficient and alternative fuel vehicles, especially

to those using renewable and cleaner fuels. Review and change the tax credit provisions to encourage these activities as appropriate.

- Strategy 4.2.3: Work with federal, state, regional and local jurisdictions and agencies as well as transportation providers, shippers and the general public to develop a contingency plan for fuel shortages affecting passenger and freight transportation.
- Policy 4.3 – Creating Communities
 - Strategy 4.3.1: Support travel options that allow individuals to reduce vehicle use.
 - Strategy 4.3.2: Promote safe and convenient bicycling and walking networks in communities by: (1) filling in missing gaps in sidewalk and bikeway networks, especially to important community destinations such as schools, shopping areas, parks, medical facilities, and transit facilities; (2) enhancing walking, bicycling and connections to public transit through appropriate community and main street design; and, (3) promoting facility designs that encourage walking and biking.
 - Strategy 4.3.4: Promote transportation facility design, including context sensitive design, which fits the physical setting, serves and responds to the scenic, aesthetic, historic, and environmental resources, and maintains safety and mobility.
 - Strategy 4.3.5: Reduce transportation barriers to daily activities for those who rely on walking, biking, rideshare, car-sharing and public transportation by providing access to public transportation and the knowledge of how to use it, as well as providing facility designs that consider the needs of the mobility-challenged including seniors, people with disabilities, children and non-English speaking populations.

Goal 5 (*Safety and Security*) contains several relevant policies and strategies.

- Policy 5.1 – Safety
 - Strategy 5.1.3: Ensure that safety and security issues are addressed in planning, design, construction, operation and maintenance of new and existing transportation systems, facilities and assets.
 - Strategy 5.1.4: Support the further development and improvement of interoperable communication systems among safety and security-related agencies, jurisdictions and private entities. Ensure that clear communication protocols are established.
 - Strategy 5.1.9: Develop and implement a reliable, comprehensive, and coordinated multimodal transportation data, crashes and incidents reporting program to manage and evaluate transportation safety with the goal of better data integration.

- Policy 5.2 – Security
 - Strategy 5.2.1: Encourage the development of security plans for all modes of transportation encompassing prevention, detection and response. Security plans should provide for coordinated response across all entities and prioritize actions based on critical impact.
 - Strategy 5.2.2: Promote the development of cost-effective security measures for transportation facilities and infrastructure.

Goal 6 (*Funding the Transportation System*) contains a relevant policy and strategy:

- Policy 6.1 – Funding Structure
 - Strategy 6.1.3: Develop a transportation finance system which consciously attempts to provide equity among competing users, payers, beneficiaries, transportation systems providers, and regions of the state.

Goal 7 (*Coordination, Communication, and Cooperation*)

- Policy 7.3 – Public Involvement and Consultation
 - Strategy 7.3.1: In all phases of decision-making, provide affected Oregonians early, open, continuous, and meaningful opportunity to influence decisions about proposed transportation activities. When preparing and adopting a multimodal transportation plan, etc., conduct and publicize a program for citizen, business, and tribal, local, state and federal government involvement. Clearly define the procedures by which these groups will be involved.
 - Strategy 7.3.3: Seek out and facilitate the involvement of those potentially affected including traditionally underserved populations.
- Policy 7.4 – Environmental Justice
 - Provide equal access to public information and decision-making about transportation planning, financing, construction, operations, and maintenance activities.

OREGON HIGHWAY PLAN (MAY 1999)

The 1999 Oregon Highway Plan (OHP), most recently revised in 2006, is a modal element of the Oregon Transportation Plan. The following portions of the OHP relate to aspects of the BTS TDP update:

- Policy 1B: Land Use and Transportation

- Action 1B.1: Work with local governments to develop and implement plans that support compact development, especially within community centers and commercial centers. Support plans, strategies and local ordinances that include:
 - Parallel and interconnected local roadway networks to encourage local automobile trips off the state highway;
 - Transit, bicycle, and pedestrian facilities, including street amenities that support these modes
 - Design and orientation of buildings and amenities that accommodate pedestrian and bicycle use as well as automobile use;
- Action 1B.6: Develop design guidelines for highways that describe a range of automobile, pedestrian, bicycle or transit travel alternatives. The guidelines should include appropriate design features such as lighted, safe and accessible bus stops, on-street parking, ample sidewalks, pedestrian crossings, pedestrian scale lighting, street trees and related features.
- Action 1B.14: Work to accommodate alternate modes on state highways according to the various types of land uses and highways. Work toward development of alternate mode facilities in Special Transportation Areas, Commercial Centers and Urban Business Areas according to the other actions in this policy and to Table 4 on page 61. Use the following objectives to guide project design and development in other areas:
 - Within Urban Growth Boundaries:
 - On Expressways:
 - Accommodate bicycle lanes, if any, on shoulders or separated facilities.
 - Although pedestrians are generally not accommodated on Expressways for safety reasons, analyze accommodation on a case-by-case basis.
 - On Other Urban Statewide, Regional and District Highways:
 - Accommodate bicycle lanes and sidewalks and other pedestrian facilities, especially in commercial centers and community use areas.
 - Provide convenient pedestrian crossings, especially at transit stops and other high-use generators.
 - Design intersections to address the needs of pedestrians and bicyclists.

- Outside Urban Growth Boundaries:
 - In unincorporated communities, address pedestrian crossing safety. This may be addressed through traffic signals and medians designed to serve as pedestrian refuges.
- Policy 1G: Major Improvements
 - Action 1G.1: Use the following priorities for developing corridor plans, transportation system plans, the Statewide Transportation Improvement Program, and project plans to respond to highways needs. Implement higher priority measures first unless a lower priority measure is clearly more cost-effective or unless it clearly better supports safety, growth management, or other livability and economic viability considerations. Plans must document the findings which support using lower priority measures before higher priority measures.
 - Action 1G.2. Improve efficiency and capacity of existing highway facilities. The second priority is to make minor improvements to existing highway facilities access for alternative modes (e.g. bike lanes, sidewalks, and bus shelters), extending or connecting local streets, and making other off-system improvements.
- Policy 2E: Intelligent Transportation Systems

It is the policy of the State of Oregon to consider a broad range of Intelligent Transportation Systems services to improve system efficiency and safety in a cost-effective manner. Deployment of ITS shall reflect the user service priorities established in the Oregon Intelligent Transportation Systems Strategic Plan

- Action 2E.6: Create a statewide network for real time weather, road condition, traffic, traveler services, and public transportation information.
- Action 2E.7: Encourage transit operators and emergency service providers to develop standardized dispatching, vehicle monitoring, and vehicle priority systems.
- Policy 2F: Traffic Safety: It is the policy of the State of Oregon to continually improve safety for all users of the highway system using solutions involving engineering, education, enforcement, and emergency medical services.
 - Action 2F.3: In identifying solutions to traffic safety problems, consider solutions including, but not limited to
 - Constructing appropriate bicycle and pedestrian facilities including safe and convenient crossings.
- Policy 4B: Alternative Passenger Modes: It is the policy of the State of Oregon to advance and support alternative passenger transportation systems where travel demand, land use,

and other factors indicate the potential for successful and effective development of alternative passenger modes.

- Action 4B.1: Promote alternative passenger transportation services in commute highway corridors to help maintain or meet established performance standards.
 - Action 4B.2: Promote alternative passenger transportation services located off the highway systems that help to preserve the performance and function of the state highway system.
 - Action 4B.3: Encourage the development of alternative passenger services and systems as part of broader corridor strategies, and coordinate them with necessary supportive local actions. Such actions include developing applicable land use regulations, appropriate types of passenger services, adequate collector-distributor roadway systems, and other local transportation system elements.
 - Action 4B.4: Encourage the use of alternative passenger modes to reduce local trips on the state highway system where limited highway facilities accommodate large numbers of both intercity and local trips.
 - Action 4B.5: Support the further development of alternative intercity passenger services in congested transportation corridors through additional peak hour service, use of excess freight rail system capacity, and the provision of support facilities and services which help connect passengers to their destinations (e.g., intercity passenger rail, air, and/or shuttle or charter bus operations coordinated with parking areas).
 - Action 4B.6: In recreational corridors, promote shuttles and/or charter passenger transportation services, coordinated with off-site parking areas, to lessen congestion during peak periods for travel to significant tourist/visitor destination areas.
- Policy 4E: Park-and-Ride Facilities: It is the policy of the State of Oregon to encourage the efficient use of the existing transportation system and to seek cost-effective expansion of the highway system's passenger capacity through development and use of park-and-ride facilities.
 - Action 4E.1: In coordination with local jurisdictions and based on an analysis of need and potential use, provide park-and-ride facilities at appropriate urban and rural locations adjacent to or within the highway right-of-way.
 - Action 4E.2: Acquire right-of-way for park-and-ride facilities during construction or expansion projects as appropriate. Consider acquisition and use of adjacent right-of-way for park-and-ride facilities at highway interchanges, consistent with ODOT access management policies and standards.

- Action 4E.3: Establish partnerships with other jurisdictions and the private sector to site park-and-ride facilities.
- Action 4E.4: Convert informal parking areas within highway rights-of-way to formal park-and-ride facilities where appropriate.
- Action 4E.5: Use ODOT surplus property for park-and-ride facilities where appropriate.
- Action 4E.6: Provide park-and-ride facilities located in urban areas that are safely accessible by pedestrians, bicyclists, and transit users whenever feasible. Include secure bicycle parking in urban park-and-ride designs.

OREGON BICYCLE AND PEDESTRIAN PLAN (1995, 2011)

This review focuses on the adopted version of the Oregon Bicycle and Pedestrian Plan. This plan is broken into two parts, the 1995 Oregon Bicycle and Pedestrian Plan and the Bicycle and Pedestrian Design Guide, which adopted in 2011 and updated the design portion of the 1995 Oregon Bicycle and Pedestrian Plan. An update of the 1995 plan is scheduled to occur in 2013.

This review focuses on the 2011 Bicycle and Pedestrian Design Guide since that document pertains to specific design considerations to transit stops and transit facilities

In the public transit portion of the introduction, it is stated that high priority should be given to providing sidewalks and bikeways on transit routes and on local streets feeding these routes. It also gives three factors to take into account when deciding the location of transit stops:

- **Passengers:** stops must be near places where there is an expectation of riders;
- **Access:** if a stop cannot be located right where riders are, people must be able to get to the stop conveniently;
- **Traffic characteristics:** bus stops are not always located in ideal locations for riders because of complex traffic patterns, especially at intersections.

There are four types of bikeways listed in this plan (Shared Roadway, Bicycle Boulevard, Shoulder Bikeway, Bike Lane), and design standards and recommendations are provided for each type. In addition, Chapter 1 provides a number of details related to bicycle facility design.

Chapter 2 of the plan identifies approaches and design considerations related to retrofitting bike lanes to existing urban roadways that were built without bike lanes. The following three approaches are proposed:

- Marking and signing existing shoulders as bike lanes;
- Widening the roadway to add bike lanes; or

- Restriping the existing roadway to add bike lanes.

Chapter 3 of the plan provides standards and recommendations for short- and long-term bike parking. It recommends the following should be considered when designing bicycle parking:

- Don't bend wheels or damage other bicycle parts;
- Accommodate high security U-shaped bike locks;
- Allow users to secure the frame and both wheels;
- Don't obstruct pedestrians (especially when bikes are parked);
- Are covered where users will leave their bikes for a long time; and
- Are easily accessed from the street and protected from motor vehicles.

Chapter 4 of the plan details walkways and identifies three types: sidewalks, paths, and shoulders. Standards and guides have been given as to walkway designs. This section also covers the standards on transit connections, as well as accommodating people with disabilities. The transit stop connections subsection details sidewalk, bus shelter, bus pullouts, bus curb extensions, and transit stop crossings.

Other aspects of the Plan that apply to the BTS TDP Update include street crossing and intersection design for pedestrians and bicycles, and standards and guidelines for shared-use path design.

OREGON HIGHWAY DESIGN MANUAL (DECEMBER 2003)

The Highway Design Manual (HDM) provides uniform design standards and procedures for ODOT. It is intended to provide guidance for the location and design of new construction, major reconstruction, and resurfacing, restoration, and rehabilitation projects. This document includes a chapter focusing on pedestrian and bicycle, and a chapter with design guidelines for public transportation. Other chapters also provide some information relating to the pedestrian, bicycle, and transit modes. Since its completion in year 2003, this manual has been updated and revised several times. The manual provides too many details to be repeated here; instead, a summary of the relevant sections is given below, along with a few key design points.

- Chapter 9, *Intersection and Interchange Design*, covers the design guidelines, standards, and process for designing road approaches, signalized and unsignalized at-grade intersections, and interchanges for State Highways. This chapter also discusses bicycle and pedestrian needs in the design of intersections and interchanges.
- Chapter 11, *Pedestrian and Bicycle*, provides general guidance for bicycle and pedestrian movements. Some key points are highlighted below.
 - Urban Highways

- Bicycle Accommodation: Shoulders are necessary for safety, capacity, and maintenance reasons. The manual also provides the standard width for bike lanes.
 - Pedestrian Accommodation: Sidewalks separated with a buffer are the preferred facility for pedestrians.
 - Sidewalk Dimensions: The manual specifies the standard width for sidewalks and lists several conditions that require greater widths.
 - Americans with Disabilities Act: Sidewalks and connections to private properties must be built so people with limited mobility and sight can easily use them. This section covers standards and guidance to make them accessible.
- Transit Stops: If a highway project is on a transit route, a complete sidewalk system should be provided for the length of the project. If the project ends at a transit stop, sidewalks should continue to the nearest intersection or to the nearest section of existing sidewalk. There are standards about bus stops in this section. Additionally, the location of bus stops in relation to street crossing opportunities is discussed.
 - Street Crossings: Sidewalks provide mobility along the highway, but full pedestrian accommodation also requires frequent, safe and convenient crossing opportunities. In most cases, it is best to combine measures to improve pedestrian crossing opportunities and safety. Potential measures include raised medians, crossing islands, curb extensions, illumination, crosswalks, pedestrian signals, signing, and sight distance improvements.
- Chapter 12, *Design Guidelines for Public Transportation*, provides guidance to designers for integrating good public transportation design practices into projects. The best practices outlined in this section are intended to provide consistent guidance for all designers.
 - Design Considerations:
 - Yield to Bus Law: This law influences the decision of the local jurisdiction and ODOT between constructing bus pullouts and curbside stops.
 - Bus Signal Priority System: These systems can provide arriving buses the capability to alter the timing (but not the sequence) of green intervals at traffic signals. Discussions with the local transit agency will result in identifying the need for bus priority signalization.
 - Americans with Disabilities Act: Public transportation provides service to persons with disabilities. Designs must comply with the requirements of the Americans with Disabilities Act.

- Safety and Personal Security: Design considerations include safety elements such as pedestrian access, passenger visibility, and traffic impacts, and personal security elements such as lighting, nearby development, and open areas.
- Bus Stops: The spacing, location, and design of bus stops significantly influence transit system performance and ridership.
 - Bus Stop Location Selection must address both traffic operation issues and passenger accessibility issues. If possible, the bus stop should be located in an area where typical improvements, such as a bench or shelter, can be placed in the public right of way. Elements to consider in bus stop placement include the following:

Use:

- Proximity to major trip generators;
- Presence of sidewalks, crosswalks, and curb ramps;
- Connection to nearby pedestrian circulation system;
- Access for people with disabilities; and
- Convenient passenger transfers to other routes.

Traffic and Rider Safety:

- Conflict between buses and other traffic;
- Passenger protection from passing traffic;
- All weather surface to step to/from the bus;
- Open and lighted spaces for personal security and passenger visibility; and
- Street illumination.

Bus Operations:

- Adequate curb space for the number of buses expected at the stop at one time;
- On-street automobile parking and truck delivery zones;
- Traffic control devices near the bus stop, such as traffic signals or stop signs;
- Volumes and turning movements of other traffic, including bicycles;
- Width of sidewalks;

- Pedestrian activity through intersections;
 - Proximity and traffic volumes of nearby driveways;
 - Street grade;
 - Ease of re-entering traffic stream; and
 - Proximity to rail crossing.
- Bus Stop Layout and Delineation: The bus stop must be clearly delineated to ensure that other traffic will not use the stop area and to give bus operators direction on where to stop the bus.
 - Guidelines for Special Treatments:
 - Bus Pullouts: Bus stops may be designed with a pullout, which allows the transit vehicle to pick up and discharge passengers in an area outside the traveled way. Bus pullouts are provided primarily on high-volume and/or high-speed arterials. Well placed, carefully designed bus pullouts offer safe passenger loading and unloading with minimal delays to both transit and other roadway traffic.
 - Curb Extensions: A curb extension may be constructed along streets with on-street parking in areas with high pedestrian use such as downtown shopping districts and central business districts. Curb extensions may be designed in conjunction with bus stops to facilitate bus operations and passenger access.
 - Bus Pads: Very concentrated loads, coupled with the dynamic nature of braking, places high demands on the pavement at bus stops. Some curbside stop areas may require strengthened pavement sections.

Park-and-Ride facilities provide parking for people who wish to transfer from their personal vehicle to public transportation or carpools/vanpools. The manual provides guidance on siting and designing park-and-ride facilities.

Chapter 13 includes specific design features and dimensions for bus facilities on state highways.

KLAMATH COUNTY COMPREHENSIVE PLAN (2010)

The Klamath County Comprehensive Plan was originally adopted in 1984 and last updated in January 2010. The Comprehensive Plan includes general transportation policies in the Goal 12 chapter, but more detailed transportation policies are included in the Klamath County Rural Transportation System Plan, reviewed separately in this memorandum. Relevant policies from the Comprehensive Plan are listed below by Goal.

Goal 10 – Housing:

11. POLICY: The County will encourage the use of planned unit development (PUDs) and other forms of clustered housing that introduce innovative and cost-effective approaches to siting, block layout, design and landscaping.

Goal 11 – Public Facilities:

1. POLICY: In order to achieve the requirements of State-wide Planning Goal 11, the County shall, in cooperation with the City of Klamath Falls, prepare and adopt a public facilities plan describing the water, sewer, transportation, and other urban facilities and services which are to support land uses within the Klamath Falls UGB.

2. POLICY: The County may encourage the development of a public facility or service in an urbanizable area only when there is provision for the coordinated development of all other urban facilities and services appropriate to the area.

Goal 12 – Transportation:

5. POLICY: The width and spacing of driveways along arterials shall be restricted. Where necessary, turning lanes cut out of abutting property or the construction of parallel frontage roads shall be required, if adequately proven to be necessary by the governing body or agency.

Implementation: The Land Development Code establishes development standards regulating ingress and egress of land uses abutting major arterials.

6. POLICY: Higher density residential development should when feasible, be located within walking distance (1,000 feet to one quarter mile) of major arterials.

Implementation: The land use plan should locate, when feasible, higher density residential development near major arterials, and the Land Development Code shall require pedestrian walkway along future streets.

7. POLICY: The County shall encourage local governments to improve the convenience and safety of pedestrian and bicycle transportation.

8. POLICY: The Country shall encourage existing airports to be maintained and improved, and encourage the development of additional airports as needed.

10. POLICY: Height and use of structures within the approach and departure zones designated for the Klamath Falls Municipal Airport in the 1976 Airport Master Plan shall be limited (Arnold Thompson Associates, Inc., Master Plan, Klamath Falls Municipal Airport, April, 1976); specifically:

A. The height of all structures within the airport approach and departure zones shall be limited.

B. All residential and heavy-use (i.e., uses where large numbers of people congregate) land uses within the airport approach safety zones shall be restricted or prohibited.

C. Uses which would create interference with or hazards to aviation shall be prohibited.

11. POLICY: A safe, convenient and economic transportation system, adequate to serve anticipated growth, shall be developed that will minimize adverse social, economic and environmental impacts and costs of the transportation systems.

Goal 14 – Urbanization:

3. POLICY: During partitioning or subdividing of urban land, the County shall encourage parcels of adequate dimension so as to maximize the utility of land resources and enable the logical and efficient extension of services to such parcels.

Implementation: The land use plan designates residential densities that follow a hierarchy of high to low densities from central to outer areas.

Updated TSP goals and policies will need to be found consistent with County transportation goals and policies that pertain to the Klamath Falls Urban Area.

KLAMATH COUNTY TRANSPORTATION SYSTEM PLAN (2010)

The Klamath County Transportation System Plan (“County TSP”) provides for transportation development in the rural areas of the County. The planning area for the Klamath County TSP is generally outside the Klamath Falls Urban Growth Boundary. The plan includes transportation issues related to the incorporated cities of Chiloquin, Bonanza, Merrill and Malin; the TSP also addresses proposed capital investments in rural communities. Overall, the TSP includes transportation issues related to state and county facilities, and not urban facilities.

Chapter 3 identifies major county roadways and briefly describes their current use and condition; appendices A, B, and C provide detailed information about county roads and their current condition, including paving and presence of certain features such as sidewalks. Chapter 3 notes that all of the most heavily used county roads identified have one lane in each direction, that none have curbs, sidewalks or parking, and that traffic controls are stop signs.

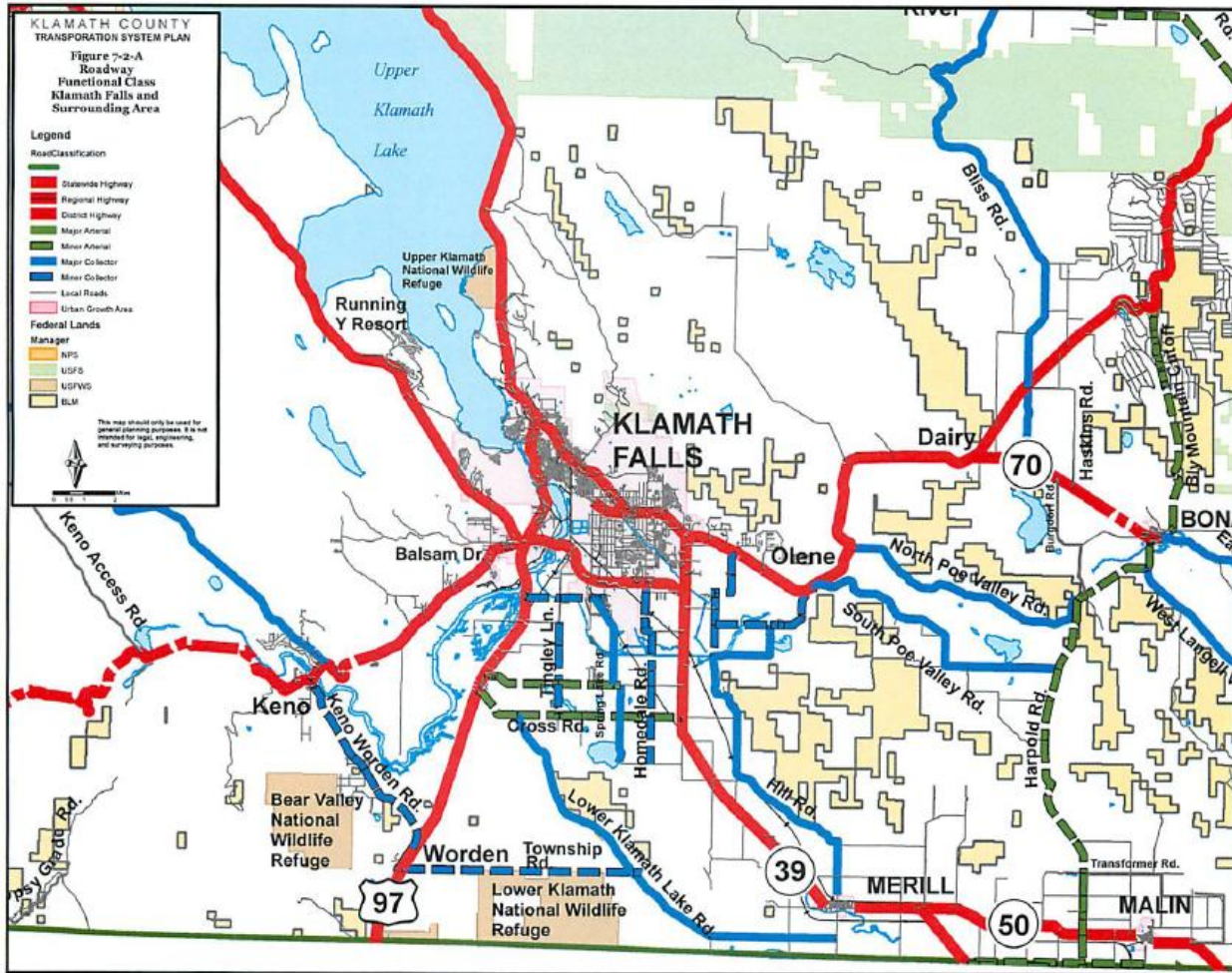
Chapter 3 also identifies dedicated bike facilities in the county, including the State Park Trail, a paved “Rails to Trails” corridor extending east from Klamath Falls to the rural community of Olene, utilizing the old railroad right-of-way.

The County TSP includes a description of the Klamath Falls Airport (Kingsley Field). The Airport offers commercial air service (7 percent of operations), general aviation services (56 percent), air taxi services (7 percent), and also is home to the Oregon Air National Guard 173rd Fighter Wing (30 percent). Land uses adjacent to the airport include:

- An industrial park developed by Klamath Economic Development group
- A new Business Park adjacent to the airfield, developed by the airport on airport property

- Agricultural lands
- Minor residential development

Chapter 7 includes sections addressing roads, transit, bicycle and pedestrian facilities. The Roadway Element includes a map of roadway functional classification around Klamath Falls, reproduced below, and a description of each classification.



In Klamath County, rural roadways generally do not require separate bicycle or pedestrian facilities. Bicyclists and pedestrian are generally accommodated on the shared roadway or on a shoulder, depending on traffic volumes. 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 and/or pedestrian activity, the standards suggest a pathway, preferably located on both sides of the roadway, separated from the roadway by at least five feet of greenbelt or a drainage ditch.

The implementation chapter (Chapter 9) notes that because the scope of the TSP does not include the Klamath Falls urban area, the focus of the recommended plan and code amendments pertain to:

- Rural portions of the county and urban areas for the remaining cities;
- Protecting street and road operations including implementing access controls and conditions on new development;
- Encourage alternatives to automobile use by providing safe and convenient pedestrian and bicycle circulation; and
- Reduced parking requirements where possible.

CITY OF KLAMATH FALLS COMPREHENSIVE PLAN (1981)

The City of Klamath Falls Comprehensive Plan was adopted in 1981 and the document itself has not been updated since that time.¹ Much of the background documentation describing existing transportation conditions was generated in the late 1970's and is not relevant to planning the future transportation system. Despite the age of the document, the adopted Comprehensive Plan remains the City's policy basis on which to make decisions. However, because updated Klamath Falls Urban Area TSP resulted in updated transportation goals and revised and new transportation policies based on up-to-date facts and analysis, the goals and policies from the Comprehensive Plan Transportation Element are not included in this memorandum. The following goals and policies also have bearing on transportation planning and are from other elements of the Comprehensive Plan.

K. HOUSING ELEMENT

Housing - Policies

97. *The interrelationship of transportation, job sites, shopping sites, recreation, open space and scenery, education, and similar activities will be emphasized to provide maximum and efficient use of public facilities and service.*

U. LAND USE ELEMENT

Land Use - Policies

231. *Residential densities adjacent to major arterials will be increased.*
233. *Core area residential densities will be as high as practical for energy and transportation advantages.*
234. *Maintenance and improvement of established residential areas will be promoted.*

¹ In September 2003 the City of Klamath Falls convened a stakeholder committee to participate in a Comprehensive Plan and Code Audit funded by the Transportation and Growth Management (TGM) Program. The Final Audit Report (Angelo Eaton & Associates, 2004) contains recommendations for Comprehensive Plan and Community Development Ordinance amendments that are consistent with "smart development" principles, which are also described in that Report. A Comprehensive Plan update followed the audit, resulting in a May 2005 draft document that included updated land use and transportation policies. The 2005 Draft City of Klamath Fall Comprehensive Plan was not adopted by the City.

238. *Strip commercialism will be avoided, due to its adverse effects on traffic, energy, safety, and convenience.*

V. URBANIZATION ELEMENT

Urbanization - Policies

153. *Coordination of comprehensive planning with State and County officials will be promoted.*

KLAMATH FALLS URBAN AREA TRANSPORTATION SYSTEM PLAN (2012)

The Klamath Falls Urban Area Transportation System Plan (“urban area TSP”) is “intended to guide the management and implementation of the transportation facilities, policies, and programs within the urban area [of Klamath Falls] over the next 25 years.” The plan includes area governed by both the City of Klamath Falls and Klamath County. Differing from the Klamath County Rural TSP, the urban area TSP focuses on area within the urban growth boundary (UGB) and, as such, urban facilities.

Several goals outlined in Section 2 of the urban area TSP pertain to the BTS TDP update. These include:

- Goal #1: Ensure a safe and efficient transportation system for all users.
- Goal #2: Provide access to the transportation system for all users.
- Goal #6: Improve system performance by balancing mobility and access, particularly along main travel routes.
- Goal #7: Minimize the impacts of transportation system development on the natural and built environment.

Section 4, Section 5, Section 6, Section 7, and Section 8 of the urban area TSP present the Roadway, Pedestrian Facilities, Bicycle Facilities, Transit System, and Rail, Air, Pipeline, & Surface Water Plans, respectively. These plans discuss the existing conditions analysis that was conducted for each travel mode, the future conditions (year 2035) analysis (where applicable), and any relative plan elements that have been included in the TSP.

The Roadway plan identifies a number of policies related to access spacing, functional classification, and freight route designation that could be applicable to the BTS TDP update. In addition, a number of roadway improvement projects including spot intersection improvements as well as planned roadway upgrades or extensions are outlined. It should be noted that the Roadway Plan includes policies to include bicycle and pedestrian facilities on all future roadways designated as collector or higher. In addition, urban area TSP specifies that these facilities should also be added to existing facilities where possible.

The Pedestrian and Bicycle Facilities Plans focus on facility improvements that would fill in significant gaps in the existing systems. In addition, the planned pedestrian facilities focus on providing complete sidewalks in the vicinity of schools, particularly elementary and middle schools. The Plans also include a future extension of the OC&E trail to downtown Klamath Falls via a pedestrian and bicycle bridge the would extend across the existing rail yard south of the existing South 6th Street bridge.

The Transit Plan documents the existing transit service provided by BTS, including the fixed route, dial-a-ride, and historical trolley tours. The urban area TSP also includes recommendations based on future land use densities that could be transit supportive. These recommended improvements are shown in Table 7-1 recreated below.

Table 7-1: Transit Projects

Project Number	Name	Description	Operations Costs	Priority
T1	Route 1 frequency	Would increase frequency of service on Route 1	\$1,300,000/year	Low
T2	Route 1 operating hours	Would extend operating hours of Route 1	\$300,000/year	Low
T3	Route 2 route modifications	Would modify Route 2 to serve downtown and South 6 th Street	N/A	Low
T4	Route 5 route modifications	Would modify Route 5 to serve OIT, Dan O'Brien Way, Pelican City, and Downtown	N/A	Low
Total:			\$1,600,000/year	

The urban area TSP includes guidance to include by reference any improvements identified by this update within the urban area TSP.

Section 9 of the documents "Vision Projects" that are included in the urban area TSP. These are projects were identified as needed based on sub-area analysis that have been conducted throughout the urban area, but were not identified as needs through the horizon year of the TSP. The urban area TSP notes that varying development patterns or intensities could result in these projects being needed earlier than anticipated.

The urban area TSP reviewed and incorporated the findings, as applicable, of the Klamath Falls West Side Refinement Plan, Orindale/Balsam Sub-Area Transportation Master Plan, Campus Area Sub-Area Master Plan, and Basin View PUD Standards.